

DUNE™ II

The Building of A Dynasty

Insider's Guide

Westwood™
STUDIOS



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The Battle for Arrakis

Introduction

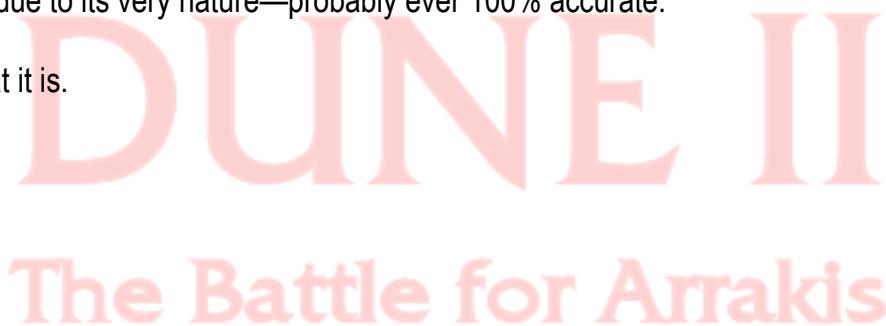
The first real-time strategy game—Dune II—was released by Westwood Studios in 1992. Since then many documents have been written regarding the game. This document is an attempt to exhaust and pre-empt them all.

Most of the information in this guide is collated from a variety of sources, and a big chunk of it is based on original research. The bulk of the data for part one is from Ledmeister's excellent reference for the Sega version, rewritten for the PC and vastly expanded with new information. Other main sources of information are Maarten Meuris', Patric Stout's and Robert Crossfield's excellent reverse engineering efforts. The rest is harvested from a field of different bulletins, dispatches, releases, pages, disclosures, lists, communications, drafts, sites, obituaries, documents, tables, posts, descriptions, papers, registers, archives, discussions, codes, notes, publications, reports, manuals, forums, communiqués, messages, reviews, comments, walkthroughs, articles, and FAQs.

None of it is—due to its very nature—probably ever 100% accurate.

Take it for what it is.

Temporary



PART 1 **ARRAKIS**

DUNE II

The Battle for Arrakis

1.1 Features of Arrakis

Spice

There is a fixed amount of spice in each mission, and a fixed number of Spice Blooms in missions that include them. Spice on sand appears in single and double layers. Harvesters process all spice at one fixed speed, one layer at a time.

While the initial amount of spice is set for every map, the true measure is indeterminate; spice can be destroyed as well as added. As a consequence the effective extent of spice for any and all maps ranges from zero to infinite. For more details about this, see *Appendix 4: Exploits and Hacks*.

A single square of spice sand contains the equivalent of 175 credits of spice, filling a harvester to 25% of capacity. The double layers of spice, also called spice dunes—recognizable by their darker color—contain 4 times the spice of a single layer of spice. One square of a spice dune contains the equivalent of 700 credits of spice, and completely fills a harvester to capacity.

Spice fields can be damaged by cannon fire, Death Hand missiles, rocket impacts, and most missile impacts, on either the spice itself, on units above the spice, or on sandworms under the spice. A self-destructing Devastator will also damage or destroy any spice layers under or adjacent to it.

Spice fields cannot be directly damaged by rifle fire, machinegun fire, Deviator missile impacts, sonic blasts, or sandworm activity.

The Computer-controlled House makes little actual use of spice *per se*; within certain limitations it has unlimited funds and mostly harvests spice as a cosmetic enhancement to game play. Since the computer has little use for the spice for many of its operations, such as repairs and reconstructing buildings, any spice it harvests is merely subtracted from the map total for the human player. The computer Computer-controlled Houses do use credits, however, and they can run out of them.

Spice fields—of any kind—are considered terrain by the game engine. However, spice fields are the only types of terrain that can be modified during the game.

Spice Bloom

A spice bloom is the only terrain feature that can be directly targeted for attack by most ground units. Only a Devastator can directly "target" any other type of accessible terrain, by moving over it and self-destructing.

Ornithopters cannot target spice blooms.

The manual mentions that the player can be awarded units when detonating a spice bloom. This never happens. The manual was printed before the game was finished. After focus testing Westwood decided to remove this option of the game because it could give one side a large advantage over the other.

When a spice bloom is touched by any ground vehicle or solid projectile, it detonates, producing a spice field. This field will be composed of a single layer of spice around a double-layer spot at the point of detonation.

Spice produced by a spice bloom will not be deposited on sand dunes, on rock, or over any spice already on the sand near the bloom.

Spice can appear underneath any units which are on the sand near a detonating spice bloom. Note that a harvester in Guard mode on empty sand will not automatically begin harvesting if spice appears underneath it.

A unit which is ordered to fire on a spice bloom will fire one salvo at the bloom, and then go into Guard mode. This remains true even if the unit's projectiles miss or otherwise have no effect on the bloom. A spice bloom will not be affected by sonic blasts.

Only missiles, rockets and sonic blasts can be fired across a spice bloom; all other solid projectiles will strike an intervening spice bloom. For example, a troopers unit firing rockets at a sonic tank would not disturb a spice bloom located directly between the two units. Likewise, if the sonic tank returned fire, the bloom would remain unaffected. By contrast, if two opposing quads attack one another, and there is a spice bloom directly between them, the first one that fires will hit the bloom, detonating it.

If a unit is ordered to fire on a spice bloom, but the bloom is detonated before the unit can execute the order, the unit will still attempt to comply, moving—if necessary—to within firing range, and then firing once at the spot where the bloom existed. The unit will then go into Guard mode.

Sandworms can move under or through spice blooms without triggering them. If a spice bloom is detonated while a sandworm is occupying the same space, the worm is destroyed.

Revealed or detected spice blooms will appear as red dots on the radar screen.

Spice blooms are not present in all missions.

The Computer-controlled forces will not intentionally detonate a spice bloom, although they might do so incidentally, either by walking on top of a spice bloom with a soldier, or a trooper, or by driving a tracked or wheeled unit over the spice bloom.

The special blooms that may appear on non-retail maps serve little to no tactical function. Only House Ordos may benefit from them in a decisive way. For the other Houses the special blooms serve no purpose. See Appendix 2 on map formats for more in-depth information regarding the anomalous special blooms.

Speed sanctions of Arrakis terrain

All terrain features of Arrakis will have some impact on the speed of all units. There are essentially six different types of units in the game; infantry, such as troopers and soldiers; tracked units, such as tanks and devastators; harvesters (which form their own type of vehicle); wheeled units, such as quads or trikes; winged units, such as ornithopters or carryalls; and slithering units, of which there is only one unit type, the sandworm.

While there are essentially four different types of obvious terrain on Arrakis—sand, dunes, rock, and hills—certain other features are considered terrain by the game engine.

The not so obvious terrains are concrete, walls, structures, rubble, and spice blooms.

The unfinished special blooms are considered terrain, as well. The speed sanction when a unit is driving or walking over a spice bloom is hardly noticeable, since the triggering unit will either be destroyed in the case of a standard spice bloom, or the bloom will produce a second unit in the case of a special bloom. The destruction of the triggering unit or the creation of the new unit happens within a game tick; the player can never notice it.

The double layered spice—which is actually a quadruple spice layer—has the same speed impact on the units as the single layered spice field. The only difference is the layered spice makes wheeled units wobble.

Speed decrease per terrain

Terrain	Infantry	Tracked	Harvester	Wheeled	Winged	Slither
Sand	3/7	3/7	3/7	4/7	N/A	3/4
Sand edge	4/7	3/7	3/7	1/4	N/A	0
Dune	3/7	4/7	4/7	4/7	N/A	3/4
Dune edge	3/7	4/7	4/7	4/7	N/A	3/4
Rock	3/7	4/7	4/7	3/7	N/A	0
Rock edge	4/7	4/7	4/7	4/7	N/A	0
Hill	1/4	0	0	0	N/A	0
Hill edge	1/4	0	0	0	N/A	0
Spice (all types)	3/7	4/7	4/7	4/7	N/A	3/4
Concrete	0	0	0	0	0	0
Wall	0	0	0	0	N/A	0
Structure	0	0	0	0	N/A	0
Rubble	4/7	4/7	4/7	4/7	N/A	0
Bloom (all types)	3/7	3/7	3/7	4/7	N/A	3/4

Note dunes can not be placed next to rock, so there can be no edge between dune and rock. Also note sandworms never move at full speed, and they counter-intuitively also move slower in spice fields of any type.

Radar Screen

Unless otherwise specified, all references to the radar screen assume that the radar screen is on and is supported by a fully-powered outpost.

Without an outpost and/or sufficient power, the radar screen will only show friendly buildings.

On the radar screen, revealed and detected rock is a darker shade of the color used for sand. Revealed/detected mountains will appear as dark dots on the radar screen. Spice blooms will appear as red dots on the radar screen. On the radar screen, a revealed and detected building appears as a rectangle in the House color of the side which controls it. Revealed and detected ground units appear as dots on radar. These will be in the House color of the side which controls them.

On the Game Screen, a deviated unit's coloring will change to the House color of the side controlling the Deviator. If the deviation effect wears off, the unit's color changes back. The radar screen will also show the color changes of deviated ground units.

Airborne units and Death Hands do not appear on radar.

If a Computer-controlled unit, turret or rocket turret fires from a position which is not visible on the battlefield, that position and the area around it will be revealed or detected.

If an Ornithopter fires from an unrevealed/undetected position on the battlefield, that position and the area around it will be revealed or detected.

Player carryalls may, from time to time, drop off new reinforcement units.

If a player unit is dropped off in an unrevealed/undetected location on the battlefield, the unit and the area around it will be revealed or detected.

When an Atreides palace successfully summons a Fremen attack, a group of Fremen units will appear at a random point on the battlefield. If these units appear in a location that is unrevealed or undetected on the battlefield, the units and the immediate area around them will be revealed or detected.

On the radar screen, revealed and detected Fremen units and sandworm mounds will appear as white dots. Concrete, walls, sand dunes and craters do not appear on radar.

Airborne units do not reveal unexplored territory.

The radar screen will not inhibit or interfere with cursor movement or the ability to select or target a unit or building located under/behind the radar screen.

The radar screen itself remains a fixed size in all missions. However the battlefield varies in size from mission to mission, so all objects shown on the radar screen will be scaled accordingly.

The edge of the radar screen itself will be in the player's House color.

As a revealed/detected ground unit moves across the battlefield, a small dot representing the unit will move across the equivalent path on the radar screen. While this is happening, there may be a time lag during updating of the radar screen, causing a dot to momentarily remain in the unit's old position while a new dot appears in the unit's new position. This effect may give the impression that more units are on the battlefield than actually exist.

The radar screen may also experience lag when updating building positions; after a building has been destroyed, it may still show up on the radar screen.

Credits

A "credit" is a monetary unit of measure, where 1 credit represents the smallest physical amount of harvested/stored spice which is considered to have any real value. In general, a credit level directly represents the total amount of spice held in a House's storage facilities (refineries and/or silos). For example, a House with "500 credits" available will usually have a combined total of 500 credits' worth of spice stored in one or more friendly storage facilities.

There are three occasions where a player's spice/credit level can exceed the normal spice storage capacity of friendly refineries and silos:

- 1) At the start of each mission, when a player has a construction yard and a number of credits, but no spice storage facility;
- 2) When a player's last/only storage facility is destroyed, but some credits remain available, and
- 3) When a cheat code is used to raise the combined storage capacity of existing facilities beyond normal limits.

If a player's last/only spice storage facility is destroyed, the player's spice/credit level will drop severely; but a very small percentage of the destroyed spice may be retained. This spice may be returned to storage if another facility becomes available.

If a construction, upgrade, or repair project is cancelled, credits invested in that project will be returned, and reconverted to spice. If all friendly storage facilities are full when the project is cancelled, the returned spice/credits will be lost.

A Computer-controlled House may still be able to expend credits after all its refineries and silos are captured or destroyed. Within certain limitations any Computer-controlled House has unlimited funds, and the AI only harvests spice as a cosmetic gesture.

The parameters on credit usage are somewhat flexible. For example, structures and units can occasionally be produced at a cost which is slightly below the documented price.

A player's spice and credit status is subject to entropy, with occasional spontaneous injects. As a game progresses spice and credits will disappear and to a lesser degree appear intermittently at a rate which can vary from game to game. If any game is left on automatic play long enough, and not

paused, a player's credit level will eventually dwindle down to zero credits. The loss is directly proportional to power consumption of the player base; the bigger the base, the faster the credits will evaporate.

If all available spice has been harvested, a player may still be able to earn credits. Each time a carryall delivers a replacement harvester to a player's refinery, the player's House gains 6 to 7 credits. Note, however, that these extra credits may quickly disappear again unless they are being invested in a current construction, upgrade, or repair project.

When a player's credit level drops below 5, it may sometimes be impossible to spend the remaining credits before the level is increased. Letting the credit level drop to zero has no adverse effects on continuing play.

When a player House's credit level is too low, all construction, upgrades and unit repairs at friendly buildings may be suspended, and may resume when more credits are available. Note that any paused construction projects will resume before any paused upgrade projects. When player credits are too low, any structural repairs underway at player buildings may stop, and will not resume when more credits are available. The halfway repaired buildings will simply remain in their damaged state until a new repair order is issued.

Spice collection and processing may continue even after all refineries and silos are full. No credits are gained from the processing of excess spice, and the excess spice itself is lost, although the excess spice is counted in scoring after the mission ends.

A player's House will not gain spice/credits by capturing Computer-controlled refineries or silos.

The game will not keep track of harvested spice beyond 32,767 credits.

Maximum starting credits for each mission:

Mission	Atreides	Ordos	Harkonnen
1	1,000	1,000	1,000
2	1,200	1,200	1,200
3	1,500	1,500	1,500
4	1,500	1,500	1,500
5	1,500	1,500	1,500
6	1,700	1,700	1,700
7	2,000	2,000	1,800
8	2,000	2,000	2,000
9	2,500	2,000	2,500

Notes: Houses indicated are player-controlled Houses, only. Also, while the credit level is 1,000 credits in the first mission, it quickly drops to 999 credits; therefore the credit level is sometimes erroneously referred to as 999 for the first mission. It is technically 1,000 however, and this is reflected in the above list.

1.2 Structures: General

The term "structure" in this guide refers to any construction yard, and to anything that can be produced by a construction yard. The term "building"—as a noun—in this document refers to any structure, excluding concrete slabs and wall sections.

When a building is placed, there is a moment where the graphics will flicker, alternating between showing a completed building, and an interim stage. Even before the image finalizes, the building may be selected, fixed, targeted, et cetera.

As a player structure is placed on the battlefield, any unrevealed or undetected terrain at the construction site will be revealed or detected.

Buildings not placed fully on concrete will start off with damage. The less rock there is directly under a building when it is placed, the less damage the building will start with. A formula to determine starting damage:

$$50 - ((50/\text{Squares in placement grid}) * \text{Number of squares over concrete})$$

Notes: the "*" character indicates multiplication. The number returned is damage sustained by the building as a percentage, where 0% would mean the building is undamaged.

Example: Placing a windtrap (2x2=4 squares in its placement grid) on only 1 square of concrete means the windtrap will start off with 37.5% damage, as $50 - ((50/4)*1) = 37.5$. Any building placed completely on rock will be 50% damaged.

If a barracks, construction yard, Hi-Tech, refinery, repair facility, vehicle factory or windtrap is damaged, its performance may suffer. The more damage done to one of these buildings, the more inefficient it will become. With windtraps, this decline in performance means a lower energy output; with all other buildings, a decline in performance means that they will function more slowly: Barracks, Hi-Techs and vehicle factories will take longer to produce units; construction yards take longer to produce structures; refineries take longer to unload harvesters/refine spice; and repair facilities take longer to fix damaged units; undamaged units are always released quickly.

Damaged buildings draw as much power from windtraps as undamaged buildings of the same type.

When a building explodes, any buildings, walls or units immediately adjacent horizontally or vertically may be damaged.

In each mission there is a limit on the combined number of player and Computer buildings that may exist at one time. From 68 to 70 buildings are usually allowed, but this can vary slightly from mission to mission. Once this limit is reached, only concrete slabs and wall sections—if available—may be constructed unless/until an existing building, friendly or enemy, is destroyed. In this way, when the mission's building limit is reached, an attacker may destroy a defender's building, and then construct a new one for the attacking side, preventing the defender from replacing the destroyed building.

Many buildings have a rotating light beacon near their southeast corner. A beacon's color will be the House color of the side controlling that building.

If fire and smoke plumes appear over a building, it has been attacked and is at least 50% damaged.

When a building is destroyed, any unit located at the building—such as a harvester or a unit being repaired—is also destroyed, along with any cargo held by that unit. Any unit located above an exploding building, such as a carryall or an ornithopter, may also be destroyed, along with any cargo held by that unit. If the building was constructing a structure or a unit at the time, the credits spent on that construction are returned. If the building was repairing a unit at the time, the credits spent on that repair are returned. If the building was being fixed or upgraded at the time, credits already spent are not returned.

Ground combat units can be ordered to fire upon all friendly structures except repair facilities and concrete.

A player cannot place structures on top of a Computer House's concrete or other Computer structures. A player can place a structure adjacent to Computer concrete, buildings, walls, or on top of areas of damage where they had existed, provided that the structure being placed is also adjacent to player concrete, buildings or walls. The exception is a construction yard produced by an MCV.

Any units attacking or moving towards a building will stop attacking or moving towards it if the building is captured by a friendly soldier, infantry, or trooper(s) unit.

Turrets and rocket turrets in Guard mode will occasionally "fidget", rotating slightly at random times.

Units may be damaged if they are directly adjacent to—or flying over—an area of a structure, a unit or a mountain which is being struck by weapon fire.

After a building is successfully upgraded, its default Build option shown on the Game Screen when the building is initially clicked on will change to the option which is now available as a result of the upgrade.

Structure list, alphabetical sort

Structure	Cost	Power	Hitpoints	Size	Prerequisite(s)	First Mission
Barracks	300	10	300	2x2	Outpost	2
Construction yard	N/A	0	400	2x2	None	1
Heavy vehicle factory	600	35	200	3x2	Refinery	3
Hi-Tech	500	35	400	2x2	Outpost and factory	5
IX	500	40	400	2x2	Outpost and factory	5
Large concrete slab	20	0	20	2x2	Construction yard	4
Light vehicle factory	400	20	350	3x2	Refinery	2
Palace	999	80	1000	3x3	Starport	8
Radar outpost	400	30	500	2x2	Windtrap	2
Refinery	400	30	450	3x2	Windtrap	1
Repair facility	700	20	400	3x2	Outpost and factory	5
Rocket turret	250	25	250	1x1	Outpost	6
Small concrete slab	5	0	20	1x1	Construction yard	1
Spice silo	150	5	150	2x2	Refinery	2
Starport	500	50	500	3x3	Refinery	6
Turret	125	10	100	1x1	Outpost	5
Wall section	50	0	50	1x1	Outpost	4
Windtrap	300	-100	200	2x2	Construction yard	1
WOR	400	20	400	2x2	Outpost	2

Notes: "Size" is measured as horizontal spaces by vertical spaces, where 1 space is equal in size and shape to 1 quadrant of a full-sized concrete slab. "N/A" means "Not Applicable"; the term "factory" here means heavy vehicle factory. The cost of a construction yard varies from mission to mission. A player's initial construction yard costs nothing, but additional construction yards can be produced through the use of MCVs, which in turn cost a variable amount to produce, depending on whether the MCV was built at a vehicle factory or purchased at a starport.

Structure list, cost sort

Structure	Cost	Power	Hitpoints	Size	Required building	First mission
Construction yard	N/A	0	800	2x2	None	1
Concrete slab	5	0	40	1x1	Construction yard	1
Large concrete slab	20	0	40	2x2	Construction yard	4
Wall section	50	0	140	1x1	Outpost	4
Turret	125	10	250	1x1	Outpost	5
Spice silo	150	5	300	2x2	Refinery	2
Rocket turret	250	20	500	1x1	Outpost	6
Barracks (soldier)	300	10	600	2x2	Outpost	2
WOR	300	10	600	2x2	Outpost	2
Windtrap	300	100	400	2x2	Construction yard	1
Barracks (trooper)	400	20	800	2x2	Outpost	2
Radar outpost	400	30	1000	2x2	Windtrap	2
Refinery	400	30	900	3x2	Windtrap	1
Vehicle factory, Atreides	400	20	800	3x2	Refinery	2
Vehicle factory, Harkonnen	400	20	800	3x2	Refinery	3
Vehicle factory, Ordos	400	20	800	3x2	Refinery	2
IX	500	40	400	2x2	Outpost and factory	5
Hi-Tech	500	35	1000	2x2	Factory	5
Starport	500	50	1000	3x3	Refinery	6
Repair facility	700	20	1800	3x2	Factory	5
Palace	999	80	2000	3x3	Starport	8

Notes: See the notes with the first chart in this series.

The Battle for Arrakis

Structure list, power sort

Structure	Power	Cost	Hitpoints	Size	Required building(s)	First mission
Windtrap	100	300	400	2x2	Construction yard	1
Concrete slab	0	5	40	1x1	Construction yard	1
Large concrete slab	0	20	40	2x2	Construction yard	1
Construction yard	0	N/A	800	2x2	None	1
Wall section	0	50	140	1x1	Outpost	4
Spice silo	5	150	300	2x2	Refinery	2
Barracks (soldier)	10	300	600	2x2	Outpost	2
Turret	10	125	250	1x1	Outpost	5
Radar Outpost	20	150	40	2x2	Windtrap	2
Repair facility	20	700	1800	3x2	Outpost and factory	5
Rocket turret	20	250	500	1x1	Outpost	6
Heavy vehicle factory	20	400	800	3x2	Refinery	2
Refinery	30	400	900	3x2	Windtrap	1
Hi-Tech	35	500	1000	2x2	Outpost and factory	5
Starport	50	500	1000	3x3	Refinery	6
Palace	80	999	2000	3x3	Starport	8

Notes: See the notes with the first chart in this series.

Structure list, hit point sort

Structure	Hitpoints	Cost	Power	Size	Required building(s)	First mission
Small concrete slab	40	5	0	1x1	Construction yard	1
Large concrete slab	40	20	0	2x2	Construction yard	4
Wall section	140	50	0	1x1	Outpost	4
Turret	250	125	10	1x1	Outpost	5
Spice silo	300	150	5	2x2	Refinery	2
Windtrap	400	300	100	2x2	Construction yard	1
Rocket turret	500	250	20	1x1	Outpost	6
Infantry barracks	600	300	10	2x2	Outpost	2
Construction yard	800	N/A	0	2x2	None	1
Light vehicle factory	800	400	20	3x2	Refinery	2
Heavy vehicle factory	800	400	20	3x2	Refinery	3
Refinery	900	400	30	3x2	Windtrap	1
Hi-Tech	1000	500	35	2x2	Outpost and factory	5
Radar outpost	1000	400	30	2x2	Windtrap	2
Starport	1000	500	50	3x3	Refinery	6
Repair facility	1800	700	20	3x2	Outpost and factory	5
Palace	2000	999	80	3x3	Starport	8

Notes: See the notes with the first chart in this series.

Structure list, size sort

Structure	Size	Cost	Power	Hitpoints	Required building(s)	First mission
Small concrete slab	1x1	5	0	40	Construction yard	1
Rocket turret	1x1	250	20	500	Outpost	6
Turret	1x1	125	10	250	Outpost	5
Wall section	1x1	50	0	140	Outpost	4
Large concrete slab	2x2	20	0	40	Construction yard	4
Barracks	2x2	300	10	600	Outpost	2
WOR	2x2	400	10	400	Outpost	2
Construction yard	2x2	N/A	0	800	None	1
Hi-Tech	2x2	500	35	1000	Outpost and factory	5
Outpost	2x2	400	30	1000	Windtrap	2
Spice silo	2x2	150	5	300	Refinery	2
Windtrap	2x2	300	100	400	Construction yard	1
Refinery	3x2	400	30	900	Windtrap	1
Repair facility	3x2	700	20	1800	Outpost and factory	5
Light vehicle factory	2x2	400	20	800	Refinery	2
Heavy vehicle factory	3x2	600	20	800	Refinery	3
Palace	3x3	999	80	2000	Starport	8
Starport	3x3	500	50	1000	Refinery	6

Notes: See the notes with the first chart in this series.

Structure list, prerequisite sort

Structure	Required building(s)	Cost	Power	Hitpoints	Size	First mission
Large concrete slab	Construction yard	15	0	40	2x2	1
Windtrap	Construction yard	300	100	400	2x2	1
Construction yard	None	N/A	0	800	2x2	1
Infantry barracks	Outpost	300	10	600	2x2	2
Rocket turret	Outpost	250	20	500	1x1	6
Turret	Outpost	125	10	250	1x1	5
Wall section	Outpost	50	0	140	1x1	4
Hi-Tech	Outpost and factory	500	35	1000	2x2	5
Repair facility	Outpost and factory	700	20	1800	3x2	5
Spice silo	Refinery	150	5	300	2x2	2
Starport	Refinery	500	50	1000	3x3	6
Light vehicle factory	Refinery	400	20	800	3x2	2
Heavy vehicle factory	Refinery	400	20	800	3x2	3
Palace	Starport	999	80	2000	3x3	8
Rader outpost	Windtrap	400	30	1000	2x2	2
Refinery	Windtrap	400	30	900	3x2	1

Notes: See the notes with the first chart in this series.

Structure list, mission sort

Structure	First mission	Cost	Power	Hitpoints	Size	Required building(s)
Concrete slab	1	15	0	40	2x2	Construction yard
Construction yard	1	N/A	0	800	2x2	None
Refinery	1	400	30	900	3x2	Windtrap
Windtrap	1	300	100	400	2x2	Construction yard
Barracks	2	300	10	600	2x2	Outpost
Radar outpost	2	400	3	1000	2x2	Windtrap
Spice silo	2	150	5	300	2x2	Refinery
Light vehicle factory	2	400	20	800	2x2	Refinery
Heavy vehicle factory	2	400	20	800	3x2	Refinery
Large concrete slab	4	20	0	20	2x2	Construction yard
Wall section	4	50	0	140	1x1	Outpost
Hi-Tech	5	500	35	1000	2x2	Construction yard
Repair facility	5	700	20	1800	3x2	Heavy factory
Turret	5	125	10	250	1x1	Outpost
Rocket turret	6	250	20	500	1x1	Heavy factory
Starport	6	500	50	1000	3x3	Refinery
Palace	8	999	80	2000	3x3	Starport

Notes: See the notes with the first chart in this series.

Construction speed

Buildings are constructed at varying speeds. In general larger buildings take a longer time to erect, while smaller buildings are constructed fairly rapidly.

Structure	Build time (in game seconds)
Small concrete slab	16
Large concrete slab	16
Wall	40
Spice silo	48
Windtrap	48
Turret	64
Barracks	72
Repair facility	80
Radar outpost	80
Construction yard	80
Refinery	80
Rocket turret	96
Light vehicle factory	96
WOR	104
Hi-tech facility	120
Starport	120
House of IX	120
Palace	130
Heavy vehicle factory	144

All structures will produce units at a speed commensurate with their damage percentile. If a construction yard is 50% damaged, it will produce additional structures at 50% of the normal construction speed.

The heavy vehicle factory is the most time consuming to erect. It is also one of the most expensive buildings, and has roughly half the hit points of another equally sized building. It will also become one of the most heavily attacked structures.

When placing the heavy vehicle factory you should be aware it is—along the repair facility—the most attractive target for the Computer-controlled units. Make sure you are protecting it.

The AI will make the heavy vehicle factory a target of choice in nearly all of its attacks. Plan your own base accordingly. For example, you might want to surround the heavy vehicle factory with other buildings, making it inaccessible to the enemy.

1.3 Buildings: Specifics and Specifications

This list is a compilation of all specifics of all the buildings available to the player.

Barracks



Infantry Barracks

Infantry barracks specifications:

Structure	Cost	Power	Hitpoints	Size	Required building	First mission
Infantry Barracks	300	10	300	2x2	Outpost	2

On the Game Screen, soldier barracks are identical in appearance to trooper barracks.

An Ordos player's construction yard can only produce a soldier barracks. In later missions an Ordos player's soldier barracks can be upgraded to produce trooper(s) units.

On the construction yard Production Screen, Atreides and Ordos soldier barracks are not identical in appearance to Harkonnen trooper barracks.

On the soldier barracks Production Screen, the soldier image is identical in appearance to the infantry image.

On the trooper barracks Production Screen, the troopers' image is a slightly refined version of the trooper image.

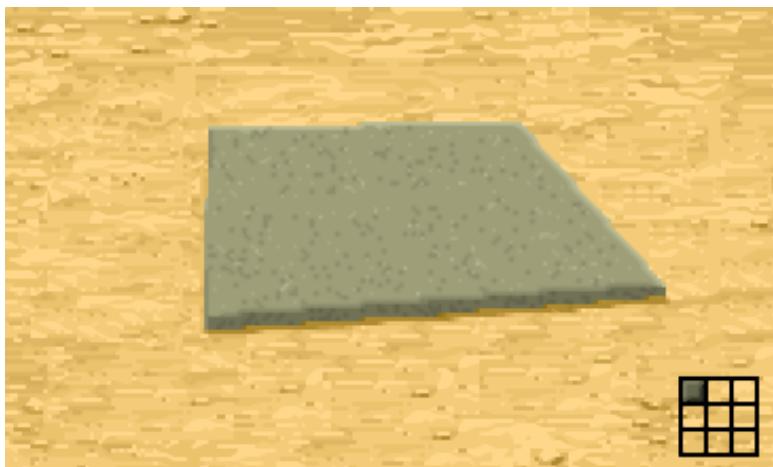
On the Ordos barracks Production Screen, the barracks image will change from soldier to trooper style whenever the barracks itself is first able to produce a trooper unit.

A player can change a production order midway through production, or any time before the unit is placed on the battlefield. In either case, credits from the cancelled order are returned.

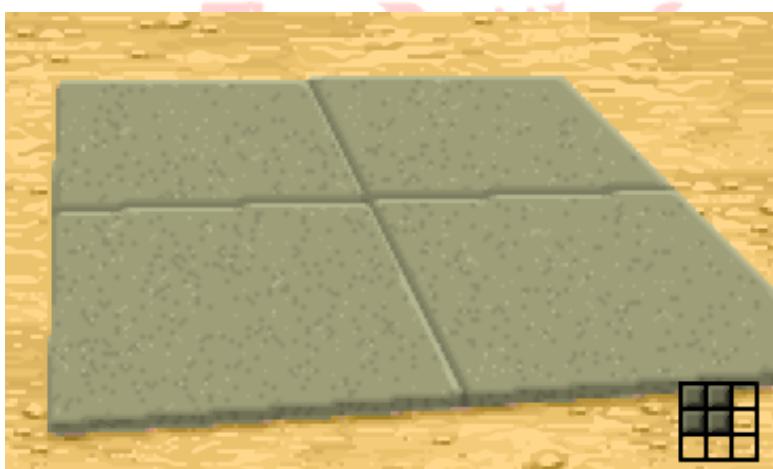
If a barracks contains a newly-completed unit, it will refuse new Build orders until that unit is discharged from the barracks.

Barracks—of any type—cannot be captured.

Concrete Slabs



Small Concrete Slab



Large Concrete Slab, also called CONCRETE 4

Concrete specifications:

Structure	Cost	Power	Hitpoints	Size	Prerequisite building	First mission
Concrete slab	5	0	20	1x1	Construction yard	1
Large concrete slab	20	0	20	2x2	Construction yard	3

Concrete slabs can be placed anywhere, as long as at least one quadrant of the slab's placement grid is white. When the mouse button is pressed, concrete will replace all white quadrants of the

placement grid, and nothing will appear in any red quadrants. If all four quadrants are red, the player must find another area to place the concrete, or choose another structure on the construction yard Production Screen.

Credits are not returned when only part of a concrete slab is placed. Production of a large concrete slab will always consume 20 credits, even if only one the slab's four quadrants are placed.

Unlike the numerical limit on buildings and units, construction and placement of concrete is ultimately limited only by the amount of accessible rock terrain.

Concrete can only be directly targeted for attack by Death Hands and self-destructing Devastators. Otherwise, concrete may be damaged or destroyed by stray missile and rocket fire, or by an attack on a unit or building above the concrete. Concrete can be directly destroyed by rocket launchers or troopers. Other ground attacks, such as attacks by tanks, have no effect on concrete slabs.

Clicking on concrete with the Selection Cursor has no effect. Concrete cannot be fixed, nor does it appear on radar.

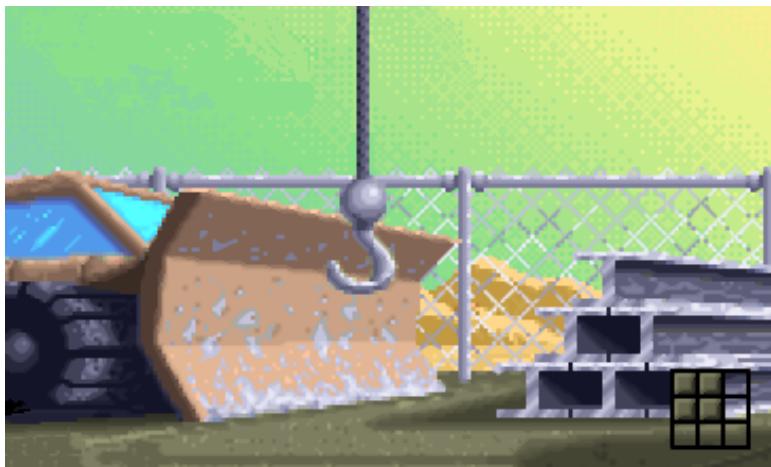
If an enemy unit is eliminated between selection of a small concrete slab to place, and actual placement, the slab cannot be placed in the square where the enemy unit was eliminated.

When placing a large concrete slab, the slab is called CONCRETE 4.

Concrete slabs—of any size—can obviously not be captured.

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Construction Yard



Construction Yard

Construction yard specifications:

Structure	Cost	Power	Hitpoints	Size	Prerequisite building	First mission
Construction yard	N/A	0	400	2x2	None	1

A player's initial construction yard will not be susceptible to damage from lack of power until after a friendly windtrap is placed—or an enemy windtrap is captured.

The construction yard upgrade costs 200 credits.

Construction yards do not draw power from windtraps. However, if windtraps are not meeting the power demands of other friendly buildings, then all friendly buildings, including construction yards, become susceptible to damage from the lack of power.

If a construction yard is not the currently-selected building when it finishes a structure, a "Construction complete" message appears on the ticker. Clicking on the construction yard that has finished the construction will bring up the finished structure's placement grid.

Once a player has a palace or starport, the player's construction yard(s) will be unable to produce another—unless or until the current palace or starport is destroyed.

A player can change a production order midway through production, or any time before the structure is placed on the battlefield. In either case, credits from the cancelled order are returned.

A captured construction yard can only produce structures of the type already available to the attacker. For example, if a Harkonnen player captures the Atreides construction yard in mission 2, the barracks type available there switches from barracks to WOR, and the light vehicle factory option disappears.

If a player's last/only windtrap is destroyed, all player-controlled construction yards will lose the ability to produce anything but concrete and windtraps. Note that this is not true for Computer-controlled construction yards. Computer construction yards may rebuild any destroyed Computer building at any time.

On the construction yard Production Screen, soldier barracks are not identical in appearance to trooper barracks.

All new construction yards have concrete pre-selected for the first Build option.

Construction yards may be captured.

Heavy Vehicle Factory



Heavy Vehicle Factory

Heavy vehicle factory specifications:

Structure	Cost	Power	Hitpoints	Size	Required building	First mission
Heavy vehicle factory	600	20	200	3x2	Refinery	5

A player can change a production order midway through production, or any time before the vehicle is placed on the battlefield. In either case, credits from the cancelled order are returned.

If a House's last or only existing harvester is destroyed while another is being built, and there are not enough credits available to complete the new harvester, the destroyed harvester will not be replaced by carryall, and the House will be left without a means to harvest spice. When this happens the construction order must be cancelled (or another solution must be found) in order for a new harvester to be made available.

The heavy vehicle factory and the repair facility have the highest attack priority of all buildings, and the Computer-controlled units will mostly direct their attacks at these two buildings.

On the vehicle factory Production Screen, the missile tank is referred to as a LAUNCHER.

The heavy vehicle factory upgrades cost 300 credits each.

Vehicle factories may be captured.

Hi-Tech Factory



Hi-Tech Factory

Hi-Tech specifications:

Structure	Cost	Power	Hitpoints	Size	Prerequisite Buildings	First Mission
Hi-Tech	500	35	400	3x2	Outpost and vehicle factory	5

A House requires both a Hi-Tech facility and a vehicle factory to produce special ground vehicles (specifically Devastators, Deviators, and sonic tanks). If a House's last/only Hi-Tech is destroyed, any special unit being produced for that House will be unmade, and the credits invested in the production will be returned. At any vehicle factory where this happens, the special-unit option will disappear, and the current Build option will be reset to the first/lowest-priced unit available.

If a player's last/only Hi-Tech is destroyed, all player-controlled vehicle factories will lose the ability to produce special ground vehicles (specifically Devastators, Deviators and sonic tanks). Note that this is not true for Computer-controlled vehicle factories. Computer vehicle factories can always build any type of vehicle available to that House in that mission.

On the Hi-Tech Production Screen, the ornithopter is referred to as a "THOPTER".

Carryalls produced at a Hi-Tech will tend to remain in the general area around the Hi-Tech unless/until they have a target to move to. Ornithopters produced at a Hi-Tech will patrol over the entire battlefield in search of a target.

Hi-Tech facilities may be captured.

IX



House of IX

IX specifications:

Structure	Cost	Power	Hitpoints	Size	Required building	First mission
IX	500	40	400	2x2	Starport	7

The IX facility provides technology updates on structures and vehicles. Special weapons and prototypes may also become available through the Research Center.

The House of IX has no production capability of its own, but will make House specific tanks and ornithopters—not for Harkonnen—available. The production capability becomes available without any specific upgrades; the House of IX needs to merely exist for the advanced units to become available.

Having several Houses of IX provides no further advantages.

The IX building cannot be captured.

Light Vehicle Factory



Light Vehicle Factory

Light vehicle factory specifications:

Structure	Cost	Power	Hitpoints	Size	Required building	First mission
Light vehicle factory	400	20	350	2x2	Refinery	5

The light vehicle factory produces small, lightly armored combat vehicles. A light vehicle factory must be built before a heavy vehicle factory can be constructed.

A player can change a production order midway through production, or any time before the vehicle is placed on the battlefield. In either case, credits from the cancelled order are returned.

The light vehicle factory upgrades cost 200 credits each.

Vehicle factories may be captured.

Palace



Palace specifications:

Structure	Cost	Power	Hitpoints	Size	Prerequisite building	First mission
Palace	999	80	1000	3x3	Starport	8

Whenever any new palace is placed on the battlefield, its weapon/ability will be available for immediate use.

Once a player has a palace, the player's construction yard(s) will be unable to produce another; unless—or until—the current palace is destroyed.

Clicking on a friendly palace will display the icon of the palace's special weapon or ability in the Command Window. If the palace is not ready to launch an attack, then a status bar may appear under the Command Window which indicates the amount of Game Time elapsing until the weapon/ability is ready. If the weapon/ability was used recently, the status bar will be at zero length for some time before beginning to increase again. The longer the status bar, the closer the weapon/ability is to being ready.

A palace's weapon/ability is regenerated after each use. This regeneration process will take a variable amount of real time, depending on the palace's House, and how fast Game Time is elapsing. Game Time generally slows down with an increase in units on the battlefield, speeds up with a decrease in units, and is suspended whenever the Game Screen is not displayed. During a typical game with minimal pausing, it takes 11 to 12 minutes of real time for a Harkonnen palace to produce a new Death Hand, 15 to 16 minutes for a Sardaukar palace to produce a new Death Hand, about 4 minutes for an Atreides palace to regenerate the summon-Fremen ability, and 6 to 7 minutes for an Ordos palace to produce a new saboteur. Note that damage to a palace will not increase this time delay.

To shorten the long delay between weapon or ability regenerations at a palace, quickly destroy and replace the palace after each use. Whenever any new palace is placed on the battlefield, its weapon or ability will be available for immediate use.

In internal game time, the Sardaukar and Harkonnen recharge times are exactly twice as long as the Atreides, Ordos, Fremen, and Mercenary recharge times.

There are neither Fremen nor Mercenary palaces in the game. If it would exist, the special palace weapon for Fremen would be themselves, i.e. Fremen. While a Fremen base can technically exist, there are no Fremen buildings in any scenario. Also, there are no Mercenary units present in the game at all—apart from a few sound files—although the code for them exists; the special palace weapon for Mercenaries would have been the saboteur.

It costs no credits to repair a palace. This is due to a rounding error in the game code. Although this feature appears after upgrading the game it is universally regarded as a bug.

It may be difficult for a player to win a mission if all spice has been harvested and funds are insufficient to assemble a conquering force. A palace then becomes invaluable, as its weapon/ability can be used at no cost, and can regenerate indefinitely.

A palace cannot directly target itself with its own weapon or ability.

A palace can continue to prepare its special weapon/ability while it is being fixed.

If an Ordos palace is tightly surrounded by other buildings, walls, or ground units, it may be difficult or impossible to deploy a saboteur.

If a friendly unit is clicked on with the palace's Targeting Cursor, that unit will request orders, whether or not it has been accepted as a valid target.

The units produced or summoned by a palace do not count against the numerical limit on units for each House in a given mission.

Palaces cannot be captured.

Radar Outpost



Radar Outpost

Radar Outpost specifications:

Structure	Cost	Power	Hitpoints	Size	Required building	First mission
Radar Outpost	400	30	500	2x2	Windtrap	3

Note that the Computer-controlled units do not need a radar outpost at all. The Computer-controlled units always "know" where the player's units and buildings are.

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If the player's combined windtrap power output drops below what is needed for the player base, or if the windtraps are destroyed, the radar will go offline. The radar will come back online when power is restored.

If a player's radar outpost is destroyed the radar map will go offline.



If a player's last or only radar outpost is destroyed, all player-controlled vehicle factories—light or heavy—will lose the ability to upgrade buildings. Note that this is not true for Computer-controlled vehicle factories. Computer vehicle factories can always build any type of vehicle available to that House in that mission.

Radar outposts cannot be captured.

Refinery



Spice Refinery

Refinery specifications:

Structure	Cost	Power	Hitpoints	Size	Required building	First mission
Refinery	400	30	450	3x2	Windtrap	1

Clicking on a friendly refinery will display its ID icon with 2 status bars. Under the damage status bar will be an orange status bar indicating the amount of spice stored at each refinery and silo under the player's control. When this status bar is at maximum length, all friendly refineries and silos are full.

Whenever spice is received by a House, the spice is immediately divided equally among all friendly storage facilities; refineries and silos. A House's total quantity of stored spice is also immediately divided equally among all its storage facilities whenever additional facilities become available through construction or capture.

When spice is used—when credits are spent—an equal share of the total spice amount is removed from all friendly storage facilities.

Although refineries and silos are normally capable of holding up to 1000 units of spice each, the internal capacity of a refinery is 1005 units. A damaged refinery can still hold at least 1,000 credits' worth of spice.

The refinery has a "docking bay" with lights that will flash in a pattern whenever a harvester is expected to arrive there.

In general, a refinery can accommodate only 1 harvester at a time. An exception is when one harvester next to the refinery is ordered inside as another harvester is simultaneously entering. In this case, both units may enter, and the first harvester will be unloaded and released before the second harvester.

Generally, if all harvesters are destroyed, a carryall will bring in a new one. However, if a refinery is destroyed while a player's last available harvester is unloading there, the destroyed harvester may not be automatically replaced by a carryall.

Carryalls tend to deliver harvesters to the last friendly refinery which was built or captured.

When a refinery is damaged, the transformation of spice into credits while a harvester is unloading there will begin to slow. Damage inflicted on a refinery will not affect a harvester unloading there. While a harvester is unloading at a refinery it will be immune to any damage unless/until the refinery itself is completely destroyed, in which case the harvester is also destroyed. If a refinery is destroyed, any spice it contained is also destroyed.

Refineries may be captured. If a refinery is captured while a harvester is unloading there, the harvester is captured as well.

Repair Facility



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Repair Facility

Repair facility specifications:

Structure	Cost	Power	Hitpoints	Size	Required buildings	First mission
Repair facility	700	20	200	3x2	Heavy vehicle factory	5

Clicking on a revealed or detected repair facility will display the facility's ID icon. If the facility is friendly and is currently repairing a unit, that unit's icon and a growing blue status bar will also be shown. The blue status bar indicates repair progress; when this status bar is at maximum length, the unit is fully repaired.

If a repair facility is tightly surrounded by other buildings, walls, or ground units, then most units scheduled to be repaired there will be dropped off at the facility by carryall.

When a unit has been repaired at a facility which is tightly surrounded by other buildings, walls, or ground units, a carryall will remove that unit and return it to the battlefield. If that unit was originally brought to the facility by carryall, then the carryall which retrieves the repaired unit will attempt to return it to its original location on the battlefield.

Soldier, infantry, and trooper(s) units will ignore orders to move to friendly repair facilities. However, the facility will repair them if they are brought to the facility by a carryall.

Airborne units cannot be repaired.

A unit will disregard orders to move to a friendly repair facility if the facility is already repairing a unit.

The repair facility will usually only accept the last unit ordered into it. In other words, when a unit is ordered to move to a repair facility, any other friendly units already en route to the repair facility will stop just outside it, and default to Guard mode.

In general, a repair facility can repair only 1 unit at a time. If 2 units are sent to be repaired, and the second unit attempts to enter while the first is still inside, the second unit's move order is cancelled, and it will not enter after the first has been repaired. An exception is when one unit next to the repair facility is ordered inside while another unit is simultaneously entering. In this case, both units may enter, and the second unit will be repaired and released before the first unit.

Friendly ground combat units can be ordered to fire upon all friendly structures except repair facilities and concrete.

If a player's last/only harvester is in a repair facility, and there are not enough credits available to complete repairs on it, it will not be replaced by carryall and the House will be left without a means to harvest spice. When this happens, the repair facility must be destroyed or an enemy refinery must be captured—or another solution must be found—in order for a new harvester to be made available.

Most ground units, whether damaged or not, will consume credits when sent into a repair facility.

Minimal credit consumption for repairs:

Unit	Credits
Combat tank	2
Devastator	6
Deviator	6
Harvester	2
Infantry	1
MCV	9
Missile tank	3
Quad	1
Raider trike	1
Siege tank	5
Soldier	0
Sonic tank	5
Trike	1
Trooper	1
Troopers	1

A repair facility will not repair units while the facility itself is being fixed.

A Devastator which is armed for self-destruction when it enters a repair facility will be repaired—if necessary—and will remain armed when it exits the facility.

Soldiers, infantry, and trooper(s) units cannot be directly ordered into a friendly repair facility. However, if such a unit is ordered to move to a location it cannot reach, a carryall—if available—will pick up the unit and drop it at any available friendly repair facility.

Carryalls will not deliver harvesters or MCVs to repair facilities; Harvesters and MCVs must use a ground path in order to enter a repair facility. Note, however, that a carryall can retrieve a harvester or MCV from a repair facility if the repaired unit becomes blocked inside or otherwise cannot find a ground path to exit the facility.

The heavy vehicle factory and the repair facility have the highest attack priority of all buildings, and the Computer-controlled units will mostly direct their attacks at these two buildings.

Repair facilities may be captured.

If a player-controlled unit captures a Computer-controlled repair facility, any unit being repaired there is also captured.

Rocket Turret



Rocket Turret

Rocket turret specifications:

Structure	Cost	Power	Hitpoints	Size	Required building	First mission
Rocket turret	250	20	200	1x1	Outpost	6

When a rocket turret is placed, its weapons will be facing north.

Rocket turrets will fire automatically on any enemy ground unit or Ornithopter within range.

Computer-controlled rocket turrets may fire on any player carryalls which come within range.

A rocket turret which is targeting an airborne unit will tend to ignore enemy ground units until the airborne unit is destroyed.

Rocket turrets will not directly target enemy structures, Death Hands, or frigates.

Rocket turret rockets can be fired over all structures or units without damaging them. Rocket turret cannons can fire over all friendly structures, most enemy structures, and all friendly or enemy units without damaging them. Rocket turret cannons cannot fire over mountains, enemy turrets and rocket turrets, or enemy walls.

Rocket turrets will not return fire if they are attacked by friendly units.

On the construction yard Production Screen, rocket turrets are referred to as R-TURRETS.

Rocket turrets will continue to function while being fixed.

Rocket turrets will attack only 1 target at a time.

Although rocket turrets have 2 rocket pods, only one rocket is fired per attack.

A rocket turret's maximum scan range for targets is 8 spaces. Note that once fired, a rocket can travel far beyond the rocket turret's scan range.

Rocket turret target scan range:

```
8765432101234567
+-----+
8 | +++++++RR++++++ | 8
7 | +++++R RRRRRR +++++ | 7
6 | ++++RRRRRRRRRRR+++ | 6
5 | ++RRRRRRRRRRRR++ | 5
4 | ++RRRRRRRRRRRR++ | 4
3 | +RRRRRCCRRRRR+ | 3
2 | +RRRRRCCCCRRRR+ | 2
1 | RRRRCCCCCRRRR | 1
0 | RRRRCCC#CCRRRR | 0
1 | +RRRRRCCCCRRRR+ | 1
2 | +RRRRRCCCCRRRR+ | 2
3 | ++RRRRRRRRRRRR++ | 3
4 | ++RRRRRRRRRRRR++ | 4
5 | ++++RRRRRRRRRR+ | 5
6 | +++++R RRRRRR +++++ | 6
7 | ++++++RR++++++ | 7
+-----+
8765432101234567
```

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Notes: The "#" indicates the rocket turret; "R" indicates where a target will trigger the launching of a rocket; "C" indicates where a target will trigger the firing of the cannon; "+" indicates a space outside of the rocket turret's scan range.

In version 1.0 of the game rocket turrets do not fire on Fremen. The 1.07 upgrade patch addresses this, thus rocket turrets fire on Fremen in all versions post 1.07.

Rocket turrets may be captured.

Spice Silo



Spice Silo

Silo specifications:

Structure	Cost	Power	Hitpoints	Size	Required building	First mission
Spice silo	150	5	150	2x2	Refinery	2

Clicking on a friendly spice silo will display its icon.

Whenever spice is received by a House, the spice is immediately divided equally among all friendly storage facilities; refineries and silos. A House's total quantity of stored spice is also immediately divided equally among all its storage facilities whenever additional facilities become available through construction or capture.

When spice is used—when credits are spent—an equal share of the total spice amount is removed from all friendly storage facilities.

If a silo is destroyed, any spice it contained is also destroyed.

Although refineries and silos are normally capable of holding up to 1,000 units of spice each, this capacity may sometimes increase. This is due to an oversight in how spice storage capacity is calculated; the spice silo storage capacity calculation only happens for the house that has built the last structure. If you have many silos you may store spice over capacity in them, only to lose a lot of spice as soon as you start constructing a new building.

A damaged silo can still hold at least 1,000 credits' worth of spice.

Spice silos may be captured.

Starport



Starport Facility

Starport specifications:

Structure	Cost	Power	Hitpoints	Size	Required building	First mission
Starport	500	50	500	3x3	Refinery	6

Sometimes the starport seems to be unable to deliver any vehicles at all. This is due to a bug. There are several types of machines that do not work correctly with Dune II versions 1.0 and 1.01. Specifically, the starport will not deliver goods after the countdown timer has expired. To fix this, Westwood have issued a patch which upgrades the 1.0 and 1.01 versions of the game to version 1.07. Please be aware that old save games will not work with the newer version of the game. If you decide not to upgrade, the only available workaround is to build another starport. Be advised this only works some of the time.

Once a player has a starport, the player's construction yard(s) will be unable to produce another, unless/until the current starport is destroyed.

When a starport is first placed on the battlefield, it will show a random number of units available, and each unit type will have a random price.

Prices of units available at a starport will change every few minutes of Game Time. All unit prices will change simultaneously.

Airborne units are generally not included in the numerical limit placed on ground units, and have a separate maximum numerical limit. An exception to this occurs when purchasing ornithopters from a starport, which cannot be done if the numerical limit on ground units has been reached.

The moment any unit is purchased at a Starport, the Order Screen is replaced with the Game Screen, which will show the starport ID icon with 2 status bars. Under the damage status bar will be a growing blue status bar which indicates Game Time elapsing. When this status bar is at maximum length, a frigate carrying the purchased unit(s) will enter the battlefield's airspace. During the wait for the frigate,

a player may purchase additional units at the starport; up to the maximum that unit availability, credits, time, and the game's limits on total existing units will allow.

The starport has a "landing pad" with lights that will flash in a pattern whenever a frigate is expected to arrive there.

Once a frigate has entered the battlefield to land at a starport, the starport will be unable to request additional units. New units can be purchased again only after the frigate has left the battlefield.

When a unit type is out of stock at a starport, it will be in stock again eventually. Unit types are restocked individually or in larger groups.

Units available at starports:

Unit	Atreides/Ordos		Harkonnen	
Mission	6	7	8/9	6
Combat Tank	Yes	Yes	Yes	Yes
Harvester	Yes	Yes	Yes	Yes
MCV	Yes	Yes	Yes	Yes
Missile tank	Yes	Yes	Yes	Yes
Ornithopter	No	No	Yes	No
Quad	Yes	Yes	Yes	Yes
Siege Tank	No	Yes	Yes	No
Trike	Yes	Yes	Yes	Yes

Notes: Harkonnen starports never provide ornithopters. Other than this one exception, starports for each House will have the same unit types available in a given mission.

If a starport is tightly surrounded by other buildings, walls, or ground units, a carryall will remove individual units from frigates which attempt to unload there, and will then place those units on the battlefield.

If a starport is expecting a frigate, but is destroyed before the frigate arrives, the frigate will drop each purchased unit at a random point on the battlefield.

Computer-controlled bases will not include starports, nor will the Computer attempt to build starports in any mission.

On the starport's Order Screen, the missile tank is referred to as a LAUNCHER.

On the starport's Order Screen, the ornithopter is referred to as a "THOPTER.

Starports can be captured.

Turret



Turret

Cannon Turret specifications:

Structure	Cost	Power	Hitpoints	Size	Required building	First mission
Cannon turret	125	10	200	1x1	Outpost	5

When a turret is placed, its cannon will be facing north.

Turrets will fire automatically on any enemy ground unit or ornithopter within range.

Computer-controlled turrets may fire on any player carryalls which come within range.

A turret which is targeting an airborne unit will tend to ignore enemy ground units until the airborne unit is destroyed.

Turrets will not directly target enemy structures, Death Hands, or frigates.

Turrets can fire over all friendly structures, most enemy structures, and all friendly or enemy units without damaging them. Turrets cannot fire over mountains, enemy turrets and rocket turrets, or enemy walls.

Turrets will not return fire if they are attacked by friendly units.

Turrets may be captured.

Turrets will continue to function while being fixed.

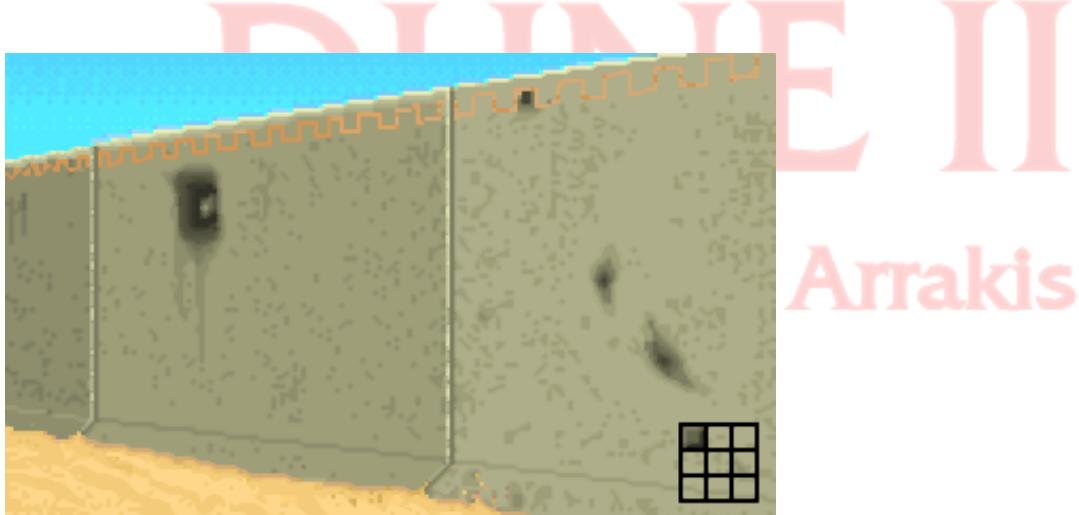
A turret's maximum scan range for targets is 5 spaces. Note that once fired, a cannon shell can travel far beyond the turret's scan range.

Turret target scan range:

```
5432101234
+-----+
5|++++CC++++|5
4|++CCCCCC++|4
3|+CCCCCC+C|3
2|+CCCCCC+C|2
1|CCCCCCCCC|1
0|CCCCC#CCCC|0
1|+CCCCCC+C|1
2|+CCCCCC+C|2
3|++CCCCCC++|3
4|++++CC++++|4
+-----+
5432101234
```

Notes: The "#" indicates the turret; "C" indicates where a target will trigger the firing of the cannon; "+" indicates a space outside of the turret's scan range.

Wall



Base Defense Wall

Wall section specifications:

Structure	Cost	Power	Hitpoints	Size	Required building	First mission
Wall section	50	0	50	1x1	Outpost	4

Unlike the numerical limit on buildings and units, construction and placement of wall sections is ultimately limited only by the amount of accessible rock terrain.

Upon placement, wall sections will automatically connect horizontally or vertically to any other adjacent friendly or enemy wall sections, and will also attempt to connect horizontally or vertically to adjacent areas where pre-existing friendly or enemy wall sections or buildings were destroyed. Existing wall sections can also reconfigure in such a way when they connect to a new wall section.

Wall sections are not damaged if placed directly on rock.

Wall sections take a random amount of damage before being destroyed.

Clicking on a wall section with the Selection Cursor has no effect; no ID icon or status bar is displayed.

Wall sections cannot be fixed.

Walls provide no defense against sonic blasts. Wall sections also cannot be affected by sonic blasts.

Saboteurs can pass over enemy walls, and may do so without slowing down.

Wall sections appear on radar. Walls cannot be captured.

Windtrap



Windtrap Power Center

Windtrap specifications:

Structure	Cost	Power	Hitpoints	Size	Required building	First mission
Windtrap	300	100	200	2x2	Construction Yard	1



Clicking on a friendly windtrap will display its damage status bar and its power output. Under the damage status bar will be a numerical reading indicating the power demand on each windtrap under the player's control. When the 'needed' reading matches the 'output' reading, all friendly windtraps are being tapped of all available power.



Windtraps do not need to be physically connected to friendly buildings to have an effect on them. Destruction of concrete, wall sections or other buildings between a windtrap and other friendly buildings will not cut the windtraps' power supply to those buildings. Also, if a player captures a Computer-controlled windtrap, its power output is diverted to the player's buildings.

If a player's windtraps cannot meet power demands, buildings will begin taking damage. Also, if the player has a radar outpost, the radar will go offline.

When windtraps are not supplying enough power, all friendly buildings which are less than 50% damaged will begin to slowly deteriorate to a 50%-damaged status. Buildings which are already at least 50% damaged are not affected by a lack of power.

Damaged buildings draw as much power from windtraps as undamaged buildings of the same type.

A windtrap only produces power in relation to its damage; a windtrap that is 75% damaged only produces 75% of its maximum capacity. However, due to an oversight in the game data, any reading below 50% is misleading. The minimum output of a windtrap is 50% of maximum capacity, regardless of what the reading says. A windtrap which only has 10% of its hitpoints left will still produce 50% of its maximum power capacity, although the reading will say 10%.

If a player's last/only windtrap is destroyed, all player-controlled construction yards will lose the ability to produce anything but concrete and windtraps. Note that this is not true for Computer-controlled construction yards. Computer construction yards may rebuild any destroyed Computer building at any time.

Windtraps may be captured.

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WOR



WOR

WOR specifications:

Structure	Cost	Power	Hitpoints	Size	Required building	First mission
WOR	400	10	400	2x2	Outpost	2

A WOR can only produce troopers.

On the construction yard Production Screen, Atreides and Ordos soldier barracks are not identical in appearance to Harkonnen WOR barracks.

On the trooper barracks Production Screen, the trooper unit image is a slightly refined version of the trooper image.

A player can change a production order midway through production, or any time before the unit is placed on the battlefield. In either case, credits from the cancelled order are returned.

If a WOR contains a newly-completed unit, it will refuse new Build orders until that unit is discharged from the barracks.

WOR buildings cannot be captured.

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1.4 Management of Buildings

Whenever spice is received by a House, the spice is immediately divided equally among all friendly storage facilities; refineries and silos. A House's total quantity of stored spice is also immediately divided equally among all its storage facilities whenever additional facilities become available through construction or capture.

When spice is used—when credits are spent—an equal share of the total spice amount is removed from all friendly storage facilities.

A construction or repair project can be started with as little as 1 credit.

When a new structure's placement grid appears, the upper left corner of the grid will replace the Selection Cursor. If this corner is placed over any part of the originating construction yard, clicking the mouse button will enter the construction yard's Production Screen instead of placing—or attempting to place—the new structure.

In general, if each square in a structure's placement grid contains at least 50% rock, the structure can be placed. Any patches of sand under a structure become rock when the structure is placed.

While a building is being repaired or upgraded, it may still accept production orders, if applicable. Note, however, that the order can only be given from that building's Production Screen. Orders issued with the mouse button while the Game Screen is displayed would be ignored. Repairs and/or upgrades are suspended while construction is underway, and resume when construction is complete.

An Upgrade order cancels any construction order being carried out in the same building.

If an order is issued at a building while a different order is already being carried out at the same building, the results will vary depending on those orders.

Dual-order results chart:

Overlapping orders	Results
Build (Game Screen), Fix	Build paused during Fix, then proceeds
Build (Production Screen), Fix	Build paused during Fix, then proceeds
Build (Game Screen), Upgrade	Build cancelled, Upgrade proceeds
Build (Production Screen), Upgrade	Build cancelled, Upgrade proceeds
Fix, Build (Game Screen)	Fix proceeds, Build ignored
Fix, Build (Production Screen)	Fix cancelled, Build proceeds
Fix, Purchase (starport only)	Both proceed
Fix, Refine (refinery only)	Both proceed
Fix, Repair (repair facility only)	Repair paused during Fix, then proceeds
Fix, Upgrade	Fix cancelled, Upgrade proceeds
Purchase (starport only), Fix	Both proceed
Refine (refinery only), Fix	Both proceed

Repair (repair facility only), Fix	Repair paused during Fix, then proceeds
Upgrade, Build (Production Screen)	Upgrade cancelled, Build proceeds
Upgrade, Fix	Fix paused during Upgrade, then proceeds

Notes: This chart shows all possible results when any two orders are issued to a given building, and the second order has been issued while the first is still being executed.

A Build order can be selected from an appropriate building's Production Screen menu, or can be issued when the building is selected on the Game Screen.

A palace can continue to prepare its special weapon/ability while it is being repaired.

A "Refine order" is initiated when a harvester enters a refinery; a "Repair order" is initiated when a unit enters a repair facility.

While a building is being upgraded, a Repair order can also be issued to the building. A player can issue a Repair order to an upgrading building even when there are no credits available to make the repairs.

Upgrading Buildings

There are no buildings to be upgraded in mission 1, for any House.

Starting with mission 4, some buildings may be upgraded twice. Starting with mission 6, an Ordos barracks may be upgraded 3 times. An Ordos barracks is the only building in the game that can be upgraded 3 times in a single mission.

Some captured Computer buildings may require upgrades to reach their full manufacturing potential.

Upgrading a building always costs 50% of the original building.

Number of building upgrades per mission, quick-reference chart

	Atreides Missions									Ordos Missions									Harkonnen Missions											
Building	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9			
Barracks	-	1	1	1	1	1	1	1	-	1	1	2	2	3	3	3	3	-	-	-	1	1	1	1	1	1	1	1		
Yard	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	
Hi-tech	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Factory	-	-	1	2	2	2	-	-	-	-	1	2	1	1	-	-	-	-	-	-	2	1	1	-	-	-	-	-	-	

Notes: Houses indicated are player-controlled Houses, only. At the start of a mission, initial barracks types are soldier barracks for House Atreides and House Ordos, and trooper barracks for House Harkonnen. Harkonnen hi-techs are never upgraded.

Upgrade detail chart, mission 2

Upgrades		First/only upgrade	
Building	Cost	New option(s)	
Barracks, Atreides	150	Infantry	
Barracks, Ordos	150	Infantry	

Upgrade detail chart, mission 3

Upgrades		First/only upgrade	
Building	Cost	New option(s)	
Barracks, Atreides	150	Infantry	
Barracks, Ordos	150	Infantry	
Light vehicle factory, Atreides	200	Quad	
Light vehicle factory, Ordos	200	Quad	

Upgrade detail chart, mission 4

Upgrades		First upgrade		Second upgrade	
Building	Cost	New option(s)		Cost	New options(s)
Barracks, Atreides	150	Infantry		-	-
Barracks, Harkonnen	200	Troopers		-	-
Barracks, Ordos	150	Infantry		150	Trooper
Light vehicle factory (all)	200	Harvester and combat tank		300	MCV

Notes: Vehicle factories for all Houses are considered identical, here.

Upgrade detail chart, mission 5

Upgrades		First upgrade		Second upgrade	
Building	Cost	New option(s)	Cost	New option(s)	
Barracks, Atreides	150	Infantry	-	-	
Barracks, Harkonnen	200	Troopers	-	-	
Barracks, Ordos	150	Infantry	150	Trooper	
Light vehicle factory, Atreides	300	MCV	300	Missile tank	
Light vehicle factory, Harkonnen	300	Missile tank	-	-	
Light vehicle factory, Ordos	300	MCV	-	-	

Upgrade detail chart, mission 6

Upgrades		First upgrade		Second upgrade		Third upgrade	
Building	Cost	New option(s)	Cost	New option(s)	Cost	New option(s)	
Barracks, Atreides	150	Infantry	-	-	-	-	
Barracks, Harkonnen	200	Troopers	-	-	-	-	
Barracks, Ordos	150	Infantry	150	Trooper	200	Troopers	
Construction yard (all)	200	Rocket turret	-	-	-	-	
Heavy vehicle factory, Atreides	300	Missile tank	300	Siege tank	-	-	
Heavy vehicle factory, Harkonnen	300	Siege tank	-	-	-	-	
Heavy vehicle factory, Ordos	300	Siege tank	-	-	-	-	

Notes: Construction yards for all Houses are considered identical, here.

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Upgrade detail chart, mission 7

Upgrades		First upgrade		Second upgrade		Third upgrade	
Building	Cost	New option(s)	Cost	New option(s)	Cost	New option(s)	
Barracks, Atreides	150	Infantry	-	-	-	-	
Barracks, Harkonnen	200	Troopers	-	-	-	-	
Barracks, Ordos	150	Infantry	150	Trooper	200	Troopers	
Hi-Tech, Atreides	250	Ornithopter	-	-	-	-	
Hi-Tech, Ordos	250	Ornithopter	-	-	-	-	

Upgrade detail chart, mission 8

Upgrades		First upgrade		Second upgrade		Third upgrade	
Building	Cost	New option(s)	Cost	New option(s)	Cost	New options(s)	
Barracks, Atreides	150	Infantry	-	-	-	-	
Barracks, Harkonnen	200	Troopers	-	-	-	-	
Barracks, Ordos	150	Infantry	150	Trooper	200	Troopers	

Upgrade detail chart, mission 9

Upgrades	First upgrade		Second upgrade		Third upgrade	
	Building	Cost	New option(s)	Cost	New option(s)	Cost
Barracks, Atreides	150	Infantry	-	-	-	-
Barracks, Harkonnen	200	Troopers	-	-	-	-
Barracks, Ordos	150	Infantry	150	Trooper	200	Troopers

After a building is successfully upgraded, its default Build option—shown on the Game Screen when the building is initially clicked on—will change to the option which is now available as a result of the upgrade.

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1.5 Units: General

Unless otherwise specified, the term "units" in this document generally refers to any mobile component of any House's combat, harvesting or support force. The term "airborne units" in this document refers specifically to all carryalls, frigates and ornithopters.

In every mission, there is a preset limit on the number of ground units, and a separate preset limit on the number of airborne units, that a House may have at any one time. If a House reaches its limit on ground units, all friendly vehicle factories and barracks will refuse to manufacture new units, and any friendly starport will refuse to purchase additional units of any type (airborne or ground). Similarly, if a House reaches its limit on airborne units, all friendly hi-techs will refuse to manufacture new units, and any friendly starport will refuse to purchase additional airborne units. These limits vary from mission to mission, and only apply to units that are directly manufactured or purchased by that House. Friendly reinforcement units that are spontaneously dropped off by carryall, palace-generated units, and frigates do not count against a House's unit limits. Also, a House may always acquire additional carryalls and harvesters through the construction of new refineries.

The term "range" in this document refers to the maximum linear distance between two points on a horizontal or vertical line. This distance is measured in "spaces", where 1 space is an area equal in size and shape to 1 quadrant of a concrete slab. See the examples of range under the sections for Rocket Turret, and Turret.

The term "Reveal Range" in this document refers to the largest area of the battlefield that a player-controlled object will reveal or detect when it is placed on the battlefield, moves, or fires. It also refers to the largest area of the battlefield that a Computer-controlled object will reveal to player-controlled forces when it fires.

The Reveal Range for player-controlled ground units varies by unit type, by whether the unit is moving or stationary.

While a player-controlled ground unit is moving to a destination (see section Management of Units), its Reveal Range is reduced. Specifically, a player-controlled ground unit (excluding Fremen and saboteur units) moving in unexplored territory will reveal/detect only the space it occupies, and the 8 surrounding spaces. A Fremen or saboteur unit in motion does not reveal any unexplored territory beyond the one space it occupies.

Minimum Reveal Range for ground units other than Fremen and saboteurs:

###

Notes: a hash character ("#") represents an area roughly equivalent in size to 1 quadrant of a concrete slab. Here, a unit would be at the center of this 3x3 matrix.

Ground units of any type (and belonging to any House) may occasionally cross paths when they should normally not be able to do so. When this happens, one unit will overlap the other, and neither unit will be damaged.

Airborne units of any type (and belonging to any House) can cross paths at any time without affecting one another.

An airborne unit can be damaged if it flies over an explosion, including projectile impacts on terrain, buildings, or units.

Once a unit has been ordered to attack a target unit, the target unit can be tracked and followed into unexplored/unrevealed territory.

If a Computer-controlled ground unit, turret or rocket turret fires from a position which is not visible on the battlefield, that position and the area around it will be revealed or detected.

Any unit which fires 2 projectiles per attack will fire only 1 projectile per attack if it becomes 50% damaged.

Any unit which fires 2 projectiles per attack can split its attack between 2 targets if one target is destroyed with the first projectile, and/or the attacking unit is given new orders before the second projectile is fired.

Ground units may ignore intervening objects when firing on targets. Results of such attacks vary depending on the type of attacking unit and the weapon used. Deviators and missile tanks can fire over intervening objects; trooper(s) and Fremen units can fire over objects when rockets are used; and sonic tanks can fire through mountains and walls without damaging them. With any other type of attack from a ground unit, intervening mountains will block attacks and remain undamaged, and intervening friendly and enemy buildings and walls will block the attack and be damaged. In most attacks, intervening friendly and enemy units will not be hit or damaged (exceptions to this can include damage from sonic blasts, inaccurate missile attacks and/or secondary damage from explosions at target locations).

Solid projectiles may be fired over sandworms without striking them. Sonic blasts directed at another target will damage intervening sandworms.

Airborne units are generally not included in the numerical limit placed on ground units, and have a separate maximum numerical limit. An exception to this occurs when purchasing ornithopters from a starport, which cannot be done if the numerical limit on ground units has been reached.

On occasion, when a combat tank, Deviator, harvester, MCV, missile tank, siege tank or sonic tank is destroyed, it will leave behind a soldier, which will be undamaged and in Guard mode.

With the exception of harvesters, Fremen and MCVs, all friendly ground units in Guard mode will occasionally "fidget", reorienting themselves (and/or their turrets, where applicable) at random times.

Computer-controlled ground units in Guard mode remain motionless, with the possible exception of saboteurs in Area-guard mode.

Airborne units do not reveal unexplored territory.

Note that on occasion an explosion may itself become a target. Specifically, an exploding enemy unit can remain a target until it explodes and the fireball fades away. Until this happens, friendly forces may continue to fire at that location, causing more explosions there. This cycle of firing and explosions may be repeated several times.

A unit's orders will be cancelled (and it will default to Guard mode) if its target has been destroyed. "Target" here means any unit or building it was ordered to move to and/or attack.

In general, when a ground unit cannot carry out an order, it will default to Guard mode. If 2 ground units are ordered to occupy the same empty target space, the first unit to arrive will go into Guard mode; the second unit to arrive will wait indefinitely for a chance to move into the target location. During this wait, the unit will ignore all other enemy buildings and units until it can complete the move, or until its move order is cancelled or changed.

As a player-controlled ground unit is destroyed, its Reveal Range increases to maximum, and any unrevealed/undetected territory around that unit is revealed/detected accordingly.

Combat units in Guard mode will never directly target walls for attack.

Soldier, infantry, trooper and troopers units in Guard mode will not attempt to capture enemy buildings.

Sand dunes will not slow the movement of ground units any more than flat sand will.

Under varying circumstances, a ground unit may occasionally be produced which will accumulate damage simply by moving. Such a unit will slowly accumulate damage as it moves, and will eventually be destroyed if it is frequently in motion and never repaired. Note that repairing such a "decaying" unit will restore it to an undamaged state, but does not alter its susceptibility to movement-related damage.

When an infantry unit or a troopers unit is 50% damaged, it will be reduced from a 3-individual group to a single, full-strength individual (an infantry unit is reduced to a soldier; a troopers unit is reduced to a trooper). When this happens, the surviving soldier or trooper may attempt to retreat from combat and return to its point of origin (typically a space adjacent to the barracks which produced the original infantry or troopers unit). While a unit is retreating, it will not return fire if fired upon. If and when the retreating unit reaches its destination, it will stop and go into Guard mode. Note that a retreating player unit can be given new orders at any time, while a retreating Computer unit cannot. A retreating Computer unit will attempt only to reach its point of origin; once it stops retreating it will go into Guard mode and may remain stationary for the remainder of the game, or until destroyed.

Ground units may not always pick the shortest path to a destination, and may occasionally become locked in a repeating search pattern when attempting to negotiate a path around large obstacles. If this happens with a player unit, it can be given a series of new Move commands to break the desired path into smaller steps.

When not moving to specific targets, ornithopters and carryalls which remain in the vicinity of the battlefield will patrol continuously. Most patrolling carryalls tend to move in tight, distorted clockwise circles or ovals, while patrolling ornithopters tend towards larger, sweeping clockwise patterns, with occasional counterclockwise curves or loops.

Damaged ground units can only summon carryalls which are already present on the battlefield.

Ground units can exit a factory or other building through any side, and can appear at any unoccupied space immediately adjacent to the building.

Availability of units through production or purchase, quick-reference chart:

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Unit availability: Atreides Missions

Unit	1	2	3	4	5	6	7	8	9
Carryall	-	-	-	-	x	x	x	x	x
Combat tank	-	-	-	x	x	x	x	x	x
Death Hand	-	-	-	-	-	-	-	-	-
Devastator	-	-	-	-	-	-	-	-	-
Deviator	-	-	-	-	-	-	-	-	-
1-Fremen unit	-	-	-	-	-	-	-	x	x
3-Fremen unit	-	-	-	-	-	-	-	x	x
Harvester	-	-	x	x	x	x	x	x	x
Infantry	-	x	x	x	x	x	x	x	x
MCV	-	-	-	x	x	x	x	x	x
Missile tank	-	-	-	-	x	x	x	x	x
Ornithopter	-	-	-	-	-	-	x	x	x
Quad	-	-	x	x	x	x	x	x	x
Raider trike	-	-	-	-	-	-	-	-	-
Saboteur	-	-	-	-	-	-	-	-	-
Siege tank	-	-	-	-	-	x	x	x	x
Soldier	-	x	x	x	x	x	x	x	x
Sonic tank	-	-	-	-	-	-	x	x	x
Trike	-	x	x	x	x	x	x	x	x
Trooper	-	-	-	-	-	-	-	-	-
Troopers	-	-	-	-	-	-	-	-	-

Unit availability: Ordos Missions

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Unit	1	2	3	4	5	6	7	8	9
Carryall	-	-	-	-	x	x	x	x	x
Combat tank	-	-	-	x	x	x	x	x	x
Death Hand	-	-	-	-	-	-	-	-	-
Devastator	-	-	-	-	-	-	-	-	-
Deviator	-	-	-	-	-	-	x	x	x
1-Fremen unit	-	-	-	-	-	-	-	-	-
3-Fremen unit	-	-	-	-	-	-	-	-	-
Harvester	-	-	x	x	x	x	x	x	x
Infantry	-	x	x	x	x	x	x	x	x
MCV	-	-	x	x	x	x	x	x	x
Missile tank	-	-	-	-	-	x	x	x	x
Ornithopter	-	-	-	-	-	-	x	x	x
Quad	-	-	x	x	x	x	x	x	x
Raider trike	-	x	x	x	x	x	x	x	x
Saboteur	-	-	-	-	-	-	-	x	x
Siege tank	-	-	-	-	-	-	x	x	x
Soldier	-	x	x	x	x	x	x	x	x
Sonic tank	-	-	-	-	-	-	-	-	-
Trike	-	-	-	-	-	x	x	x	x
Trooper	-	-	-	x	x	x	x	x	x
Troopers	-	-	-	-	-	x	x	x	x

Unit availability: Harkonnen Missions

Unit	1	2	3	4	5	6	7	8	9
Carryall	-	-	-	-	x	x	x	x	x
Combat tank	-	-	-	x	x	x	x	x	x
Death Hand	-	-	-	-	-	-	-	x	x
Devastator	-	-	-	-	-	-	x	x	x
Deviator	-	-	-	-	-	-	-	-	-
1-Fremen unit	-	-	-	-	-	-	-	-	-
3-Fremen unit	-	-	-	-	-	-	-	-	-
Harvester	-	x	x	x	x	x	x	x	x
Infantry	-	-	-	-	-	-	-	-	-
MCV	-	-	-	x	x	x	x	x	x
Missile tank	-	-	-	-	x	x	x	x	x
Ornithopter	-	-	-	-	-	-	-	-	-
Quad	-	-	x	x	x	x	x	x	x
Raider trike	-	-	-	-	-	-	-	-	-
Saboteur	-	-	-	-	-	-	-	-	-
Siege tank	-	-	-	-	-	x	x	x	x
Soldier	-	-	-	-	-	-	-	-	-
Sonic tank	-	-	-	-	-	-	-	-	-
Trike	-	-	-	-	-	x	x	x	x
Trooper	-	x	x	x	x	x	x	x	x
Troopers	-	-	-	x	x	x	x	x	x

Notes: These charts show all unit types available to all Houses through direct production or purchase, only; units obtained by any other means (such as harvesters delivered with newly purchased refineries) are not included here.

Availability of units not commonly produced or purchased

Unit	Atreides	Ordos	Harkonnen
Death Hand	Unavailable	Unavailable	-
Devastator	Capture/Deviation	Capture/Deviation	-
Deviator	Capture/Deviation	Capture/Deviation	-
Fremen	-	Unavailable	Unavailable
Infantry	-	-	Deviation
Ornithopter	-	-	Capture/Deviation
Raider trike	Capture/Deviation	-	Capture/Deviation
Saboteur	Unavailable	-	Unavailable
Soldier	-	-	Deviation/Survivor
Sonic tank	-	Capture/Deviation	Capture/Deviation
Trooper	Deviation/Survivor	-	-
Troopers	Airlifts/Deviation	-	-

Notes: "Unavailable" means that this unit will not be available to this House under any circumstances; "Capture" means that this House may build this unit after capturing an appropriate enemy vehicle factory or Hi-Tech facility; "Deviation" means that this House may control this enemy unit through successful attack by a Deviator (note that in some cases this will mean that this House must first

capture an Ordos vehicle factory which is capable of producing Deviators); "Airlifts" means that this unit may be delivered to this House by carryall (in missions where carryalls supply reinforcement units); "survivor" refers to instances where this unit is generated from the destruction of another unit belonging to this House.

Unit list, alphabetical sort

Unit	Cost	Arms	Hitpoints	Speed	Range	Provided at	Requires
Carryall	800	0	100	200	N/A	Refinery/Hi-Tech	Hi-Tech
Combat tank	300	38	200	25	4	Vehicle factory/starport	Outpost
Death Hand	0	150	70	250	N/A	Palace	-
Devastator	800	60	400	10	5	Vehicle factory	Hi-Tech
Deviator	750	0	120	30	7	Vehicle factory	Hi-Tech
1-Fremen unit	0	8	90	15	3	Palace	-
3-Fremen unit	0	8	220	10	3	Palace	-
Harvester	300	0	150	30	N/A	Refinery/factory/starport	-
Infantry	100	4	50	5	2	Barracks	-
MCV	900	0	150	20	N/A	Vehicle factory/starport	Outpost
Missile tank	450	112	100	30	9	Vehicle factory/starport	Outpost
Ornithopter	600	75	5	150	5	Hi-Tech/starport	Hi-Tech
Quad	200	10	130	50	3	Vehicle factory/starport	-
Raider trike	150	8	80	75	3	Vehicle factory	-
Saboteur	0	150	40	40	2	Palace	-
Siege tank	600	45	300	20	5	Vehicle factory/starport	Outpost
Soldier	60	4	20	8	2	Barracks	-
Sonic tank	600	90	110	30	8	Vehicle factory	Hi-Tech
Trike	150	8	100	60	3	Vehicle factory/starport	-
Trooper	100	8	45	15	3	Barracks	-
Troopers	200	8	110	10	3	Barracks	-

Notes: Some units are only available to certain Houses, and/or are only available in later missions. "Cost" indicates only the unit's manufacturing cost at a barracks, vehicle factory or Hi-Tech facility. At starports a given unit's cost will vary over time. "Speed" is maximum speed for airborne units, and maximum speed for ground units on concrete; "Range" is maximum weapon range; "To build requires" indicates a building which is required in order to manufacture this unit. This is usually a building which is required in addition to the factory or Hi-Tech where the unit will be manufactured. "N/A" means "Not Applicable"; "Vehicle factory" and "factory" are synonymous terms here. The starport frigate is not included in this chart. For more information, see section Frigate.

This document uses the ornithopter range rating of 5, which is used in the actual game. The manual included with the game rates an ornithopter's range at 50.

This document uses the ornithopter shield rating of 5, which is used in the actual game (appearing on the Hi-Tech Production Screen and the starport Order Screen). The manual included with the game rates an ornithopter's shield at 3.

This document uses the trooper speed rating of 15, which is used in the actual game. The manual included with the game rates a trooper unit's speed at 10.

This document uses the troopers' speed rating of 10, which is used in the actual game. The manual included with the game rates a troopers unit's speed at 15.

Unit list, cost sort

Unit	Cost	Arms	Hitpoints	Speed	Range	Provided at	Requires
Death Hand	0	150	70	250	N/A	Palace	-
1-Fremen unit	0	8	90	15	3	Palace	-
3-Fremen unit	0	8	220	10	3	Palace	-
Saboteur	0	150	40	40	2	Palace	-
Soldier	60	4	20	8	2	Barracks	-
Infantry	100	4	50	5	2	Barracks	-
Trooper	100	8	45	15	3	Barracks	-
Raider trike	150	8	80	75	3	Vehicle factory	-
Trike	150	8	100	60	3	Light vehicle factory/starport	-
Quad	200	10	130	50	3	Light vehicle factory/starport	-
Troopers	200	8	110	10	3	Barracks	-
Combat tank	300	38	200	25	4	Heavy vehicle factory/starport	Outpost
Harvester	300	0	150	30	N/A	Refinery/factory/starport	-
Missile tank	450	112	100	30	9	Heavy vehicle factory/starport	Outpost
Ornithopter	600	75	5	150	5	Hi-Tech/starport	Hi-Tech
Siege tank	600	45	300	20	5	Heavy vehicle factory/starport	Outpost
Sonic tank	600	90	110	30	8	Heavy vehicle factory	Hi-Tech
Deviator	750	0	120	30	7	Heavy vehicle factory	Hi-Tech
Carryall	800	0	100	200	N/A	Refinery/Hi-Tech	Hi-Tech
Devastator	800	60	400	10	5	Heavy vehicle factory	Hi-Tech
MCV	900	0	150	20	N/A	Heavy vehicle factory/starport	Outpost

Notes: See the notes with the first chart in this series.

The Battle for Arrakis

Unit list, arms sort

Unit	Cost	Arms	Hitpoints	Speed	Range	Provided at	Requires
Carryall	0	800	100	200	N/A	Refinery/Hi-Tech	Hi-Tech
Deviator	0	750	120	30	7	Vehicle factory	Hi-Tech
Harvester	0	300	150	30	N/A	Refinery/factory/starport	-
MCV	0	900	150	20	N/A	Vehicle factory/starport	Outpost
Infantry	4	100	50	5	2	Barracks	-
Soldier	4	60	20	8	2	Barracks	-
1-Fremen unit	8	0	90	15	3	Palace	-
3-Fremen unit	8	0	220	10	3	Palace	-
Raider trike	8	150	80	75	3	Vehicle factory	-
Trike	8	150	100	60	3	Vehicle factory/starport	-
Trooper	8	100	45	15	3	Barracks	-
Troopers	8	200	110	10	3	Barracks	-
Quad	10	200	130	50	3	Vehicle factory/starport	-
Combat tank	38	300	200	25	4	Vehicle factory/starport	Outpost
Siege tank	45	600	300	20	5	Vehicle factory/starport	Outpost
Devastator	60	800	400	10	5	Vehicle factory	Hi-Tech
Ornithopter	75	600	5	150	5	Hi-Tech/starport	Hi-Tech
Sonic tank	90	600	110	30	8	Vehicle factory	Hi-Tech
Missile tank	112	450	100	30	9	Vehicle factory/starport	Outpost
Death Hand	150	0	70	250	N/A	Palace	-
Saboteur	150	0	40	40	2	Palace	-

Notes: See the notes with the first chart in this series.

The Battle for Arrakis

Unit list, hitpoint sort

Unit	Cost	Arms	Hitpoints	Speed	Range	Provided at	Requires
Ornithopter	5	600	75	150	5	Hi-Tech/starport	Hi-Tech
Soldier	20	60	4	8	2	Barracks	-
Saboteur	40	0	150	40	2	Palace	-
Trooper	45	100	8	15	3	Barracks	-
Infantry	50	100	4	5	2	Barracks	-
Death Hand	70	0	150	250	N/A	Palace	-
Raider trike	80	150	8	75	3	Vehicle factory	-
1-Fremen unit	90	0	8	15	3	Palace	-
Carryall	100	800	0	200	N/A	Refinery/Hi-Tech	Hi-Tech
Missile tank	100	450	112	30	9	Vehicle factory/starport	Outpost
Trike	100	150	8	60	3	Vehicle factory/starport	-
Sonic tank	110	600	90	30	8	Vehicle factory	Hi-Tech
Troopers	110	200	8	10	3	Barracks	-
Deviator	120	750	0	30	7	Vehicle factory	Hi-Tech
Quad	130	200	10	50	3	Vehicle factory/starport	-
Harvester	150	300	0	30	N/A	Refinery/factory/starport	-
MCV	150	900	0	20	N/A	Vehicle factory/starport	Outpost
Combat tank	200	300	38	25	4	Vehicle factory/starport	Outpost
3-Fremen unit	220	0	8	10	3	Palace	-
Siege tank	300	600	45	20	5	Vehicle factory/starport	Outpost
Devastator	400	800	60	10	5	Vehicle factory	Hi-Tech

Notes: See the notes with the first chart in this series.

The Battle for Arrakis

Unit list, speed sort

Unit	Arms	Cost	Hitpoints	Speed	Range	Provided at	Requires
Infantry	5	100	50	5	2	Barracks	-
Soldier	8	60	20	8	2	Barracks	-
Devastator	10	800	400	10	5	Heavy vehicle factory	Hi-Tech
3-Fremen unit	10	0	110	10	3	Palace	-
Troopers	10	200	110	10	3	Barracks	-
1-Fremen unit	15	0	45	15	3	Palace	-
Trooper	15	100	45	15	3	Barracks	-
Harvester	30	300	150	20	N/A	Refinery/factory/starport	-
MCV	20	900	150	20	N/A	Heavy vehicle factory/starport	Outpost
Siege tank	20	600	300	20	5	Heavy vehicle factory/starport	Outpost
Combat tank	25	300	200	25	4	Heavy vehicle factory/starport	Outpost
Missile tank	30	450	100	30	9	Heavy vehicle factory/starport	Outpost
Deviator	30	750	120	30	7	Heavy vehicle factory	Hi-Tech
Sonic tank	30	600	110	30	8	Heavy vehicle factory	Hi-Tech
Saboteur	40	0	10	40	2	Palace	-
Quad	50	200	130	40	3	Light vehicle factory/starport	-
Trike	60	150	100	45	3	Light vehicle factory/starport	-
Raider trike	75	150	80	60	3	Light vehicle factory	-
Carryall	200	800	100	100	N/A	Refinery/Hi-Tech	Hi-Tech
Ornithopter	600	600	25	150	5	Hi-Tech/starport	Hi-Tech
Carryall	0	800	100	200	N/A	Hi-Tech	Hi-Tech
Death Hand	250	0	150	250	N/A	Palace	-

Notes: See the notes with the first chart in this series.

The Battle for Arrakis

Unit list, range sort

Unit	Range	Cost	Damage	Shield	Speed	Provided by	Requires
Infantry	2	100	4	50	5	Barracks	
Saboteur	2	0	150	40	40	Palace	
Soldier	2	60	4	20	8	Barracks	
1-Fremen unit	3	0	8	90	15	Palace	
3-Fremen unit	3	0	8	220	10	Palace	
Quad	3	200	10	130	50	Vehicle factory/starport	
Raider trike	3	150	8	80	75	Vehicle factory	
Trike	3	150	8	100	60	Vehicle factory/starport	
Trooper	3	100	8	45	15	Barracks	
Troopers	3	200	8	110	10	Barracks	
Combat tank	4	300	38	200	25	Vehicle factory/starport	Outpost
Devastator	5	800	60	400	10	Vehicle factory	Hi-Tech
Ornithopter	5	600	75	5	150	Hi-Tech/starport	Hi-Tech
Siege tank	5	600	45	300	20	Vehicle factory/starport	Outpost
Deviator	7	750	0	120	30	Vehicle factory	Hi-Tech
Sonic tank	8	600	90	110	30	Vehicle factory	Hi-Tech
Missile tank	9	450	112	100	30	Vehicle factory/starport	Outpost
Carryall	N/A	800	0	100	200	Refinery/Hi-Tech	Hi-Tech
Death Hand	N/A	0	150	70	250	Palace	
Harvester	N/A	300	0	150	30	Refinery/factory/starport	
MCV	N/A	900	0	150	20	Vehicle factory/starport	Outpost

Notes: See the notes with the first chart in this series.

The Battle for Arrakis

Unit build times, in ascending order

Unit	Build time (in Game seconds)
Death Hand	0
Soldier	32
Infantry	32
Trike	40
Raider trike	40
Quad	48
Saboteur	48
Troopers	56
Trooper	56
Harvester	64
Carryall	64
Combat Tank	64
Missile Launcher	72
MCV	80
Deviator	80
Ornithopter	96
Siege tank	96
Devastator	104
Sonic tank	104

These are all the build times for all the units. The Death Hand special weapon has no build time at all, since recharge times are not counted for.

Unit Weapons, Unit index sort

Unit	Range	Damage	Type	Sight
Carryall	0	0	N/A	0
Ornithopter	50	50	Mini rocket	5
Infantry	2	3	Bullet	1
Troopers	5	5	Bullet	1
Soldier	2	3	Bullet	1
Trooper	5	5	Bullet	1
Saboteur	2	2	Bullet	1
Launcher	9	75	Rocket	5
Deviator	7	0	G-Rocket	5
Tank	4	25	Bullet	3
SiegeTank	5	30	Bullet	4
Devastator	5	40	Bullet	4
SonicTank	8	60	Sonic blast	4
Trike	3	5	Bullet	2
RaiderTrike	3	5	Bullet	2
Quad	3	7	Bullet	2
Harvester	0	0	N/A	2
MCV	0	0	N/A	2
Sandworm	0	300	Special	0
Frigate	0	0	N/A	0

Bullets can not pass over other structures.

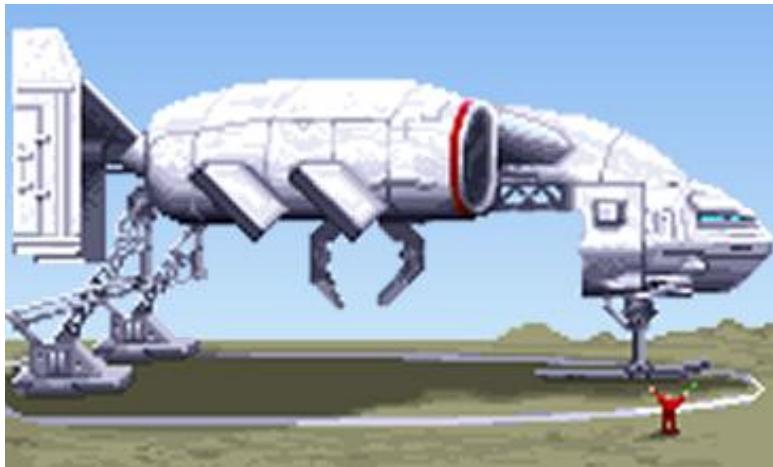
The sonic blast of the sonic tank has an indeterminate range; the range of the blast depends on the game speed setting. On the fastest game speed setting the sonic blast covers almost the entire screen.

The rocket of the Ordos Deviator does no damage.

1.6 Units: Specifics and Specifications

Herewith are specifics and specifications for all the 19 units that can be encountered on the battlefield.

Carryall



Carryall

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Carryall specifications:

Unit	Cost	Arms	Hitpoints	Speed	Range	Provided at
Carryall	800	0	100	200	N/A	Refinery/Hi-Tech

A carryall is white, trimmed with the House color of the side controlling it.

Carryalls do not appear on radar.

Clicking on a carryall has no effect. A player cannot target, order, or get the damage status of a carryall.

Carryalls may be made available to a House under varying circumstances. In missions 5 through 9, carryalls may be manufactured by any House; but in all 9 missions, carryalls may also be provided on a temporary basis from outside sources. Manufactured carryalls and those delivered with refineries patrol the battlefield continuously, awaiting tasks to perform, while "outside" carryalls will enter the battlefield only when required, and then leave again when they are no longer being utilized. Note that damaged ground units can only summon carryalls which are already present on the battlefield.

Externally spawned carryalls are not confined to the battlefield, and may cross its borders at any time.

Carryalls can automatically retrieve full harvesters and bring them back to refineries. They can also remove unloaded harvesters from refineries and place them on the battlefield.

Carryalls can automatically retrieve damaged ground units and bring them back to repair facilities.

Friendly carryalls may, from time to time, drop off new reinforcement units; this will vary by House, and mission number. If a unit is dropped off in a location that is not visible on the battlefield, the unit and the area around it will be revealed or detected. Note that this is the only time a friendly carryall may transport more than one unit at a time.

Starting with mission 4, Computer-controlled carryalls may, from time to time, drop off Computer-controlled ground units near a player's structures. Note that more than one Computer unit at a time may be transported by a single Computer carryall.

Starting with mission 4, Computer-controlled carryalls may continue to drop off Computer units even after that House's base can no longer produce units.

Carryalls will not reveal unexplored territory.

If a carryall is destroyed, anything it was carrying is also destroyed.

Carryalls can transport units to and from repair facilities and vehicle factories when those buildings are tightly surrounded by other buildings, walls, or ground units. If a starport is surrounded in this way, a carryall will remove individual units from frigates which attempt to unload there, and will then place those units on the battlefield.

Any unit's Move or Attack order is cancelled if it is picked up by a carryall. A Devastator's Self-Destruct order is not cancelled, but is suspended until it is returned to the battlefield.

Carryalls produced at a Hi-Tech will tend to remain in the general area around the Hi-Tech unless/until they have a target to move to.

If a carryall is delivering a harvester to a refinery, and the refinery is destroyed before the carryall reaches it, the carryall will search for another unoccupied friendly refinery and make the delivery there, if possible. If no such refinery exists, the carryall will keep the harvester and will begin to patrol the battlefield. If a new friendly refinery is made available, the carryall may deliver the harvester, or it may continue to patrol.

If a harvester is ordered to move to a location that it cannot reach, a carryall will attempt to retrieve the harvester, and take it to an unoccupied friendly refinery. If such a refinery is not available, the carryall will fail to make the pickup, and will repeat the attempt until a refinery is available, or until the harvester's orders are changed so that it no longer requires pickup.

If a ground unit other than a harvester or MCV is ordered to move to a location that it cannot reach, a carryall may attempt to retrieve the unit, and take it to an unoccupied friendly repair facility. If no friendly repair facilities exist, no carryall is summoned, and the unit returns to Guard mode.

In general, a carryall will attempt to retrieve any unit which is ordered to move to a location that the unit cannot reach on its own. However, if the player orders an MCV to a location that it cannot reach, the MCV will likely be ignored by carryalls.

Any number of carryalls may become available for transporting units. The number of carryalls available at a given time does not necessarily correspond to the number of carryalls provided with refineries and/or manufactured at Hi-Techs.

Deviator missiles cannot affect carryalls; however, a Deviator missile explosion beneath an overflying enemy carryall may deviate any unit(s) held by the carryall.

Carryalls will not deliver harvesters or MCVs to repair facilities; Harvesters and MCVs must use a ground path in order to enter a repair facility. Note, however, that a carryall can retrieve a harvester or MCV from a repair facility if the repaired unit becomes blocked inside or otherwise cannot find a ground path to exit the facility.

Carryalls are immune to deviation.

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Combat Tank



Combat Tank

Combat tank specifications:

Unit	Cost	Arms	Hitpoints	Speed	Range	Provided at	Requires
Combat tank	300	38	200	25	4	Heavy vehicle factory	Outpost

A combat tank can fire only 1 cannon shell per attack.

Combat tanks can be used to overrun enemy soldier, infantry, trooper(s), Fremen, or saboteur units.

While not organic, combat tanks are not immune to sonic attacks.

Combat tanks are not immune to deviation.

Death Hand



Death hand specifications:

Unit	Cost	Arms	Hitpoints	Speed	Range	Provided at
Death Hand	0	150	70	250	N/A	Palace

Clicking on an in-flight Death Hand has no effect. A player cannot target, order, or get the damage status of a Death Hand in flight.

The explosion caused by a Death Hand can damage terrain, spice not yet harvested, friendly and enemy structures, all ground units, most airborne units, and sandworms.

A Death Hand explosion cannot destroy a frigate, unless the frigate is at a starport which is hit and destroyed by the Death Hand.

Although a Death Hand explosion on screen is roughly asterisk-shaped, any actual damage occurs within a 5 by 5 space square:

```
#####
#####
```

Notes: a hash character ("#") represents an area equal in size and shape to 1 quadrant of a concrete slab. Here, the Death Hand would have impacted at the center of this 5x5 matrix.

Death Hands are generally inaccurate. As such, a Death Hand launched at a target near an edge of the battlefield can explode partially or completely off-screen. When a Death Hand explodes completely off-screen, no explosion sound is played.

If there are a many sound producing event on the screen, you may hear the "Missile Warning" sound after the missile has already hit.

The Death Hand is quite obviously immune to deviation.

Devastator



Devastator specifications:

Unit	Cost	Arms	Hitpoints	Speed	Range	Provided at	Requires
Devastator	800	60	400	10	5	Heavy vehicle factory	Hi-Tech

On the Game Screen, Devastators are somewhat similar in appearance to siege tanks. Note that Devastators have square-like turrets with cannon barrels set relatively close together. Siege tanks have rounded turrets with cannon barrels set relatively far apart.

A Devastator does not have a rotating turret; the entire tank must turn to face a target.

An undamaged Devastator can fire up to 2 cannon shells per attack.

If a Computer-controlled Devastator succumbs to an attack from a Deviator, the Devastator may be ordered to self-destruct. If given the self-destruct order while deviated, the order will be carried out even if the Devastator reverts back to enemy control.

A self-destructing Devastator can damage an area of this size and shape:

###

Notes: a hash tag character "#" represents an area equal in size and shape to 1 quadrant of a concrete slab. Here, the Devastator would have exploded at the center of this 3x3 matrix.

Concrete which is directly under a self-destructing Devastator is always destroyed. Concrete adjacent to a self-destructing Devastator is never affected.

A self-destructing Devastator can damage nearby sandworms.

A self-destructing Devastator can damage or destroy overhead airborne units.

A Devastator which is ordered to self-destruct will be in Guard mode, and may still fire on enemy buildings or units before exploding. A Devastator ordered to self-destruct will not explode if it is swallowed by a sandworm. A Devastator's Self-Destruct countdown usually lasts about 4.5 seconds.

Devastators can be used to overrun enemy soldier, infantry, trooper(s), Fremen, or saboteur units.

Devastators are not immune to deviation, nor are they immune to sonic attacks.

Deviator



A Deviator in an ice field

Deviator specifications:

Unit	Cost	Arms	Hitpoints	Speed	Range	Mission	Requires
Deviator	750	0	120	30	7	Vehicle factory	Hi-Tech

On the Game Screen, Deviators are identical in appearance to missile tanks—difference in House colors being the only exception.

Deviators cannot directly affect terrain—with the exception of spice blooms—or spice not yet harvested.

Deviators in Guard mode will not fire on enemy structures.

Deviators in Guard mode will fire on enemy saboteurs and may fire on sandworms.

If ordered to fire on a spice bloom, a Deviator will only fire at it once, and then go into Guard mode. A direct hit from a Deviator missile will detonate the spice bloom. This is the only instance where a Deviator missile can directly affect terrain.

A Deviator will fire only 1 missile per attack.

Deviator missiles can affect any units within in area of this size and shape:

```
#  
# #  
## ##  
## # #  
# # #  
#
```

Notes: a hash character ("#") represents an area equal in size and shape to 1 quadrant of a concrete slab. Here, the missile impact would be at the center. Any enemy units within this area may be affected; although it is also possible that a given Deviator missile will have no effect on any unit.

Missiles will attempt to strike wherever the target was located at the moment of firing.

Deviator missiles can affect most enemy ground units, and enemy ornithopters.

Deviator missiles have no effect on friendly or enemy structures, friendly units, carryalls, Fremen, frigates, saboteurs, or sandworms.

Deviator missiles cannot affect carryalls; however, a Deviator missile explosion beneath an enemy carryall flying over it may deviate any unit(s) held by the carryall.

The only units that are immune to the deviating effects are the carryall, the Death Hand missiles, and the frigate.

When a ground unit is deviated, it goes into Guard mode.

On the Game Screen, a deviated unit's coloring will change to the House color of the side controlling the Deviator. If the deviation effect wears off, the unit's color changes back. The radar screen will also show the color changes of deviated ground units.

When a Deviator successfully attacks an enemy unit, that unit will be under the control of the House operating the Deviator. The affected unit can revert back once it is fired upon by any other unit, turret or rocket turret, or when the Deviator gas effect wears off.

After a House deviates a unit, its forces will ignore that unit unless the unit reverts to enemy control while it is executing an order or the unit reverts and then executes an enemy order. If a deviated unit in Guard mode reverts but remains in Guard mode, it will not be attacked by the forces of the deviating House.

Note that a deviated unit cannot overrun units which belong to its original House. Example: An Ordos player deviates a Harkonnen tank. The tank, now under Ordos' control, is ordered to overrun a Harkonnen trooper. Here, the tank will attempt to maneuver around the trooper, instead.

If a Computer-controlled unit is clicked on, and is then deviated, the Selection Cursor changes to a Targeting Cursor, and the deviated unit is ready to accept an order from the player.

When a unit is deviated, it is not subtracted from the unit limit of the House which built it. In other words, if a House is prevented from building or purchasing new units because too many friendly units already exist, then that situation will not change if one or more of those friendly units are deviated by the enemy.

Deviated harvesters which revert to Guard mode will not automatically return to friendly refineries; they must be ordered to do so.

A harvester can be deviated while it is unloading at a refinery. When this happens, the harvester will continue to unload, and the House which controls the refinery will receive the spice/credits. When the harvester leaves the refinery, it may still be deviated.

If a refinery contains an enemy harvester, any nearby friendly units may fire upon the refinery in an attempt to destroy the harvester.

If a refinery controlled by one House contains a harvester controlled by another House, a carryall from the first House may remove the harvester. This is the only time a carryall can pick up an enemy unit.

If a Computer-controlled Devastator succumbs to an attack from a Deviator, the Devastator may be ordered to self-destruct. If given the self-destruct order while deviated, the order will be carried out even if the Devastator reverts back to enemy control.

Computer-controlled soldier, infantry or trooper(s) units which are deviated to player control may be used to capture Computer-controlled buildings.

Deviators can themselves be deviated by enemy Deviators. When a Deviator is deviated, the nerve gas in the missiles it fires is also changed to benefit the House which now controls it.

The Harkonnen succumb most easily to deviation, with a 78% success rate, followed by the Ordos at a 30% rate, and the Atreides at a 10% rate. Fremen and Sardaukar are extremely difficult to deviate, and they boast a mere 4% success rate. Mercenaries are impossible to deviate.

When deviated units revert to friendly control, they will be in Guard mode.

Deviators can be used to overrun enemy soldier, infantry, trooper(s), Fremen, or saboteur units.

Fremen



Fremen unit specifications:

Unit	Cost	Arms	Hitpoints	Speed	Range	Provided at
1-Fremen unit	0	8	90	15	3	Palace
3-Fremen unit	0	8	220	10	3	Palace

Fremen may be summoned by the Atreides palace to attack a specific target, or to attack unspecified targets of opportunity. To summon a Fremen attack on a specific target, click the palace's Targeting Cursor on a friendly or enemy building, friendly or enemy ground unit, or a sandworm (enemy targets may be clicked on in revealed or unrevealed areas). Clicking the palace's Targeting Cursor anywhere else on the battlefield will summon Fremen to attack targets of opportunity, which include only enemy buildings and/or enemy ground units which are visible and detectable to player-controlled forces. If there are no valid targets when Fremen units are summoned, they can still appear, but will remain inactive until a valid target of opportunity is revealed.

The Atreides palace will summon from 0 to 5 Fremen units at a time. Each Fremen unit will be either a single Fremen, or a grouped unit of 3 Fremen. These units will all attempt to enter the battlefield simultaneously, in one general area chosen at random. Note that a Fremen unit will disappear if it emerges on the battlefield in a location shared by another solid object. If a player's Fremen units appear in a location that is not visible on the battlefield, the units and the area around them will be revealed or detected. From there they will approach any valid target if one exists.

On the radar screen, a revealed/detected Fremen unit will appear as a white dot.

On the Game Screen, Fremen units are identical in appearance to trooper and/ or troopers units, but with House Atreides coloring.

If a Fremen unit is fired on by an enemy unit, it may disregard any palace-chosen target, and return fire against the enemy unit. If a Fremen unit is fired on by an enemy turret or rocket turret, it may disregard any palace-chosen target, and attack a nearby target of opportunity, instead.

On rare occasions, Fremen units may be ignored by enemy turrets or rocket turrets.

Some Fremen units appear as a group of three individuals. When such a unit is 75% damaged, 2 of these individuals are simultaneously destroyed. When this happens, the remaining individual will be a single full-strength Fremen, i.e. a "1-Fremen unit".

The grouped unit of 3 Fremen will fire twice as often as 1 lone Fremen.

A 1-Fremen unit is equivalent to a trooper unit in armament, speed and range, but has double the shield strength. Similarly, a 3-Fremen unit is equivalent to a troopers unit in armament, speed and range, but has double the shield strength.

Fremen/trooper(s) comparison chart:

Unit	Cost	Arms	Hitpoints	Speed	Range	Provided at
1-Fremen unit	0	8	90	15	3	Palace
Trooper	100	8	45	15	3	Barracks
3-Fremen unit	0	8	220	10	3	Palace
Troopers	200	8	110	10	3	Barracks

A player cannot give new orders to Fremen units; Fremen are autonomous after they first appear on the battlefield.

Fremen units will launch rockets at targets which are up to 3 spaces away. Closer targets are fired on with heavier projectile weapons.

The rockets fired by Fremen can travel over intervening objects to strike a target.

Fremen units may all concentrate on a single target, or attack different targets simultaneously.

Up to 7 Fremen units may be active at a time. Once 7 Fremen units are on the battlefield, any further attempt to summon Fremen will have no effect. An attempt will still use up the palace's summoning ability, but no additional Fremen units are summoned.

Atreides ground vehicles cannot overrun Fremen units; they will attempt to maneuver around Fremen when necessary.

A player-controlled Fremen unit in motion does not reveal any unexplored territory beyond the one space it occupies.

Fremen can seldom be affected by Deviator missiles. In fact, only 4% of attempts to deviate a Fremen unit are successful; it translates to 1 out of 25.

Sometimes Fremen units may be trapped "off screen"—beyond the borders of the displayed territory—and you will be unable to target them, although they can inflict damage on your units and building. The only known solution to this problem is to fire on the ground as close to the trapped units as possible. The trapped, off-screen units will change their target to the attacking vehicle(s) or unit(s)

and will follow them if they retreat, revealing themselves in the process. They can then be targeted and eliminated.

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Frigate



Frigate

Frigate specifications:

Unit	Cost	Arms	Hitpoints	Speed	Range	Provided at
Frigate	N/A	0	100	130	N/A	Starport

A frigate is considered a "unit" only in this document. During the game's tutorial and during actual game play, there are no references to frigates, nor do frigates appear in the unit descriptions or unit tables in the manual included with the game (pages 22 through 27).

On the Game Screen, a frigate appears as a large, metallic, rectangular flying object. See also the illustration on page 11 of the game manual.

Clicking on a frigate has no effect. A player cannot target, order, or get the damage status of a frigate.

A frigate can only be destroyed while at an exploding starport, and is otherwise invulnerable to attack. If a frigate is destroyed, anything it was carrying is also destroyed.

A frigate's cruising speed is comparable to that of an ornithopter.

A frigate has no offensive capability.

Once a frigate has entered the battlefield to land at a starport, the starport will be unable to request additional units. New units can be purchased again only after the frigate has left the battlefield.

If a starport is tightly surrounded by other buildings, walls, or ground units, a carryall will remove individual units from frigates which attempt to unload there, and will then place those units on the battlefield.

If a starport is expecting a frigate, but is destroyed before the frigate arrives, the frigate will drop each purchased unit at a random point on the battlefield.

Frigates will not reveal unexplored territory.

Frigates tend to fly north when leaving the battlefield.

Frigates are immune to deviation.

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Harvester



Harvester

Harvester specifications:

Unit	Cost	Arms	Hitpoints	Speed	Range	Provided at
Harvester	300	0	150	30	N/A	Refinery/factory/starport

At the beginning of a mission, when a refinery is completed and placed, the harvester brought to it will begin seeking spice automatically. When the harvester is full, it will return to the refinery—or another friendly refinery, if applicable—and unload automatically. This process is repeated until all spice that can be detected by the harvester has been processed.

Spice on sand appears in single and double layers. Harvesters process all spice at one fixed speed, one layer at a time.

A harvester can be ordered to harvest spice from an unrevealed/undetected area of the battlefield. Specifically, a harvester with any free cargo space will begin harvesting whenever it is ordered to move to a spice field, whether or not the spice field was revealed or detected on the battlefield at the time the order was given.

If a harvester succumbs to attack from a Deviator, the harvester can be made to unload in a refinery belonging to the attacker.

Clicking on a revealed or detected friendly or enemy harvester will display its ID icon with 1 status bar.

A harvester can hold about 700 credits' worth of spice.

A harvester's performance or storage capacity will not be affected by damage.

In general, if a player has no harvester available, but a player refinery remains, a carryall will deliver a new harvester. However, there are three exceptions to this rule:

- 1) if any refinery is destroyed while a player's last available harvester is unloading there, or
- 2) a player's last/only harvester is in a repair facility, and there are not enough credits available to complete repairs on it, or
- 3) a player's last/only existing harvester is destroyed while another is being built, and there are not enough credits available to complete the new harvester.

In all cases, the player's House will be left without a means to harvest spice; in some cases this problem can be corrected; see sections for repair facility, and heavy vehicle factory.

When a harvester carrying spice is destroyed, some spice will occasionally survive, and appear on flat sand—if any—at and around the harvester's last position. Spice produced by a destroyed harvester will not be deposited on sand dunes, on rock, or over any sand already covered with spice, with the possible exception of a small spot at the harvester's last position.

The speed of the harvester is dependent on the spice load it carries; the more it carries, the slower it can move. A fully loaded harvester moves at 60% of its maximum speed.

Once a harvester reaches a refinery and begins unloading, it will not accept new orders or return a status report until it leaves the refinery again.

Damage inflicted on a refinery will not affect a harvester unloading there. While a harvester is unloading at a refinery it will be immune to any damage unless/until the refinery itself is completely destroyed, in which case the harvester is also destroyed.

A harvester has a limited spice-sensing range. If spice is too far from a harvester, the harvester will not automatically move to it.

In every mission, there is a limit on the number of units a player may directly build or purchase. However, harvesters delivered by carryall with the purchase of new refineries are not accounted for. A player could ultimately have dozens of harvesters in addition to the maximum number of other units.

If a harvester succumbs to an attack from a Deviator, it will cease all activity until it is given new orders, and/or the deviation effect wears off.

After deviated units revert to friendly control, they will be in Guard mode. Deviated harvesters which revert will not automatically return to friendly refineries; they must be ordered to do so.

If a deviated harvester reverts to enemy status as it enters a friendly refinery, it explodes, damaging the refinery.

Once a deviated harvester begins unloading in a refinery, it cannot revert back to enemy control until it leaves the refinery.

A full harvester will ignore orders to move to an area of spice-covered sand.

Spice can appear underneath any units which are on the sand near a detonating spice bloom. Note that a harvester in Guard mode on empty sand will not automatically begin harvesting if spice appears underneath it.

Harvesters will tend to move from low-density spice towards any nearby high-density spice. In this way, harvesters tend to strip off the top layer of spice from bi-level spice fields before harvesting the bottom layer.

If a harvester can exit a refinery, but is then blocked from moving to spice, a carryall will attempt to retrieve the harvester and return it to a refinery. This cycle will repeat until a ground path from the refinery to spice is opened, or the refinery becomes tightly surrounded, forcing a carryall to remove the harvester and place it on the battlefield.

Ordering a harvester to move to a refinery while it is carrying out another Move order may cause the harvester to stop outside the refinery, and not enter. Check the refinery's "docking bay" lights. If they remain dark, no harvester is expected there.

Harvesters in motion will not attempt to avoid, or maneuver around, enemy soldiers, infantry, trooper(s), Fremen, or saboteurs.

A player harvester in Guard mode will never move when a Computer-controlled unit attacks it.

Carryalls will not deliver harvesters to repair facilities; harvesters must use a ground path in order to enter a repair facility. Note, however, that a carryall can retrieve a harvester from a repair facility if the harvester becomes blocked inside or otherwise cannot find a ground path to exit the facility.

Harvesters can be used to overrun enemy soldier, infantry, trooper(s), Fremen, or saboteur units. This is a harvester's only offensive capability under normal circumstances.

Harvesters are not immune to deviation, nor are they immune to sonic attacks.

Heavy Troopers



Heavy Troopers

Heavy troopers' specifications:

Unit	Cost	Arms	Hitpoints	Speed	Range	Provided at
Heavy troopers	200	8	110	10	3	Barracks

In the game, a troopers' unit icon depicts a pair of standing individuals, heavily armed and armored. This icon incorrectly appears next to the "trooper" description on page 22 of the manual included with the game.

On the Game Screen, troopers units are somewhat similar in appearance to infantry units. Note that troopers units carry heavy rocket launchers; infantry units carry smaller, lighter weapons.

A troopers unit is a group of three individuals. When a troopers unit is 50% damaged, 2 of these individuals are simultaneously destroyed. When this happens, the remaining individual will be a full-strength trooper. Note that this trooper may discard any orders and attempt to retreat from combat.

The grouped unit of 3 troopers will fire twice as often as 1 lone trooper.

The firepower of a troopers unit remains at maximum until the entire unit is destroyed.

Troopers units will launch rockets at targets which are up to 3 spaces away. Closer targets are fired on with heavier projectile weapons.

The rockets fired by a troopers unit can travel over intervening objects to strike a target.

This document uses the troopers' speed rating of 10, which is used in the actual game. The manual included with the game rates a troopers unit's speed at 15.

Troopers can be deviated.

Infantry Soldier



Infantry Soldier

Soldier specifications:

Unit	Cost	Arms	Hitpoints	Speed	Range	Provided at
Soldier	60	4	20	8	2	Barracks

In the game, a soldier icon depicts a running individual, lightly armed and armored. This icon does not appear in the manual included with the game. The "soldier" icon on page 22 of the manual is actually the icon used in the game for a trooper.

On the Game Screen, a soldier is somewhat similar in appearance a trooper. Note that a soldier carries a smaller, lighter weapon; a trooper carries a heavy rocket launcher.

To attack any structure larger than a turret, a soldier unit must fire from a space adjacent to the target.

A soldier unit in Guard mode will tend to ignore an enemy building—other than a turret or rocket turret—which is diagonally adjacent to it.

A soldier can fire only 1 shell per attack.

Infantry soldiers can be deviated.

Light Infantry Squad



Infantry Squad

Infantry specifications:

Unit	Cost	Arms	Hitpoints	Speed	Range	Provided at
Infantry squad	100	4	50	5	2	Barracks

In the game, an infantry unit icon depicts a pair of running individuals, lightly armed and armored. This icon does not appear in the manual included with the game.

In the tutorial, under the "DESCRIPTIONS OF UNITS:" section, the "INFANTRY" unit indicated is actually a soldier unit.

On the Game Screen, infantry units are somewhat similar in appearance to troopers units. Note that infantry units carry smaller, lighter weapons; troopers units carry heavy rocket launchers.

An infantry unit is a group of three individuals. When an infantry unit is 50% damaged, 2 of these individuals are simultaneously destroyed. When this happens, the remaining individual will be a full-strength soldier. Note that this soldier may discard any orders and attempt to retreat from combat.

The grouped unit of 3 infantry will fire twice as often as 1 lone infantry (soldier).

The firepower of an infantry unit remains at maximum until the entire unit is destroyed.

To attack any structure larger than a turret, an infantry unit must fire from a space adjacent to the target.

An infantry unit in Guard mode will tend to ignore an enemy building—other than a turret or rocket turret—which is diagonally adjacent to it.

The infantry unit is not immune to deviation, nor is it immune to sonic attacks.

MCV



Mobile Construction Vehicle

MCV specifications:

Unit	Cost	Arms	Hitpoints	Speed	Range	Provided at	Requires
MCV	900	0	150	20	N/A	Vehicle factory/starport	Outpost

In order to produce a construction yard, an MCV must be located in the top left quadrant of a square space that is large enough to hold a construction yard. The terrain in this space may only be composed of one or more of the following: flat rock, cratered rock, friendly concrete, or wall rubble, friendly or enemy. The space must also be free of any other units. Note that if the construction yard is built over rock it will not start off with damage. This is the only instance where a building can be placed directly on rock without taking any damage.

An MCV cannot create a construction yard if the maximum structure limit for the mission has been reached. The MCV countdown timer will reach zero, then the Deploy order is cancelled.

A player will lose a mission if all friendly buildings are destroyed. This is true even if the player still has one or more MCVs available to create new construction yards.

If an MCV is deviated while executing a Deploy order, it will deploy a construction yard belonging to the House which controls the Deviator.

In general, a carryall will attempt to retrieve any unit which is ordered to move to a location that the unit cannot reach on its own. However, if the player orders an MCV to a location that it cannot reach, the MCV will likely be ignored by any available carryalls.

An MCV's Deploy countdown usually lasts about 4.5 seconds.

Carryalls will not deliver MCVs to repair facilities; an MCV must use a ground path in order to enter a repair facility. Note, however, that a carryall can remove an MCV from a repair facility if the MCV becomes blocked inside or otherwise cannot find a ground path to exit the facility.

To repair an MCV, it will frequently require 2 Move orders to move the MCV into a repair facility. With the first order, an MCV will often halt just outside the facility, and not enter.

MCVs can be used to overrun enemy soldier, infantry, trooper(s), Fremen, or saboteur units.

Computer-controlled Houses do not manufacture or use MCVs.

MCVs are not immune to deviation, nor are they immune to sonic attacks.

Missile Launcher



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Missile Launcher

Missile launcher specifications:

Unit	Cost	Arms	Hitpoints	Speed	Range	Provided at	Requires
Missile launcher	450	112	100	30	9	Vehicle factory/starport	Outpost

On the Game Screen, missile tanks are identical in appearance to Deviators, difference in House colors being the only exception.

The missile tank has a greater firing range than any other ground unit, and can also strike at turrets and rocket turrets while remaining beyond the range of their return fire.

Missile tanks in Guard mode may fire on any enemy ornithopter which comes within range.

An undamaged missile tank can fire up to 2 missiles per attack.

Missiles will attempt to strike wherever the target was located at the moment of firing.

The missile tank cannot directly strike targets closer than 4 spaces away.

Missile tanks can be used to overrun enemy soldier, infantry, trooper(s), Fremen, or saboteur units.

On the starport Order Screen and the vehicle factory Production Screen, the missile tank is referred to as a LAUNCHER.

Missile launchers are not immune to deviation, nor are they immune to sonic attacks.

Ornithopter



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Ornithopter

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Ornithopter specifications:

Unit	Cost	Arms	Hitpoints	Speed	Range	Provided at
Ornithopter	600	50	25	150	5	Hi-Tech/starport

An ornithopter is white, trimmed with the House color of the side controlling it.

Ornithopters are not confined to the battlefield, and may cross its borders to leave it temporarily.

Clicking on an ornithopter has no effect. A player cannot target, order, or get the damage status of an ornithopter.

Ornithopters can only attack buildings, units or sandworms which have been at least partially revealed or detected on the battlefield. In the absence of such targets, an ornithopter will patrol over the battlefield continuously. Ornithopters cannot attack spice blooms.

If an ornithopter fires from an unrevealed/undetected position on the battlefield, that position and the area around it will be revealed or detected.

An ornithopter will not reveal unexplored territory unless it fires from an unrevealed position.

An ornithopter can fire only 1 rocket per attack.

Ornithopter rockets can pass over all terrain features and all friendly and enemy structures and units to strike a target.

Turrets, rocket turrets, and missile tanks in Guard mode may fire on any enemy ornithopter which comes within range.

An ornithopter can be deviated if it flies over the explosion of an enemy Deviator missile. As with other deviated units, a deviated ornithopter will revert if the gas effect wears off.

Ornithopters will not fire on enemy airborne units.

On the Hi-Tech Production Screen and the starport Order Screen, the ornithopter is referred to as a "THOPTER.

This document uses the ornithopter range rating of 5, which is used in the actual game. The manual included with the game rates an ornithopter's range at 50.

This document uses the ornithopter shield rating of 5, which is used in the actual game (appearing on the Hi-Tech Production Screen and the starport Order Screen). The manual included with the game rates an ornithopter's shield at 3.

Due to oversights in the game code, Game Speed settings do not affect the speed of the ornithopter as much as the percentage would indicate. In fact, no flying unit speed is synchronous with game speed.

Ornithopters are not immune to deviation.

Rocket Launcher



Rocket Launcher

Rocket launcher specifications:

Unit	Cost	Arms	Hitpoints	Speed	Range	From
Rocket launcher	450	10	130	50	5	Vehicle factory/starport

See missile launcher for specifications.

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Quad



Quad

Quad specifications:

Unit	Cost	Arms	Hitpoints	Speed	Range	From
Quad	200	10	130	50	3	Vehicle factory/starport

An undamaged quad can fire up to 2 shells per attack.

Quads cannot directly affect terrain—with the exception of spice blooms—or spice not yet harvested.

Quads cannot overrun soldier, infantry, trooper(s), Fremen, or saboteur units.

Quads are not immune to deviation, nor are they immune to sonic attacks.

Raider Trike



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Raider Trike in an icy field

Raider trike specifications:

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Unit	Cost	Arms	Hitpoints	Speed	Range	Provided at
Raider trike	150	8	80	75	3	Vehicle factory

On the Game Screen, raider trikes are identical in appearance to trikes, difference in House colors being the only exception.

Raider trikes cannot directly affect terrain—with the exception of spice blooms—or spice not yet harvested.

An undamaged raider trike can fire up to 2 shells per attack.

Raider trikes cannot overrun soldier, infantry, trooper(s), Fremen, or saboteur units.

Raider trikes are not immune to deviation, nor are they immune to sonic attacks.

Saboteur



Saboteur during a mission.

Saboteur specifications:

Unit	Cost	Arms	Hitpoints	Speed	Range	Provided at
Saboteur	0	150	40	40	2	Palace

If an Ordos palace is tightly surrounded on all sides by other buildings, walls, or ground units, it may be unable to deploy a saboteur. There must be at least 1 empty space directly adjacent to the palace in order for a saboteur to be deployed. If there are only a few empty spaces adjacent to a palace, it may take several attempts to deploy a saboteur before it can "find" a space to deploy to.

A saboteur may be deployed from the Ordos palace to attack a specific target, or to attack an unspecified target of opportunity. To send a saboteur to attack a specific target, click the palace's Targeting Cursor on an enemy building, enemy ground unit, or a sandworm (these targets may be clicked on in revealed or unrevealed areas). Clicking the palace's Targeting Cursor anywhere else on the battlefield will deploy a saboteur to attack a target of opportunity, which includes only enemy buildings or enemy ground units which are visible and detectable to player-controlled forces. If there are no valid targets when a saboteur is deployed, it will appear, but will remain inactive until a valid target of opportunity is revealed.

A saboteur cannot be ordered to attack any friendly structures, enemy concrete or enemy wall sections, friendly units, or enemy units deviated to Ordos control.

On the Game Screen, a saboteur is identical in coloring and appearance to a Sardaukar soldier.

If a player's saboteur is moving towards a target, and the target is destroyed before the saboteur reaches it, the saboteur will halt in place and wait for a new target of opportunity; an enemy building, ground unit or sandworm which has been revealed or detected on the battlefield.

Only 1 saboteur can be active at a time. As soon as a saboteur is ready for deployment at a palace, any other saboteur on the battlefield will instantly self-destruct.

A player cannot issue new orders to a saboteur after it has been deployed.

Saboteurs can pass over enemy walls, and may do so without slowing down.

Saboteurs cannot pass through friendly or enemy buildings, friendly or enemy ground units, or friendly walls.

A saboteur's kamikaze attack can destroy any undamaged rocket turret, silo, turret, windtrap, enemy ground unit, or sandworm. Any other undamaged target will be damaged by the attack.

A ground unit which is in motion may survive a saboteur's kamikaze attack, but may still receive heavy damage.

In addition to its self-destruction/kamikaze capability, a saboteur is armed with a very powerful shell-firing weapon which can be used repeatedly against enemy units or buildings. This weapon is only used if the saboteur is unable to move to its chosen target, forcing it into a special Guard mode.

A saboteur can fire only 1 shell per attack, when this special projectile weapon is used.

A saboteur's projectile weapon has a maximum range of 2 spaces.

If a player's saboteur cannot find or negotiate a path to an available enemy target, it may permanently halt in place. When this happens, the saboteur remains on the battlefield until killed or replaced, and may or may not fire on enemy ground units—or buildings—which appear within firing range of its projectile weapon.

Computer-controlled saboteurs will only target player buildings for kamikaze attacks; player units are never deliberately targeted for kamikaze attacks.

If, upon deployment, a Computer-controlled saboteur cannot find or negotiate a path to a player building, it will deactivate, ignoring all player targets. If a path to a player building then becomes available, the saboteur will go into an Area-guard mode, moving to and firing upon any player unit or building within a limited scan range, and will then attempt to return to its starting position—or a point adjacent to its starting position—once the target is destroyed. Computer-controlled saboteur's Area-guard scan range:

```
432101234
+-----+
4 | +++++G++++ | 4
3 | ++GGGGGG++ | 3
2 | +GGGGGGGG+ | 2
1 | +GGGGGGGG+ | 1
0 | GGGG0GGGGG | 0
1 | +GGGGGGGG+ | 1
2 | +GGGGGGGG+ | 2
3 | ++GGGGGG++ | 3
4 | +++++G++++ | 4
+-----+
432101234
```

Notes: The "0" inside the diagram represents the saboteur's starting point (this point does not move with the saboteur); "G" indicates where a target will trigger a gun/shell-firing weapon attack by the saboteur; "+" indicates a space outside of the saboteur's scan range.

Ground vehicles cannot overrun friendly saboteurs or directly target them for attack.

If a ground vehicle overruns an enemy saboteur, the saboteur explodes, often destroying the vehicle.

When a saboteur explodes, any other buildings or units directly adjacent to the explosion may also be damaged.

Saboteurs cannot capture enemy buildings.

When a saboteur is blocked from attacking its intended target, it may attempt to retreat from combat and return to its point of origin, typically a space adjacent to the palace which deployed it. While the saboteur is retreating, it will not return fire if fired upon. If and when the saboteur reaches its destination, it will stop and go into Area-guard mode.

Saboteurs cannot be affected by Deviator missiles.

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Siege Tank



Heavy Siege Tank

Siege tank specifications:

Unit	Cost	Arms	Hitpoints	Speed	Range	Provided at
Siege tank	600	45	300	20	5	Heavy vehicle factory/starport

On the Game Screen, siege tanks are somewhat similar in appearance to Devastators. Note that siege tanks have rounded turrets with cannon barrels set relatively far apart. Devastators have square-like turrets with cannon barrels set relatively close together.

An undamaged siege tank can fire up to 2 cannon shells per attack.

Siege tanks can be used to overrun enemy soldier, infantry, trooper(s), Fremen, or saboteur units.

Siege tanks are not immune to deviation, nor are they immune to sonic attacks.

Sonic Tank



Sonic Tank depicted in lush vegetation

Sonic tank specifications:

Unit	Cost	Arms	Hitpoints	Speed	Range	Provided at
Sonic tank	600	90	110	30	8	Heavy vehicle factory

When a sonic tank fires, all buildings which are touched by the sonic blast will be damaged. All ground units—with the exception of other friendly or enemy sonic tanks—and sandworms will also be damaged if touched by a sonic blast.

A sonic blast can pass unhindered through any object or terrain feature.

A sonic tank can fire only 1 sonic blast per attack.

A sonic blast has an uneven effect over distance. For example, firing a sonic blast straight along a column of undamaged combat tanks will cause a varying amount of damage to each tank.

The visible sonic blast effect will be tinted in the House color of the side controlling the sonic tank.

A sonic tank cannot directly affect terrain, spice not yet harvested, spice blooms, concrete, walls, other sonic tanks (friendly or enemy), or airborne units.

Sonic tanks can be used to overrun enemy soldier, infantry, trooper(s), Fremen, or saboteur units.

Sonic tanks are not immune to deviation, but they are themselves immune to sonic attacks. They are, in fact, the only unit immune to sonic attacks.

The Atreides sonic tank attack range is supposed to cover the whole screen, but the range is actually determined by the game speed setting. When set to "Very Fast" the attack covers the whole screen, but when set to "Very Slow" it only covers about half of the screen.

Trike



Light Attack Trike

Trike specifications:

Unit	Cost	Arms	Hitpoints	Speed	Range	Provided at
Trike	150	8	100	60	3	Light vehicle factory/starport.

On the Game Screen trikes are identical in appearance to raider trikes, difference in House colors being the only exception.

An undamaged trike can fire up to 2 shells per attack.

Trikes cannot directly affect terrain, or spice not yet harvested. The exceptions are spice blooms, which the trikes can detonate.

Trikes cannot overrun soldier, infantry, trooper(s), Fremen, or saboteur units.

Trikes are immune to neither deviation nor sonic attacks.

Trikes are the fastest land unit in the game.

Trooper



Trooper

Trooper specifications:

Unit	Cost	Arms	Hitpoints	Speed	Range	Provided at
Trooper	100	8	45	15	3	Barracks

In the game, a trooper icon depicts a standing individual, heavily armed and armored. This icon incorrectly appears next to the "soldier" description on page 22 of the manual included with the game.

On the Game Screen, a trooper is somewhat similar in appearance to a soldier. Note that a trooper carries a heavy rocket launcher; a soldier carries a smaller, lighter weapon.

Trooper units will launch rockets at targets which are up to 3 spaces away. Closer targets are fired on with heavier projectile weapons.

The rockets fired by a trooper can travel over intervening objects to strike a target.

A trooper can fire only 1 shell or rocket per attack.

This document uses the trooper speed rating of 15, which is used in the actual game. The manual included with the game rates a trooper unit's speed at 10.

Troopers are not immune to deviation, nor are they immune to sonic attacks.

1.7 Management of Units

Units will not take action on an order until the order is acknowledged—the "acknowledge" or "*moving out*" sound is played if sounds are on and digital sounds were enabled when the game was installed.

Friendly ground combat units can be ordered to attack any friendly structures except concrete and repair facilities.

Note that player-controlled units can be ordered attack unrevealed/undetected enemy buildings and units at any time. Player units can attack an enemy building whether it is revealed, detected or not; however, if a player unit is ordered to attack an undetected enemy unit, it will attempt to overrun the enemy unit instead. When this happens the player unit will not open fire or defend itself unless or until its orders are changed or cancelled.

Harvesters, combat tanks, missile tanks, siege tanks, sonic tanks, Deviators, Devastators and MCVs can be used to overrun and crush enemy soldier, infantry, trooper(s), Fremen, or saboteur units. Note that if a ground vehicle overruns an enemy saboteur the saboteur explodes, often destroying the vehicle. When any other unit is overrun, the attacking vehicle remains undamaged.

Soldier, infantry and trooper(s) units will ignore orders to move to friendly repair facilities. However, the facility will repair them if they are brought to the facility by a carryall.

Airborne units cannot be ordered into repair facilities.

Any friendly units which are attacking, or moving to, an enemy building will stop attacking or moving if the building is captured by a friendly soldier, infantry, or trooper(s) unit.

If a ground unit succumbs to attack from a Deviator, the unit will lose any Move or Attack orders given to it, and any units escorting it will also lose their orders and go into Guard mode.

Any unit's Move or Attack order is cancelled if it is picked up by a carryall. A Devastator's Self-Destruct order is not cancelled, but is suspended until it is returned to the battlefield.

In most cases a stationary ground unit will be in Guard mode, and as such will fire when possible on any enemy units that come within range.

Game Time—time elapsing within the game environment—generally slows down with an increase in units on the battlefield, speeds up with a decrease in units, and is suspended whenever the Game Screen is not displayed. Game Time may also slow down when units on the battlefield experience difficulty in carrying out orders.

Capturing Buildings

Building-capturing detail:

Enemy building	Damage status: Green/yellow	Damage status: Red
Barracks, soldier	Siege attack may take place	Siege attack may take place
Barracks, trooper	Siege attack may take place	Siege attack may take place
Construction yard	Damaged	Captured
Hi-Tech	Damaged	Captured
Radar outpost	Siege attack may take place	Siege attack may take place
Palace	Siege attack may take place	Siege attack may take place
Refinery	Damaged	Captured
Repair facility	Damaged	Captured
Rocket turret	Damaged	Captured
Spice silo	Damaged	Captured
Starport	N/A	N/A
Turret	Damaged	Captured
Light vehicle factory	Damaged	Captured
Heavy vehicle factory	Damaged	Captured
Windtrap	Damaged	Captured

Notes: This chart details all possible results of directly targeting any Computer building for attack by player soldier, infantry or trooper(s) units. "Damage status" refers to the color of the building's damage status bar at the moment of contact with the attacking unit; "Siege attack" means that the attacking unit will stop near the target building, and may begin firing on it; "Damaged" means the attacking unit disappears into the building and the building is damaged; "Captured" means the attacking unit disappears into the building, and control of the building goes to the attacking House; "N/A" means "Not Applicable". Computer-controlled bases will not include starports, nor will the Computer attempt to build starports in any mission. Concrete can only be directly targeted for attack by Death Hands and self-destructing Devastators. Otherwise, concrete may only be damaged or destroyed by stray missile and rocket fire, or by an attack on a unit or building above the concrete. Friendly and enemy wall sections are besieged when targeted for attack.

There are rare occasions when a unit will attempt to capture a building and fail, even though the building's damage status bar appeared red. This usually occurs when the building is under repair and the building's damage status changes from red to yellow at the moment the unit attempts to enter.

If a unit enters a building and fails to capture it, the amount of damage done to the building will vary depending on the type of attacking unit. Ranked in order of lowest to highest damage potential, the units are soldier, infantry, trooper, and troopers.

Any friendly units which are attacking, or moving to, an enemy building will stop attacking or moving if the building is captured by a friendly soldier, infantry or trooper(s) unit.

A captured construction yard can only produce structures of the type already available to the attacker. For example, if a Harkonnen player captures the Atreides construction yard in mission 2, the barracks type available there switches from soldier to trooper, and the vehicle factory option disappears.

If a refinery is captured while a harvester is unloading there, the harvester is captured as well.

If a player captures a Computer-controlled windtrap, its power output is diverted to the player's buildings.

A captured Sardaukar vehicle factory can produce trikes, quads, harvesters, MCVs, combat tanks, missile tanks, siege tanks, and 1 or more special units. These special units vary depending on the capturing House: Devastators are produced for Atreides, Devastators and sonic tanks for Ordos, sonic tanks for Harkonnen. Note that the capturing House must also control a Hi-Tech in order to produce special units.

A player's House will not gain spice/credits by capturing Computer-controlled refineries or silos.

If a player-controlled unit captures a Computer-controlled repair facility, any unit being repaired there is also captured.

If a vehicle factory is captured while it is producing a unit, the factory's default production capability will be switched to the type of unit which captured the factory. (This change includes a conversion of the unit that the factory was working on at the time of capture.) For example, a Computer-controlled Harkonnen vehicle factory is producing a quad. Halfway through production, the factory is captured by a player-controlled Ordos trooper. At that moment, the unit already under production at the factory changes from a Harkonnen quad to an Ordos trooper, which is then released from the factory if and when construction is completed. From this moment on, when the factory is clicked on, the factory's default Build option on the Game Screen will be to produce an Ordos trooper. All other vehicle types that the factory can produce may still be built, but such Build commands must be given from the factory's Production Screen. Note that if the factory is then upgraded—if possible, any barracks-type production option will disappear and the factory will return to vehicle-only production.

Computer-controlled soldier, infantry, or trooper(s) units which are deviated to player control may be used to capture Computer-controlled buildings.

Multiple-weapon Units

Soldier, infantry, trooper, troopers, Fremen, and saboteur units can each use a variety of weapons and tactics to attack enemy structures and units.

Attack abilities of multiple-weapon units:

Unit	Gun	Rocket launcher	Kamikaze ability
1-Fremen unit, player	Yes	Yes	No
3-Fremen unit, player	Yes	Yes	No
Infantry, player	Yes	No	Yes
Saboteur, player	Yes	No	Yes
Soldier, player	Yes	No	Yes

Trooper, player	Yes	Yes	Yes
Troopers, player	Yes	Yes	Yes

Notes: Guns/shell-firing weapons may be used by all of these units against targets which are 1 to 2 spaces away. Rocket launchers are used by some units against targets which are 2 to 3 spaces away. (Note that among units which carry both guns and rocket launchers, the guns will cause more damage per round to a target.) The "kamikaze ability" means the unit can move into a target and explode, destroying the unit, and damaging or destroying the target. In general, a saboteur will only use its gun under rare circumstances (see section Saboteur). For infantry, soldier, trooper and troopers units, a kamikaze attack can only be made against accessible, seizable enemy buildings while the building's damage status bar is green or yellow. A player-controlled saboteur may use a kamikaze attack against enemy buildings, enemy ground units, or sandworms. A Computer-controlled saboteur will only attempt to use a kamikaze attack against player buildings.

Weapon usage by trooper(s) or Fremen units when ordered to attack a target:

1x1-space targets	2x2-space targets	3x2-space targets	3x3-space targets
3210123	32100123	321000123	321000123
+-----+	+-----+	+-----+	+-----+
3 +++R+++ 3	3 +++R+++ 3	3 +++R+++ 3	3 +++R+++ 3
2 +RRGRR+ 2	2 +RRGRRR+ 2	2 +RRGGGR+ 2	2 +RRGRRR+ 2
1 +RGGR+ 1	1 +RGGGGR+ 1	1 +RGGGGR+ 1	1 +RGGGGR+ 1
0 RGG#GGR 0	0 RGG#GGR 0	0 RGG##GGR 0	0 RGG##GGR 0
1 +RGGR+ 1	0 +RG#GR+ 0	0 +RG##GR+ 0	0 +RG##GR+ 0
2 +RRGRR+ 2	1 +RGGGGR+ 1	1 +RGGGGR+ 1	0 +RG##GR+ 0
3 +++R+++ 3	2 +RRGRR+ 2	2 +RRGGGR+ 2	1 +RGGGGR+ 1
+-----+	3 +++R+++ 3	3 +++R+++ 3	2 +RRGRRR+ 2
3210123	32100123	321000123	3 +++R+++ 3
			321000123

Notes: "1x1-space targets" include ground units, turrets, rocket turrets, wall sections and sandworms. "2x2-space targets" include construction yards and other buildings of equal size; "3x2-space targets" include refineries and other buildings of equal size; "3x3-space targets" include starports and palaces. A "#" indicates a single 1x1-space target, or a 1x1-space section of a larger building; "G" indicates a position relative to the target from where the attacking unit will use a gun/shell-firing weapon; "R" indicates a position relative to the target from where the attacking unit will use a rocket launcher; "+" indicates a position which is too far from the target for an attack by either weapon.

Note that a player-controlled trooper(s) unit will attempt to enter any seizable building which it has been ordered to attack. If a trooper(s) unit cannot enter a capturable building, it will move as close as it can to the building—along a straight path—and then go into Guard mode. If the building remains within the unit's Guard-mode scanning range, the unit may fire on it.

Weapon usage in attacks on targets by trooper(s) units in Guard mode:

1x1-space targets	2x2-space targets	3x2-space targets	3x3-space targets
3210123	210012	10001	2100012
+-----+	+-----+	+-----+	+-----+

3 +++R+++ 3	2 ++GR++ 2	2 +RGG+ 2	2 +++G+++ 2
2 +RRGRR+ 2	1 +GGGG+ 1	1 GGGGG 1	1 +GGGGG+ 1
1 +RGGR+ 1	0 GG##GG 0	0 G###G 0	0 +G###G+ 0
0 RGG#GGR 0	0 RG##GR 0	0 G###G 0	0 GG##GG 0
1 +RGGR+ 1	1 +GGGG+ 1	1 GGGGG 1	0 +G###G+ 0
2 +RRGRR+ 2	2 ++RG++ 2	2 +GGR+ 2	1 +GGGGG+ 1
3 +++R+++ 3	+-----+	+-----+	2 +++G+++ 2
+-----+	210012	10001	+-----+
3210123			2100012

Notes: "1x1-space targets" include ground units, turrets, rocket turrets, and sandworms. (Note that wall sections are never directly targeted for attack by a unit in Guard mode, and sandworms may or may not be considered targets by a unit in Guard mode, depending on the guarding unit's House.) "2x2-space targets" include construction yards and other buildings of equal size; "3x2-space targets" include refineries and other buildings of equal size; "3x3-space targets" include starports and palaces. A "#" indicates a single 1x1-space target, or a 1x1-space section of a larger building; "G" indicates a position relative to the target from where an attacking trooper(s) unit will use a gun/shell-firing weapon; "R" indicates a position relative to the target from where an attacking trooper(s) unit will use a rocket launcher; "+" indicates a position which is too far from the target for an attack by either weapon.

DUNE II

The Battle for Arrakis

1.8 Computer-controlled Forces

The term "Computer-controlled" in this guide refers to the units and buildings manipulated solely by the game/"Computer" in combat or competition with the forces controlled by the human player. The term is not used in reference to any fully autonomous units—such as ornithopters—allied with player forces.

Computer-controlled forces are fully established at the start of every mission. Computer units and/or structures will always be located and configured in the same way each time a given mission is started.

Computer-controlled forces always "know" where a player House's initial construction yard is located; computer units can locate it without searching the battlefield.

A Computer-controlled House will not expand its bases or change their configuration. If a Computer building is destroyed, the Computer can only replace it at the same location with an identical building. Note that when replacing a destroyed building, the Computer may place the new building over friendly or enemy concrete, and/or any player units located at the site. Player units at the site are destroyed when this happens.

Computer-controlled bases will not include starports, nor will the computer attempt to build starports in any mission.

The Computer can fix any building under its control.

The Computer will not replace destroyed concrete or wall sections.

The Computer will use its palace's weapons/abilities whenever possible.

In missions where the player faces more than one Computer-controlled House, the various Computer units—including Sardaukar where applicable—will not normally combat each other; they will all attempt to destroy only the player's forces.

Computer-controlled forces may capture player-controlled buildings, but such events may be extremely rare.

Computer-controlled Houses neither manufacture nor use MCVs.

Computer-controlled units can be issued new orders more quickly than player units can. Entire groups of Computer units can move and/or attack simultaneously.

The Computer can use ground vehicles to overrun a player's soldier, infantry, trooper(s), Fremen, or saboteur units.

Computer-controlled units will not directly attack spice blooms.

The Computer can make use of all buildings under its control.

Computer-controlled turrets, rocket turrets, and missile tanks may fire on any player ornithopters or carryalls that come within range.

Computer-controlled Deviators may attempt to deviate a player's harvesters. The Computer will use deviated harvesters and will unload them in Computer refineries when possible.

Computer-controlled Deviators may attempt to deviate a player's MCVs, although the Computer will not attempt to deploy them. However, if an MCV is deviated while executing a Deploy order, it will deploy a construction yard belonging to the House which controls the Deviator.

Computer-controlled units in Guard mode around Computer bases may tend to remain there throughout the game, unless/until they are destroyed. Such units, if led away from their positions, will tend to return to them when possible.

If a player unit attacks a Computer-controlled unit, the Computer unit will often return fire if possible. If that player unit then retreats from the encounter, the Computer-controlled unit will tend to pursue it, if possible. If the Computer unit was in Guard mode when it was attacked, it may break off a prolonged pursuit and return to its starting position; if the Computer unit was not in Guard mode, the pursuit can last until either unit is destroyed, or the Computer unit is otherwise prevented from chasing the player unit.

If the last or only windtrap of the player is destroyed, all player-controlled construction yards will lose the ability to produce anything but concrete and windtraps. Note that this is not true for Computer-controlled construction yards. Computer construction yards may rebuild any destroyed Computer building at any time.

Computer-controlled vehicle factories can always build any type of vehicle available to that House during the current mission. Destroying Computer outposts or hi-techs will not affect the manufacturing potential of a Computer-controlled vehicle factory.

The Computer may not always repair a palace under its control, and/or may not always repair it to full strength.

Some captured Computer buildings may require upgrades to reach their full manufacturing potential.

In a given mission, two captured Computer-controlled buildings of the same type may have different production capabilities.

With the exception of harvesters, Fremen, and MCVs, all player ground units in Guard mode will occasionally "fidget", reorienting themselves—and/or their turrets, where applicable—at random times. Computer-controlled ground units in Guard mode remain motionless, with the possible exception of saboteurs in Area-guard mode.

A player's House will not gain spice or credits by capturing Computer-controlled refineries or silos.

Computer-controlled forces will attempt to harvest and refine spice even if all Computer refineries and silos are filled to capacity. A Computer-controlled House may still be able to expend credits after all its refineries and silos are captured or destroyed. In fact, the computer has very little actual use for spice or credits and is therefore harvesting spice mainly as a cosmetic device.

The AI does use credits, however, and can run out of them.

When a Computer-controlled structure is destroyed, the AI is awarded the amount of credits needed for the AI to rebuild the structure. This may also make it seem the computer has infinite credits.

The Computer-controlled House can build units and structures at half the price of the player.

The AI rebuilds destroyed structures in the sequence they were destroyed, although it can only hold a total of 5 structures in the internal rebuild list. If the player destroys more than 5 buildings in an attack, the AI will only rebuild the first 5.

When an infantry unit or a troopers unit is 50% damaged, it will be reduced from a 3-individual group to a single, full-strength individual—an infantry unit is reduced to a soldier; a troopers unit is reduced to a trooper. When this happens, the surviving soldier or trooper may attempt to retreat from combat and return to its point of origin—typically a space adjacent to the barracks which produced the original infantry or troopers unit. While a unit is retreating, it will not return fire if fired upon. If and when the retreating unit reaches its destination, it will stop and go into Guard mode. Note that a retreating player unit can be given new orders at any time, while a retreating Computer unit cannot. A retreating Computer unit will attempt only to reach its point of origin; once it stops retreating, it will go into Guard mode and may remain stationary for the remainder of the game.

Only a player-controlled House can achieve victory by meeting a spice quota objective. Computer-controlled forces can only achieve victory in any mission by defeating player-controlled bases.

AI attack preferences

The Computer-controlled House attacks the player base building by building according to assigned importance. All structures have an assigned value which will not change during the game.

The Computer-controlled House also attacks units in order of their assigned values. These unit specific values will not change, either.

Building AI priority levels, in ascending priority

Building	AI priority
Small concrete slab	5
Large concrete slab	10
Wall	30
Rocket turret	75

House of IX	100
Barracks	100
Turret	150
Spice silo	150
WOR	175
Light vehicle factory	200
Hi-tech	200
Starport	250
Radar outpost	275
Windtrap	300
Refinery	300
Construction yard	300
Palace	400
Heavy vehicle factory	600
Repair facility	600

If two buildings are equidistant to a Computer-controlled unit the AI will attack the building with the highest assigned priority. The most attractive buildings are the Heavy vehicle factory and the Repair facility, both clocking in at 600, followed by the Palace at 400. Keep these values in mind when planning your base.

The smallest priority and thus least importance is assigned to walls and concrete slabs. The computer will, in fact, seldom attack these at all, even if there are no other targets of opportunity in range. All attacks on slabs are incidental and merely the result of collateral damage.

Even though concrete slabs have an assigned priority, they do not have an owner—the owner flag is neither raised nor set—therefore the Computer-controlled units do not deem concrete slabs enemies, and will not attack them at all.

Upgrading a structure does not change the assigned AI priority.

Computer-controlled building usage

The computer will try to keep all its buildings busy, all the time. It continuously checks all its buildings, and orders the building to do whatever it is it can. It will continue to do so until the building is destroyed or credits run out.

Upgrading a building takes priority over unit production. The computer will always try to create the most expensive unit it can produce in all of its buildings. It will continue to do so until the building is destroyed or until credits run out.

Computer-controlled repairs

The AI will immediately begin repairing any building that falls below 50% damage, and it will continue to repair it until it is fully repaired or until credits run out.

Unit AI levels, in ascending priority

Unit	AI priority
Soldier	10
Carryall	16
Infantry	20
Trooper	30
Ornithopter	30
Troopers	50
Trike	50
Raider trike	60
Quad	60
Combat tank	100
Sonic tank	110
Harvester	150
Siege tank	150
Missile Launcher	150
MCV	150
Deviator	175
Devastator	180
Saboteur	700

Unit priority will not change during the game.

A saboteur unit is of the highest priority for the Computer-controlled units; any saboteur unit(s) will be given attack priority over any other unit. A saboteur unit has a priority value equal to four Deviator units combined.

Special units—such as sandworms and frigates—are not assigned any priority at all. They will generally be ignored by the Computer-controlled units. The only damage done to them is collateral.

Internally, all projectiles—including missiles from missile launchers or missile turrets—are considered units. Though short-lived, projectiles could theoretically be attacked by the enemy. The reason they are ignored while existing is they have no set priority.

The only time the AI will destroy a player frigate, is when it is delivering units at the precise moment of a Death Hand missile strike. The Computer-controlled units will never specifically target a frigate, deliberately or otherwise.

Sandworm



Sandworm, the Shai-Hulud

Sandworm specifications:

Unit	Cost	Arms	Hitpoints	Speed	Range	Provided at
Sandworm	N/A	300	1000	35	0	N/A

There are no sandworms in missions 1 or 2, for any House. Sandworms are present in all other missions.

All sandworms are identical in coloring and appearance. The presence of a sandworm is indicated by a smooth, circular mound of sand on the Game Screen. The worm itself can be seen only as it strikes a target.

Two or more worms may occupy the same space at the same time.

The maximum amount of sandworms that can be present on any one map depends on the game version; version 1.0 allows 3 simultaneous worms, whereas version 1.07 only allows 2.

A revealed or detected sandworm mound will appear as a white dot on the radar screen.

Some sandworms will become active only after being revealed or detected on the battlefield.

In general, a sandworm can sense any unit on sand at any distance. A sandworm can devour any ground unit. A worm may also attempt to attack fireballs on sand which are produced by exploding units and projectiles.

Sandworms can be clicked on, targeted, and attacked. Clicking on a revealed or detected sandworm mound will display the worm's ID icon and damage status bar.

Sand covering a worm will not protect it from damage.

A ground unit on top of a sandworm mound can be damaged if other units, turrets or rocket turrets are firing on—and hitting—the sandworm. A worm may move back and forth between firing units, pausing beneath them without striking, as the units above take damage from weapon fire.

Sandworms cannot permanently affect terrain, or not harvested spice. A sandworm mound will always be composed of plain, smooth sand. As a worm moves under spice fields, spice blooms, dunes and sand craters, those terrain features will be obscured by the sandworm mound, but reappear if the worm moves away.

A sandworm will disappear if it devours 3 units or is destroyed. A worm may also disappear when it becomes 50% damaged. In version 1.0 the amount of units a sandworm swallows before disappearing is 4. Upgrading to version 1.07 reduces this amount to 3.

Sandworms can move under or through spice blooms without triggering them. If a spice bloom is detonated while a sandworm is occupying the same space, the worm is destroyed.

A Devastator ordered to self-destruct will not explode if it is swallowed by a sandworm. A self-destructing Devastator can damage nearby sandworms.

A sandworm is immune against deviation, but not against sonic attacks.

Turrets, rocket turrets, and units in Guard mode may automatically fire on any sandworm which comes into range. This auto-targeting ability will vary by House and mission number.

Ordos and Harkonnen units in Guard mode will fire on any sandworms that come within range.

Solid projectiles may be fired over sandworms without striking them. Sonic blasts directed at another target will damage intervening sandworms.

A ground unit moving across sand will usually attempt to navigate around any sandworm mound in its path.

Sardaukar



Imperial Sardaukar

Sardaukar specifications:

Unit	Cost	Arms	Hitpoints	Speed	Range	Provided at
Sardaukar	N/A	5	110	10	1	N/A

In this guide, the term "Sardaukar" refers to the combat forces of the Emperor. They first appear in mission 4 as troopers units transported by carryall. In later missions, Sardaukar units may be of any unit type available to any House, excluding Deviators, Fremen, MCVs, raider trikes, and saboteurs.

Before mission 9, the Sardaukar will have no base located on the battlefield.

Purple is the House color for all Sardaukar forces.

A captured Sardaukar vehicle factory can produce trikes, quads, harvesters, MCVs, combat tanks, missile tanks, siege tanks, and 1 or more special units. These special units vary depending on the capturing House; Devastators are produced for Atreides, Devastators and sonic tanks for Ordos, sonic tanks for Harkonnen. Note that the capturing House must also control a Hi-Tech in order to produce special units.

Mentats may refer to the Sardaukar as "Sarduakar". This is due to typos in the game data.

1.9 End Mission

If all player or Computer buildings are destroyed or captured, the mission will end. Note that turrets and rocket turrets are excluded from consideration here.

A player will lose a mission if all friendly buildings are destroyed. This is true even if the player still has one or more MCVs available to create new construction yards.

If both or all sides in combat lose all of their buildings, the Computer enemy wins by default. The player must always hold at least one building—other than a turret or rocket turret—at the end of a mission in order to win.



Score

At the end of a mission the score is determined. The breakdown of the scoring algorithm is not complex, but the results might seem bewildering.

During game play the player gains points by eliminating units and structures, and loses points by losing units and structures. The awarded points are always 1% of the cost of the unit or structure, with a minimum of 1 point. Translated to real units, this means eliminating a soldier—which costs 60 credits to train—will give a total of 0.6 points. This will then be rounded to 1. Thus 1 point is added to the game play score for every eliminated enemy soldier.

At the end of the mission, the game play score is combined with the spice harvesting total. 1 point is added for every 100 credits of spice. This function then returns a new total score.

Finally, for every minute the player finishes before the mission deadline, the player is awarded 1 point. The deadline depends on campaign position. For mission 1 the deadline is set at 45 minutes, and an additional 45 minutes is added for every mission; mission 2 has a deadline of 90 minutes; mission 3 has a deadline of 135 minutes, and so on. The final mission has the deadline set at a relatively ridiculous 6 hours and 45 minutes.

Time elapsing while the game is paused is not applied to the "time" value on the score screen at the end of a mission.

The game will not keep visual track of harvested spice beyond 32,767 credits, but credits and spice beyond this point will add to the score.

If units destroy friendly buildings, the buildings are counted as being destroyed by the enemy.

When a destroyed ground vehicle produces a surviving soldier, both the destroyed vehicle and the soldier are scored as separate units.

Concrete slabs—small and large—and wall sections are not counted in scoring. Counter-intuitively, when a Devastator self-destructs it is counted as being destroyed by the enemy.

Sandworms are counted as enemy units in scoring. A sandworm is counted as being destroyed whether the sandworm is destroyed or driven away, or disappears after consuming three units. Units eaten by sandworms are not counted as being destroyed by the enemy.



Units destroyed by spice blooms are not counted as being destroyed by the enemy.

When a unit composed of three individuals—such as an infantry or troopers unit—is reduced to a single individual, the two destroyed individuals are not counted in scoring.

Captured buildings and deviated units are not counted as being destroyed.

Spice collection and processing may continue even after all refineries and silos are full. No credits are gained from the processing of excess spice, and the excess spice itself is lost, although the excess spice is counted in scoring.

Scores awarded per unit or structure

Structure/Unit	Points
Barracks	3
Construction yard	4
Heavy vehicle factory	6
Hi-Tech	5
IX	5
Light vehicle factory	4
Palace	10
Radar outpost	4
Refinery	4
Repair facility	7
Rocket turret	3
Spice silo	2
Starport	5
Turret	2
Wall section	1

Windtrap	3
WOR	4
Carryall	8
Combat tank	3
Devastator	8
Deviator	8
1-Fremen unit	1
3-Fremen unit	2
Harvester	3
Infantry	1
MCV	9
Missile tank	5
Ornithopter	6
Quad	2
Raider trike	2
Siege tank	6
Soldier	1
Sonic tank	6
Trike	2
Trooper	1
Troopers	2

Ranks in Dune II

When a mission is over, a rank is assigned to the player. Ranks are determined solely on the score amassed during the game.

Ranks, listed in alphabetical order:

Base Commander, Desert Mongoose, Dune Trooper, Outpost Commander, Ruler of Arrakis, Sand Snake, Sand Warrior, Scourge of Dune, Squad Leader.

When updating Dune II from version 1.0 or 1.01 to version 1.07, four new ranks are added; Sand Flea, Warlord, Chief Warlord and Emperor. The title Scourge of Dune is removed upon upgrading the game, as well. Also, the points required for each rank is adjusted upon patching the game to version 1.07.

The titles Chief Warlord and Ruler of Arrakis are usually awarded upon campaign victory.

Ranks in version 1.0

Rank	Points required
Sand Snake	50
Desert Mongoose	100
Sand Warrior	150
Dune Trooper	200

Squad Leader	300
Outpost Commander	500
Base Commander	700
Scourge of Dune	1000
Ruler of Arrakis	1500

Ranks in version 1.07

Rank	Points required
Sand Flea	0
Sand Snake	25
Desert Mongoose	50
Sand Warrior	100
Dune Trooper	150
Squad Leader	200
Outpost Commander	400
Base Commander	500
Warlord	700
Chief Warlord	1000
Ruler of Arrakis	1400
Emperor	1800

DUNE II

The Battle for Arrakis

PART 2

TACTICS

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2.1 Tactics - Defense

Use your harvesters to run over approaching enemy troops before you get hit by them. Once you can get tanks, use them to run over troops; it is much quicker than shooting them.

As soon as you start a new level, use the vehicles that you are given to explore in all directions to find:

- a) Spice and those little "bumps" in the sand that often have spice under them.
- b) The approximate location of the enemies' base. Once you have done this, restart the level, and start building.

Do not explore too far until you have built a good defense. The computer at the start works on a strategy of "if you can't see him, he can't see you."

As soon as you can build rocket turrets, build about 3 and put them in a line, facing in the direction of the enemy base, about 3 squares apart. Make sure that you have "explored" at least 2 squares greater than the radius of the turret. This allows the turret to get a lock on approaching vehicles/soldiers, and attack them before they can hit the base.

Build about 5-7 of your heaviest direct combat vehicle (i.e. tank), and set them up in a flat U, with missile launchers—if you have them—on the sides i.e.

LX XL

X X X

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{L : launcher; X : tank}

The most important point is that the left and right "horns" should be far enough away from the centre to not be attacked.

Then when the enemy vehicles (Y) arrive:

Y

Y

LX Y XL

X X X

Wait for the enemy to get past the "horns" and start being attacked by the front tanks. Then move the horns inward to attack from the side/rear, using the launchers from a distance.

Above all, do not let your front line break. Keep a few vehicles as backups, and move them up if part of the line is taking a beating.

Defend missile launchers well, as they are devastating from a distance, but easily destroyed from close up.

Make sure you leave a few units at the rear of your buildings, to defend against the enemy units that will be dropped by carryalls.

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2.2 Tactics - Offense

Destroy enemy harvesters when they get too far from the enemy base. The harvester will explode, releasing however much spice it had harvested. Make sure you destroy it while it is on sand; if it is destroyed over rock the spice is lost.

Do not use soldiers or troopers to attack harvesters—the harvesters simply turn and run over the attackers. The only time you should do this is if the infantry unit is standing on a mountain range—the only units that can go over mountains are infantry. They still can be attacked while on the mountain, just not run over.

Focus your attack on one structure at a time. If the computer is pumping money into repairing while you are attacking, you will not be able to keep pace unless you have a concentrated attack.

When attacking buildings, use the missile launchers to attack the rocket turrets first, moving tanks behind the launchers to defend them from vehicle attacks. Remember the radius of detection of a launcher is one square greater than that of a turret. That is:

X T X

X X {- radius of the turret (T)}

X X

X X

XXX XXX

XX XX

LXL {- best position for the launcher (you do not get hit!)}

After the turrets are down, use the tanks to destroy the buildings. Remember that, if you are using the patched version, the computer will rebuild the turrets in the same place, so do not hang around; move in and destroy quickly. It is often useful to leave a couple of strong vehicles in the squares directly around the turret, so if it is rebuilt they will immediately attack it again while the turret cannot use its missiles due to their closeness. Hence the turret can only fire back with normal guns which do much less damage.

Before attacking the enemy in force, use some kamikaze units to scout the base and locate the construction yard.

2.3 Tactics – General

Create a repair facility as soon as you can. It is a lot cheaper and faster to repair, rather than build.

Build one carryall for each harvester you have, as well as 1 to 3 extras to use for transporting damaged units.

Do not bother building four refineries. It is much more efficient to build about two, along with an extra harvester for a total of 3, and to use carryalls for transportation.

Build a starport early on, as that is the only way you can get more than 25 vehicles. Watch the prices carefully, as there is a lot of fluctuation. It is often better not to build a hi-tech factory, as carryalls can be bought from there, often for cheaper than the 800 they cost to make (plus the 800 for the factory). The cheapest prices I have seen are:

Rocket launchers: 180

Siege tanks: 240

Combat tanks: 150

Harvesters: 150

MCVs: 360

Carryalls: 320



After Level 4, build two refineries and a few Silos to increase your cash for the more expensive units.

Sandworms remain dormant until a unit—yours or the computers'—comes within a couple of squares of it, or it is fired on. If all the vehicles on the map—computer's and yours—are over rock, then the Sand Worm will just stay still until it is reduced to half damage, or until a vehicle goes on to the sand.

Sandworms will disappear when they have been reduced to half damage, or have eaten 3 units. If you are in a hurry to get rid of one, send a trike towards it, and lead it towards the enemy base. When you are just about to be fired on, let the enemy vehicles get drawn onto the sand, then let the sandworm eat the trike and then watch it eat the fleeing enemy.

Deviated units that are sent to attack another house's units—other than their own—will continue to do so, even after their allegiance has reverted.

When you choose the region to attack in mission 8, remember that the house controlling the region will have a palace whereas the other house does not. Hence attack, in order of preference: Ordos, Atreides, and Harkonnen.

Deviated harvesters set to return should continue to return, even after they have reverted. This lets you get a nice amount of spice from the remains after it has run into your rocket turrets. Some people have said this does not work on the IBM, but it seems to work for me.

You can not order more than 10 of any one vehicle at one time from the starport. The starport does replenish 'Sold Out' stock over time, though.

Damaged buildings produce items slower than undamaged ones. There is not much difference while in the green, but below that the production rate is noticeably lower. Rocket turrets also fire less often when damaged.

Damaged units fire less frequently. If a unit is down to below green, they fire at half the rate.

Palaces do not cost anything to repair, so keep them in top condition all the time.

Place concrete slabs before placing structures. It is worth upgrading the construction yard so you can build the larger slabs. Upgrade the light vehicle and heavy vehicle factories as soon as you can so you can produce siege tanks. It is worth upgrading the heavy factory several times on later levels so you can produce a mobile construction vehicle. Watch the state of all your structures and repair them when necessary—it costs spice but it is usually cheaper than building replacements.

Do not bother building walls—they cost too much and do not last very long—build rocket turrets instead. You need to upgrade the construction yard to be able to build them but you are going to do that anyway, are you not? Spot where the enemy is attacking from—they always attack from the same direction—and place concrete slabs on the rock in that direction. Put half a dozen turrets on the extremities of the slabs and with a bit of luck they should see off most of the attackers before they get too close. Keep an eye on the state of the turrets and repair them when necessary.

See whether there is a line of rock that stretches from your base towards the enemy base. If there is create a pathway of concrete slabs along the rock and position rocket turrets close to the enemy base. When you attack the turrets are able to give your units covering fire and you find yourself with a significant advantage. If there is not an unbroken line of rock consider using a mobile construction vehicle to establish a construction yard on a piece of rock close to the enemy which you can then use as a base for extending the range of your turrets.

On the later levels it is extremely important to restrict the amount of spice the enemy mines because spice runs out quickly. You need to use a fast trike or quad to explore the map and find spice fields and enemy harvesters and then you simply do everything possible to destroy the harvesters.

The enemy will attack in a large group once you build a light vehicle factory and/or a heavy vehicle factory. The best thing is to build the defense and put enough units for protection first and then build these buildings. That way you can repel the attack and perform a counter attack.

Since windtraps do not cost much, it is generally a good idea to have a surplus of windtraps built. If by any chance the computer destroys one or two you still have enough power left.

It is not worth it to put all the structures on concrete slabs. The structure will be half damaged when you set it up, but if you put it somewhere in the back—behind the main base and defenses—it will be safe. This is especially worth for windtraps, barracks later in the game, and defensive walls that only steer or direct the opponent to your primary defenses.

All the races have the "best technology" available, what changes is their way of thinking.

The Harkonnen are very heavy and slow. They have access to their destructive missile by late game, and it is the most destructive weapon in the whole game.

The Atreides have a nice mix of defense and speed and also have the only aircraft in the game. They can call up on Fremen in the late game and they are really worth it.

The Ordos are very light but also very fast. Their missile launchers can "brainwash" enemy units to fight on your side, so you should not even bother trying to mind the lack of their own unit armor. Their secret agents are sure not worth much though. They do not have heavy tanks. Their "path" is tougher, also because the Ordos Palace ultimate weapon is of no use. They too have aircrafts.

1: Ordos (green) Deviator (that brainwashing missile tank). I tried using it once—except I forgot that the effect was only temporary. Very useful against Harkonnen Devastators though! Brainwash them then self destruct them before they regain their senses! As for the spies, they were only good if they did not run into anything along the way to the enemy base.

Has anyone else lost up to 6 tanks in a battle, simply because the computer *built* a structure—a heavy vehicle factory—on top of them? This was fixed in Command & Conquer, but in Dune II having an enemy unit in the way did not prevent a structure from being placed.

The Sega Genesis—called Mega Drive in Europe—version was easier in some respects - each "block" was relatively larger than on the PC version so missile tanks were much more effective at attacking turrets—since they were less likely to miss—on the PC version, the missile had to score a direct hit to do any damage.

At the end of the Atreides campaign, the Mentat and some guards enter the Emperor's throne room. He asks 'what is the meaning of this intrusion', and the Mentat tells him that he is to be removed and charged with crimes against House Atreides. You see his face fall you see Arrakis turn blue—since it is owned by the Atreides now.

Infantry and troopers are almost pointless here – I find it hard to capture buildings, due to the speed at which repairs are conducted (so it is hard to keep the enemy building in the "red zone" in terms of health). Also, they are so slow, and can all run over by even the slowest tank. However, I think they can be used as a sacrifice to those sandworms (I think these disappeared either if you hurt one by more than 50% or if it had swallowed a certain number of units).

Missile Tanks have a bigger range than the Missile Towers. The trick is that you must be at the furthest range before telling them to attack or the stupid computer AI will make them move forward +1 square as soon as they are in range, effectively putting them in range of the towers too.

As for the Harkonnen, I think that is the newbie race of choice. On the other hand, I always played as Atreides and I like them too. They have special weapons which counter the fact that they have less armor, and they go faster too which give you a bigger range of strategies to exploit.

The Fremen are really tough soldiers too. Since they are free to produce with your palace, at worst you send them on suicide missions against buildings and you should be able to capture one or two easily.

As for the ornithopters, well yeah, they are fragile. But think about them as an extra attacker when you have the spice to come up with the cost of building them one after the other. Just do not build them when you know your enemy still has a lot of rocket turrets still up and you should be fine.

I prefer the Atreides. Their sonic tanks are immensely powerful. And the function of this weapon is also very original; it destroys the molecular structure with gigantic sonic blows. I do not want to know how this must feel.

Also you had to be careful that none of your own units get in the way of these units as they are lethal to everyone.

I think the Death Hand was one of the best implemented weapons of mass destruction ever implemented in a real-time strategy game, because I do not like the fact that the one with the first nuclear missile, or ion cannon, or whatever, automatically wins. This makes the whole game a little boring. I appreciate the fact that the Death Hand missile was not a game winner.

Oh, and it was too bad that you could never build Sardaukar. They were really awesome infantry troops and as far as I know in one mission you even had a squad under your command.

What I consider a big advantage of the Harkonnen and the Ordos, was that they automatically opened fire against the worms. The Atreides did not open fire and there was no way to attack the worms with their towers.

Send out a trike or any light vehicle find the enemy Harvester, as soon as you find the harvest site send a Trooper to the site. Attack the Harvester with your trooper, the Harvester will then follow your trooper, move your trooper to the nearest rocky area and stop. The enemy Harvester will crush your trooper but for the rest of the mission it will not move.

Make sure this happens on a rocky area, if you do this on the sand a sandworm will swallow the Harvester and the enemy will receive a new Harvester.

Contrary to what people say, House Atreides have more unique technologies than the other Houses. They have in fact three special units—sonic tanks, ornithopters, and Fremen—whereas the other Houses have only two.

The Ordos only have two specials, the Saboteur and the Deviator. The ornithopter is taken from the starport and it is not Ordos's technology, the same with siege tank. So Ordos have the fewest technologies.

Try to harvest fields that are farther away first, and leave the ones closer to you for the end of the game. This will make the enemy bring their harvester near your base, and you can easily kill their crops.

Always attack silos first; try to capture silos or refineries because you will get their spice into your pool. If you managed to capture a refinery quickly spend all you have, if they destroy it or get it back, you have lost no spice. You get credits if you kill their refineries or silos.

The AI always attacks in roughly this order; the heavy vehicle factory first, the repair facility second, the hi-tech factory or the starport third, and the light vehicle factory last. The AI does not much care about the structures or units, and such other stuff.

You can use a Deviator to steal an enemy harvester and take the spice contained in it. Your carryall will think the harvester is ready to go and will take it, drop it to your base, take the spice, and put it back, and several seconds later the harvester reverts to the enemy side. You can see how full a harvester is by clicking on it, and looking in the info area, will say something like "75% full and harvesting." It does that for your and the enemy harvesters.

You do not control Fremen; you just call for a Fremen attack.

Atreides do not have troopers.

The worms attack movement no matter from whom, only Fremen are not detected by worms.

Harkonnen get neither trikes nor infantry.

House Ordos has more tech than the other Houses, from game you get that they always stealth them but who cares? They got the raider trikes—a stronger and faster trike—but they do not get the quad.

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2.4 House Tactics - Atreides

Build as many palaces as you can afford, generate Fremen as often as possible, and overwhelm the enemy with sheer numbers of them. They are very useful for mapping out the enemy base, but as you cannot control their movement, it makes the mapping somewhat erratic. In the non-patched version, rocket turrets do not fire on them, only vehicles that are being attacked. In the patched version they are fired upon.

Sonic tanks are most effective against infantry, which they can destroy in two hits. They are also very useful against rocket turrets, provided you put the Game Speed to Fast/Fastest, as this is a bug which increases their range.

2.5 House Tactics - Ordos

The Deviator is the best weapon you can use for indirect offensive purposes, and the best time is close to the opposing forces' buildings. Aim the Deviator at the strongest vehicle you can find, and get it to attack its own structures. The defenses of the enemy will not recognize that it is an enemy, and let it destroy the structure. Once it has destroyed a structure, its allegiance will revert, but it can easily be re-Deviated. The problem comes if you use it to attack vehicles, as they will return fire, and the vehicle will revert to its original allegiance.

They are also very effective against defending Devastators; deviate them and destroy them. If you have a deviated unit selected when it reverts, you will be able to give it one last order, with its allegiance set to the enemy. This allows it to attack its own buildings without being attacked. Beware of the fact that Deviators have a significantly shorter range than Missile Launchers.

If you have raider trikes the most important thing is to keep them moving. Due to their speed, they can outrun anything, and a missile launcher is pretty useless against them if you get up close. They should be used to map out the enemy base, as their speed should keep them out of most trouble. As an offensive weapon they are not much good unless you are continually moving them.

Saboteurs are generally seen as rather weak, as they are highly unlikely to break through a solid defense. In general, save your money, do not build a palace, and buy other units instead. If you do want to use them, it is best to send them both—you get two at a time—against the same target, generally a turret. The first one will hopefully destroy the turret and the second one should destroy the building behind it. Even better, try make them destroy the opposing Palace. Be sure that you always leave a direct path from the palace to the target - they will destruct on the first building they come to, yours or the enemy's.

More than any other house, it is of paramount importance for the Ordos to build a starport and to buy missile launchers.

Early in the game, when the other houses have siege tanks and you do not, you must split up attacking siege tanks, and attack them with 3 to 4 combat tanks each.

2.6 House Tactics – Harkonnen

A group of Devastators is a formidable offensive or defensive force, but make sure you have a repair centre surrounded with walls, as well as a couple of carryalls. This way, they can attack, do what damage they can, get repaired, and start attacking again. If one is about to be destroyed, it is better to destruct it than to let it explode as it does more damage on self-destruct.

When launching Death Hand missiles target them in a group of buildings—if you are lucky they might hit the target. What you aim for and what you hit are generally two very different things, but their power is undeniable.

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PART 3

STRATEGY

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Campaign Breakdowns

There are a total of 66 missions in the game, 22 missions for each house. Of these 22 missions, only a select nine will be played in each campaign due to the mission branching in the campaign.

Since the campaigns are branching, there are literally 1,458 permutations per campaign. Given 3 campaigns, this means there are a grand total of 4,374 different variations of campaigns in *Dune II*. Also note the mission advancement screen only has 27 regions, of which a maximum of three are available as choices at any one time. Obviously no guide can cover all permutations, so instead every single map of every single campaign will be covered separately, 66 maps in all.

The following table presents the mission objectives for all the levels.

Mission	Maps	Atreides Missions	Ordos Missions	Harkonnen Missions
1	-	1000 spice, Ordos units	1000 spice, Harkonnen units	1000 spice, Atreides units
2	3	2700 spice, Ordos base	2700 spice, Harkonnen base	2700 spice, Atreides base
3	3	Harkonnen base	Atreides base	Ordos base
4	3	Harkonnen base	Atreides base	Ordos base
5	3	Ordos base	2 Harkonnen bases	Atreides base
6	3	Harkonnen base	2 Atreides bases	2 Ordos bases
7	3	2 Ordos bases	2 Harkonnen bases	2 Atreides bases
8	2	Ordos/Harkonnen bases	Atreides/Harkonnen bases	Atreides/Ordos bases
9	-	2 Sardaukar bases	2 Sardaukar bases	2 Sardaukar bases

Note the objectives for Mission 2 is a special case; the mission has two separate objectives, meeting any one of them ends the mission in victory. This means the player can choose between eliminating the enemy presence or gather the set amount of resources. Victory is achieved regardless. Further details for mission 2 are presented along the map breakdowns.

Only the first and last missions are set; the first mission is not user selectable, and the last mission map is identical for all player houses. The last mission is also the only one with Sardaukar bases. Which mission the player chooses to play is of no concern to the continuing campaign; the following choices will always be the same. Only the two first missions are of smaller size, being 32 x 32 tiles. All the rest of the maps are 62 x 62 tiles. The third possible map size, 21 x 21, is never used in any of the campaign maps.

As an aside, there are flags for countdown missions in the game engine data and they can be set and produce no errors, but the script engine cannot interpret the countdown flag due to development for the countdown code being cut at the final stages of production.

Further, there is even a fourth victory condition flag set in some missions and maps. What this fourth game type would have been will remain unknown. Only three mission types are known to date; resource gathering, military victory, and the unfinished time-out mission type.

Atreides Campaign



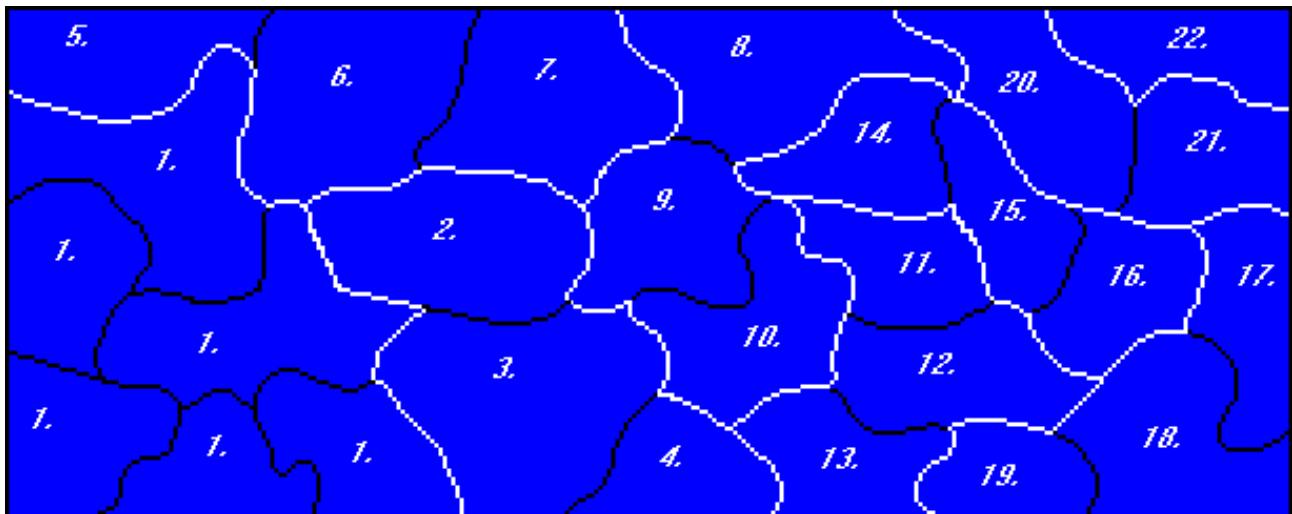
House Atreides

Caladan, home planet of the Atreides, has a warm, calm climate and the lands are lush and green.

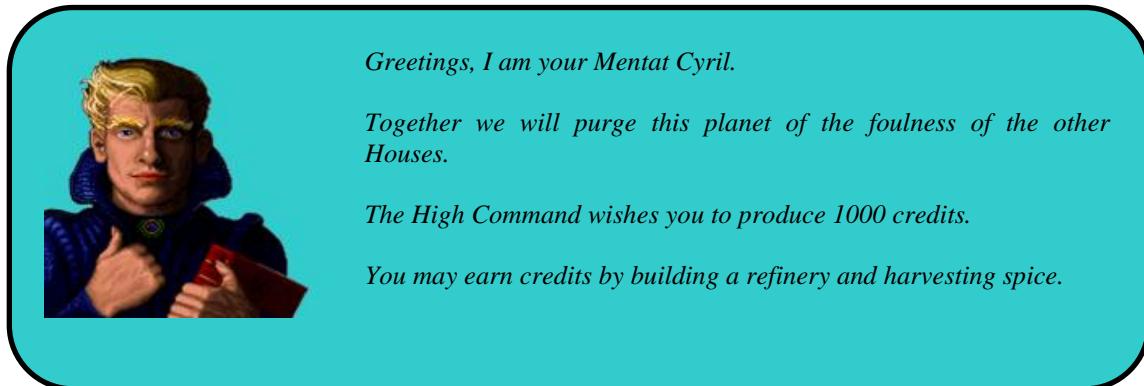
The rich soils and mild weather supports an extensive variety of agricultural activities.

In recent centuries industrial and technological developments has added to the prosperity of the Caladanian peoples.

House Atreides is probably the one most players start with. It may not be the easiest campaign, but it is not the hardest one, either. Here are some strategies that will help you prevail.



Atreides Mission 1



General notes

Starting credits	1000
New units	trike, soldier
New structures	windtrap, spice refinery
Mission objectives	1000 credits of spice
Internal name(s)	scena001

This mission is really easy; there is basically nothing to achieve. You must make an effort to fail. The only thing you need to do is harvest enough spice.



There are eight enemy entities from the Ordos present in the first Atreides mission. These are pictured in the screenshot. Three of the units start the scenario with orders to hunt and attack, using suicidal attacks if need be. The rest of the Ordos units are in ambush mode, only engaging if engaged. If they are ignored, they will not bother the player.

Quietly harvest the spice, and you will meet the mission objectives. The huge patch to the west of the starting location contains all the spice you need. Simply build a windtrap, and a spice refinery.

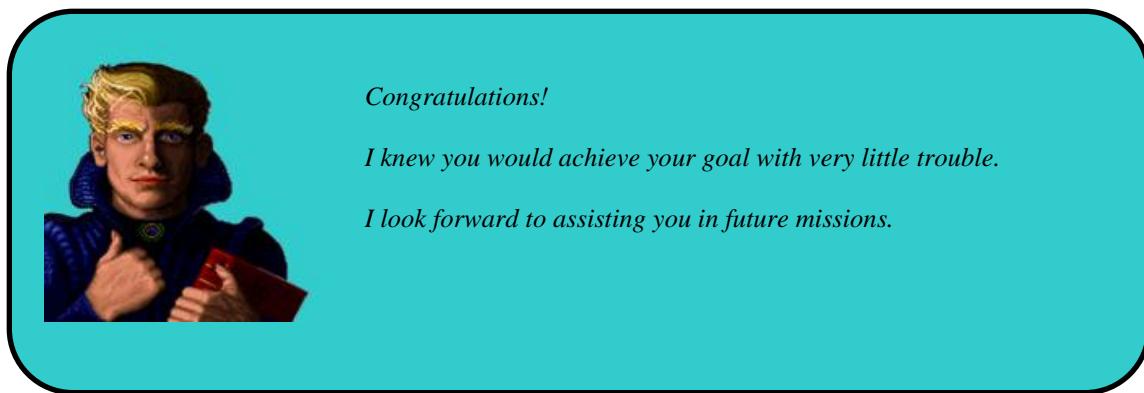
Please remember you can gather more points if you eliminate the Ordos

presence. Also, if you decide to harvest all of the spice on the map you will be rewarded. Be careful when doing so, since going over the 1000 credit cap is really easy to do. Keep constructing more windtraps to keep your credit levels low. Constructing another refinery is rather counter-productive when going for maximum points.

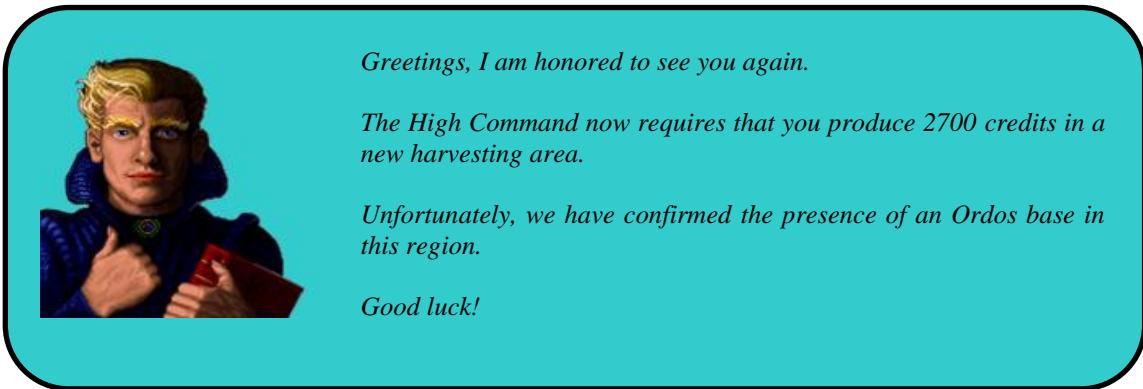
The mission is basically auto-play.

For some unexplainable reason, there were seemingly supposed to be starports in the mission.

Another remnant from previous design decisions is present, as well; in version 1.0 of the game, the human units are capped at a maximum of 16, whereas the upgraded version has the maximum unit amount capped at 25. Since the player can neither produce nor create any tactical units in the mission, the only cap is for the harvester; the maximum amount is seemingly capped at 11 harvesters, provided the player does not lose any units during the mission. This seems implausible.

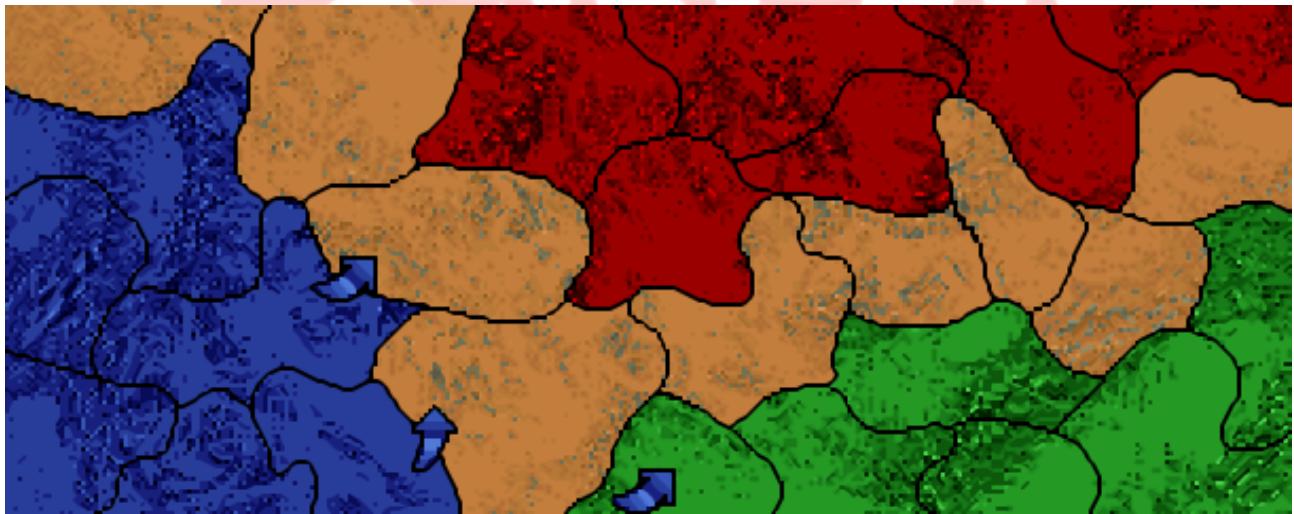


Atreides Mission 2



General notes

Starting credits	1,200
New units	infantry, soldier, trike
New structures	barracks, silo, outpost, light vehicle factory
Mission objectives	2700 credits of spice, or eliminate Ordos presence
Internal name(s)	scena002, scena003, scena004



At the mission choice screen, choosing the western mission will present the player with map A, choosing the middle map will present the player with map B, and choosing the southern mission will present the player with map C.

Starting from the second map mission branching will dictate which map will be played; therefore all three of the maps are presented here. Branching will continue until the last map of the campaign. The first and last maps are always the same.

At the inception of the mission you will be given an option between three missions.

In any of the missions you will encounter an enemy base, but you do not need to engage the enemy at all. Fight off the sporadic attacks, and keep harvesting spice.

If you do attack the enemy, keep in mind the enemy bases in version 1.0 have no construction yard. This means the enemy cannot rebuild any structures if they are destroyed.

In version 1.07 the enemy bases have a construction yard. Focus on this structure first. After the construction yard is destroyed the enemy cannot rebuild any structures on this map, either.

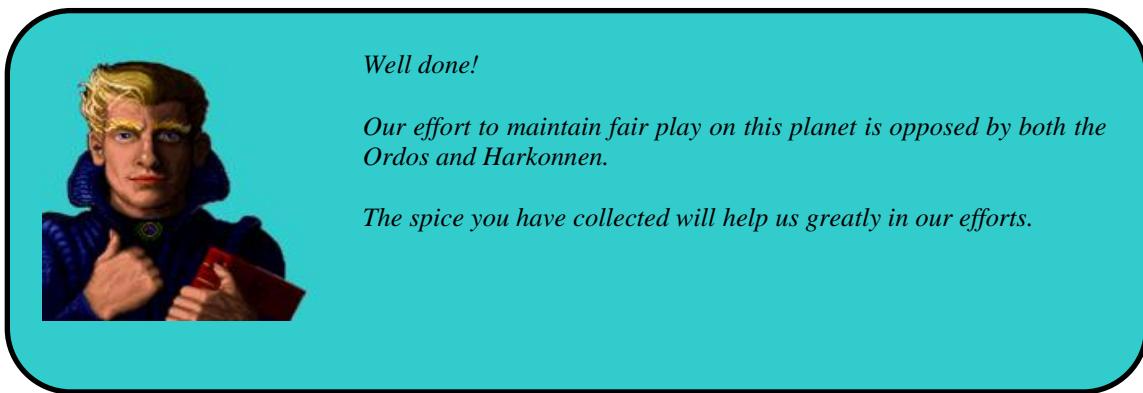
Attack only one structure at a time, and keep attacking it until it is destroyed, regardless of losses. Do not engage enemy units, the computer can churn out a seemingly endless supply of them, even when all spice has been exhausted. Instead, focus on destroying the enemy structures. Also note the only tactical building in the enemy base—in both versions—is a barracks. Destroy this building first if you are playing version 1.0 of Dune II. To play it safe, merely harvest spice until you have met the mission objectives.

In this mission, you should build two refineries and two spice silos to contain the requested amount of Spice.

Just harvest enough spice, and you will meet the mission objectives. The huge patch to the west of the starting location contains all the spice you need. Simply build a windtrap, and a spice refinery. The rest is auto-play.

You will get more points for eliminating the enemy presence, although is it not necessary for the completion of the mission. If you want additional points, you may opt for harvesting all the spice on the map. If you choose to go for this point creep, keep in mind it is easy to accidentally go over the 2700 credit cap, unless you keep building structures all the time.

Mission maps A and B have two paths to victory; either you can eliminate the Ordos presence or harvest enough spice. Map C can only end in victory by harvesting spice. In version 1.0 the maximum amount of Atreides units is capped at 20. In version 1.07 the cap is set at 25. Originally there were supposed to be reinforcement shipments in all the maps; 5 soldiers for the Ordos, and 4 soldiers plus a trike for the Atreides. All the reinforcement references are commented out.

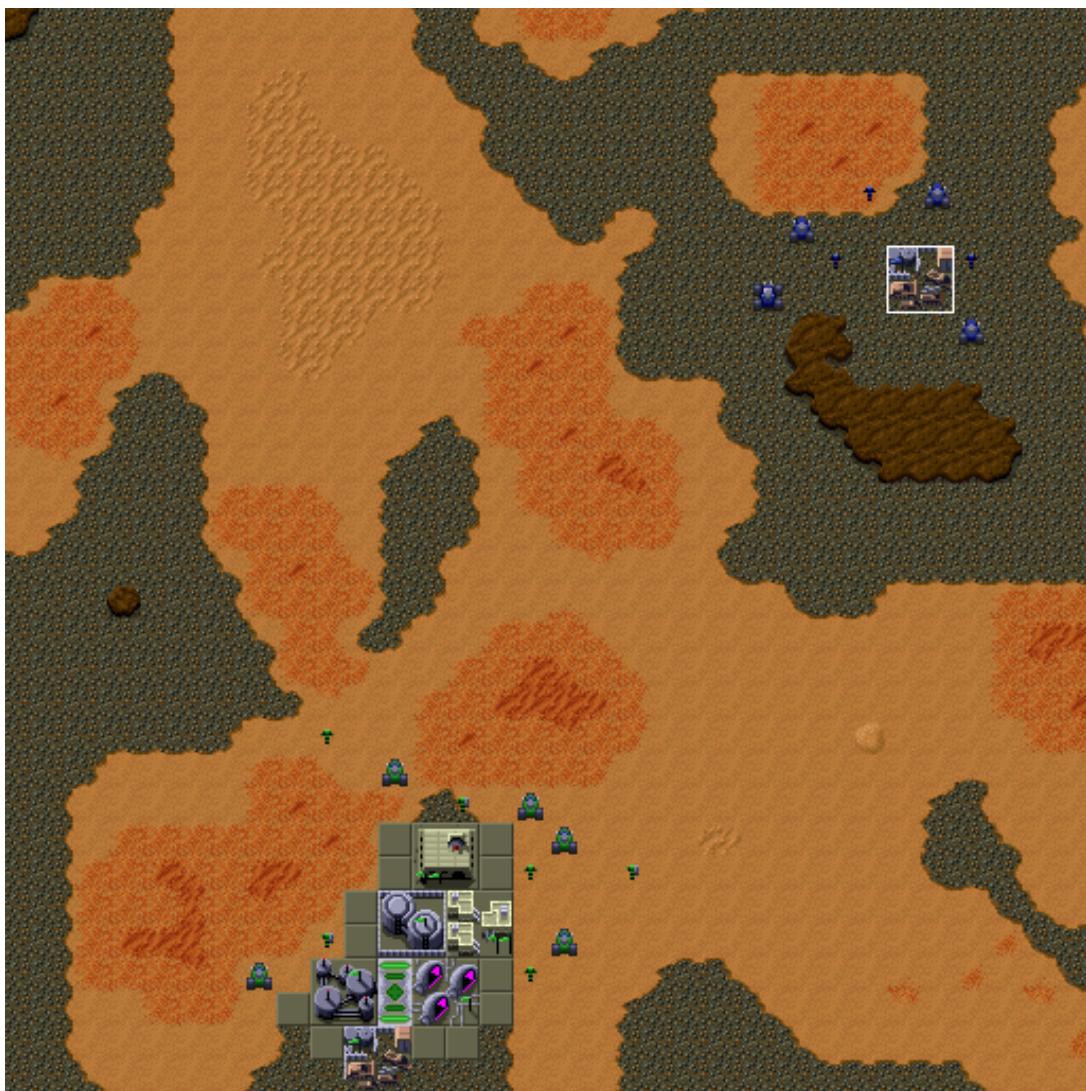


Atreides Mission 2 Map A



The first main objective—the construction yard—is located at the northwestern corner of the Ordos base. Make sure you raze it before attacking the other enemy structures.

Also make note of the spice bloom southwest of your starting position; the spice bloom may present a hazard to your scouting troops. You may wish to detonate it at the start of the game to remove it.

Atreides Mission 2 Map B

Make note the map has a safe basin of spice directly north of your starting position. You may wish to harvest this spice basin first.

There is a spice bloom located south from your base. The bloom is in a hazardous location, being located near the Ordos base, but it is thankfully not needed.

The Ordos construction yard is inconveniently located at the very southern tip of the enemy base. The safest route towards it is by moving your main attack force directly west towards the edge of the map, and southward along the western edge of the map to the southwest corner. Attacking from there southwest corner there are few enemy units to stand in your way when attacking the construction yard. After the construction yard is destroyed, you might want to destroy the nearby spice refinery, as well. If you destroy it after the construction yard, the enemy cannot replace it, and all the spice on the map is yours.

Atreides Mission 2 Map C



Note there are two spice blooms directly to the west of your starting location. While there is plenty of spice on the map to satisfy the credit requirements, the two spice blooms can be hazardous when your troops are exploring the map.

Also, on this map you can for the first time utilize the concrete creep tactic; keep building concrete slabs towards the enemy base, all the way to the enemy concrete foundation. This will automatically trigger an enemy attack, so have your defenses at the ready.

There is a known anomaly in the map data; the mission will not end in victory when you destroy the enemy base. The only way to end the scenario in victory is to harvest enough spice.

Atreides Mission 3

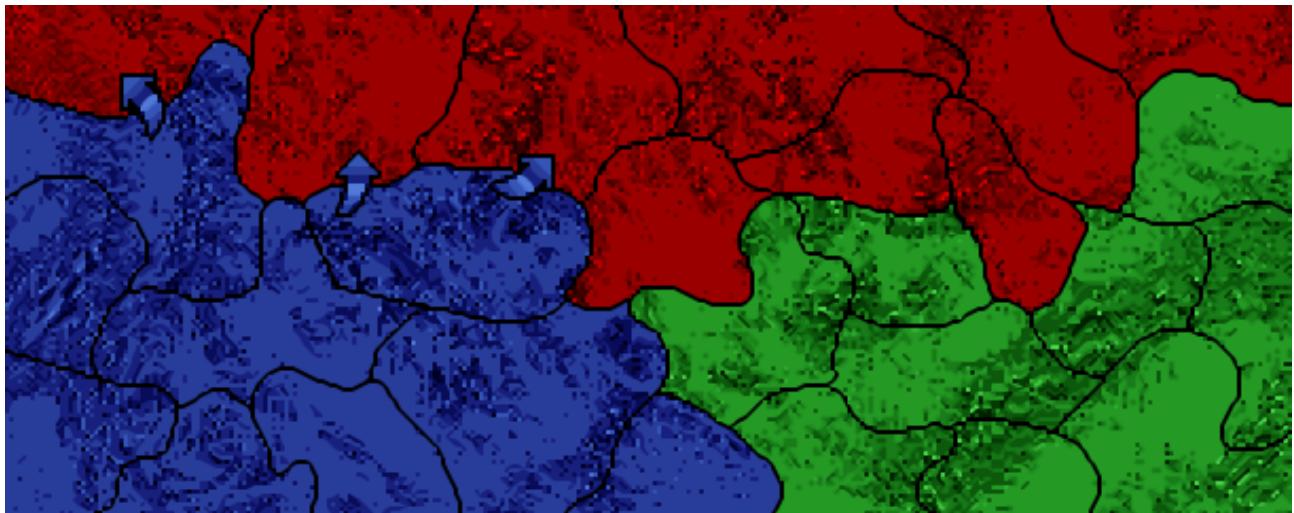


The battle with the other Houses has intensified and we are now forced to engage in some selected offensive maneuvers.

The Harkonnen are being extremely troublesome in your next region, and we must ask you to remove their presence from this area.

General notes

Starting credits	1,500
New units	harvester, quad
New structures	-
Mission objectives	eliminate Harkonnen presence
Internal name(s)	scena005, scena006, scena007



From here, the mission objective will be always the same, destroy every enemy unit and building on the map.

As always, unless you want to use the provided maps, the first thing to do is to discover the enemy position. Save the game and send your start-up units to each angle of the map, and when you finally know where the enemy is simply reload the previously saved game. The save/load trick is necessary because the enemy will usually launch a heavy attack at you when "discovered" and this is very bad at the beginning of any mission.

Place all your units in the direction of the enemy's attack—that is, the direction of the previously discovered base—to have a good defense, but leave some of them in other parts of your base; this is mandatory, because at the beginning of the mission the enemy will send flying carryalls which will drop units randomly near your base.

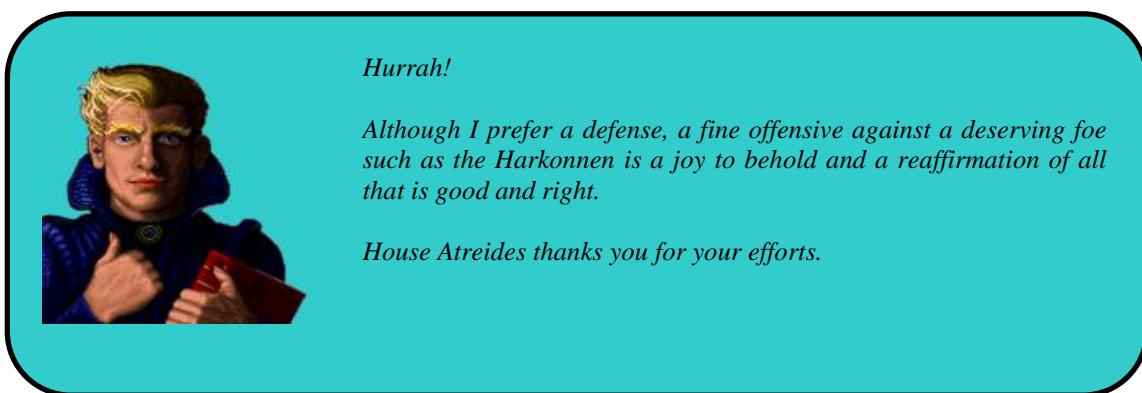
Build a windtrap power center and a refinery, followed by a radar outpost and a light vehicle factory. Atreides and Ordos troops are quite ineffective, so it is not worth it to train them. Also upgrade the light vehicle factory to build quads, because trikes are too weak to be effective; this cannot be done if you are playing with Ordos. In fact when playing as Ordos these first missions are much more difficult.

Build a second refinery—this is a *must* in every mission; *always* build at least 2 refineries, from the beginning—and store credits, while defending your base from attacks. Your defense units should be placed very near each other—that is in adjacent cells—to have more fire power against attackers. When you have stored enough credits—from 8000 to 10000 credits—it is time to plan the attack. Build another light vehicle factory—one is not enough to send the reinforcements that you will need in the attack—and build quads—and some troops if you want to—until you reach the maximum number of units.

Group all your units on a rock near the enemy base, save, and begin the attack. Your primary objectives are the light vehicle factory and the construction yard. If you destroy those buildings you win by attrition.

Do not waste too many resources in fighting enemies units for now. Rather designate as many units as you have to destroy the buildings listed above. Once done, you should destroy the troop training building; after that you can destroy enemies units. Each time a unit is destroyed—yours or enemy's, it does not matter—start building a new quad in your base and send it immediately into the battle. This way you should be able to win fairly easily. You will receive four units of reinforcements during the mission, whereas the Harkonnen will receive six units.

In version 1.0 the maximum amount of Atreides units is capped at 20. In version 1.07 the cap is set at 25. There even exists a demo version of map B with the Atreides units capped at an unorthodox 16.



Atreides Mission 3 Map A

All five spice blooms on the map are in the north section, close to the player base. There is a small sand basin directly north of the starting location; the basin has a spice bloom in the middle. Detonating it will produce very little spice. There is even an anomalous spice bloom placed in the middle of rock. Detonating it will produce no spice; it acts practically as a unit killer. The bloom is universally regarded as a bug. Both of these spice blooms are a liability, rather than an asset. Be wary when navigating around the neighborhood of your starting location.

Also be aware the Computer-controlled units were supposed to be capped at 20, but due to a spelling bug the cap is disregarded. The Harkonnen therefore have access to more troops than originally intended. This is universally regarded as a bug.

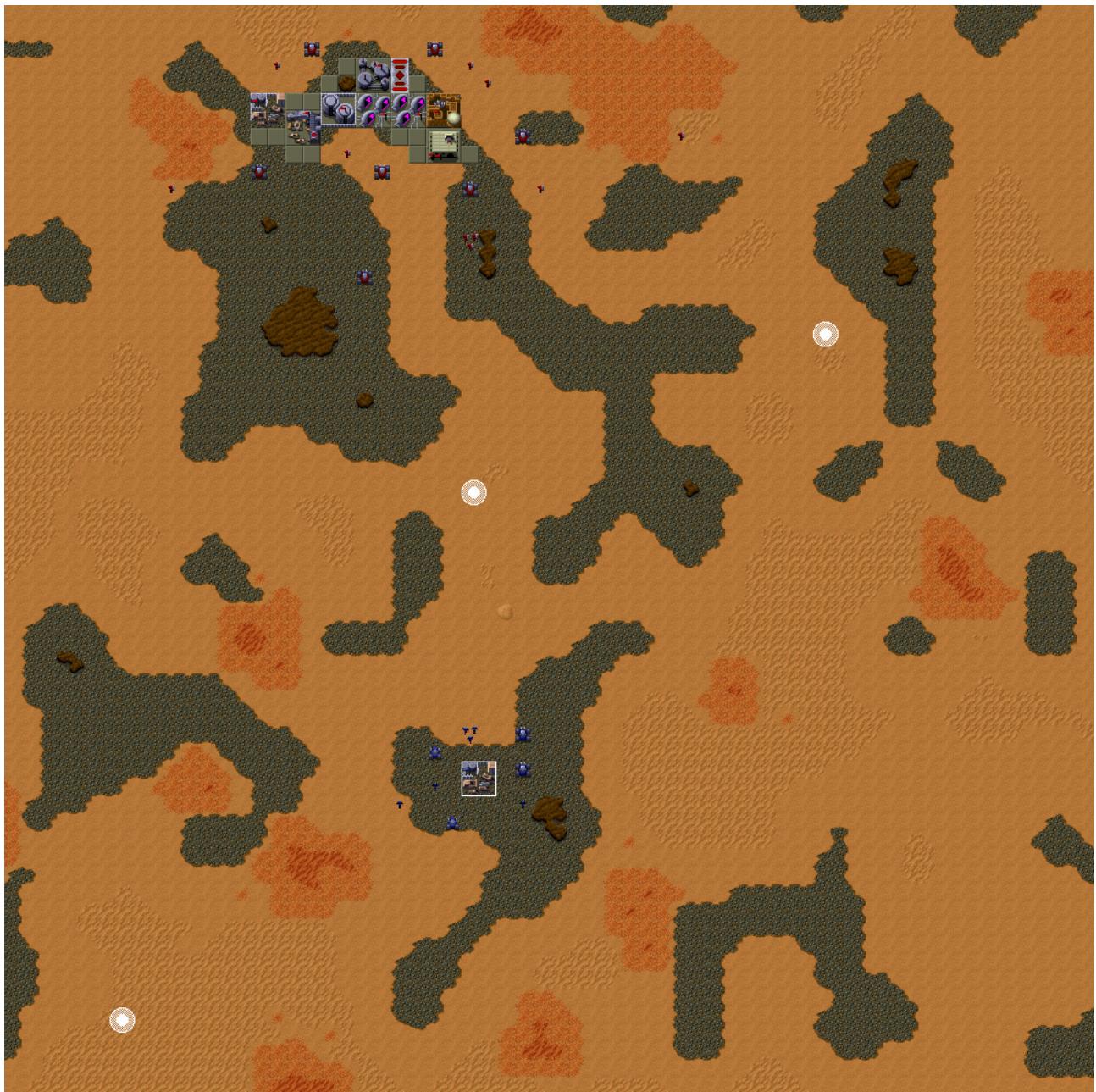
Atreides Mission 3 Map B

There are two spice blooms on the map; both are located close to the player start location.

There are two small, isolated basins with spice close to the player base. There is even a third such basin located further east. Since the third mission maps are the first maps with sandworms, the basins are completely secure for harvesting.

If you have only experienced the demo version of Dune 2, you might recognize the map. For more on this topic, see *Appendix 7: The Dune 2 demos*.

Atreides Mission 3 Map C



There is a spice bloom to the north of the starting location.

Keep to the west when approaching the Harkonnen base; bypass the enemy base on the west side and you will have unrestricted access to the poorly defended construction yard.

Atreides Mission 4

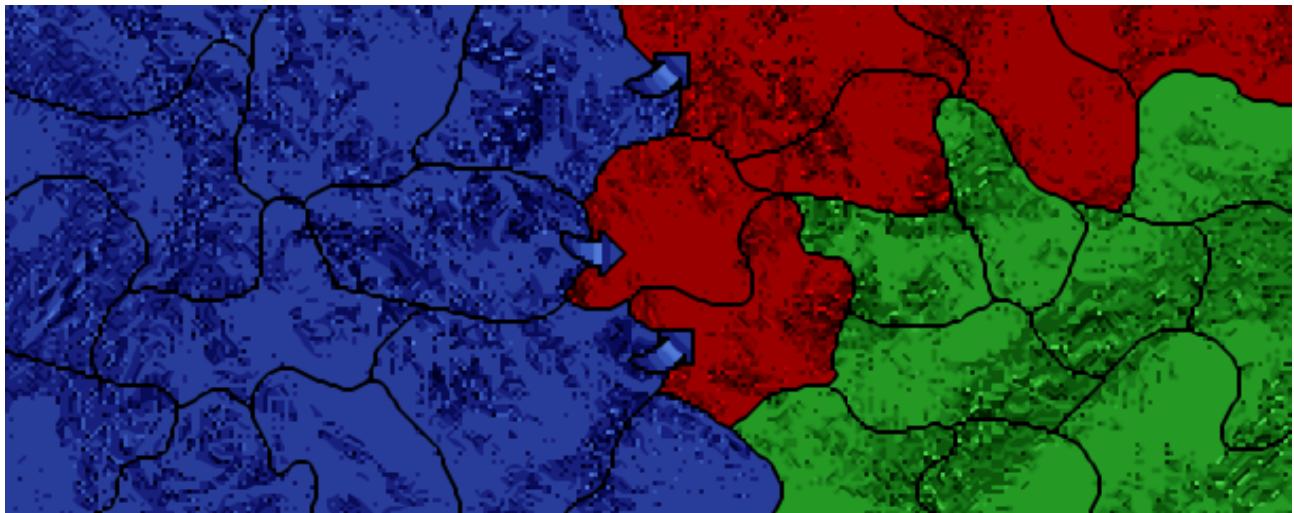


Your demonstration of military skills now forces us to assign you to another offensive campaign against the House Harkonnen.

They have continued to attack our peaceful harvesters, and must be removed from the area.

General notes

Starting credits	1,500
New units	combat tank, MCV
New structures	large concrete slab, wall section
Mission objectives	eliminate Harkonnen presence
Internal name(s)	scena008, scena009, scena010



From this mission onwards the enemy bases are surrounded or enhanced with walls.

The wall sections will not withstand attacks for any length of time, but they will force you to reconsider previously used tactics and previously valid maneuvers.

In this mission you can build the heavy vehicle factory and walls. Walls are rather useless as a tactical asset—except when slowing down attack from the enemy direction—so do not waste your time building walls all around your base.

From this mission onwards you should not rely on ground troops any longer; they are effectively obsolete. It is preferred you use tanks and quads instead.

As always, build two refineries; also build an additional harvester, using a heavy vehicle factory.

To win this mission you should proceed in the same way as the previous mission; build the maximum number of units, wait to have enough credits for reinforcement, and lead the attack.

Before attacking, you should have at least one light vehicle factory and at least two heavy vehicle factories. Unless you have enough production capability you will not be able to re-supply your attack force, nor might you be able to quickly establish a defense perimeter should the enemy break through your attack line.

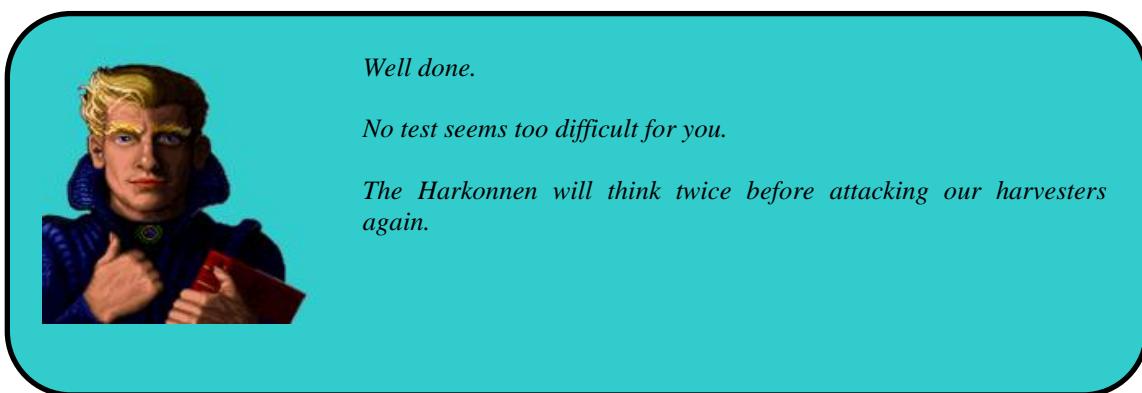
Your primary objectives should be vehicle factories—both light and heavy—and the construction yard. Except for tanks, this mission is quite similar to mission 3, so you should win this rather easily.

During this mission you will encounter Imperial Sardaukar units for the first time. Emperor Fredrick has thus shown his true colors.

After the fourth mission you will see an intermission consisting of the Emperor chastising your opponents.

In version 1.0 the maximum amount of Atreides units is capped at 20. In version 1.07 the cap is set at 25.

All the maps in mission 4 have an additional flag for ending the scenario in victory, but it is seemingly never used. What the flag is supposed to have done will remain unknown for all time and cannot be re-enabled, ever.



Atreides Mission 4 Map A



There are three spice blooms on the map, two of which are relatively close to the player starting location. The third is midway between the enemy base and the starting location.

Atreides Mission 4 Map B



There are three spice blooms on the map, all relatively close to the player base. The spice bloom directly east of the player base is located in the middle of an isolated rock basin, making the released spice safe to harvest.

Atreides Mission 4 Map C



There are five spice blooms on the map, one of which is located directly next to the enemy base.

Atreides Mission 5



Welcome.

The rules seem to have changed.

As you have witnessed the Emperor himself has been aiding the efforts of our competitors!

As a part of our new strategy, we must ask that you eliminate the treacherous Ordos forces that presently control this region.

General notes

DUNE II	
Starting credits	1,500
New units	carryall, missile tank
New structures	hi-tech facility, repair facility, turret
Mission objectives	eliminate enemy presence
Internal name(s)	scena011, scena012, scena013

The Battle for Arrakis

This is the first non-easy mission.

You have new buildings, such as light turrets, repair facility and hi-tech factory.

New units are also available; they are the carryall and the rocket launcher.

From this mission onward it is very important to plan a good defense before you begin any attack.

So, quickly build 2 refineries and a light vehicle factory; keep all your units as defensive units, until you build 5 to 6 light turrets in the attack main path. Turrets should not be built in adjacent cells, but within a distance of one to two cells. While doing that, build some quads if enemy attacks are frequent. After building the turrets, you can build a heavy vehicle factory; with that you can make a new harvester. The repair facility is not very useful for now—but it will become indispensable in the next missions—so you can avoid its construction. Without a carryall the repair facility is cumbersome.

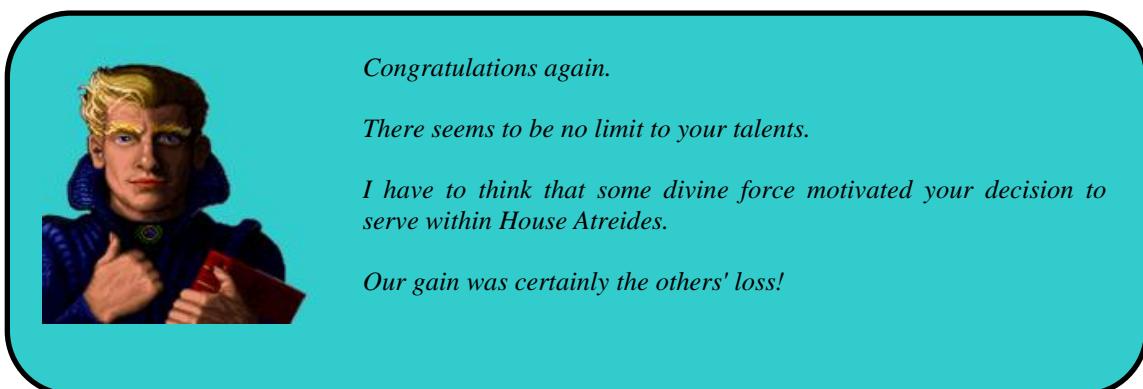
When your defense is ready—meaning the enemy's attacks are more or less ineffective and can be easily stopped—you can build the hi-tech factory in order to produce carryalls. Carryalls are very useful, because they will transport harvesters from spice fields to refinery and vice versa, this means that you do not have to manage the resource collection anymore.

The enemy will also attack using rocket launchers, it is easy to destroy them by using your quads; simply move 1 or 2 of them in an enemy's launcher's adjacent cell and attack it.

When you have enough credits—12,000 at least—make another heavy vehicle factory and begin constructing tanks. Also build 2 to 3 rocket launchers, you do not need more.

The attacks should be done in the usual way; build the maximum number of tanks that you can and lead a massive attack against the enemy base. Anyway, it will be hard to win in a single attack, since enemy defense is strong. Always remember that your primary targets should be the factories and the construction yard. Use launchers to destroy buildings beyond walls and use tanks to protect them from enemy attacks. If you see that you are losing the battle then retreat to your base: you will lead another attack after a while.

Enemy turrets can be annoying. Use 2 to 3 tanks to get them down quickly; do not use quads or launchers to destroy them. Quads and launchers have too weak armors, and launchers are more effective against buildings.



Atreides Mission 5 Map A



There are four spice blooms on the map. The map has relatively little spice close to the player's starting location, so getting a second harvester as quickly as possible is paramount.

Note there are two construction yards at the Ordos base. Essentially the Ordos presence consists of two minor bases functioning in tandem. Also note the Ordos have a WOR facility in the base. Since the Ordos cannot use a WOR facility, this is universally regarded as a bug.

Atreides Mission 5 Map B



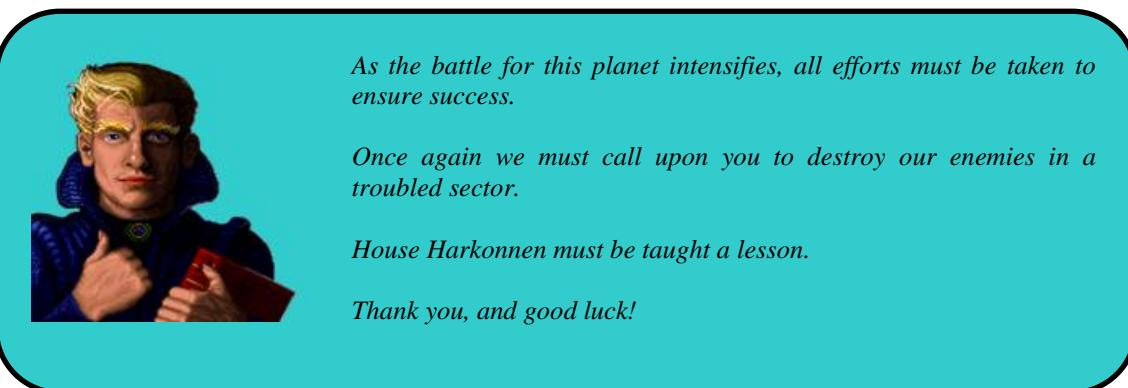
There are seven spice blooms on the map, only three of which are in locations that can be accessed with relatively little risk. The other four are all located in the southern half of the map.

Atreides Mission 5 Map C



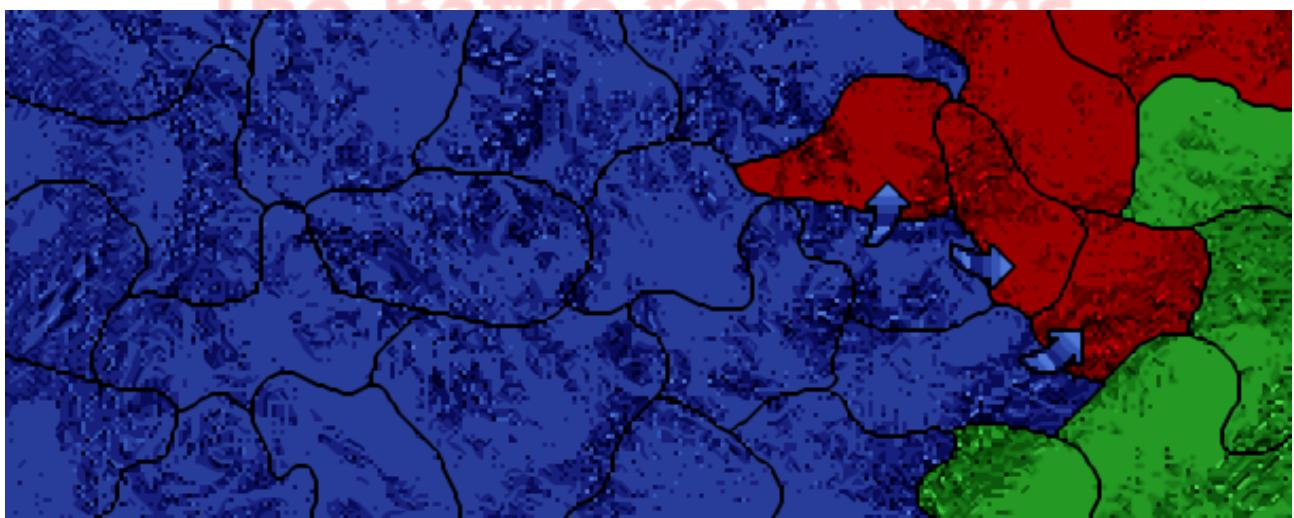
There are as many as nine spice blooms on the map, two of which are located relatively close to the player's base. One is immediately in front of the Ordos base.

Atreides Mission 6



General notes

Starting credits	1,700
New units	siege tank
New structures	rocket turret, starport
Mission objectives	eliminate Harkonnen presence
Internal name(s)	scena014, scena015, scena016



From this point onwards proceeding starts becoming rather difficult.

First of all, note that you can build long-range turrets. They are extremely powerful and they must be the key of your defense; also, they essentially make light turrets obsolete, so do not waste money building them anymore.

As always, build two refineries, a light vehicle factory—useful only to unlock other building construction, since from this mission you do not need quads anymore—and a heavy vehicle factory, which should be used to build a new harvester.

Now plan your defense. Place 5 to 6—or more—long-range turrets in the attack main path, as explained in the previous mission. Enemy units will often target the heavy vehicle factory, so the key is they must be under turret fire while approaching your buildings; and of course the must be destroyed before they reach them.

From this mission you can build the starport, and you can use it to buy carryalls—so you do not have to build the hi-tech factory—and tanks, so that having only one heavy vehicle factory will be enough even during attacks.

A repair facility is now a *must*. Since you can construct siege tanks from this mission onwards—which are as expensive as they are useful—it is a good idea to repair them instead of constructing them from scratch.

You can now build ornithopters. They are somewhat useless, especially in the later missions, so do not waste your money.

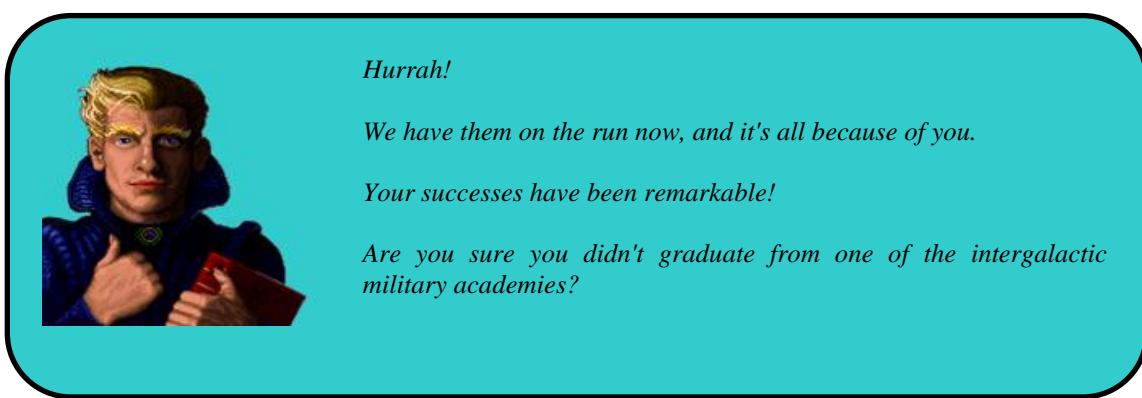
When you have enough credits it is time to begin the attack.

From this mission, it is a suicide to lead a massive attack to the enemy base since it is well defended. So you should use 1 to 2 launchers escorted by some tanks. Approach to the nearest enemy turret and use launchers to destroy it—this can require a lot of time—and the buildings in the surroundings. Use tanks to defend launchers when the enemy attacks—and you can be sure he will.

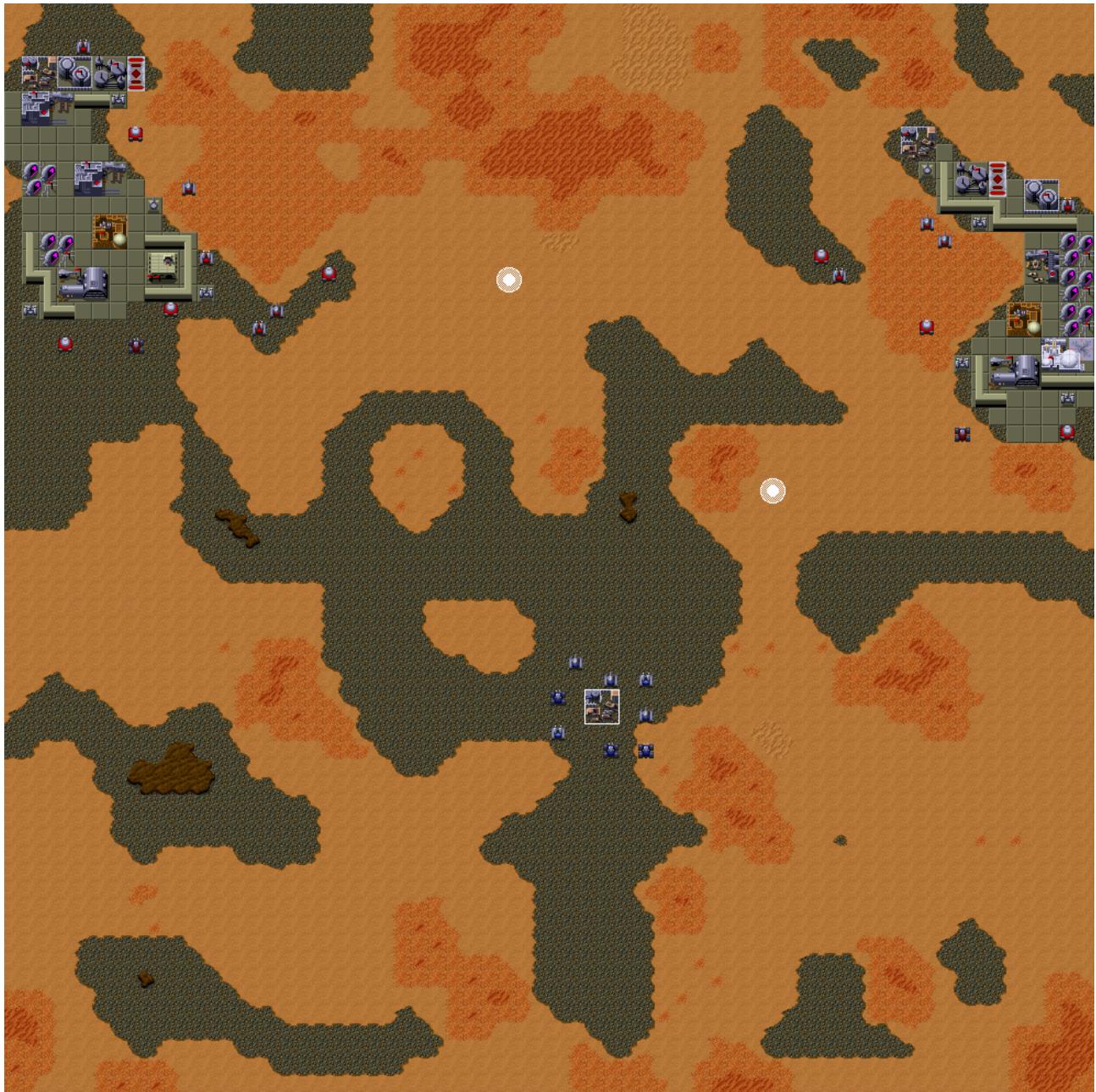
Remember that you should do hit-and-run attacks, so if you think you are losing, retreat. You should always proceed in the same way; approach, destroy, defend, and retreat.

The more you approach near the enemy's base, the more units you will have to fight with at the same time; this means that you should not approach too much, at least during first attacks.

When you think that enemy has fewer units than you do, lead a massive attack and finish him.



Atreides Mission 6 Map A



Please note you the western enemy base is connected to your starting position via a thin land bridge. You may, if you wish, connect the western enemy base with your own with concrete slabs and surround the enemy base with rocket turrets.

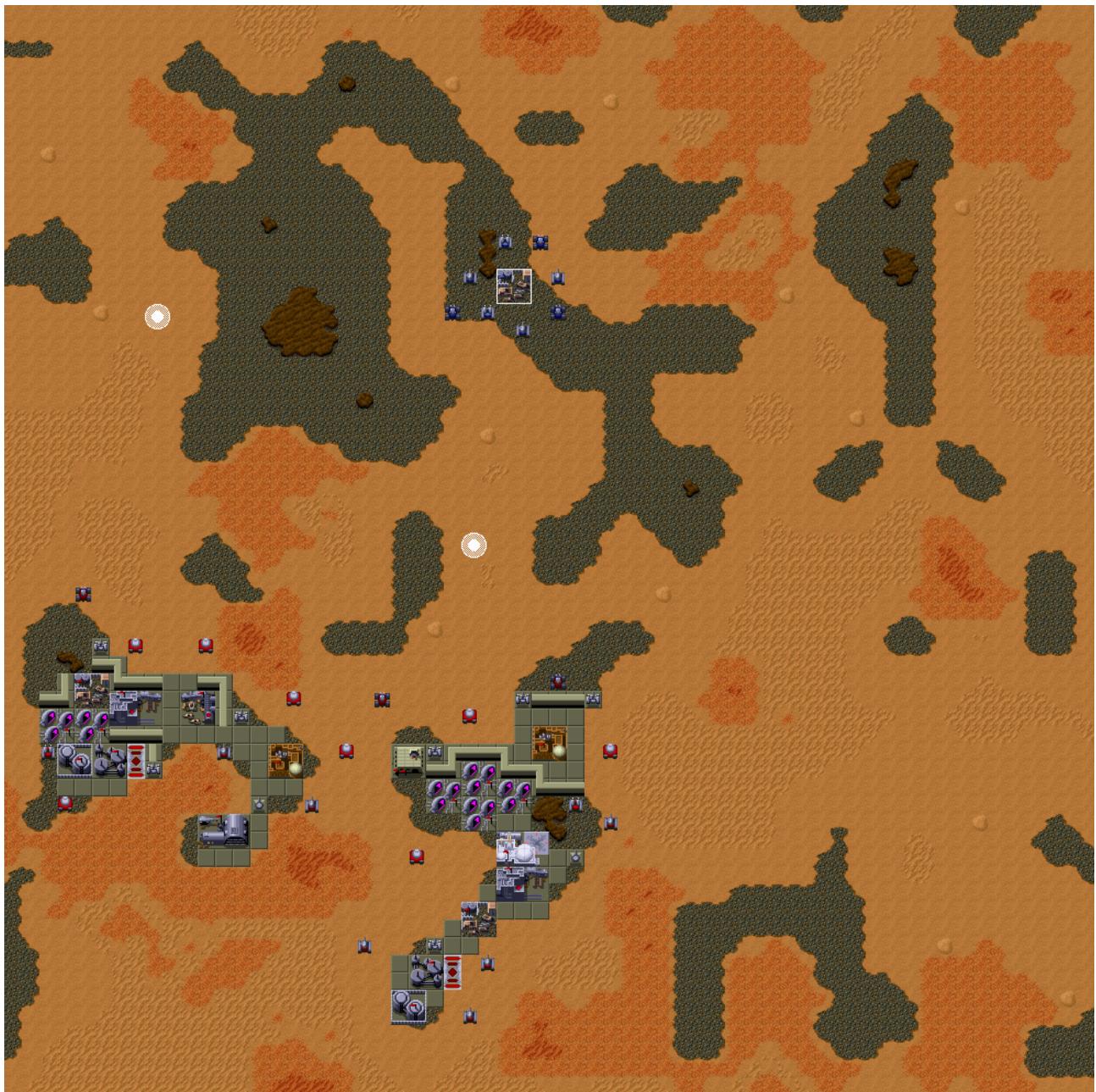
This map can also be found elsewhere, such as Ordos Map 6A, Ordos Map 6B, and Harkonnen Map 6B.

Atreides Mission 6 Map B



Note you may employ the concrete creep tactic on this map; the enemy base is connected to your own starting position via a land bridge.

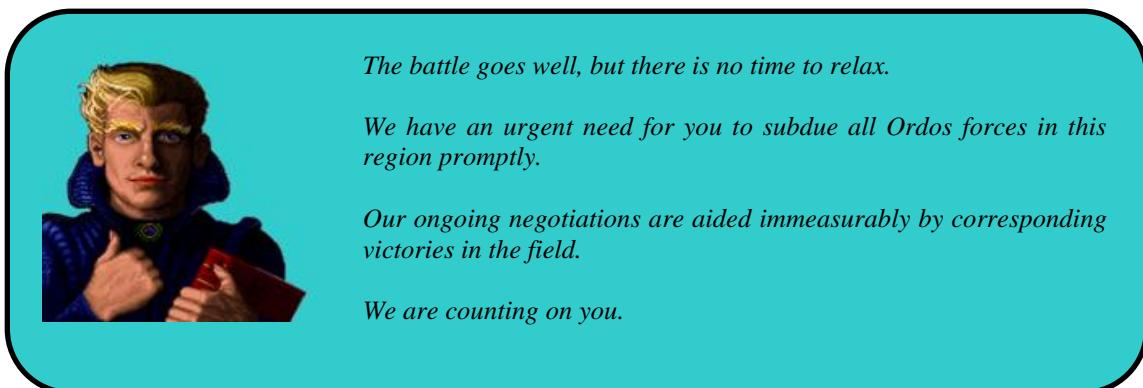
Atreides Mission 6 Map C



There are a massive thirteen spice blooms on the map, nine of which are relatively safe to detonate and harvest.

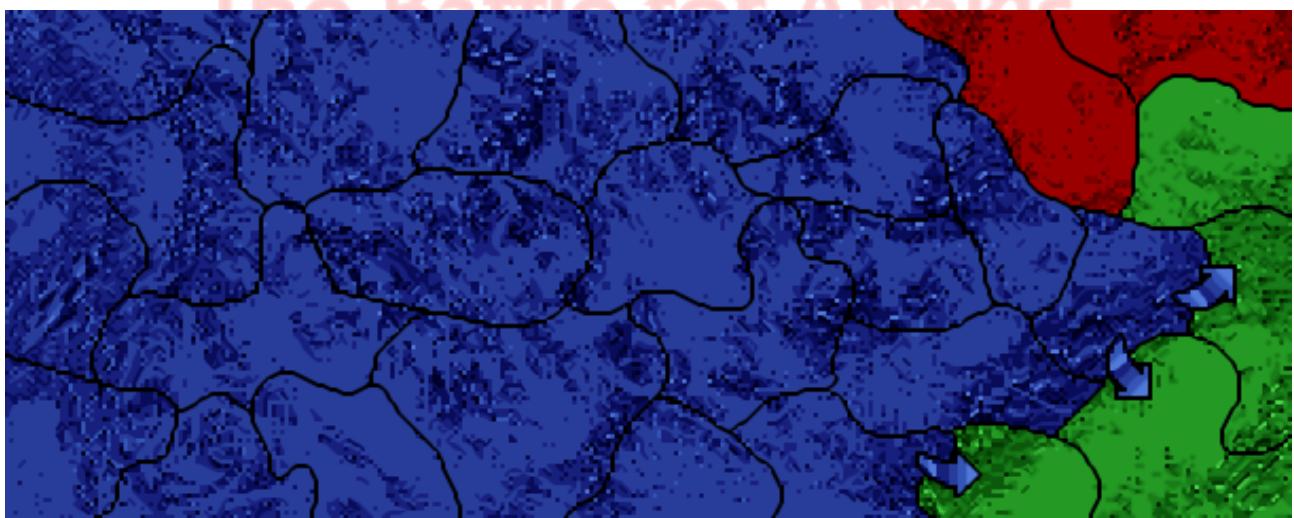
Note the Harkonnen base is overpowered; the base has a total of six windtraps, though it would essentially only need four.

Atreides Mission 7



General notes

Starting credits	1,800 – 2,000
New units	ornithopter, sonic tank
New structures	-
Mission objectives	eliminate enemy presence
Internal name(s)	scena017, scena018, scena019



This is the only mission in the campaign with enemy Houses of IX.

This mission is quite similar to the previous, except that each House can now build a new special House unit.

Ordos can use the Deviator, Atreides now have the sonic tank, and Harkonnen have the Devastator.

The sonic tank is useful for defense; place it in front of your turrets.

It is also useful in destroying the enemy turrets; it can do it in less time than a rocket launcher.

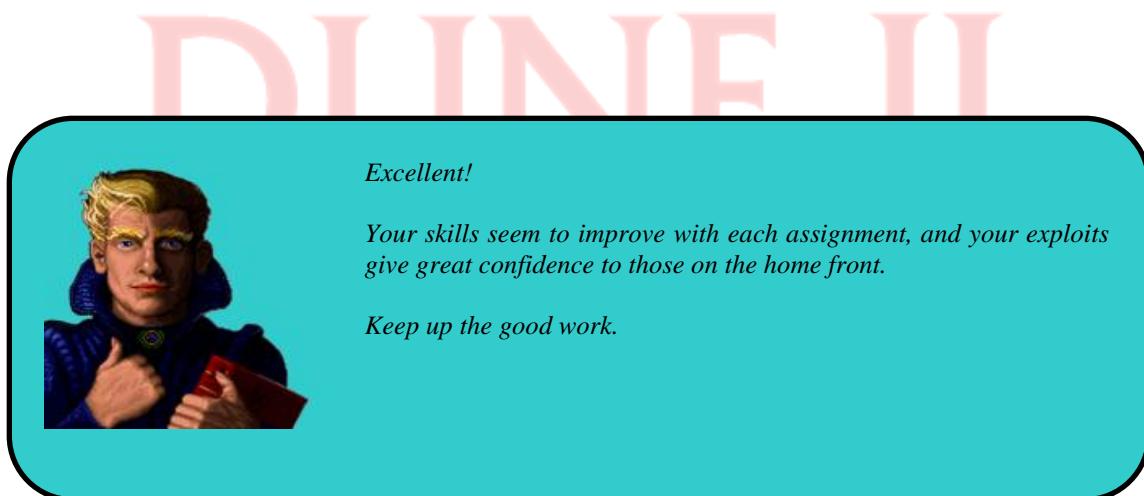
Please make sure you read the notes regarding the sonic tank if you intend to use them.

It is paramount you go fast turret at the beginning of the mission; the enemy now has access to ornithopters and unless you can erect a couple of batteries of rocket turrets, your structures will be destroyed in very short order.

There is not much to say about this mission; proceed in the same way as the previous mission.

The new units do not make a major difference—except that Atreides sonic tanks are useful to destroy enemy turrets faster—so build only 2 to 3 of them and use them at your discretion.

Be aware the Ordos should have their maximum unit amount capped at 25, but due to a spelling error in the map data there is no unit cap for the Ordos at all. Thus no restrictions apply to the enemy army size. This is universally considered a bug.



Atreides Mission 7 Map A

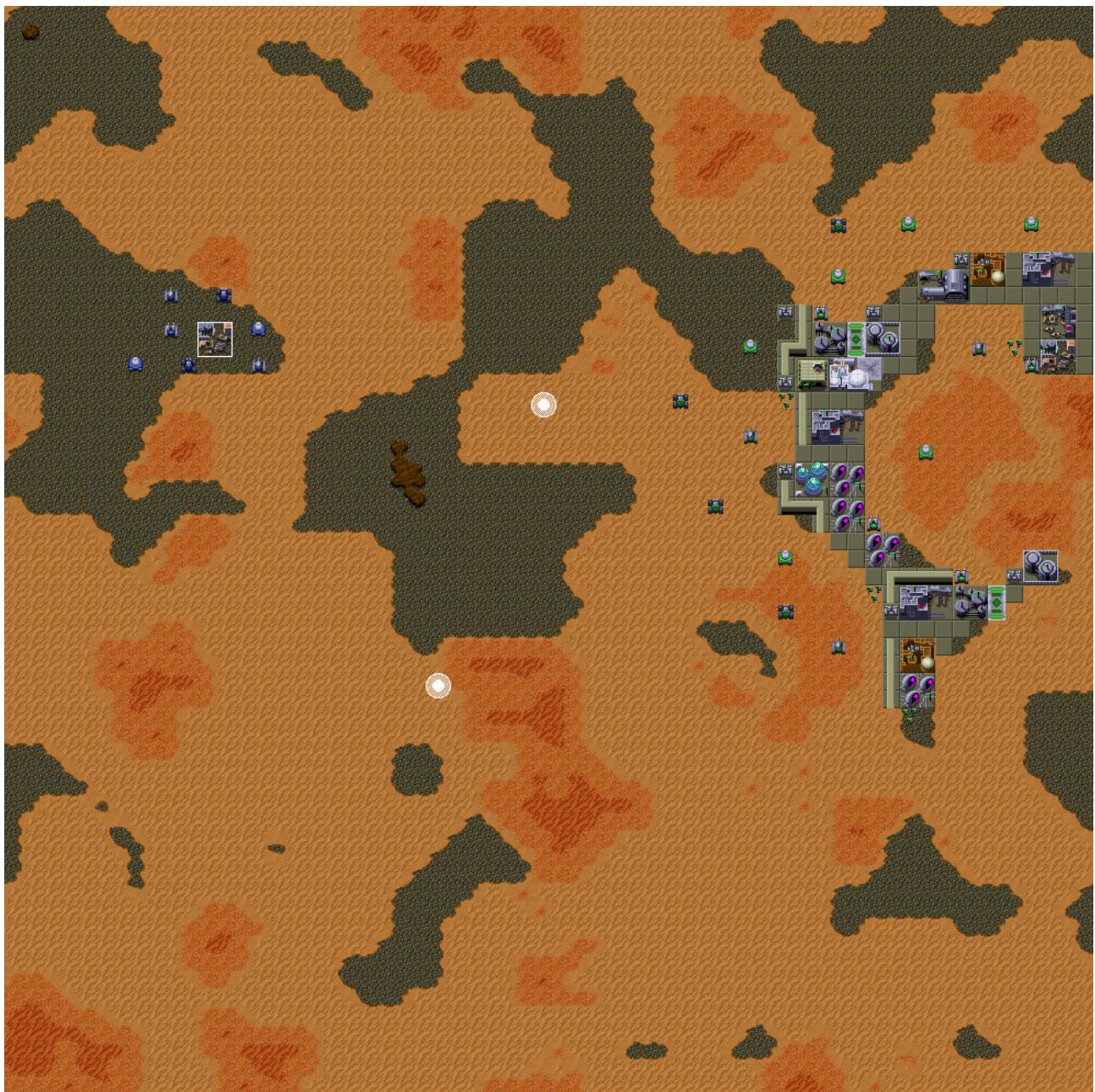


There are five spice blooms relatively close to the player's starting location. There are nine spice blooms in total.

Atreides Mission 7 Map B

This is the first map in the campaign that completely lacks spice blooms. In fact, there is so little spice available close to the player's starting location credits might run out quickly. However there is a small, secure spice basin to the north of the start location. Also, in this map the player starts with only 1,800 credits. All other maps have starting credits set at 2,000.

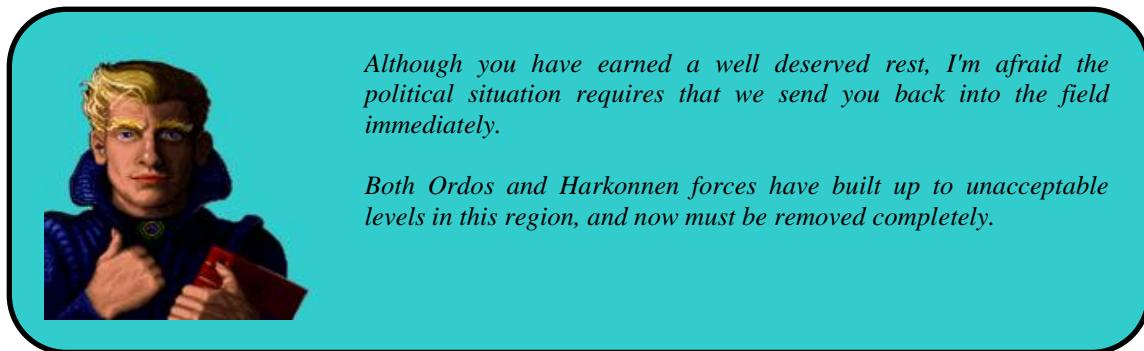
Atreides Mission 7 Map C



This is the second map in the campaign without any spice blooms. There is very little spice available at the start, so consider expanding your base as soon as possible.

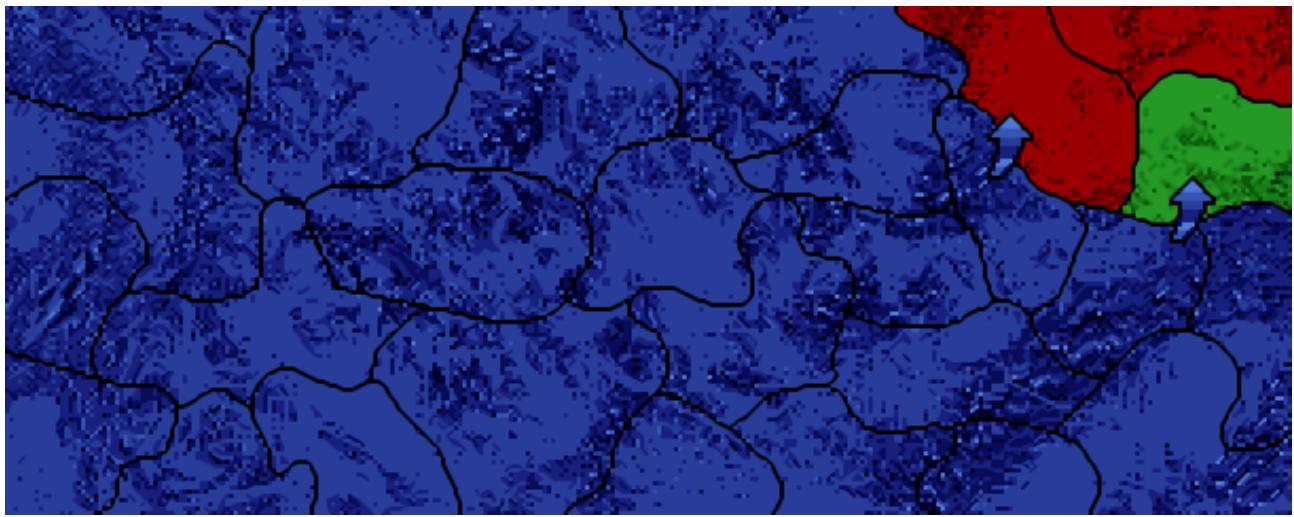
Note the Ordos units were supposed to be capped at 25, but due to a spelling error in the map data there are no restrictions on the Ordos' force size. This is universally considered a bug. The Atreides units max out at 25 however.

Atreides Mission 8



General notes

Starting credits	2,000
New units	Fremen
New structures	palace, House of IX
Mission objectives	eliminate Ordos and Harkonnen presence
Internal name(s)	scenh020, scenh021

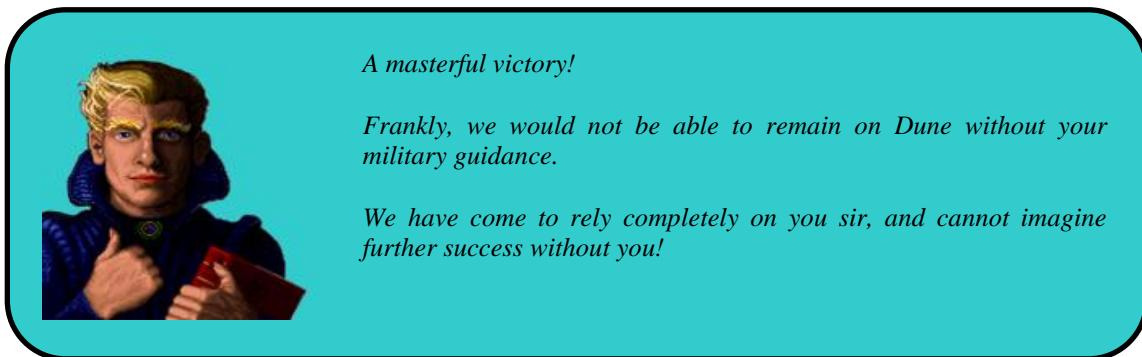


There is not much to say about this mission; proceed in the same way as the previous mission.

Having the House of IX means you can now produce the special house unit, which for the Atreides is the sonic tank. You can also build the palace, which will give you access to the Fremen. The new units do not make a major difference regarding battle space tactics—with the exception of sonic tanks; they are rather useful when destroying enemy turrets.

Make sure you read the section about game speed settings in Appendix 4: Exploits and Hacks, especially concerning sonic tanks.

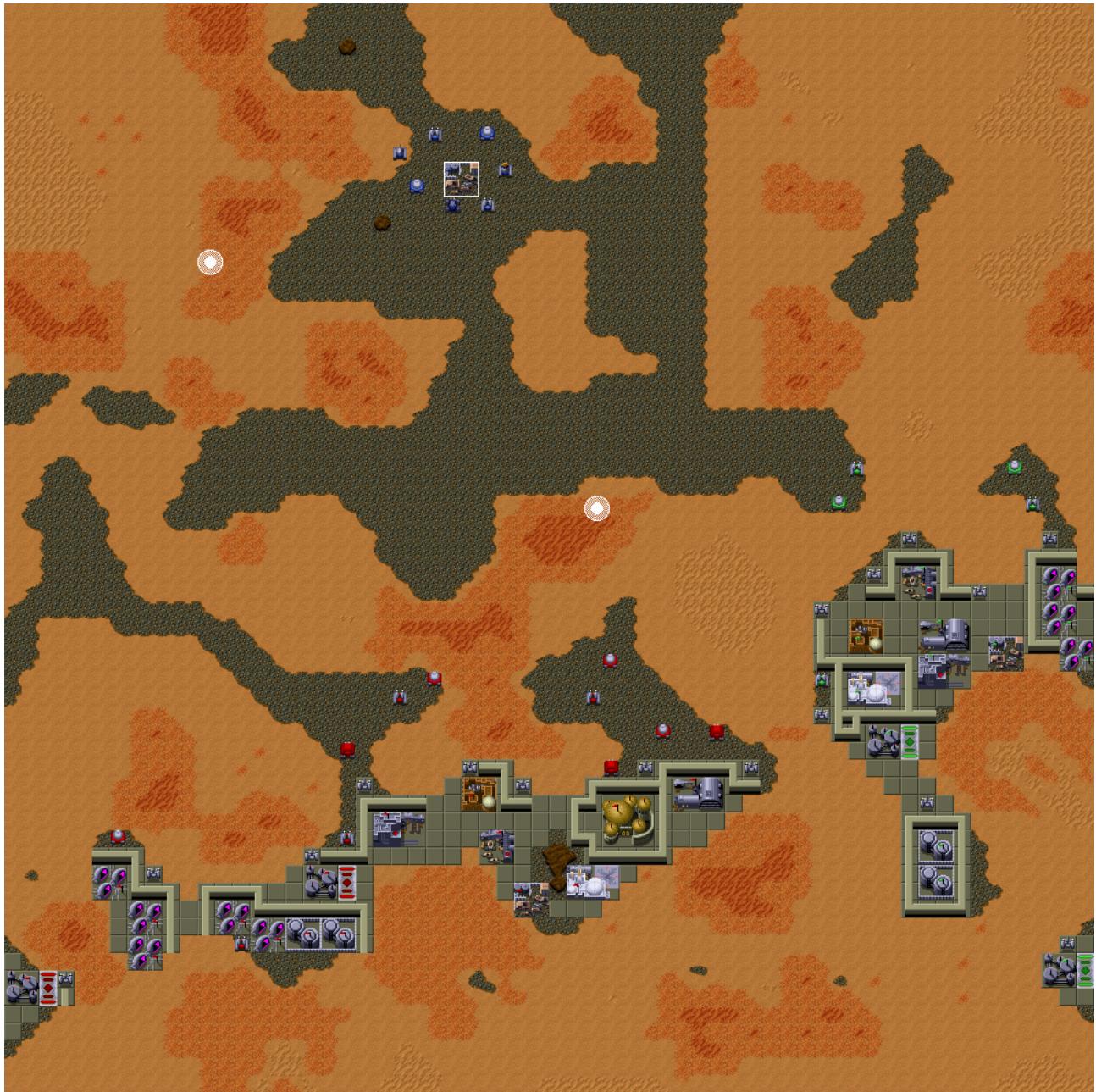
The Ordos strangely have launchers guarding their base in the missions. The Ordos can never produce such units. This is universally recognized as a bug.



DUNE II

The Battle for Arrakis

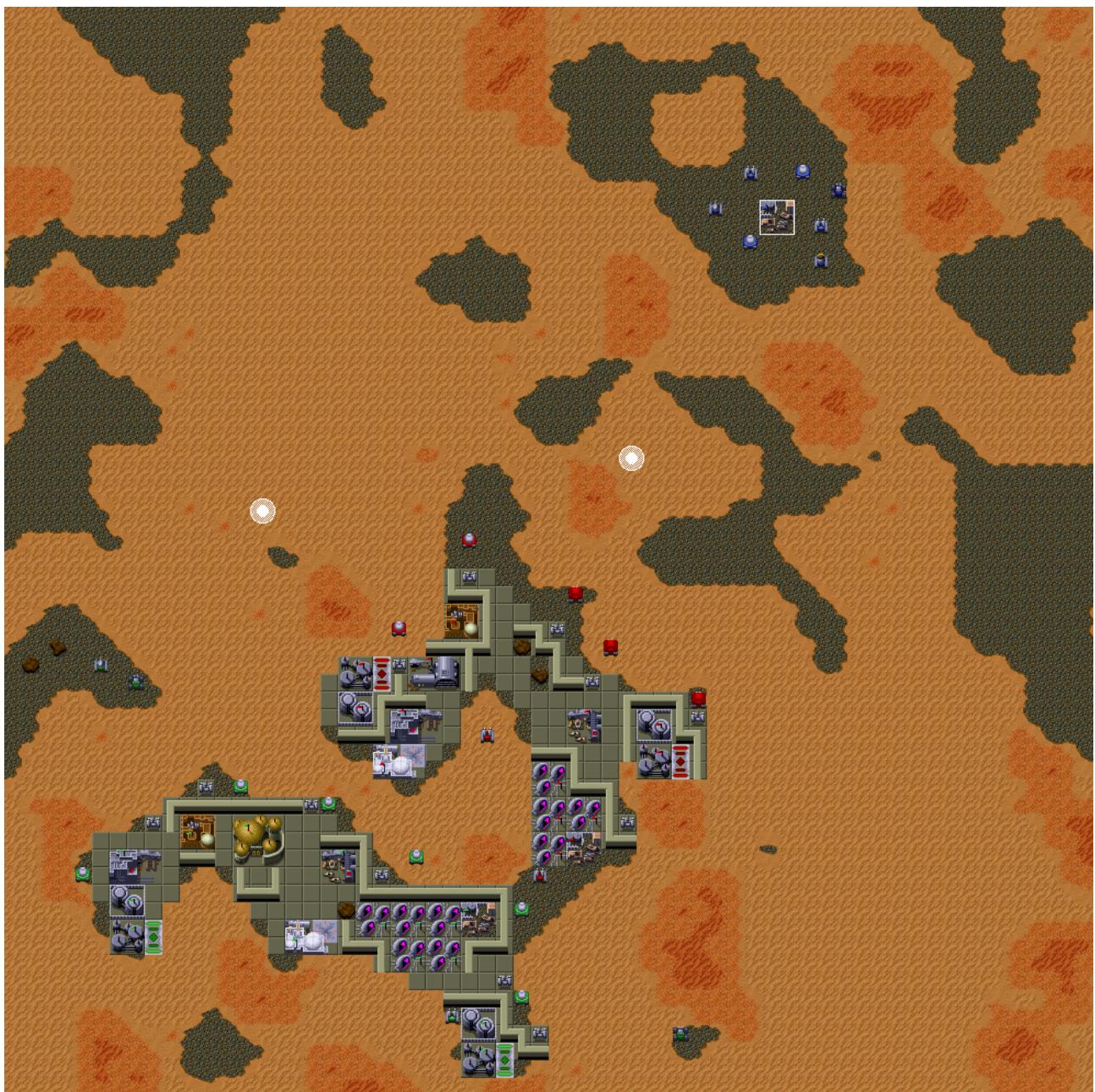
Atreides Mission 8 Map A



There are no spice blooms on the map. There is a secure spice basin directly to the northeast of the starting location. You might, however want to keep that spice as a reserve and first focus on the spice fields to the west and south of your base.

The Harkonnen base is poorly defended in the west. Make the Harkonnen your first priority. The Ordos base to the east is densely packed with rocket turrets.

Atreides Mission 8 Map B

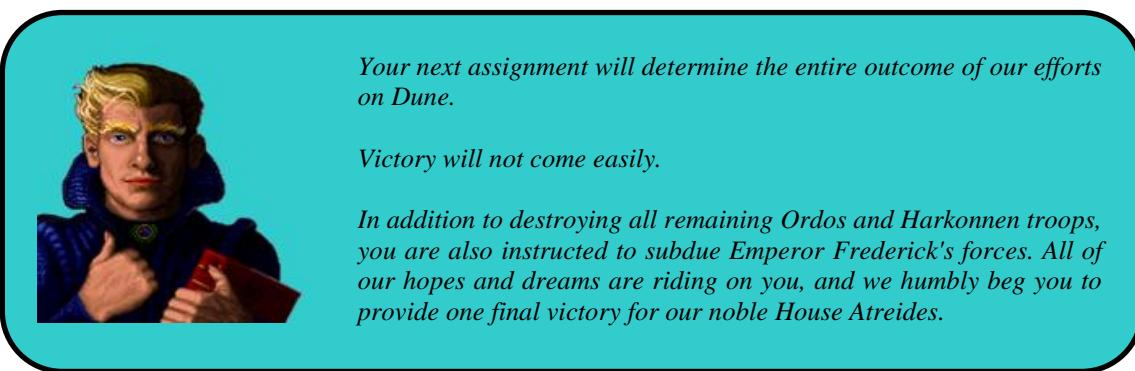


The map contains no spice blooms. However, there is a small, sandworm-safe basin in the far northwest corner of the map.

There are vast spice fields to the northeast of the player base; make sure you get your harvesting set up quickly. A line of spice silos combined with at least three harvesters will ensure a steady flow of spice.

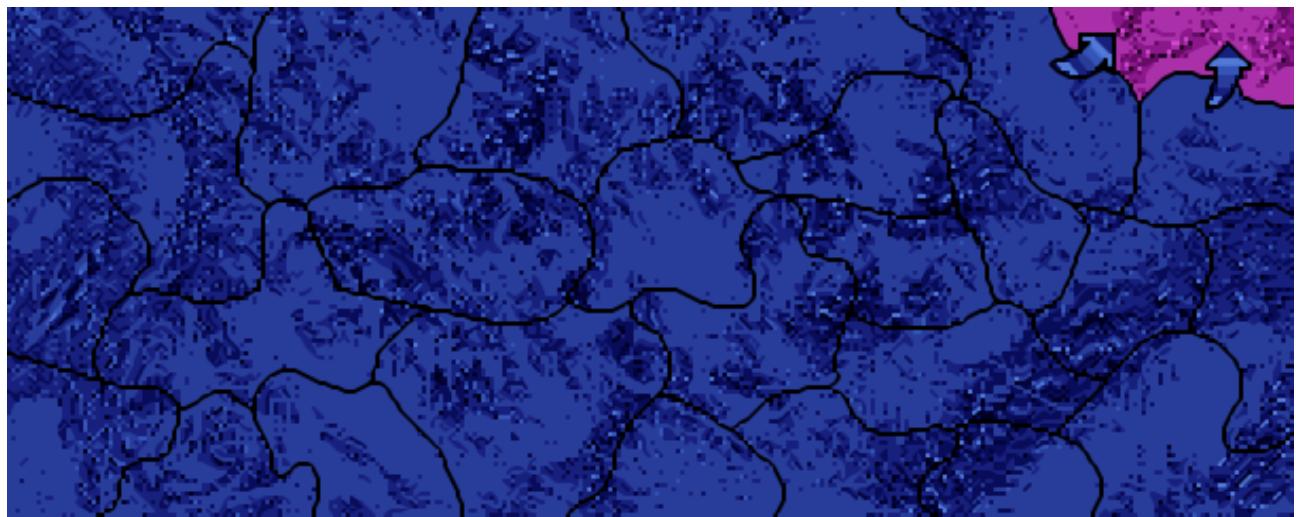
Note the Ordos base is overpowered; while the power consumption only would require four windtraps, their base has a total of five.

Atreides Mission 9



General notes

Starting credits	1,000
New units	-
New structures	-
Mission objectives	eliminate all three enemy bases
Internal name(s)	scenh022



The layout for the last level is the same for all campaigns; only the House of the various bases changes. You will be facing two Death Hand missiles and an attack wave which lasts around 15 to 20 minutes. Once you have overcome these obstacles, it is a matter of destroying the enemy bases, much as before.

Unless you know how to divert the Death Hand missiles, or choose not to divert them, overcoming the missile attacks is mostly luck. Either you get hit or you do not.

It is possible and not even especially difficult to get through this battle *without* using the 'save/restore' game cheat. It mostly depends on whether or not the first two missiles hit your construction yard or not, most of the time they will not. To ensure you do not need to worry about them again, you need to build a starport.

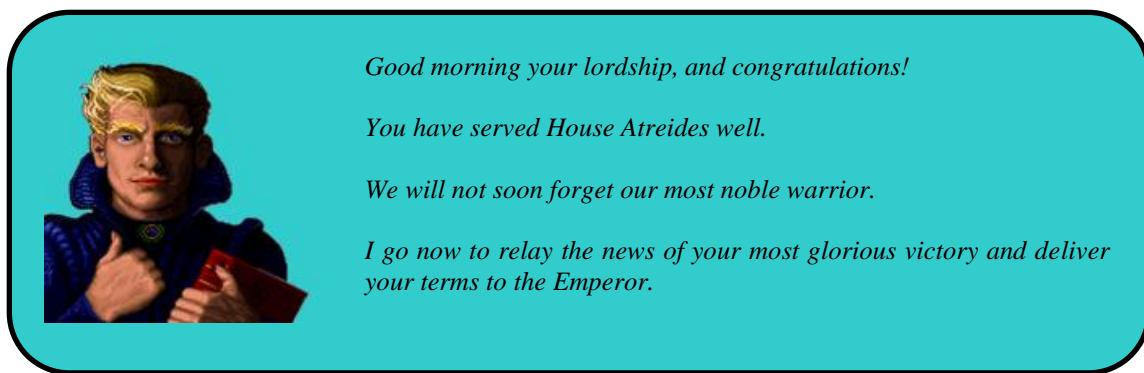
Start exploring, to find the spice reserves. There are lots of them around, so you will not run out of money if you harvest quickly. You start out with 1,000 credits. This is just enough money to build concrete over to the west, as far as you can go in a straight line, then a power center and a spice facility. When your Harvester returns, keep building westward and build a spice facility and a radar station. When these harvesters return, build more windtraps, and build your starport. By this time, the enemy should have found your base. Note that the Death Hand missiles will not be launched until units from the respective Houses—Sardaukar or Harkonnen—have actually found your base. By this time though, you should have enough money to buy an MCV. If your yard gets hit, deploy it, on another rock usually; the enemy will not always "find" it the second time; and rebuild, if it does not, move it to the rock to the right of your base and wait. You now have a construction yard in reserve.

The Death Hand missiles will mostly fire at the construction yard. As long as you build buildings a reasonable distance away, they will not get hit. For more information on this, refer to Appendix 4: Exploits and Hacks. This is one obstacle down. The other obstacle is an attack wave from all three opposing houses that lasts about 15 to 20 minutes. The best defense here is six or seven rocket turrets on the rock just above your construction yard—they tend to get hit by Death Hand missiles, but are easy to rebuild—and two or three on the northern most part of the rock you are on, towards the top left. This will defend against all three houses.

Note the Ordos base in the east is severely underpowered; it would need three windtraps but does not have a single one. The other bases are underpowered as well; both the Harkonnen and Sardaukar would need an additional windtrap.

In version 1.0 of the map the Harkonnen, Ordos, and Sardaukar units are capped at a maximum of 25 each, whereas in version 1.07 the cap is set at 20.

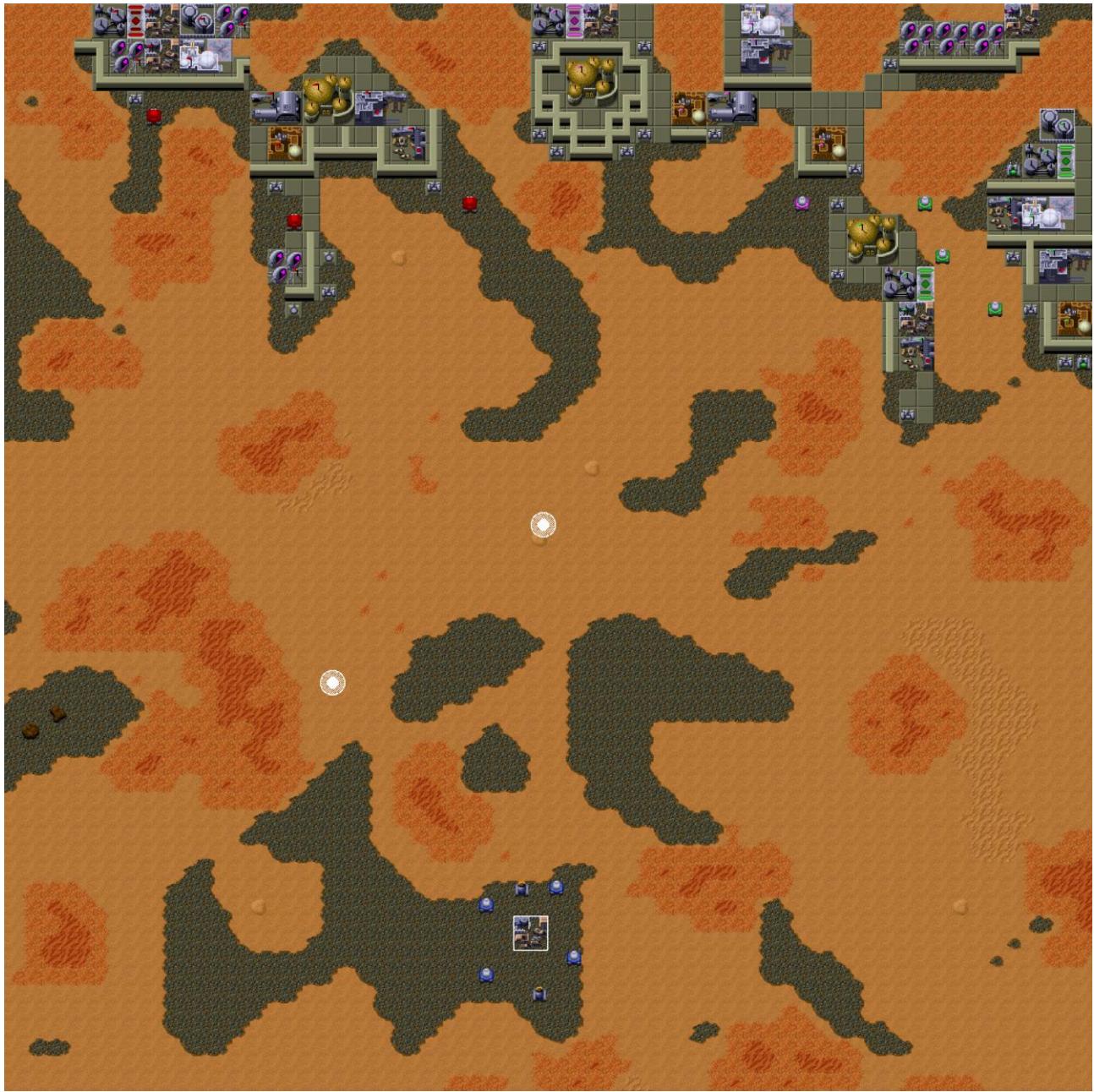
At the 22 game minutes mark—which seldom coincides with real minutes—the player will receive Atreides troopers as reinforcements. House Atreides can never produce trooper units. This is universally considered a bug.



DUNE II

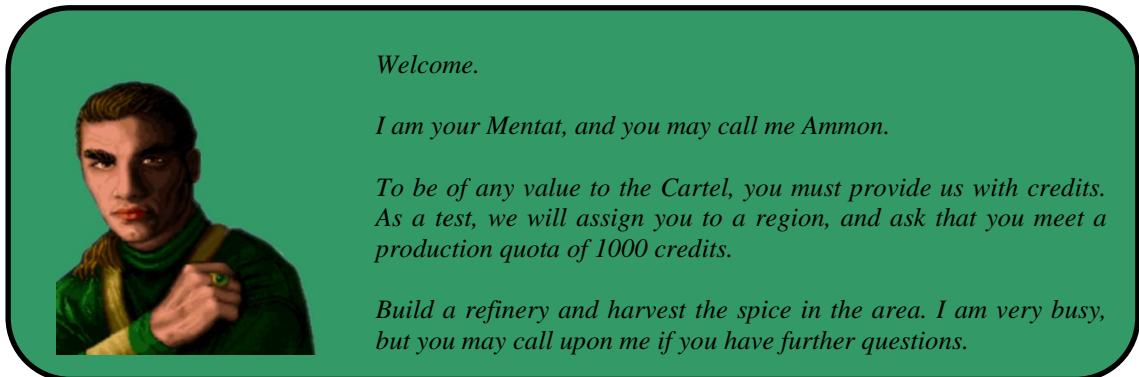
The Battle for Arrakis

Atreides Mission 9

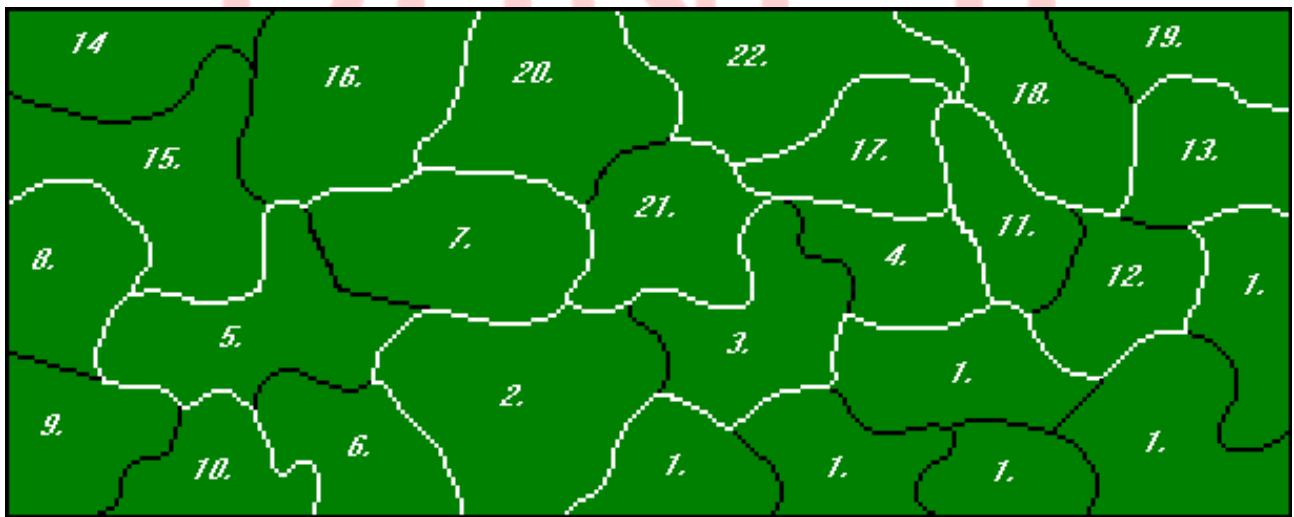


There are only four spice blooms on the map. One of them is located west of your starting position, in a semi-protected rock basin. Detonate it upon detection, preferably at the very start of the mission.

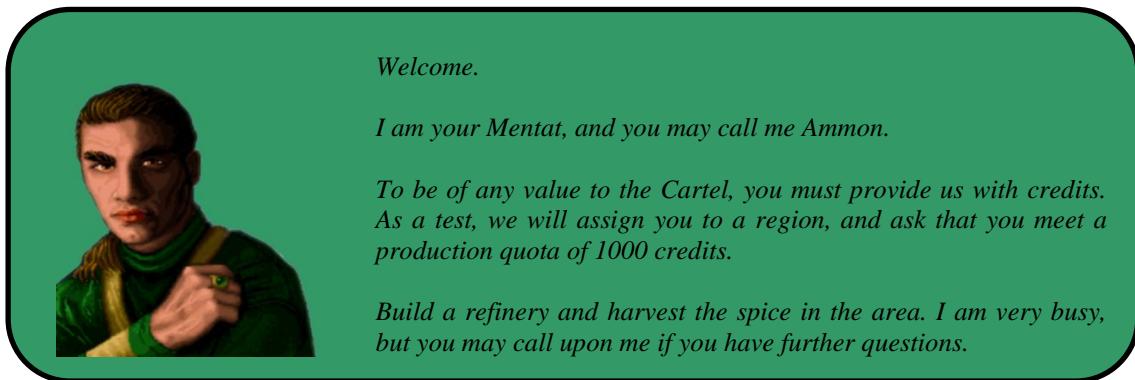
Ordos Campaign



The Ordos campaign is surprisingly challenging. The Ordos do not have many high powered units, and their operative word is stealth. Experienced players rate the Ordos campaign as the hardest of the three. You may want to try it last.



Ordos Mission 1



General notes

Starting credits	1,000
New units	infantry, soldier, trike
New structures	windtrap, spice refinery
Mission objectives	1000 credits of spice
Internal name(s)	sceno001

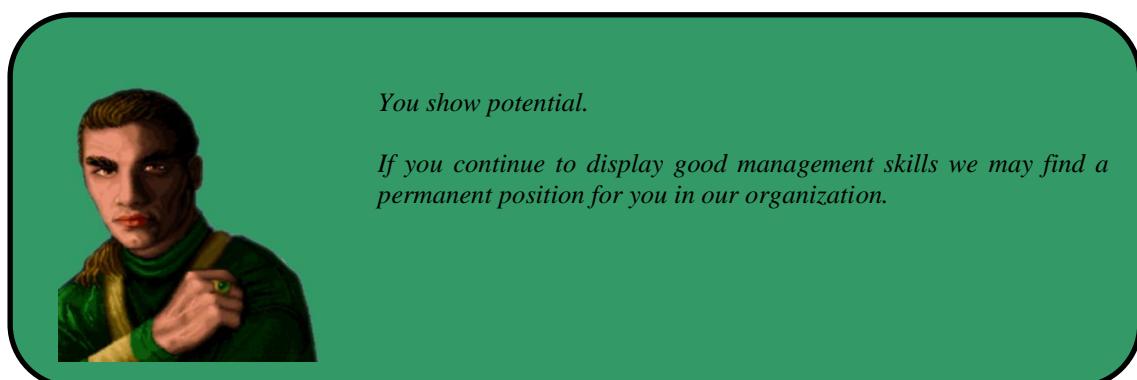
Mission Objectives: harvest 1000 credits worth of Spice

DUNE II The Battle for Arrakis

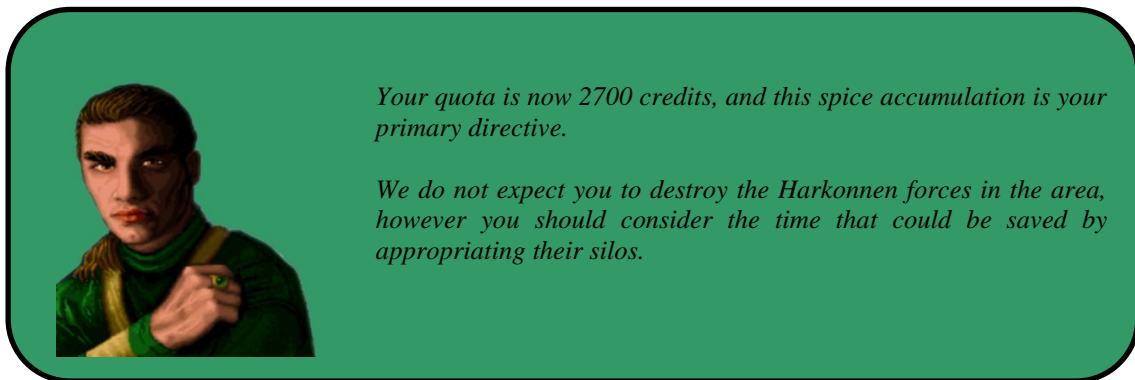


There are 10 enemy entities of the Harkonnen present when you enter the map. Simply keep harvesting spice and eliminate targets of opportunity.

You cannot fail this mission.

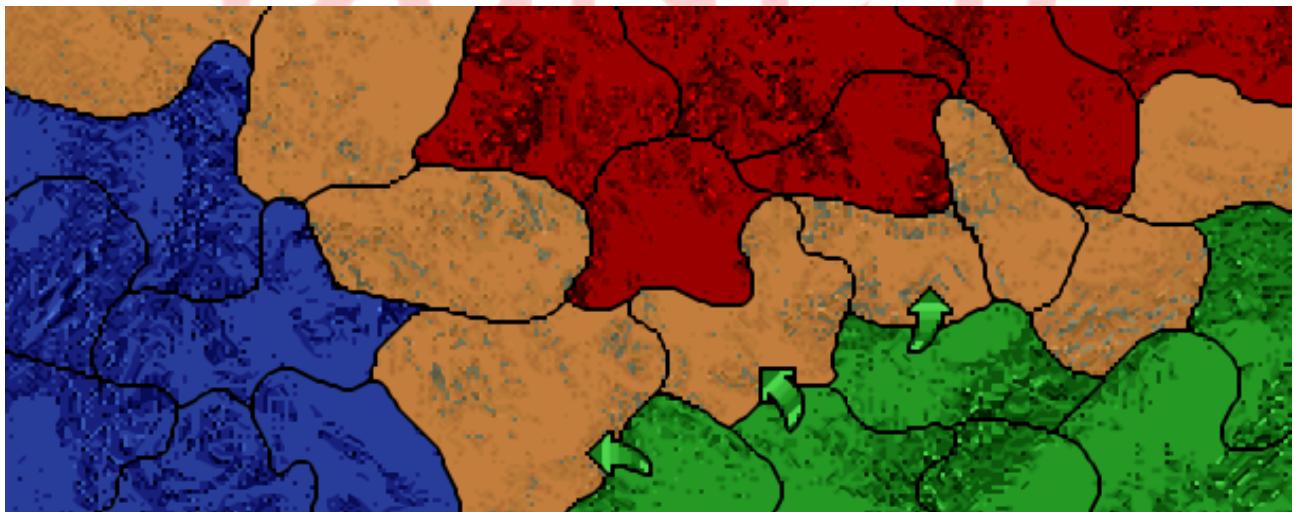


Ordos Mission 2



General notes

Starting credits	1,200
New units	infantry, soldier, trike
New structures	barracks, silo, outpost, light vehicle factory
Mission objectives	2700 credits of spice, or eliminate Harkonnen presence
Internal name(s)	sceno002, sceno003, sceno004

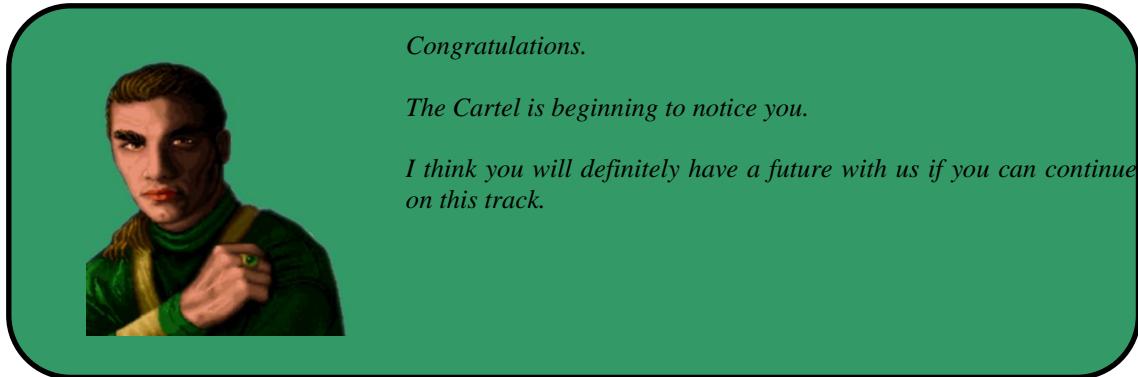


The objectives are simple; either take out the Harkonnen base, or gather 2,700 credits worth of spice. You may choose which objective to pursue; victory comes by completing either objective. You do not need to complete both.

Note version 1.0 of Dune is much easier; the enemy bases do not have a construction yard at all, so when you destroy an enemy structure it cannot be rebuilt.

Versions 1.01 and 1.07 both have added a construction yard to the enemy bases. This changes the game completely for this mission. On the later versions you must make the Harkonnen construction yard priority one. All other priorities are secondary.

Once the construction yard is destroyed, go for the tactical buildings i.e. WOR, and the refinery.



DUNE II

The Battle for Arrakis

Ordos Mission 2 Map A



Ordos Mission 2 Map B

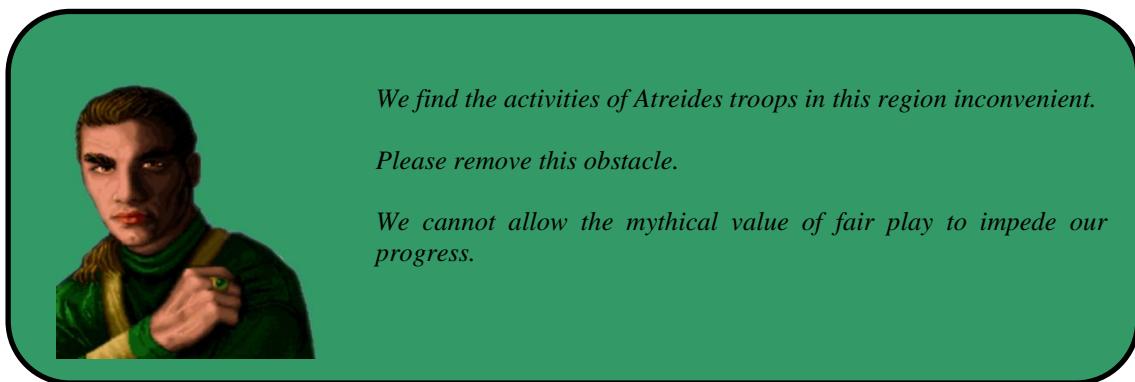


Ordos Mission 2 Map C



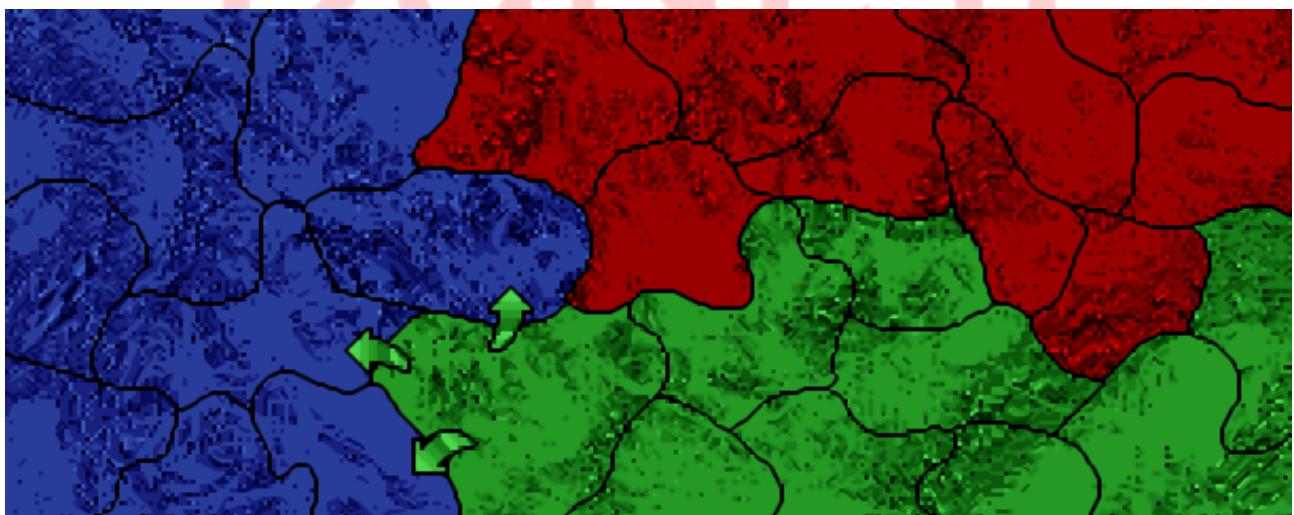
The objectives are simple; either take out the Harkonnen base, or gather 2,700 credits worth of spice. You may choose which objective to pursue; victory comes by completing either objective. You do not need to complete both.

Ordos Mission 3



General notes

Starting credits	1,500
New units	infantry, soldier, trike
New structures	heavy vehicle factory
Mission objectives	eliminate Atreides presence
Internal name(s)	sceno005, sceno006, sceno007



This is the last easy mission. After this the missions provide a challenge. Until now they have not.

After building a windtrap and refinery, build a radar outpost as soon as you have the cash—this will help you keep track of what vehicles are around.

Once you have these basic buildings, build more windtraps and a light vehicle factory. Then build your heaviest units and place them at the front of your base facing in the direction of the enemy to defend the buildings.

It is now time to build another refinery to build up some credits.

Make sure you leave a couple of units at the rear and sides of your base to defend against units brought in by the computer's carryalls.

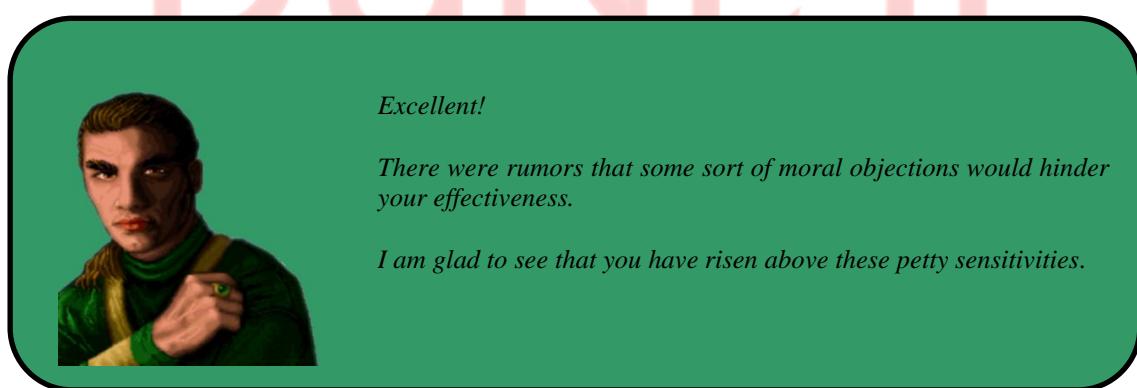
After you have set up this defense, build as many offensive units as possible, until the "Unable to create" message comes up.

Send a series of raiding groups consisting of 3 to 4 units out to scout the enemy base, and locate the enemy construction yard. If the units are destroyed simply build some more as quickly as possible.

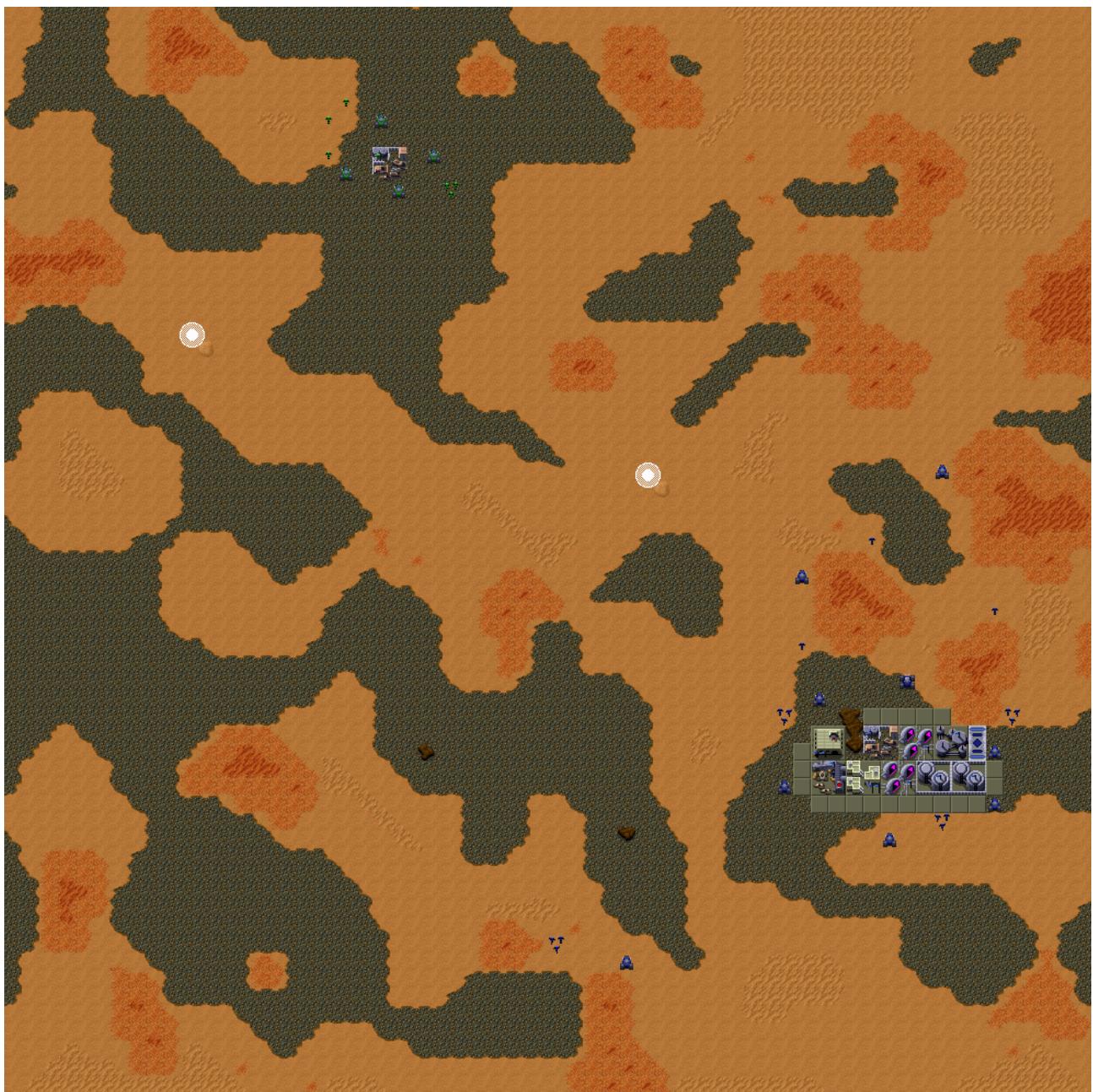
Once you have found the main enemy buildings, try doing a flank attack with a large group of units to destroy the construction yard first, as this will stop the enemy from creating more structures as you destroy them.

Once the construction yard is destroyed, go for the tactical buildings i.e. light vehicle factory, WOR, and barracks.

If you start losing vehicles, call off the building attack and use the remaining vehicles to take out as many enemy vehicles as possible before they die. Then re-build your forces as quickly as possible, as the computer will often counter attack when you have just retreated—never leave your base undefended.



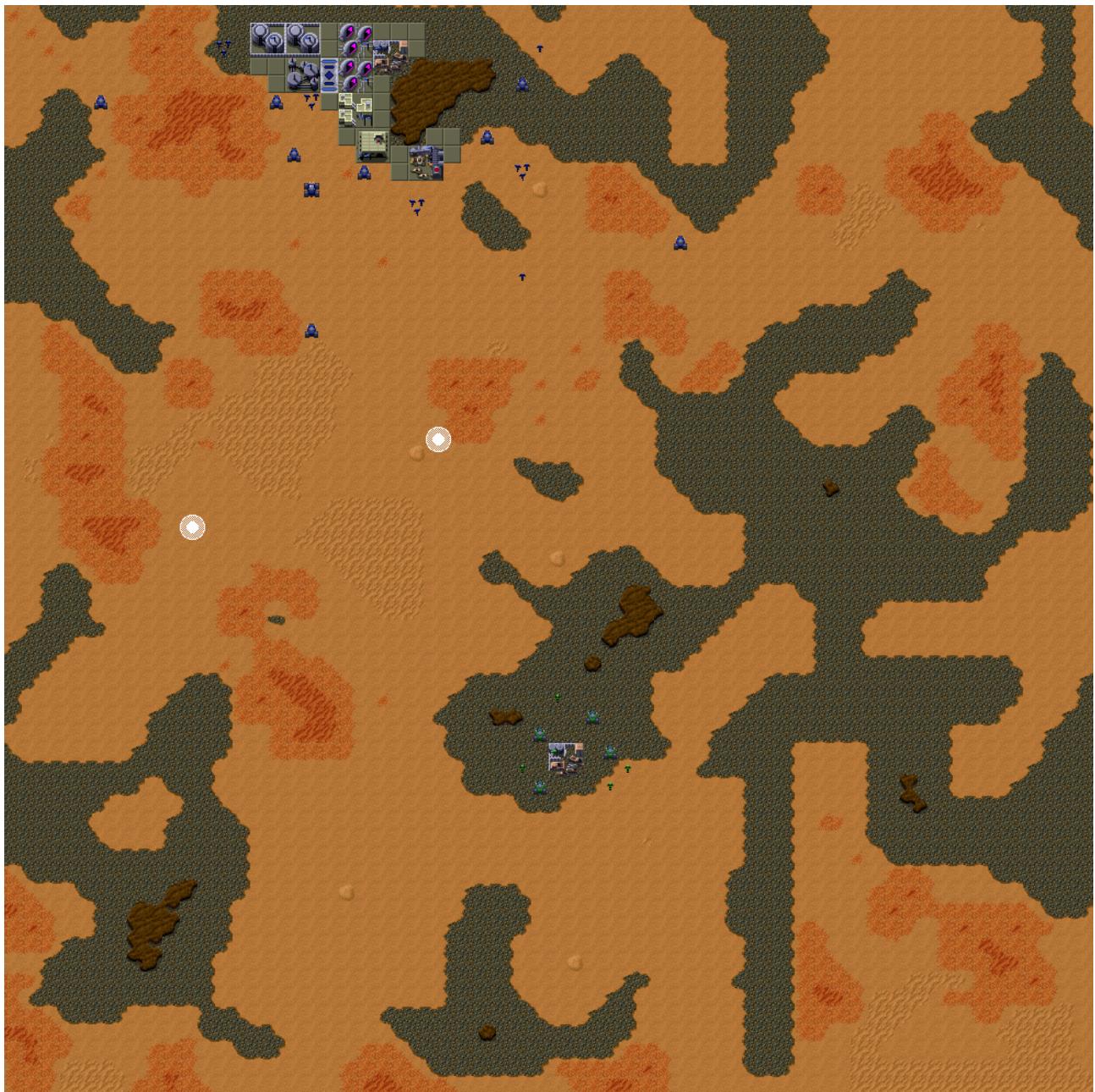
Ordos Mission 3 Map A



There are two spice blooms on the map, right next to the sandworm spawning positions.

There is a strange bug in the map data; a bug placing two Atreides spice silos on top of each other. Since the game engine does not support layered structures, the bug has no effect.

Ordos Mission 3 Map B



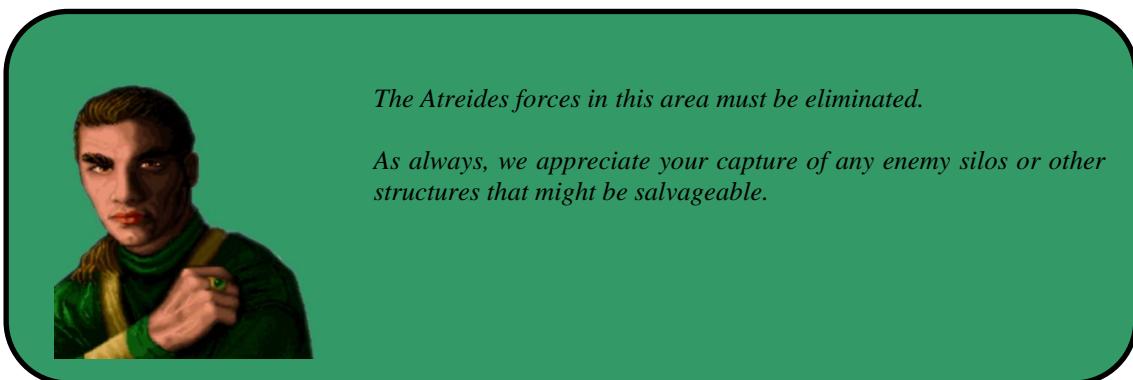
There are five spice blooms on the map, three of which are safe to detonate and harvest. The fourth is located halfway to the enemy base, and the last bloom is right next to the enemy.

Ordos Mission 3 Map C



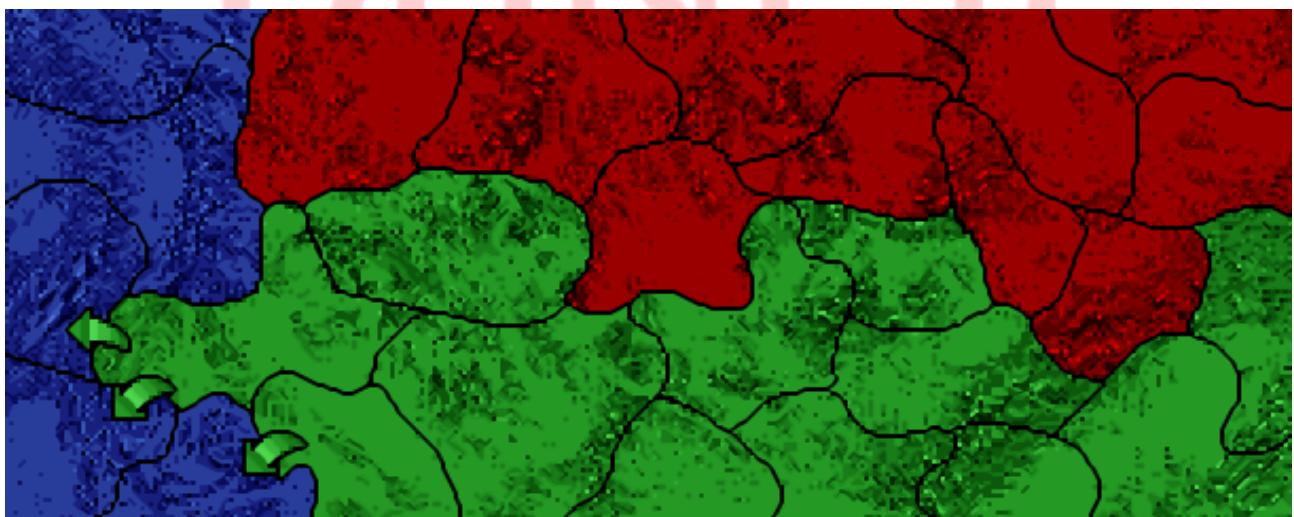
There is only one spice bloom on the map.

Ordos Mission 4



General notes

Starting credits	1,500
New units	infantry, soldier, trike
New structures	Large concrete slab, wall section
Mission objectives	eliminate Atreides presence
Internal name(s)	sceno008, sceno009, sceno010



Ammon's wish for salvaging enemy spice silos is merely a cosmetic device; there is no reward for capturing enemy spice silos.

In this mission you can build the heavy vehicle factory and walls.

Walls are practically useless, except in the direction from where the attacks will come, so do not waste your time building walls all around your base.

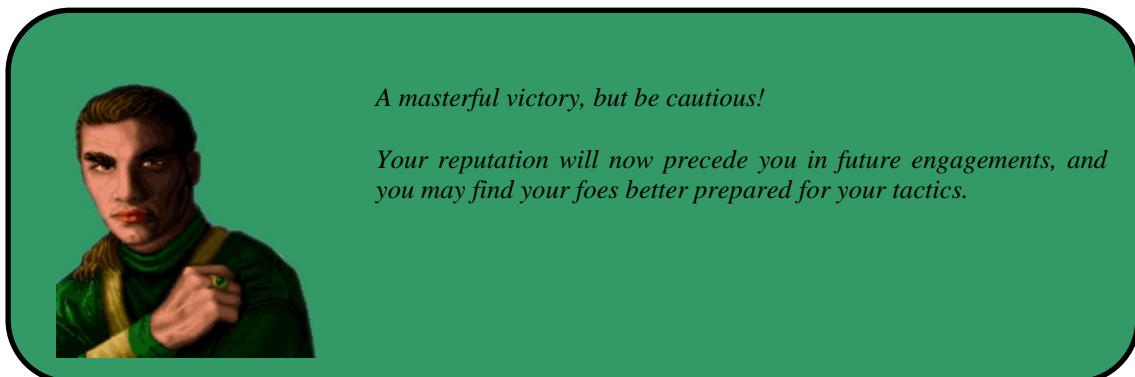
From this mission onwards you do not need ground troops any longer; they are effectively obsolete. Build tanks and quads instead.

As always, build two refineries; also build an additional harvester, using a heavy vehicle factory.

To win this mission you should proceed in the same way as the previous mission; build the maximum number of units, wait to have enough credits for reinforcement and lead the attack. Before attacking, you should have one light vehicle factory and two heavy vehicle factories.

Your primary objectives should be vehicle factories—both light and heavy—and the construction yard. Except for tanks, this mission is quite similar to mission 3, so you should win this fairly easily.

Please note the Ordos campaign was the last one to be designed, therefore there are quite a lot of bugs still present in the map data. This is the first time the errors have a decisive impact on the campaign and the game play. The Atreides are reinforced with originally Harkonnen troopers in all of the maps of level 4; House Atreides can neither use nor produce troopers. These bugs are generally thought to be leftovers from when the maps were copied to the Ordos campaign.



Ordos Mission 4 Map A

The entire sand area northeast from the starting location is isolated from the rest of the general sand area. This means the basin is safe to harvest; no sandworms can enter it. There is even a spice bloom located in the basin.

Ordos Mission 4 Map B



There is only one spice bloom on the map, located to the north of the player's starting location. In addition, the bloom is located in a sandworm safe basin. In fact the entire southern half of the map is sandworm safe.

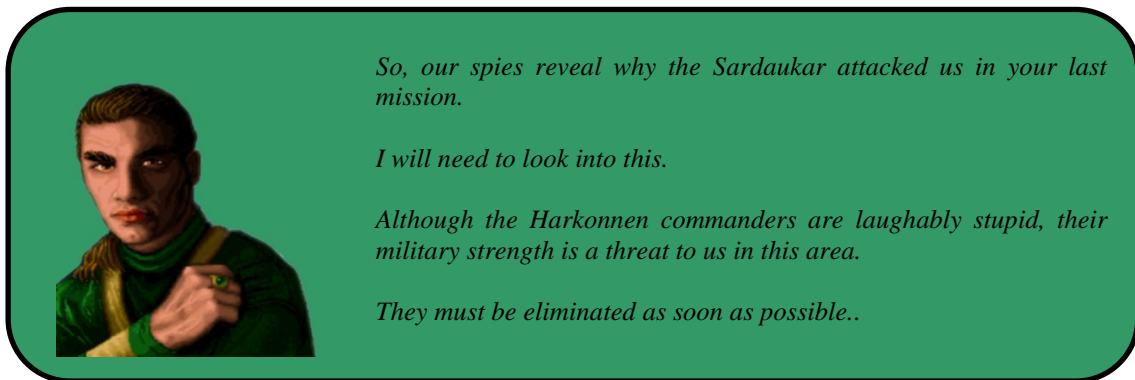
Ordos Mission 4 Map C



There are four spice blooms on the map.

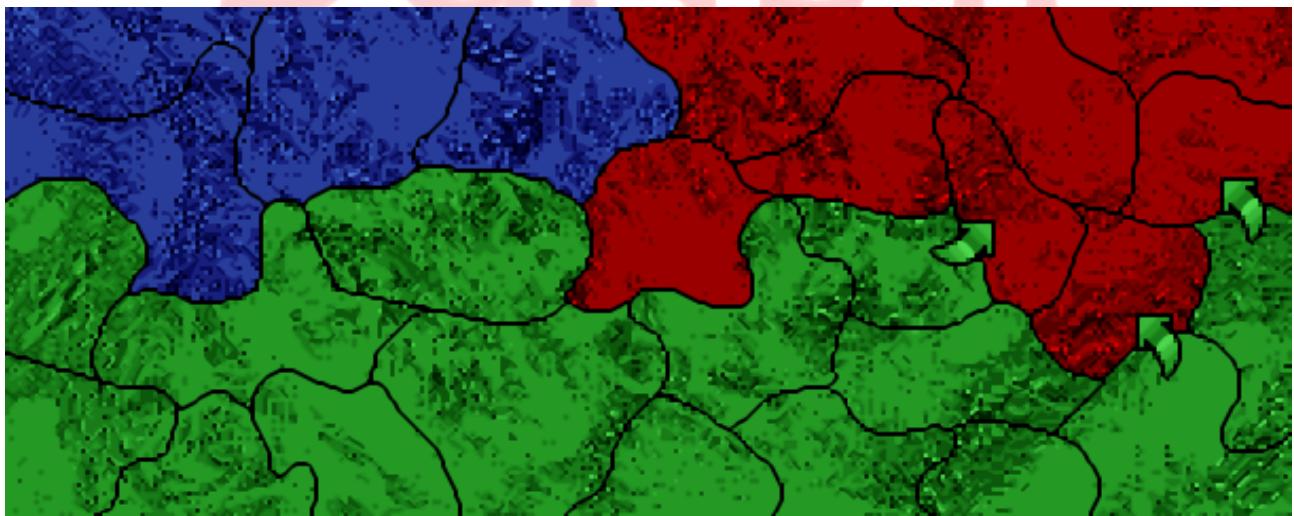
The southern edge of the map is semi-safe from sandworm attacks; there is only a small strip of sand connecting it to the main game area. While this is not completely safe, you might experience fewer losses to sandworms in the southern area.

Ordos Mission 5



General notes

Starting credits	1,500
New units	carryall, rocket launcher
New structures	turret, repair facility, hi-tech facility
Mission objectives	eliminate Harkonnen presence
Internal name(s)	sceno011, sceno012, sceno013



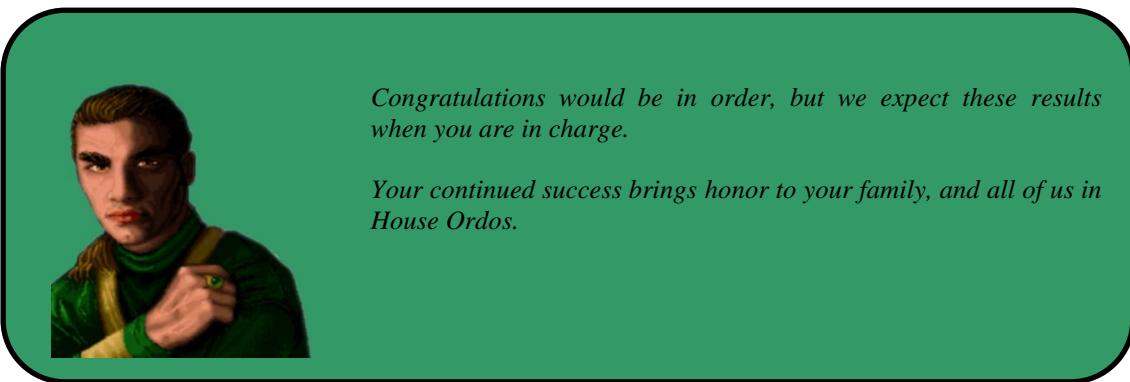
This is the first non-easy mission. The previous missions have not really provided any challenge; from this mission onwards they do.

You have new buildings, such as light turrets, repair facility and hi-tech factory.

The cannon turrets are not really useful, since rocket launchers are available. Do not waste your credits erecting batteries of essentially redundant-upon-delivery structures.

New units are also available; they are the carryall and the rocket launcher.

From this mission onwards is very important to plan a good defense before beginning any attack.



DUNE II

The Battle for Arrakis

Ordos Mission 5 Map A



There are two spice blooms on the map.

The eastern edge of the map is semi-safe from sandworms; there is only a small strip of sand where the worms might enter.

Ordos Mission 5 Map B



There are no spice blooms on the map.

Note the southern half of the map is semi-safe from sandworms; there is only a thin strip of sand via which the worms can enter the southern dunes.

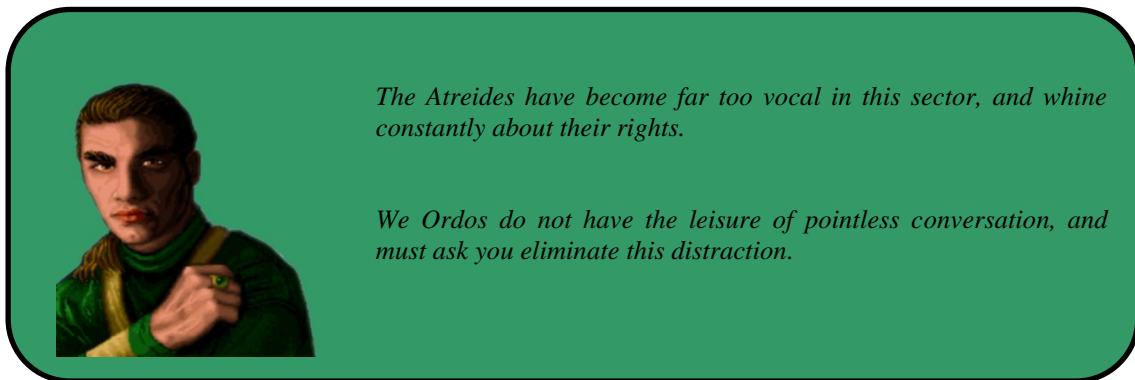
Ordos Mission 5 Map C



There are no spice blooms on the map.

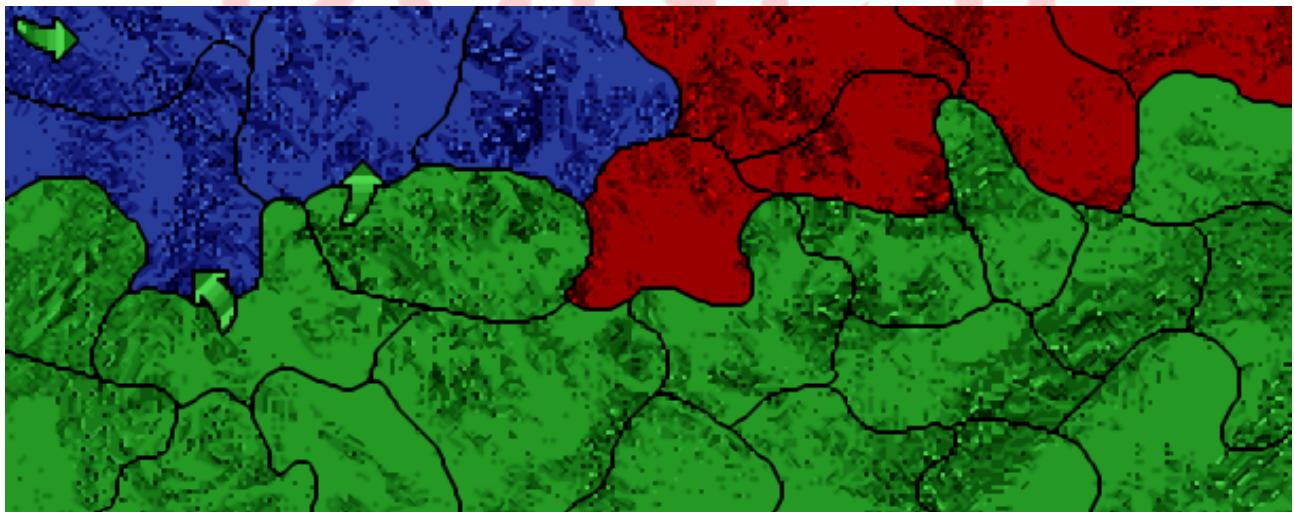
Note there is a safe spice basin to the west of the starting position.

Ordos Mission 6



General notes

Starting credits	1,700
New units	infantry, soldier, trike
New structures	rocket turret, starport
Mission objectives	eliminate enemy presence
Internal name(s)	sceno014, sceno015, sceno016



This can be considered as the first mission of the end game. After this mission the maps do not really get any harder.

You can now have missile launchers, ordering them from the starport.

Also, note that you can now construct rocket turrets. Though they are expensive, they must be the key of your defense; also, they essentially make light turrets obsolete as main defense units. Use a ratio of three to one when constructing turret batteries; one cannon turret for every three rocket turrets.

The enemy will also attack using rocket launchers, it is easy to destroy them by using your quads; simply move 1 or 2 of them in an enemy's launcher's adjacent cell and attack it.

Several of the maps can be found elsewhere in the campaigns. Use similar tactics to be victorious.

Note maps A and B are geographically identical.

Note that the Atreides bases do not have two barracks, but a barracks and a WOR facility instead. The Atreides cannot properly utilize a WOR facility, so the structure is essentially only decoration. This error is on all the maps of mission 6 and is universally considered a bug.



Ordos Mission 6 Map A

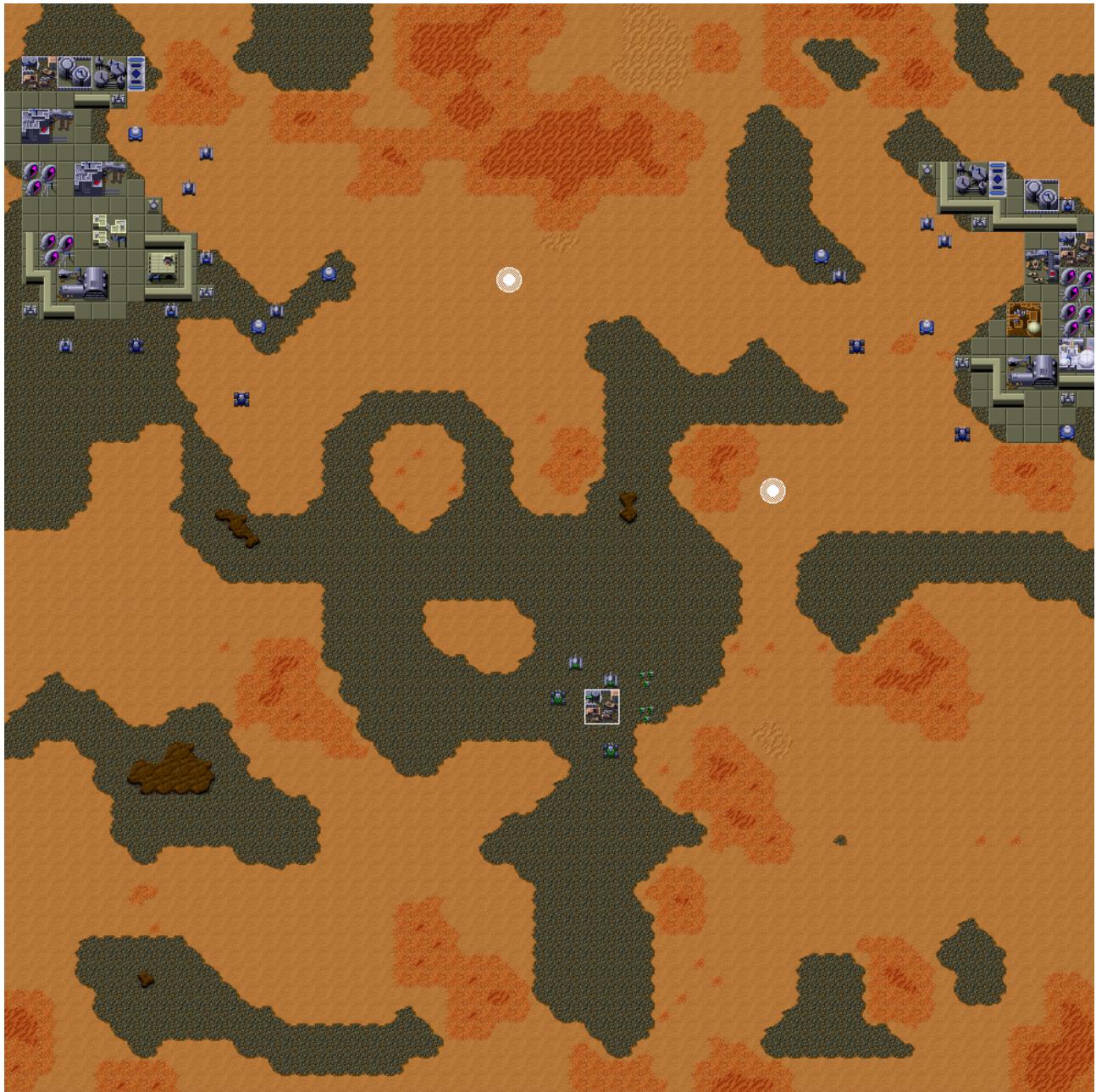


There are no spice blooms on the map.

The western enemy base is connected to the player's starting location via a land bridge.

This map can also be found elsewhere, such as Atreides Map 6A, Ordos Map 6B, and Harkonnen Map 6B.

Ordos Mission 6 Map B



There are no spice blooms on the map.

This map can also be found elsewhere, such as Atreides Map 6A, Ordos Map 6A, and Harkonnen Map 6B.

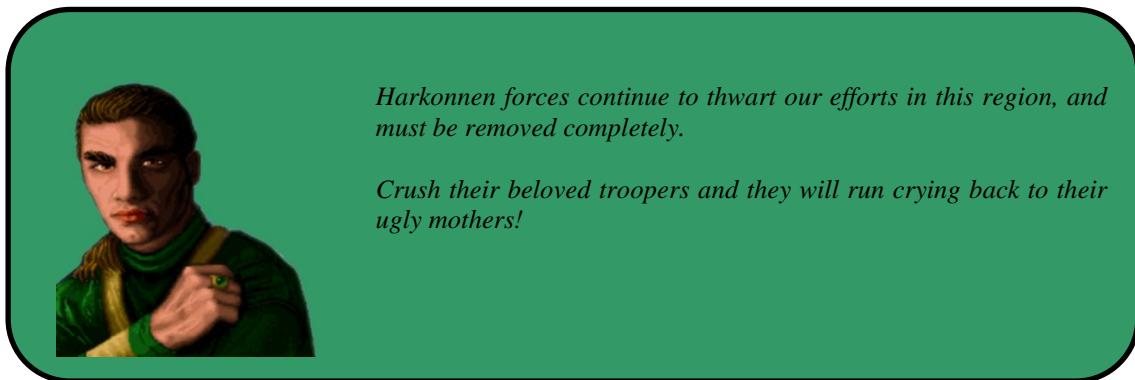
Mission 6 Map C



There are four spice blooms on the map.

The entire southern half of the map is totally sandworm safe. Also, there is a safe basin in the northeastern corner of the map.

Ordos Mission 7

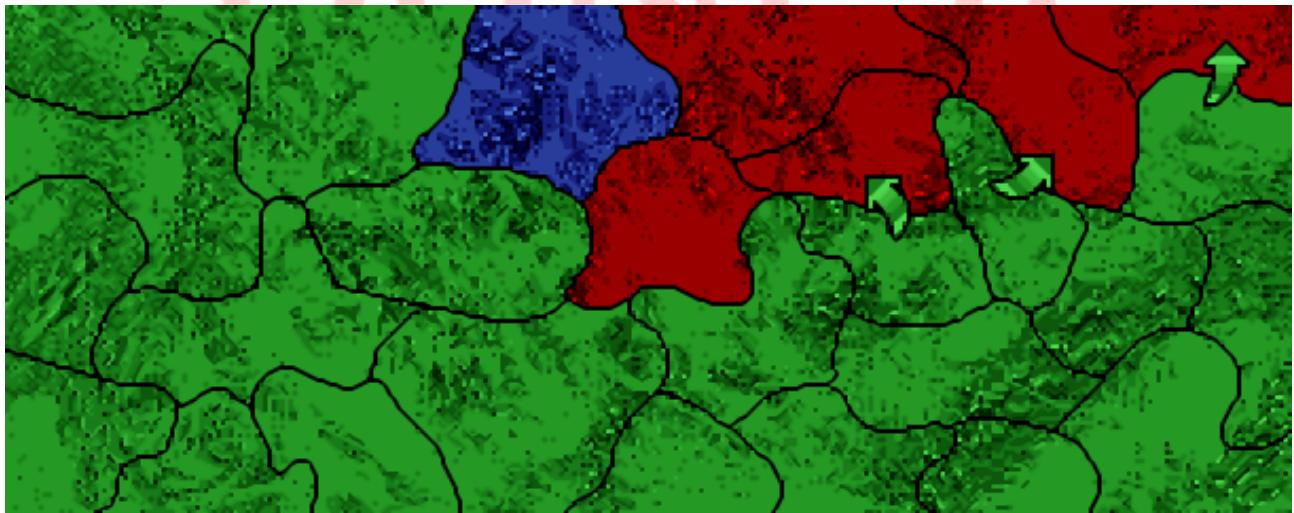


Harkonnen forces continue to thwart our efforts in this region, and must be removed completely.

Crush their beloved troopers and they will run crying back to their ugly mothers!

General notes

Starting credits	2,000
New units	infantry, soldier, trike
New structures	-
Mission objectives	eliminate Harkonnen presence
Internal name(s)	sceno017, sceno018, sceno019



This is the only mission in the campaign with enemy Houses of IX.

This mission is quite similar to the previous, except that each House can now build a new special House unit.

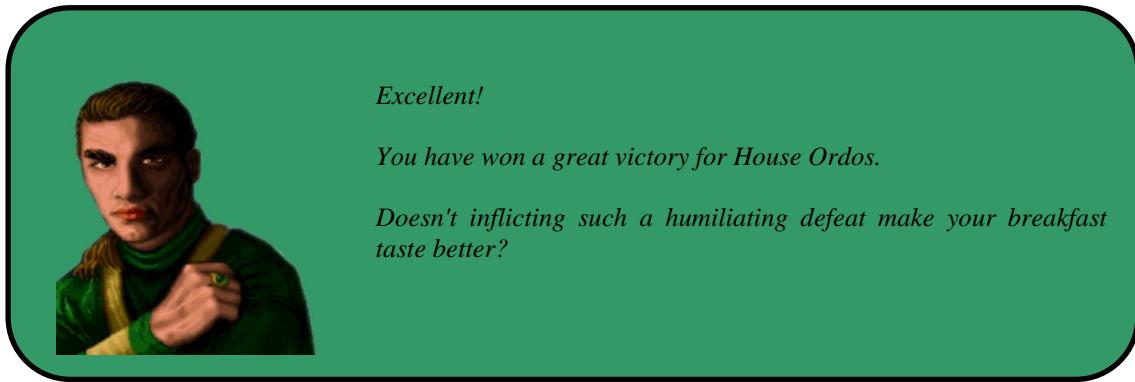
Ordos can use the Deviator, Atreides now have the sonic tank, and Harkonnen have the Devastator.

The Deviator is somewhat useful for stealing enemy carryalls, but it is generally not as good in battle. As a rule they tend to not be used very much.

In any case Deviators are powerful when used by the enemy—their effect lasts longer in this case—so you should quickly destroy those using tanks; put tanks in the Deviator's adjacent cells.

At the start of this level, no matter what house you are, you must build a couple of rocket turrets as soon as possible. On this level, the computer will always send a series of ornithopters against you, and unless you have the turrets, your buildings will soon be destroyed.

Be aware the Atreides should have their maximum unit amount capped at 25, but due to a spelling error in the map data there is no unit cap for the Atreides at all. Thus no restrictions apply to the enemy army size. This is universally considered a bug.



DUNE II

The Battle for Arrakis

Ordos Mission 7 Map A



There are no spice blooms on the map."

Note there are vast fields of spice to the southwest from the starting base.

Ordos Mission 7 Map B



There are no spice blooms on the map.

There are only a few spice fields located close to the player base. You must expand your harvesting operations quickly in order to maintain a steady spice flow. The topmost base is connected to the player base via a land bridge; you might want to use the concrete creep tactic here.

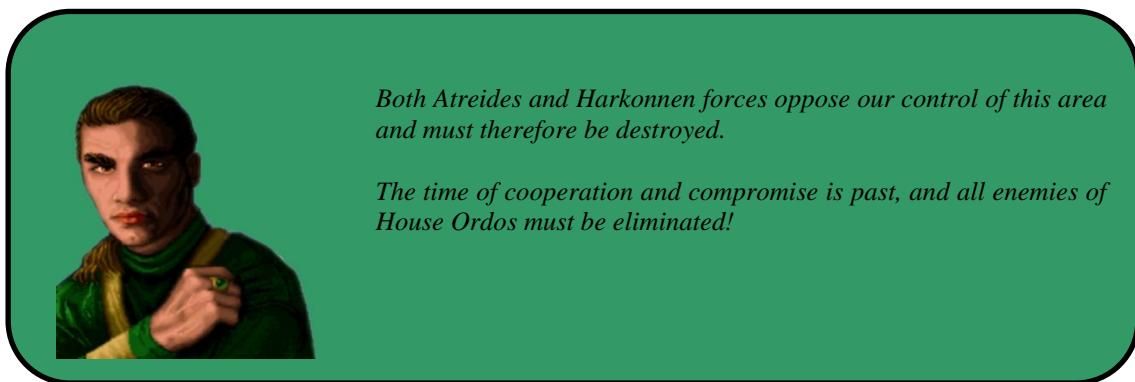
Ordos Mission 7 Map C



There are no spice blooms on the map.

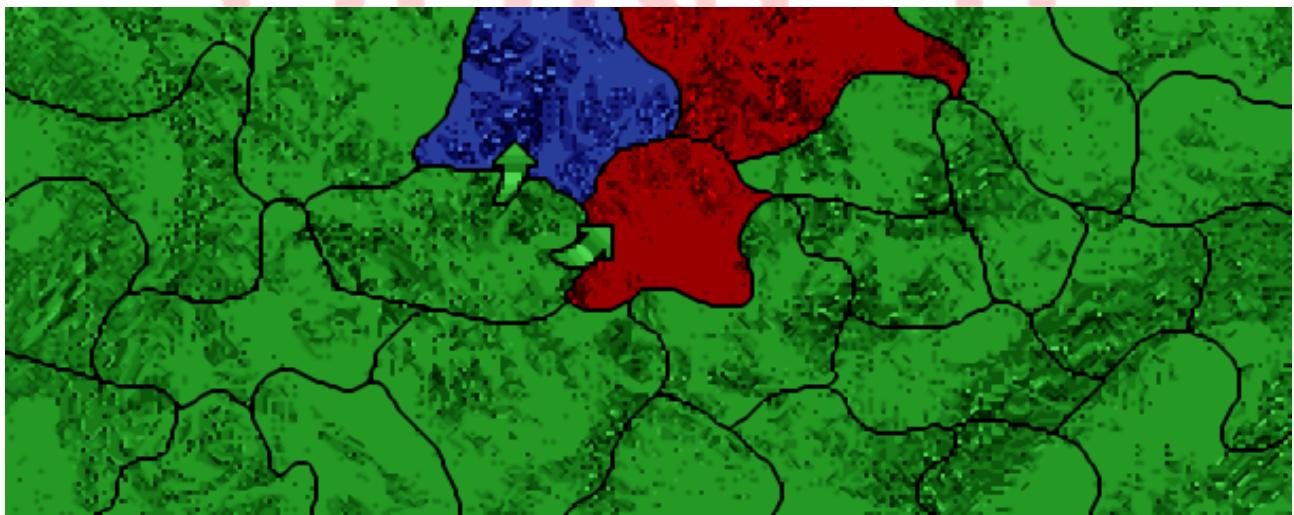
Note you can use the concrete creep tactic against both the Harkonnen bases. Also note the construction yard is poorly defended when attacking from the rear. Bypassing the bases along the extreme eastern edge towards the southeastern corner, and then proceeding along the southern edge will keep your attack force completely out of range of the enemy turrets, also bypassing the bulk of the defending Harkonnen units. Use this to your advantage.

Ordos Mission 8



General notes

Starting credits	2,000
New units	saboteur
New structures	palace, House of IX
Mission objectives	eliminate enemy presence
Internal name(s)	sceno020, sceno021



Mission 8 is the first really tough mission in the Ordos campaign.

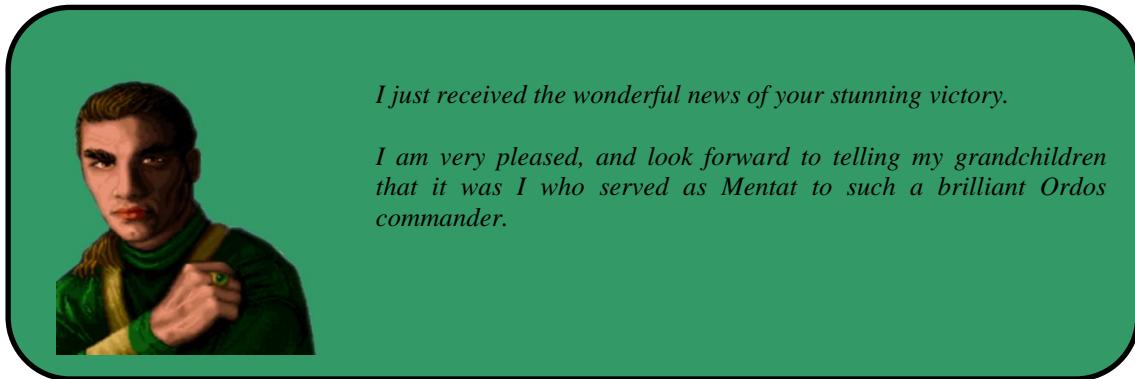
There are only two maps to choose from in this mission as opposed to three as in the other, previous missions.

Neither the Atreides nor the Harkonnen have Houses of IX, so there is little danger of aerial attacks from House Atreides and Devastator attacks from House Harkonnen. Keep this in mind when choosing scenario.

Also note the different maps have different palaces; map A has an Atreides palace, whereas map B has a Harkonnen palace. The special threat in map A is thus the Fremen, and in map B the Death

Hand missiles. The "blue region tile" contains the map with the Atreides palace, and the "red region tile" contains the map with the Harkonnen palace.

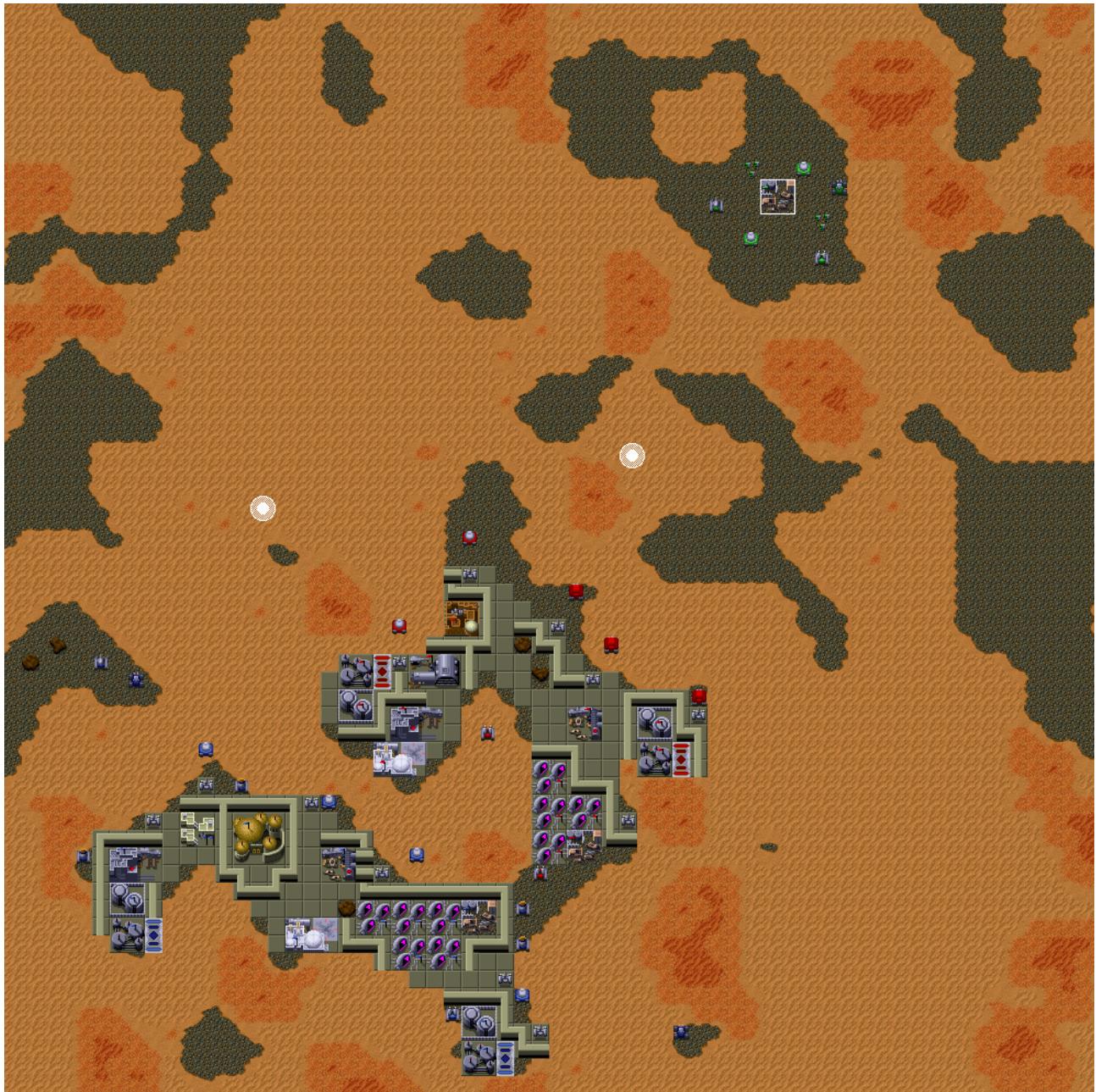
An oversight in the map data restricts the player's army to 20 units in map B. This is generally seen as a severe oversight, and is mostly considered a bug.



DUNE II

The Battle for Arrakis

Ordos Mission 8 Map A



There are no spice blooms on the map.

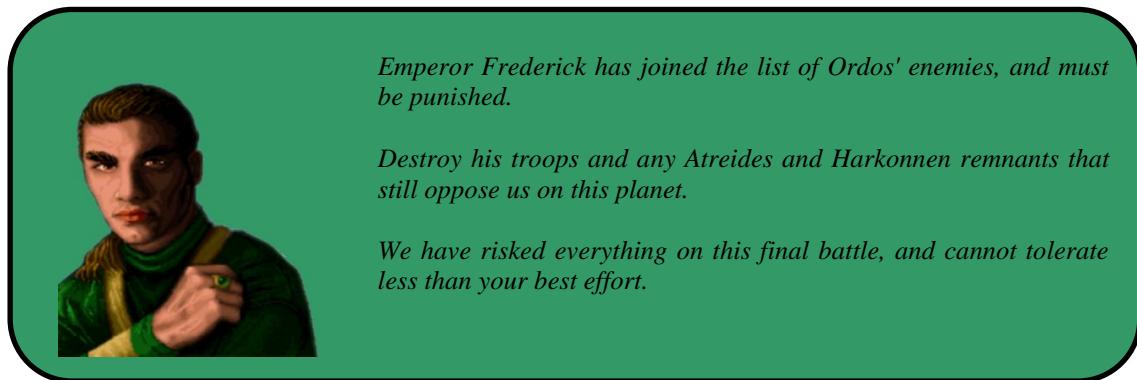
There are two enemy construction yards on the map; one is surrounded by a single layer of walls, but the other is completely undefended. Your main attack force should bypass the enemy base on the east, and attack the yards from the southeast. With sufficient micro management you can take out both the yards in one attack. Note the enemy bases have two heavy vehicle factories and two light vehicle factories. Combined with a WOR facility, the enemy can quickly assemble attack forces of note; it is paramount you attack and take out the construction yards as soon as possible.

Ordos Mission 8 Map B

There are no spice blooms on the map. The almost exact same map is used in the Harkonnen campaign, the difference being the Harkonnen map has an additional construction yard.

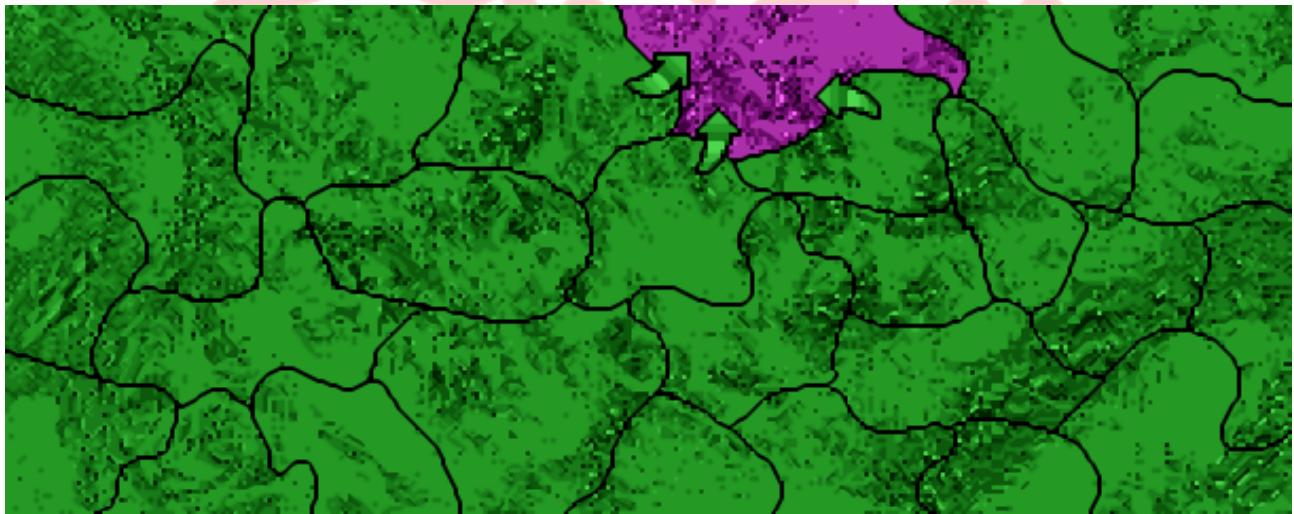
The southern base is connected to the player base via a land bridge; you may use the concrete creep tactic, if you wish. Note there is a thin pathway of slabs separating the western and eastern portions of the southern base. Use this to your advantage; advance your attack force past the poorly defended gap and attack the construction yard from the rear. Once the construction yard is down, destroy the tactical buildings—barracks, vehicle factories, and turrets—then head for the northern base. The northern base is more densely packed and has the construction yard tucked away behind the base.

Ordos Mission 9



General notes

Starting credits	1,500
New units	-
New structures	-
Mission objectives	eliminate all enemy presence
Internal name(s)	sceno022



The layout for the last level is exactly the same regardless of campaign; only the color of the various bases change. You will be facing two Death Hand missiles and an attack wave which lasts around 15 to 20 minutes. Once you have overcome these obstacles, it is a matter of destroying the enemy bases, much as before.

Overcoming the Death Hand missile is mostly luck. Either you get hit or you do not.

It is possible—and not even especially difficult—to get through this battle *without* using the 'save/restore' game cheat. It mostly depends on whether or not the first two missiles hit your

construction yard or not, most of the time they will not. To ensure you do not need to worry about them again, you need to build a starport. Basically, this is what I have found is the best method.

Start exploring, to find the spice reserves. There are lots of them around, so you will not run out of money if you harvest quickly. You start out with 1500 credits. This is just enough money to build concrete over to the west, as far as you can go—in a straight line—then a power center and a spice facility. When your harvester returns, keep building to the left and build a spice facility and a radar station. When these harvesters return, build more windtraps, and build your starport. By this time, the enemy should have found your base. Note that the DHMs will not be launched until units from the respective houses—Sardaukar and Harkonnen—have actually found your base. By this time though, you should have enough money to buy an MCV. If your yard gets hit, deploy it (on another rock, the AI will not always find it the second time) and rebuild, if it does not, move it to the rock to the right of your base and wait. You now have a construction yard in reserve.

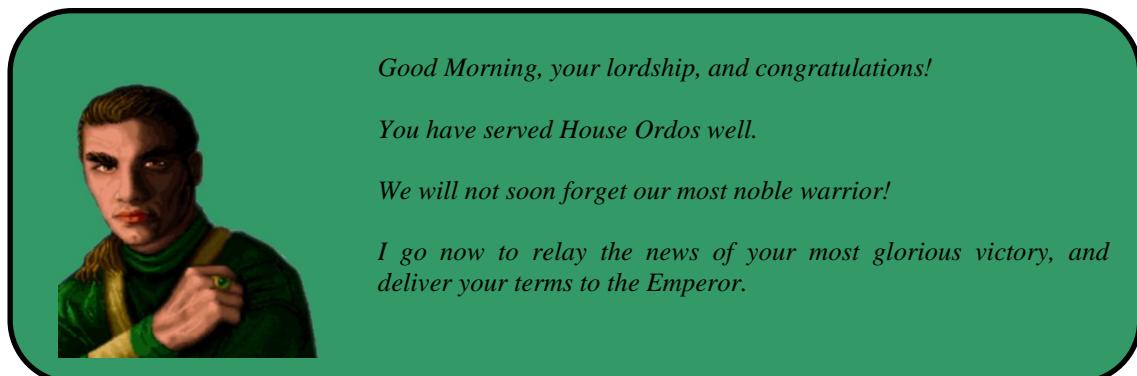
The DHMs will mostly fire at the construction yard. As long as you build buildings a reasonable distance away, they will not get hit. This is one obstacle down. The other obstacle is an attack wave from all three opposing houses that lasts about 15 to 20 minutes. The best defense here is six or seven rocket turrets on the rock just above your construction yard (they tend to get hit by DHMs, but are easy to rebuild), and two or three on the northern most part of the rock you are on (towards the top left). This will defend against all three houses.

Note that all the enemy bases are severely underpowered; the Atreides in the east have a need for three windtraps, but they do not possess a single one. The other bases are underpowered as well. This makes production times a lot slower for all the enemy houses, in addition to making all the enemy structures slowly lose hit points.

The Battle for Arrakis

As always, the retail scenario is packed with bugs. On this map, the Atreides have been given a Harkonnen WOR facility. The Atreides cannot properly use a WOR, so no infantry will be produced by the House. In addition, a bug in the starport list prevents the player from buying ornithopters.

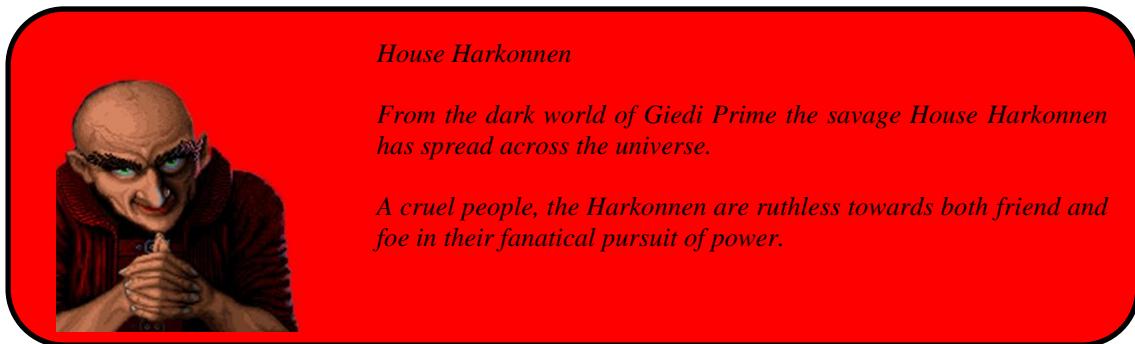
Also, due to an oversight when the map was copied from the Harkonnen campaign, the starting credits were not adjusted; the Ordos should start with 1000 credits, just like all other campaigns, but they are given 1,500 credits. This makes the beginning of the mission much easier for the Ordos.



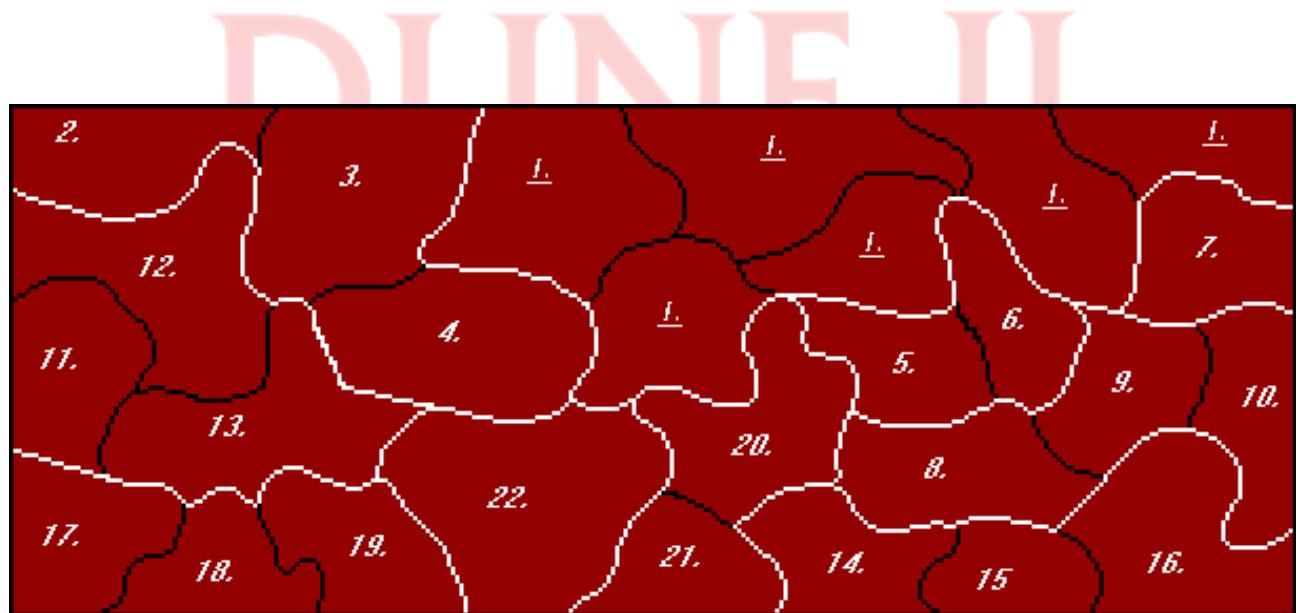
Ordos Mission 9



Harkonnen Campaign



The Harkonnen campaign is often mentioned as being the easiest campaign. This is especially true for brute force players. The Harkonnen relies on firepower. The Harkonnen campaign is probably the most spice-poor of all the campaigns, however.



Harkonnen Mission 1



I am the Mentat, Radnor.

With my guidance, you may be able to assist us in conquering this dusty little planet.

For your first test you will be expected to produce 1000 credits, and not a granule less.

You may earn credits by harvesting spice, and will need to build a refinery to convert spice to credits.

If any of our foolish enemies attempts to attack your base you will have the pleasure of seeing the invincible Harkonnen troops in action.

General notes

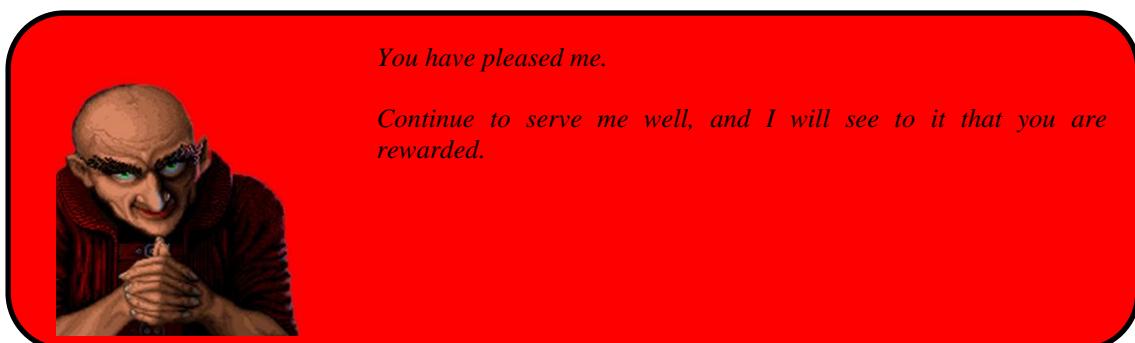
Starting credits	1,200
New units	infantry, soldier, trike
New structures	windtrap, spice refinery
Mission objectives	1000 credits of spice
Internal name(s)	scenh001

The objective of the mission is to harvest 1000 credits worth of spice.



There are 11 enemy units of the Atreides on the map. Keep harvesting spice and eliminate targets of opportunity.

It is almost impossible to fail this mission.



Harkonnen Mission 2



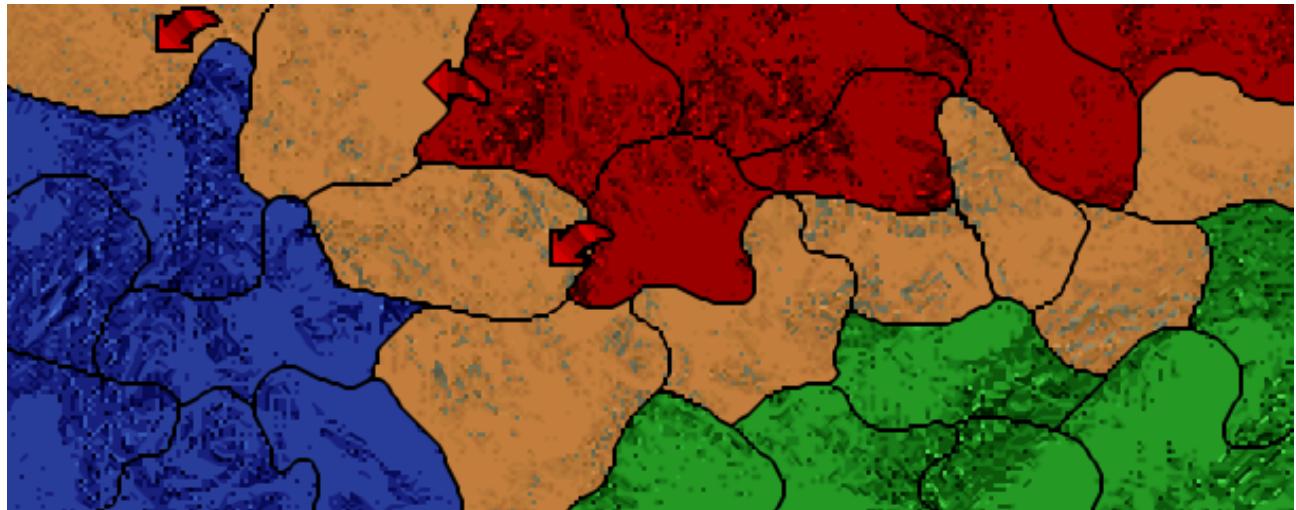
House Harkonnen has generously granted you a new opportunity to serve us.

We will now allow you to take command in a more dangerous area, and accumulate 2700 credits.

Although the worthless Atreides you may encounter in this region should always be eliminated as a matter of principle, the spice quota is your objective.

General notes

Starting credits	1,200
New units	infantry, soldier, trike
New structures	barracks, silo, outpost, light vehicle factory
Mission objectives	2700 credits of spice, or eliminate Atreides presence
Internal name(s)	scenh002, scenh003, scenh004

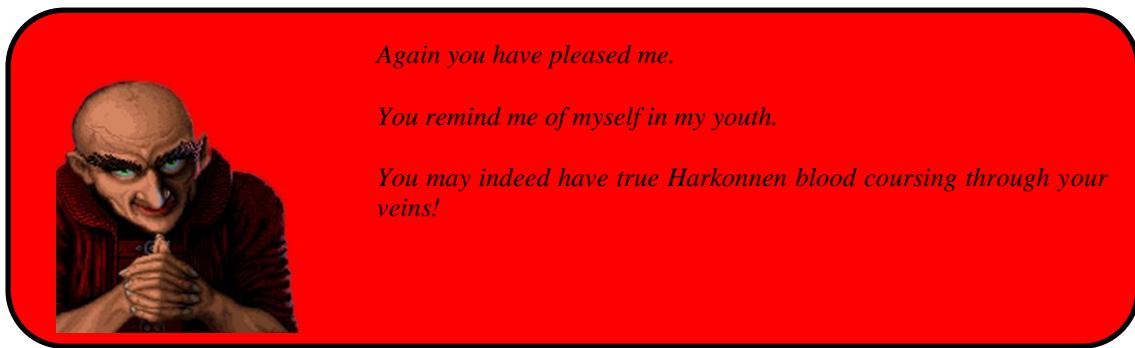


The second mission is the same as the other missions.

In any of the missions you will encounter an enemy base, but you do not need to engage the enemy at all. Fight off the sporadic attacks, and keep harvesting spice.

If you do attack the enemy, keep in mind the enemy bases in version 1.0 have no construction yard. This means the enemy cannot rebuild any structures if they are destroyed.

All of the maps in mission 2 for the Harkonnen have an additional victory condition flag set. What the flag was meant to do is presently unknown. There is no way of figuring it out, either.



DUNE II

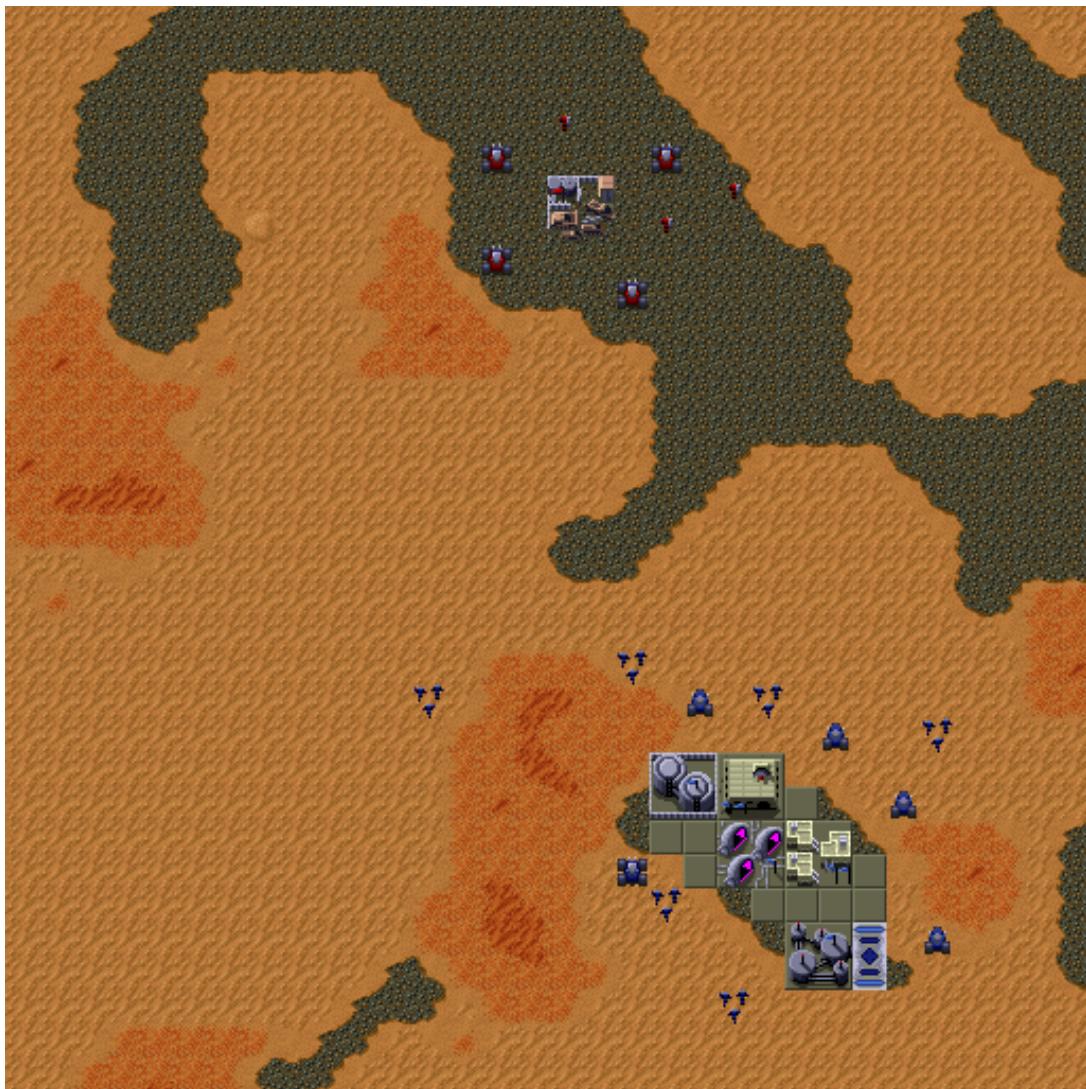
The Battle for Arrakis

Harkonnen Mission 2 Map A



There are three spice blooms on this map.

Harkonnen Mission 2 Map B



There are no spice blooms on this map.

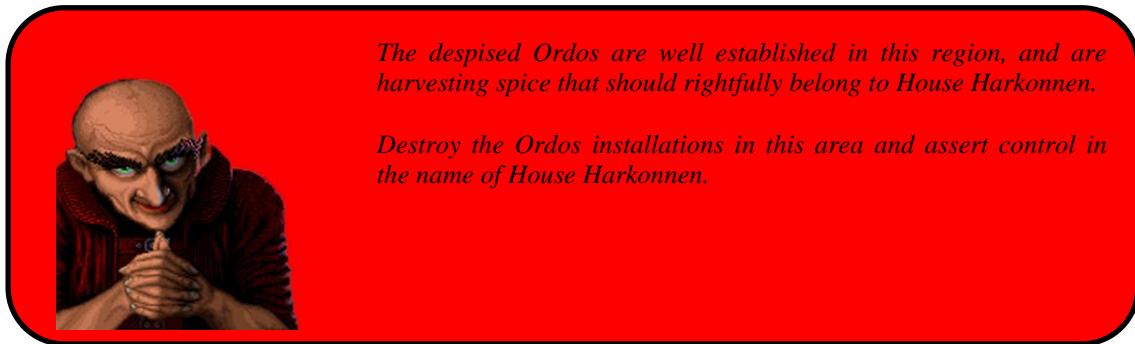
Harkonnen Mission 2 Map C



There are no spice blooms on this map.

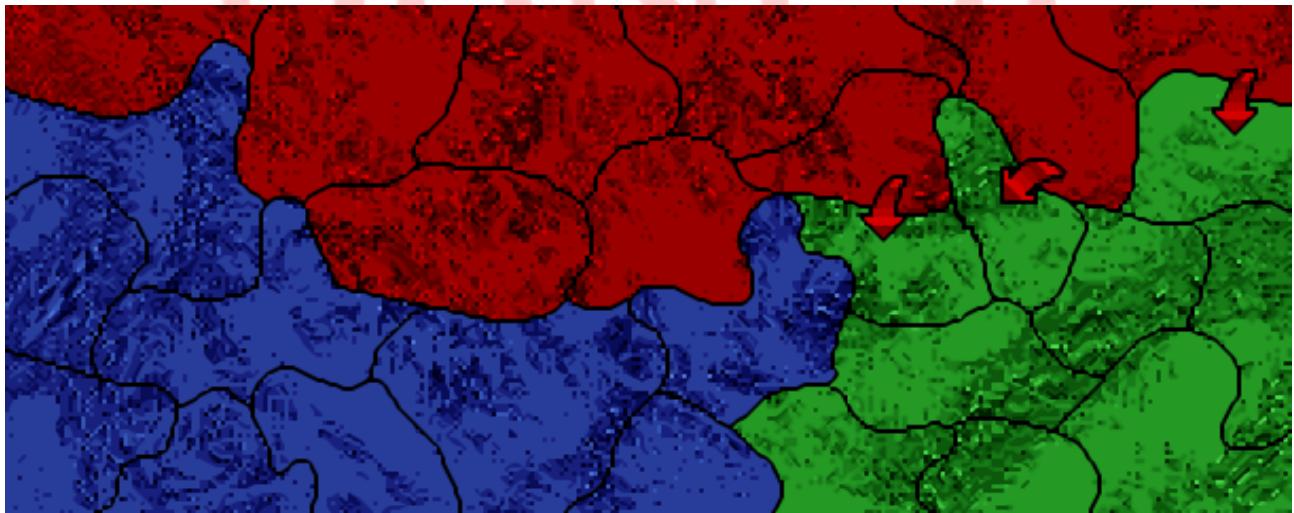
The map data contains entries for several reinforcement shipments; a group of 3 troopers set to arrive to the Harkonnen at 1 minute, a group of 3 infantry for the Ordos at the 5 minute mark, two more infantry for the Ordos at 10 minutes, and finally a quad and a trooper for the Harkonnen at 11 minutes. All of these reinforcement entries have been commented out.

Harkonnen Mission 3



General notes

Starting credits	1,500
New units	combat tank
New structures	barracks, silo, outpost, light vehicle factory
Mission objectives	eliminate Ordos presence
Internal name(s)	scenh005, scenh006, scenh007



From here, the mission objective will be always the same, destroy every enemy unit and building on the map.

The first thing to do is to discover the enemy position. So, save the game and send your start-up units to each angle of the map and when you finally know where the enemy is, simply reload the previously saved game. The save/load trick is necessary because the enemy will launch a heavy attack at you when "discovered" and this is very bad at the beginning of any mission.

Place all your units in the direction of the enemy's attack—that is, the direction of the previously discovered base—to have a good defense, but leave some of them in other parts of your base; this is mandatory, because at the beginning of the mission the enemy will send flying carryalls which will drop units randomly near your base.

Build a windtrap and a refinery, followed by a radar outpost and a light factory. Upgrade the light factory to build quads. Build a WOR to have strong troops in aid to your quads.

Build a second refinery—this is a *must* in every mission; *always* build at least 2 Refineries, from the beginning—and store credits while defending your base from attacks. Your defense units should be placed very near each others—preferably in adjacent cells—to have more fire power against attackers.

When you have stored enough credits—in the range of 8000 to 10000—it is time to plan the attack. Build another light vehicle factory—one is not enough to send the reinforcements that you will need in the attack—and build quads—and some troops if you want to—until you reach the maximum number of units.

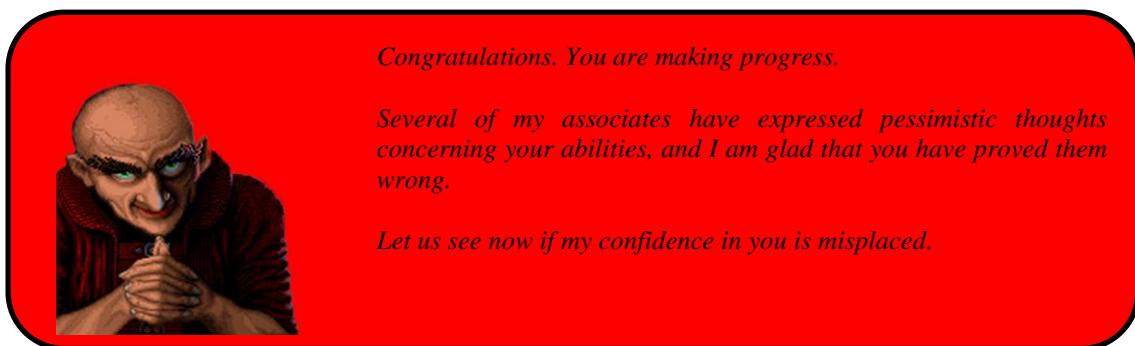
Group all your units on a rock near the enemy base, save, and begin the attack. Your primary objectives are the light vehicle factory and the construction yard. If you destroy those buildings you will win.

Do not waste too many resources in fighting enemies units for now; rather designate as many units as you must, to destroy the buildings listed above. Once done, you should destroy the troop training building; after that you can destroy enemies units.

Each time a unit is destroyed—yours or your enemy's, it does not matter—start building a new quad in your base and send it immediately into the battle. This way you should be able to win fairly easily.

All of the maps in mission 3 for the Harkonnen have an additional victory condition map flag set. It is unknown what the victory condition was supposed to be.

Note House Harkonnen is set to receive trikes as reinforcements at 6 game minutes on all the maps in this mission. House Harkonnen cannot produce nor use trikes units; this is universally considered a bug.

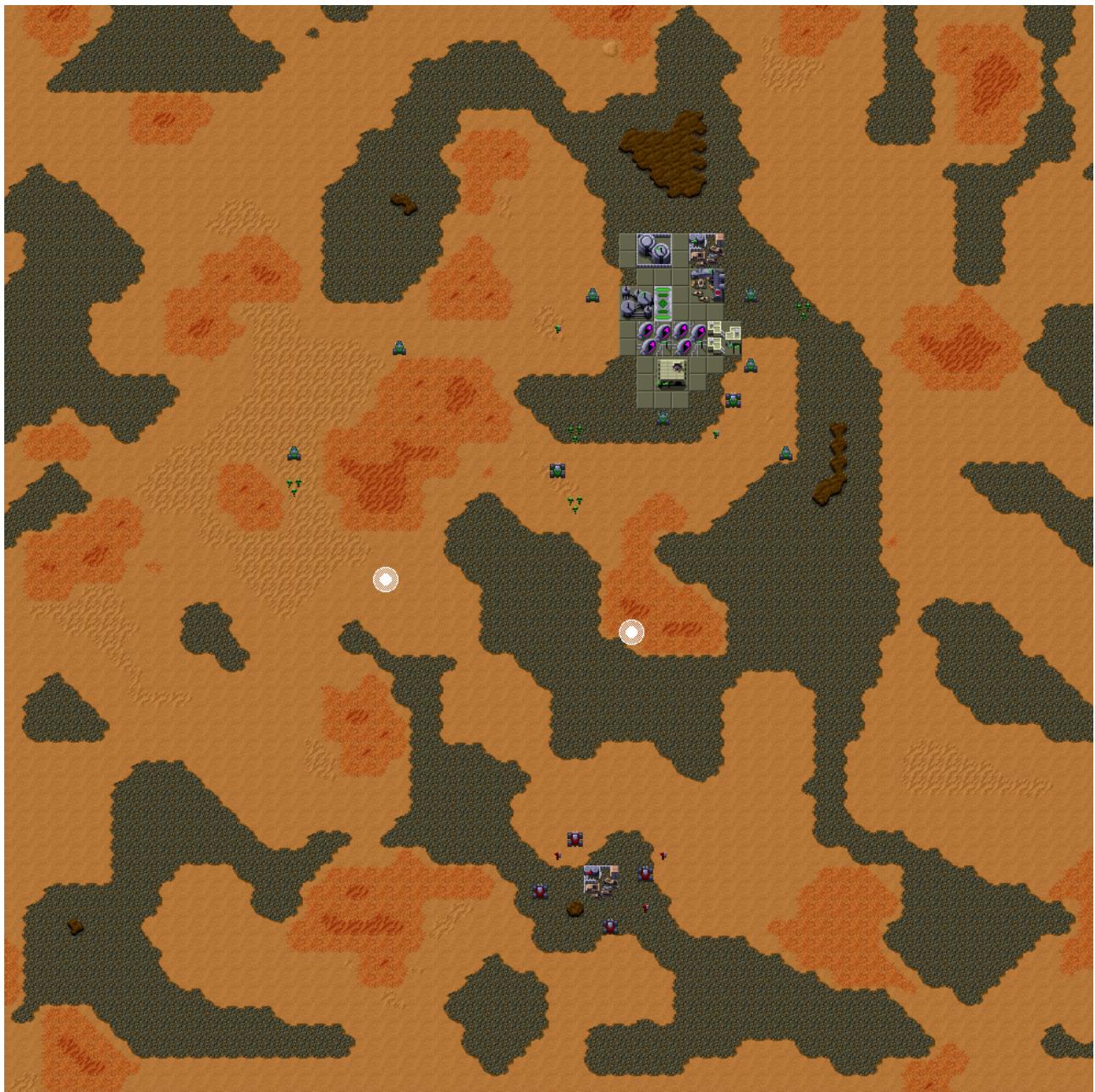


Harkonnen Mission 3 Map A



There are no spice blooms on the map.

Harkonnen Mission 3 Map B



There is a single spice bloom on the map, located to the north of the enemy base.

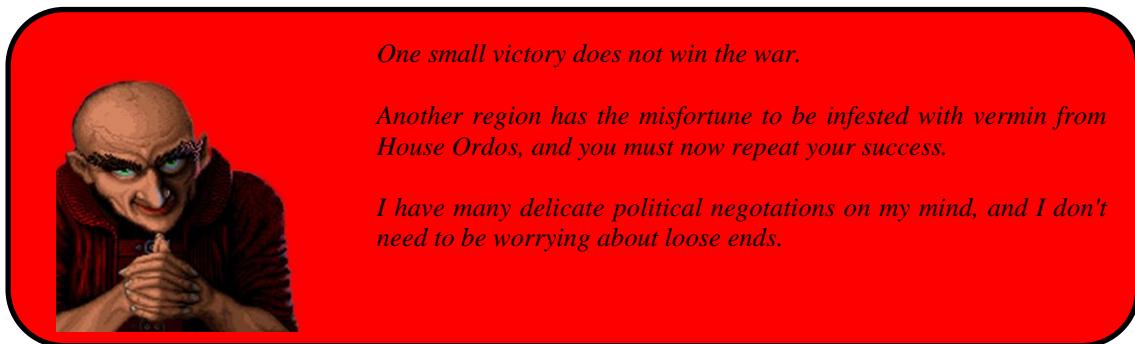
There is a bug in the map data giving the Ordos construction yard a 3300% hit point boost, and the Ordos light vehicle factory a whopping 5500% boost. The game engine disregards these entries—making the entire hit point entry redundant—and caps all hit points at 100%, although some users have noticed saved games may have these buildings virtually indestructible. A simple reloading has fixed the problem.

Harkonnen Mission 3 Map C



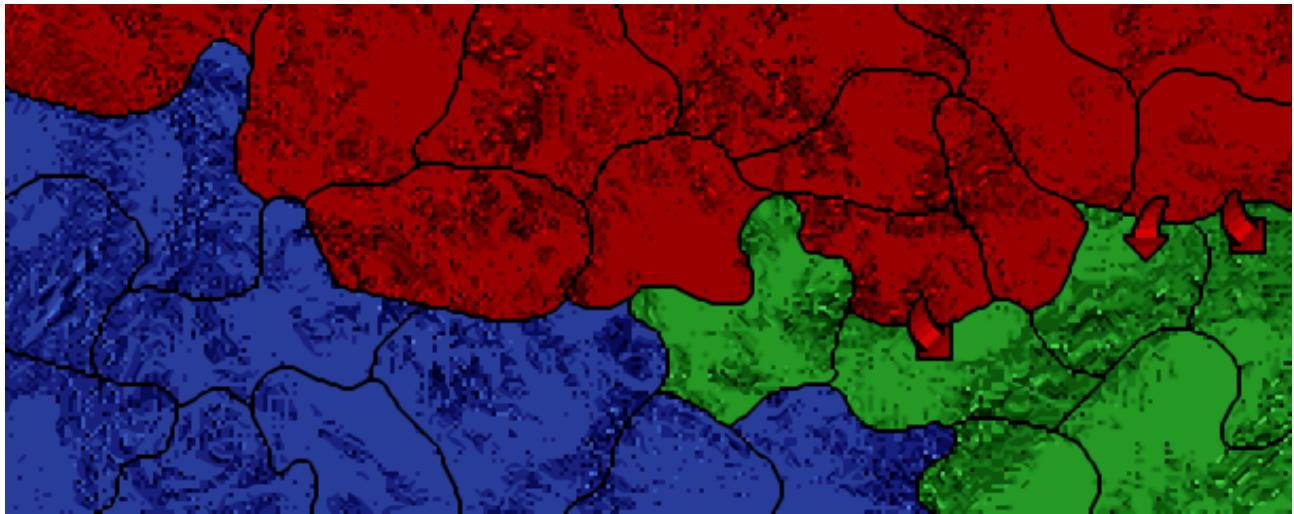
There are three spice blooms on the map, only one of which is conveniently located.

Harkonnen Mission 4



General notes

Starting credits	1,500
New units	MCV
New structures	large concrete slab, wall section
Mission objectives	eliminate Ordos presence
Internal name(s)	scenh008, scenh009, scenh010



In this mission you can build the heavy factory and the walls. Walls are useless, except in the direction from where the attacks will come, so do not waste your time building walls all around your base.

From this mission onwards you do not need ground troops any longer; they are effectively obsolete. Build tanks and quads instead.

As always, build two refineries; also build an additional harvester, using a heavy factory.

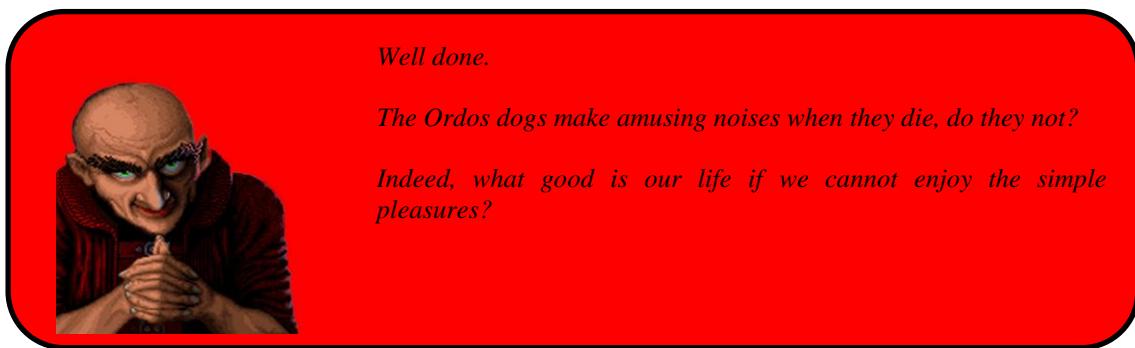
To win this mission you should proceed in the same way as the previous mission; build the maximum number of units, wait to have enough credits for reinforcement and lead the attack. Before attacking, you should have one light factory and two heavy factories.

Your primary objectives should be vehicle factories—both light and heavy—and the construction yard. Except for tanks, this mission is quite similar to mission 3, so you should win this rather easily using the same tactics.

This is also the first mission where you will encounter Imperial Sardaukar troops.

Upon completion of the mission, the player will see an intermission, consisting of the Emperor chastising the player's opponents.

All of the maps in mission 4 for the Harkonnen have an additional victory condition map flag set. It is unknown what the victory condition was supposed to be.

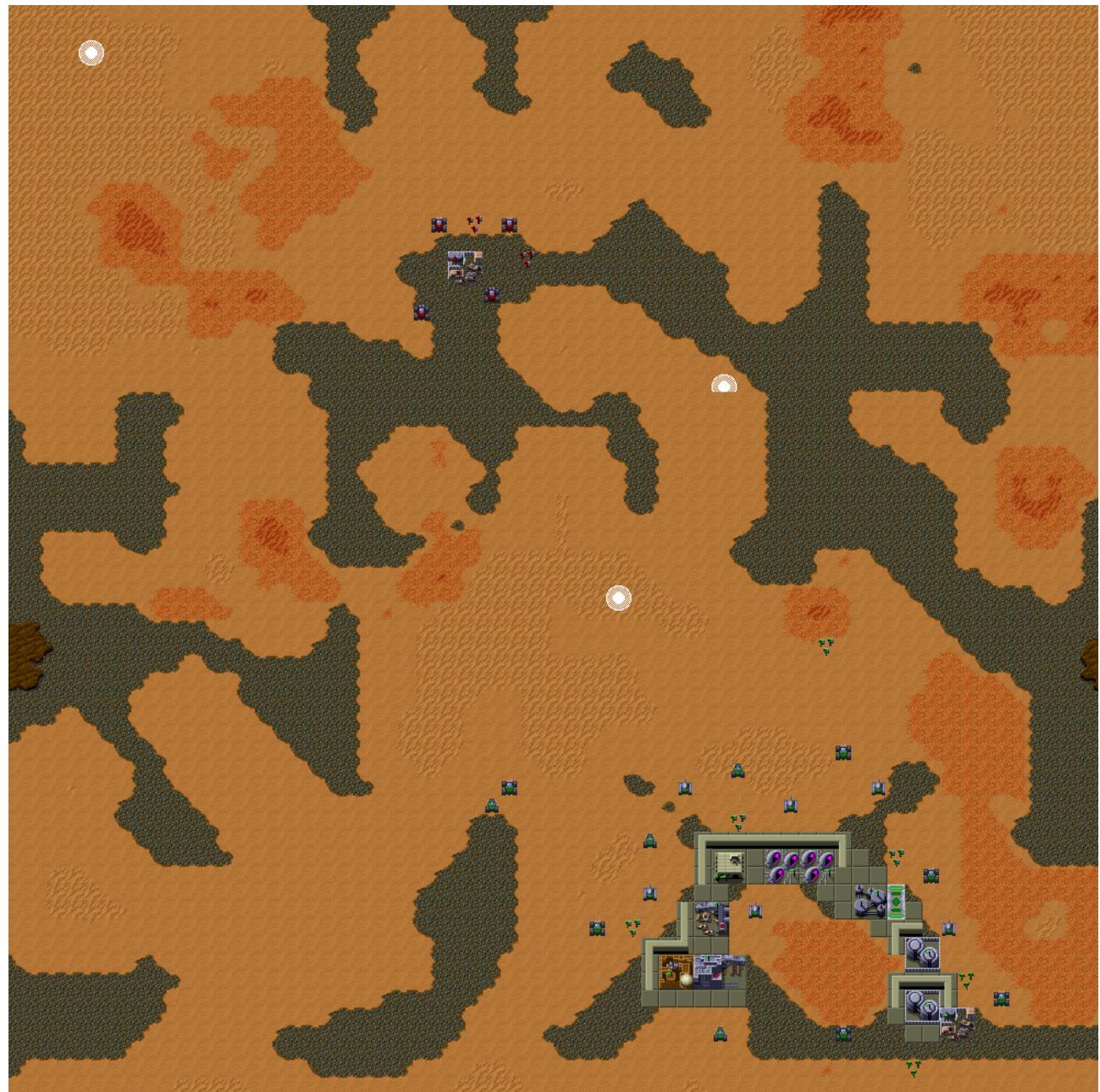


Harkonnen Mission 4 Map A

The maps in versions 1.0 and 1.07 are not the same; in version 1.07 there are no sandworms on the map at all. This is due to an oversight in the mission data, and it has never been officially fixed; the worms were commented out during map testing, but were not put back before shipping. The worms are present on version 1.0 of the map.

Also, the only spice bloom on the map is located near the player's starting location.

Harkonnen Mission 4 Map B



There are no spice blooms on the map at all.

Harkonnen Mission 4 Map C



There are no spice blooms on the map at all. There is a small, isolated basin to the northeast of the player's starting location.

One of the sandworms is nesting right to the west of your starting position; if you place your troops at the edge of the rock and place them in guard mode, they will commence firing upon the worm. The worm will usually not move from its nesting position unless units move into the sand, and it will disappear when 50% damaged. If you manage to eliminate the worm, you will not need to worry as much about your harvesters disappearing.

Harkonnen Mission 5



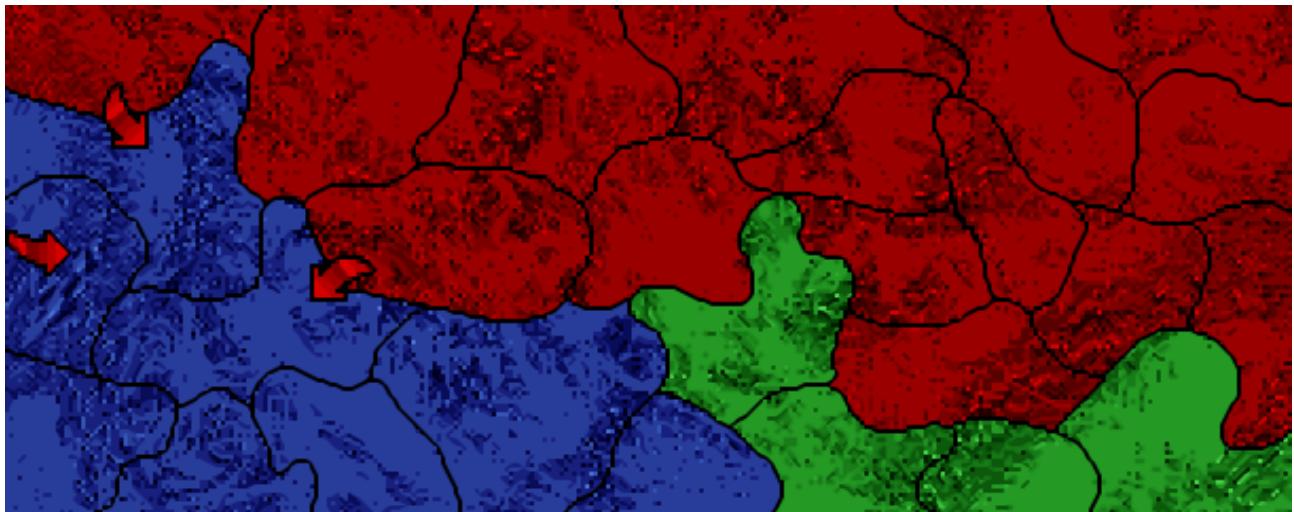
So, the Emperor was helping the Ordos in your last mission.

Never the less, House Atreides has grown stronger due to our negligence, and must now be taught a lesson.

You will remove all the Atreides from this region.

General notes

Starting credits	1,500
New units	carryall, rocket launcher
New structures	hi-tech facility, repair facility, turrets
Mission objectives	eliminate enemy presence
Internal name(s)	scenh011, scenh012, scenh013



This is the first non-easy mission.

You have new buildings, such as the light turrets, the repair facility, and the hi-tech factory.

New units are also available; they are the carryall and the rocket launcher.

The carryall is the first aerial unit you have at your disposal.

The carryall dramatically changes the dynamics of your economy; by returning your harvesters quickly, you will experience an accelerated influx of spice and thus credits.

From this mission onwards it is very important to plan a good defense before beginning any attack.



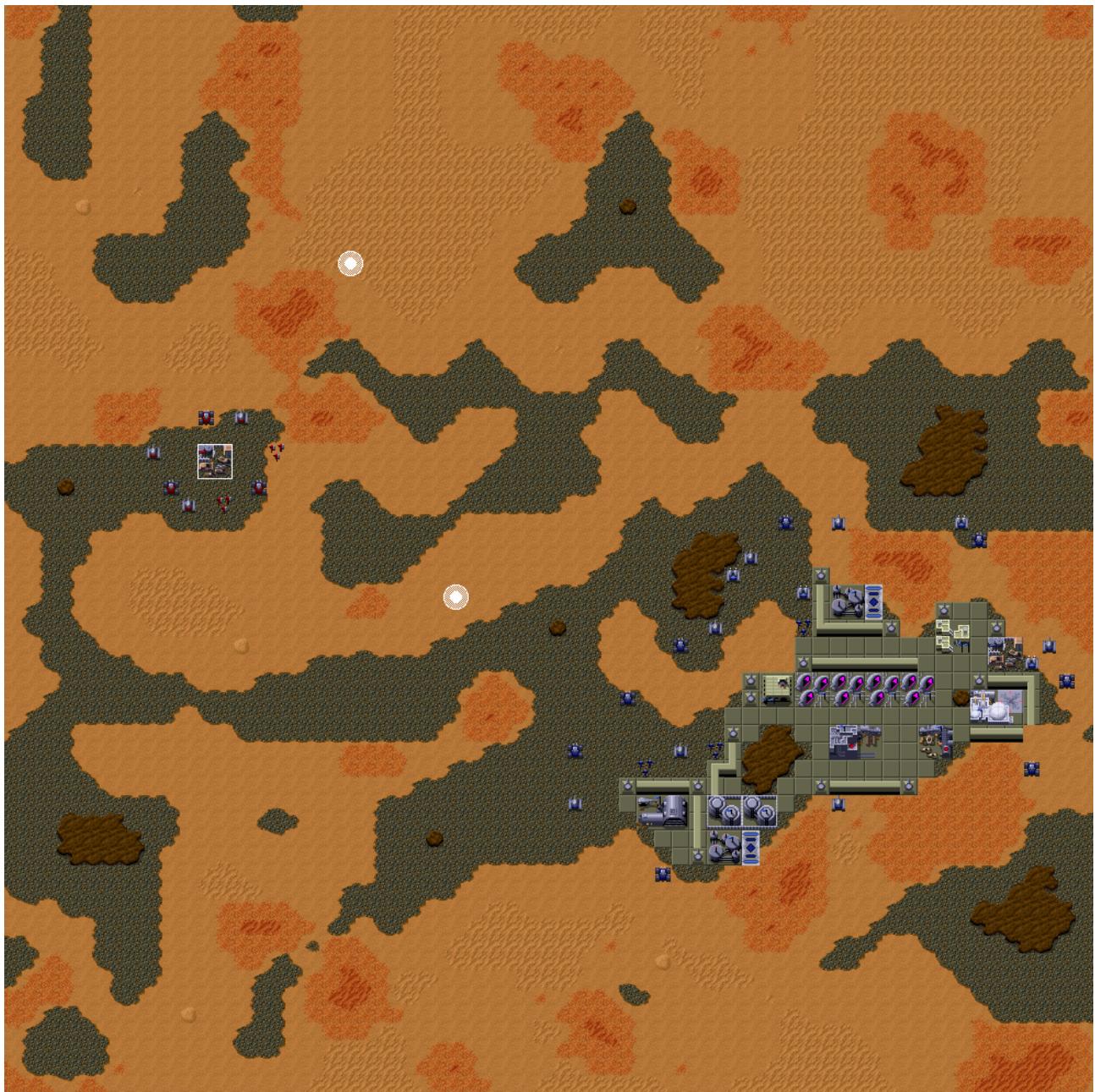
In appreciation for your recent performance, I will now allow you to resume the struggle with the Ordos.

At least they will put up a fight worthy of our Troopers.

DUNE II

The Battle for Arrakis

Harkonnen Mission 5 Map A



There are a total of four spice blooms on the map.

Your base is connected to the main enemy base with a land bridge. Thus it is possible to utilize the concrete creep tactic.

Harkonnen Mission 5 Map B

There are no spice blooms on the map. Note your starting position is surrounded by vast spice fields, however. Create at least three harvesters and a line of spice silos; try to go fast tank. For defense you can build a line of turrets on the rock structure to the south of your base; you need a MCV for this.

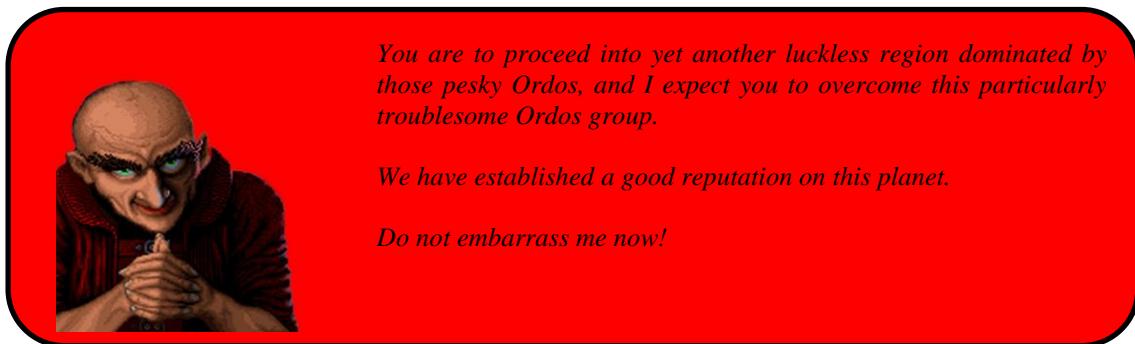
Note you can slip between the two bases to establish a staging area behind the enemy. Destroy the eastern construction yard first. Focus on the construction yard, and disregard the other structures during the first phase. The second phase is to destroy the western construction yard. After both construction yards are destroyed, commence a normal attrition strategy; prioritize tactical structures such as the barracks and vehicle factories, while eliminating targets of opportunity.

Harkonnen Mission 5 Map C



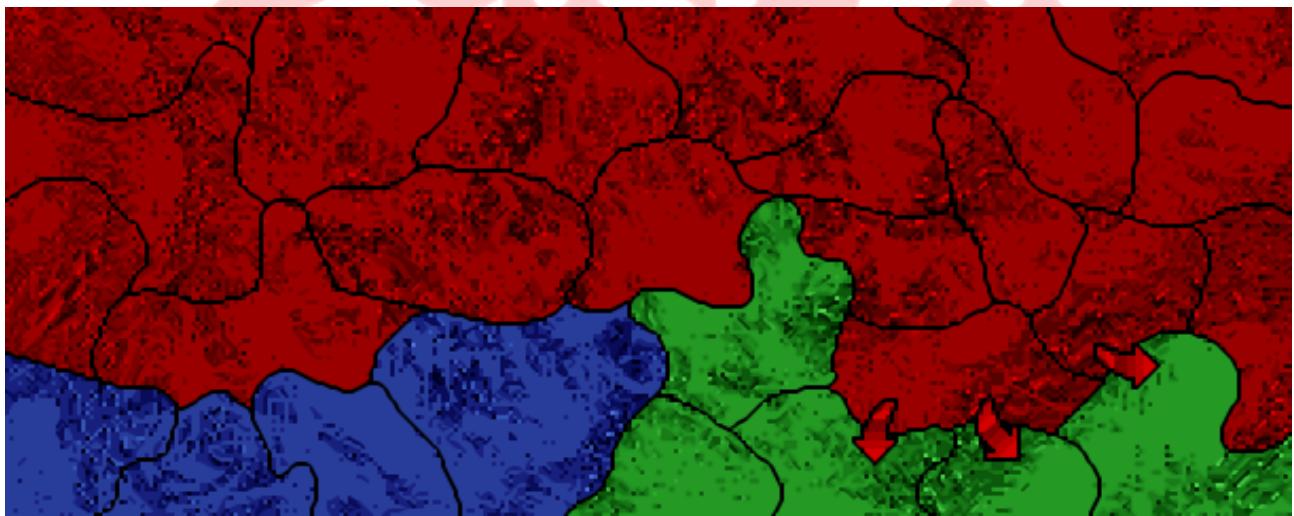
There are no spice blooms on the map.

Harkonnen Mission 6



General notes

Starting credits	1,700
New units	siege tank, trike
New structures	rocket turret, starport
Mission objectives	eliminate enemy presence
Internal name(s)	scenh014, scenh015, scenh016

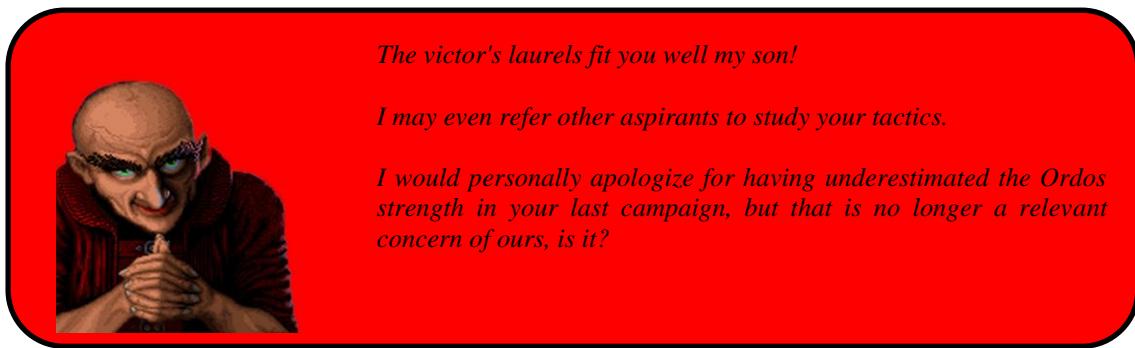


The sixth mission has the so far toughest enemies in the campaign. The difference between this and the previous scenario can present challenges to player tactics.

You can now create more tactical units. The siege tanks are expensive, but they will prove indispensable as you proceed. Preferably use the siege tanks in group; when left to fend for themselves siege tanks can easily fall prey to other ranged tanks, due to the shorter range of the siege tanks.

In addition to siege tanks you can now also build trikes, but they have weak armoring and weaponry, and they are tactically rather useless. Their primary usage seems to be scouting, and the occasional

confrontation with missile launchers. Experience suggests they tend not to be used much as tactical units, if at all.



DUNE II

The Battle for Arrakis

Harkonnen Mission 6 Map A



There are no spice blooms on the map.

Note the western base does not have a construction yard; the only enemy construction yard is at the very northern edge of the map, at the northernmost tip of the northern enemy base.

Harkonnen Mission 6 Map B



The western Ordos base is connected to the player's starting location via a thin rock bridge, allowing for a concrete creep tactic.

There are no spice blooms on the map.

The same map is reused in many other scenarios. This map can also be found as Atreides Map 6A, Ordos Map 6A, and Ordos Map 6B.

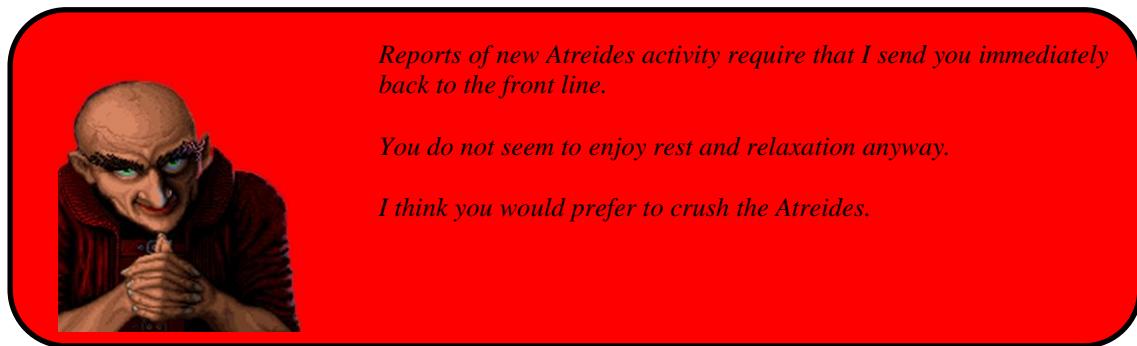
Harkonnen Mission 6 Map C



There are no spice blooms on the map.

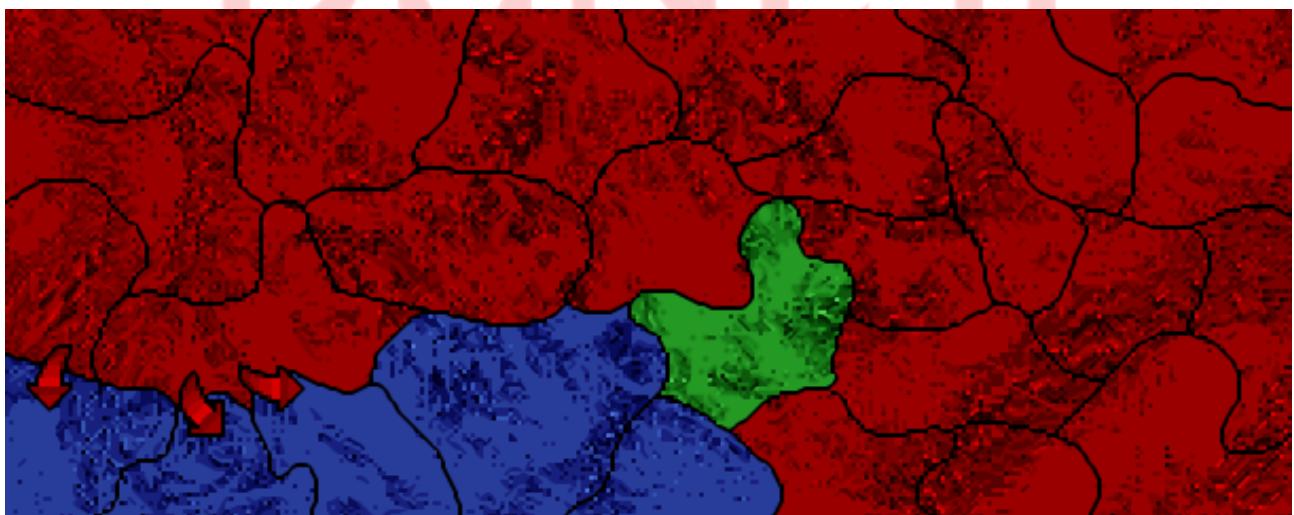
Note the Ordos base has a ridiculous amount of excess power production; the power needs for the base calls for 4 windtraps, but 7 exist. Also notice the strangely placed gun turret in the eastern base.

Harkonnen Mission 7



General notes

Starting credits	1,800 / 2,000
New unit(s)	Devastator
New structure(s)	-
Mission objectives	eliminate enemy presence
Internal name(s)	scenh017, scenh018, scenh019



This is the only mission in the campaign with enemy Houses of IX.

This mission is quite similar to the previous, except that each House can now build a new special House unit.

Ordos can use the Deviator, Atreides now have the sonic tank, and Harkonnen have the Devastator.

You now have access to the Devastator tank. Make sure you read the notes regarding the new unit. The Devastator is rather expensive, and while it can be very destructive when used correctly it tends not to be used that much.

The Devastator is powerful, but it is also very slow, so it is not very good for hit-and-run attacks and I suggest use them only in the last phases of the mission.

The new House units are very expensive and have very weak defensive armor—except the Devastator which is heavily armored—therefore you should be careful when using them and quickly send them to the repair facility when they are damaged.

At the start of this level, you should go fast turret, and build a couple of rocket turret batteries as soon as possible.

On this level, the computer will always send a series of ornithopters against you, and unless you have the turrets, your buildings will soon be destroyed. In fact, whenever the AI can build ornithopters, it will expend its' entire economy on them.

House Harkonnen is supposed to get reinforcements in the shape of Devastators at the 21 game minutes mark. All the maps of mission 7 have the same spelling error—Devastator spelled as Devistator—so the reinforcements never arrive. This is universally considered a bug.

Be aware the Atreides should have their maximum unit amount capped at 25, but due to a spelling error in the map data there is no unit cap for the Atreides at all. Thus no restrictions apply to the enemy army size. This is universally considered a bug.



Harkonnen Mission 7 Map A



There is a grand total of seven spice blooms on the map.

The Atreides base is split in two; proceed through the gap between them with your attack force, and take out the construction yards from the rear.

Note the Atreides base has excessive power production; the base needs only 5 windtraps, but has a total of 7.

Harkonnen Mission 7 Map B



The enemy bases are connected to the player's starting location via a rock bridge, so it is possible to utilize the concrete creep tactic.

There are no spice blooms on the map, but the player will start with 2,000 credits instead of 1,800 as on the other maps of the level. Bypass the Atreides on the east side, and gather your attack force behind the base. This way you will be out of range of the rocket turrets, and will only have to deal with mobile enemy units.

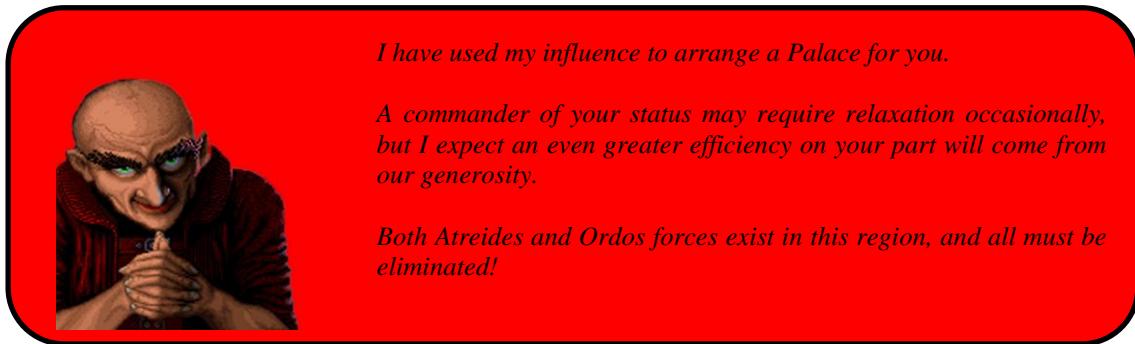
Harkonnen Mission 7 Map C



There are no spice blooms on the map.

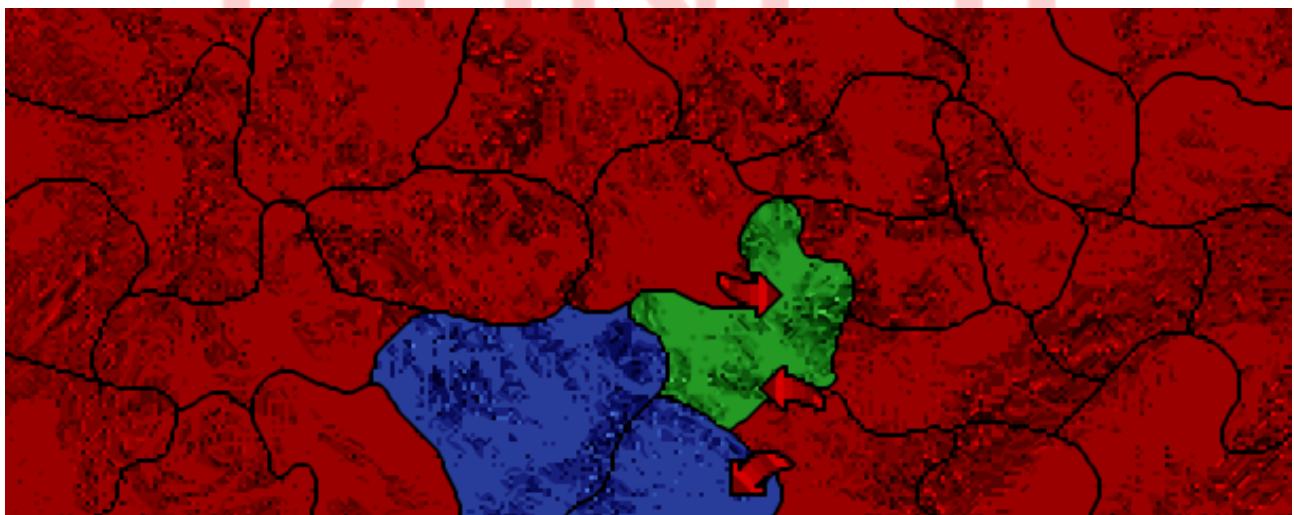
Note that both the Atreides construction yards are located in the back of the base.

Harkonnen Mission 8



General notes

Starting credits	2,000
New units	Death Hand
New structures	palace, House of IX
Mission objectives	eliminate enemy presence
Internal name(s)	scenh020, scenh021



There are only two maps for this mission as opposed to three as in the other missions.

The first map has a wide Atreides base, and the second map has an Atreides base and an Ordos base.

Neither the Atreides nor the Ordos have Houses of IX, so there is little danger of aerial attacks from House Atreides or Deviator attacks from the Ordos. Keep this in mind when choosing scenario.

You can build the palace on this map, but experience suggests it will seldom be used as a special weapon, but rather as a barrage weapon. Due to the inaccurate nature of the Death Hand missiles, many players tend to use the brute force of Harkonnen ground forces instead. The brute force

approach is also preferred with the special weapons. Use them in numbers; launch them as often as you can.

Be advised you may construct as many palaces as the building limit allows. With 6 palaces at your disposal you can launch one Death Hand missile attack on the enemy every game minute. The preferred method is to launch missile attacks at the enemy construction yards until they are destroyed.

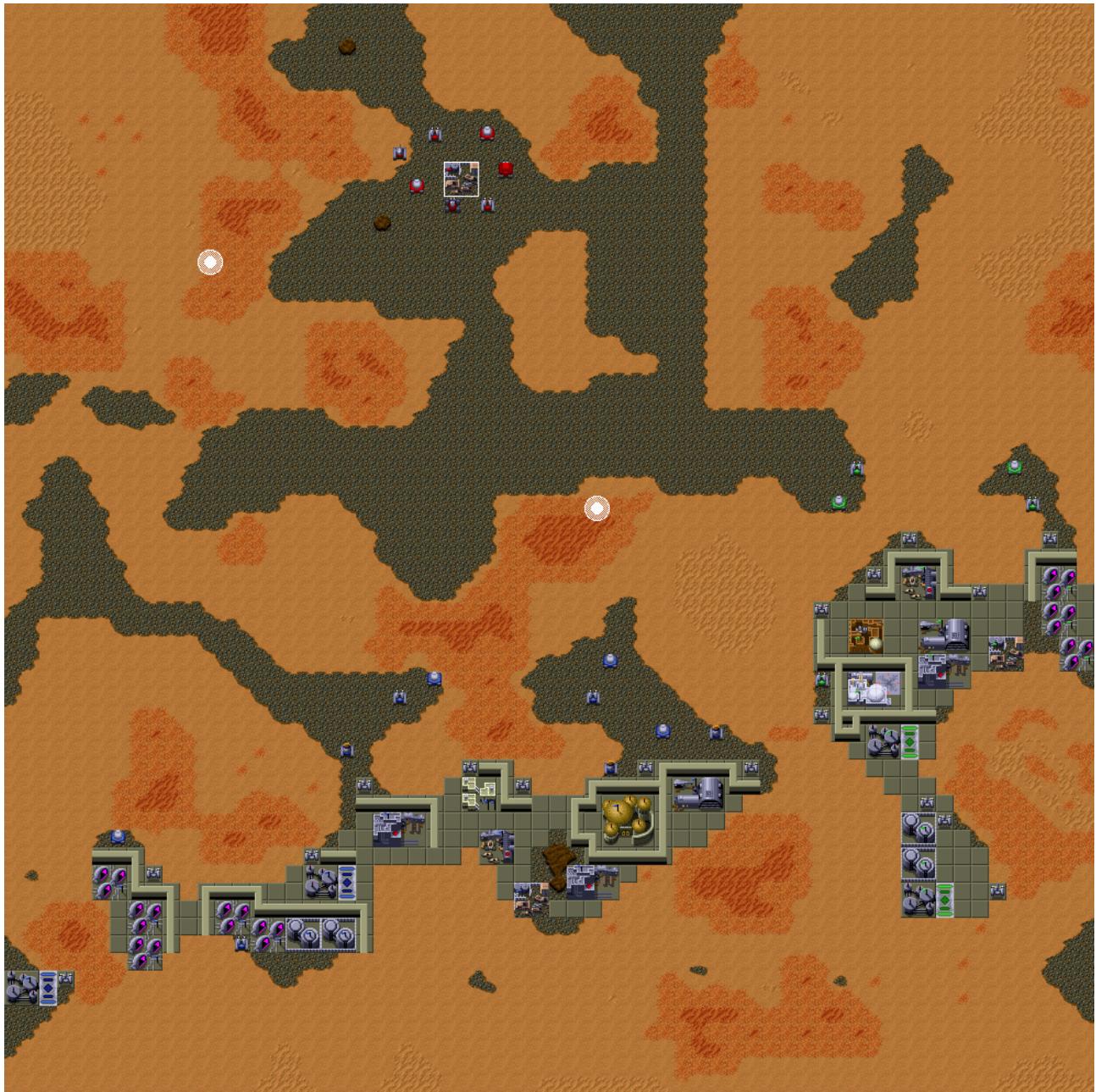
Also remember the Death Hand special weapon has double the recharge time of all other House special weapons.

There are no spice blooms on either map; it might take a while to get a stable economy going.

When and if the mission ends in Harkonnen victory you will be treated to another fine intermission scene from the imperial palace.

In map A House Harkonnen is set to receive infantry reinforcements at the 22 game minutes mark. House Harkonnen can however neither use nor produce infantry. This is universally considered a bug.



Harkonnen Mission 8 Map A

There are no spice blooms on the map. The vast spice fields to the west of the starting position will provide enough spice to last throughout the mission. Make sure you place spice refineries there as soon as possible. Also notice the secure spice basin directly to the northeast of the starting position.

As always, the easiest way to attack the enemy is from the rear; assemble your attack force at the western edge of the map and proceed southwards through the gap at the westernmost part of the base. When behind the base, proceed along the southern edge until you can attack the construction yard; it will be completely undefended. If you have not expended your attack force when the yard is destroyed, immediately head east-southeast until you reach the eastern edge of the map. Proceed north with your force and attack the remaining construction yard. Be advised the enemy has a total of three heavy vehicle facilities, and can quickly assemble a retaliatory force.

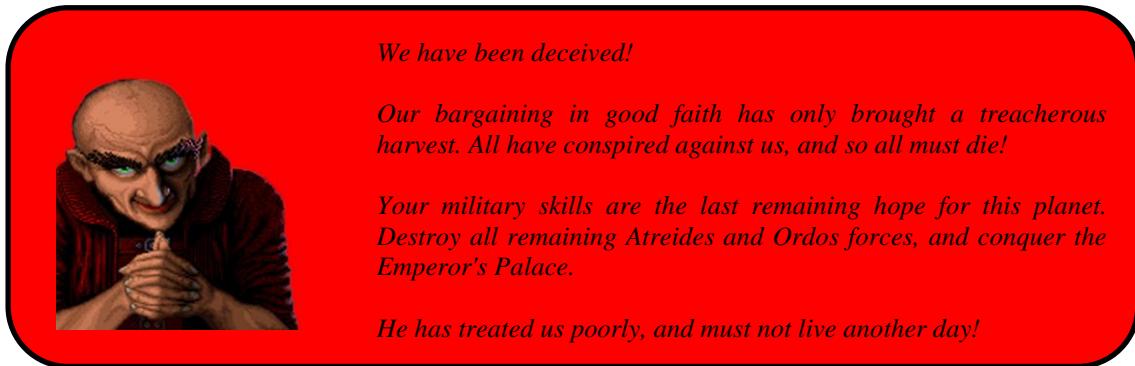
Harkonnen Mission 8 Map B

There are no spice blooms on the map. This map is the same as map 8B of the Ordos campaign, except the Ordos map only has one enemy construction yard in the south. This one has two.

Focusing on the southern Atreides base first, there is an undefended gap between the western and eastern parts of the base; have your main attack force proceed through the gap, and attack the eastern construction yard from the rear.

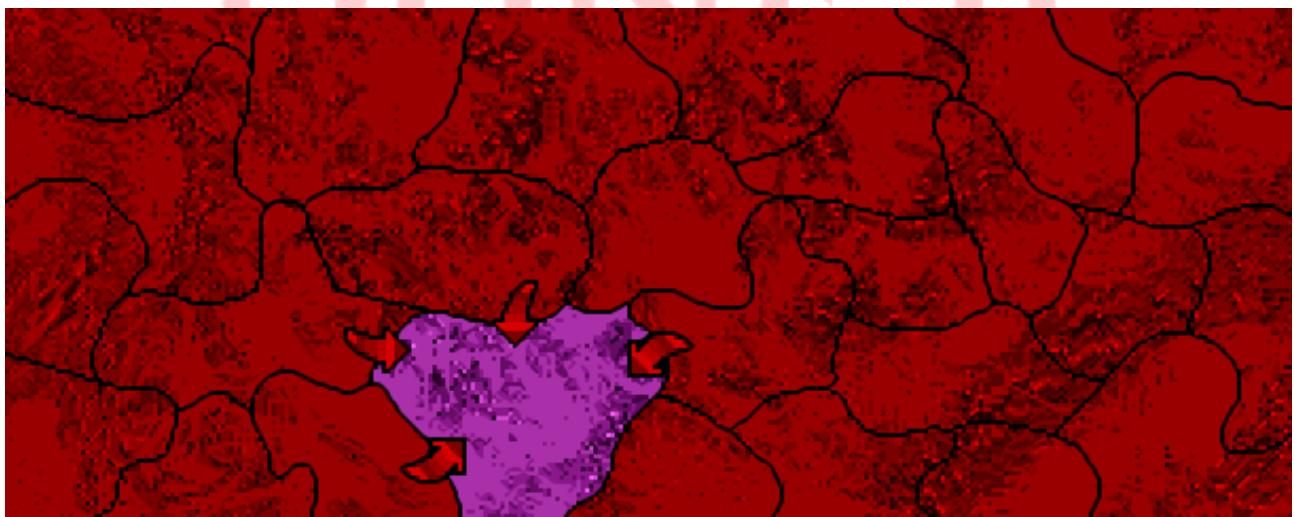
The Ordos base in the north has a WOR facility that is cannot use; this is universally regarded as a bug.

Harkonnen Mission 9



General notes

Starting credits	1,000
New units	-
New structures	-
Mission objectives	eliminate enemy presence
Internal name(s)	scenh022



Despite what you might initially think, once you are well established, and have two or three harvesters out and about, saboteurs are not that serious. Simply save your game often. Thus, getting the palaces that make them is not first priority.

Be advised you may construct as many palaces as the building limit allows. With 6 palaces at your disposal you can launch one Death Hand missile attack on the enemy every game minute. The preferred method is to launch missile attacks at the enemy construction yards until they are destroyed.

Your first target should be the Atreides base in the east. The House on the far right has a poorly defended one construction yard. Approach the base from the south; you should have your main force advancing roughly 3 to 4 squares from the eastern edge of the screen.

You will encounter a rocket turret placed outside the base and behind it an erroneously placed WOR; the Atreides can neither build nor use WOR structures, so the building serves no real purpose; this is a universally acknowledged bug.

Destroy the turret and advance quickly to the northwest; you will encounter the Atreides construction yard. Be careful; you can usually expect to be attacked by a number of siege tanks and rocket launchers, both from this House and from the Emperor's. The Atreides base has four siege tanks and one missile launcher guarding the area.

Once the construction yard here has been destroyed, you can take apart the rest of the base at your leisure; you might want to destroy as much as possible before moving on to the next phase, but keep in mind only the vehicle factories and the rocket turrets serve any tactical purpose.

You may opt for keeping the other buildings standing until the end game; the choice is yours.

Your next target will always be the emperor's base. The construction yard is poorly defended, albeit hidden in the northeastern corner of the map. Use one or two rocket launchers defended by siege tanks to advance through the emperor's base along the northern edge of the map, making sure to eliminate any offending rocket turrets towards the south.

Be sure to have your defense forces at the ready; the units to the south will be facing the brunt of the emperor's forces. Try to advance as quickly as possible; the computer rebuilds buildings roughly in the order in which they were destroyed, though if the construction yard is destroyed nothing will be rebuilt. Eventually, your units will reach the edge of the emperor's palace.

The palace is surrounded by 6 rocket turrets, 3 launchers, and several layers of concrete wall. The palace is easy enough to destroy before or after taking out the construction yard. Let the first target be based on how badly saboteurs are taking out your base.

Once the emperor's palace is destroyed only the Ordos base in the west remains intact.

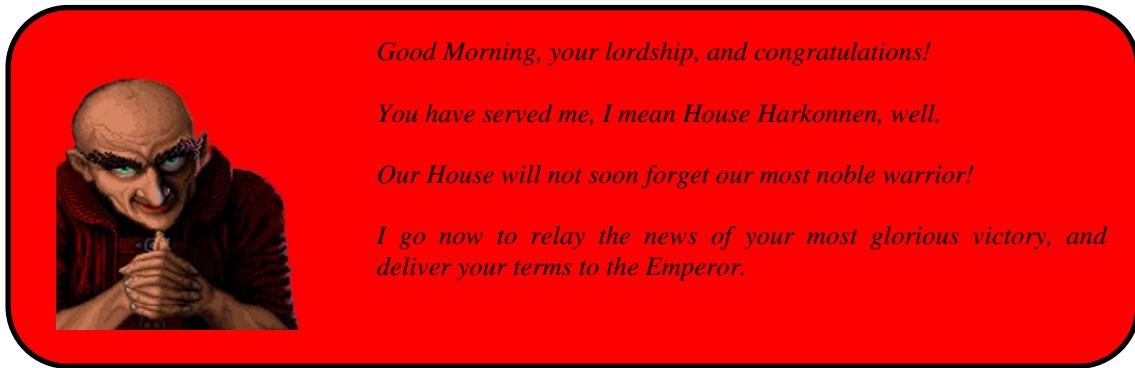
The Ordos base, like the emperor's, has a rather poorly defended construction yard. To get at it, simply attack it from the northeast. After the construction yard is destroyed advance as before, taking out the rocket turrets first, then the palace and heavy vehicle factory you will find next to the now demolished construction yard.

It should not be hard then to destroy the rest of his base from the top southwards. Take out the remaining tactical structures—the rocket towers and the vehicle factories—and the game is basically over.

The only thing you should watch for is in sending more troops for support—this base has a number of small 'arms' which jut out from it and have four rocket turrets for fingers. These are nasty things for unsuspecting vehicles to wander by on their way to the slaughter at the top of the screen.

Note the enemy bases are severely underpowered throughout the scenario; the Ordos have 3 windtraps, although the power consumption would require 5 windtraps. The Sardaukar have only 4 windtraps, though they would need 5, as well. The turrets alone would require their own dedicated windtrap, both for the Ordos and the Sardaukar. The Atreides only have a single windtrap, though they would need 3.

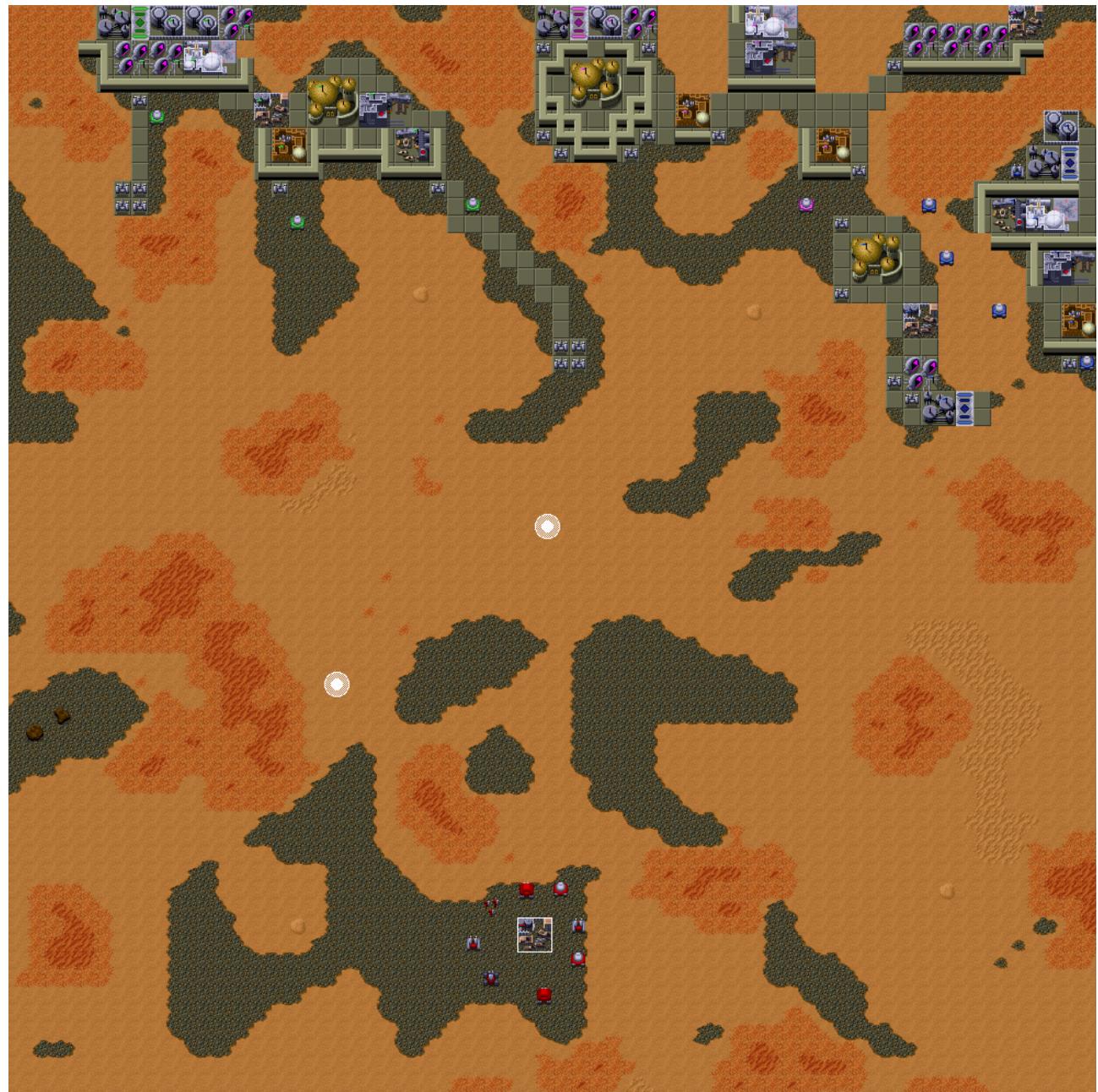
This lack of power to the structures makes unit and building production slower for the enemy bases, and thus makes the scenario much easier for the player. The lack of power also makes all the buildings slowly lose hit points. Additionally, the Atreides base has the power draining WOR facility, which the House can neither use properly nor replace, making the Atreides relatively easy pickings.



DUNE II

The Battle for Arrakis

Harkonnen Mission 9



APPENDICES

DUNE II
The Battle for Arrakis

Appendix 1: Anomalies and Bugs

There are several known issues in Dune II. These are all addressed here. The issues are in two distinct categories; known anomalies and outright bugs. This list is the most complete bug list to date.

Anomalies

While technically not a bug *per se*, the routine for saving a game allows for a name with a length of 65,536 bytes. This is the average length of a short story or novelette. The game will both save and load the files without a problem, but an excessively long name might cause other problems.

The maximum amount of spice allowed to be stored is 32767 credits. After this spending is reversed; harvesters decrease money, building increases money. This is due to the credit data being stored in a signed 16-bit variable. The bug is merely cosmetic; you will be awarded points for the harvested spice.

When a spice silo is being constructed at the construction yard it is already added to your spice storage capability, even before being placed.

If the computer tries to launch a total attack with all remaining, the un-patched version of the game launches an attack using all units with a zero prefix (0X0000), instead of all units (0xFFFF). The only unit with a zero prefix is the carryall. The AI is supposed to use this tactic immediately upon the player attacking any AI building. Needless to say, such a non-violent, pacifist aerial attack leaves the computer at a disadvantage.

Repair cost calculation is unfair. Dune II uses a 256 float-resolution, meaning that you get rounding errors very fast. As a result a Palace costs nothing to repair, and a windtrap costs 2 credits instead of 3 credits per repair tick. In detail, the mathematics is this: $(2 * 256 / \text{hit points}) * \text{credits} / 256$. The first part causes rounding errors.

When building a wall, the owner-bits are not cleared correctly, which in theory could mean a wall built by the player could show up as being owned by the Sardaukar.

When building a structure completely on slabs, it still degrades. This seems diametrically at odds with the idea of slabs.

When building a structure, the fog is only removed with a radius of 2 from the first tile defined in the layout of the structure; the first tile being the upper left tile. This is most noticeable with the palace and the spice refinery, leaving the rightmost parts of them still in the fog, even after being placed.

If one structure gives a script error, no structures after it in the linked list are handled. This is obviously not really correct.

In Script function which finds the closest unit to target, it does not pick the closest unit within range, but the one with the highest index within range.

Too many tile colors are remapped with house colors, causing graphical issues with the IX building. The game engine maps the colors 0x90 to 0xA0, instead of correctly mapping the colors 0x90 to 0x96.

When taking over a building by having an infantry walk in it while the structure is on low hit points, your own units keep firing at it, and will most likely destroy it.

When you have a refinery and have lost all your harvesters, you get a new one even if you are currently building one in heavy vehicle factory. You will even get a new harvester if you only have one refinery and your only harvester is deviated. When the deviation effect wears off, you will have two harvesters at your disposal.

The structure '% hitpoints' is ignored. In result all structures always have 100% hit points, even when they are 99% damaged.

When getting free trikes on the map, you never get ownership of them. The parameter order is switched, where the type of the unit becomes the number of the house, and the house becomes the unit value of a trike (13). This also means that these vehicles read/write outside the house struct, which in terms results in random artifacts.

Windtraps that have less than 50% hit points still produce 50% of the power, even though the GUI tells you differently. Of course the GUI makes more sense in this case.

Within certain limitations, the computer has unlimited credits. You can destroy all refineries and silos, but the computer can always rebuild them. The AI does, however, use credits and can even run out of them.

When the computer rebuilds buildings, they can be placed over your units, destroying them. This is not considered a bug. This only occurs in the upgraded version, and will obviously not be fixed. The simple solution is to not leave vehicles in a destroyed building's "old" space, if at all possible.

A mission countdown flag exists in the game engine data; this flag was in place to make countdown missions possible. The engine exists, but the flag reading code contains a bug which makes it skip the countdown, bypassing the code entirely. The flag can be raised in custom missions, but it will simply be ignored. This anomaly has no effect on game play whatsoever, it merely bloats the code.

At the start of a scenario, there will be a set of units guarding each enemy construction yard. When these units are destroyed, they are never replaced.

The French version of the looping intro demo of Dune II contains a different sound file package with higher quality French voice over files for the intro animation. The date stamps of the files are later—meaning newer—than the date stamps of the same files in the retail version. If you are using the newer files as a replacement package for the retail version, you may experience lags or gaps in the

intro audio. No other sounds are affected; the newer, differently sized files only concern the intro audio. Why older sounds files were used for retail cannot be explained.

When a unit is deviated, it automatically reverts to House Ordos, regardless of which House actually owns the Deviator. Since a Deviator can normally only be controlled by the Ordos, this is rather an oversight than an actual bug or anomaly. It is mentioned here, never the less.

Bugs

Spice silo credit capping is done outside the main house loop, causing it to only update the house which owns the latest structure. This allows you to go over your silo capacity most of the time, and then losing it all of a sudden when you start building a structure.

Rocket turrets and refineries may begin blinking, and after that the turrets will not fire on anything. This is apparently spontaneous and is very rare. The solution seems to be to either reload the game, or quit and restart the game. This only occurs in the upgraded version(s).

A bug in how the engine reads the '+' sign in scenario scripts causes the repeat flag for reinforcements to always be false. As a result reinforcements are only sent in once, even when marked as multiple.

Ornithopters are unavailable from any starport due to how definitions are stored in the SCENARIO.PAK file. You will find the word "Thopters" in the [CHOAM] definition blocks. The bug is a simple unnoticed typo. Changing the word to "Thopters"—adding a single quote—makes ornithopters available from the starport, restoring the intended functionality. You will have to restart the current mission for it to take effect.

The speed of sandworms is not synchronized with game speed. On slower game speed settings the sandworms are unreasonably fast, making it impossible for any unit to escape. This could just as well be seen as an anomaly, but the game code is not correct, so it is considered a bug.

The infamous "starport bug"; starports gets stuck and no units arrive. The message ticker displays the 'Frigate arrival in t-0 seconds' message indefinitely. This bug is exclusive to version 1.0. Get the 1.07 upgrade, or simply build another starport. This solution only works some of the time, and even then the second starport may freeze. Generally, any units on order from the first starport will be delivered to the new one. It is strongly advised you get the upgrade patch, as many things are fixed, and the game is quite a bit harder. The bug has not been reported on version 1.01.

A harvester, when full and showing the "Awaiting pickup" message, will sometimes take a very long time before it is picked up. The answer is not, as might be expected, to build more carryalls. The problem here is that your system is too close to the minimum required memory. If you are playing on a DOS system try exiting and running from a boot disk with no TSRs loaded.

Fremen will sometimes get "stuck" off screen, but will still be able to attack your base, and you cannot target them. The solution is to fire at the ground as close to the Fremen as you can get. After a while,

they will move forward and attack the vehicle instead, which will bring them onto the screen for you to attack.

The "group movement" does not work as it says in the manual due to a typo in the game data. The data is supposed to be 'wheeled' and 'tracked', but the actual data is 'wheel' and 'track'. No official patch addresses this bug.

Rocket turrets do not fire on Fremen. This is a known bug in versions 1.0 and 1.01. Simply get the official 1.07 upgrade patch, and upgrade your version.

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Appendix 2: Map format

All game data of Dune II is stored in PAK archive files. SCENARIO.PAK contains the campaigns for all three houses, which consist of region files—REGION[initial letter of House].INI—plus the scenario or map files—SCEN[initial letter of House]001.INI to SCEN[initial letter of House]022.INI.

The region files describe in which order the scenarios are played. They are needed for the map selection screen between two scenarios (the screen where you can select between the regions to attack next). The scenario files describe one map. Dune II has only 9 levels but on the map selection screen you choose between different scenarios to play.

INI Files

INI files are plain ASCII (Codepage 437) text files with a special structure. They consist of many key-value pairs. There is one pair per line. The format of one line is as follows:

<key> <whitespace> = <whitespace> <value>

<whitespace> is either spaces (' ') or tabulators ('\t') or both.

<key> may contain any characters except '[', ']', ',', '=' or line break. A whitespace is not allowed at the beginning or end of the name.

<value> may contain any characters except '[', ']', ',' or line break

The following example tells Dune II that the starting credits are 2000:

Credits=2000

Every pair belongs to exactly one section. A section is started with a line in the following format:

[<sectionname>]

where <sectionname> may contain the same characters as <key>.

A section is closed with the start of the next section or with the file end. There shall be no key-value pair before the first section is started. Given the filename, the section and the key, every key-value pair can be accessed. This implies that there shall be no two keys with the same name in one section. INI files may also contain empty lines and comments. Comments are started with ';' at the beginning of the line and end after the next line break.

Please note some INI files in SCENARIO.PAK have garbage data at the end. All software handling scenarios should be able to handle this. The easiest way is to treat it as a comment (without the starting ';'). If a line is not empty and the first non-whitespace character on the line is neither '[' nor '=' it must be a key-value pair or garbage. If the line contains an '=' it must be a key-value pair, otherwise it is garbage.

Note Dune II does not always detect comments correctly. Especially in the "UNITS" and "STRUCTURES" sections the game engine often fails to recognize comments and will parse the string thereafter. The safest way to force the game engine to ignore a line is starting it with ";=".

Regions

File naming

There is one REGION<HouseLetter>.INI file for every house. When playing the campaign you first have to select your house. Then you always play SCEN<HouseLetter>001.INI. Afterwards you get to the map selection screen. The presented map consists of 27 pieces and REGION<HouseLetter>.INI controls what pieces are changing its colors and what pieces (usually 3) are selectable by the player.

Section "GROUP<LevelNumber>"

The REGION<HouseLetter>.INI file contains 8 GROUP<LevelNumber> sections. Depending on the just played level (1 to 8) the sections are used for the map selection screen. After Level 9 there is no map selection screen and therefore no section in the file. Each GROUP<LevelNumber> Section may contain any of the following keys:

<House3Letter> = <ListofRegions>

REG<digit> = <RegionNumber>, <ArrowNumber>, <XPos>, <YPos>

<Language3Letter>TXT<RegionNumber> = <description>

It is possible to create a campaign of arbitrary length, but it entails disabling the ending cinematic, which requires hex editing of the executable, a technique rather outside the scope of this document. The ending cinematic is hard-coded to play after mission 9, and will end the campaign by default. If the ending cinematic is disabled, a campaign will follow the list in the INI files. When the end of the mission list is reached, the game will simply exit.

Colored regions

<ListofRegions> is a comma separated list of region numbers. These regions are colored in the house color of <House3Letter>, one region at a time.

Example:

ATR = 5, 13, 22

This will first color region 5 with blue, then region 13 and last region 22.

There can be only one key for each house. It is important to note here that this key only determines which regions are re-colored in a new color. If you want to know how the map looks like after e.g. level 5, you have to first calculate how it looked before level 5 based on GROUP1, GROUP2, GROUP3 and GROUP4. Then you can apply GROUP5 visually, e.g. blending in regions one by one.

Selectable regions

REG<digit> describes the selectable regions. There can be multiple REG<digit> entries, but the numbers should be continuous starting with 1, e.g. REG1, REG2 and REG3 (Dune II uses up to REG4). <RegionNumber> is the piece on the map that gets selected when clicking the region. <ArrowNumber> is the zero-based index in ARROW.SHP (in DUNE.PAK) which is used to load the right arrow picture. There are 8 different directions; Arrow 1 pointing to the upper left, Arrow 2 pointing upwards, etc. <XPos> and <YPos> determine the position the arrow shall be drawn.

The following example shows an upper right arrow to piece 8, drawn at (80, 80):

REG1=8, 3, 80, 80

There shall be 3 (different) selectable regions after mission 1 to 6. After mission 7 there shall be only 2 selectable regions and after mission 8 only one. There might be more than one arrow to one region but additional arrows to the same region must be listed after all arrows to distinct regions. When a region is selected the game determines with "REG<digit>" of the first arrow pointing to the selected region what scenario INI file to load next. This is done as follows:

```
if previousLevel <= 7
    nextMission = (previousLevel-1) * 3 + 2 + <digit>
        else if previousLevel == 8
    nextMission = (previousLevel-1) * 3 + 1 + <digit>
else
// should not be reached since there are only 9 levels
nextMission = (previousLevel-1) * 3 + <digit>
```

Text shown below the selection map

<Language3Letter>TXT<RegionNumber> encodes for which language and when the text is shown. <RegionNumber> must be one of the regions listed in one of the <ListofRegions> entries in this section. When the specified the region is faded in the text is also shown. The shown text is the value of this key. For Dune II it has to be encoded in DOS Codepage 437.

Example that will show the text when region 13 is fading in, but only if the language is English:

ENGTXT13= The Atreides claimed strategic regions.

Section "PIECES"

This section is needed to tell Dune 2 where the different pieces of the map have to be drawn. It contains keys with the format

<RegionNumber> = <XPos>, <YPos>

In Dune II the RegionNumber goes from 1 to 27. <XPos> and <YPos> determine the position the arrow shall be drawn.

Section "INFO"

This section contains only one key:

TOTAL REGIONS = <NumRegions>

<NumRegions> is 27 in Dune II.

Scenarios

File naming

There is one SCEN<HouseLetter><digit><digit><digit>.INI for every scenario and every house. In total there are 22 scenarios per house. On most levels there is the choice between 3 different scenarios. In level 1 and 9 you have no choice, in level 8 only 2.

Level	Available Scenarios/Maps
1	1
2	2, 3, 4
3	5, 6, 7
4	8, 9, 10
5	11, 12, 13
6	14, 15, 16
7	17, 18, 19
8	20,21
9	22

Map Positions

Positions on the map are saved in one integer value. All cells on the map are continuously numbered row by row starting with 0 at the top left map corner. These coordinates are always based on a 64x64 map, even when MapScale=1 and the map is displayed as 32x32. The transformation between two-dimensional map coordinates and the position value is done as follows:

$$\text{position} = \text{y} * 64 + \text{x}$$

The transformation in the other direction is $\text{x} = \text{position} \bmod 64$, $\text{y} = \text{position} \div 64$, where mod is the modulo operator and div is the integer division.

Timing

Dune II can be run with different game speeds. Depending on the game speed a different number of game ticks are performed per second:

Game speed	Ticks/Second
Slowest	15
Slow	22.5
Normal	30
Fast	45
Fastest	60

All timings in the scenario INI file are given as minutes when using the game speed "fastest".

Section "BASIC"

This section contains the following keys.

Keys "LosePicture", "WinPicture" and "BriefPicture"

The keys LosePicture, WinPicture and BriefPicture specify an WSA file that gets shown when the player loses the scenario, wins it or in the briefing before the scenario started.

Dune II uses the following values for these keys:

LosePicture (from DUNE.PAK)	WinPicture (from DUNE.PAK)	BriefPicture (from MENTAT.PAK)
LOSTBILD.WSA	WIN1.WSA	HARVEST.WSA
LOSTVEHC.WSA	WIN2.WSA	HEADQRTS.WSA
		QUAD.WSA
		LTANK.WSA
		REPAIR.WSA
		HVYFTRY.WSA
		IX.WSA
		PALACE.WSA
		SARDUKAR.WSA

Key "TimeOut"

The key TimeOut is not correctly implemented in Dune II. It is enabled with Bit3 in WinFlags/LoseFlags. Part of the code actually exists, but unfortunately the timeout is not copied into the right variable in the retail version of Dune II. This always results in a TimeOut value of 0.

Note the self-playing demo is the only officially released version that has any sort of time-out function. For more on the Dune 2 demo, see *Appendix 7: the Dune 2 demos*.

Key "MapScale"

A Dune II map is always 64x64 tiles big but only a portion of this map is displayed depending on the value of MapScale:

MapScale	Position of top left tile	Position of bottom right tile	Visible map size
0	(1,1)	(62,62)	62x62
1	(16,16)	(47,47)	32x32
2	(21,21)	(41,41)	21x21

All positions are still calculated on the 64x64 map. Map scale 2 is never used in any retail scenario, in any campaign. The small size makes such a map essentially unplayable. A map scale value bigger than 2 defaults to 0.

Note reinforcement placements are based on a 62 x 62 map when using the absolute drop location positions of north, south, east, or west. On smaller maps this results in the reinforcements being dropped 30 or 41 map squares outside the map border on the smaller and smallest maps, respectively. This may result in those units being unreachable, and the inability to engage those units will leave them present indefinitely. This may result in scenarios that cannot conclude.

Key "CursorPos"

This position specifies the position of the selected unit or structure when the map is loaded.

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Key "TacticalPos"

This position specifies the top left corner of the screen when the map is loaded. The screen is 15x10 tiles big which gives the center of the screen at

$$\text{TacticalPos} + 64*5 + 7 = \text{TacticalPos} + 327$$

Keys "WinFlags" and "LoseFlags"

The Keys "WinFlags" and "LoseFlags" determine under which conditions the game ends and which side has won. The keys are confusingly named; WinFlags only checks whether a scenario should end, LoseFlags checks for the victory or defeat conditions.

They are specified using decimal numbers but their meaning is better explained by the numbers binary bit pattern; both flags use the same bit pattern:

Bit	Decimal	Explanation
1	1	check if AI player has no buildings
2	2	check if player has at least one building
3	4	check if player credits ≤ quota

4	8	check if time \leq timeout
5	16	unused; scenario files sometimes have it set, but it is never checked

The bit pattern of the "WinFlags" key determines which of these conditions should be checked every 5 seconds. The first check is done 2 minutes after the game starts. This means no scenario will end before the 2 games minutes mark.

If any of the specified conditions is met the game will end. After the scenario ends "LoseFlags" determines which side has won.

If any of the bits in "LoseFlags" is set and the corresponding condition holds true the player has won, and the computer has lost. If all of the specified conditions are not met the computer has won.

There is one exception to this rule, only for the "LoseFlags": If Bit 1 and Bit 2 are both set than their conditions have to be both met for the player to win, otherwise the computer has won.

Examples:

WinFlags	LoseFlags	Meaning
3	1	This is the standard configuration for a battle scenario. This combination will result in a victory for the player if the enemy base is destroyed while the player base is still intact.
6	4	Bit 3 is set in both, thus the player wins if the quota is reached. "WinFlags" has additional set Bit 2 but is not set in "Lose Flags". This means the player has lost when his/her base is destroyed.
7	5	The same as above but additionally Bit 0 is set in both. If the enemy base is destroyed the game ends and the player has won. Even if the player base is destroyed at the same time as the AI base (or both bases in the first 2 minutes of the game), the player has won.
1	0	The only way to end the game is the destruction of the enemy base. Since Bit 1 is not set in "LoseFlags" the player has lost (and the AI won).
1	4	This construction is particularly interesting. It forces a particular order in which the conditions have to be met. First you should recall that the "LoseFlags" are not checked before one of the "WinFlags" conditions is met. The only specified condition in the "WinFlags" is the destruction of the enemy base like above, but this time Bit 3 in "LoseFlags" is set. If the enemy base is destroyed and the player has more credits than the specified quota he has won; if he has less the AI wins (even if the enemy base is destroyed).

The function of the fifth flag—Bit 5—is currently unknown. It is doubtful whether the original function will ever be uncovered; there is no code left for a fifth function, and the original programmers can no longer recall what the fifth flag was supposed to do, if anything. The only clue that exists to additional defeat or victory conditions is the palace description, where the Ordos and Harkonnen Mentats erroneously state a scenario is automatically forfeit if the player loses his/her palace. Beyond this scant clue there exists nothing in the game code regarding a fifth victory or defeat condition. What is even stranger is where in the campaign(s) the flag is raised; the flag is raised in the WinFlags key in Ordos and Harkonnen missions 2, 3, and 4, as well as Atreides mission 4. No mission details are shared between those scenarios. In addition, the palace description would only apply to missions 8 and 9, which have standard victory and defeat flags.

Section "MAP"

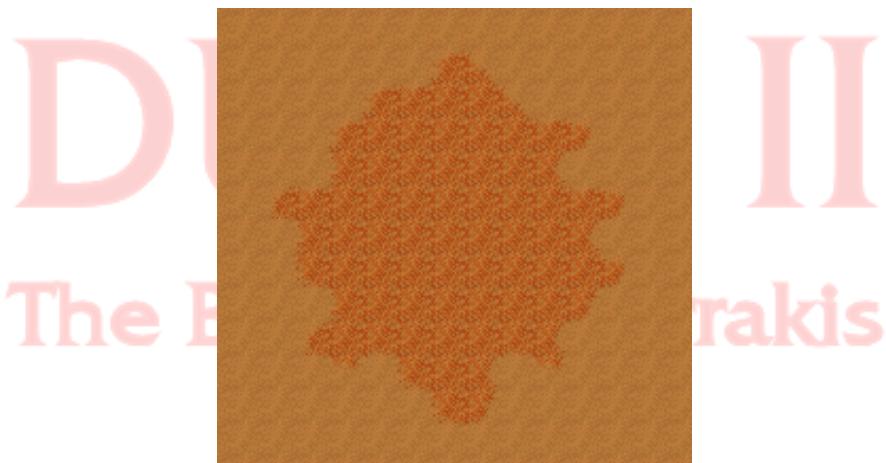
This section contains the following keys.

Key "Field"

This key specifies positions on the map where additional spice fields should be created. Its value is a comma separated list of positions. The field is a pseudo-randomly created semi-circle with a 5 tile radius centered at the position given in the key, so the resulting field is roughly 9x9 tiles in size. Spice fields added to the map via this key cannot contain double layered spice, so called spice dunes; only single layered spice, also known as spice sand. The field will only change sand tiles into spice tiles. No other tiles—rocks, dunes, hills—will change.

Example:

Field = 2000, 3048



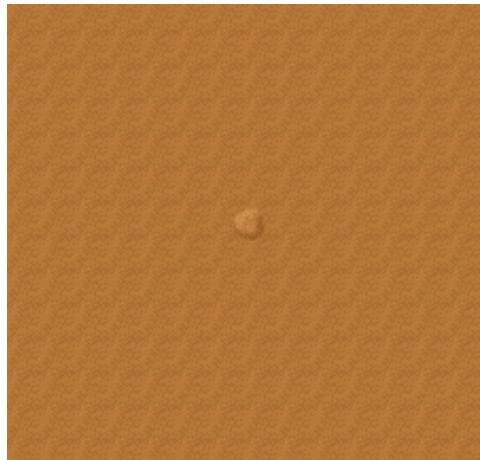
A typical spice field

Key "Bloom"

This key specifies positions on the map where spice blooms should be placed. Its value is a comma separated list of positions. The spice bloom will explode if a unit drives over it, or it is fired upon. Sonic tanks cannot detonate a spice bloom. The spice bloom cannot be detonated by aerial units or sandworms. When the spice bloom detonates it will create a field of roughly 7x7 spice fields.

Example:

Bloom = 2000, 3048



A typical spice bloom

Key "Seed"

Dune II creates its maps based on a random map generator. This random map generator uses a pseudo random number generator. The pseudo RNG is seeded with the value specified by the key "Seed", which is a single number.

Example:

Seed = 1234

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Key "Special"

This key specifies positions on the map where special blooms should be placed. Its value is a comma separated list of positions. The special bloom looks relatively similar to a spice bloom, though they are perceptibly different. It will open up if a unit drives over it but it does not open up if it is fired upon. When triggered something random happens; you either receive some credits or a unit is spawned. Unfortunately Dune II has a bug resulting in very strange behavior.

The expected behavior is that one of the following 4 things happens:

- 1) The player gets a randomly chosen amount of credits between 150 and 400
- 2) The player gets a trike for free. It spawns beside the special bloom
- 3) One of the AI players on the map—one that has at least one unit—gets a trike for free; it spawns beside the special bloom
- 4) One of the AI players on the map—one that has at least one unit—gets an Infantry unit (3 Soldiers) for free; they spawn beside the special bloom

However, apparently the Dune II programmers mixed up the parameters for the unit creation function and switched the house ID with the unit ID. This causes very weird results, because the created unit depends now on the AI players on the map. The trike has a unit ID of 13 but there is no house with ID 13; Harkonnen = 0, Atreides = 1, Ordos = 2, Fremen = 3, Sardaukar = 4, and Mercenaries = 5.

While a trike should be the unit spawned, another unit is spawned depending on your or your enemies' House. This unit belongs to the invalid house 13 and will be quite useless, because it can

interact with neither the player nor the AI. It will be an ornithopter, a carryall, or nothing, since the game will not create a ground unit with an invalid house. Aerial units with an invalid owner seem to present no problems.

Even more bizarre is the case where an infantry unit should be spawned. The unit ID of the infantry unit is 2, which is the same as house Ordos. Depending on the houses of the AI there will be an Ordos ornithopter, an Ordos carryall, or an Ordos infantry unit spawned. These units function normally. If there are Fremen, Sardaukar, or Mercenary units on the map the spawned units might be 3 Ordos troopers, 1 Ordos soldier, or 1 Ordos trooper.

If the player already has explored a special bloom which produced one of these useless units from house 13 there might be 1 Ordos trike spawned when exploring further special blooms.

Walking on top of a special bloom will not destroy the walking unit; neither will driving over the bloom destroy the triggering unit.

Example:

Special = 180, 348

The only possible units to be created are the first 6 units in the unit index, corresponding to the 6 possible Houses; 0 = carryall, 1 = ornithopter, 2 = infantry, 3 = troopers, 4 = soldier, and 5 = trooper.

There are no special blooms in any retail scenario. The official online FAQ on Westwood's site stated the special blooms were removed after "focus testing" because they apparently gave "one side a large advantage over the other". Based on this we can say with certainty special blooms were correctly coded during beta testing, but that code did not survive into retail. The sound to be played when the special bloom is triggered—"Something's under the sand"—was not removed from the sound files, however.

The special blooms mostly do nothing when triggered with the demo executable; they simply vanish, leaving a square of sand where they were. Sometimes the special blooms act as in retail.

Key "Cxxxxxx"

This key allows for placement of any in-game sprites as decorations on the scenario map. The letter C is assumed to stand for 'create'.

The syntax for the key is the following:

C<AAA><XPos><YPos> = <Integer>,<Sprite>

Where:

- AAA is an arbitrary string of characters; can be any 3-character sequence
- XPos is the X position of the sprite
- YPos is the Y position of the sprite

- <Integer> the integer must be present for syntax; sets tiledata+2.
- <Sprite> is the number of the sprite to display, beginning with 0

The key allows placing sprites such as crashed planes, damaged terrain, and decoration anywhere on the map. The sprites are read from the internal ICON.ICON file.

Example:

CBLD4040=1,24

The example places sprite 24, a blood smudge, at co-ordinates 40, 40.

Any passable, decorated terrain is internally treated as rock, making wheeled units wobble.

In contrast with temporary decorations that are placed during game play, decorations placed with this key will not deteriorate over time. While it is possible to visually re-create game structures such as entire buildings, these will be treated as decorations by the game engine; units can drive through them, they have no impact on the game, and so on.

Certain features placed with this key will function as expected; walls—values 34 to 107—placed with this key will behave like normal walls; the only difference is no House will own them, hence they will not show up on the radar. Concrete slabs placed with value 126 will function like normal slabs, and spice blooms placed with value 208 will behave like normal spice blooms. However, special blooms placed with value 209 will sometimes merely evaporate when triggered.

Terrain placed with the key will have the same properties as terrain generated by the map seed; rock—with the value 143—can serve as a base for constructions, and hills—with values 160 to 175—are only traversable by infantry and trooper units. The key can even place spice; the spice—placed with values 176 to 207—can be harvested and it will be replaced by sand. Within limitations it is possible to create completely tailor made maps with the function, especially the smallest map size; the restriction is the 10 kb upper size limit.

The decoration function is rather crude, and not really usable; the code to produce the sprites was never finished during programming. This manifests in unorthodox behavior, such as many sprites initially being placed on black background, having the background change during game play, and so on. Very few decorations will behave as intended, they are all listed above. Also note the sprite IDs differ between the Dune 2 versions, due to the later version having fewer sprites.

Using this key is not recommended. The key is not used in any retail scenario.

Section "<House>"

For every house that has units or structures on the map there shall be one house section with the name of the house. There are two exceptions to this rule:

- Players that only have Sandworms on the map—they usually belong to Fremen—can omit their house section

- Players that appear in the middle of a game; e.g. Sardaukar reinforcements, or Fremen Troopers called by the Atreides palace

Key "Quota"

This key specifies the amount of credits this player needs to harvest and refine to win. It is only used if Bit 3 in "WinFlags" or "LoseFlags" is set. Setting "Quota" for AI players is virtually meaningless.

Starting credits and refined credits are handled separately by Dune II. Both together give the current amount of credits the player owns. When spending money the starting credits are first reduced until they are 0, and only after then are the harvested credits spent. To reach the winning condition the player has to have the specified amount as harvested credits.

Key "Credits"

The starting credits are specified by this key. The amount should be less than 32,768 to be displayed properly.

Key "Brain"

This key can have the value "Human", "None", or "CPU". The game will try to load any combination of values, but only one player can be a human player. All others have to be AI players and therefore of type "CPU". Values of "None" are accepted but will do nothing; the value is seemingly a remnant from the testing stage, and has no effect on the game what so ever. In fact, any value for the key other than "Human" will default to "CPU". Also, if several values of "Human" are detected, only the first one detected will be controllable.

Key "MaxUnit"

This key specifies up to which unit count the player is allowed to build units. It is only relevant for building units; not for ordering them at the starport. Nevertheless ordering units at the starport will increase the unit count and may later disallow the player to build units. The key is misspelled "MaxUnits" in many of the retail scenarios, thus rendering the key invalid.

Section "CHOAM"

This section describes what vehicles are available at the starport and in what amount. For every available vehicle there is one key-value pair in this section with the key being the name of the vehicle and the value giving the amount of vehicles available for order at the beginning of the game. The special value -1 indicates that the vehicle will be available during the game but the amount at the beginning is 0.

Example:

```
[CHOAM]
Launcher=2
Trike=3
Quad=-1
```

This makes 2 launchers and 3 trikes available at the beginning of the game. Quads will be later available.

Every 30 seconds a unit is chosen randomly and its amount is increased by 1, up to an amount of 10. If the chosen unit is not listed in the "CHOAM" section and thus not available nothing happens. Furthermore the prices for all available vehicles are changed every 60 seconds. The price is calculated with the following formula:

```
price = min( rand(4,15) * UnitPrice / 10 , 999 )
```

where $\text{rand}(a,b)$ gives a random number between a and b and UnitPrice is the normal price the unit costs when building it in a factory.

CHOAM is short for *Combine Honnête Ober Advancer Mercantiles*.

Section "TEAMS"

This section is used by the AI. It defines several teams of units controlled by the AI. All units produced by the AI will be added to one of the teams. A team is defined by a key-value pair with the following format:

<TeamID>=<HouseName>,<Behaviour>,<Type>,<MinUnits>,<MaxUnits>

<TeamID> is the ID of the team. It is a number between 0 and 15. Normally team ID starts with 1 and goes up continuously.

<HouseName> is the house of the team.

<Behaviour> can have one of the following values:

Normal	Normal means a team can retreat, and regroup.
Kamikaze	Units in Kamikaze teams will not only attack until destroyed, but also ignore enemy fire and focus on taking out priority targets, i.e. structures. All other team types return fire and switch their targets to those units—but, as it seems, not turrets—that attacked them.
Staging	This is the only defensive team type. The AI will amass units inside the base and position them so that the buildings and approaches to the base are guarded. The units in a Staging team will remain where they are for most of the time, and only attack hostile units in range.
Flee	The Flee team type is designed as a quick strike force. Once produced, units immediately leave for the enemy base, and the entire team is being assembled on the move. Teams of this type can easily overwhelm the player because they generate an almost constant flow of units; killed units get replaced immediately.

<Type> determines the type of units to produce for this team:

Type	Unit
Foot	Infantry and Trooper units
Wheel/Wheeled	Raider and Quad units.
Track/Tracked	All tracked units like Tanks, Launchers, Siege Tanks, Sonic Tanks, Devastators and Deviators.
Winged	'Thopters
Slither	Sandworms
Harvester	This is an unknown type. While the team should rather obviously consist of harvesters, no harvester teams are actually produced by the game engine.

Note that Dune II has a bug regarding Wheel and Track teams. The program checks for "Wheeled" or "Tracked" but the scenario files contain 'Wheel' and 'Track'.

<MinUnits> and <MaxUnits> determine the minimum and maximum size of the team.

Section "UNITS"

This section contains all the units that are placed on the map when the game is started. For every unit there is a key with the following format:

ID<ID>=<House>,<Unit>,<Health>,<Position>,<Angle>,<Order>

<ID> is a unique 3 digit number used internally by Dune II. Two units cannot have the same ID number.

<House> is the House of the owner of the unit

<Unit> is the type of unit to place. The following are valid names:

Carryall	'Thopter	Infantry	Troopers	Soldier	Trooper	Saboteur
Launcher	Deviator	Tank	Siege Tank	Devastator	Sonic Tank	Trike
Raider Trike	Quad	Harvester	MCV	Sandworm	Frigate	

Placing frigates with this function will produce no unit; while the syntax is correct and the scenario will load without problems or errors, the frigate is not a player controllable unit in any sense. As a result, no unit will show up on the map at all.

If sandworms are placed on rock via this key, they will immediately head for the nearest area of sand and proceed normally.

<Health> gives the initial health of the unit in percent of the maximum health of this unit. A value of 256 equals 100% health; 128 equals 50% health.

<Position> is the position on the map.

<Angle> gives the initial heading of the unit. The value gives the angle in which the unit is orientated.

The following table shows the possible values:

0	North	32	Northeast	64	East	92	Southeast
128	South	160	Southwest	192	West	224	Northwest

<Order> gives the initial order of the unit. The following orders are possible:

Guard	The unit will attack enemy units but will neither move from its location nor follow enemy units. The unit will stay put until an enemy comes within range. After the enemy is destroyed it will return to its default location. MCVs and harvesters will default to IDLE if their mode is set to this. Carryalls and sandworms will ignore this mode.
Ambush	Ambush means a unit will remain in position until sighted by the enemy, and then proceed to attack any enemy units it might find on the map. The unit will stay put until found, then it will follow the enemy and attack until either is destroyed. Human controlled units in Ambush mode will attack any enemy within sight. MCVs and harvesters will default to IDLE if their mode is set to this. Carryalls and sandworms will ignore this mode.
Hunt	Hunt makes a unit start from its position towards enemy units, even if the player has not sighted the AI; normally the AI will not attack until there has been a contact between the player's and the AI's units. Also works for player controlled units; they will head towards any enemy units on the map upon mission start if the enemy is within sight. MCVs and harvesters will default to IDLE if their mode is set to this. Carryalls and sandworms will ignore this mode.
Area Guard	Area Guard is the most common command for pre-placed Computer-controlled units. They will scan for targets in a relatively large radius, and return to their original position after their target was either destroyed or if it left the immediate area. MCVs and harvesters will default to IDLE if their mode is set to this. Carryalls and sandworms will ignore this mode.
Stop	This is the default mode for the MCV. The mode can be used with a harvester as well. Any other unit given this order will default to IDLE. The unit will neither move nor attack in this mode. Carryalls and sandworms will ignore this order.
Deploy	This order is only useful for the Mobile Construction Vehicle. All other units will simply ignore the order. When this order is given to the MCV in the scenario data, the unit will immediately deploy when the scenario is started. The MCV must be placed on rock for the order to work, otherwise the order is ignored and the MCV will default to IDLE.
Harvest	If used for a harvester it will immediately go to the nearest spice field and start to harvest spice. If the mode is set for any other unit it will work as Stop, and default to IDLE. Carryalls and sandworms will ignore this mode.
Sabotage	Sabotage is the default command for Saboteurs, who will head towards the highest priority enemy structure on the map that is already explored and attempt to destroy it. Other infantry with this order will head towards an enemy structure and enter it, either dealing damage or capturing it. MCVs and harvesters will default to IDLE if their mode is set to this. Carryalls and sandworms will ignore this order.

Example:

```
[UNITS]
ID034=Atreides,Sonic Tank,256,1837,32,Guard
ID024=Ordos,Siege Tank,192,2649,96,Area Guard
```

This places an Atreides sonic tank at position 1837 with 100% health. The sonic tank is headed towards the northeast and put in guard mode.

The second unit is an Ordos siege tank at position 2649 with 75% health and headed towards the southeast. It is in area guard mode.

Section "STRUCTURES"

The section "STRUCTURES" contains all the structures that are placed on the map at the beginning of the game. For every structure there is one key-value pair. For walls and concrete the format is as follows:

GEN<Position>=<House>,<StructureType>

<Position> is the position on the map.

<House> is the name of the House this wall or concrete belongs to. This is important for placing buildings near this wall or concrete.

<StructureType> is either 'Wall', 'Concrete' or 'Concrete4'. When placing other structures the ID format for structures should be used. The game might behave strangely if placing regular structures with 'GEN', since the owner bit is not set properly when using the GEN format. The GEN entries do not need to be consecutive.

The other format for structures can be used for any type of structure, but should be used for anything beside Wall and Concrete.

ID<ID>=<House>,<Structure>,<Health>,<Position>

<ID> is a unique 3 digit number used internally by Dune II. The ID numbers do not need to be consecutive; they are in fact arbitrary. No two structures can have the same ID.

<House> is the House the structure belongs to.

<Structure> is the name of the structure to place. The following table lists all 19 possible values:

Concrete	Concrete4	Palace	Light Fctry	Heavy Fctry	Hi-Tech	IX
WOR	Const Yard	Windtrap	Barracks	Starport	Refinery	Repair
Wall	Turret	R-Turret	Spice Silo	Outpost		

<Health> gives the initial health of the structure in percent of the maximum health of this structure. A value of 256 equals 100% health; 128 equals 50% health.

<Position> is the position on the map.

Example:

```
[STRUCTURES]
GEN1629=Atreides,Concrete
GEN1693=Atreides,Concrete
ID000=Atreides,Const Yard,256,1630
ID001=Ordos,Const Yard,128,2650
```

This will create an Atreides construction yard at position 1630 with 100% health. To the left of the construction yard there are two tiles of concrete. The Ordos construction yard is at position 2650 with 50% health. However, the game engine completely disregards the hit point entries, making the entry utterly redundant.

When the game engine places a structure, only the top left corner of the building is checked for free ground. This can result in building being placed on hills.

Section "REINFORCEMENTS"

Reinforcements are units dropped near the home base or the enemy base or somewhere else. Dune II uses a table with 16 entries to store them thus there can only be 16 reinforcements specified. They have the following format:

<TableIndex> = <HouseName>,<UnitName>,<DropLocation>,<Time>

<TableIndex> is the index in the reinforcement table used by Dune II. In the original Dune II missions the developers used only index 1 to 15. The indices should be continuous and they most commonly start with index 1. It is however possible to have 16 reinforcement entries; if a 16th entry is needed it must have index 0 to not overflow the table.

<HouseName> is the house the reinforcement belongs to.

<UnitName> is the name of the unit to drop.

<DropLocation> specifies where a unit should be dropped. There are 8 different values possible:

Drop location	Meaning
North East South West	The unit will suddenly appear at the top, right, bottom or left edge of the map. At the top and left edges the unit is not placed directly at the edge but at a distance of 2 map squares from the edge; at the bottom and right edges the distance is 1 map square. This DropLocation only works reliably on maps with a MapScale of 0. Other map sizes will see the units dropped outside the map. This might result in peculiarities such as never ending scenarios because the dropped units can never be destroyed.
Air	This will drop a unit with a carryall at a randomly chosen position on the map. This is the only truly random reinforcement distribution method.
Visible	This will drop a unit with a carryall. The unit is dropped in the map rectangle currently visible. At the start of the mission this is: Drop.x = rand(TacticalPos.x, TacticalPos.x+14) Drop.y = rand(TacticalPos.y, TacticalPos.y+9)
Enemybase Homebase	This will drop a unit with a carryall. "Homebase" drops the unit near the base of the owner of the unit. "Enemybase" drops it near the other player. Thus the drop location is relative to the owner of the unit. If there is no base (= no structure) a unit of the player is located. If even this fails the unit is dropped randomly on the map.

The unit is dropped in a circle with radius 7 around the located structure or unit (the position base):

```
r = rand(0, 7)
angle = rand(0°, 360°)
Drop.x = base.x + r * sin(angle)
Drop.y = base.y - r * cos(angle)
```

If the chosen drop position is occupied the position finding algorithm is simply repeated until a free position is found. If there is no free position the game will hang.

<Time> is the time in minutes when the unit should be dropped. It may be postfixed with a '+' meaning it should repeat infinitely, every ((value * 6) + 1) game minutes. Unfortunately Dune II has a bug in the game code which results in the game engine ignoring the '!' character; the code compares the first character of the lines, instead of the last as it should. The reinforcement repeat is easy enough to enable with simple hex editing, but such an endeavor is rather outside the scope of this document. Never the less, the reinforcement bug is universally recognized. When using the original, retail version the plus sign is redundant.

If multiple units of the same house should be brought at the same time there will be only one carryall delivering them all.

Example:

```
1=Atreides, Trike, Homebase, 6
2=Atreides, Infantry, Homebase, 6
3=Atreides, Infantry, Visible, 11
4=Atreides, Infantry, Visible, 11
5=Harkonnen, Trooper, Enemybase, 5+
6=Harkonnen, Trooper, Enemybase, 5+
```

This will drop a trike and an infantry unit at the Atreides base after 6 minutes. After 11 minutes two infantry units are dropped at the Atreides base. Additionally every 5 minutes two trooper units should be dropped; these are however only dropped once due to a bug in the code. They are also dropped in the Atreides base because they are Harkonnen and should be dropped in the enemy base (= the Atreides base).

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Appendix 3: User FAQ

These are some of the most common questions asked by players of Dune II. If your question has not been answered elsewhere in this document, you might find an answer here.

When I try to create a vehicle I get the message "Unable to create more".

When I try to create a structure I get the message "Unable to create more".

The computer keeps rebuilding the rocket turrets I just destroyed.

My carryalls and ornithopters will not accept any orders.

My carryall never returns the harvester to the field.

The Death Hand missiles keep destroying my base.

The house of IX does nothing.

I cannot shoot down ornithopters.

I cannot steal spice.

I build more refineries, but I keep losing credits.

I have several heavy vehicle factories but I cannot create more units.

My carryall never transports units back after they have been repaired.

There is no more spice.

The Death Hand missile does not strike where I aimed it.

Sometimes the sonic tanks have a shorter range than missile launchers.

The new technologies are not consistent.

I am playing as the Ordos, but cannot get missile launchers.

I cannot capture a building.

I can not build any ground vehicles, but I can still build carryalls.

My harvesters do not return to their home refinery.

The scoring system makes no sense.

When I try to create a vehicle I get the message "Unable to create more".

This is due to the fact that using production facilities you cannot create more than 25 vehicles. There are a few solutions to this one. Build a starport; this lets you create many more vehicles—until they sell out—but only of certain types, e.g. you cannot buy your special house weapons from there, etc. Send your lower class vehicles—if you have Tanks, get rid of Quads and trikes—to map out the enemies structures, and in the process, get destroyed; then use the freed up vehicle slots to create stronger units.

When I try to create a structure I get the message "Unable to create more".

This is due to the fact that there can only be a total of 75 structures on the entire map. This message generally only occurs in the last mission, as there will be three opposing forces all building against you. When you get this message you can either:

Destroy one of your old buildings, and create the new one. This is not advised, as with the Death Hand opposing you, you will have enough trouble keeping your structures standing. It can, however, be advisable to destroy your rocket turrets and move them forward to let your defenses "roll" forward as you expand.

The better method is to send a series of vehicles to destroy a few outlying enemy structures. Do not worry about defending the vehicles, just destroy one structure, and pull back. As soon as the structure falls, start building your own. If you wait too long, the computer will rebuild and you will have lost your opportunity. The size of the building you can build afterwards depends on the size of the building you destroyed. If you destroyed one rocket turret, do not expect to be able to build a palace.

The computer keeps rebuilding the rocket turrets I just destroyed.

First destroy enough space on the same rock section as the enemy to build a Construction Yard. Then use that yard to place concrete up to the enemy turret, and use your vehicles to destroy the turret. As soon as it is destroyed, build a turret of your own and place it in the exact same square as the enemy one was. The computer never seems to have any originality and build the turret elsewhere. This is also useful as the turret immediately targets enemy units as they are produced. The problem with this method is the fact that sometimes the Turret will change sides and become the computers. Beware of this.

My carryalls and ornithopters will not accept any orders.

You cannot issue any orders to these units; ornithopters automatically attack the enemy base, and carryalls do whatever is judged most appropriate by the computer; carry harvesters to and from spice fields, pickup damaged vehicles, et cetera. Carryalls can be influenced by putting damaged vehicles on Guard, instead of Move or Attack, as carryalls seem to give preference to Guarding vehicles.

My carryall never returns the harvester to the field.

The carryalls must "learn" where the harvester was harvesting, and then it will be returned there after unloading harvested spice. Two things will disrupt this. If you have fewer carryalls than harvesters, and two needs to be taken back at once, one will be returned and the other will be deployed next to the refinery. You must send the deployed one back to the spice fields manually. Also, if the place where it was harvesting has no spice left, it will be deployed next to the refinery, and you must set it harvesting manually.

The Death Hand missiles keep destroying my base.

There are a few ways of getting around the problem of a destroyed base. Spread your base out. That way, if a missile hits, it will not destroy too many buildings at once.

Build or buy a MCV to replace your construction yard if it gets destroyed.

If you do not let Harkonnen units get within sight of your base, the missiles' hit chance is much lower. To achieve this, build rocket turrets well away from your base, in the direction of the Harkonnen, and defend them with tanks.

Build another construction yard as far away as possible from your first one. That way, if the main one gets destroyed, the missiles will start to be targeted on the newly built one, and this will get you some breathing room to rebuild.

Send a large contingent of vehicles to take out the palace as quickly as possible.

Build a palace as far away from your main base as possible. This will then become the target for Death Hand missiles. The first option is to cheat. Save frequently, roughly every 2 to 3 minutes. If your base gets hit, reload the game. Make sure you save before the message "Missile Approaching!" comes up, as by this time the missiles target point has already been set.

The house of IX does nothing.

The house of IX is only useful when you have built a heavy vehicle factory. It allows you to build the House weapons (Devastator, Sonic Tank, or Deviator). The house of IX also allows you to build ornithopters in the hi-tech factory if you are playing as Atreides or Ordos.

I cannot shoot down ornithopters.

Build rocket turrets as soon as you can; they provide an excellent defense against enemy vehicles, but secondly because they are the only unit with any chance of destroying an ornithopter. Do not worry if it seems to take a long time to destroy the ornithopter – remember it is moving very fast and it takes quite a few shots to get a hit. All it takes is one hit to destroy it however, so be patient and repair whatever it is attacking. Also do not worry if some of your missiles miss, and hit your own buildings – just repair the damage quickly. Before you can build rocket turrets, you must build a radar outpost and upgrade your construction yard twice.

I cannot steal spice.

As a general rule it is fairly pointless to steal spice. Once a spice silo is damaged "into the red" so it can be captured, it will generally be attacked immediately by the surrounding enemies, and destroyed in a short space of time. The simplest way to successfully steal spice is to deviate an enemy harvester and make it empty its contents into your refinery.

I build more refineries, but I keep losing credits.

Do not overdo it. In later games it is enough to build one and simply buy an extra harvester or two, and focus on building silos instead. There are many good reasons to do so; they take up less space, they cost less, they hold only 100 units less of spice, and they use less power.

I have several heavy vehicle factories but I cannot create more units.

Generally, one factory is enough to create your army. A second factory only decreases the speed of constructing your attack force. Remember you can only create 25 units; once the limit is reached, you can only increase the number by buying units from the spaceport. If you want a large number of vehicles quickly, build two factories. In the long term your money and building space is better used for other things.

My carryall never transports units back after they have been repaired.

Completely surround your repair centre with other buildings. This way the repaired unit will automatically be carried away by a carryall. Be advised, if you only have one carryall and it gets destroyed or is doing something else when you have a vehicle ready to be returned to the field, the repaired vehicle will eventually smash its way out of the repair centre, destroying a building if necessary.

There is no more spice.

The amount of spice is limited on each map. Once it is totally gone, it cannot be replaced. The only way to get more is to steal it from the enemy, which is difficult.

I cannot skip the opening intro.

After you have watched it once, a zero-length file called ONETIME.CFG or ONETIME.DAT is created in the main game directory. After this the intro may be skipped by pressing the space bar or clicking the mouse. You may even create this file manually. In fact, any save game file, or high score file will force a skip of the opening intro, if present. Even stranger, any file with a DAT extension will do the same.

The Death Hand missile does not strike where I aimed it.

The Death Hand is inaccurate by design. If it always hit where you aimed it, Harkonnen would be immensely overpowering.

Sometimes the sonic tanks have a shorter range than missile launchers.

Dune II has a bug relating sonic tank range to game speed. At the slow or slowest setting sonic tanks have a much shorter range. When playing at normal game speed the range is roughly equal. Effectiveness depends on the target size; launchers are better against larger targets, sonic tanks are better against smaller ones. When playing at fast or fastest game speed sonic tanks have a greater range and quickly dispose of rocket turrets without suffering damage.

The new technologies are not consistent.

This varies between the houses, but a basic list is:

- Level 1, 2, 3 - light vehicle factory, barracks
- Level 4 - heavy vehicle factory, WOR
- Level 5 - gun turrets, rocket tanks (not if playing as Ordos)
- Level 6 - rocket turrets, starport, hi-tech, siege tanks
- Level 7 - House of IX
- Level 8 - palace
- Level 9 - {nothing new}

I am playing as the Ordos, but cannot get missile launchers.

The Ordos can never build missile launchers, but they may buy them from the starport, when available. If they capture an enemy heavy vehicle factory, they may be able to use it to produce them, if certain conditions are met.

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I cannot capture a building.

Damage the building until it is in the "red" damage sector. Then move an infantry unit in to take it over. If the damage is not in the red, then the unit is destroyed, and the building is damaged.

I cannot build any ground vehicles, but I can still build carryalls.

This is due to the fact that there is a separate count for the total number of carryalls and ornithopters owned by everyone, just like the building quota. If the computer has too many, shoot them down as they are picking up a damaged vehicle.

My harvesters do not return to their home refinery.

Harvesters generally return to the last refinery they unloaded at. If you want it to go to a different one, you have to instruct it to Move there, and after that it should return to that one, if possible.

The scoring system makes no sense.

The score depend very little on time, despite what it looks like. The main things that factor in to it are amount of spice harvested, number of enemy units destroyed and number of enemy buildings destroyed. Buildings that are taken over do not count as buildings destroyed. To maximize your score, take time at the end, before destroying the last building, to harvest all available spice. Even better, let

the last enemy building left be a refinery, and harvest spice while destroying the continual supply of harvesters the computer will get.

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Appendix 4: Exploits and Hacks

There are no actual, built-in cheats for Dune II; no secret codes, no Easter eggs, nothing of that kind at all. The only available in-game cheats are in the form of game engine exploits, or outright data hacks. Since hacks are both innumerable and generally considered bad form, only a select few will be mentioned.

Exploits

The infamous speed cheat is the most well known of all exploits; the speed setting changes the range of the sonic tanks; the faster the game setting, the longer the range. At the fastest setting sonic tanks outrange missile tanks.

Units sometimes only do half damage vs. other units; buildings always take full damage. It is dependent mostly on the unit's position relative to the target, and occasionally on the current game speed. For example, a quad's attack damage is like the following:



The quad is located in the centre, the darkest tiles mean the quad will do full damage in that square, and the medium dark tiles mean the quad will do half damage in that square. Many units do full damage straight north or south, full damage to the squares adjacent to straight south, and half damage to other squares. In a unit vs. unit combat, you should move your units one square to the west or east of any square above the enemy unit—this means one tile diagonally above the enemy—so the unit is doing full damage to the enemy but the enemy is doing half damage to the friendly unit. The advantages are not inconsequential; an Ordos raider trike can beat a quad this way, and a siege tank can beat a Devastator this way as well. For equal units that fire twice at full health—quad, siege tank, and so on—your unit ends up with about 60% of its hit points left when the other unit dies, because units only fire once when below half health. Many times, it is advantageous to move to the superior firing position even if it means taking an extra hit or two. The half damage rounds down, so a quad, with a normal damage rate of 7, only does 3 points of damage if its damage is halved. Mathematically, this is only 42% of the initial damage rate. A 49% damaged quad at an inferior firing position will make only 3 points of damage per round, whereas a 51% damaged quad in the superior firing position will make a total of 14 points of damage per round.

Also, when troopers fire their rockets, they only do 4 points of full damage, compared to 5 points of full damage if they are using cannons, so it is actually better to stay at a distance. Of course, if you are in a square where they are only doing half damage, they only do 2 points of damage either way due to the rounding. Mathematically this means their damage rate gets cut to only 40%. Rockets seem to do full damage in the vertical, horizontal, and diagonal directions, but half damage in the other squares.

The Ordos deviator changes the loyalty of a targeted unit to yours for a short period of time. If you deviate an enemy unit, select it, and then click the Attack or Move button without selecting a target. Eventually, the unit will revert to its original side. However, you will keep the target cursor, and can now select a target. The unit will think it received the command from its own side, and will execute it and continue to do that command until it is completed or the unit takes damage. Common uses of this tactic are to have the "deviated" unit destroy a computer structure or to command an enemy harvester to drive back to your base, where you can destroy it. Any harvested spice in the enemy harvester when it is destroyed will be placed on the ground.

If you are short of spice around your base—or if most of it is near the enemy base and you do not feel like risking your harvester each time it is harvest time—once your harvester is 99% move it to an area close to your base—preferably away from where the enemy is attacking you so that the sand is not filled with combat holes—and destroy your harvester with your tanks, or whatever unit is available to you. The amount of spice that will disperse over the sand in the explosion can be up to three times greater than what the harvester contained; it is however never less than the initial harvester content. You can repeat this as many times as needed. Starting with any percentage of spice content in the harvester, you can go on to multiply spice indefinitely giving you in effect unlimited credits; you can even "re-spice" whole maps if desired. This is not fixed in any version of the game.

In version 1.0 of the game, you can exploit a carryall glitch by placing a refinery very close to a spice pool. The carryall will bring the harvester as soon as you place the refinery. Let the harvester collect spice for at least five seconds and issue a return to refinery command; sometimes the exploit will work by clicking "Return" immediately. If the carryall that brought your harvester is still milling around near your base—as it many times will be—it will pick up the harvester and transport it to your base. The harvester will drop some credits and soon be ready for release. The carryall then takes the harvester back to the field and never leaves the war zone, as it normally should. Instead, it will behave as if you had constructed a carryall. This is very useful early in the game before carryalls become available for construction. The glitch essentially makes carryalls available in any mission. Any carryall bringing a new harvester can be fooled to stay, so this works just as well with the second or third refinery. This bug is fixed in version 1.07, although by synchronizing two harvester returns you can keep a carryall in the field indefinitely in version 1.07, as well.

The Atreides sonic tank attack range is supposed to cover the whole screen, but the range is actually determined by the game speed setting. When set to "Very Fast" the attack covers the whole screen, but when set to "Very Slow" it only covers about half of the screen.

Carryalls pick up damaged units and bring them to a repair center, but if every side of the repair center is blocked, the carryall will return the vehicle to its former position. As long as the unit attacks buildings, the enemy will ignore it.

In order to keep the game playable on 8-16 MHz systems, off-screen units update at about half the rate of those on-screen. This only affects movement, but it results in the player being able to move an army much faster if the map is scrolled to keep the units in view. The speed increase may be up to 200%.

The AI launches the Death Hand missile against the first structure in the internal structure list that is not an ally; mostly this is the player's construction yard. If the player wants to redirect the Death Hand missiles—and thus turn them into a non-threat—it is easy to place a building at the top of the structure list; simply destroy a Computer-controlled structure and directly build one of your own. This will create a new non-ally structure entry with the lowest index. If you want to, you may place this structure at the far end of a long line of slabs. The Death Hand missiles will now be directed there.

Other cheats consist of merely taking advantage of the AI limitations, such as only defending in the direction of the enemy base, and so on.

Hacks

For outright data hacks; to get more than 25 units, use a hex editor to edit the SCENARIO.PAK file, and find the line containing "Brain=Human, Maxunit=25, Credit=1500". Simply change the number after the 'Maxunit' token to 99. Be advised the game engine is not designed for this amount of units, and you may experience anomalous behavior if you change the file. Also, setting the credit line to -1 will give you 65,536 units of credit. The game will display negative numbers, but the huge credit amount is internally real. Make a backup copy of any game file you intend to change.

Other hacks include changing the credits of the player and enemy unit hit points in saved games. Any such exploits are held as bad form and they will not be presented here.

Appendix 5: Patch 1.07

This is a complete list of fixes and changes for the 1.07 upgrade patch.

Bug/error fixes:

- Fixed the "Frigate arrival in T-0" Starport bug
- The numbers of units in stock at the starport that are defined in each mission are now used correctly; there were some problems with it in version 1.0
- Fixed a bug that sometimes caused carryalls that drop scripted reinforcements to get stuck at the border of the map
- Fixed a small graphical glitch on the Atreides Mentat screen
- Fixed a broken frame in the gun turret animation
- The corners of the map are no longer revealed from shroud at the beginning of the mission
- Fixed some minor errors in briefing texts

Gameplay changes:

- The AI now rebuilds destroyed structures more actively and frequently
- Building repair cost has been reduced
- Palace repairs now cost nothing
- The maximum overall number of buildings that can be present on the map reduced from 81 to 80
- The player can now build concrete slabs and wall segments even if the building-per-map limit is reached; in version 1.0, no construction whatsoever is possible if the building limit is reached, although concrete slabs and walls are actually not affected by it
- The saboteur is now visible to the player
- The maximum number of saboteurs that can be present on the map at any given time reduced from 3 to 2
- Ornithopter hit points increased from 10 to 25
- Troopers and launchers are now able to fire at air units
- The maximum number of sandworms that can be present on the map at a time reduced from 3 to 2
- The number of units a sandworm will swallow before disappearing reduced from 4 to 3
- Fremen units and sandworms are no longer ignored by turrets
- Carryalls can no longer be tricked into remaining on the battlefield after delivering a new harvester
- All mission 2 maps have an added enemy construction yard

Interface changes:

- The "Repair" button on the sidebar now starts flashing red when a building is below 50% its original HP; in version 1.0, the button always flashes red regardless of the damage
- Most unit orders can now be correctly issued from keyboard by pressing the first letter of the corresponding order's name
- Pressing the "A" key no longer can be used to issue a "Harvest" order to a harvester
- Pressing the "G" key now orders a combat unit to guard

- Pressing the "H" key no longer orders a combat unit to retreat
- The wormsign is now announced for the Atreides player; in version 1.0, the wormsign would only be announced if the owner of the sandworm was not Fremen, presumably because the Atreides and the Fremen are allied

Miscellaneous:

- Added two more player ranks ("Chief Warlord" and "Emperor") to the scoring system
- The Fremen color scheme has been made a bit brighter
- Removed several animation frames of the heavy vehicle factory, repair facility and hi-tech factory
- Removed two Mentat database entries: "Sardaukar" and "Frigate"; the corresponding image of the frigate had also been removed from the files of the US patched version; it is still present in the European releases
- Certain characters from the 6p font (used on the game sidebar) have been narrowed down by 1 pixel. These include the letters C, E, F and L

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Appendix 6: Official Dune II FAQ

A list of the most commonly asked questions from our customers is listed below. If you don't see something on this list, check with our general list of questions instead.

As always you can write us mail and we'll try to get back to you within 24 hours.

The Starport never delivers my units!

My system locks up after I exit to DOS.

I can't create teams.

Where are the extra units and other items under the spice blooms?

I can't get my music card to hear the voices in DUNE II.

The Starport does not deliver ordered units.

There are several types of machines that do not work correctly with DUNE II. Specifically, the starport will not deliver goods after the countdown timer has expired. To fix this, we have issued a patch which upgrades the 1.01 version of the game to version 1.07. Please be aware that old save games will not work with the newer version of the game.

DOWNLOAD THE DUNE II PATCH FILE –

ftp://ftp.westwood.com/pub/dune2/updates/dune_fix.exe

My system locks up as soon as I exit the game.

Most of the new memory managers will allow you to use the monochrome memory region to get back a little more low memory after installation. DUNE II uses this memory area for its own use, and when this option is turned on, problems can occur, usually when exiting the game. An easy solution to this problem is to run MEMMAKER if you use EMM386, or OPTIMIZE if you're using QEMM. Go to the user options screen and turn "USE MONOCHROME MEMORY AREA" to OFF. The game should operate and exit normally.

I can't create teams in DUNE II.

Creating teams can be a little awkward. Here's the easiest way to create a team of units...

Click on the follower unit. Click "MOVE" then click on the lead unit as the destination. Your follower unit will immediately begin moving toward its leader.

Continue clicking follower units until your entire team is moving toward the lead unit.

Click on your lead unit and tell it where you want it to go.

Your team should stay together until the follower units catch up to the lead unit. At this point, the team is disbanded and you will need to recreate the team again.

We suggest you make your lead unit one of the faster vehicles to keep your team from disbanding too early.

I never find units under the sand, just spice.

The manual was printed before the game was finished. After focus testing we decided to remove this option of the game because it could give one side a large advantage over the other.

I hear no voices in the game.

DUNE II uses an environment variable to find the correct interrupt, IRQ and address settings of your sound card. If you do not have a line in your CONFIG.SYS or AUTOEXEC.BAT files that looks like the one below, you may not receive digitized voices in the game..

SET BLASTER=A220 I7 D1 T1

The parameters for the above line are:

A=Address of your soundcard

I=Interrupt setting

D=DMA setting

T=Type of sound card. (type 1 is for the original SoundBlaster card.)

We suggest you check your soundcard manual for further information about this statement.

The Battle for Arrakis

Appendix 7: The Dune 2 demos

There were two distinct demo versions released for Dune 2; one self-playing demo and one which only looped the intro cinematic. The looping demo cannot be altered in any meaningful fashion and it will only be mentioned in passing at the end of this appendix. The appendix will focus on the self-playing demo.

Note the self-playing demo is the only officially released version that has any sort of time-out function. The time-out function of the demo is not real, it is provided by the dune.log file distributed with the demo.

Making the demo playable

The self-playing demo simply plays back a recorded game from a dune.log file. However, starting the demo with any parameter will make the demo interactive, controllable—including enemy units—and will record a new dune.log file, of unlimited size. Simply create a shortcut or a batch file with any parameter—a batch file with the line "DUNE2.EXE PLAY" is fine—and you will gain control over all the units and buildings.

It is possible to rework the self-playing demo to play retail games by providing three files—CHOAM.CPS, CHOAMSHP.SHP, and GRAYRMAP.TBL—from version 1.0 of the retail version of Dune 2. Version 1.07 does not have the CHOAMSHP.SHP file. Simply extract the files from the DUNE.PAK file using any Westwood Pak extractor, and place the files in the root directory of the demo. No further installation is necessary. Please be aware the demo is a work in progress, and retail scenarios might not play accurately, although most scenarios will be playable.

The intro cinematic will play every time you start the demo. In the retail version, the intro can be skipped by pressing the space bar if a file named ONETIME.DAT, HALLFAME.DAT, or _SAVE000.DAT exists. This is not true for the demo. The only way to skip the intro is to hex edit the executable; set the byte at 3A108 to 1 and the intro will never show. This is, of course, optional.

This appendix assumes you have created a controllable demo of any flavor. You do not need all the above files, but this appendix will make more sense if you do.

Map

The map used in the demo is actually reused in the retail Atreides campaign. You may recognize the map from Mission 3 of the campaign, it is in fact the 'middle map' of the three available maps, also known as map 3B. The map is provided in two separate files, both as a map file in the packed data file, and as a saved game.



The demo map in its entirety

The map is not an exact match with the retail version. The retail version has an enemy unit cap set at 20 units, whereas the demo version has the Harkonnen unit cap set at 16 units. The game engine disregards the unit cap however, rendering it meaningless.

As you may recognize this map from the retail campaign, you may also realize how little effort was put into creating the maps; all the scenario bugs that were shipped with retail—and there are many—were seemingly firmly in place 6 months before the game shipped.

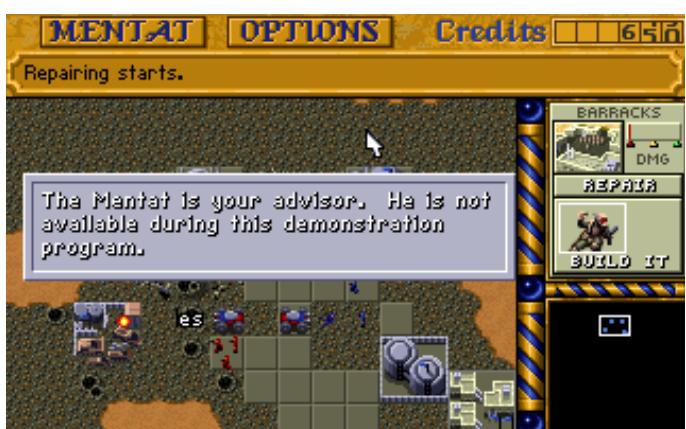
Keys

Since the demo version allows control over the enemy units and enemy structures, certain additional keys have special functions. These serve no purpose in the retail version.

Key	Function	Notes
H	Hunt	Places enemy units in Hunt mode (only when controlling enemies).
R	Area guard	Places enemy units in Area guard mode (only when controlling enemies).
A	Ambush	Places enemy units in Ambush mode (only when controlling enemies).
G	Guard	Places enemy units in Guard mode (only when controlling enemies).
W	Exits demo	Displays a banner prompting the player to buy the retail version and terminates.
R	Step thru messages	Step backward in the internal message cycle (only after F7 or F8 are pressed).
T	Step thru messages	Step forward in the internal message cycle (only after F7 or F8 are pressed)
L	Reveal map	Completely removes the Fog-of-war, revealing the map.
[esc]	Pause	Halts the game. Pressing any key or clicking the mouse will un-halt the game.
[insert]	Add credits	Adds 1000 credits to the player being controlled (including the enemy).
[period]	Place special bloom	Places special bloom in active position (only when controlling units).
[hyphen]	Place spice bloom	Places spice bloom in active position (only when controlling units).
F3	Rotate unit	Anti-clockwise rotation of unit (only when controlling a unit).
F4	Rotate unit	Clockwise rotation of unit (only when controlling a unit).
F5	Rotate turret	Anti-clockwise rotation of turret (only for units with turrets, i.e. tanks).
F6	Rotate turret	Clockwise rotation of turret (only for tanks).
F7	Reseed the map	Subtracts the seed by 1 and resets the map, including the Fog-of-war.
F8	Reseed the map	Adds 1 to the map seed and restarts the map, resetting the Fog-of-war.

The Battle for Arrakis

Differences and peculiarities



Mentat error screen

There are obviously several differences between the demo and the retail versions of the game. These are due to several reasons. The first reason is the demo version precedes the retail version and must be seen as a work-in-progress. The other obvious reason for the peculiar behavior is due to the demo not being meant to be playable. Thus one of the main differences is the demo is not nearly as stable as the retail version. The demo is known to spontaneously freeze, to unexpectedly terminate, to lock the keyboard, and so on. These differences are obviously invisible to the player.

The first differences player most often notice, however, are the colors of the mini map, i.e. the radar screen. In the retail version, the spice fields are a brownish hue. In the demo the fields are a festive pink.

Another difference that the player soon notices is the massive speed increase the harvesting has in the demo. The harvesters fill up quicker, up to three times faster than they do in retail.

Trying to access the Mentat screen by either pressing F1 or by clicking the 'Mentat' button will only produce a message stating the demo is indeed what is supposed to be, merely a demonstration program, and that the Mentat advisor is therefore unavailable.

What is most peculiar about this is that the Mentat message should never even be accessed; without hacking the demo and making it playable the message cannot be seen, it should simply never possible to even get the message.

There are other instances that are equally perplexing. By providing the three missing files and by making the demo interactive, the player can open the construction window of the buildings. When doing so a message will inform the player detailed pictures are not available in the demonstration program.

This is yet another message that should never be available to the player. Without hacking the demo the message can never be seen. This same error message can be seen in all the production windows of all buildings that can produce either units or more buildings. Note the production screen for enemy structures cannot be accessed; clicking on the structure icon or pressing F3 has no effect whatsoever. Also note the higher resolution images are not supplied with the demo.



Production screen



Note pink spice lots and short form names

As a further peculiarity, the demo sometimes displays messages to the player using the internal strings as names for the structures and units, and not the long form names as it is supposed to.

The user interface was not yet polished at this point; the demo must for all intents and purposes be seen as a work-in-progress.

Of note is also the different tech tree. The map is supposedly one of the three maps

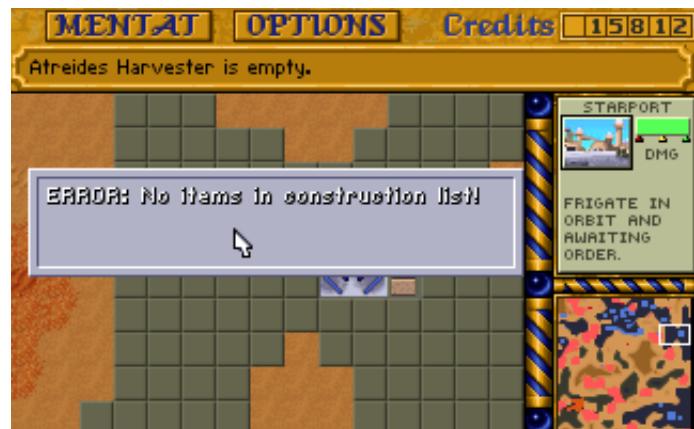
in the third mission of the Atreides campaign, yet the tech tree seems to be the same as the tech tree of mission four. Be advised the recorded game includes sonic tanks; these are not available this early in any campaign. The recorded game is tailor made for the demo.

As the demo is a work in progress, the game play is still littered with bugs, and the game is in a much unfinished state.

Destroying enemy turrets will not replace the turrets with rock, as should happen, but the turrets will instead be replaced by the upper right corner of the spice silo. This is a graphical glitch only.

If the player places a starport on the map and tries to place orders via the structure, the demo will display an error message and terminate.

In the demo, if any House except Atreides has a House of Ix, they can produce devastators at the heavy vehicle facility.



Starport error

Controlling the enemy

The perhaps most fascinating aspect of the demo is it gives the player almost complete control of the enemy forces and the enemy's activities. The player can issue orders to and control every enemy unit, including enemy harvesters. The player can also stop enemy unit production, disengage repairs, halt advancing armies, and make AI credits completely dry up.

In addition to making the demo ridiculously easy and unchallenging to play, by monitoring the enemy units the player can gain insights into how the Computer-controlled forces operate, and how the AI spends and manages its resources.

The simplest way to immediately cripple the AI is to simply stop the enemy harvesters from harvesting spice. There can be no simpler way to achieve this; simply click the enemy harvester, and click the 'stop' button. The harvester will remain stationary until told otherwise. The AI will now slowly but surely run out of spice and thus credits. The player can even move the enemy harvester to another location, for example into the mouth of the Fremen sandworms that roam the map. Doing so will *not* automatically provide the enemy with a brand new harvester, in contrast with the retail version.



Stopping the enemy harvester dead in its tracks

*Shai-Hulud in the demo*

In the demo the sandworm is explicitly mentioned as belonging to the Fremen. While it is mentioned in the books and the movie that the Fremen and sandworms have a profound relationship, it is never made explicit in the retail game. Internally the sandworms are obviously Fremen, but the player never sees this during game play. Other differences include the ability of the sandworms to detonate spice blooms.

completely different set of commands in the demo, as compared to the command set in the retail version of the game. In the retail version, the sandworm only has an attack command. In fact it has four of them.

Game maps can be edited in the retail version to give the player control over the sandworms, but even if the player has a semblance of control over the worms, the massive Shai-Hulud remain semi-autonomous—devouring player units, spontaneously attacking its own faction, and so on. In the demo, the sandworms can be given the standard set of commands available for the Computer-controlled units. Under certain circumstances, the sandworm can even be told to retreat. As mentioned, in retail

Dune player-controlled sandworms can only attack. This might actually reflect their nature fairly accurately. In another departure from the retail version, sandworms in the demo disappear after devouring one unit.

The player has almost total control of the enemy units. While the command set lacks the possibilities to stop and specifically move the units, rather complex unit movement can be achieved.

To stop approaching enemy units, simply click on the unit and click the 'guard' button. This will place the enemy unit in guard mode, effectively stopping it. If the enemy units have already entered your base, you can send them back to their point of origin by clicking the unit and clicking the 'area guard' button. Since the unit's point of origin is the enemy base, the unit will simply retreat to the enemy base and possibly begin its attack again. Repeat as necessary.

*Player-controlled sandworm in retail Dune*

It is theoretically possible to place the enemy units in ambush mode by clicking the 'ambush' button, but since an enemy unit must be visible in order to be controlled, ambush mode will immediately revert to hunt mode. So, while this should be theoretically possible, it is a logical impossibility.

The player can even control enemy structures, albeit in a limited fashion. The player can interrupt ongoing repairs by simply clicking the 'repair' button. The player can also put unit production on hold indefinitely. The AI will in certain circumstances restart repairs, but unit production will remain on hold until manually restarted by the player, or until the game ends. The player can even upgrade enemy structures, although the AI will do so itself immediately when it has the necessary funds. While 'helping the AI along' is theoretically possible, it is of very limited application.



Controlling an enemy siege tank

Trying to control enemy palaces will result in the demo crashing. The only palace super weapon that works seems to be the Death Hand missiles. Also, the player can launch three consecutive Death Hand missile attacks from the palace, with no recharging time in between. However after the attacks have been launched, the demo will not give control back to the player, even after restarting the scenario. The demo will display the palace control panel indefinitely.

By monitoring the enemy units and the enemy base, it is easy to get an insight into the AI strategy. The demo is not an exact copy of the retail version; there are major differences. When an enemy structure is destroyed, the AI is rewarded credits in the form of spice; the amount of credits is half the cost of the destroyed structure. Since the AI only pays 50% of the normal price when constructing a building, the AI can theoretically replace any destroyed structures indefinitely. This cycle can easily be stopped by halting the enemy harvesters and putting all construction on hold.

End of map



End of demo

When the demo map comes to an end—either through loss or victory, or by pressing the W key—the player will only see a prompt message, urging the player to order the soon-to-be-released retail version, or to look for the game at well equipped game retailers.

When the map ends there is no tallying of the scores, no rank is awarded, and no statistics are displayed. In fact, there exists

neither graphics nor data files anywhere in the packed files for the rank display and high score entry panels.

After the prompt message has been displayed, the demo will terminate and exit to the MS-DOS prompt, or back to Windows if the demo is played in a box, without any further prompts.

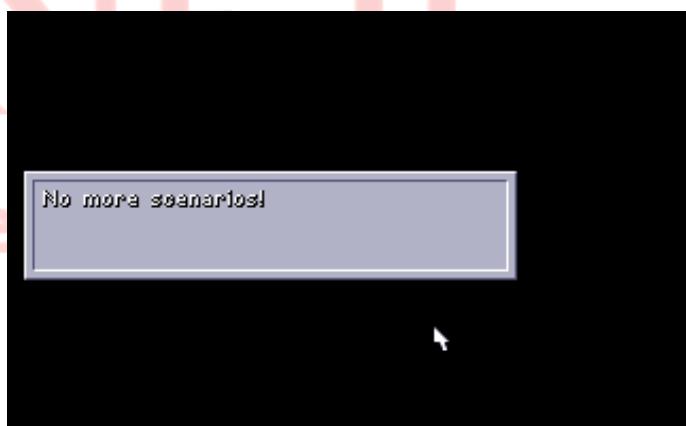
The demo map is a version of Atreides map 3B, the main difference being the lesser unit cap for the Harkonnen. However, the demo completely disregards the unit cap, making this a difference without distinction.

If the player attempts to challenge fate, and clicks on the 'Pick another house' option from the in-game menu, the demo will inform the player there are in fact no other scenarios, wait a while, and terminate, exiting to the MS-DOS prompt without further ado.

The map itself is unique to the demo, and it is provided in several places; inside the DUNE.PAK file, as part of the saved game, and as the provided dune.log file.

Special demo keys

There are functions in the demo that cannot be found in any subsequent installment of the game. The most tantalizing is the map reseeding function. By pressing the keys F7 and F8 the player can change the seed of the map, and reset the map to its initial state. This will of course also reset the Fog-of-war, setting the map black. Only units and buildings will be visible. Any concrete slabs that have been placed on the map will irretrievably disappear. When reseeding and resetting the map, the player will lose control of most of the buildings; all buildings will be stripped of their ownership bit, except the spice refinery. Due to this the buildings—except the refinery—will have no owner and can no longer be controlled. Structures without owner will be considered rock terrain by the demo game engine; units will be able to pass right through them, structures may be erected on top of them, and so on. If the AI commences construction in such a ghost building that can normally produce units or additional structures, that building will become controllable, and will function as expected. Non-producing structures such as spice silos, radar outposts, and windtraps will remain uncontrollable indefinitely.



It is possible to regain control of any and all buildings by erecting a new construction, and by starting construction of a large concrete slab. You will regain control of the buildings immediately when you start constructing the slab, you do not need to place it anywhere. This is only possible if the player has access to a Mobile Construction Vehicle, or MCV. The function is rather unstable and can produce unexpected results.

In addition, reseeding and resetting the map will corrupt the map data; four, sometimes two, rectangular pieces of mountains will run along the southern edge of the map. The terrain will have the same function as mountains; carryalls, ornithopters, and frigates can fly over it, and infantry units can traverse it. Saving and re-loading the game will not reset the map; the corrupt data will still be present.

The Fog-of-war can be completely lifted by pressing the L key. This does not reveal the mini map unless you have a radar outpost. When used together with the reseeding keys, the player can quickly cycle forwards and backwards in the seed queue; lifting the Fog-of-war will immediately show if the new map can be used as a scenario map. The theory is these special demo keys were used by the developers when trying to find usable map seeds.

If you are going to use the L key when playing a custom scenario, be advised all enemy units placed in ambush will immediately revert to hunt mode when they become visible.

The player can place blooms—special blooms or spice blooms—anywhere on sand, by pressing the period key or by pressing the hyphen key, respectively. Please be advised the blooms are placed in the current active position of the unit; this may not be where the unit is located when the bloom is placed. If the active position is where the unit is heading, the bloom will be placed in front of the unit. The bloom will then be triggered—in the case of a special bloom—or detonated—in the case of a spice bloom—by the unit placing the bloom. If the bloom placed is a spice bloom, the player will lose the unit. Blooms can be placed both by friendly and hostile units, even sandworms.

When controlling a unit—any unit; friendly or hostile—the player can rotate the unit by pressing F3 and F4, even whilst the unit is moving. When the unit is moving, it will move in the direction it is heading; if it is forced in a direction perpendicular with its heading, the unit will veer off track. This can cause the unit to be placed in unorthodox positions.

If the unit is heading east on the north side of a building—or a long, walled set of structures—forcing the unit to face south by pressing F4 will make it head towards the building. In certain cases the unit will be 'swallowed' by the structure. If the offending structure is a spice refinery, it will in most cases eject the unit; after the unit has been ejected, the unit will stop and default to Guard mode. If the structure is not a refinery, the unit will in most cases disappear; effectively swallowed by the structure.

Pressing the R and T keys—while not controlling a unit or building—will display, or play if you have configured a sound card, internal messages to the player. The T key will step forward in the message queue, and pressing the R key will step backward in the message queue. These messages are not in correspondence with any action on the game canvas, but rather an internal messages cycle produced by the demo game engine. The messages will eventually come full cycle and the sequence will repeat. The message keys will usually only become active after either the F7 key or the F8 key have been pressed. At other times they may seemingly spontaneously become active.

By pressing the 'insert' key, 1000 credits are added to the player currently being controlled. The unit or building being controlled will determine which House will receive the credits. Computer-controlled Houses on receive 500 credits. If no unit or structure is being controlled, pressing the 'insert' key will have no effect.

Structure and Unit Placement Keys

The demo has a structure and unit placement function. The tool is a leftover from the in-house testing and map-generating code. Since the code is incomplete, the function is also rather crude and obviously incomplete. It is presented here for completeness only.

This function has several special keys associated with it. The keys serve no purpose in subsequent releases of the game. With the structure and unit placement function, you can place Harkonnen, Ordos, and Atreides units and structures, and (perhaps strangely) Mercenary, Fremen, and Sardaukar units and structures, as well.

Placing units

Key	Function	Notes
House key + F3	Place trike	Places Atreides trike at current location.
House key + F4	Place quad	Same as above, but places quad.
House key + F5	Place tank	Same as above, but places tank.
House key + F6	Place siege tank	Same as above, but places siege tank.
House key + F7	Place launcher	Same as above, but places launcher.
House key + F8	Launch carryall	Launches Atreides carryall.
House key + F9	Launch ornithopter	Same as above, but launches ornithopter.
House key + F10	Place House special	Places the special unit of the House.
House key + 1	Place harvester	Places harvester at current location.
House key + 2	Place soldier	Places soldier at current location.
House key + 3	Place trooper	Places trooper at current location.
House key + 4	Place MCV	Places MCV at current location.
House key + 5	Place sandworm	Places sandworm (the sandworm is always Fremen).
House key + 6	Place devastator	Same as above, but places devastator.
House key + 7	Place saboteur	Same as above, but places saboteur.

Other items

Key	Function	Notes
[period]	Place special bloom	Places special bloom (only on sand).
[hyphen]	Place spice bloom	Places spice bloom (only on sand).

Note you do not need to press any House key in order to drop blooms.

Placing structures

Key	Function	Notes
House key + E	Place windtrap	Places windtrap.
House key + R	Place repair facility	Places repair facility.
House key + T	Place turret	Places turret.
House key + U	Place rocket turret	Places rocket turret.
House key + I	Place House of Ix	Places House of Ix.

House key + O	Place radar outpost	Places radar outpost.
House key + P	Place palace	Places palace.
House key + A	Place slab	Places concrete slab (see notes).
House key + S	Place starport	Places starport.
House key + D	Place wall	Places wall.
House key + F	Place refinery	Places spice refinery.
House key + G	Place hi-tech	Places hi-tech facility.
House key + H	Place heavy factory	Places heavy vehicle factory.
House key + K	Place large slab	Places large concrete slab (uses internal name).
House key + L	Place light factory	Places light vehicle factory.
House key + C	Place construction yard	Places construction yard (special case applies).
House key + B	Place barracks	Places barracks.

Note it is not possible to place WOR facilities with the function.

Also note Fremen cannot be placed with the Structure and Unit Placement Tool. While frigates cannot be placed, either, this is not considered an anomaly.

House keys

House	Key(s)
Atreides	Alt
Harkonnen	Ctrl
Ordos	Shift
Fremen	Shift + Ctrl
Sardaukar	Ctrl + Alt
Mercenary	Shift + Alt

The simplest way to place the units and structures is to enable the placement cursor and press any of the above key combinations. When the construction yard has finished constructing a building, clicking 'Place' will make the placement cursor active. The placement cursor can also be activated by pressing—for example—the keys Alt and A; this is actually the placement command for a small concrete slab for the Atreides. Pressing the above listed keys will place the unit or structure in the list. The unit or structure will be placed at the cursor.

Be aware you can place units freely; when placing units, no unit limit applies prior to the 75 unit limit, regardless of the map data; you may place as many units on a map as you feel are necessary. No limits are in effect prior to the 75 unit limit. In order to place units belonging to the non-player Houses certain restrictions apply; the House must exist as a CPU controlled enemy House in the map definitions, and the 75 unit cap must not have been reached. Also, neither trikes, quads, tank, nor siege tanks can be placed for CPU Houses, due to the function keys F3 to F9 having no effect for those Houses. The only exception is the raider trike for the Ordos; since this is a special House unit, it can be placed with the F10 key. The Computer-controlled House can be any House—including Sardaukar, Fremen, and Mercenaries—and also those Computer-controlled units can be placed without limits.

Under certain conditions it is possible to place units without the placement cursor. Pressing the function keys F5 to F10 while holding the Alt key places various units in the current, active location. In sequence the units are tank, siege tank, launcher, carryall, ornithopter, and the special House unit. The tanks or the launcher will only be placed if the player is controlling an enemy infantry unit while pressing the keys. However the flying units will appear from any controlled location, even from sandworms.

Please be advised any ornithopters will attack any other House, without prejudice. This might include the player's units. In addition, ornithopters spontaneously self-destruct in the demo.

When placing structures, please notice you can place the structures according to certain restrictions. If the player's House is Atreides, normal game play restrictions apply; the structures need to be placed on rock, and so on. The placed structures function normally. If the House is Ordos, Harkonnen, Mercenaries, Sardaukar, or Fremen, the placed structures have their ownership bit off and can be placed anywhere, even in impossible locations such as on mountains or sand. The ownership bit is set upon placing the structure. The only exceptions are small and large slabs; these can never be placed for the non-player Houses, regardless of House. This makes walls impossible to place for those Houses, as well. Please note turrets and rocket turrets will attack all other units and structures. Also note there is obviously no way to place WOR facilities with the placement tool.

When placing a construction yard, you must hold the keys and click where you want the structure.

Construction yards do not need to be connected to anything when they are placed.

Be advised it is possible to construct sonic tanks in the Atreides heavy vehicle construction facility after placing a House of Ix. Ornithopters never become available, though.

Attempting to place a spice bloom in a location that already contains a spice bloom will make the spice bloom(s) detonate.

Attempting to place a special bloom in a location that already contains a special bloom will have no effect.

The log file

When the un-hacked demo is started normally, it automatically replays the ending of a scenario, shows a prompt asking the viewer to pre-order the game, waits for a few seconds, and then exits. The replay is contained in the log file provided with the downloadable demo.

When the demo is started with any parameter, the log file is disregarded; the demo enters its interactive mode, and the player can control the game. When this is done, the log file is overwritten with a new log file. This log file is then replayed when the demo is started without parameters.

The log file replay will begin at the point of game entry; if a saved game is loaded, the replay will start at the load point. If the map is played from start to finish in one go, the log file will contain the entire game play.

The log file is a recording of the keyboard entries and mouse movements during the game, including any clicks. Mouse movement is due to its nature difficult to quantize and record. Be advised the log file will most likely be unable to completely record the movements of the mouse, and will with certainty desynchronize from the scenario at some point. In the long run this causes the log replay to become corrupt, merely playing back nonsensical mouse movements.

Be advised there is no real size limit to the log file; the only limit is the ability of the game code to write a file to disk. Since the game is a 16-bit game, the log file can be 2 gigabytes in size. If the demo is started from a non-writeable media, such as a compact disc, the log file cannot be recorded and the game engine will stall.

Unit and building specifications

The unit and building specifications in the demo are essentially identical to the initial retail version—version 1.0—with a few minor differences.

The unit and structure hitpoints are identical.

Weapons damage is almost identical, with the difference being more damaging sonic tanks in the demo; the sonic tank deals 75 points of damage in the demo, whereas the retail version is slightly tamer, with only 65 points of damage.

The sonic blast itself is doubly as lethal in the demo, with 50 points in the demo compared to 25 in retail.

House Atreides is just as susceptible for structural damage as all the other Houses in the demo.

House Harkonnen is even easier to deviate in the demo; the demo has an 89% success rate set, whereas the retail has lowered the Harkonnen deviation success rate to 78%.

Costs are slightly different. Repair facilities cost 900 credits in the demo as opposed to 700 in retail, but since the hard coded tech tree never allows repair facilities to be built this is a difference without distinction.

Walls cost 60 credits in the demo, whereas they only cost 50 in retail.

The Ordos' special weapon is somewhat crippled in the demo; the recharge time is double that of retail. The Ordos' saboteur is also significantly slower in the demo; moving at half the speed.

As a final curiosity, none of unplayable Houses—Fremen, Sardaukar, or Mercenaries—have a special palace weapon in the demo. Thus their palace recharge time is also set to zero.

When compared to the last version of the game—version 1.07—the actual differences are trivial—frigates have 500 hitpoints instead of 100, ornithopters have 10 hitpoints instead of 25—and have very little impact on game play.

Looping demo

The looping demo cannot be made playable. The looping demo is—while simpler—in fact a later creation, based on the last patched version of the game; version 1.07. It must be seen as the historically last official Dune 2 offering by Westwood, demo or otherwise.

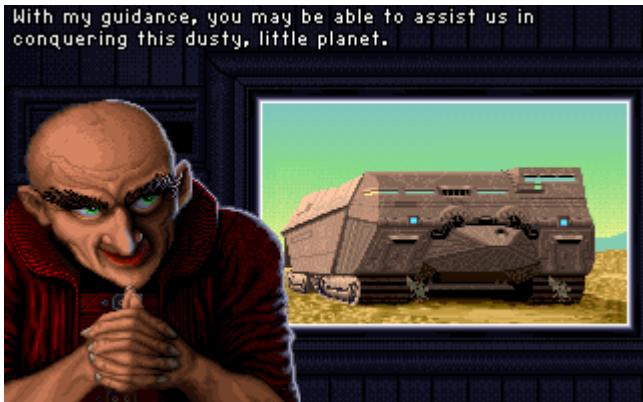
DUNE II

The Battle for Arrakis

Appendix 8: The Battle of Dune

Many computer games titles lay claim to have been "firsts".

While many titles may be considered "firsts" in whatever category, some of the bestowed titles are somewhat debatable. What was, indeed, the first "shooter", or which game was the first "mainstream game"? Definitions differ and arguments arise. Of course, many firsts remain undisputed; the first computer game was OXO from 1951, the first multi-player game was Spacewar! from 1961, and the first coin-op Galaxy Game was released in 1971.



Likewise, while many titles lay claim to have been the first real-time strategy game, there are few who protest when the first RTS title for the PC is named; Dune II. The influence of the game can hardly be overstated.

It can be argued that Dune II was not the first real-time strategy game for the PC; there have, in fact, been many claims to which game was the first such. John Gibson's 1983 Stonkers, or the 1984 game Ancient Art of War by the Murry brothers have both been called the first RTS game; Herzog Zwei has been crowned the first RTS game, and so on. While some of the claims might have some merit, the modern real-time strategy gamer will recognize one game and one game only as the great-granddaddy of all RTS games on the PC.

The long and winding road that lead up to the seminal game involves several twists and turns, including several companies and a gallery of actors, and it stretches over two continents. In fact, the story is so complex and long several of the key figures are not with us anymore. To make sense of it all we must turn the dials of our time machine all the way back to 1981.

Pre-history

In 1981 French game developer studio ERE Informatique was founded by Emmanuel Viau and Philippe Ulrich. Ulrich had made a bit of a name for himself since 1980 by releasing successful games for the new Sinclair ZX80, such as *Othello* and *Panique*. Ulrich had seen a listing for *Othello* in a paper, and decided to improve upon it. When his own creation finally managed to beat him, he saw the possibility for revenue in what had until then been only a hobby. ERE struck a deal with Sinclair distributor Direco, and the game was distributed throughout France. *Othello* sold over 100.000 units, a



Philippe Ulrich of ERE Informatique

staggering number for the times.

From the beginning ERE consisted of a group of programmers and developers whose payment consisted of royalties, thus enabling a very fluid company profile. ERE was one of the absolutely first French computer games companies, and they released games for the emerging computer games market, mainly for the Sinclair and Oric Atmos computers.

ERE became a registered company on April 28, 1983.

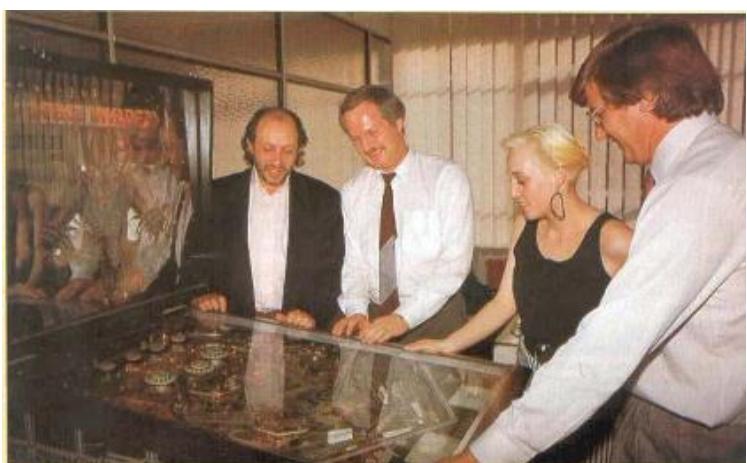


Alan Sharam of Mastertronic

long term."

According to Guter, "Mastertronic's founders gave up their other interests and committed themselves to succeeding as publishers by selling games as cheaply as possible. Other publishers seemed to be concerned only with the process of creating the software and marketing an image, a strategy aimed directly at the consumer, with the hope that customer demand would somehow bring the games into the shops. In contrast, Mastertronic aimed its strategy at the distributors and retailers. If the games could be put on the shelves then the low selling price would do the rest."

On the other side of the British Channel, in November 1983 video distributors Frank Herman and Martin Alper, along Alan Sharam who had a background in property surveying, founded the company Mastertronic on Paul Street in West End, London. The company was a distributor for budget games, selling games at half the usual going rate of games on the market. Former Mastertronic financial controller Anthony Guter remembers the beginnings, "The main ambition was to build up the business and the brand name and then to sell out, either via a stock exchange listing or to an institutional investor. The business strategy was to forge strong links with retailers and to control the supply chain, i.e. manage each step from sourcing to manufacture to warehousing to wholesale distribution and to retail shelf stocking. Some of the money to start up Mastertronic came from investors who had backed Herman and Martin Alper in the video distribution business. The investors also wanted to make a quick profit and had no interest in the



Martin Alper, John Maxwell, Alison Beasley, and Alan Sharam playing pinball at the Mastertronic offices.

In France ERE Informatique continued to expand. In 1984 Philippe Ulrich became editor and producer. The same year ERE released *Intercepteur Cobalt* for the Sinclair series of computers, and it became a hit in France. The game was also released under the title *Mission Delta* for the Amstrad and the Oric Atmos. However, the game failed to attract international attention, due to the limited distribution capabilities of the company. The game was programmed by Marc André Rampon, and he invested the royalties from the game back into the company by acquiring shares from Viau, thus becoming one of the owners.

Meanwhile, London based Mastertronic went public on April 1, 1984, having in extremely short time become one of the biggest budget games distributors in the United Kingdom.

Westwood

In 1983, there was only one store in Las Vegas that sold Apple hardware and software in Las Vegas; Century 23.

Louis Castle had just finished up majoring in fine arts and computer science at University of Nevada, Las Vegas and was working there as a salesman. Brett Sperry had also just finished his architecture and psychology degrees at Arizona State University. Louis Castle had a very humble

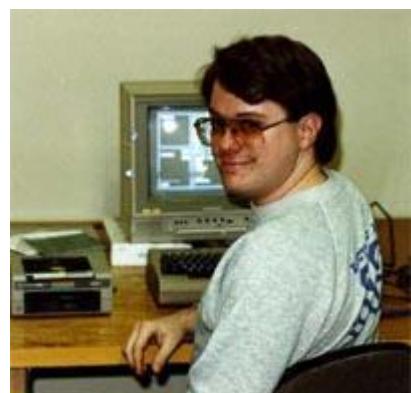


Westwood Associates screen logo.

start in the gaming industry; his first job after graduating was working for an educational software company in Las Vegas; "I worked on graphics for a children's video game called Funbunch, if memory serves." As so happens, he kept frequenting Century 23 for his Apple computing needs. Over the next couple years the two developed a friendship.

Computer access was not entirely simple at the time. "In high school I was fascinated by them," Brett Sperry says, "but it was in college I realized I wanted to have one, just for fun and not for long evenings." Louis Castle continues, "My friend in eighth grade and I had a computer and we really liked the games we played on it, but when I asked my father to buy me one, he told me it would probably just end up in the dumpster, like many of my previous toys. The worst part is that he was probably right."

In that time Brett began to do contract work designing games for Epyx software, but he had no printer of his own, so he would borrow Louis'. The first time he did the two began talking about their future. "There were no local companies that would hire a young guy going to University so me and my friend Brett Sperry decided to create a company of 2 and make it a place we would want to go to work every day. We grew very slowly, attracting friends like us that did not have the classic industry backgrounds. That's how Westwood was born."



Brett Sperry of Westwood Associates.



Westwood Associates small logo.

So, in the summer of 1985, in Nevada, United States, two years after the great video game crash of 1983, 21-year-old Brett W. Sperry and 20-year-old Louis Castle set to work in Castle's garage in Las Vegas. They initially wanted to call their team Brelous Software—a simple play on their names—but in the end they decided to call their collaboration Westwood Associates, to emphasize that it was indeed a collaborative effort. Remembers Sperry, "In the end we decided to go with Westwood because it sounded professional, and it was similar to Hollywood." Says Louis Castle, "I personally have always enjoyed West LA and in fact that was part of the reason we originally named our studio Westwood." Westwood Associates, later Westwood Studios, was named after the Westwood business district of Los Angeles.

Louis Castle remembers the naming process, "OK, so where did Westwood come from? Brett and I used to drive out to Westwood, California, all the time just to see movies, shop, and hang out in the cool coffee shops. But there were also lots of law firms in the city. It struck me that Westwood was the right name that was close to Hollywood, to youth culture because of the University of California at Los Angeles, and to business. Brett added the "Associates" because both of us were tired of working for people who knew nothing about our business and we wanted to work with people who shared our passion. We did not like being considered second class for being "employed." We felt being an associate was far better than an employee."

"Brett and I just wanted to work for a company that cared as much about the games we were making as we did", says co-founder Castle. "Westwood was created simply so we could have the environment we wanted to create games. Brett always wanted to be successful; I was more interested in just enjoying my every day work."

Louis Castle says, "I wanted to use this computer to do art. But back then, there were no art programs. Computers didn't have mice. I learned to write basic programming and did digital artwork."

Says Castle, "We had to form our own company that had certain values and was concerned with the products. We forcefully had to build Westwood. If you really feel like you had to do something and you can't find any way to do it, do it yourself but only as a last resort."

"Westwood came about mostly because Brett W. Sperry and myself wanted a great place to make games and there were not many games companies in Las Vegas. It was almost an accident in that Brett wanted to get a print out so I told him to come on over and we started chatting. Otherwise it may never have happened. Many companies at that time saw games as a way to have young enthusiasts work for very little money and get a big pay day. This was especially true in Las Vegas so we simply had to build our own."

"To be two guys in a garage that literally had no capital, it was all bootstrap," Castle said about Westwood's start.



Westwood Associates box logo.

Castle said their first big break, translating a three-part game series, came from a company that didn't know much about Westwood.

"They had no idea we were only two guys. We said, 'Great we'll do it' and then got on the phone and tried to hire an employee," Castle said.

"I think our first couple of employees were a manager at Taco Bell and a UPS driver," Castle said.

Before founding Westwood Associates with Castle, Sperry had designed and programmed several game titles while studying architecture and psychology at Arizona State University.

"I started programming in high school when I was 16 years old and initially I did ports to the Apple II, some utilities and six 'edu-games'. My first big game was called *Terra 12* but it was never published. Around 1984 I met Louis Castle during a port of *Impossible Mission* for the Apple II that I was working on. Louis did most of the art and animation on that project. In fact, after seeing his superior artwork, that was the end of my computer art career!" says Brett.

While he was studying, Sperry worked for eight months in a company that produced educational software. It was not a happy time. "But I had no money and could not afford a computer. Here was the opportunity to use after business hours for my own projects. That is how I did it all the time—and it nearly killed me."



Louis Castle of Westwood Studios.

Louis Castle was studying fine arts and, perhaps surprisingly, architecture at the University of Nevada before teaming up with Sperry. "My Mom always supported me in no matter what career choice I had for that week. The final non-starter career was Architecture which I actually stuck with throughout high school and only changed my mind as I graduated. It was Architecture that led me to video games since it inspired me to learn about how computers would be used as graphics tools." Castle recalls, "In art school, you find out pretty quickly that no matter what you come up with, some guy who died hundreds of years ago already did it. Creating fine art on computers, however, was this vast, uncharted territory."

Westwood Associates was brought together by an old printer. Sperry remembers, "I worked for Epyx at the time, on the game *DragonFire*, and when it came time to send Epyx the design document, I had to ask for Louis to lend me a printer." Brett and Louis began talking about their careers and ambitions, until Castle finally showed Sperry a 3D animation he had just finished. "I found out that Lou was a huge hidden talent. During the summer of 1985, we finally put it all together and decided to start a new shared company."

Says Sperry, "Louis and I started Westwood Studios in March of 1985 as a 16-bit game company. Our early games were for the Amiga and the Atari ST. We were a three-man shop initially [with

programmer Barry Green]. Louis did all the artwork, all three of us were programming, and each of us did some of the audio work."

Louis Castle remembers the beginnings, "Our first project was a trilogy, *The Temple of Apshai*; Brett did the design and took care of business matters, I did the programming and the graphics." Soon Westwood Associates signed a contract for two games for the Amiga and Atari ST for \$18,000 with publishers Epyx. "It gave us the possibility to make games for machines on the market, and of course plenty of money, so we jumped straight on it."

"We had zero business acumen at the time, and when our first cheque to Westwood came to us we had no idea how to cash it," laughs Louis Castle. "We had never filed to register a company, opened a bank account, or anything like that. I guess you could say we learned how to be entrepreneurs from the very basic stages – as ignorant as you could possibly be."

Westwood's early days was dedicated to porting various video games from one platform to another, such as from the Commodore 64 to the Atari ST. It would be three long and arduous years before they would release their first original game.

Their early games included mainly role-playing games such as *The Mars Saga* in 1988 and *Eye of the Beholder* in 1990. These games helped Westwood grow, as well as providing technological and content inspiration for future games.



Westwood Studios office.

From these rather humble beginnings came then a long line of worthy games. The strategy elements were seemingly present from the very beginning. "One of the very first games we did as Westwood was a port of a game called *The Temple of Apshai Trilogy*, and the reason I bring that up is because we implemented real-time game play into it," explains Castle.

"Our publisher told us that it was just too difficult for people to understand, and that we had to go back to making it a turn-based strategy game like the original was. So from the beginning we were always looking to make games that had that sort of time pressure in addition to making you think. It's not enough to make people have to act quickly, but they have to think quickly as well."

The French connection

In France things were picking up for ERE Informatique. In 1985 they released *Macadam Bumper*, a pinball simulation created by Rémi Herbolut, who had recently left car part manufacturer Valeo to join the business of computer games. The game topped many lists and became an international hit, selling very well in England. Distribution, however, still remained a big problem for the company. Distribution networks were notoriously unreliable for smaller companies back in 1985, and many of the distribution hubs simply went bankrupt without prior warning. Personal Software Services PSS struck a mutual distribution deal with ERE Informatique and this helped stabilize money flow for a



Philippe Ulrich in 2007

moment. However, the funding problems and the uneven cash flow issues kept returning, and they were a persistent, unresolved obstacle for the remainder of the company's existence.

In 1986 the cash flow issues came to a head for the French; the company hit insurmountable financial problems and was teetering on the brink of bankruptcy. Luckily French media company Infogrames stepped in and bought Marc Rampon's shares by

the end of the year—after a short competitive bidding war with FIL—effectively saving the company. The following year Infogrames would further increase their stake. Meanwhile ERE continued to cement their reputation by releasing several well-received games, such as the strategy game *Contamination*, the arcade game *Pacific*, and the adventure game *1001 B.C.*

In London things were looking good for Mastertronic. So good, in fact, in 1986 Martin Alper left England for the United States and set up the USA branch of Mastertronic in California; Mastertronic, Inc. The UK branch of Mastertronic was left in the hands of "Big Frank" Herman.



Mastertronic's last logo



Martin Alper of Mastertronic in 1986

In Las Vegas Westwood Associates' work was gathering momentum. Brett Sperry stopped programming in 1987, though, as the demands of design work, running the new company and overseeing production on all of Westwood's games

was all becoming too much. "With the rise of the 16-bit machines, the rules and standards changed dramatically. We actually had to hire two artists and an audio guy. Almost overnight the industry went from one and two-man teams, to groups of five or six."

Apart from proving that some things in the game industry never change, Sperry also recalls that by the same period he was getting bored with programming, "For me, game conceptualization and design was the hardest and the most exciting job of all, and I was jealous of any time I spent away from doing that."

Sperry adds, "I was always interested in computers in high school, but they were just going to be a hobby. You know, I had to go off to college to discover what I really wanted to do for a career. And even back in the high school days I was interested in game design, but purely as a hobby – something I'd toy around with at night."

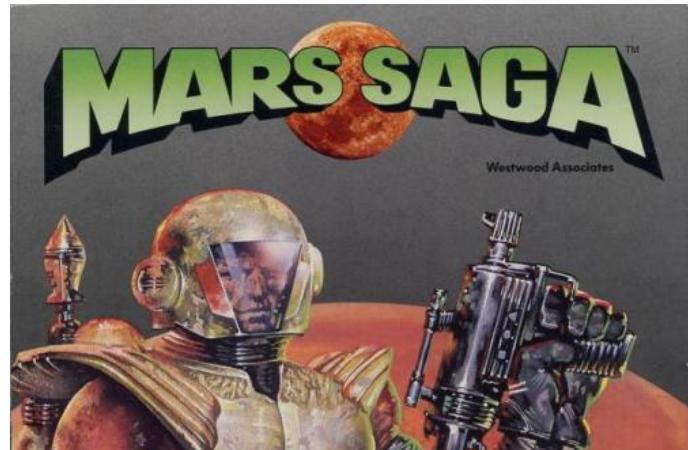


Infogrames logo in 1988.

Meanwhile, in France Infogrames bought the entire stock of ERE Informatique's shares in June of 1987, effectively acquiring the company. In conjunction with the acquisition the label ERE Informatique was phased out, being replaced by the Exxon label.

Another event in London the same year was to have a major impact on the games industry. Frank Herman from Mastertronic in London had noticed Sega did not have a distribution deal for the United Kingdom, or in fact for the entirety of Western Europe. Acting quickly on this, Mastertronic made a deal with Sega and created the massively successful Sega Europe. This was to have a major impact on the following story.

In 1988 Westwood Associates finally released their first original game; *Mars Saga*. The same year they also released *BattleTech: the Crescent Hawk's Inception*, a tie-in to the BattleTech franchise. This was the first of Westwood's tie-in games. Many were to follow. The game already displayed some of the strategy elements that were crucial to the development history of *Dune II*, although the game itself was a rather ordinary role playing game.



Mars Saga, the first original by Westwood.

In 1988—after long negotiations between Richard Branson and Frank Herman—Virgin Group bought Mastertronic. Virgin had no intention to pursue the budget games market, their main interest was the Sega distribution rights. Mastertronic was scheduled to disappear from the radar, but due to the complex contract Alper, Herman, and Sharam remained within the now reformed Virgin Games as developers and producers. Virgin Games and Mastertronic Group Ltd were merged to Virgin Mastertronic.



Jean-Martial Lefranc of Virgin

In France, former TV6 channel manager Jean-Martial Lefranc became the development manager for Virgin, France, where he oversaw introduction of Sega videogame consoles onto the country's store shelves. The focus for Virgin Mastertronic was now high price games, and the budget games were becoming irrelevant. In a few years the name Mastertronic would be but a distant memory.

During 1988 Martin Alper – long-time fan of the Dune novels – finally decided to try to procure the rights to adapt the Dune novel into an interactive game. He did a study to assess the viability of such an adaptation and estimated there to be between 3 to 4 million fans of the

novel in the United States.

In 1988 Exxon released *Captain Blood*, developed by Philippe Ulrich and Didier Bouchon. Virgin Games development manager Jean-Martial Lefranc noticed the game, and was very impressed. The first copies of the game were still released as an ERE game, and it was to become the swan song of the company. Even though the company was now owned by Infogrames, the parent company decided

to close it, the equivalent of bankruptcy. Subsequent releases were labeled Exxon. The game went on to become the biggest selling French software title, simultaneously grabbing the top spot in software charts in France, England, and Germany. The title even got into the Top Ten in Japan and the United States. Bizarrely enough, the game was also released for the Sinclair ZX Spectrum.

In 1989 Westwood Associates released *Mines of Titan*, a semi-sequel or reboot of *Mars Saga*. The game was in fact a rewrite of the earlier game, fixing many things and correcting downright errors in the earlier outing. The same year Westwood also released *A Nightmare on Elm Street*, yet another game tied to an existing franchise.



Herzog Zwei game play

During this year most of the previous ERE staff, by then called Exxon, left Infogrames due to royalty non-payments and formed their own independent developer group. They called the group Cryo.

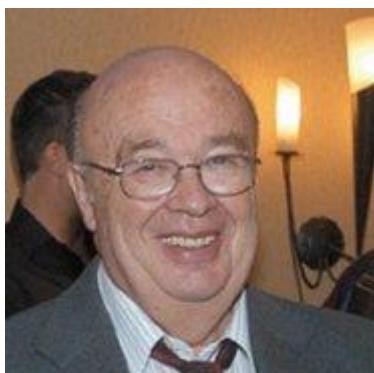
DUNE II

Crucial to the development of *Dune II*, in 1989 Japanese game studio Technosoft released their game *Herzog Zwei* for the Mega Drive. The game was not a massive hit upon release—in fact it received rather lackluster reviews, and was barely able to recoup its development costs—but it was to

cast a long shadow over the computer industry.

Dune

Most importantly, in 1990 Virgin Games producer Martin Alper finally secured the interactive game rights to the Dune franchise from Universal. This was the result of prolonged legal wrangling; Dune author Frank Herbert had died in 1986, the company that produced the Dune movie had gone bankrupt, and no-one really knew who held the rights. Finally MCA/Universal Merchandising, Inc licensed the rights to interactive movie spin-offs to the Virgin Group.



Frank Herman of VIE

Virgin Games designer David Bishop remembers his first meeting with producer Frank Herman, "On my first day at Virgin Games back in 1989, director Nick Alexander introduced me to Frank as 'your new boss'. Tossing a copy of science fiction epic Dune in my general direction, Frank's first words to me were, 'Make a game based on this by Easter.'"

In 1990 Stephen Clarke-Willson joined Virgin Interactive Entertainment as vice president. Recalls Stephen, "Virgin Interactive – then Virgin Games – president Martin Alper had licensed the movie –



Philippe Ulrich and Emmanuel Viau at the release party of *Captain Blood*.

not the book, which caused a few annoying misunderstandings later on, but not showstoppers – because he liked it, with no idea how to turn it into a game. In those early days he wanted VIE to become the next Sierra Online and wanted to make adventure games. So before I joined the company in 1990 someone had made a deal with a little company in France called Cryo Interactive to make a Dune adventure game."

What had happened was after the rights to the franchise had been acquired, Virgin Games development manager Jean-Martial Lefranc set out to find a suitable development crew to create a game out of the franchise. Having been very impressed by *Captain Blood* by French developers ERE Informatique, led by Philippe Ulrich, he set out to find the crew responsible for it. At this point ERE Informatique—after having been acquired by Infogrames, renamed Exxon, and been disbanded—was in the process of reforming. During a meeting on July 20 between Frank Herman, who was then the London director for Virgin Games, Lefranc, and the Cryo team led by Ulrich the plans to create 'a major game' are first discussed. The Dune license is not mentioned. The meeting concludes with an agreement for further meetings to include producer Martin Alper.



Rémi Herbulot of Cryo

At the later meeting, between Rémi Herbulot and Martin Alper in Los Angeles, three concepts for a game were presented by Herbulot and the concepts were discussed; all the projects were set in a science fiction universe. It was at this meeting Alper at last revealed his intentions to Herbulot; adapting the Dune license for an interactive video game. The understanding was that the licensing rights were still not entirely certain, but that Alper would 'do his best' to acquire them. Three weeks after Herbulot returned to France, the call came from Virgin; the license was certain and the French team was given the go-ahead. A deal finally sealed orally in August 1990 at a dinner at Fouquet's in the presence of Philippe Ulrich and Frank Herman.

"I went to see Virgin Loisir, a company about to launch Sega in France", remembers Philippe Ulrich. "We went to the US, and I met Martin Alper. So I told him about *Captain Blood*. And he told me, 'What you guys should do is a video game adaption of Dune.' So we came back from the US with a sort of promise that, maybe, if he's able to get the license, we could work on a Dune game."



Game designer David Bishop

"Quickly, we started to directly work on this particular project. And we started working on a CD-ROM whereas the CD wasn't even around yet. You work on the equivalent of 512 floppy discs. Characters aren't just a few pixels. You really get to the level of cinema and graphic novels."

A team of developers—most of them fans of Frank Herbert's work—was attached to the project. Philippe Ulrich's team of programmers already called themselves

Cryo, so he called the new team Cryo Interactive, and they began submitting design documents and proposals to Virgin Games. They worked for months on paper and organized weekly meetings. Ulrich met up with game designer and producer David Bishop, who remained unconvinced by the production design. The relationship between Bishop and the French team would remain frosty throughout the entire project.

On April 9, 1990 Graeme Devine, the head of research and development, sent a sarcastic memo to Virgin Games' David Bishop. The title of the memo is "Dune, the first title that will require 50 disks!" Devine criticized the game for 'lack of unity' by integrating too many cinematic sequences inspired by the film Lynch, at the risk of boring the player. Frank Herman on the other hand offered his support during his visits to the Paris offices, but Virgin Games' management remained unconvinced.

In the first months the proposals Cryo sent to the United States did not compel Virgin. The plans passed via Bishop in London, who did not find the project attractive, either. The Americans criticized the game design including perceiving the interface aesthetics "too French". They were also not impressed by the unorthodox mixture of adventure and strategy, and could not envision the game catering to the American public's tastes. Ultimately the plans and design documents were unable to persuade the Virgin team of the strengths of Cryo's game design. David Bishop finally called a meeting in London to discuss the game. The participants felt the French game did not accurately portray or convey the central elements of Frank Herbert's book; colonization and ecology. The decision was made to quietly drop the French development plans.

Virgin Games vice president Clarke-Willson remembers, "We would get milestone submissions from Cryo and in the very early days, things were pretty sketchy and everyone decided to cancel the game. According to Martin nobody told Cryo the game was cancelled, and since they were very slow, it was a long time before another milestone submission arrived."

However, on 19 September 1990 Cryo received a memo from Gerry Tucker of Virgin Games informing them they are about to cancel their collaboration, for which no contract was yet signed. After protests by Cryo, Frank Herman managed to partially save the project's funding, but Martin Alper was not informed of this.

Philippe Ulrich remembers the incident a bit differently; "One day I got a letter saying: 'We don't want to collaborate on Dune with you anymore. You're fired.' I got fired from Virgin all of a sudden. I told my team; 'Let's vote! Do you want to finish the game anyway? Or else, each of us goes his own way, and we abandon our talent and everything.' We all decided to go on developing Dune at our own expense."

Dune II

Stephen Clarke-Willson remembers the aftermath of the cancellation, "During that time, I was given the task of figuring out what to do with the Dune license. Since I have read the book a number of times I thought from a gaming point-of-view the real stress was the battle to control the spice, and that a resource-



Stephen Clarke-Willson in 2004

strategy game would be good. Coincidentally, everyone at the office – no doubt thanks to Graeme Devine, who worked at Virgin at the time before founding Trilobyte – was playing a little known Sega Genesis game called *Herzog Zwei*. Only a very few people know about this game; *Herzog Zwei* was the first true real-time strategy game. As I said, everyone was playing it in the office, and quite frankly, I did not get it. You kept clicking on stuff and then zooming off to another part of the screen. It was very hard to keep track of what was going on as an observer. Still, everyone liked it, it had fast action, and it was a strategy game."

Herzog Zwei for the Sega Genesis had already been released in Japan the previous year, and it hit the European and American markets in 1990. It was not a huge hit for Technosoft, in fact the game received rather dismal reviews in the United States upon release, but the effects of the game can still be felt in the game market.

Clarke-Willson remembers, "Seth Mendelsohn, one of my original producers—hired by Graeme, and now apparently co-designing Ultima things with Richard Garriott—who understood *Herzog Zwei* went with me to visit Westwood. Westwood had a *Kyrandia* demo going at the time, and since Martin wanted to be like Sierra Online, Seth and I went out to look at it. It was great looking. We also went to talk about making a Dune game."

Westwood's involvement in *Dune II* began with an approach from Martin Alper, president of Virgin Games. During a meeting in Las Vegas Martin Alper and Westwood Associates agree on developing a game from the Dune license. "Martin asked what I thought about Frank Herbert's Dune books and the Dune movie," remembers Sperry. "I loved the books and I loved David Lynch's movie as well, and I told him as much. Martin told me he had locked up the license years ago and I could use it if I wished."

The Battle for Arrakis

Alper's comments to Sperry had been made with the understanding that work by French developer Cryo on a Dune-themed adventure/strategy hybrid had already been cancelled. As Sperry later found out, however, Cryo had not taken no for an answer. "They rushed to finish their game before ours," he reveals. "The result was a branding nightmare—the Cryo game had nothing to do with ours and yet it was published first because Virgin was anxious for the revenue. Against my violent protests our game was



So totally not Sting.

called *Dune II: the Building of a Dynasty* [Battle for Arrakis in Europe and for the Mega Drive version] and the rest is history."



Absolutely not Sting.

Meanwhile, the Cryo developers were still self-funding development on their game, and eventually created a game design folder containing more than 100 pages. The game was now based on the novel by Frank Herbert, as well as the David Lynch film. Feyd-Rautha incorporated the features of

Gordon Sumner, better known by his artist name Sting—in fact, the musician had insisted his likeness should *not* be used—but the majority of the characters were completely redesigned by Jean-Jacques Chaubin, including Paul Atreides who according to the developers "is too old in the movie". Kyle MacLachlan's character in the film is 25 years old, while Paul is supposed to be 15 years old in the novel.

Creating the game

Herzog Zwei preceded *Dune II* by almost three years. Sperry remembers *Herzog Zwei*, which to him was a pioneering console title. "I played *Herzog Zwei* and enjoyed it," he said. "Some of my peers thought *Herzog Zwei* was an influence on *Dune II*. That's a compliment; however, the games that helped trigger the genesis of my RTS concept were *Eye of the Beholder* and its forefather, *Dungeon Master* by FTL."



Rescue Raiders for the Apple II

Says Louis Castle, "Really, it was Joe Bistic's passion to make this strategy game; it started out with all sorts of ideas what it was going to be about. The latest game [we were playing] was called Military Madness for the NEC, for the TurboGrafx. Probably nobody knows about this now, but it was a great game. He said, 'This would have been a great game, but I hated the fact I had to wait for the turn. So why don't we make it real time, like we did with *Eye of the Beholder* and some other games?' That was the genesis of *Dune II*. So

people have pointed to a lot of other games, like *Herzog Zwei* and others, but that's not actually where it came from; it came from a game called Military Madness, and another game that grabbed us at the time called Rescue Raiders for Apple II. Those two games combined is what became *Dune II*."

Sperry commented that, "our game design and programming technologies evolved by quantum leaps thanks to *Eye of the Beholder*. Keep in mind this all led me to ponder how the real-time aspects could be applied to strategy games, which eventually led to *Dune II*".

"*Herzog Zwei* was a lot of fun, but I have to say the other inspiration for *Dune II* was the Mac software interface", says Brett Sperry. "The whole design/interface dynamics of mouse clicking and selecting desktop items got me thinking, 'Why not allow the same inside the game environment? Why not a context-sensitive playfield? To hell with all these hot keys, to hell with keyboard as the primary means of manipulating the game!'"

"When we built our first real-time strategy game, we weren't trying to take something that already existed somewhere and put it somewhere else," Castle said. "We were actually looking at a broad variety of products we loved, and we felt these turn-based strategy games had something exciting, and we thought, 'Wow, with computers and mice, wouldn't it be great if we took off the constraint of having as much time as you wanted and made it a speed chess kind of game?' And that drove everything in the decision-making process. It worked around the fundamentals of a mouse as a pointing device, and that's what lead to the innovation that became *Dune II*. So for many years, the approach of taking these kinds of games to consoles was to take those same metaphors of moving, pointing, clicking and typing, and map them to the gizmos on a controller. And when we did that, we

did that to the best of our ability, and I would say that a lot of the ports we did were successful. But they fundamentally lacked an important approach, which was to treat the controller as a controller. They were all flawed fundamentally."

Sperry explained Westwood Studios' thinking, "How can we take this really small war game category, bring in some fresh ideas, and make it a fun game that more gamers can play? [Previous war games] usually combined a map, playing pieces representing historical personages or military units and a set of rules telling you what you can or cannot do with them". Sperry noted, "*Dune II* was all about taking on the challenge of combining war gaming and real-time control".

By 1992, personal computers were fast enough to handle a real-time war game. The *Dune II* team set out to make—in the words of Westwood producer Del Castillo "a game that would make adrenaline fire and muscles twitch". The interface was simple enough to manage quickly, and the attacks could become fast and furious. Some traditional war gamers frowned upon this new approach, claiming "real-time strategy gave a very inaccurate sense of how things were done at the operational and strategic level. This particular issue irritated a lot of history minded war gamers." But many other gamers loved the idea, and *Dune II* sold well.

There were at the time a few other earlier real-time strategy games. *Battalion Commander* published by Strategic Simulations, Inc. in 1985—which they called a "real-time modern tactical combat simulation"—was one of the first real-time computer war games. *Herzog Zwei*, released for Sega Genesis in 1989, is arguably the first real-time strategy game. Neither of these games was very successful, and Westwood producer Del Castillo aptly noted that "some say *Herzog Zwei* was the first, others say *Siege*, but either way, it was *Dune II* that put real-time strategy on the map."

The Battle for Arrakis

Entr'acte

In 1990 Westwood Associates had already released *BattleTech: the Crescent Hawk's Revenge*, a small-scale strategy game that was mostly played out in real-time. They also released *Circuit's Edge*, yet another franchise tie-in, this time tied to the novel Gravity Falls. Later the same year they released *Dragonstrike*, a flight simulator – role playing game hybrid.

In 1990 Westwood Associates also released its first commercial blockbuster, *Eye of the Beholder*, a role-playing game for the PC which was published by SSI – Strategic Simulations, Inc. It was yet another franchise tie-in based on the Dungeons & Dragons license, making 1990 their most productive year in regards to titles released, four in all.

In 1990, Louis Castle got a game-changing call from British entrepreneur Richard Branson; "He said he wanted to buy our company and when I told him we didn't have it up for sale, he said in his experience, everything is for sale," Castle said. "It was probably underpriced and we learned from the experience, but we thought 750K (\$750,000) was pretty good at the time."

In the early 1990s Sperry and Castle were nearing completion of a game that would forever change the direction of Westwood Studios. Up until that point, Castle felt that their games were targeted only

towards hard-core players. He recalls looking at the 8-bit Nintendo; "All these developers [were creating] great games with two buttons. Why did we need all these Shift-Alt combinations on the PC?"

Their answer to this was *The Legend of Kyrandia*, an adventure game with a completely novel and extremely simple point-and-click interface. With this new game in hand, they approached Ken Williams at Sierra—who was at the time enjoying incredible success from their own King's Quest series of adventure games—in hopes that Sierra would publish Kyrandia.

Recalls Sperry, "We gave him a demo of it, and we really thought it blew him away. Little did we know that Sierra had *King's Quest V* in development at the same time, using the company's own icon-driven interface. So after our demo, Ken shows us *King's Quest V*. You can only imagine what our faces looked like! It was a huge letdown moment."

While Sperry and Castle were recovering from their blow during the meeting, Ken quickly followed with a second one. "Still, Ken really liked what we showed him, and he actually asked Lou and me if we would be willing to sell Westwood to Sierra. I was taken aback by his question. Lou and I weren't really ready to sell the company. We wanted freedom and control. Screw that!"

At the time, they really did not think much of the offer and continued on their search for a publisher for Kyrandia. They eventually settled a deal with Virgin Interactive. It was here that Sperry casually mentioned to Martin Alper of Virgin that Sierra's Ken Williams had made them a business offer. Martin, not one to be standing idle, said that he, too, wanted to make an offer for Westwood.

Selling out

The Battle for Arrakis

It was at this point that Sperry and Castle began seriously considering selling their company. They began to see the benefits of being bought by a larger, more established game developer and publisher. They had wanted to produce games that pushed multimedia and programming might to the very limits available. Selling out to such gaming powerhouses seemed like the perfect solution.

As Castle recalls, "The bottom line for me was that I was tired of having to put so much of our retained earnings into a product beyond what a publisher would advance us. Basically, we were betting our home mortgages on each and every title. We did not make any huge mistakes, but it only would have taken one to do us in."

After much discussion with the two companies, the final decision was left to Sperry and Castle. Although Sierra offered more money for the sale of Westwood, Virgin promised more independence for the studio. With that, the decision was quite easy to make, as Sperry recalls, "Virgin offered us complete creative freedom if we met financial goals; they put that in writing. Combine that with being taken off the hot seat personally, and I was sold."

When Virgin's Richard Branson and later Ken Williams from Sierra offered to buy the Westwood studio, Castle once again faced a difficult decision. Even though Sierra was offering 6 million dollars to Castle and his partners out, they had chosen the Virgin deal instead. "They gave us a piece of the business," Castle explained. "Always bet on yourself. You can either go with the short run, or take the

longer view and try to get a piece of the action. We thought we could build a business and it turns out we were right."

Closing the Virgin deal, Castle suddenly found himself becoming the company's CFO. He found himself mostly working out of a check. Still, it required him to reinvent himself once more. "I was CFO with 250 people," Castle said. "I grew in that position and we never lost the value of the fidelity of the systems. I stopped counting how many times I had to reinvent myself."

Indeed, that deal helped Westwood to become the company that Sperry and Castle truly wanted it to be, as illustrated by one of their first games together; *Dune II*. In 1990, Virgin had obtained the licensing rights in order to create a Dune game. The development was done by a company called Cryo Interactive Entertainment and was mostly a first person adventure game based on the settings in the book, *Dune*, by Frank Herbert. The game was very innovative, but the game play was deemed tedious by the American public; thus the game was not very successful on the American market. Virgin decided to take another shot and this time handed the development to its newly acquired company, Westwood Studios.



In April Sega bought the European operations of Virgin Games. Virgin was eager to sell in pursuit of revenue.

Creating Dune II

"During the 1991 CES in Las Vegas, one of my fellow producers and I met the crew from Westwood Studios, who had just shipped one of the greatest Advanced Dungeons & Dragons RPG's of all time: *Eye of the Beholder* for SSI," explains *Dune II* producer Lyle Hall from Virgin Games. "From that day on, we made it our mission to get Virgin to sign Westwood Studios to a publishing deal for their next few games. Soon after, it actually happened, and I feel fortunate to this day to have worked so closely with many of Westwood's founders and key veterans."

The same year, Virgin began expanding into the console and handheld markets as well, something Hall was more than happy about. "As a huge fan of Sega's 16-bit console," Hall muses, "I took this opportunity to take on production duties for our entire slate of Genesis games, and *The Terminator* was the first one I produced."

In the same year, Hall also produced the Genesis version of Core Design's *Chuck Rock*, before once again working with Westwood Studios; this time as co-director on their revolutionary real-time strategy title, *Dune II*.

"*Dune II* surpassed all of our expectations," Hall recalls. "We knew we had something special when everyone in product development and quality assurance spent all day playing it for months before it shipped, but none of us expected it to define a new genre of computer game and inspire countless competitors. Without it, it is likely there would not have been a *Warcraft*, let alone a *World of...*"

Westwood artist and designer Joseph Hewitt remembers the development process, "*Dune II* has long held the honor of being the first real-time strategy game. There has been some dispute to this claim with people pointing out some of Westwood's earlier titles such as *BattleTech: the Crescent Hawk's Revenge* and the previous title *BattleTech: the Crescent Hawk's Inception*. Other games like *The Ancient Art of War* have come up as even pre-dating those. I could also mention most of SSI's catalog of strategy games, some of which Westwood ported to the Amiga and Atari ST in their early days. The point is those are turn-based strategy games (TBS) where you take turns moving units with your opponent(s). *Dune II* was an evolutionary step forward with "real-time" action. There were no longer any turns, everything happened in real time. Comparing turn-based strategy to real-time strategy is like comparing chess to hockey. Nothing wrong with either, but the pace and strategic thinking used in the two is quite different. This jump in evolution was so different from previous strategy games that phrases "turn-base" and "real-time" came in to being to separate them."

Joseph Hewitt continues, "It would be unfair to not give credit where credit is due however. One of the things our industry has done from the beginning is building on the success of previous games. Taking what has come before, polishing it, adding something new and creating something new out of it. *Dune II* was no exception and was inspired by some other great games. A lot of the development and production side of the game was inspired by *Populous* and Sid Meier's *Civilization*, two games that were played quite a bit in the office. But the most credit should go to a little known Sega Genesis game we were playing in the office called *Herzog Zwei*. *Herzog Zwei* can be viewed as a real-time game, but it is not generally lauded as the first RTS because it is not really the same type of game. *Herzog Zwei* was its own unique thing and feels more 'arcadey' than a strategy game. The player is not individually controlling all the units in *Herzog Zwei*, so much as controlling one unit that is kind of a transport director. *Dune II*, on the other hand, took all the elements of a traditional turn-based strategy game, large armies of units, added resource collection and base building, and had you manage them in real-time. This was quite different than the turn-based strategy games that it was born out of."

Sacré Bleu!

Meanwhile development on the first *Dune* offering continued unabated in France. The Cryo game graphics were solidified as VGA in 256 colors. The Gulf War also began in 1991, and it had an impact

on Philippe Ulrich; he made the somewhat controversial decision to integrate images of the night bombing of Baghdad into the game. In fact, one of the soundtrack titles is, indeed, Baghdad.

"So we went on with this, and one day, I met journalists from TILT. Back then, I think that was TILT, TILT was the first French magazine about video games", recalls Ulrich. "They came to visit, I showed them a few things, and they were amazed. And when the new issue of TILT was released later, I got a phone call a few days later, from a furious guy, screaming at me: 'You have no rights to do this! I'll sue you! You are dead!'"

"I told him, 'If you are a bit clever, you'd invite me to London, we'd have some coffee, and I would show you the game.' So he said, 'You have five weeks to finish the game and send it over to California and THEN I'll kill you all.'"

Finally, Alper and Bishop were sufficiently impressed by the work on the first prototypes and they rescinded on the cancellation decision, despite the fact they had another project Dune in the works. They gave Cryo five weeks to present a prototype able to satisfy the American public.

The plot of the game was modified from the novel and the developers chose to start the game with the arrival of Paul on Arrakis. A few weeks later, they sent a prototype of the game to the United States.

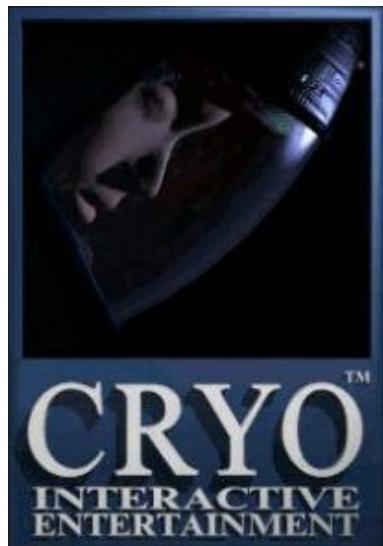
"Everybody worked very hard then, and five weeks later ... I went to the post office to send the package, I kissed it ... There were tons of floppy discs inside", remembers Ulrich. "And actually, I didn't know that, but the game was given to 'a team in California' that tested the game in order to approve it or not."

"So Westwood received a heretic version of Dune from Europe, made by froggies, developed without any green light or anything. And they told me that when they saw the game ... they were like WOW!"

"Martin called me, 'Phillipe, you have ten years of collaboration with us ahead. At least! Create your company, there won't be any problem.'"

Martin Alper was thrilled, not only by the game but also by the music, to the extent he wanted to release the music on CD as a stand-alone soundtrack. In September 1991, at a meeting in London a publishing contract was finally signed for the game, and Alper agrees to finance the end of the development cycle. On 27 September 1991, Virgin Games Sega USA signed a contract regarding an adaptation of Dune on Mega-CD; this assured 15 months of work for Herbolut's team. In October 1991, the game was in pre-beta and a public demo was in the process of being designed and planned.

In January 1992, Ulrich, Herbolut and Lefranc, finally created the independent company Cryo Interactive, turning the Cryo Interactive team into a shared company. Lefranc was appointed



Cryo Interactive logo

Managing Director. The first Dune game hit stores in May of 1992, months before the Westwood game that was eventually renamed '*Dune II: The Battle for Arrakis*'. The Cryo game sold 20,000 copies in the first week after release, outselling the next title in the list by a factor of five. After all was said and done, the development of Dune had cost 3 million francs, of which 800,000 were for Cryo's direct expenses. A distribution contract was signed and Cryo was given an additional budget of 600,000 francs.

Cryo's follow-up plans included several ports, including the Atari ST, Amiga and Super Nintendo, and possibly NES and Master Systems. Most of these never saw the light of day. Philippe Ulrich's plans also included a sequel, this time placing the player as the Harkonnen. The originally floppy disk game was one of the first video games distributed on CD-ROM; this corresponds with the desire by Philippe Ulrich to exploit the new medium, these plans were also initially opposed by David Bishop.

Westwood

Meanwhile Westwood released several titles, among them two more franchise tie-ins, this time tied to the Dungeons & Dragons franchise; *Order of the Griffon* and *Dungeons & Dragons: Warriors of the Eternal Sun*. This was also the year Westwood released *The Legend of Kyrandia – Book I*. However, the main Westwood teams were now in place to commence design work on *Dune II*.

"The inspiration for *Dune II* was partly from *Populous*, partly from my work on *Eye of the Beholder* and the final and perhaps most crucial part came from an argument I once had with Chuck Kroegel, then vice president of Strategic Simulations Inc," recalls Westwood Studios co-founder and *Dune II* producer Brett Sperry.

"What became *Dune II* started out as a challenge I made for myself. The challenge was that strategy games would be out-of-control fun if the real-time aspect of *Eye of the Beholder* could be combined with resource management and a dynamic, flat interface. Just one mode of play and no additional screens. But how? Long before I decided to experiment with actually building this new game in a Dune setting, I kept toying with the answer."

These thoughts apparently percolated for a long time. "The thought process began around 1989 during *Eye of the Beholder*'s development," remembers Sperry. "This is how many of my 'visions' for a new game start. It's always 'What if you add this and that?' or 'Wouldn't it be hellaciously cool if...?' Then I kick it around for a few years, make random notes, and then maybe we build it. I remember we built several prototypes to see and feel the dynamics I had been pondering for so long. And the first three instances (at least) were crap. So we kept working on it again and again. The vision was powerful, but the details eluded us for a good year."

"We wanted to create a game that was, roughly, a melding between *Populous* and *Civilization*", says programmer Joe Bostic. "We had seen some elements of game-play in the Genesis game of *Herzog Zwei* that we liked. We also had the Dune license so together the result was *Dune II*. It would have been Dune 1, but Cryo had released a Dune based game prior to our release."

Sperry explains, "The crux of my argument with Chuck Kroegel [of SSI] was that war games sucked because of a lack of innovation and poor design. Chuck felt the category was in a long, slow decline, because the players were moving to more exciting genres."

"I felt that the genre had a lot of potential—the surface was barely scratched as far as I as concerned, especially from a design standpoint. So I took it as a personal challenge and figured how to harness real-time dynamics with great game controls into a fast-paced war game."

"The first time we showed that game internally it had wizards and castles," recalls Castle. "We were working with Virgin at the time, and they said that they had this great IP, Frank Herbert's Dune, and Brett loved the books. So we took the game we were working on and recreated it in the Dune universe."

"It solved one of the fundamental problems we had with making an RTS, which was that we wanted to have a central resource that everybody was fighting over. Dune has spice, which made perfect sense—and it was also used when we came to the idea of Tiberium. It became the anchor of the C&C universe because people were arguing over a limited resource that represented wealth and power".

Initial development was hardly any less problematic, as Sperry recounts; "Joe Bostic was my lead programmer, and I remember telling him about how I wanted the units to move around on the battlefield and the basics of combat. And so he put it all together, and the resultant game was really boring!"

At this stage, though, the game bore little resemblance to the final product, with only four to eight units fighting on each side. "When we played with it, the whole game was over in no time. So we worked in obstacles on the battlefield and later production dynamics, the base and unit construction, and the fog of war effect. The production dynamics were partly inspired by *Civilization*. Sid [Meier]'s production dynamics gave me ideas on how to make *Dune II* more interesting."

Fly-by-night

According to Sperry there was no fleshed-out game design and development was largely organic. "I wasn't very good at communicating what I saw in my mind," he admits. "I knew how I wanted the controls and interface to work very clearly, but some of the unit dynamics and pacing were still murky. So we basically built the game iteratively and the design documents were often made up as we went along."

This open-ended approach to game design is clearly how Sperry prefers to work, admitting that today he spends more time as a voyeur than a player. "When I focus on watching others play, I learn more about game design and entertainment, what's working, what's frustrating and how much or little players are willing to put up with and why. Game design and gamer interaction is still a source of endless fascination for me."

Sperry describes *Dune II*'s core challenge as "combining combat, exploration and production at a particular pace and rhythm to make it all exciting and almost out of control. That was a key part of

what made it so addictive." Indeed, the experience was quite unlike more staid turn based strategies, where success or failure rolled in slowly rather than rushing over sand dunes at the speed of an action game.

"You had to think and respond fairly quickly, and in real-time, or else your base and forces would all be overrun. And as we developed the game further, it became clearer how the pacing and battle scenario design were all a delicate balance."

Joe Bostic remembers the groundbreaking nature of Dune 2, "Game development is fun on every project, but I would say that Dune II development was the most interesting. Dune 2 was inspired by elements of other games such as Populous, Civilization, Military Madness, Herzog Zwei, but for the most part it was a new formula. There is a lot of adventure in creating something so different that what currently existed." Years later, Dune 2 still stands out among the Westwood projects, "[My favorite project was] probably Dune II because of all the new challenges it presented. We couldn't look at existing RTS games for guidance."

"Some of the challenges were in getting the AI to behave challengingly (partially successful), getting the carryalls to pick-up and deliver units, and coming up with an understandable scoring system," says programmer Joe Bostic. "There were some discussions about adding multiplayer, but at the time we had neither the time nor expertise to implement it. That was rectified in the subsequent game of *Command & Conquer*."

Regarding the game play and the introduction on the Ordos faction programmer Joe Bostic remembers the reasoning, "We wanted to have a third side and there wasn't a compelling and suitable one available from the movie. I think producer Marc Cram came up with the idea to use Ordos and we decided to give them the sneaky and devious character."



Producer Marc Cram of Virgin Games

Producer Marc Cram from Virgin Games' UK offices remembers the thoughts that went into the decision, "I was a producer and designer for this project. The original idea was to make a game that captured the fun and imagination of those plastic army men. There were a couple of games out of Germany that were heading in that direction, but nothing that had all of the different equipment and abilities that we wanted to put into a game. Virgin had the license to do Dune. They secretly gave to the project both to Westwood and a French company; I cannot remember the name. The French finished the game first, which was a 3D crawl game. Our thoughts were that the story was too

complex and rich to replicate in a video game. We decided that it would be best to take all of the fun elements in the game and create our own story. I had read the books once and was a little confused as to all of the elements, but my friend Wesley was a big fan of the books and so I invited him to lunch at the Golden Nugget buffet. Over a piece of salty roast beef, he pulls out the Dune Encyclopedia. He told me that the book was very rare and would not let me take it home. So, on the back of a Keno pad I started writing down the profiles of all of the houses. I think I still have the Keno pad. Originally, I was going to use House of IX as one of the houses, but it seemed better as a resource. Also, living in Vegas, the House Ordos seemed like the Mafia. This appealed to me for some reason."

Gathering the team

In 1991 programmer Scott K Bowen joined Westwood Associates. He came from a company called Rhyse Development, Inc., an office automation tools development and integration firm, also a business technology consulting and custom software development firm operating out of Utah. Bowen became one of the main programmers of *Dune II*.

Joe Bostic was already on Westwood's payroll when *Dune 2* came around the corner. However, he was almost not hired due to a small mishap; "I was doing payroll report processing for local casinos – a boring job that often required long hours of just sitting and waiting to feed another box of paper into the high speed printers. During that time I would tinker with the terminal control language and make simple games on the data entry terminals. It was harder to do than it sounds as the language was just barely powerful enough to do screen forms for data entry. Anyway, I applied to Westwood. I didn't hear back from them so then applied to work in the Aerospace industry (making rockets, drones, etc). Westwood lost my resume as it fell behind a desk by accident! Just as I was starting to get responses to get interviews in the Aerospace industry, Westwood called. Apologized for losing my resume and asked me to come in to interview ASAP. I did. They hired me straight away and that is how I got into the industry."

The soundscapes and the graphics were naturally central to Westwood's titles; great care was taken to set the game apart from other releases at the time, and the QA team really had their work cut out for them. This time it felt different; however; the teams that were responsible for how *Dune II* looked and sounded knew they were creating something extraordinary.

Westwood Studio's in-house composer Frank Klepacki remembers the music from the *Dune* game by Cryo, "I was influenced by the soundtrack in the first non-RTS *Dune* game created by Cryo, which I thought was brilliantly composed by Stéphane Picq, and I also took a great deal of influence from the original film soundtrack by Toto." Klepacki knew about Westwood before joining them; "I remember when Louis Castle was getting the company off the ground from humble garage beginnings. I showed interest in testing there as a summer job my junior year of high school. I was a distracted tester, though. I was just in awe of the talent and creativity there, from the art to the audio and how it all got put together. After I graduated, I asked the audio director if I could help in any way, and showed some promise in my skills as a composer. The rest is history."



Music composer Frank Klepacki.

Decades later the soundtrack for *Dune II* is still impressive, considering the constraints and limitations of computer audio in 1992, and perhaps even more so considering Klepacki was only 17 years old at the time of composing the score. "I got to be part of some great history there with the first real-time

strategy game. I drew some influence from the movie and from the other Cryo Dune game at the time, though I was encouraged to be creative and do my own thing with it. So I had fun with it." Not only was he only 17, but he did not really have composing duties in mind at all at first. "I was a fan of Westwood Studios games at that time, and when I found out they were in my home town of Vegas, I applied there as a game tester, and got to know the head of audio there, and gave him my demo. After I graduated high school, he gave me a shot to prove myself over a 3 month trial period, and the rest is history!" Klepacki knew he was part of a team creating something extraordinary. "Dune 2 had truly marked a turning point in the game industry. Real time strategy had now been established."



Graphic artist Ren Olsen

Having signed on with Westwood Studios in December of 1990, graphics artist Ren Olsen did the artwork for the backdrops. He, Aaron Powell, and Elie Arabian are equally credited with graphics in the credits on the package, but Olsen remembered it a bit differently; "Elie Arabian was hired end of 1992, if he worked on Dune II it was minimal. Myself and Aaron Powell did 98% of the graphics." Lebanon-born Elie Arabian started working at Westwood in June of 1992, and only had

time to work on the intro and finale

animations at the very tail end of the



Graphics director Aaron Powell

production. Graphics artist Aaron Powell had double duties during the development of Dune II, doubling as director. The graphics team worked on what today seems like ridiculously small screen real estate. In fact everything was made small right from the beginning. "There were never any higher quality imagery in the first place", says Ren Olsen. Perhaps he is a reason for the rather cartoonish graphics of the game; "My work experience began as a layout artist for the Saturday morning cartoon series 'Thundarr the Barbarian'."

Quality Assurance director Glenn Sperry—incidentally the younger brother of producer Brett Sperry—joined Westwood way back in 1988, and even worked for other companies before that. Glenn was the director of QA ever since he joined Westwood Studios, and built the entire QA department from the ground up, hiring one guy at a time. Sperry had a strict regimen for his testers; "There's a difference between playing a video game and testing a video game", he says. "If you're playing it, you're not paying attention." Sperry's hard work and diligence paid off handsomely; for a long time Westwood boasted the smallest number of 'shipped bugs' in the industry. For *Dune II* he headed a team of 14 people.

Creating a genre

"A lesser-known fact was the official genre naming that was going to be used to explain the game to the press and players", recalls Brett Sperry. "It wasn't until sometime after the game was in development that I decided to call it 'real-time strategy'—it seems obvious now, but there was a lot of back and forth between calling it a 'real-time war game,' 'real-time war,' 'wargame,' or 'strategy game.' I was deeply concerned that words like 'strategy' and 'wargame' would keep many players from even trying this completely new game dynamic. Before 1992, wargames and strategy games were very

much niche markets—with the exception of Sid Meier's work—so my fears were justified. But in the end, it was best to call it an 'RTS' because that is exactly what it was."

"The reason it was Dune II; so, the back story is we were working for Virgin at the time, and they said 'we have this great property, Herbert's books of Dune', one of Brett's favorites. So I said, 'wow, that's going to be great, I can't wait to do a lot of art direction on that'. That's actually what I contributed to Dune II more than anything was art direction, so I'm really proud of those pixels. And we sat down as we said, 'wow, we can make this really great game about this combat; we can have this spice Melange and that'll be the resource everyone's fighting over, and it's going to be fantastic'. So we get the game all the way done, we preview to a bunch of people like you, fans of course they didn't know about the game. They went completely crazy about it; they went 'this is amazing'. It was called Dune, and it originally was called 'Dune, the Battle for Arrakis', which is what it was called on the Genesis, but that was the original PC release. We're all excited and it's about now three months before we launch the game; we got the artwork done, we got all the internals done, and they go 'oh, hang on a tick, there's this problem here'. Because Virgin had a European group doing this game which is an adventure game called Dune on the Herbert books, 'and they're going to be out next month, so you can't call it Dune'. That's how it became Dune II. So, they actually have nothing at all to do with each other, it was just too late for us to change everything. So the only thing we could do quickly was to add a 'll' at the end."

In spite of concern over the obscure title the game was an immediate hit when released in 1992. "We called *Dune II* a 'real-time strategy' game—we did that to make it clear to software retailers and users that we had something new," says Sperry, who seems to have been afforded the rare chance to not only create a new genre but to name it as well. "But it was a war game at heart. You built and managed units and took out the other side. Once people tried the game, they were hooked, and soon *Dune II* was a huge commercial success."

Despite initial fears of how the market would react to the new genre *Dune II* was ultimately a success, selling over 300,000 copies over a period of less than two months before piracy overtook it and made the game impossible to sell.

Louis Castle says, "*Dune II* had done very, very well anecdotally. Sales-wise it did not do as well because it was heavily pirated, but everybody knew the game and it became a favorite amongst many people, so we knew we were working on something great."

1992 was also the year Westwood Associates finally became Westwood Studios by being bought by Virgin Games. Stephen Clarke-Willson remembers the acquisition, "It's pretty simple. They were great! Actually the deal had fallen apart but I was in London and I met with [Virgin France's] Robert Devereaux—incidentally Richard Branson's brother-in-law—and kind of sketched out what I thought would be acceptable to the Westwood guys, and he thought that wasn't too crazy. We'd been more successful so we could afford a little more. *Dune II* was the key thing. People who played it loved it. Unfortunately, not very many people played it. Martin kept wanting to cancel their follow-on strategy game, but I kept pushing for it. Fun is a rare commodity. That game became *Command & Conquer*."

The sale was discussed by Castle and Sperry. Remembers Castle, "The bottom line for me was that I was tired of having to put so much of our retained earnings into a product beyond what a publisher

would advance us. Basically, we were betting our home mortgages on each and every title. We did not make any huge mistakes, but it only would have taken one to do us in."

Post mortem

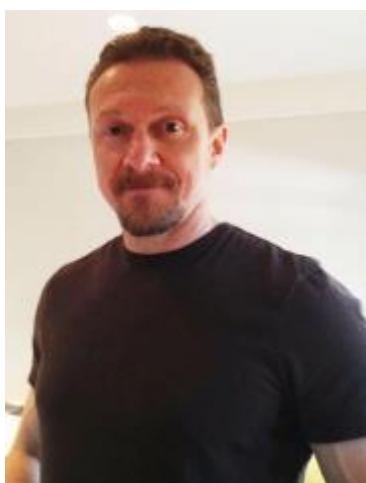
As work on the game came to a close, Sperry was working on its successor: "I was evolving my designs and figuring out how to streamline the interface even more. I had developed a new game and mythos with a modern-day setting, and that's how *Command & Conquer* was born."

Stephen Clarke-Willson remembers that it was *Dune 2* that paved the way for C&C; "[Virgin Games'] Martin Alper, gaming genius, wanted to cancel *Command & Conquer* because it was built on the *Dune 2* engine, and *Dune 2* didn't sell at stellar levels. Still, everyone, and I mean, everyone, that played the game *loved it*."

Although *Dune II* earned itself two sequels—a remake in 1998 named *Dune 2000* and the more favorably received sequel *Emperor: Battle for Dune* in 2001—it is the *Command & Conquer* series that is the game's true legacy. The series is still the most successful real-time strategy franchise today and its debt to Westwood's original games is immediately obvious.

Sperry has little to offer in support of subsequent entries in the genre, though. "The few war games I've played lately have left me uninspired," he admits. "I don't really recognize the realtime strategy genre as such on consoles."

"That said gaming today is still fun and exciting to me personally", Sperry continues. "I play *World of Warcraft* with some friends on a PvP server. I thoroughly enjoyed *BioShock* and I still play *Mario Kart* from time to time. Mostly social games and multiplayer games are what appeal to me. The quality of games is still a mixed bag despite all the new technology. But hasn't it always been like this? In music, literature and film we see the same thing—lots on offer, but a pretty small number of exciting gems each year. And I can assure you that, like other entertainments, every game project starts out as something new and exciting in its creator's minds. But without a great design, critical feedback and a solid team, it's still a dicey outcome."



Dune II audio designer and director Paul Mudra.

Stephen Clarke-Willson remembers, "Anyway, the long and the short of it was Westwood agreed to make a resource strategy game based on *Dune*, and agreed to look at *Herzog Zwei* for design ideas. And the rest is show business history. Of course, as you probably know, it turned out the *Dune 1* game never was cancelled, which we discovered when another milestone submission arrived several months later, and it was finished just slightly ahead of the Westwood game, and since we shipped everything the instant it was ready, or maybe even a little before (!), the adventure game—with minimal strategy elements in it—came out first and Westwood's game became *Dune 2*, much to their chagrin."

Dune II came out in 1992. In gaming years, such a release date is

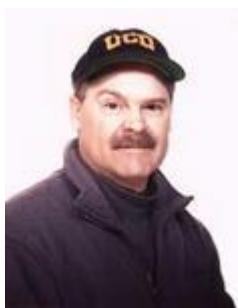
positively primordial. The gaming industry has changed a lot since those days, and Westwood Studios is no more. Many of the people involved in the twisting history of the game are no longer with us, either.

The year after *Dune II* was released Virgin Games changed its' name to Virgin Interactive Entertainment. In 1998 Virgin Interactive Entertainment sold Westwood Studios to Electronic Arts for US\$122 million. The world's largest toy maker, Hasbro, and largest software company, Microsoft, also made bids for the company. Many members of the staff did not like the new management, and were not happy with how Westwood was made merely a department of EA. They felt the Westwood brand—a brand they had worked very hard to create—was being deleted. Some left at that point to find employment elsewhere, and When EA decided to close Westwood for good a mere 5 years later some formed their own companies. One such is Petroglyph Games, whom have a lot of Westwood alumni on their payroll, such as programmer Joe Bostic, composer Frank Klepacki, and graphic designer Elie Arabian.

Says Louis Castle; "We sold Westwood to Virgin in 1992. Virgin was sold to Viacom, including Westwood and Westwood alone was sold to EA. We were not part of the decision to sell Westwood when it was sold to EA but we were agreeable with EA or Microsoft, both of which were actively bidding to buy Westwood. In the end, both Brett and I were well compensated but we also made sure to take care of all the Westwood staff in 1998 when EA bought Westwood."



Dwight Okahara in 2004.



Coco Gush, writer of Dune II.

The Westwood veterans are, however, scattered far and wide around the industry. After Westwood Studios was finally shut down audio designer and director Dwight Okahara went to work for Buzz Monkey Software, LLC in 2004, and to Insomniac Games in 2006. There he joined sound designer and director, and former *Dune II* veteran Paul Mudra, who had been working with Insomniac Games since 2003. Aaron Powell worked at Westwood until October 1997, after which he went to work for Blur Studios for 6 years. He is nowadays a photographer and CG supervisor operating out of Los Angeles.

Some have left the gaming industry for good. In 1990 Rick 'Coco' Gush joined Westwood Studios, then a happy newcomer in the computer game development industry. A successful novelist and scriptwriter in his own right, Gush was initially hired to write dialog, but quickly became a major contributor to the game. Together with Donna J Bundy he wrote the dialogue and scripted the cut-scenes for the game. Incidentally Donna Bundy was also behind some of the voices in the game; the other female voice artist Julie Stainer-Loehr is now a theater professional operating out of New



Voice artist Julie Stainer-Loehr

York. Coco Gush later became lead designer at Westwood, and after the implosion of the company he went to work for Trecision in 2002. Merely three years later, however, Gush moved to Italy to focus on art and to enjoy his pension.

Producer and Westwood Studios co-founder Brett Sperry has likewise left the industry. He is now a photographer and graphic artist. Westwood co-founder Louis Castle has also left the gaming industry, at least computer games; Castle stayed with EALA until 2008, when he joined InstantAction, but after InstantAction folded in 2011, Castle has been with Shuffle Master, Inc. since 2011, creating card shufflers for table card games and casinos.

On an infinitely sadder note, many of the people in and around the story have left us and sailed off into the great void. Graphics artist Ren Olsen passed away in 2012. Mastertronic veterans Frank Herman and Alan Sharam passed away many years ago. In more ways than one, the story thus comes full circle.

The legacy of Dune

Dune II provided the stock blueprint for roughly speaking every single real-time strategy title produced since. It is somewhat shocking how little the genre has evolved since then. Apart from the obvious inclusion of multi-player environments and 3D graphics, it can be said nothing is fundamentally that different in RTS games of today, and the argument is not completely unjustified. Resource gathering and structure maintenance is still part of every real-time strategy game, as is the slow amassing of troops and the following elimination of the foe. Dune II contained all of those elements. The same goes for playing in an environment that dictates your strategic and tactical decisions by changing the way your units behave, while being stumped by the fog of war; Dune II had all of that, too. In fact, one is sorely pressed to find any real changes of note when comparing Dune II to titles released 20 years on.

Dune II was born in the heady days of the emerging gaming industry. This was a time of creative thinking, risk taking, and unrestricted visions. Today the gaming industry has long surpassed the movie industry in terms of revenue—development cycles can far outlast even the longest Hollywood productions and routinely involve hundreds of people—and it is a major industry, employing hundreds of thousands of people worldwide. But by becoming established, perhaps the industry has lost something. Perhaps the industry will never see days like those early trail blazing days again. In a time when gaming titles have become more or less carbon copies of each other, with little to no variety, the imaginative titles of the early pioneers may in retrospect seem strange, hallucinogenic even.

Programmer Joe Bostic perhaps best sums up the creative spark that fueled the early gaming industry; "You would have to admit that placing a real-time strategy game in the world of Frank Herbert's Dune is a stretch."

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DUNE II

The Battle for Arrakis

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