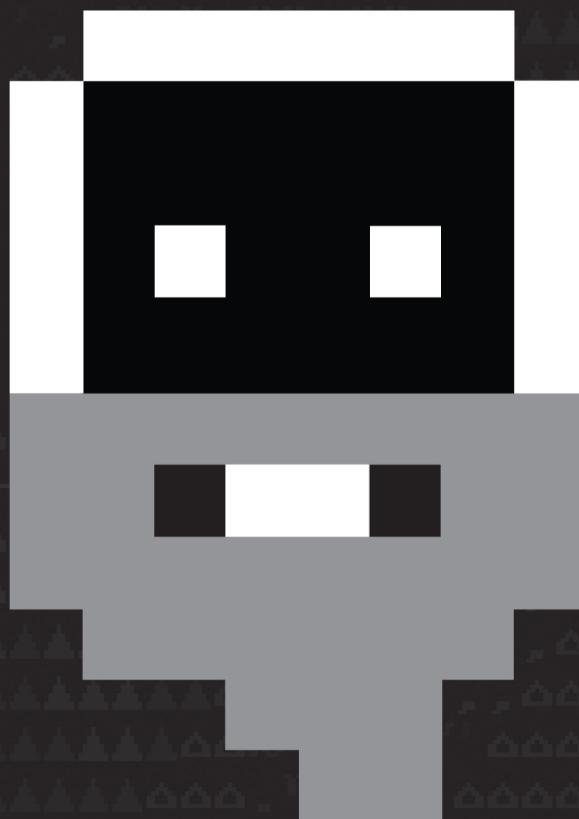


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GETTING STARTED WITH

DWARF FORTRESS



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PETER TYSON

GETTING STARTED WITH DWARF FORTRESS



Dwarf Fortress may be the most complex video game ever made, but all that detail makes for fascinating game play, as various elements collide in interesting and challenging ways. The trick is getting started. In this guide, Fortress geek Peter Tyson takes you through the basics of this menacing realm, and helps you overcome the formidable learning curve.

The book's focus is the game's simulation mode, in which you're tasked with building a dwarf city. Once you learn how to establish and maintain your very first fortress, you can consult the more advanced chapters on resource management and training a dwarf military. You'll soon have stories to share from your interactions with the Dwarf Fortress universe.

- Create your own world, then locate a site for an underground fortress
- Equip your party of dwarves and have them build workshops and rooms
- Produce a healthy food supply so your dwarves won't starve (or go insane)
- Retain control over a fortress and dozens of dwarves, their children, and their pets
- Expand your fortress with fortifications, stairs, bridges, and subterranean halls
- Construct fantastic traps, machines, and weapons of mass destruction

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Getting Started with Dwarf Fortress

Peter Tyson

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Getting Started with Dwarf Fortress

by Peter Tyson

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Foreword by Tarn Adams

Long before we had a website, my brother Zach and I were writing computer games. For as long as I can remember, really—and back then we were our whole audience. This means that one of our key goals was to write a game we could play ourselves, and that in turn meant that replayability was far more important than traditional storytelling. If we focused on constructing an intricate narrative and interesting characters, all the effort would be wasted, since we'd already know all of the details. Instead, we drew inspiration from the map and creature generation techniques of games like *Starflight* and the Roguelikes, and tried to make each play of a given game as novel as possible.

That doesn't mean that storytelling was unimportant to us. We were just trying to offload the work onto the computer so that we could be entertained by whatever emerged from the game. Having grown up on Ray Harryhausen and Conan movies, as well as the traditional Tolkien novels and *Dungeons and Dragons* roleplaying, there was always a fantasy game in the works, and we worked to break things down into manageable pieces that could be interlinked with various game mechanics. We even started passing tablets back and forth, and took turns writing sections of swords and sorcery tales, which we'd then analyze to see how the different elements of the story could be brought into the generation systems within the game. This process was later formalized at the Threetoe's Stories area on Bay 12.

We released our first game on the Bay 12 website at the end of 2000, the never-finished *Slaves to Armok: God of Blood*, and it really demonstrated the dangers you can get into when you spend all of your time working on the nuts and bolts without looking at the bigger picture. We had distinct properties of different hair on a creature, but you couldn't talk to anybody. It was a very bottom-up affair that was destined to sputter and die. A few years into that debacle, we started working on a diversion called *Mutant Miner*, which eventually mutated itself into a game about dwarves. Small at first, but freed from the shackle of developing (bad) 3D graphics that had stopped *Armok* from moving forward, the new project began to absorb more and more of the features from *Armok* until it accomplished more than the original. We released the first version of *Dwarf Fortress* in 2006.

The game created a very small ripple on the Internet as a whole, but to us, it was amazing to watch new message board posts spring up and new people drop by to visit our own previously quiet forums. There was a podcast interview to stumble through (I almost clammed up entirely...it was kind of terrifying), and then the stories started to spring up. Players were doing and experiencing things we hadn't even imagined, to the point that reading their posts and emails was almost as fun to us as playing the game itself. People started passing around their save files to add to a single dwarven fort in succession, just like the tablet we had been passing around a decade before (Boatmurdered is the most popular example from this time). The best of what people can do on the Internet shone through, and over the years, experienced players have always been very helpful to people trying to learn how to play the game.

I first corresponded with Peter (aka TinyPirate) when his Dwarf Fortress tutorials were mentioned on Penny Arcade, and they've been an important starting point for many new players since they appeared in 2009. The spontaneous contributions by community members have been one of the most surprising and welcome aspects of putting the game out online, and Zach and I will always be grateful for all the help we've received over the years and all the kindness people have shown each other. Getting into Dwarf Fortress can be quite daunting at first, but you've already taken the first step on what I hope will be an entertaining and rewarding expedition. Just remember, losing is fun!

—Tarn Adams

Bay 12 Games

February 13, 2012

Preface

Dwarf Fortress is a fascinating but extremely complex game. What other game models the individual fingers, teeth, and organs of the creatures you control? What other game models the individual likes, dislikes, and grudges of dozens of your minions? What other game has a development plan that spans twenty years? What other game has caused so much gamer terror over that gentle giant, the elephant, or that humble river predator, the carp? The answer is none! This baffling complexity and Dwarf Fortress's infamous and seemingly impenetrable ASCII graphics can be extremely offputting to new players. *Getting Started with Dwarf Fortress* aims to help you overcome these challenges and to guide, comfort, enlighten, and hopefully inspire the inner Dwarf Fortress player in all of us.

The book is split into two broad sections. In the first few chapters you will be carefully guided in how to establish and maintain your very first dwarf fortress. [Chapter 2](#) and [Chapter 3](#), in particular, should be closely followed. In later sections, advanced topics are explored in depth and the reader is expected to take from these chapters the information needed to address whatever current problem they face. For example, a new player may wish to read about traps in [Chapter 11](#), but might not want to delve into dwarven machinery until they are more confident with the game.

The book aims to be comprehensive, while not overwhelming the reader with detail. Even so, an immense range of topics are covered, everything from how to dig your very first tunnel to training a dwarven militia to take on strange forgotten beasts. Occasional treatises on dwarven insanity, the value and dangers inherent to chickens, fortress defense, and other topics of use and interest are also included to provide as much practical guidance as possible. This book is current with releases of Dwarf Fortress up to May 2012.

By the time you have finished this book, you should be a confident fortress manager with a grasp on how to manage a dwarf fortress to maturity. You should also have the confidence to construct great, world-shaping projects and to dig ever deeper. Glory, after all, does not lie on the surface of the earth, but deep beneath, where dark caverns and damp tunnels hold surprises both grand and terrifying.

About the Author

Peter Tyson is a human born in 1975 in New Zealand. He is the oldest son of Ron Tyson and Ann Tyson. In the Summer of 1996, Peter became a student at Auckland University. In the Summer of 1999, Peter became a student at Victoria University. In the Spring of 2000, Peter became an Analyst at Datamonitor. In the Spring of 2002, Peter became a Community Manager at Codemasters. In the Autumn of 2005, Peter became an Administrator in the New Zealand Government. In the Summer of 2008, Peter married Laura. In the Winter of 2009, Peter wrote popular tutorials for Dwarf Fortress on his blog, ateractionreporter.com. In the Winter of 2011, Peter was struck by a Strange Mood.

In the Summer of 2012, Peter wrote *Pasubabo Thrathdad Teme* (also entitled *Getting Started with Dwarf Fortress*), a legendary wood-pulp bound book. The written portion consists of a 230 page guide to the game Dwarf Fortress. The writing is lighthearted with moments of humor.

In Summer 2012, *Getting Started with Dwarf Fortress* was stored in O'Reilly by the human administrator, Peter Tyson. Peter can be found on Twitter @tinypirate.

He is a tall creature fond of tea and games.

About the Artist

Throughout this book, you will find illustrations by Tim Denee of tales from Dwarf Fortress. Dwarf Fortress players were invited to submit their stories of amazing events that had happened to them in-game, and some of our favorites were turned into beautiful ✨illustrations✨ for you to enjoy.

Tim Denee is a human born in 1984 in Aotearoa. In the Summer of 2003, Tim became a Dabbling designer. In the Winter of 2006, Tim became a Competent designer. In the Summer of 2010, Tim became a Novice Dwarf Fortress player. In the Winter of 2010, Tim was struck by a Strange Mood.

Tim claimed a workshop. Tim sketched pictures of Dwarf Fortress...Vector graphics...Comics...

Tim created a legendary comic, *Bronzemurder*. It bristles with vectors. It depicts the events of the legendary fortress Bronzemurder. It has over 500,000 views.

In the Spring of 2010, Tim created a legendary item, Oilfurnace. It bristles with vectors. It has over 350,000 views.

He is a sturdy creature fond of drink and industry.

Conventions Used in This Book

The following typographical conventions are used in this book:

Italic

Indicates new terms, URLs, email addresses, filenames, and file extensions. Also indicates user interface elements as seen onscreen.

Constant width

Used for program listings, as well as within paragraphs to refer to program elements such as variable or function names, databases, data types, environment variables, statements, and keywords.



This icon signifies a tip, suggestion, or general note.



This icon indicates a warning or caution.

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Introduction

Dwarf Fortress is a freeware game developed by Bay 12 Games for Windows, Linux, and Mac OS X-based computers. It has been in development since 2002 and is the full-time passion of programmer Tarn “Toady One” Adams, assisted by his brother, Zach “ThreeToe” Adams. Bay 12 Games is entirely supported by donations, and Tarn and Zach have built a loyal following for their unique creation.

Dwarf Fortress has two and a half game modes but when gamers talk about Dwarf Fortress, they are usually talking about the simulation mode in which a player is tasked with building a dwarf city. The complexity of the simulation allows for some wonderful emergent game play as various game elements collide in interesting and challenging ways.

Two and a Half Game Modes

Unbeknownst to many, Dwarf Fortress is not just a dwarven city building game. Dwarf Fortress actually has two game modes and a third, non-game mode: Fortress mode is the dwarf city simulation, Adventurer mode allows you to play a Roguelike adventurer and explore the worlds you have created, and Legends mode simply allows you to read the history of your world and the heroes, creatures, and civilizations that have risen and fallen in it.

The focus of this guide is Dwarf Fortress mode (otherwise known as “fortress” or even “fort” mode). It is the more complete game experience and one of the most unique games you are ever likely to play. But that’s not to say that Adventurer and Legends modes don’t have their charm. One of the more interesting features of Adventurer mode is that you can take a character and explore your own, abandoned fortresses. There’s nothing like digging through familiar ruins to bring back fond memories of blood, terror, death, and despair deep underground!

Legends mode is, essentially, a history tome covering the worlds you generate. You may explore Legends mode after you create your first world (or perhaps after a fortress has fallen and you wish to remember your glory days). The randomly generated histories

and descriptions that enrich Legends are a constant source of amusement, as you will discover the day you read about your first giant, three-eyed, skinless mole—beware its deadly venom!

Losing Is Fun!

If there's one thing all Dwarf Fortress players should be prepared for, it is losing. You will lose your first few games, and probably quite quickly. But do not fear! There's a good chance that your losses will be quite amusing. My own first game ended with an insane dwarf chasing the only other survivor around the massive communal dining table in the only room in the fortress that wasn't filled with water. After a chase that lasted days, the insane dwarf eventually succumbed to dehydration, collapsing dead at the sole survivor's feet. The last dwarf was safe from the axe-wielding maniac, but trapped with no chance of rescue. Thus ended my first, tragic attempt at fortress construction!

If you find yourself overwhelmed playing Dwarf Fortress, try to use your early fortresses to learn just one or two features well. You may, for example, use your first fortress to learn how to dig and construct. With these skills mastered, you could then start a new fortress and focus on learning how to grow food and make goods. In due course you will have the skills to move on to trickier topics such as the military and engineering systems and the knowledge to handle all of these systems simultaneously. Playing Dwarf Fortress in this way can help turn the learning cliff into more of a learning hill (it will never be a gentle curve, sorry!).

When you do lose, enjoy the tales of doom and enjoy the many amusing ways there are to lose and the lessons your losses will contain. There's no perfect Dwarf Fortress, and in the end, no goal to achieve other than having fun exploring this unique game. Embrace the dwarfy way; dig deeper, build higher, and use magma as a decorative feature! Yes, disaster is probably just around the corner, but it is far better to go out with a magma-induced sizzle than a sigh.



If you enjoy Dwarf Fortress, why not donate (<http://www.bay12games.com/support.html>) to Bay 12 Games and support the ongoing development of Dwarf Fortress?

Installing Dwarf Fortress

Dwarf Fortress is freely available from the Bay 12 Games website (<http://www.bay12games.com/dwarves/>). To download Dwarf Fortress, simply find the SDL version that matches your operating system and click the link. You will be prompted to save a zip file. Unzip the file to a directory of your choice and then run the Dwarf Fortress executable to start the game. You can resize the default window using whatever method

your operating system relies on, or run it full screen. Many of the initial menu items will not resize to your new window, but once you are playing, the play area will fill all available space.

Many players find the Lazy Newb Pack (a fan compilation of the game with a game launcher, tools and graphic sets, found at <http://www.bay12forums.com/smf/index.php?topic=59026.0>) a superb way to get into Dwarf Fortress. With its built-in graphics and ready-to-use third party tools, the Lazy Newb Pack is a great introduction to the game. If you chose to use the Lazy Newb Pack, please keep in mind that all screenshots in this book are from the default game without any graphic sets or modifications.

Saving and Quitting

At any time when you are playing Dwarf Fortress, you can save the game through the **escape** menu option. Doing so will return you to Dwarf Fortress's main menu. Dwarf Fortress only permits one save per world: there are no do-overs! To continue your game, simply select *Continue Playing* from the main menu, press **enter** and then **enter** again with your world selected.

Dwarf Fortress only lets you play one fortress or adventurer at a time per world. As each game involves the player interacting with and adding to world history, two concurrent games in the same world are impossible. If you wish to play more than one game at a time, you must generate new worlds as required.

Should you wish to end a game, the **escape** menu will let you select *Abandon the Fortress* to end your currently active fortress. The events took place in that fortress will be written to the world history, and may be recounted in the next fortress you play in that world. Alternatively, should you wish to try Adventurer mode, your player character will be able to explore your now-empty halls.

Once a fortress has been abandoned or destroyed, you will again be able to select the same region to play another game of Dwarf Fortress, review Legends, or play Adventurer mode. It can be fun to play several games across the same world and get a feel for the gods, civilizations, and creatures that inhabit your individually crafted realm.

The Keyboard Is Your Friend

Dwarf Fortress is not the kind of game that holds your hand and leads you away for a magical evening of fun. Yes, it will charm you, but it's going to play hard to get and it's going to present you with some big hurdles to overcome. The first challenge you face is using the keyboard to drive the game. At this point you couldn't be blamed for shouting "Hello! 1980 called and wants its interface back!" In the age of iTabletDroid devices, keyboard-driven games seem archaic, but don't worry—in time you will confidently direct the game with just a few keystrokes. Stick with it! Don't forget that being keyboard-driven and largely graphics-free makes it very easy to convince bosses,

partners, and parents that you are actually engaged in Serious Computer Programming Activities and not simply trying to figure out how to get rid of the zombie dog that one of your militia shoved down your well. As for the mouse, well, although some screens offer mouse control, it is largely non-existent in Dwarf Fortress and it is often easier (with practice!) to use the keyboard to get things done. This book will guide you through the specific key presses you need to use, but the most common are listed in [Table 1-1](#).

Table 1-1. Common Dwarf Fortress key commands

Key	Binding
Cursor keys	Moves focus around the map and controls some menus.
Plus and minus keys	Cycles through secondary menu options.
Enter	Selects an option.
Esc	Backs out of a menu.
Shift and left-angle-bracket	Drops player view by one layer.
Shift and right-angle-bracket	Raises player view by one layer.
Mouse wheel	Zooms and scales the map and interface.
Left click	Designates where the mouse pointer is located.
Right click	Moves the designation X.
F12	Toggles TrueType fonts (on is advised).

Many keys are situational, and what a key will do changes depending on the menu you are in. Oftentimes, you will need to press two or three keys to move through menus to the feature you are looking for—and some command chains can get longer than that! Be brave; each set of key commands will be introduced to you at a reasonable pace over the course of this book.

Somewhat confusingly, you can often navigate a menu (such as the *Designations* menu) using the **plus** and **minus** secondary menu scroll keys rather than the key that corresponds to the menu item selection. This, and many other idiosyncrasies are common in Dwarf Fortress. Don't worry: in time, your hands will dance across the keyboard like a piano player, but instead of playing music, you will be digging tunnels, forging steel war hammers, and activating magma bidets to destroy your foes!

If you use a keyboard without a number pad, you may wish to rebind the *Move secondary selector* key bindings to something more convenient, because pressing the Shift key to reach “plus” and “minus” will get tiring. Press **escape** in Dwarf Fortress, use the cursor keys to select *Key Bindings* and find the secondary selector options under *General*. Cursor key across to *Add Binding*, press **enter** and define your new, preferred keystroke.

Mods and Ends

Dwarf Fortress has a passionate and creative fan base who have made a number of modifications and tool contributions to the community. Most well-known are the graphical tilesets that replace some of the Dwarf Fortress text map with simple graphics. Although there are purists who prefer the game as provided by Bay 12 Games, a large number of players enjoy playing with a tileset and other modifications and tools. Some of the most useful and popular contributions are featured below.

Tools

The following list highlights some of the best third-party tools for the game. If you're new to Dwarf Fortress, you may at first want to stick with just the game (either the vanilla version or the Lazy Newb Pack version) and Dwarf Therapist (which many consider essential), leaving other tools for when your confidence has grown.

Lazy Newb Pack (<http://www.bay12forums.com/smf/index.php?topic=59026.0>)

The Lazy Newb Pack (LNP), compiled by LucasUP, is a superb all-in-one compilation of tools, tilesets and the game itself. The Lazy Newb Pack features a simple launcher interface where players can change the tileset they are using, launch other tools, and edit the game's settings. It is recommended that all gamers new to Dwarf Fortress download and use the LNP, as having tools and resources such as Dwarf Therapist and a selection of tilesets at your fingertips is extremely handy.

Dwarf Therapist (<http://www.bay12forums.com/smf/index.php?topic=66525.0>)

If there ever was an essential tool for Dwarf Fortress, it is this one. Dwarf Therapist provides a graphical user interface for managing the labour settings of your dwarves. Currently maintained by DwarfEngineer, Dwarf Therapist runs alongside Dwarf Fortress and reads the current jobs, skills, and labors of your dwarves. You can easily adjust the labor settings of dozens of dwarves and then commit the change to Dwarf Fortress at the click of a mouse button. Dwarf Therapist is included in the Lazy Newb Pack.

Fortress Overseer (<http://www.bay12forums.com/smf/index.php?topic=63484.0>)

Thewonderidiot has provided the community with a handy tool that lets you explore your fortresses in 3D. Create an enormous statue to your favorite dwarf and then fly around it in Fortress Overseer!

SoundSense (<http://www.bay12forums.com/smf/index.php?topic=60287.0>)

If you've already tinkered with Dwarf Fortress, you will have noticed that there are no game sound effects. SoundSense rectifies this by running alongside Dwarf Fortress and firing off a sound or a little voiceacting every time an event happens. SoundSense is included in the Lazy Newb Pack, and was created by zwei.

DFHack (<http://www.bay12forums.com/smf/index.php?topic=91166.0>)

Peterix and many helpers have provided a compilation of tools that access the game's memory and modify or monitor game data. DFHack has features that let you prospect your map before digging, set up workflows, and make other advanced changes. DFHack launches automatically as a console window when the Lazy Newb Pack loads. Note that DFHack's memory manipulation code may cause virus scanners to report a false positive.

Stonesense (<http://www.bay12forums.com/smf/index.php?topic=106497.0>)

Created by jonask and now maintained by Japa, this clever tool links to Dwarf Fortress and displays an isometric, pixel art-style view of your fortress. While you cannot control Dwarf Fortress through Stonesense, it does offer a unique way to view your fortress and is a perfect companion to the game when loaded on a second monitor. Stonesense is built into DFHack and launched from the DFHack terminal window.

IsoWorld (<http://www.bay12forums.com/smf/index.php?topic=70700.0>)

Japa has created IsoWorld, a utility for viewing maps exported from Legends mode in more detail. Using IsoWorld, you can explore the worlds you create in 3D, which is a great aid to finding interesting places to embark.

Legends Viewer (<http://www.bay12forums.com/smf/index.php?topic=72702.0>)

Legends Viewer (created by Parker147) is a standalone utility that reads the world history files that Dwarf Fortress generates, in order to provide you with a point-and-click history browser. Legends Viewer makes it a breeze to learn about the world you're playing, and is a huge aid for players looking to immerse themselves in the worlds the game creates.

Websites

Numerous interesting and useful fan websites have been created to support Dwarf Fortress players.

Dwarf Fortress Forums (<http://www.bay12forums.com/smf/>)

If you're looking for help and can't find answers on the Dwarf Fortress Wiki, then the forums are a great place to look for aid. The Dwarf Fortress forums prove that you really can have a witty, creative, and helpful community on the internet. No, really!

Dwarf Fortress File Depot (<http://dff.wimbli.com>)

Janus runs the Dwarf Fortress File Depot, a file storage hub for everything Dwarf Fortress. The DFD is commonly used to store game mods, tools, and tilesets.

DF Map Archive (<http://mkv25.net/dfma/>)

The DF Map Archive allows players to upload game recordings and game maps, and view and interact with them on the Archive. Dwarf Fortress players commonly use the DF Map Archive to show off particularly cunning feats of engineering or impressive megaprojects.

Dwarf Fortress Wiki (http://dwarffortresswiki.org/index.php/Main_Page)

The Dwarf Fortress Wiki is a vital resource for all Dwarf Fortress players. Maintained by volunteers, the wiki has more than 1700 pages on just about every topic, and the many detailed articles are likely to answer almost any question that you may have on the game.

Tilesets

There are several great graphics sets that will, in the opinion of some, considerably enhance your Dwarf Fortress experience. Several are included with the Lazy Newb Pack and can be installed via the graphics tab in that utility. Many others can be found at the Dwarf Fortress File Depot.

Modifications

Due to the mod friendliness of Dwarf Fortress, many dedicated players have created complex modifications that add new creatures, workshops, weapons, items, and much, much more. All mods are available from the Dwarf Fortress File Depot and are discussed on the Dwarf Fortress modding sub-forum.

Total Conversions

Several modders have created total conversions for Dwarf Fortress. Many of these include more races, new constructions, new metals, items, and even tech trees. Four of the more popular and complete total conversions include Corrosion, Genesis, Legends of Forlorn Realms, and Masterwork.

Fan Conversions

Some mods aim to inject a little humor or to reference existing worlds and themes for amusing crossover potential. The most popular include Warhammer Fortress and Pony Mod, based on the Warhammer universe by Games Workshop and the My Little Pony universe, respectively.

KILLED BY OWN HAND. LITERALLY.

From Hugo Luman

ADVENTURE MODE!



Playing God

Before we can build a fortress, we need a world and a party of seven brave dwarves to explore it. In this chapter, world creation and party building will be covered in detail. By the end of the chapter, everything will be in place for you to tackle the task of building your first fortress.

Building Worlds

Dwarf Fortress lets you create worlds, complete with continents, oceans, gods, peoples, histories, and fantastical beasts—all at the press of a button. Get started by running **Dwarf Fortress.exe** (**df** on a Mac). Once Dwarf Fortress has loaded, select the *Create New World* option by using the cursor keys and the **enter** key. Eventually, with warnings skipped, the *Create A World* screen will load. Using the **up** and **down** cursor keys will move the highlighted selection between world options, and the **left** and **right** cursor keys change the values. For your first world, reduce the savagery to *Very Low* and increase the mineral settings to *Everywhere*. Once your world creation settings match those in [Table 2-1](#), hit the **y** key.

Table 2-1. *Create A World settings*

Option	Setting	Determines
World Size	Medium	Physical size of the world, from a few small islands to enormous sprawling continents.
History	Medium	Longer histories take much longer to generate.
Number of Civilizations	Medium	How many different dwarf, human, goblin, and elf civilizations exist at the start of world generation.
Maximum Number of Sites	Medium	Maximum number of cities and towns.
Number of Beasts	Medium	Number of megabeasts, dragons, and titans at the start of world gen. Some will die off during history generation.
Natural Savagery	Very Low	How much of the map contains savage zones with aggressive creatures.

Option	Setting	Determines
Mineral Occurrence	Everywhere	Increases the chance that a suitable site will have several different minerals.

Dwarf Fortress will now create a world. World creation usually takes a few minutes as the game creates continents, populates the world and develops your world's history. World creation will be complete once it hits year 250; then, Dwarf Fortress will present you with a map that you can explore using the cursor keys. If you like the look of the world generated, press **enter** to save your creation.



If you press **p** when world creation is finished, Dwarf Fortress will export a large image of the world into the Dwarf Fortress directory.

Once you are familiar with Dwarf Fortress, you may feel like creating a more challenging world. Adjusting the world creation settings to produce a world with higher savagery is the easiest way to increase the difficulty, as more locations will have dangerous and aggressive animals and creatures to face. This will necessarily force a change to your embarkation strategy—and traveling equipped and skilled for battle is advisable when deploying to a particularly dangerous area.

If you wish more control over the world generation settings, then delving into the *Design New World with Advanced Parameters* option from the main menu may be worth exploring. This option offers an immense range of settings to adjust and is best touched only by experienced Dwarf Fortress players who like to create worlds to precise specifications. The Dwarf Fortress Wiki page on Advanced World Generation (http://df.magmawiki.com/index.php/DF2010:Advanced_world_generation) exists to satisfy the urges of any eternal tinkerers out there.

Your World

With a world created, we can now begin to play. Well, nearly. At the main menu, select *Start Playing* and then press **enter**. The world you created should be highlighted by default. If you've created multiple worlds, choose one with the cursor keys. You will now be presented with three choices: *Dwarf Fortress*, *Adventurer*, and *Legends*. Dwarf Fortress mode is what this book is about, but for fun, let's look at Legends mode first. Select *Legends*, press **enter**, and then press **enter** again on *Historical Figures*. You will be presented with a list of all the figures of note that ever existed in your world. Find a forgotten beast or god, and press **enter** to view their history. Here's a typical example:

Amxu the Eight-Legged Llama

Amxu Gravedoomed was a forgotten beast. It was the only one of its kind. A huge eight-legged llama with lidless eyes. It squirms and fidgets. Its mint-green hair is short and even. Beware its deadly spittle! Axmu was associated with water, murder, and caverns. In a time before time, Axmu began wandering the depths of the world.

Murder and caverns and water! As you shall discover, these are three things any sensible dwarf fortress manager will be wary of. That being said, the mint-green hair sounds like it might make a wonderful carpet. Wouldn't it be great to encounter and brutally murder such an attractive beast during the course of our explorations?

Finding a Site

Once you're done exploring Legends mode, hit **escape** until you're back at the main menu. This time, select *Dwarf Fortress* after *Start Playing*. You will now be presented with a screen showing three maps and some other options (Figure 2-1). The maps are labelled *Local*, *Region*, and *World*, and your cursor keys control the flashing yellow **X** at the center of the region map. As you move the **X** around, the cursor flashing on the rightmost world map will also move (but much more slowly), whereas the leftmost local map will change with every keypress.

If you find this screen confusing, keep this in mind: the area of the region map is represented by the land under the **X** of the world map and the area under the **X** on the region map is shown in the local map. Easy! Now, look closely at the local map. Inside this display is a deployment box that highlights a particular area on the local map. The deployment box indicates the size and features of the map you will be using in Fortress mode.

Try moving the deployment highlight using the **h**, **k**, **u**, and **m** keys. As you move the box around, watch the information panel on the right. As the box moves and the terrain symbols change, the name of the area and the terrain description will change accordingly. For example, Δ shapes are mountains, \spadesuit are forests, brown lines are roads between towns and cities, and \cap shapes tend to be hills. Oftentimes these symbols are colored according to the temperature of the region. Yellow tends to indicate hot; green, temperate; and blue, cold. Purple-colored terrain indicates evil zones, areas that should be avoided by the new player. Table 2-2 has a sample of some typical terrain icons you will find in Dwarf Fortress.



Figure 2-1. The fortress site selection screen (with detail below)

Table 2-2. World map key

Graphic	Translates to	Contains
	Savanna, shrubland or grassland	Grass, some trees.
	Badlands	Barren, some soil.
	Conifer forest	Heavily wooded.
	Mountains	Pointy, rocky things. You can't embark to an area that only contains mountains.
	Brook or river	Only major rivers appear on the region map, but many brooks and smaller rivers can be found on the local map.
	Ocean	Salt water, whales—you know the deal.
	Tundra	Frozen, devoid of trees.

Graphic	Translates to	Contains
	Desert	Sand, few trees.
	Rocky wasteland	Barren, little or no soil.
	Road	Connects cities and towns. No effect on gameplay.
	Volcano	Magma! On the surface! It's so wonderful! On the local map, volcanos are a single, red, water-like tile.
	Human city or town	Human settlements lie along coasts and in wet areas.
	Elf retreat	Elves live in forests and near rivers.
	Dwarf fortress or mountainhome	Dwarves settle close to mountains.
	Goblin fortresses	Goblins prefer dry, barren areas.
	Necromancer's tower	Embarking within ten squares of a tower is likely to result in a challenging game.

As you explore the map, you will notice the towns and cities of dwarves, humans, elves, and other civilizations. You can't embark where there is another city or town, but it is often good to know who your neighbors are likely to be, especially if you wish to avoid necromancers popping round with some friends. The civilizations are color-coded accordingly, as shown in [Table 2-3](#).

Table 2-3. Civilization colors and preferences

Civilization	Color
Dwarf	Blue
Elf	Yellow
Goblin	Purple
Human	Grey



The **H**, **K**, **U**, and **M** keys resize the deployment box, resulting in a larger or smaller deployment area. The default size is usually ideal.

Once you're comfortable exploring the map and using the controls to move your deployment box, it is time to find a suitable site for your first fortress. Fortunately, there's a tool built into Dwarf Fortress to make this job easy. Simply press **f** to activate the *Site Finder* and then examine the new menu on the right. These options instruct Dwarf Fortress to hunt for a site best suited to our needs. Use the **up** and **down** cursor keys to move between options, and the **left** and **right** cursor keys to change the settings until they match those shown in [Table 2-4](#).

Table 2-4. Site Finder settings

Option	Setting	Determines
X Dimension	4	Width of your search box.
Y Dimension	4	Height of your search box.
Savagery	Low	Whether you are searching for benign (low), neutral (medium), or savage (high) areas.
Evil	N/A	Whether you are searching for good (low), neutral (medium), or evil (high) areas.
Elevation	N/A	How hilly the site will be, from mostly flat to mostly mountainous.
Temperature	Medium	Whether the site will be cold, warm, or hot.
Rain	N/A	How much rain falls at your site.
Drainage	N/A	How dry a site is. Deserts and glaciers are very dry.
Flux Stone	Yes	Whether a site contains flux stones—required for steel production.
Aquifer	No	Whether areas with water-loaded rock or soil layers are selected.
River	Yes	Whether a site needs to have a brook or river in it.
Shallow Metal	Multiple	Whether a site has metal or metals in the first few layers below ground.
Deep Metal	Multiple	Whether a site has metal or metals deep underground.
Soil	≤Some	How much soil a site has.
Clay	N/A	Whether a site has clay.

With the site finder settings entered, press **enter** and the search will begin. As Dwarf Fortress hunts for ideal sites, the world and region maps will slowly fill with red **X** marks showing areas with no suitable sites, and green **X** marks showing areas with sites that match the settings. When the search is complete, Dwarf Fortress will prompt you to hit **escape** to browse the available locations. If you see no green marks, you may wish to hit **escape** again, select **abort**, and generate a new world.

When you browse available locations with your cursor keys, you will see a lot of flashing green **X** marks across your map. Browsing can be confusing; start by moving the cursor around while watching the region map. You are looking to place the yellow, center **X** over the flashing green ones, indicating a suitable location. With a suitable green **X** on the region map highlighted, look at the local map and get a sense for the terrain in the recommended area.



Pressing **shift** while you press a cursor key will rapidly move your **X** cursor around the map. **shift** is frequently used to quickly move your view in Dwarf Fortress.

When searching for a fortress site, try to avoid islands or regions cut off from the main continent of your world. Doing so will make it impossible for invaders to reach you

(which can get pretty boring!) and only trade caravans from your own civilization will ever visit your fortress.

As you search, look for areas that aren't all mountains, have a river or brook, and hopefully have some forest. Once you find an area that appeals to you, move your deployment box around using the **h**, **k**, **u**, and **m** keys, and watch how the information on the far right changes. You should place the deployment box in such a way that it includes a section of river, and you want the site information to inform you that there are trees and vegetation in that location. Your area should also include soil, as well as shallow and deep metals. Try to avoid locations where two or more rivers meet. These sites often have waterfalls, which are frequently fatal to careless dwarves. And all dwarves are careless. See [Figure 2-2](#) for an example of an ideal site.



Figure 2-2. A great fortress location with all the desired features

If you have a high-end computer, you may wish to increase the size of the deployment box to 5×5 squares (or even larger) to capture some interesting or useful terrain features in your fortress map. Larger deployments come with a substantially increased CPU load due to increased pathfinding processing and the greater number of creatures on your map. This can result in a noticeable drop in the game's speed as your fortress population grows. Conversely, if you have an older computer or you're playing Dwarf Fortress on a lower spec machine, you should reduce the deployment box size to 3×3 or even 2×2 squares. Even 1×1 sized fortress maps aren't unheard of—some players enjoy the particular challenges a tiny map generates.

As you move the deployment box around, you will see **F1** and other function keys listed below the site information panel. These allow you to switch the site information panel between the different biomes covered by the deployment box. When you press a function key you will see (in the local map) the areas that each biome covers in that location, designated by flashing green **X** marks. It is not uncommon (and often advantageous) to

choose a deployment area that covers multiple biomes, each with their own unique and complementary features.

Due to the Site Finder settings you entered, you will hopefully not be shown sites with wild or evil surroundings. For your first game, surroundings that are *calm*, *serene*, *mirthful*, or *joyous wilds* are ideal. Once you are a confident fortress manager, try building a fortress in one of the more challenging surroundings listed in [Table 2-5](#). The more evil and savage the surroundings, the more likely you are to face aggressive creatures, undead, or unholy rain that turns internal organs to a bloody slurry.

Table 2-5. Surroundings

	Benign	Neutral	Savage
Good	Serene	Mirthful	Joyous Wilds
Neutral	Calm	Wilderness	Untamed Wilds
Evil	Sinister	Haunted	Terrifying

The site finder will also prevent any extremes of temperature from cropping up in your suggested fortress locations. Climates with very high or low temperatures can kill your dwarves and livestock, and make it difficult to establish a successful fortress (see [Table 2-6](#)). For your first fortress, try to find a warm or temperate location and save the difficult climates for future ice pyramid or desert fortress plans!

Table 2-6. Site temperatures

Site Temperature	Effect
Scorching	Rivers will not dry up, but surface pools will. Exposed dwarves and livestock may die due to the heat.
Hot	Pools may evaporate during summer.
Warm	Water available from pools and rivers all year round, little risk of freezing or drying pools.
Temperate	Surface pools and rivers will freeze in winter, but thaw in spring.
Cold	Surface pools and rivers will be frozen most of the year, but may thaw in summer.
Freezing	Pools and rivers remain frozen throughout the year. Dwarves and livestock exposed to the cold may freeze to death.

Another potential problem for budding fortress builders are aquifers. Aquifers are layers of water-bearing permeable rock that, without engaging in some advanced engineering, will prove impossible for you to dig through as a new fortress owner. Worse, even if you do manage to build a fortress through an aquifer, a single mistake often results in the death-by-drowning of all your dwarves. Thankfully, the site finder should have prevented the selection of any areas with an aquifer (although it is possible that some sites will have aquifers as one of the biomes bordering them).

If you do deploy to an area containing an aquifer biome, then care should be taken to avoid digging on the side of the map containing the aquifer. Aquifers usually only cross

a few layers near the surface, so digging down a dozen layers in a safe area usually means you will be safe to dig across the rest of the map without risking drowning. Thankfully, should your dwarves get too close to water-bearing rock or dirt, they will alert you and stop digging unless ordered to recklessly resume their excavations!

Once you have chosen your ideal location, it is time to hit **tab** to have a look at who your neighbors will be should you embark to this site. It is not uncommon to have Dwarves, Elves, Humans, and Goblins as neighboring civilizations, and a range of neighbors will result in a range of trading opportunities. Any civilization at war with yours is marked with a red line and will send armies instead of trade caravans. How rude! Goblins will always be at war with you, but other races may be in conflict with yours due to historic events.

Hit **tab** again to see a list of dwarf civilizations. The **minus** and **plus** keys will cycle through the list, and the one you leave highlighted will be set as the original home of your fortress inhabitants. As you cycle through the dwarf civilizations, you will notice that areas of the world map change, indicating cities that this civilization owns. It is advisable to select a dwarf civilization with several cities, as if you choose a civilization with no cities, you will receive no migrants or trade from your home.

Another press of **tab** will show you the spread of elevations across the local area, with the map key on the righthand side. Pressing **tab** once more shows the height of cliffs in the local map in much the same manner. For your first fortress, aim for a relatively flat area, as extremes of elevation will make your fortress building needlessly complex for new players.



If you enjoyed building a world and finding a great site, why not consider a degree in geology?

With a suitable location selected, it is time to gather our forces so we might embark and establish a legendary fortress! Press **e** to *Embark!* and then select either *Play Now!* if you wish to throw yourself in at the deep end (in which case you can skip ahead to the next chapter), or *Prepare for the journey carefully* if you wish to have more control over the configuration of your initial dwarven settlers.

Preparing Carefully

Although it is possible to enjoy Dwarf Fortress with the equipment and skills provided under the *Play Now!* setting, it is advisable to learn how to prepare a party of dwarves yourself. An individually crafted expedition will help ensure success and make early fortress development proceed more smoothly.

When you select the *Prepare Carefully* option, you will be presented with a list of seven dwarves with the number 10 next to them and the title *Peasant*. The number represents the number of skill ranks still available for each dwarf. As you assign skill ranks to a dwarf, this number will go down. When it reaches zero, the dwarf's brain is full and no more skills can be added.

To the right, you will see a list of skills. All will be marked *not*, indicating that the dwarf selected on the left does not have this skill. At the bottom-right of the screen, you will see the remaining points you have to spend on your dwarves' skills and equipment. Before we mess around with dwarf skills, you should hit **tab** and switch to the embark item list. This list shows everything your dwarves plan to bring on their expedition. Let's start by removing everything, using the cursor keys to select items on the left and then the **minus** key to remove them from the list. You can hold down the **minus** key to remove many items quickly. Once there are no items in the left column, your *Pts* total should read 1274. [Table 2-7](#) summarizes the goods we're going to buy for our expedition.

Table 2-7. Expedition goods summary

Item	Quantity
Copper Picks	2
Copper Battle Axe	1
Iron Anvil	1
Cats	1 Male / 2 Female
Dogs	1 Male / 2 Female
Rooster	1
Hens	4
Plump Helmet Spawn (seeds)	15
Dimple Cup Spawn (seeds)	10
Rock Nuts (seeds)	10
Sweet Pod Seeds (seeds)	10
Cave Wheat Seeds (seeds)	10
Pig Tail Seeds (seeds)	10
Meat	40
1 of each type of fish (fish)	1
Plump Helmets	20
Dwarven Rum	30
Dwarven Ale	30
Dwarven Beer	30
Dwarven Wine	30

Let's start by adding some animals to our expedition. Cats will chase rodents and vermin that speed food spoilage, and dogs can be trained to help defend our fortress. We want to add one male and two females of both cats and dogs (but not hunting or war dogs), as this will give us a healthy breeding stock of animals to populate our site! Use the right cursor key to move to the animal column, and then move up and down to select the male and female dogs and cats. Then using the **plus** and **minus** keys, you can add and subtract animals until you have the required number. Next, scroll down through the animal list and find *Hen*. Add four hens, followed by a single *Rooster*. Chickens and their delicious eggs will help feed our fortress.



If chickens aren't available, add four turkey hens and a turkey gobbler, or any other fowl that is available.

But we need more than chickens, dogs, and cats to make a happy fortress! Press the left cursor key to move off the animal list, and then press **n** to add new items to our expedition inventory. The first thing we want to bring with us is an anvil. Scroll down to *Anvils*, press the right cursor key, and select *iron anvils*. Hit **enter** to add it to our inventory. If there is no suitable anvil, you will have to press **escape** until you can select *Abort Game*, and then embark again with a different dwarf civilization. The availability of goods can vary depending on the civilization you chose during your site finding escapades. Not having an anvil at the start of your first fortress adds needless complexity for new players.

With the iron anvil added, we want to add two copper picks and one copper battle axe for our miners and our wood cutter, respectively. Using **n** again, find *Digging Implements* and add a copper pick. Then, on the inventory view, hit the **plus** key to increase the number of picks to two. You can find the battle axe under *Weapons*; just one will suffice.

Now we need some seeds to ensure that our farming starts off well. Add one of each type found under the *Seeds* menu, and then increase plump helmet spawn to 15 and all the other seeds to 10. Plump helmets are a delicious mushroom that you will spend a lot of time growing (and your dwarves, eating), so starting with a good supply will help ensure the quick development of substantial food stocks.

We will also need some food for our dwarves. This is where we can choose to be a bit tricky. As different foodstuffs are stored in their own barrel, and we really want a lot of barrels, we can add one of each meat type to the inventory until we have about forty pieces. The easiest way to do this is to press **n** and then type **meat**. This will cause Dwarf Fortress to filter down to just items with meat in their name. We are looking to add two-point meat goods to our inventory—no need to buy expensive meat for our dwarves just yet! If you find that adding forty individual types of meat gets a bit tedious, just add a few different meats and then increase their quantity until you have 40 total.

You won't have as many free barrels, but you will have saved a precious minute of your life.

With meat added, let's add one of each type of *Fish* to round out our Dwarves' diets. Once you have completed this task, you will have a veritable smorgasbord for your dwarves to dine on! But starvation is always a risk, so let's provide a bit of room for failure by adding some more food stocks. Press **n**, select *Plants* and add 20 plump helmets to the inventory.

From there, we need to consider the all-important addition of alcohol to our inventory. Dwarves get depressed if they do not have access to booze. Hit **n**, find *Drinks*, and then add 30 of each type of booze to the inventory. Alcohol is very important; without it, your dwarves move slowly and will wander the map hunting for water to drink (complaining the whole time, of course).

We have now bought the essentials, so it is time to look at skilling up our dwarves. Hit **tab** and switch back to the dwarf skill view. As you cycle through each dwarf using the up and down cursor keys, you can hit **v** to view a dwarf and read about their habits and personality traits. Have a quick look through each one and try to remember which dwarves are strong, which are weak, which are sociable, and which are not. We are going to try to give the strong ones skills involving hard labor, and the most social dwarf will be our expedition leader (and will also be in charge of dealing with any trade caravans that may visit). The skills and the skill rank we will buy are summarized in [Table 2-8](#).

Table 2-8. Expedition dwarf skills summary

Dwarf	Primary Skills	Other skills
1	Miner (Proficient)	Mason (Skilled)
2	Miner (Proficient)	Stone Crafter (Skilled)
3	Wood Cutter (Proficient)	Carpenter (Skilled)
4	Grower (Proficient)	Cook (Skilled)
5	Grower (Proficient)	Brewer (Skilled)
6	Herbalist (Competent), Animal Trainer (Competent)	Building Designer (Novice), Butcher (Novice), Fisherman (Novice), Fish Cleaner (Novice)
7	Mechanic (Competent)	Negotiator (Novice), Appraiser (Novice), Record Keeper (Novice), Conversationalist (Novice), Comedian (Novice), Consoler (Novice), Leader (Novice)

Let's start by creating two proficient miners. Use the cursor keys to select a strong dwarf, and then press the right cursor key to move the highlighted selection right. *Miner* is highlighted first, so simply press the **plus** key to add ranks in the miner skill to the dwarf until the skill level hits *Proficient*. If you ever add too many skill ranks, use the **minus** key to subtract skills from a dwarf. With miner maxed out, scroll down to *Mason*, and make this dwarf a *Skilled* mason as well.

Once you have your first proficient miner/mason, use the cursor keys to move the selection left, then down to the next strong or tireless dwarf, and then right again (back into the skill list). Make the second dwarf a *Proficient* miner and a *Skilled Stone Crafter*. We now have two dwarves who will mine out our fortress at speed, and can dip into making stone furniture or stone crafts for trading as required.

Next, you want a woodcutter. Select your third most capable dwarf and make him a *Proficient Wood Cutter* and a *Skilled Carpenter*. This dwarf is going to be cutting down trees and turning the lumber into furniture, barrels, and storage bins. Your fourth and fifth dwarves need to be *Proficient Growers*, as these dwarves are going to be generating the bulk of your food. In addition to proficiency in growing, one should be made *Skilled* in *Cook* and the other *Skilled* in *Brewer*. You will have to scroll down the skill list to find these skills.

Dwarf six will be a bit of a jack-of-all-trades and will pick up a number of skills that will help keep the fortress running smoothly. First of all, add *Herbalist* and *Animal Trainer* up to *Competent*, and then let's add a selection of useful skills—in particular, *Building Designer*, *Butcher*, *Fisherman*, and *Fish Cleaner* should be set to *Novice*. This dwarf is going to gather plants from the area around your fortress, train your animals, and do a spot of fishing in their downtime.

Our final dwarf will be the leader of this expedition and hopefully has the best social skills of the group. This dwarf will need *Mechanic* at *Competent* (to help us establish traps to defend our fortress as soon as possible) as well as a number of social skills, at *Novice*, including *Negotiator*, *Appraiser*, *Record Keeper*, *Conversationalist*, *Comedian*, *Consoler*, and *Leader*. These skills will help ensure that deals we make with visiting traders go smoothly.

At this point, you will likely have some points left over. You could add more animals to your traveling menagerie; perhaps more hens or female dogs to boost your early fortress food production and defenses, or perhaps more food and drink to insulate you against failure. In any case, once your points are spent, you are ready to embark!

But, before you go hitting the **e** key, why not choose a name for your fortress with **F**? Pressing **r** (for *Random*) until something amusing comes up seems to be the most popular way to name most fortresses. This step usually takes me the longest to complete! Press **escape** when you're satisfied with the fortress name. You can also name your expedition team using **G**. Again, pressing **r** a few times will cycle through some options, or you can build a name yourself using the onscreen instructions.

With everything set, press **s** to **save** your embark template. Type in a name and hit **enter**. You will now be able to select this configuration the next time you start a fortress, instead of having to *Prepare Carefully* all over again. Finally, it really is time to get started! Hit **e** for *embark*, and after a few seconds some text will introduce you to your new home. Press **escape** and *Strike the Earth!*

CACAME

From Holy Mittens



At the beginning of history, the elves and dwarves were constantly warring.



In Year 90, the dwarves conquered the home of an elf called Cacame, who was 7.



Five years later, at age 12, Cacame joined the dwarf guard.



Two years later, free elves attacked. Cacame was injured and his wife was killed.



The elves ate his wife.





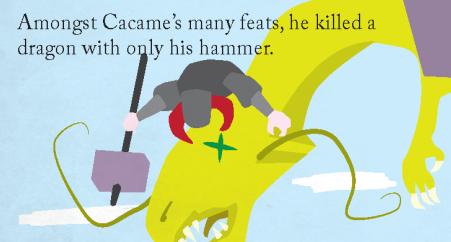
Two years after that, the Dwarven King was killed in battle.

Cacame was chosen as the new King of the Dwarves.



In the year 146, a fortress was founded by Holy Mittens. This fortress built the Colossus of Cacame to honour his legend.

Amongst Cacame's many feats, he killed a dragon with only his hammer.





- Eyes of glass with magma pumped into the sockets.
- Platinum flesh
- Metal warhammer. 132 bars.
- Obsidian armour.
- Solid gold cape. 949 bars of gold.

For the rest of his reign, Cacame, Elf King of the Dwarves, waged war against the elves.



First Steps

In this chapter, you will take charge of your seven dwarves and lead them in building your first fortress. You will learn to dig, build workshops, and establish living quarters. As you work through this chapter, try to keep the game paused as much as possible. A lot can happen quickly in Dwarf Fortress. If you leave the game running while you read, you could be overrun with migrants eating you out of house and home, petulant merchants who might be offended by your lack of attention to them, or you may even face invading goblins. Pause regularly, read carefully, and your fortress will be a bustling metropolis in no time!

What Does It All Mean?

Whether you have prepared carefully in [Chapter 2](#), or selected **Play Now**, your first view of the game world will resemble something like [Figure 3-1](#). You should immediately press **space** to pause the game and give yourself time to understand what you are looking at. You should also resize the Dwarf Fortress window if you have not done so already; either to full screen or to a size you are comfortable with. You may also wish to enable TrueType font rendering by pressing **F12**, which makes text much easier to read.

You will note that the game interface is divided into three sections. The left panel displays the terrain, the central panel indicates all of the hot keys available to you, and the right panel shows a mini-map of your site. Use your mouse wheel and note how the user interface scales and the game zooms in and out accordingly; adjust it to a comfortable setting. Once you are happy with the display, press the **tab** key to cycle through the menu arrangement options. Until you are a Dwarf Fortress expert and have memorized the key combinations you need, it is advisable to leave the hot key menu visible at all times. However you don't need the minimap, so **tab** until it's gone.

It's now time to look around the map. Explore using the cursor keys. What you will probably notice is patches of green ground, grey or brown wall-like areas, and black empty areas. In addition you may spot pools of water, a river, and what appears to be open air. You will almost certainly see a number of curious symbols, such as up and

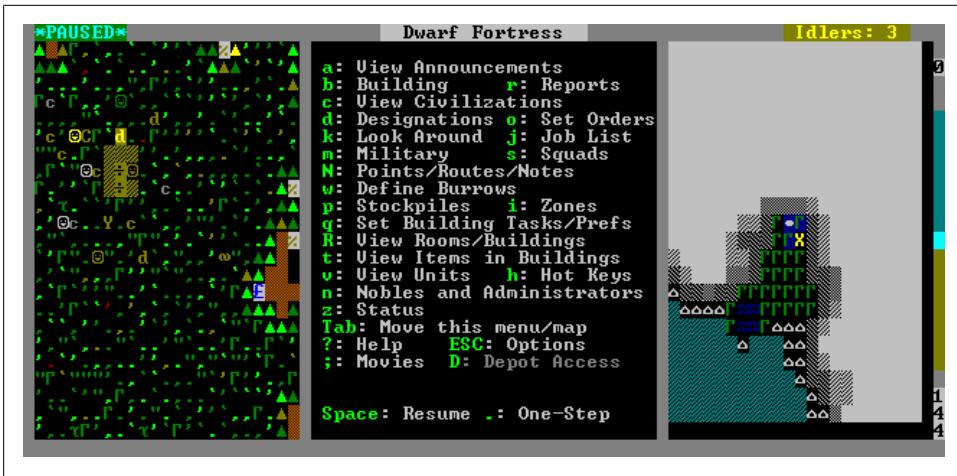


Figure 3-1. First look at a fortress site

down triangles, smiley ASCII-character faces, and perhaps a few letters like *d* and *c*. What you're seeing is a top-down view of one layer of your fortress site. Where that layer intersects a hill, you will see an upward-facing triangle indicating that the land slopes up, and behind the triangle the ground goes dark, indicating underground elements. Where the layer drops down a level, you will see a downward-facing triangle indicating a downwards slope, and then empty space indicating that there's now only thin air at this level. Likewise, river banks are downward-facing blue slopes, and rivers and brooks wavering blue lines. You can probably spot the symbols for trees easily enough, and you probably have shrubs, boulders, grass, and other flora dotting your landscape. Where the ground drops a level, you will see only the tops of trees and some empty space. Where the ground drops off more than a single level, the area will be a hazy blue, indicating wide open space.

Start moving your view up and down layers by using **shift** with the **comma** or **period** keys. As you move up and down layers, you will see the view change as new sections of terrain are displayed. Use the cursor keys to move your focus around the map and explore the hills, valleys, and water features. Note how when you look at water from one view you can see the surface, and from a layer down you can see the body of the water, surrounded by the bank of the pond or river). It is important to know when you're looking at the top of the water or when you're level with its mass; as you might imagine, there can be consequences if you get it wrong when you're digging!



If you press the **F1** key, your view will return to the location and level where your dwarves and animals are.

To help you understand what you're looking at, [Table 3-1](#) provides samples of some (but not all!) common terrain elements.

Table 3-1. Map key view

Icon	Object
	Grasses
	Trees
	Tree sapling
	The top of a tree, one level down
	Shrubs
	Boulder
	Upward slope
	River bank slope
	Downward slope
	Surface of water
	Body of water
	Brook
	Dwarves (colors correspond to profession)
	Cat
	Dog
	Chicken
	Open air, but ground one level down
	Open air, no ground one level down
	Solid sand wall
	Solid marble wall (each type of rock is different)
	Magma! ... Or red sand
	Ice
	Snow, trees, and shrubs will get colored white by snow

Exploring the Map

Once you are confident exploring the map, press **F1** to return to your dwarves and their wagon, and then press **k** for *Look Around*. You will now have an **X** marker that you can move using the cursor keys. When you press **k**, the panel on the right will change. It now displays a list of items at the location highlighted by the **X**. The **k** key is extremely helpful and will help you quickly understand the symbols you are looking at. Any time you aren't sure what is happening in an area, press **k** and examine the squares.

Move the *Look Around* marker over a dwarf, and note that the information panel now includes two or more items in it. You can cycle through these items with the **plus** and **minus** keys. As you do so, some options may change at the bottom of the panel. Select the dwarf, press **enter** and then **enter** again to learn about their personality and current thoughts. You can even examine the animals you've brought with you using the same method (animals may be the letters *d*, *h*, *c*, *w*, and *y*, for example). When you are done exploring with *Look Around*, simply press **escape** until you are back at the map view with the default menu displayed.

Similar to the *Look Around* option is the *View Units* option, accessible from the **v** key. Press **v** and move the cursor across your dwarves and animals. The cursor will cause the nearest unit to flash, and information on that unit will appear in the rightmost panel. You will also see a number of options available for viewing more information on that creature. Feel free to try a few of them using the suggested hotkeys, but don't worry if they make no sense just now—we'll return to most of them in time.

Responding to Alerts

During the course of play, the game will alert you to important events, often pausing the game and moving the view in the process. The alert log can easily be reviewed by pressing the **a** (*Alerts*) key. In the alerts window you can use the cursor keys to scroll up and down through the alerts, and often the **z** key will *Zoom* you to the location of the alert—or at least the current location of the entity the alert is about. If an alert moves your view and leaves you lost and confused, simply press **F1** to return to your wagon landing point.

Let's Get Digging!

It is time we get settled in and set this game into motion, so press **d** to bring up the *Designations* menu. If your view was centered over the underground areas, then *Mine* will already be highlighted. If your view was focused on the surface, then *Chop Down Trees* will be selected, so let's make sure we're set to mine by pressing **d** again. Your yellow **X** marker will now let you set where your dwarves will dig.

Find an area with a wall bordering some flat surface—hopefully close to your start location. You may have to go up and down levels to find a suitable area. With a site selected, move the cursor twenty-or-so spaces into the dark interior (**shift** and pressing a cursor key twice will accomplish this). Next, press **enter**, move the cursor to one side twice, and then move the cursor back outside and press **enter** again. You should now see a section of the map highlighted, similar to what is shown in [Figure 3-2](#). We're told our dwarves to dig a three-tile wide tunnel into the side of a hill.

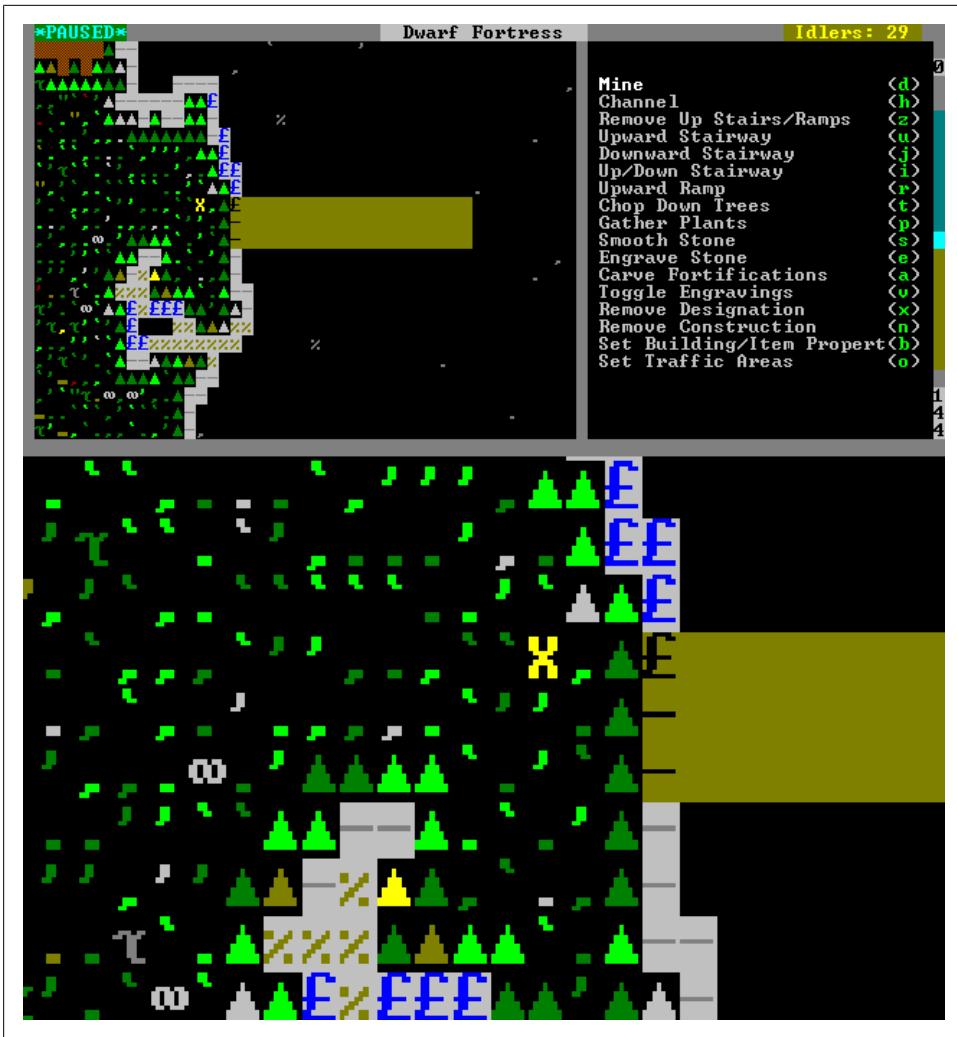


Figure 3-2. Selecting terrain to be dug

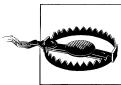
Pressing **escape** will bring you out of the designation menu and then **space** will unpause the game, and your miners will rush to dig out the area you have selected. In no time, you will have the start of a mighty fortress! In case you are wondering why we use a three-tile wide tunnel, there are two reasons: firstly, wider tunnels result in less congestion in your fortress (dwarves will slow down if their paths are overcrowded). Secondly, dwarf and human traders bring wagons with them and the wagons are three squares wide. Since we want to build a trading depot inside our fortress (where we can keep it safe), we better provide access via a good, wide entranceway.



Marking an area with **d-x** (*Remove Designation*) will clear any digging orders from a location. This is great for fixing designation mistakes.

With your entrance dug, it is time to add some rooms from which our dwarves can base themselves as they develop the fortress. Use **d-d** again to designate more space to be dug. In [Figure 3-3](#), I have selected a 5×5 space, a 10×10 space, and a 20×20 space to be dug, and connected them to the tunnel by single doorways. The exception is the 5×5 room, which will be our trade hub; its partly dug doorway is three spaces wide to allow the wagons in. Of the remaining rooms, the 10×10 room will be used for temporary living quarters, and the 20×20 room will be for workshops and stockpiles.

As your dwarves dig, explore your tunnels with **k** (*Look Around*). Some areas will likely have rocks on the floor, some floors and walls will be dirt or sand, others may be stone, and you may even find gems of various kinds. This is all perfectly normal and we will use all of these resources in due course, even the dirt!



Avoid digging into (or diagonally next to) any square with water in it. You do not want a river or a pool to flood your first fortress ten minutes into playing!

The digging will take some time, so let's select some trees to be cut down and some plants to be harvested while we wait. Start by moving the map to display a large open area. Next, press **d** and then **t** for *Chop Down Trees*. Hit **enter** in one corner of your view, then move the cursor to the other corner using **shift** and the cursor keys. Press **enter** again, and you will see that all of the trees in the area you just selected have been highlighted. This indicates they have been marked for felling; this task will fall to your woodcutter.

Now let's tell our herbalist to gather edible plants and berries. Press **d-p** for *Gather Plants* and mark approximately the same area you covered with your fell tree job. You will now see all of the shrubs in the area also marked for harvesting. When you unpause the game, one dwarf will race off to start chopping trees and another will start to gather foodstuffs from the shrubs. Any trees felled and food gathered will remain where they are until you create wood and food stockpiles later in this chapter.

In [Figure 3-4](#), my rooms are dug out and the local plants and trees are in the process of being cleared, but we still have more work to do—let's build some workshops!

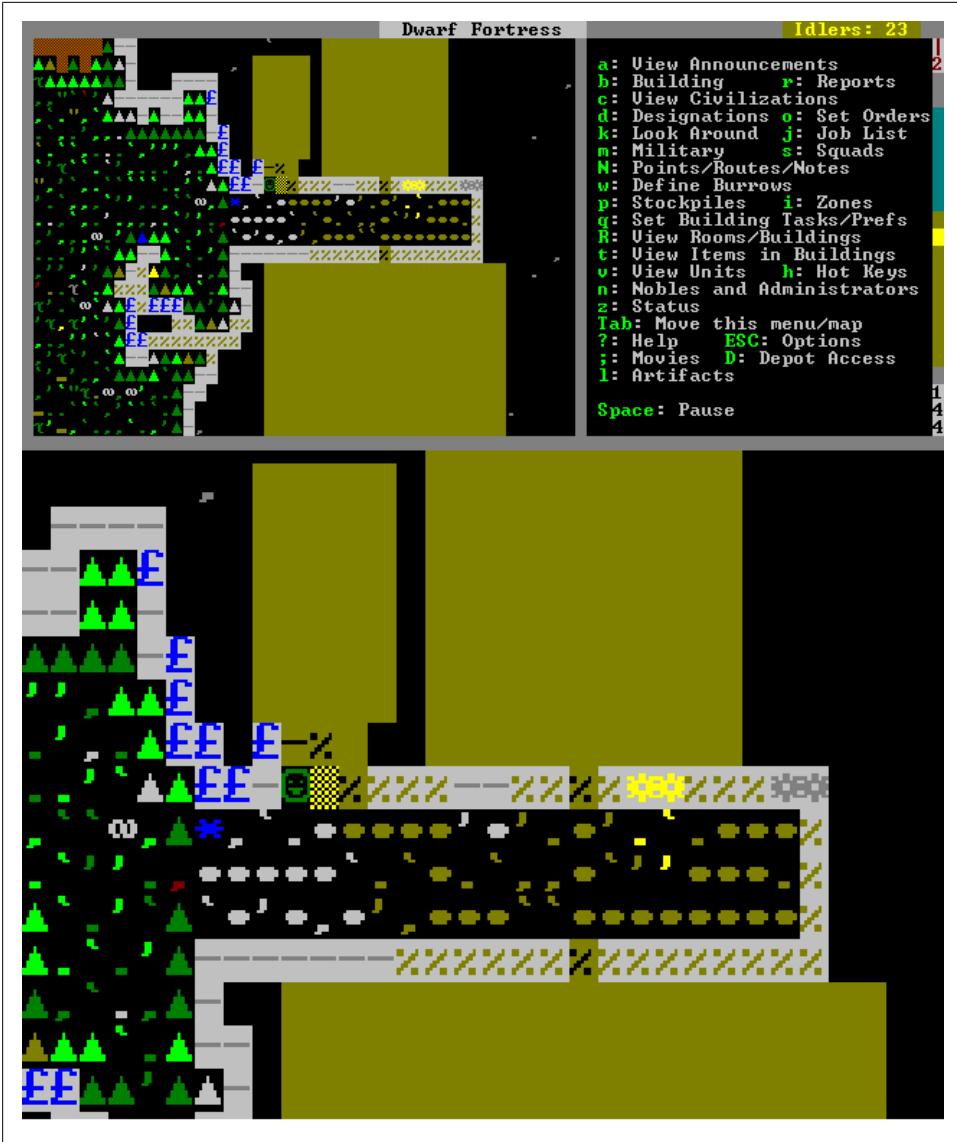


Figure 3-3. Selecting rooms to be dug



Figure 3-4. Rooms dug out

Building Basic Workshops

Workshops are where your dwarves will complete job orders you set. As with almost everything else in Dwarf Fortress, you are not directly controlling individual dwarves and telling them where to go, but setting the overall parameters of what you would like done and then waiting for the dwarves to comply with your wishes.

Building workshops is easy, so let's get started. With your view over the 20x20 room, press **b** for *Build* and then **w** for *Workshops*. The list of workshops you can construct will appear on the right, and you can scroll down with the **plus** and **minus** keys to see more options. Press **c** for *Carpenter's Workshop* and a 3x3 grid will appear. When it is in a placeable position, the **X** grid will be green; when placement is blocked by something, the grid will be red. Move the grid into the twenty-by-twenty room and, without blocking the doorway, place the grid along the wall closest to your entrance tunnel. Press **enter** when you have chosen a location you are happy with.

You should now see a list of stones and wood on the right. This is the building materials list, and allows you to select what your workshop will be built from. If you see an error message about needing non-economic building material, let the game run for a minute so your woodsdwarf has a chance to cut some lumber for you, and then try again. On

the item select screen, simply hit **enter** to choose the first item on the list (it will be wood or stone). Then hit **escape** until you're back at the main menu, and ensure the game isn't paused.

In due course, one of your dwarves will go to the site and start building your workshop. First they will gather the materials you selected for the workshop's construction, and then they will clear away any stones or debris blocking the site and finally they will build the workshop. When it is complete, you will see a curious arrangement of characters is now set where previously there was only fortress floor; this is your Carpenter's Workshop!

Build another workshop using **b-w**, but this time we will press **m** for *Mason's Workshop*. Place it next to the Carpenter's Workshop. Let's build even more workshops. This time, press **b-w-t** for the *Mechanic's Workshop*, **b-w-r** for the *Craftsdwarf's Workshop*, and **b-w-l** for the *Still*. Place them near your existing workshops. Once your workshops are set, unpause the game and watch them get constructed. This might take a little time, as your dwarves may need to complete other tasks before they start the construction jobs.



You may have already lost a dwarf to wild badgers or some other malady. This sort of tragedy is common when you are new. Keep playing until the dead outnumber the living (or are trying to eat them)!

Our final building task at this stage is to set up the *Trade Depot* promised earlier. Press the **b-D** key to bring up the trade depot footprint. Place the depot in your 5x5 room near the entrance. You will have to press **enter** several times at the construction selection screen, as the depot uses several items in its construction and you need to press **enter** for each one. You may have to use **plus** and **minus** to scroll to other items if you are short of stock in a single type of wood or stone. In [Figure 3-5](#), you can see the Trade Depot and workshops completed in my fortress. The depot might take some time to complete as it requires the assistance of the (hopefully) quite busy herbalist dwarf who should be out gathering food for your fortress. The herbalist dwarf has the Architecture labor enabled, and the Trade Depot is one of a few constructions that requires an architect to cast their eye over them before it can be completed. But don't worry, he will get to it in time, and we have plenty of tasks to be getting on with in the meantime!

On the Importance of Alcohol

Dwarves like to drink. And by drink, I mean constantly consume copious amounts of alcohol. Dwarves will only drink water when there is no booze left or if they are injured, in which case a dwarf will bring them water in a bucket.

If you see dwarves with blue down arrows running to rivers or ponds and pausing for a moment, they are probably making do with a drink of filthy H2O and you have run out of alcohol. If this is the case, you should immediately find your Still and **a** (*Add*)



Figure 3-5. Workshops and Trade Depot constructed

the *Brew Drink* task ten times. Dwarves who are forced to drink water get unhappy thoughts and work slower than happy, alcohol-fueled dwarves. Brewing ten stacks of alcohol will provide enough stocks to keep your dwarves happy for a month or two.



A blue down arrow means your dwarf is thirsty. A brown down arrow indicates hunger, and a red down arrow shows that you have a very unhappy dwarf!

You can monitor your stocks of food and alcohol from the **z** (*Status*) menu. The panel in the bottom-left corner shows, roughly, how much food, alcohol, and seeds you have available. Until you appoint a bookkeeper (more on this in [Chapter 6](#)), these numbers will only be approximate.

Managing Your Workshops

With workshops and a Trade Depot placed, it is time to get them producing. The **q** key activates the *Set Building Tasks/Prefs* option. Press **q** and move the cursor to the Carpenter's Workshop. As you move the **x**, you will see the closest workshop start to flash, and the information panel on the right will change to reflect the actions available from the highlighted object.

The Carpenter's Workshop presents us with a few options, but for now, press **a** to *Add new task*. A long list of buildable items will appear. If you can't read all of their names, press **tab** until the menu expands enough to show each listing. Scroll through the list using the **plus** and **minus** keys to get a sense of everything that you could potentially build. Once you have had a look, press **b** for *Construct Bed*. Repeat **a-b** again until you have added four beds to the task list.

With items in the build queue, the other commands in the workshop will now highlight, indicating you can activate them if you wish. They should all be quite self-explanatory and include options to cancel tasks, move tasks up the list, and so on. Hit **escape** to exit back to the map and let your carpenter get to work.

Let's move on to tasking the Mason's Workshop; press **q**, find the workshop, and then press **a**. Again, have a look through the available options if you wish. When you are done, press **d** for *Construct Rock Door*. Fill the build queue with door construction orders; you are going to need plenty in due course. You will discover that you are only permitted to have ten items in the build list, so if you want to build more you need to press **r** for *Repeat*, which will mean an item is produced ad infinitum (or until resources for the item run out). But don't do this now—we have better things for our miner/mason to be doing!

Next, press **q** and find the Mechanic's Workshop. There are only two tasks that we can choose from at this site, and the one we want is *Make Rock Mechanisms* (available with **t**). Mechanisms are at the core of all traps and machinery in Dwarf Fortress and traps make for great early defenses. We want to make sure we have a few mechanisms available for trap building, so queue up ten mechanisms.

At the Crafts Dwarf's Workshop, you want to add an order for four nest boxes. Finding them can be tricky; press **a** for *Add new task* and with *rock* highlighted, press **enter**. Now use the **plus** and **minus** key to scroll down to *Make Rock Nest Box* and press **enter** again. Repeating the task is easy—when you press **a** again, the nest box will be selected, ready to be added to the queue with **enter**. We chose rock over wood because we should have a lot of spare rock. Wood is a harder resource to gather, so we will try and reserve it for making storage bins, wheelbarrows, and beds. We'll cover how to use the nest boxes later on when we look at food production.

Unpause the game and watch your dwarves rush to work. You should see dwarves moving stones and logs to the workshop, and then sitting there for a time before repeating the movements. Your dwarves are industriously filling the job orders you placed

and producing your goods! If you press **q** and move the marker over your workshops, you should see the top task marked with an **A**, indicating that the task is currently *Active*.

It is possible that you will get order cancellation messages when ordering the rock doors, mechanisms, and nest boxes to be made. This will almost certainly be because you have yet to uncover any rock—perhaps your first halls are dug entirely out of mud or sand. If this is the case, you can build wooden doors at a Carpenter’s Workshop and change from rock to wooden nestboxes at a Craftsdwarf’s Workshop by selecting *Wood* instead of *Rock* at *Add new task*. If the fact that your dwarves are currently living in little more than muddy holes causes you to fear for their dwarfiness, do not worry—we’ll be sure to dig into good, clean rock in due course.

Once production is underway, you may ask yourself: where all the goods are that our dwarves are producing? Press **t** for *View Items in Buildings* and move the cursor over the workshops, and you will see the beds, doors, mechanisms, and nest boxes piling up on the workshop floors. This is less than ideal, as workshops can become cluttered (marked with **CLT** when a workshop is viewed with **q**), and a cluttered workshop will significantly reduce the speed at which your dwarves complete your production orders.



You may have noticed that items in your workshops are bracketed with various symbols, including \equiv and $+$. These markers indicate the item quality, and are detailed in [Appendix A](#).

Piles (of Stuff)!

Thankfully, the threat of cluttered workshops will not give us bad dreams, as Dwarf Fortress has given us the power of *Stockpiles*. Stockpiles are areas the player designates that dwarves use to store goods. Stockpiles are a powerful feature, but before discussing them in depth, let’s set some up to give you an idea of how they work.

With the 20×20 workshop room visible, press **p** for *Stockpile*. *You will now see another menu where you can select the sort of pile you wish to create, and the cursor marker will appear*. Press **f** for *Food*, and it will highlight, indicating we are ready to place a food stockpile. Go to a far corner of your large room where there are no workshops, press **enter**, and then move the cursor. A small turquoise cross will flash, indicating the home point of our selection. Move the **X** across the room and then down, so as to mark a selection that is the width of the room and three spaces wide. Press **enter** again to create the stockpile. Terrain that isn’t covered by rock will now show an \equiv , indicating the presence of a stockpile. Don’t worry about the stones and other litter that may seemingly block your stockpile—the stockpile still exists under the rocks and debris, as you will note if you press **k** and move it over any of the stockpile squares.

If you unpauses the game, you should see something magical happen: dwarves running to and fro carrying food and food containers to your new stockpile! You may also notice

dwarves come visiting your stockpile and spending a bit of time there—they are probably stopping for a bite to eat or a drink, as we have yet to build a feast hall for our little friends.

When you get tired of watching the dwarves moving food, press **p** again and set up more stockpiles. You'll want to add stockpiles for goods, wood, and furniture of a similar size to the food stockpile. I prefer not to place stockpiles adjacent to each other, as it can get confusing telling one from the other. A one-square gap between each pile will help keep the stockpiles neat and ordered. Piles for cloth, leather, bar/blocks, and gems may also be created, but at this point in time they only need to cover approximately a dozen squares, as you won't have much in the way of goods to fill them.

If you make a mistake in placing piles, press **p-x** for *Remove Designation* and then use the **enter**, select area, **enter** method to clear any stockpiles (or part of a stockpile) under your marked zone.

Once you have placed all the required stockpiles in the large room, use **p-r** to add a *Refuse* pile (of about fifteen to twenty squares) outside your entrance. Spoiled food and waste goods are dumped in refuse piles, in order to prevent the buildup of the nasty stench ("miasma", in game terms) associated with rotten food. In due course, use **p-y** to add a *Corpse* pile, to ensure that any dead pets or livestock are removed from the hallways. Refuse and corpse piles require access to the open air. Unpause the game and let your dwarves go to work storing your fortress goods.



Do not use large stone stockpiles without good reason. Filling stone stockpiles can become a full-time job for your dwarves.

If you get curious as to what goods are in your stockpiles, press **k** and examine the stockpile squares. Where there is a container, you can select it with the secondary menu keys and then press **enter** to look inside.

Warehouse Management

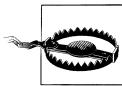
Dwarf Fortress stockpiles allow for detailed control over production processes. Using some of the advanced settings available, we can enjoy precise control over what is or is not stored in a stockpile; we can set one stockpile to be supplied from another stockpile or workshop; tell a stockpile to only supply a certain workshop, and determine whether a stockpile will use wheelbarrows. These features are useful because they can help us improve the efficiency of our fortress. For example, next to a farm, you could place a food stockpile that only takes seeds. This will help your farmers work faster, as they won't have to walk far to fetch the seeds they need to plant.

Let's do some advanced tinkering. Find your food stockpile, press **q**, and place the cursor over the pile. The pile will flash and details on the right panel will offer various

options. We want to press **s** for *Change Settings*. Dwarf Fortress will now present a list of items showing what is allowed in the stockpile. Navigate this menu with the cursor keys, and move the highlight down to *Food*. Next, hit the right cursor key and move the highlight down to *Egg*. Now check the options at the bottom of the screen—we want to press **f** for *Forbid Eggs*. A couple presses of **escape** will take you back to the game.

Why are we banning eggs? Simple: we want our chickens to lay eggs, and for those eggs to be fertilized by our rooster and subsequently hatch into chicks. If we don't ban the eggs, they will be gathered by our dwarves and stored for cooking rather than left to hatch. By banning the storage of eggs we can let the chicks hatch and grow into chickens in due course. Once we are happy with the number of chicks and chickens in our fortress, we can simply permit eggs in our food stockpile and the dwarves will start gathering them again.

Do remember that if you have multiple food stockpiles, you will need to ban eggs in each one—otherwise your dwarves will store eggs in those stockpiles that do permit eggs, frustrating your plans for a chickenopolis. One way to make the management of your food stockpile restrictions easier is to have one, master stockpile of food which bans eggs and then set all other food stockpiles to take from the central stockpile.



Too many of any creature will cause Dwarf Fortress to slow. If you experience a lag-inducing “chicksplosion”, study [“Butchering Live-stock” on page 52!](#)

The advanced stockpile options won't be very useful to a young fortress. But, as your fortress matures, the advanced features will offer some much-needed control over some of the complex industrial processes you will wish to employ. You can read more on this in [“Improving Industry Efficiency” on page 125.](#)

Container Storage

You may have noticed that some of your stockpiles appear to fill with items quickly, while others remain half-full but laden with various containers. This is because many (but not all) items can be stored in bins, barrels, jugs, bags, and pots and your dwarves are smart enough to use these miraculous space-saving devices. As a rule, you can never have too many containers.



Did you know that your dwarves will carry containers around so they can collect multiple items at once? Do not make containers out of lead or gold unless you enjoy watching your dwarves move very slowly!

Bins and barrels are commonly made at a Carpenter's Workshop, and jugs and pots are most easily made at a Crafts dwarf's Workshop out of rock. Bags are made at a

Clothier's Workshop or at a Leatherworks and (conveniently) can be filled and then stored in other containers. Having an adequate number of containers can significantly reduce the need for enormous stockpiles, as dwarves will naturally fill each container to capacity and store goods appropriately (see [Table 3-2](#)).

Table 3-2. Container summary

Container	Can store	Made from	Made at
Bag	Seeds, quarry bush leaves, flour, sugar, dye, sand	Leather or cloth	Leather Works, Clothier's Shop
Barrel	Alcohol, plants, bags of food or dye, fish, fat and tallow, meat and organs	Wood or metal	Carpenter's Workshop, Metalsmith's Forge
Bin	Crafts, blocks and bars, ammunition, armor, gems, leather, cloth and clothes, weapons	Wood, metal	Carpenter's Workshop, Metalsmith's Forge
Jug	Honey, royal jelly, rock nut oil	Rock, clay, metal, or glass	Craftsdwarf's Workshop, Kiln, Metalsmith's Forge
Pot	Same goods as a barrel	Rock, metal, or clay	Craftsdwarf's Workshop, Kiln, Metalsmith's Forge

Dumping, Refuse, and Storage

When you placed your stockpiles, you may have noted that any stones in the area of the stockpile are not moved (as they are when a door or a workshop is placed). This can cause problems when you need a stockpile to store a lot of goods. Stockpile squares with a stone on them can not be used for storage until the stone is removed. This is probably not going to cause a lot of problems for you early on, as stones will be used by your team in the course of making crafts, doors, tables, chairs, and constructions—but in a large fortress, tidying your stockpiles will help keep production efficient.

There are two methods for doing this. One method is to build a Mason's Workshop and a Craftsdwarf's Workshop in any newly-dug space, and order each to produce rock crafts and rock blocks on repeat. All you have to do then is wait for the rocks to be cleared from the room and converted into crafts and blocks by your busy workers. When the room is empty, dismantle the workshops and move on to the next project.

A faster option is to use the handy *Dump* feature, which is a powerful fortress management tool. To dump, press **d-b** to bring up the *Set Building/Item Properties* window. This menu lets you tell Dwarf Fortress that all goods in an area should be treated a certain way. In this case, press **d** for *Dump Items*. Now find a room full of rock and, starting from one corner, press **enter** and then move the cursor and press **enter** in the other corner. All loose items in the room (not doors and tables, for example) will now be marked for dumping.

You can see this yourself by pressing **k** and highlighting any square with a stone. The stone should have a *D* next to it, indicating that it is scheduled to be dumped. You can toggle an individual item's dump setting by pressing **d** from this view, allowing you to easily set just a few items for dumping (since the dump designation can be a little indiscriminate). You could also press **f** for *Forbid* and prevent any dwarf from using or moving the item. Fortress managers sometimes forbid goods to prevent dwarves from trying to recover them from dangerous areas.

Before the stones marked for dumping will be moved, we need to create a dump zone somewhere nearby. Choose a corner of your room, press **i** for *Zones*, and place a single square zone by pressing **enter** twice. Next, press **g** to turn the zone into a *Garbage Dump*. Once you exit out of the menu, dwarves should start clearing the space of stones marked for dumping. In the future, any item marked for dumping will be moved to this dump zone (unless a closer one is available).



It is possible to use dump zones to create “quantum stockpiles” that store an infinite amount of goods. No one is sure if this is a bug, or a feature. Which, if you think about it, is appropriately quantum.

It is sometimes useful to reclaim items in a dump zone. This is frequently the case when you dump a lot of stone and wish to make the stone available for use in construction or workshops. So long as an item retains its dump status, it cannot be used, so let's change that. Once the stones have been moved to the garbage dump, press **d-b** again, and this time leave the menu set at *Reclaim Items/Buildings*. Move the cursor over your dump zone, press **enter**, and then **escape** out of the menu. If you use **k** and look at the enormous stack of stone in the dump zone, you will note that the stones no longer have the *D* dump designation on them. These items can once again be used by your dwarves.



Refuse stockpiles are areas where rotten or worn-out goods are automatically dropped by dwarves. Dump zones hold goods specified by the player.

Bulk reclaiming is also useful if you want to collect all of the items dropped by enemies upon their death. By default, all items dropped by your foes are set to forbidden (marked by an *F* when looked at with **k**) but designating a claim box over an area where enemies have fallen will tell your dwarves to gather their delicious loot for your fortress. This automatic forbidding-of-items-on-death behavior is to prevent peasant dwarves from trying to rush into a fight to collect stray socks, and can be changed under the *Forbid* submenu of the **o** (*Set Orders*) menu.

Building Rooms

Before we continue, ensure that your herbalist and woodsdwarf are busy by specifying additional terrain to have wood cut and plants harvested. Go up levels, down levels, all around your fortress—cut back those trees and plants! Keep your industry fed! Now, let's go on and place all of these items we've constructed. First, press **b** for *Building* and admire the long list of objects you can construct. Let's get the doors into all the gaps we've placed off the hallway, by pressing **d** for *Door*. The info panel on the right will now indicate that we're placing doors and tell us whether placement is blocked or not. Door placement is forbidden if your door is not attached to a wall; hence, we can't fill the three-tile wide Trade Depot entrance with doors, but we can fill all the other doorways. Move the cursor into a doorway, press **enter**, and **enter** again when you need to choose which door to place. You will now see a flashing door icon, indicating that a furniture placement task has been generated. Press **d** again and continue to place doors around your fortress. If you run out of doors, you will get a *Needs Door* message, and you'll know it is time to return to the Mason's Workshop to order more.

When you **escape** out of the menus and let the game run, idle dwarves will dash to the furniture stockpile, pick up doors, and move them into place. In moments you will experience the joy of a minimally decorated dwarf fortress! Now let's go place those beds we made. Use **b-b** for *Bed*. Beds can be placed anywhere, but let's fill the small room near the fortress entrance. I like to be tidy, so I tend to line beds up against the walls.



Want to stop dwarves accessing an area? A simple way is to block access with a door. Press **q**, highlight the built door, and then press **l** and the door will be locked.

This temporary living space (we will work on fully featured bedrooms later) needs some tables and chairs to make it easier for your dwarves to enjoy a pleasant dining experience. Head to the Mason's Workshop, press **q** and then **a-t** for *Construct Rock Table*. Add two or three tables and then press **a-c** to add two or three *Construct Rock Throne* orders. Confusingly, both the Carpenter's and the Mason's Workshop let you build chairs, but stone chairs are called thrones, whereas wooden ones have the more modest name. Don't worry, chairs and thrones are functionally identical.

Let those orders complete, and then use **b-t** and **b-c** to place tables and chairs in the middle of the room. Tables and chairs need to be adjacent for the dwarves to use them for eating, but be sure that there is enough room around all of your objects for your dwarves to walk. Interior decorators call this "creating a free flowing space that encourages the movement of positive energy." We call it ruthless efficiency serving the goal of increased production!

With items placed, it is time to tell Dwarf Fortress (and our dwarves), how to treat the objects. Press **q** and move the cursor to any bed. On the right, the option *Make Bedroom* will be available at the press of the **r** key. Do that now, and note the flashing box. With the **plus** and **minus** keys, you can adjust the size of the room you're creating (use **plus** to increase the flashing blue square to cover all the beds). Doors and walls prevent the room from leaching out into the corridors.

Once you press **enter** to set the room size, the blue box will continue to flash and some options will be presented in the info panel on the right. The options include assigning the selected bed to an individual dwarf; setting the room as a barracks for our military to sleep in; or we could simply ignore the options, leave the room as-is, and wait for a dwarf to come along and claim it for themselves. Instead, we're going to push the **d** for *Dormitory* key. This will flip the (N) to (Y) next to *Dormitory*, and the room and any beds covered by the blue box will be used by tired dwarves to catch some Zs (literally, dwarves flash with a Z when asleep). Congratulations! You have just created your first homeless shelter!



You only need to create the room once off of a single bed, not for every bed you've placed.

Next, press **q** and move the cursor over a chair and table and review the options. The *Make Throne Room or Study* option available for chairs is something we will deal with in [“Nobles” on page 72](#), so let's move the **X** over a table and press **r** for *Make Dining Room*. There's no need to fill all the room with the blue box; just make sure that the blue highlight covers all the tables and chairs. Press **enter** and review the options. Again, we can assign the room to an individual dwarf (nobles love to eat alone, useless snobs that they are) but in our case we want to press **h** for *Meeting Hall*. The room, and all tables and chairs in it, will now be used by off-duty dwarves looking to socialize, and having our dwarves party safe behind our walls is ideal.

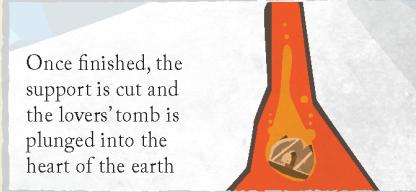
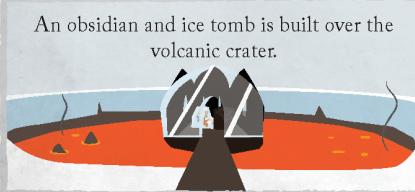
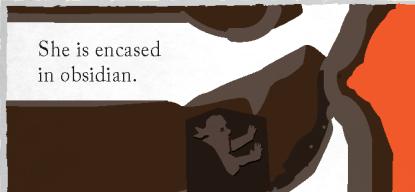
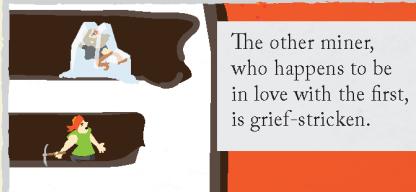
With these tasks complete, dwarves should swarm to our temporary frat house. Some, however, will still spend time around the wagon that we arrived with. Find it (it will be centered when you press **F1**), press **q**, and then with the wagon highlighted, press **x** for *Remove Building*. The wagon will be taken apart for timber and it will no longer be used as a meeting location for dwarves looking for a chat.

Rooms are an important part of Dwarf Fortress. Rooms help us control what activity goes on where, particularly where dwarves will live, socialize, receive medical care, train for military service, or be punished by the Hammerer. We will discuss more specialized rooms in several other sections of this book.

Praise Armok! The settlers have found a volcanic glacier.

ENTOMBED

From Quinn Aggeler



Filling Dwarf Bellies

Producing food is vital in Dwarf Fortress. Without it your dwarves will starve, which causes them to work poorly and forces them to consume vermin to survive (at least for a while). As you would expect, starving to death creates an unhappy thought in a dwarf's head, and too many unhappy thoughts may turn an otherwise hard-working and industrious dwarf into a homicidal maniac intent on turning his best friend's head into a macabre totem (this is literally true). To avoid this fate we must farm, harvest, fish, and butcher our way to a healthy food supply. And once we have some food, let's get all fancy and try our hand at cooking it.

In this chapter, we will lay the foundations for abundant food production while discussing some alternative and advanced strategies you may consider at a later date. If something in this chapter doesn't make sense, come back to it—there are so many interlocking elements in Dwarf Fortress that learning them sequentially can be nearly impossible. Dwarf Fortress is best treated as a gaming buffet. Take a few bites here and there before returning for seconds.

Chickens and Eggs

Which came first? The chicken, of course, because we embarked with some. As you may recall, we built some nest boxes at the Crafts Dwarf's Workshop. Nest boxes will be claimed by our chickens when they go to lay eggs. Unless those eggs are gathered and placed in a food pile, they will eventually hatch into baby chickens so long as a rooster is on the map. But, in order to start our chicken empire, we will need to place the nest boxes somewhere that can be accessed by our chickens. In order to do that, we should specify an area of ground as pasture.

Chickens (and all other fowl) don't need to live outside, as they don't graze on grass. As such, you can either dig out a large room for them or just use some flat space outside your fortress for their pasture. For now, a 10×10 room will suffice, but in time you may need a larger space to prevent overcrowding. Creatures that are crowded become aggressive, and are prone to attacking each other and even your dwarves. You will see

alerts along the bottom of the screen if your chickens get aggressive and seem likely in need of more space.

Let's get on with specifying a pasture zone and placing all of our chickens in it. We will then place the nest boxes in the middle of the pasture so that the hens can claim the boxes and lay eggs in them. It won't be long until we have many little chicks running around being adorable and consuming CPU cycles with their path-calculating requirements.

Let's start by pressing **i** for *Zones*. Find either an outside area near your entrance or the room you have dug out, and then mark out an area of at least 10×10 squares. If you make a mistake, find the zone using **i**, press **x**, and then press **X** to remove it. Once you have created a suitable zone, you will see the right info panel change its header to *Activity Zone 1*, and it will present you with some options. Set this zone to *Pen/Pasture* using the **n** key. You can then, as you will see from the list of commands at the bottom of the panel, press **N** to change the zone's settings.

You should now see a list of animals. Scroll through the list and as you see an animal that isn't a dog or a cat, press **enter** to assign it to the pasture. If your pasture is inside, you should not assign grazers such as cows, yaks, horses, or camels to your rocky pen, as they will starve to death. Create another large 20×20 pasture outside for these creatures. Be ruthless; even if your dwarves are keeping pet lambs who adorably follow your dwarves around, assign them to your outside pasture or they will starve to death underground in due course. Animal fodder isn't usually available deep underground, at least not until you breach the caverns and cave moss spreads. Don't feel heartbroken; your dwarves much prefer living pets to dead ones (which, again, can result in unhappy thoughts and the whole skulls-on-poles thing).

When you unpauses the game, your dwarves will rush about moving animals to the pasture. There is usually no need for any fences around your fields. Your animals are mostly quite obedient and dwarves will return them to their pasture if they do stray, but note that your livestock can be popular targets for any invaders, so you may want to wall in your pasture, build ditches, or move your pasture deep underground in due course.

If you do plan to keep a number of grazing animals for your food supply, keep in mind that even large pasture can easily become grazed clean by only a few animals. If you have more than a dozen grazing creatures, consider creating several pastures for your animals and spreading them around. The last thing you want is an enraged yak crushing a loved pet's skull.

With your chicken pasture established, it is time to build your nest boxes. Press **b-N**, which will allow you to select where to place your first nest box. The middle of the chicken pasture makes sense, so place your first nest box there and repeat the process until all remaining nest boxes are placed. When you resume the game, the boxes will be installed, and should the chickens feel in an egg-laying mood, they will be claimed.

As eggs are forbidden from being stored in food stockpiles, the eggs will sit there until they hatch. You can examine the contents of the nest boxes using **t**, if you wish.

With each nest box placed, you should have one box per chicken. As you raise hens to maturity, you should place more nest boxes to provide room for your chickens to lay eggs. One box per chicken is ideal; less may result in fewer eggs available to be gathered by your dwarves.



Other egg-laying creatures may claim your nest boxes. Alligators, giant eagles, and even dragons have been known to claim nest boxes and lay eggs.

Once your first batch of eggs hatch and you have a dozen or more chicks running about, you can re-enable eggs in your food stockpile by revisiting it, pressing **q**, then **s**, selecting *Food*, finding *Egg*, and pressing **p** for *Permit Eggs*. Fifteen to twenty hens should be more than enough to provide your fortress with a good supply of food in addition to what you grow. What's more, as you only need one rooster, any surplus roosters that reach maturity can be butchered for their meat, bones, and skin, a topic we'll cover later in this chapter.

Harvesting eggs, while relatively easy, is only the first step in turning them into food for your dwarves. Dwarves prefer their eggs cooked, which requires us to build a Kitchen. We will examine Kitchens more closely later in the chapter.

It is important to note that chickens aren't the only egg-laying creatures available to you in Dwarf Fortress. The full list of egg layers is enormous, but in terms of poultry that Dwarves are able to embark with, ducks, geese, turkeys, guineafowl, and blue peafowl are also an option for fortress managers. Each has their own advantages and disadvantages (explained in [Table 4-1](#)), but suffice to say the choice of which to farm is up to you. It has been suggested that embarking with two different types of poultry can be useful as it is easy to ban, say, chicken eggs while farming duck eggs, and then once the chicken population has grown, switching it around and farming chicken eggs while hatching more ducks. In this way your dwarves can enjoy eating eggs shortly after your fortress is founded, reducing the risk of early starvation.

Table 4-1. Poultry pointers

Poultry	Notes
Blue Peafowl	Low number of eggs laid per bird. One year to maturity.
Chickens	Average number of eggs laid per bird. Two years to maturity.
Ducks	Large number of eggs laid per bird. Two years to maturity.
Geese	Low number of eggs laid per bird. One year to maturity.
Guineafowl	Average number of eggs laid per bird. One year to maturity.
Turkeys	Large number of eggs laid per bird. Two years to maturity.

Growing Crops Above Ground

The staples of a dwarf's diet are likely to be the crops you grow on farms both above-ground and underground. Farming also provides a steady supply of materials to process into dye ingredients and materials for the cloth-making industry. Fortunately, we embarked with everything we need to get a few farm plots under way.

Underground farming can be somewhat involved, so let's come to grips with the basics with an aboveground farm first. Find a nice clear, grassy space (hopefully free of trees by now) near your fortress entrance, and press **b-p** for *Farm Plot*. You will get a placement **X**, along with a message complaining about a lack of mud or soil. But so long as the **X** is green, we will have no trouble building our farm. For the farm footprint to be green, you need to place it over a patch of grassy or muddy ground. The bottom of the right panel also gives us instructions for increasing the size of our farm plot. If you press **u** or **k**, the size of the plot will grow, while **h** or **m** will shrink the plot. Create a 4x5 plot footprint and then place it using **enter**. It is likely that your farm plot will have holes in it due to rocks or trees, but don't worry, a few gaps won't be a problem.



As your farmer dwarves increase in skill, they will plant faster and their plants will produce more food at harvest time.

The farm plot will now flash until a dwarf comes along to build it. Building the plot will only take a few seconds and once complete, it is time to specify what gets planted each season. Press **q** and move the cursor over the farm plot. It will then flash and a new menu will appear in the right panel. At the top, the panel lists what plants can be grown that season, and below, the season can be selected (among other settings). Start by pressing **a** for *Spring* and review your planting options. You are aiming to set a simple food to be produced, so plants such as wild strawberries, fisher berries, bloated tubers, sun berries, and rat weed are ideal. Press **enter** on a crop of choice; you get bonus points for selecting one you recognize from your earlier exploration of the map with the **k**, key. With Spring's crop selected, you should cycle through the other seasons using **b**, **c**, and **d**, and set a plant for each. So long as there are available seeds, farmer dwarves will plant and harvest the crops as they grow and mature. If you are curious about what product each plant provides, a full list is available on the Dwarf Fortress wiki.

You should have seeds for some of these plants, and can watch dwarves busy themselves planting your first crop (Figure 4-1). If you have no planting options, you may need to wait a short while for your dwarves to eat some of the gathered plants, which will release their seeds for planting (dwarves are silent on the question of whether the seeds are gathered before or some time after the food is consumed). Revisit your plot regularly—when you do find planting options available, use the secondary menu keys to select the plant you wish to grow and press **enter**. If you do not see dwarves moving to plant

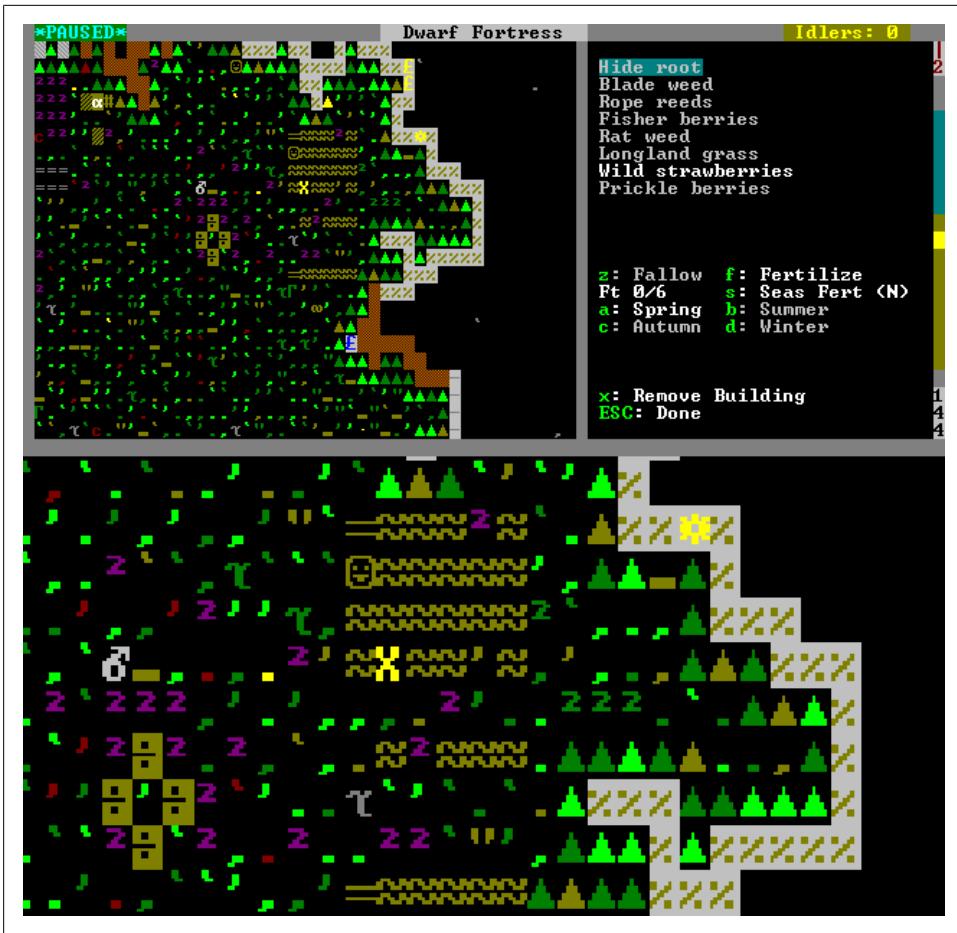


Figure 4-1. Three outside farm plots tended by a dwarf

seeds (and the farm plot tiles changing as the seeds are planted), try returning to the crop selection menu and choosing a different plant type. You should find something that the dwarves will plant relatively quickly. In the future, you will learn how to use the **z** (*Status*) menu to look at your fortress stocks, which will make selecting plants for which you have seeds much easier.

It will take some time for each plant to grow, but when it is ready for harvesting, a dwarf will come collect the ripe plant and move it to your stockpiles. With outdoor farming firmly in your grasp, you may want to build two more small farm plots to ensure that you have several food plants growing at all times. It may take time to build up a seed stock that will keep your farm plots filled, but it will happen in time. Each farm square takes one seed but produces several plants, each of which produces a seed when brewed, eaten or processed. In this way, you can use the products of a small plant harvesting venture to eventually feed your entire fortress.

Although outdoor farming is a great way to kick off some early food production, it does come with a few risks and problems. First of all, your dwarves are exposed to the sun, not snug deep beneath the earth where all good, honest, hard-working dwarves belong. Second, your dwarves are far too close to wild animals and invading goblins. Finally, as your fortress develops, you will naturally move storage, production, and housing facilities deeper underground, resulting in very long, inefficient hauling routes for your farmers.

There are a few ways we can get around these problems while maintaining varied food production. Some of these techniques rely on construction and management skills you will learn later, but it is worth bringing them up now for you to think about. First, you could take the aboveground farming down to your fortress by digging a deep shaft, open to the sun, that ends close to your production and storage floors. Second, you could create a *burrow* (we will look at these later) for your aboveground farmers, and force them to live their lives close to the food they are tasked with producing and processing, leaving the task of moving the food underground to other dwarves. Third, you could simply accept that aboveground farming is a risky endeavor and live life on the edge! For all of these options, constructing walls around your farms and private entrances to your fortress can protect the fields and your dwarves from random encounters with dangerous invaders, and placing a floor over the farms will add protection from flying invaders while, curiously, preserving the farm plot's "outside" status.

Of course, another option is to ignore aboveground farming entirely and to focus solely on underground farms. You will miss out on a few crops that would add variety to the food and alcohol produced by your fortress, but this won't cause any problems for you other than the occasional dwarf missing out on a chance to drink their favorite exotic booze. In the end, you do not need vast swathes of land dedicated to farming in order to feed your fortress. Thirty farm squares busy with food production, a few chickens, and maybe a dwarf or two fishing should provide more than enough food for even a large fortress. How you split your farming between aboveground or underground farms is entirely a matter of personal preference.

Growing Crops Underground

Over the many years people have been playing Dwarf Fortress, one of the most frequent complaints from new players centers around the difficulty of establishing sustainable underground farming. Underground farming can be a challenge, but if we take on the task step-by-step, it won't be long until we're knee-deep in plump helmet mushrooms and other delicious treats.

If you have built productive aboveground farms and your chickens are laying eggs, there is no need to immediately establish an underground farm. You may wish to wait until you have worked through [Chapter 7](#) before tackling the job of searching for soil or muddying some rock. That being said, it doesn't hurt to try if you're feeling brave!

Finding Dirt

Before we can begin, it is important to understand that underground farms must be placed on dirt or muddied rock. If the only space you have for farming is a rock floor, you are going to have to muddy the rock by spreading water across it or you are going to have to dig around to look for soil. Muddying the floor can be achieved through controlled flooding (something we will look at in [Chapter 11](#)) or we can instruct our dwarves to haul water in buckets and to dump the water where we want our farm to be built (covered in [Chapter 7](#)).

The easiest way to begin underground farming is to place the farm on soil that you have uncovered through digging. Chances are you've already discovered soil as you dug your initial tunnels into the hill. Using **k** for *Look Around*, see if you can find any underground terrain marked sand, clay, loam, silt, or peat. All of these terrains will support a farm plot without any fiddly irrigation. If you find a suitable location, dig out some space and connect it to your fortress. Then use **b-p** and place a farm plot or two on the ground. Once placed, use the techniques you have learned earlier to assign crops to your fields, focusing on *Plump helmets* for all seasons.

If you have dug straight into a large hill, it is likely that the first couple of squares around your fortress entrance are a suitable terrain type but that the rest of the ground is rock and not suitable for easy underground farming. If you don't want to experiment with irrigation but do want to farm indoors, you now have two choices. First, you could find an area of flat grassland, press **d-h** for *Channel*, and then press **enter** over an area near your fortress entrance. This will result in your miners channeling a ramp down to the layer just below the grass and trees. This should be a suitable soil type, and you can now use **d-d** on that lower level to carve out a space for your dwarves to farm on. If you do this, be sure not to dig out the ground around your ramp, as ramps unconnected to neighboring rock or soil or a constructed wall will vanish or be unusable.

Another option is to dig upwards from inside your fortress to try to find soil on layers above your fortress entrance. Press **d-u** for *Upward Stairway* and designate an upward stairway in an undug wall of your fortress, perhaps at the end of your first corridor. If you then move the view up one level, you can designate an *Up/Down Stairway* using **d-i** directly above where the up stairway is on the level below. This, once dug, will provide your miners access to the level above your fortress entrance floor. If you dig around this new level, you may find soil. If not, designate another up/down stair above the one you just dug, and try again. Keep digging up until you find soil. If you accidentally breach the top of your hill and worry about invaders, build a floor on top of the entrance stair using the construction instructions in [Chapter 7](#).

Once you have dug out a suitable location, simply place a farm plot as you would with outside farming. A single 20-square plot will probably suffice at this point, but if you're able to build several plots and have a few different crops running at any one time, you will keep your farmers busy. In [Figure 4-2](#), I have found a corner of my world where there is enough dirt to start two small underground farm plots. The larger is set to only



Figure 4-2. Underground farming on soil

grow plump helmets (a delicious mushroom), and the other has a mix of cave wheat, pig tails, and sweet pods, crops which can be processed into further useful goods.

If you lack suitable soil or wish to farm deep underground, you will be forced to make a rocky surface muddy before you can place your farm plots. Surfaces are made muddy by allowing water to wash across them and then leaving the water to evaporate. Using dwarven engineering and machinery, this task can be accomplished relatively painlessly, but it does require some advanced skills (which we will tackle in [Chapter 11](#)). The alternative to flood gates, levers, and mechanisms is to tell our dwarves to carry buckets of water from a water source to the area we need muddied. The “bucket brigade” approach to irrigation is covered in [Chapter 7](#).

Fishing

When we equipped and trained our dwarves in [Chapter 2](#), we gave one some skill in fishing. Chances are that this dwarf has been spending time, when not otherwise engaged, wandering around the water sources on your map fishing. Fortunately for us, our dwarves don't need to mess around with nets, rods, or reels. Instead, dwarves simply pull the fish right out of the rivers and ponds. How they do this is a mystery, but I like to imagine that they dip their dirty, food-encrusted beards into the water and simply wait for fish to get tangled in them.

Unfortunately, dwarves don't like to eat raw fish. To process the fish, we need to build a Fishery, which is a workshop where fish are cleaned and processed into chopped-up processed raw fish. From there, we will need to cook the fish for it to be palatable to our dwarves. We will also need to ensure that we have enough barrels (constructed at the Carpenter's Workshop) or rock pots (constructed at a Crafts Dwarf's Workshop) to store the food.

Let's set up a Fishery. Find a clear space handy to your food stockpiles (dig out more room if you need to) and then press **b-w-h** for *Fishery* (it is on the second page of workshops; use the alternate scroll keys to have a look if you wish). Place the workshop and wait for it to be built. Fish preparation tasks will be automatically added to your Fishery as required, and dwarves with the *Fish Cleaning* labor enabled will work in the Fishery to prepare fish for cooking. If the fish are lobsters, turtles, oysters, or other shelled marine-life, shells will also be recovered. These items are often called for by dwarves in "Strange Moods" and so running a modest fishing industry ensures you always have a few to hand.

Unless migrants with the *Fish Cleaning* labor enabled join your fortress, it is possible that your fisher dwarf will spend all their time fishing and no time cleaning and preparing the fish for cooking. The fishing labor seems to take some precedence over the cleaning labor. You can work around this problem by temporarily turning off the fishing labor for your fishing dwarf (there's more information on dwarf labors in [Chapter 6](#)), or by dedicating an immigrant to the *Fish Cleaning* labor.

Fishing adds another useful food type to your fortress stockpiles and is easy (if dwarf labor-intensive) to gather and process. It does come with some risk: fishing dwarves will often need to roam well beyond your fortress walls, where danger and strife await. Once you are confident that your other food production systems are running well, you may wish to consider disabling fishing and using fisher dwarves for other tasks.

If you become truly enamored with fishing, then you can create a secure fishing ground by establishing a zone dedicated to fishing in an underground pool you've created or explored. Simply place a zone adjacent to the pool using **i**, and then press **f** to dedicate the zone to fishing. You then need to change your dwarves' standing orders so that they prefer fishing zones over searching out their own fishing spots. Press **o-w-f** to switch to zone-only fishing.

Hunting

It is possible to start the game with a dwarf who is equipped to hunt the local wildlife, and some hunters are likely to turn up as migrants. Embarking with one or two dwarf hunters, along with a few dogs that can be trained to hunt, can provide not only a source of protection for your fortress, but also a supply of meat and other goods to feed your dwarves.

Dwarves you want to embark with as hunters should have *Ambusher* set as their highest skill. They will then be given free armor and a crossbow, a quiver, and some crossbow bolts. In addition to the *Ambusher* skill, hunters benefit from skill in *Crossbowman*, *Hammerman*, and *Wrestler*, all of which will aid them on the hunt. Once you are building your fortress, hunter dwarves will automatically pick an animal on your map and then stalk it before sneaking in for the kill. They will continue hunting as long as the *Hunting* labor is enabled. Animals killed by hunters will be carried by the hunter to a Butcher's Shop, where a dwarf with the *Butcher* labor enabled will process the carcass into meat, bones, skin, and other products.

Butchering Livestock

Raising animals for the pot is one way of feeding your dwarves, but it can be tricky to establish reliable meat-based food production. First of all, you need a good source of animals, either farm-raised or game your dwarves have hunted down. Next, you need a series of workshops and stockpiles designed to turn a beast first into meat, bones, skin, fat, and other products—and then into food and goods based on these inputs. As if this isn't complex enough, the various jobs required to achieve these tasks need to be completed relatively quickly, or the animal material will start to rot.

Fortunately, as we have seen, there are other ways to feed your fortress. If you have yet to raise numerous chickens or other animals, there is no need to follow along with these instructions at this time. Return to this section when you are ready to chop some kittens up!

Start by pressing **z** to pull up the *Status* menu. The *Status* menu provides a good summary of the current status of your fortress. Press **enter** (the *Animals* tab is already selected) and you should now see a list of creatures, their sex, their name (if they are a pet), if they are owned, and their training level.



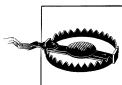
Dwarves will adopt and name some animals on their own. Except for cats. Cats choose their owners.

Creatures with a name are tame and cannot be sent to the butcher's block. Indeed, if the pets of an already-depressed dwarf are killed, it may push the doting owner over the edge into axe-wielding mania. Dwarves truly do live on a sanity knife-edge; hard-working one minute (albeit, fueled by alcohol and mushrooms), axe murderers the next. A Dwarven fortress is much like "Burning Man" meets "Psycho".

With the animal stock tab displayed, scan the list using the cursor keys. Creatures set to *Unavailable* are not the sort of critter your dwarves will adopt as a pet. Those marked *Uninterested* have yet to be made a pet. Any uninterested or unavailable creature can be marked for slaughter by pressing the **b** key. As a rule, you will want to slaughter males of a species, as you only need one of them to impregnate all the available females on the map. If you have managed to hatch and raise a few chickens, now would be a good time to have a look through all of your chickens and set all but one or two of the roosters for slaughter. As a rule, wait for a creature to be fully grown before slaughtering it—you will gain more resources from a mature animal than from a baby one.

If you are concerned about an eventual catsplosion (an endless number of pet cats breeding endless more pet cats), then you might wish to break the above rule and regularly cull the kittens filling your fortress halls. Puppies, on other hand, eventually grow into dogs that can be productively trained to aid your hunters or soldiers, so you may want to keep dogs around.

With a few creatures selected for slaughter, we should set up our Butcher's Shop. You can either set it outside (close to your livestock) and prevent the risk of miasma build-up, or put the butcher shop inside, perhaps in its own dedicated room where a door will keep any miasma generated inside. Whichever you chose, **b-w-u** for *Butcher's Shop* will let you place the building. Once built, a *Slaughter Animal* task will be added automatically to the Butcher's Shop task list and will remain there until all the set animals are butchered. You should also build a *Tanner's Shop* using **b-w-n**. This will result in a *Tan a hide* task being automatically added once an animal with a tannable skin is butchered. For the workshop to be built and hides to be tanned, a dwarf will need to have the *Tanning* labor enabled. Labors and jobs are further explained in [Chapter 6](#).



Miasma is a build up of stench and gas from rotting or spoiled plant or animal material. Dwarves encountering miasma will experience an unhappy thought. There is no risk of miasma outside.

Even if you're not relying on meat to feed your dwarves, you will still find use in keeping a few animals for the pot, or simply butchering stray ones. Meat, bones, hides, and prepared organs (delicious!) are all useful to you, from providing resources for bone ammunition production through to materials for backpacks, waterskins, strange moods, and fine meals.

Which Animals Should I Farm?

Food animals can be placed into three broad categories. There are egg-laying fowl, grazing livestock, and non-grazing livestock. Unless you are willing to spend time managing pastures, you will want to raise animals that don't graze. Grazing animals need large areas of grassland (or mossland) to survive, and providing enough secure pasture for them can be a challenge.

Which animals graze and which do not? Well, the list of possible animals you will be able to purchase, embark with, or capture is simply too huge to reproduce here. Suffice to say that what applies in the real world is likely to apply in Dwarf Fortress. For example, cows, sheep, and horses graze, whereas pigs, fowl, bears, cats, and dogs do not.

If you are looking to add creatures in addition to egg layers at your embark, then pigs make an excellent addition to any fortress. They can be milked (bacon-flavored milk, yum!), pastured anywhere as they do not graze, and provide substantial goods when butchered. At the embark screen, female pigs are called sows and males, boars. As they are expensive, you will need to cut down on embark points spent elsewhere. One option is to reduce the points spent on raising the mining and wood cutting skills. They will go up quite rapidly on their own through constant use, so a somewhat slower start should not be a problem.

Cooking and the Kitchen

Cooking is a great way to turn piles of inedible foodstuffs into meals your dwarves can enjoy. However, cooking can also very easily destroy your seed stocks, as cooking plants will destroy the seeds (brewing, conversely, does not). To prevent this, start by heading back to the *Status* menu using **z**, then use the cursor keys to move the highlight to *Kitchen*, and then press **enter** to review the options.

Against each food type, you will see a number and the available permissions. Red means that cooking or brewing that food is forbidden, while blue signals that it is permitted. If there is no option, then brewing or cooking that item isn't possible. You will also see a number, often with a question mark next to it. The question mark indicates the best guess of your dwarves as to the number of that ingredient in the fortress stores. Once you set a bookkeeper dwarf (see the section “[Nobles](#)” on page 72 in [Chapter 6](#)), more accurate stock counts should be common.

Scroll through the ingredients using the cursor keys, and when you get to *Plump Helmets*, press **c** to turn off cooking for this plant. The word *Cook* will change color to indicate that this plant will no longer be considered a potential ingredient in the Kitchen. Ensure that the kitchen settings forbid cooking all other available plants, seeds, and alcohol. We do not want to accidentally turn all of our seed and booze stockpiles into fine meals; dehydration is a terrible curse! Once you have a bookkeeper providing accurate counts of your food and drink stocks, you may wish to re-enable alcohol and

plant cooking to help provide a wider variety of meals for your dwarves. Now that you have adjusted the Kitchen settings, let's build our Kitchen!

Find a likely spot, preferably close to your food stockpiles, and press **b-w-z** for *Kitchen*. Place the Kitchen, and once it has been constructed, check the options available to work with using **q** and then **a** for *Add new task*. At a Kitchen, you can order the Kitchen to prepare easy, fine, or lavish meals, and to render any available fat (from butchered animals) to tallow (a useful soap-making ingredient). You can safely ignore the *Render Fat* option for now, as this task is automatically added to the production queue by your dwarves when fat becomes available.

The meal-cooking options determine how many ingredients your dwarves will use in the production of a meal. Easy meals have two ingredients and are referred to in-game as biscuits. Fine meals are made of three ingredients and are named stews. Lavish meals are made of four ingredients and are called roasts. Each meal generates a number of meal portions equal to the number of ingredients—cooking does not waste food.



If you are doing a lot of cooking but wish to make a lot of soap, be sure to turn off cooking tallow in the stocks menu as tallow becomes available.

If you have engaged in a spot of animal slaughtering, make sure to keep some easy meals queued up in the Kitchen to ensure that the meat and organs are quickly converted into more easily stored and valuable goods (easy meals are made a lot more quickly than the other meals). Poorly stored animal products will rot.

Beekeeping

Raising bees for their honey, wax, and royal jelly can be a nice supplement to your food and alcohol production. Beekeeping is relatively easy, so let's get right into it! For starters, head to the Crafts Dwarf's Workshop and **a** add a **g** (*Rock*) task; then use the secondary scroll keys to find *Make Rock Hive*. Add four to the task list.

Once the hives are built, find a quiet, outside area away from your animals and dwarves and press **b** for *Building* and then **alt** and **h** for *Hive*. Place your hives in a group. Once they are built, press **q** and review the options each hive presents you with. There are two settings you can adjust: first, **c** toggles whether or not a bee colony can be installed in a hive or not. Leave that one be: we want colonies to be placed in these hives. The next option is **g** (*Gather any products*). This we should toggle off on each hive so they are all set to *Do not gather products*.



Bees will sting. Bee stings don't cause any real harm (although a single bee dies), and generate no unhappy thoughts (except maybe in the bee!).

What will happen next is that if a dwarf has the *Beekeeping* labor turned on, it will try to find a native beehive on your map and split it, placing half of the swarm in one of your hives. In time the swarm will grow, and it will again be available for splitting or harvesting. Due to our setting choices, the swarm will be split instead of harvested, and half of the swarm will be placed into an empty hive. Once your four hives are filled, you have a choice: you can either toggle two of the hives to *Gather any products* with **g**—so long as you have made some rock jugs, two hives will have their bee colonies destroyed, and honeycomb and royal jelly will be placed into two jugs. Alternatively, build four more hives and leave these new hives toggled to *Gather any products*, and in this way your four original hives will produce colonies that will eventually be split, placed in the new hives, and then harvested.

Once you have jugs (easiest built at a Crafts Dwarf's Workshop out of rock) filled with honeycomb and royal jelly, you can either cook or trade the royal jelly and you can process the honeycomb at a Screw Press. Build one near your food stockpile using **b-w-p** for *Screw Press*. A Screw Press needs two mechanisms that can be built at a Mechanic's Workshop if required. Once built, the Screw Press will present you with two options when you **q** over it. The *Press liquid from paste* option refers to turning rock nut paste (made at a mill stone or quern) into rock nut paste oil and rock nut press cake. The *Press honey from honeycomb* task is the job we're interested in, and it will be red until some honeycomb is available. Once the task is available, you are able to set a job to turn honeycomb into honey (which can be cooked, eaten, or brewed into mead) with wax as a byproduct (used to make wax crafts). You will, again, need jugs for the pressing process, so ensure that your Crafts Dwarf's Workshop has produced a surplus.

Milking

It is possible to milk livestock that you own and then process the milk into cheese. Although you are unlikely to ever feed a fortress with just milk or cheese, they provide yet more ingredients that can be cooked into meals or used as raw food. If you have likely female livestock (cows, camels, donkeys, goats, sheep, reindeer, yaks, pigs, llamas, etc.), the *Milk Creature* task can be set from a Farmer's Workshop (**b-w-w**).

Your dwarves will need spare buckets, barrels, or pots for the milking task and milk storage, but assuming all is in place, your dwarf will go fetch the animal and then milk it at the workshop. Once you have a supply of milk, you can set a *Make Cheese* task at the same workshop and your milk will be processed into delicious cheese. Farmer's Workshops are important for all manner of food- and plant-processing jobs. You are likely to need three or four in a busy fortress to keep up with the milking, cheese-making, and plant-processing jobs.

Merchants and Trading

Trade caravans from neighboring friendly civilizations will arrive throughout the year, offering you useful goods and happily taking just about anything you don't want off your hands. Trading is an excellent way to get your hands on animals for training and breeding, exotic goods, weapons and armor, and emergency food and drink rations. Supporting your trade empire is easy—keep your Crafts Dwarf's Workshop churning out rock crafts, and pretty soon you will be exporting your tacky ethnic trinkets to middle-class hovels across your world.

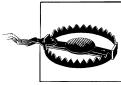
Merchants Have Arrived!

Inevitably, you will eventually get a message at the bottom of your screen (remember, you can view all alerts by pressing **a**) informing you that a merchant caravan has arrived. The camera will switch to the caravan's location, and if you wish, you may watch the merchants and their goods move in towards your Trade Depot. Once they arrive, you will receive a message about the merchants unloading their goods and the Trade Depot will start to look quite busy.

At this point, it is advisable to press **q** (*Set Building Tasks*) on the Trade Depot and then review the options. We want goods moved to the Trade Depot so we can trade them to the merchants, and we want our broker to be there to conduct the trade negotiations. There should be a name under *Broker*, which is probably also your expedition leader. If not, press **n** for *Nobles and Administrators* from the main menu, scroll down to *Broker*, and press **enter**. The first dwarf in the list should be your expedition leader (the dwarf you gave the leadership skills to in [Chapter 2](#)), so press **enter** to set them as the broker.

Once you have a broker, **q** over the Trade Depot again and press **g** for *Move Goods to/from Depot*. You will now be presented with a list of all items in your fortress. Use the cursor keys to scroll all the way down to *Crafts* (hopefully your Crafts Dwarf's Workshop has been churning out stone crafts), cursor-key to the right, and then examine the list. You will almost certainly have *Finished Goods Bins* which contain many crafts, as

well as individual crafts that haven't been stored in a bin. Against each bin, press **enter**—and likewise, select the individual goods if you wish (although ordering dozens of items to be moved will take some time). Press **escape** to return to the Trade Depot menu, and then press **r** to set the depot status to *Trader requested at depot*.



Elves will not accept goods made from or derived from wood. Offering elves wooden items (including the wooden bins or barrels holding other goods) will offend the elves and cause them to leave.

Once the trade goods are moved to the depot and your trader has made an appearance (which may take some time if the dwarf is engaged in a complex task, sleeping, or some distance from the depot) you will find that **q** shows that *Trade* is available as an option. Press **t** and review the trade screen. In [Figure 5-1](#), you can see a trade screen showing the goods we can trade for on the left, and the goods we have to offer on the right. Against each item is a value (the first number) and a weight (the second number). Traders can only carry so much (allowed weight is displayed in the bottom right). So long as you are not trading raw stone to the merchants, the weight limit should not be a problem.

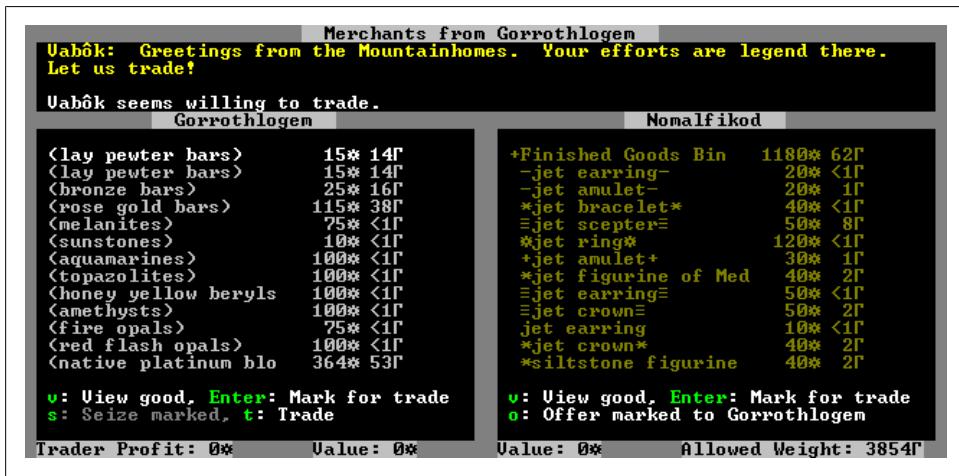


Figure 5-1. The trade screen showing the goods of both parties

To complete a trade, you first need to look through the list on the left for things you would like to buy. You are unlikely to be able to afford a great deal at your first trading session, but picking up some items your fortress is currently short of is probably a good idea. Food is always useful, as is alcohol, along with spare picks for miners, cloth, thread, empty bags, rope, glass (for moods, more on those in [Chapter 6](#)), and maybe even caged animals. Once you have done some shopping, cursor-key over to your own goods and scroll through. Select a finished goods bin and press **enter** to mark it for trade. The bin and all goods in it (the indented items below the bin's description) will

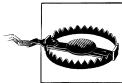
now have their value and weight calculated against the trade goods you have selected. You need to ensure that the trader makes a good profit or they will decline your offer (or come back with a counter-offer). Until you have a skilled broker, you should aim to allow the trader at least a twenty percent profit. The profit the trader is making is displayed as a figure beneath their goods, and the total value of the items you are offering is displayed below yours.



If a caravan's merchants and guards are driven off by enemies, you will be able to claim all of the goods for yourself.

Once you are prepared, press **t** for *Trade*, and with luck the merchant will thank you for your business and the trade goods will change to reflect the deal. If you are unable to trade, it could be that the goods you are offering are too heavy for the trader to carry out of the fortress. If this is the case, then the weight limit text will be red and you will be prevented from trading until you buy some heavy items or remove some heavy items from your trade offer. Another reason for a failed trade is that the trader isn't happy with the profit margin. In this case, the trader may suggest a different deal. Accept it if you can—or escape out, remove some goods from your purchase list, and try to offer them again with **t**. If you attempt to offer several bad trades, the merchants may get upset and leave. Try to be generous.

Once you are done trading, press **escape** and then **r** to let your broker go about their usual business. Your dwarves will haul your purchases from the depot to the appropriate stockpiles, and in due course the merchants and their guards will depart your fortress.



Admitting that you trade with elves may result in ridicule and public mockery. If you are questioned, claim that you give all pointy ears magma baths. Keep your secret shame hidden.

Liaisons

Trade liaisons (represented by a white @ symbol) will often accompany caravans and seek out the broker dwarf in order to make a trade agreement. A screen will pop up when negotiations begin, and you will be prompted to press keys to tap through the options. Liaisons will usually suggest items they would like you to make (and they will pay a premium if you do) and you can suggest to the liaison items you would like to see them bring next year, bumping the priority of items should you see fit (although the higher priority you place on an item, the more expensive it will be). Any agreements you make can be viewed in the **c** (*Civilizations*) screen.

To be honest, other than perhaps bumping the priority of few items such as weapons, armor, and metal, I largely ignore liaison negotiations and I expect you will do the same in due course. Traders have an inexhaustible desire for tacky dwarf rock crafts, so worrying about what precisely they would like to buy seems a little pointless when it isn't hard to have a couple of Crafts Dwarf's Workshops supplying the entire world's rapacious appetite for toy rock boats, harps, necklaces, and other assorted rock junk. The only qualifier to this is that if you challenge yourself with a difficult embark and extremely limited local resources, then traders may represent a lifeline to timber, metals, or other goods in short supply. In this case, extracting maximum value from trading—especially early on—may be important to the survival of your fortress.

Dwarf Resource Management

Dwarf Fortress gives players immense control over the running of a fortress but, as you may have noticed, little direct control over the dwarves who occupy it. I like to think that this feature is a subconscious reflection by the developers on the chaos and complexity of the modern world.

But although control is minimal, you can influence the actions of your dwarves in several ways. In this chapter we will look at the *Labor* menu, which allows you to change the jobs a dwarf will undertake. This powerful feature is essential to maintaining your fortress and the efficient management of your dwarves.

This chapter also addresses some other features of dwarf management, including strategies for managing the labor of a large dwarf population. By the end of this chapter, you should be able to modify the *Labor* options for your dwarves in order to produce the outcome you desire, as well as having a grip on some of the more complex dwarf management problems. This chapter is best read around the time you get your first wave of dwarf migrants.

The Fundamentals of Labor and Jobs

It's important that the difference between labor and jobs is addressed now (before you get confused, you poor dear). Essentially, dwarves don't have jobs: they have labors that they are permitted to undertake. Jobs are tasks created by your actions and by the dwarves themselves. For example, if you designate a tree to be cut down, a *Cut down tree* job is created and automatically assigned to a dwarf with the *Wood Cutting* labor enabled. Once the tree is cut, a *Pick Up Item* job is created to move the timber to a stockpile.

Note that jobs and labors do not necessarily match up on a one-to-one basis. For example, the jobs *Make Rock Mechanisms* and *Construct Building (Stone-Fall Trap)* might seem completely different and unrelated, but both require a dwarf with the *Mechanics* labor activated in order to be completed. There are far more potential jobs that a dwarf may undertake than there are labors, and problems with getting tasks done are usually caused by misunderstanding precisely which labor needs to be set so that a job will be picked up by a dwarf. Experience, [Table A-42 in Appendix A](#), and the Internet may help in these situations.

In addition to the various automatically generated jobs, sometimes a single job can set off a cascade of follow-up jobs. For example, butchering an animal is a job undertaken by a single dwarf with the *Butchery* labor enabled and takes but an instant. But once an animal is butchered, a great number of hauling jobs are created (all the animal's parts being stockpiled), and a *Tan a Hide* job (in the Tanner's Shop) and *Render Fat* job (in the Kitchen) are also automatically created and assigned to any dwarf with tanning or cooking labors active. As you learn the game, try to plan ahead and ensure you have enough dwarves free to see a big job completed quickly. If, for example, you order the mass dumping of stone, you may keep your dwarves so busy that crops are left to rot on the plant rather than being harvested. Likewise with butchery: slaughter orders should be spaced out so that your dwarves have a chance to clear the Butcher's Shop of animal bits (and the other workshops of follow-up tasks and hauling jobs) before the next animal is turned into bloody chunks. Otherwise, you not only risk that the workshop will generate miasma, but may lose animal products to spoilage.

Some jobs are automatically generated based on the wants and needs of your dwarves, and cannot be controlled by the labor menu options. Dwarves will eat, drink, relax, sleep, and go insane without prompting—and without the labor settings having any impact on their actions. Dwarven personalities do have an impact though: you may see hard-working military dwarves practice individual combat drill in their spare time, and social dwarves look to make new friends. Not needing to guide the eat, poop, and sleep habits of your dwarves leaves you free to manage the important tasks of growing mushrooms, building traps, and turning animals into delicious meals.

If you are interested in tracking the jobs Dwarf Fortress has generated, press **j** for the *Jobs* menu. This will display a long list of jobs, the dwarf assigned to the job, and the location of the job. Pressing **v** for *ViewJob* will take you to a screen where you can learn more about the current task (whereas **c** will zoom you to the creature, and **b** to the building, if applicable). The jobs list can be a great way to discover suspended tasks that need intervention (usually by pressing **s** to unsuspend something once you have zoomed to it) or pointless tasks that are keeping many otherwise valuable dwarves busy.

Skills

As your dwarves engage in various jobs, they will often gain proficiency in an associated skill. Tell a dwarf to go mine and they will grab a spare pick and undertake mining tasks, increasing their skill in mining as they go. When you view the dwarf and review their skills, you will see their skill at mining start at *Dabbling* and move through *Novice*, *Adequate*, *Competent*, *Skilled*, *Proficient*, *Talented*, *Adept*, *Expert*, *Professional*, *Accomplished*, *Great*, *Master*, *High Master*, and *Grand Master* before hitting the skill cap at *Legendary*.

Many skills correlate directly with a labor that you can toggle, but some do not. For example, the social skills on the leader dwarf that we established at embark develop as your dwarf socializes (or, in the case of nobles, engage with traders or do stock-takes), but there are no labors you can adjust to encourage the development of certain social skills. Many skills associated with combat fall into the same category: you can get your dwarves to spar and thus practice their armor use, dodging, and weapon skills, but you have no direct control over which skills increase and can't toggle them on and off.

As a dwarf gains skill levels, they will usually complete an associated job faster, more efficiently, or to a higher quality. Legendary miners can dig out a room far quicker than novice miners. Highly skilled masons reliably produce high-value masterwork furniture, whereas novices won't.

Labor Management

Now that you understand how jobs are generated, let's look at how we can manage dwarf labors. As you will have noticed by now, your dwarves are extremely industrious, toiling tirelessly and more than happy to brave unsafe work conditions for the betterment of the fortress. Luckily for us, the dwarves in Dwarf Fortress have never heard of weekends, maternity leave, holidays, or health and safety regulations, and they happily accept micromanagement without complaint.

To get started with managing your dwarves, press **u** for the *Unit List*. You will now see a list of all the dwarves in your fortress, with tabs for pets and other creatures. Dwarves are color-coded by profession (which is listed after their name) and their current task will be listed on the far right. Ideally, all dwarves will be busy at all times, and you will have no idlers wasting time by attending parties, socializing, or engaging in other such pointless endeavors.



The *Unit List* includes dwarves, livestock, the dead, and other...things. The cursor keys navigate the lists, and **c** will zoom your view to any selected creature.

When you start a fortress, your seven dwarves are likely to be busy just about all the time. There's so much digging, farming, land clearing, and construction to be done that there's more than enough work for all of them. However, as more dwarves migrate to your fortress, you will end up with a lot of dwarves with professions that aren't exactly useful and won't keep them occupied all the time. There are only so many soap makers or millers that a single fortress needs! These dwarves can be gainfully reassigned to other tasks, and browsing your unit list will help you identify dwarves suitable to move to more productive endeavors.

You have a few different options when it comes to how best to manage your dwarf labor force. You can go in without any particular strategy and simply adjust individual dwarves as you notice jobs taking too long, you can take the time to divide your dwarves into groups clustered around certain labors, or you can focus on developing a few highly skilled dwarves and use the rest of the fortress to support them. In fact, there are endless strategies and no single best approach. Use what works best for you.

Setting Professions and Labors

In this section, we'll work on grouping dwarves into custom professions and adjusting their tasks to suit our goals. Examine the **u** (*Unit List*) and scroll through the list of dwarves with the up and down cursor keys, mentally noting which dwarves seem to be gainfully employed and which are not. With this in mind, it is time to create a small labor force of dwarves who only haul items—let's call them the Plebian class. By default, all dwarves are available for hauling tasks that come up, whether that be moving logs to stockpiles, placing furniture, or hauling refuse vast distances to a refuse stockpile. But as you can imagine, this sort of menial labor is not something we want our highly skilled miners, farmers, or crafts dwarves wasting their time on. By creating a dedicated peasant class that only engage in menial labor, we will be able to unassign hauling labors from our more useful dwarves, ensuring rapid completion of important jobs such as mining, farming, woodcutting, and industrial production.

Using the unit list, select your first likely candidate (perhaps a soap maker or a spare pump operator, lye maker, or some other poorly gifted individual) and press **c** for *Zoom-Cre* (zoom creature). You will now be taken to their location on the map, which will be marked by the **X** in the center of your screen. On the right side of the info panel, you will see a list of the dwarf's skills, and at the top of the panel, their current task, name, profession, and sex. Press **z** for *St* (status) and on the following screen, **y** for *Customize*. This is where we're going to give this dwarf a new profession name (this is for aesthetic purposes only). Press **p** and then type **Plebian**, pressing **enter** when done. Pressing **escape** a couple of times will back you out to the dwarf task overview, and you will note that the dwarf has now adopted their new profession name at the top of the info panel.

Now let's get on with the task of reassigning the labors of our new plebian dwarf. With the dwarf selected, press **p** for *Prf* (preferences) and then **l** for *Labor*. You will now see

a list of all the labors the dwarf can be assigned. Some (such as *Hauling*) will be highlighted in white text, others will be pale grey, and the remainder will be a darker grey. Confusingly, this list contains both individual labors (for example, *Mining*), as well as groups of labors (for example, *Hauling*). A labor group in white indicates that all labors in that group are enabled; a group in light grey, only some labors; and dark grey, no labors are enabled. In [Appendix A, Table A-42](#) shows the full list of labors and labor groups, and marks which ones are enabled by default on all dwarves.

For our plebian caste of hauler-dwarves, let's turn off all but a few labors. Scroll through the labor list with the cursor keys and press **enter** on each to determine which labors live within which categories. Our plebians should have all the Hauling labors enabled, along with the *Feed Patients/Prisoners* and *Recovering Wounded* labors in the *Health care* group, and *Cleaning* under *Other Jobs*. You can safely turn off all other labors using **enter**. As with most menus in Dwarf Fortress, navigate back out of any labor subcategories using the **escape** key.

Having dedicated haulers and cleaners means that we can turn off these labors on our more valuable dwarves (for example, miners, woodcutters, and farmers). Try this now; find your miners from the unit list and turn off all the hauling and health care labors, as well as the *Cleaning* labor in *Other Jobs*. We want these valuable dwarves to be focused solely on their important job, with breaks only for rest, eating, and sleeping.

At any one time, you may have up to 20 or even 30 percent of your fortress workforce engaged solely in the peasant tasks of hauling and cleaning, leaving the rest of your fortress to train in the military or engage in various industries. At first, the number of dwarves focusing on only one or two specialist labors are likely to be small (mostly dwarves engaged in time-intensive jobs such as farming, brewing, and mining), but this will change. In due course, you will want to equip your military, smelt the ores you dig up, develop advanced mechanical contraptions, or simply redecorate—and to keep these projects moving, you are likely to want several skilled dwarves focusing on just one or two labors each, undistracted by hauling tasks.



Created a dozen new miners and woodcutters, but none are working? Remember that miners need picks and woodcutters need battleaxes to work at this labor.

Dwarf Therapist, a superb third-party utility, makes managing a large number of dwarves extremely easy. Dwarf Therapist is a stand-alone program that reads the labors, skills, and attributes of your dwarves and displays them for you in a simple tabular format. Not only can you select dozens of dwarves at once and assign them custom professions, you can set up custom sets of labors for each profession. Dwarf Therapist is included with the Lazy Newb Pack, and is available from the Lazy Newb Pack *Utilities* tab.

Labors and Attributes

As mentioned earlier, there are sixteen different ranks of skill for each labor, starting with *Dabbling* and finishing with *Legendary*. As your dwarves engage in a labor, their skill will go up. As skills change, so do various attributes that define the physical and psychological makeup of each dwarf. For example, a dwarf engaged in heavy labor (such as mining) will get stronger and tougher over time—you may even notice them moving more quickly than other dwarves. Psychological attributes will also change, but are much harder for you to modify through dwarf labors than physical attributes.

Attributes are divided into two groups, physical and mental. The physical attributes include *Strength*, *Agility*, *Toughness*, *Endurance*, *Recuperation*, and *Disease Resistance*. The mental attributes include *Analytical Ability*, *Focus*, *Willpower*, *Creativity*, *Intuition*, *Patience*, *Memory*, *Spatial Sense*, *Musicality*, *Kinesthetic Sense*, *Empathy*, and finally *Social Awareness*. You can view a dwarf's rating in any of these skills by going to the **z Status** page of a dwarf and pressing **enter** to view the dwarf's thoughts. Using the cursor keys, you can scroll through a description of the dwarf, and their attribute ratings will be reflected in the text description.

Attributes have an impact on the job performance of your dwarves. Empathy, for example, is important for medically skilled dwarves; you want your doctors and nurses to enjoy helping others, or they may get negative thoughts from caring for wounded dwarves. Likewise, dwarves with a lot of focus and willpower are likely to practice weapon drills even when off-duty. It is possible to spend a lot of time carefully matching a dwarf to labors that they most naturally suit, but once you hit more than a couple of dozen dwarves, the task becomes extremely time-consuming and the payoff fairly slight. Perhaps the only exception would be in ensuring that your medical team are (as much as is practical) focused, empathic individuals, so as to ensure they respond quickly to any medical emergency that crops up.

Migrants

Once per season you are likely to receive a notification on the bottom of your screen that migrants have arrived, and your view will snap to their location. The migrants will then proceed to march, with their pets and livestock, into your fortress and to the nearest meeting hall. Once they have made it to the meeting hall, they will be added to your fortress's population list and are available for tasking (and their animals made available for your pleasure).

Migrants are dwarves who have traveled from the splendid home fortress to start new lives among the chickens, cats, and squalid dormitories you have thrown together. Why they would choose to do such a silly thing is never explained. I figure they must all be crooks on the lam, and so I have no compunction about conscripting many of them into the militia or plebian class!

It isn't uncommon to have more than a dozen migrants arrive at once, and accommodating them can be a problem if you haven't planned for new arrivals in advance. Rather than have migrants sleeping on the floor for weeks on end, always make sure that you have a number of empty bedrooms ready to be claimed by members of the next migrant wave. You should also plan to make some allowances for animals they have brought with them; either gently usher them to the butcher's block or assign them to a prepared pasture.

Strange Moods

A problem not often featured in real-world management guides is the challenge of dealing with employees who have had a psychotic break and, having murdered a colleague, turn their bones into artful decorations for staff to admire. This is a pity, as if they did, you might be better prepared to handle some of the strange moods dwarves can fall prey to in *Dwarf Fortress*. Thankfully, this book is here to fill this important gap in the business management literature market.

The term "Strange Mood" describes any one of a number of mental ailments that may strike a dwarf at any time. When a strange mood strikes, a dwarf will stop whatever they are doing and rush to a workshop, their heads filled with an idea for a legendary artifact that they would like to construct. Why these strange moods strike dwarves is not known, but their random nature and the torment they can inflict speaks to the influence of a particularly tricky and bothersome deity.

If the dwarf is able to successfully complete the artifact, they will often become legendary in the associated skill, gain a happy thought, and your fortress will have a valuable artifact to use and admire. If you are fortunate enough to get an artifact weapon (especially one made of metal), you will have a powerful tool for foe-smiting and will be the envy of many fortress managers.

Not all dwarves are eligible for a strange mood. For starters, babies can't get strange moods (but children can), and neither can military dwarves with a profession other than *Recruit*. Dwarves must also have at least *Dabbling* rank in a suitable skill. Without spoiling the fun too greatly, suitable skills are generally craft-related. Finally, if a dwarf has had a strange mood once, they are ineligible to have another strange mood.

Struck by a Mood!

Dwarves can be struck by one of five different moods. These are outlined in [Table 6-1](#), along with a few notes on what causes them (if known) and the effect the mood may have.

Table 6-1. Strange moods

Mood	Notes
Fell	The moody dwarf will claim a workshop and then kill the nearest dwarf for their parts. Results in a legendary bone carver or leatherworker. Only strikes particularly unhappy dwarves.
Fey	Makes the dwarf happy. The dwarf will clearly express their ingredient demands. Dwarf will become legendary in the associated skill.
Macabre	Similar to a fell mood. Only available to unhappy dwarves and likely to require animal pieces, but does not result in a dwarf being murdered. Does provide legendary skill.
Possessed	Possessed dwarves have ambiguous ingredient requests and do not get a skill increase once the artifact is completed.
Secretive	Ingredient requirements are unclear. Does provide legendary skill.

Once the mood has struck, the dwarf's icon will alternate between the traditional smiley face and an exclamation point, and the dwarf will immediately cancel what they are doing and rush to a workshop suitable for the item they wish to make.

If they don't rush anywhere, the workshop they require does not exist. In this situation it's usually best to examine the list of workshops (**b-w**) and build any you don't have (the number of workshops of a type in your fortress is indicated by the number in parentheses after the workshop's name). Don't forget to check furnaces as well (**b-e**), as strange moods sometimes require a Glass Furnace or Kiln.

Hopefully your moody dwarf will now be ensconced in a suitable workshop (having kicked out any other dwarf that happened to be operating it at the time) and, with luck, will shortly start dashing about the fortress gathering the ingredients they need for their artifact. Once the ingredients are gathered, you will get a message stating that the dwarf has started their mysterious construction—and when the dwarf eventually finishes the item, you will again be alerted. It is always entertaining to read an artifact's description, and you can easily find any artifacts in your fortress by pressing **1** from the main screen and then following the onscreen prompts.

But.

It is highly likely that at some point along the route from strange mood to artifact, something will go horribly wrong and you will end up with a dwarf camped out in a workshop doing nothing but flashing **!** impatiently. This is a problem: while in a strange mood, a dwarf won't eat, drink, or sleep, and will eventually go insane and may even start randomly attacking nearby dwarves. Rampaging psychotic dwarves can be somewhat disruptive to the smooth running of your fortress. If a dwarf fails to make their dream artifact, chances are something went wrong in the ingredient-gathering phase of artifact construction—in other words, the dwarf's demands weren't met.

Artifact Ingredient Demands

If your moody dwarf has claimed a workshop but failed to start making the artifact, chances are that a crucial ingredient is unavailable. If you press **q** and highlight the claimed workshop, you will see a rotating list of items that the dwarf needs in order to make the artifact. Ingredient demands may be explicitly outlined, or merely hinted at. Materials will be fetched in the order displayed and unless you're watching carefully, it can be unclear which item the dwarf is currently stuck on. You are likely to have an instinct for what may be required and can then, if possible, work on making missing ingredients available. [Table 6-2](#) indicates some typical ingredient demands (although not all the ways they can be described by your moody dwarves; working that out is part of the fun!), and provides tips on how the demand can be met.

Table 6-2. *Ingredient demands*

Demand	Meeting the Demand
Bars	Smelt ores into bars of metal at a <i>Smelter</i> .
Blocks	Turn rocks to blocks at a <i>Mason's Workshop</i> .
Bones	Butcher animals to provide bones.
Cloth	The demand may be for plant, silk, or yarn cloth. Manufacture at a <i>Loom</i> .
Gems	Raw or cut gems may be required. Gems can be cut at a <i>Jeweler's Workshop</i> .
Glass	Process sand into glass at a <i>Glass Furnace</i> .
Leather	Butcher animals and process their skins into leather at a <i>Tanner's Shop</i> .
Shell	Some seafood, when processed at a <i>Fishery</i> , produces a shell. Raw turtles and fish cannot be traded for, only bought at embark or collected by fishing dwarves.
Wood	Cut down trees.



When a trade caravan visits, why not trade for some of the more unusual items on the demands list just in case they are required for a strange mood?

The Consequence of Failure

Sometimes, despite your best efforts, you can't provide the ingredients a moody dwarf demands. Perhaps you have no shells to hand and didn't embark with any shellfish; perhaps silk cloth is required and there are no timely traders; or perhaps your fortress is in the midst of grander problems, and you don't have the time to deal with moody dwarves. If failure is an option, you will need to be prepared for your moody dwarf to go insane and become lost to your fortress.

After some time of not being able to complete their artifact, a moody dwarf will snap, abandon the workshop, and one of two things will happen: they could become withdrawn and stop eating and drinking, eventually dying of thirst; or they could go berserk and start attacking nearby dwarves. A berserk dwarf is quite tough to stop and can easily kill two or three (or more!) other citizens before finally succumbing to injuries or thirst.

Since the death of the moody dwarf is inevitable no matter which outcome occurs, it is best to prepare in advance for the worst case scenario. There are a number of strategies you can use, but the three most common are:

Assign a number of war dogs to the moody dwarf

They will peacefully guard the dwarf until the moment the dwarf becomes a threat to the fortress, whereupon they will tear the dwarf limb from limb in seconds. War dogs can be assigned from the labor menu and are trained from the *Animal* tab in the *Status* menu. This process is described in greater detail in [Chapter 10](#).

Construct a wall around the workshop, sealing the moody dwarf in forever

You will have to wait until the dwarf dies of thirst before you can tear down the wall and use the workshop again, but this is the simplest way of dealing with the problem. Building walls is described in [Chapter 7](#). Walls and a locked door will keep the moody dwarf from escaping, and allow access after death for easy cleanup.

Station a squad of military dwarves near the workshop

With a military guard, should the moody dwarf leap out of the workshop in a berserk rage, they will be cut down mere moments later—and will also serve as useful combat practice for your squad at the same time! Every cloud has a silver lining.

The loss of the dwarf is the only consequence of a failed strange mood, but if the dwarf was particularly skilled, the loss can be frustrating. Worse, if the dwarf had many friends and the remaining dwarves are already on edge due to various calamities, the death may set off tantrums in other dwarves and the horrors of an emo death spiral. Let's hope this doesn't happen to you.

Consequence of Success

Should your moody dwarf successfully construct a legendary artifact, you will hopefully have a dwarf who is now legendary in some trade skill and an item that may be useful to your fortress. Legendary artifacts are always pleasant for dwarves to look upon, so placing the artifact somewhere it can be admired is usually a good idea.

Not all artifacts are easily employed in your fortress, but where possible, you want to use an artifact to impress as many dwarves as possible by deploying it to a high-traffic area (such as a communal dining room). Alternatively, an unhappy noble can be kept very happy indeed with an artifact item in their room. [Table 6-3](#) has some ideas for deploying artifacts around your fortress.

Table 6-3. Artifact uses

Artifact	Possible Use
Furniture (bed, table, chairs, etc.)	Place in a room owned by your most important noble, or build into the communal dining room in order to spread the happiness around.
Barrel	Use in a Dyer's Shop or Ashery.
Bucket	Use in building a Well, Soap Maker's Workshop, Ashery or Dyer's Shop.
Mechanism	Build a lever with a mechanism or use the mechanism in a trap for an extremely deadly surprise.
Weapon	Assign to a dwarf or use in a weapon trap.
Shield, Armor, Clothing	Assign to a dwarf.
Gems	Add as a decoration to furniture and place the furniture.
Toys and Trinkets	No known use.

When you need to locate an artifact to place or employ in another construction, it isn't often obvious how to choose the precise object you want. The answer is to press **x** for *Expand/Contract* at the item select menu. You will now see every available item by type, along with item quality markings. Your artifact will be easy to spot due to its unique name. This technique also lets you find the highest quality items when fitting out a high-quality bedroom for, say, a noble. A table of quality markings is available in [Appendix A](#).



Soldiers may name their weapons and armor if they become particularly attached to them. These items will also appear in the artifact list but they are not, strictly speaking, artifacts.

Artifact weapons and armor can be very useful additions to your fortress, but only if they are made out of suitable material. An artifact tin sword is probably not going to be much better than a well-made steel one, although it will be quite an impressive show piece for the owner! One great use for artifact weapons of poor material is to turn them into weapon traps. In this way, they can serve as an attractive but lethal art installation to be admired by passing dwarves. This is considered very dwarfy, and a good thing by all right-minded Dwarf Fortress players.

It is important to note that legendary artifacts can significantly increase your fortress wealth, which may lead to increased immigration, the arrival of nobles, goblin sieges, and perhaps even the arrival of megabeasts. Fortress wealth is a measure of all the items and constructions in your fortress—and as the wealth of your fortress increases, so do the number and variety of challenges you face. You can view your fortress wealth from the **z** (*Status*) screen.

Nobles

Nobles are dwarves that you either appoint to office or who arrive as immigrants. Nobles you appoint are usually “normal” dwarves who have been given a special job that will improve the running of your fortress or unlock new fortress management options. Immigrant nobles are useless layabouts that are commonly ushered into rooms that accidentally flood with magma. Oops!

There are eight positions to which you can appoint a dwarf from the **n** (*Nobles*) screen. Table 6-4 lists the roles and the benefits of having the role filled with a dwarf.

Table 6-4. Player-specified nobles

Position	Benefit
Mayor	Required to appoint other nobles. Will often be appointed automatically from among the dwarves with leadership skills. May issue mandates and demands. Meets with foreign dignitaries.
Sheriff/Captain of the Guard	Dispenses justice and leads the fortress guards.
Militia Commander	In charge of the fortress military, and may lead up to ten soldiers.
Manager	Allows for the creation of production orders from the <i>Jobs</i> menu.
Chief Medical Dwarf	Enables the <i>Health</i> page under the z (<i>Status</i>) screen when appointed. Leads the fortress’s medical staff.
Broker	Trades with visiting caravans.
Bookkeeper	Keeps track of all the goods in your fortress.
Militia Captain	This position only appears once you have a Militia Commander. Can lead a squad of dwarves. You can have multiple militia captains.

Appointing a noble is simply a matter of pressing **n**, scrolling through the list with the cursor keys, and then pressing **enter** to select an appropriate dwarf from the list. Dwarves with relevant skills (if there are any!) will be placed at the top of the list of selectable dwarves, making it easier to find an ideal candidate.

You can appoint the same dwarf to multiple positions. When you first start a fortress, it is often ideal to ensure that the expedition leader is appointed to mayor, manager, broker, and bookkeeper. This will not only improve their social skills, but ensure that trading is conducted efficiently and unlock the Manager options.

In time, you may wish to appoint new dwarves to these positions—especially if you are fortunate enough to have dwarves immigrating with the profession *Administrator*, indicating some skill in the bureaucratic arts. This allows for a degree of redundancy, and will prevent one dwarf from missing important tasks. For example, if your broker and your mayor are the same dwarf, traders may be kept waiting while the dwarf finishes a meeting with another dwarf.



Once your fortress has grown beyond a few dozen dwarves, you may need to relieve your mayor of all labor duties so that they are available to counsel upset dwarves.

From the *Nobles* menu, you gain access to one special page of settings once you appoint the bookkeeper. Highlighting the bookkeeper row with the cursor keys will result in *Settings* changing from grey to white. Pressing **s** will then take you to a page where you can set how accurately the bookkeeper counts the items in the fortress.

Without a bookkeeper, the numbers under the *Stocks* page in the **z** *Status* menu are extremely inaccurate. With a bookkeeper, your numbers will quickly become much more precise. If your bookkeeper is required to hold down multiple jobs, setting the precision to *Low* will ensure that they aren't spending all their time in their office counting. Once you have appointed a dwarf to the bookkeeper role as their full-time job, consider bumping the accuracy to high or highest precision. Counting all day may not be a very dwarfy occupation, but it is a useful one.

Housing Your Nobles

Nobles will inevitably start getting Big Ideas about how they should be treated. All appointed nobles require a certain standard of accommodation and will not be happy with the simple rooms you may end up creating for all the other peasants.

Although various nobles have somewhat variable room requirements (some like to have en-suite tombs, some do not), it is simplest (at first) to carve out four rooms for each noble, equip them identically, and then assign them to each noble as needed. Each room should have a surface area of at least nine squares, but if space isn't a problem, consider increasing the size of each room to ensure that your nobles are as happy as possible.

In [Figure 6-1](#), rooms for four nobles have been designated and are ready to be dug out by miners. In due course they will need doors between each room and the hallway, and each room will need to be furnished and then created using **q**. Until you are confident managing the nobles, try following the schema in [Table 6-5](#) for each noble you need to house.

Table 6-5. *Quarters for nobles*

Room	Furniture
Bedroom	Bed , chest, weapon rack
Dining room	Chair , table, chest
Office	Table , chair, cabinet
Tomb	Coffin , armor stand

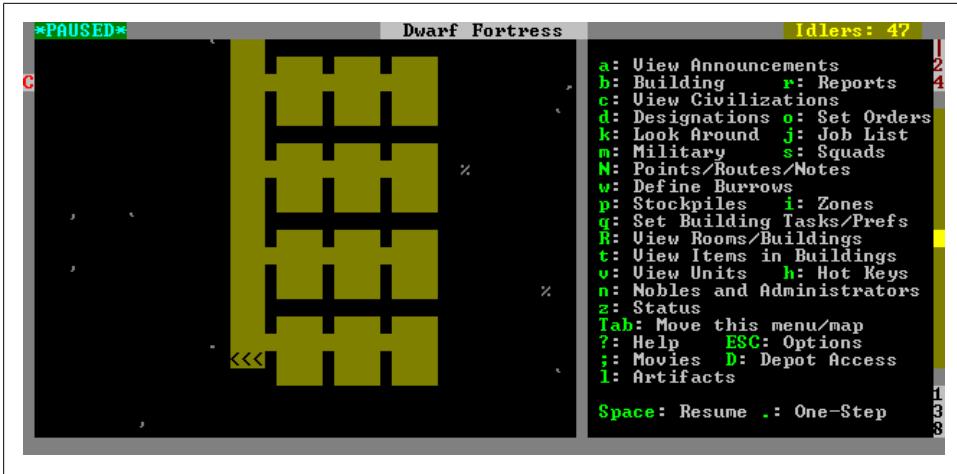


Figure 6-1. Quarters for four nobles designated

The bolded furniture in the table above indicates the item each room is created from when using the **q** option. Once the items are placed, **q** over the key furniture item, create the room, and then **a** (Assign) the room to the noble. Remember to always place tables and chairs adjacent to each other so that these objects are usable by your dwarf.

In [Figure 6-2](#), the entire floor of a rock spire has been dedicated to housing the fortress nobles. The walls and floors have been smoothed (**d-s**) and in the hallway, engravings have been carved into the smoothed floor (**d-e** on any smoothed rock surface). Furniture has been installed and the riffraff kept well at bay!

In time, as your fortress develops, you will be given the opportunity to add new nobles to your menagerie, appointing them from within your own population or through immigration. These nobles needed to be treated very carefully; the one-size-fits-all approach will not work with a baron, for example, who will demand far better accommodation than anyone else on pain of homicidal mania. Save some gold and silver blocks for forging into lavish furniture and learn to cut and encrust gems on furniture to ensure that your high-maintenance nobles are kept satisfied. [Chapter 8](#) covers these topics in more detail.

Demands and Mandates

In addition to requiring better accommodation than the average dwarf peasant, nobles may also issue demands and set mandates that need to be addressed. Demands and mandates can both be monitored from the *Nobles* menu. The demands and mandates column will be highlighted against any currently needy nobles. You can view the specifics of a mandate or demand by pressing **enter** when a noble is selected, and examining the ensuing text.



Figure 6-2. Noble's quarters inside a rock spire

Mandates are issued by leaders such as mayors and other high-ranked nobles, and instruct you to either produce certain items or forbid you from exporting those items. The items and material specified in mandates are often based on the personal preferences of the dwarf concerned, so you may want to keep that in mind when you are appointing nobles to leadership positions. A noble with a love of tin on a map with no tin is probably going to cause you problems in due course.

Failing to meet a mandate will generate a bad thought in the noble's head and the noble will demand the punishment of one or more dwarves. The terrible, criminal dwarves guilty of transgressing against their leaders may then be punished in some fashion by your sheriff and any guards under the sheriff's command. Should criminals escape

punishment, the offended noble will have another negative thought and, as we know, too many negative thoughts can lead to homicidal violence.

Demands function in a similar manner to mandates, but differ in that a demand is a request for a specific piece of furniture to be placed in the noble's room. If a demand isn't met, the noble will have a negative thought, but no dwarves will be sentenced for punishment—meaning demands are somewhat less important to meet than mandates.

Some may argue that meeting demands and mandates is far too much hassle for very little benefit and simply ignore these requests. If you've kept your dwarf nobles happy with luxurious quarters, fantastic food and drink, and tastefully arranged furniture, then missing a mandate or two isn't likely to cause a psychotic break. However, you may have to deal with the noble demanding that one or more dwarves are beaten or sent to jail for some time (unless you don't bother building a jail or specifying a sheriff).

Ignoring the bizarre requests of nobles is a perfectly viable strategy so long as your fortress and dwarves are safe and happy. If, for whatever reason, life gets difficult for your fortress, you may want to be especially careful to prevent any further outbreaks of sadness by meeting demands and mandates. Finding a balance between obsessing about your nobles and ignoring them is something that will take practice and experience.

Unfortunate Accidents and Nobles

A big downside of immigrant, non-appointed nobles is that they will accept no labor assignment other than hauling. This lack of flexibility, combined with their demands for quality accommodation, has led many fortress managers to consider them a useless drain on fortress resources. For that reason, it is not uncommon for fortress managers to arrange for “unfortunate accidents” to happen to their nobles. Sometimes a noble's quarters suddenly fill with magma for no good reason. Sometimes a noble may be encouraged to eat in private dining rooms in which wild beasts are insecurely restrained. Sometimes sections of cave roof inexplicably drop on nobles as they pass. Life in a fortress is always risky.

As a fortress manager, it is up to you to decide just how unlucky your fortress is for immigrant nobles. Conversely, you may enjoy trying to make nobles' quarters as luxurious as possible. Gold beds? Why not! Obsidian cabinets decorated with chicken bones? Sure! Happy nobles can at least help the peasants haul garbage. The choice is yours.

Relationships

Dwarves naturally form bonds with other dwarves after spending time with each other. These relationships are reflected in the relationships screen for each dwarf, which can be reached by pressing **r** for *Relationships* at the dwarf's **z** (*Status*) screen (Figure 6-3).



Figure 6-3. The family and friends of Thob Oslanshethbeth

From the *Relationships* screen, it is possible to see pets, deities, siblings, children, parents, and friends the dwarf cares for. Making friends and building a family produces happy thoughts in dwarves—but with the risk that if friends or family die, the negative thoughts generated could result in tantrums. For this reason, parties (where idle dwarves all gather to meet and make friends) could be considered the bane of a fortress.

It is almost inevitable that many dwarves will get married and produce children. Weddings will be announced and parties crop up for the special event. From this point on, the couple will share the same bed—and in due course, children are likely to be born. The wife will usually carry the baby around in one hand and do their job with the other. For this reason, some players will never recruit female dwarves into the military, as babies make both poor shields and poor weapons.



Dwarves can form grudges against other dwarves, and having to talk to a dwarf they have a grudge against causes an unhappy thought.

Although there is little that you as a fortress manager can do to influence dwarf relationships, understanding them may help prevent fortress collapse due to tantrum spirals (sometimes also called an “emo death spiral”), the causes and effects of which are described in the next section.

Tantrum Spirals

One of the greatest risks to any established fortress comes not from outside, but from within—the tantrum spiral. Tantrum spirals usually start when one dwarf snaps and

starts a fight with another dwarf, either killing that dwarf or being killed in self-defense. The death of a popular dwarf (or worse, **two** popular dwarves) will result in a flood of unhappy thoughts through the heads of many fortress dwarves. Combine that with a bad day at the office and another dwarf or two (...or three) may throw tantrums. You can see where this is going. Pretty soon, half your fortress is throwing a tantrum, and the other half is cowering behind the tables trying not to get struck down by the crazed miner (grown legendarily strong and tough) with a steel pick in her hands.

The best way to prevent a tantrum spiral is to reduce the opportunity for unhappy thoughts to fill your dwarves' minds. Since we can't lace the alcohol supply with anti-depressants, we instead need to be clever fortress managers. Try and reduce these common causes of unhappy thoughts:

- Hunger and thirst
- Encountering miasma
- Sleeping in poor or no bedroom
- Dining in poor dining rooms
- Not enough tables and chairs in the dining room
- Accidentally murdering a friend while in a strange mood
- Encountering ghosts
- Seeing another dwarf die
- Sustaining injuries
- Having no clothes (dwarves are psychotically puritanical)

Happy thoughts are the antidote to unhappy thoughts, and many are created simply by removing the above causes or improving living conditions (for example, providing dwarves with a nice bedroom and putting up some statues in the communal dining room). Some other thoughts you can take advantage of include:

- Making soap so dwarves may enjoy nice baths
- Cascading water where dwarves congregate, in order to provide a happy thought from seeing a waterfall and mist.
- Ensuring that you have a functional hospital with medical staff free from other duties, so injured dwarves may be cared for.
- Placing, when possible, artifacts for your dwarves to admire.
- Cooking meals to increase the chance of happy thoughts from eating a favored food.

Unfortunately, once a tantrum spiral has begun, they are very hard to stop. Even with your best efforts, a tantrum spiral is quite likely to destroy your fortress or to leave the few survivors so overwhelmed that endless spirals become inevitable. If you have a vampire locked away (yes, there are vampire dwarves!), you are likely to get at least one

survivor to wait out the arrival of new migrants...but if not, relax and enjoy the ride! Remember, losing is fun!

Inventory

Every dwarf has an inventory that you can monitor. With a dwarf selected (press **v** and find a dwarf), press **g** for *General*, and then **i** for *Inventory*. The info panel will now show you what each dwarf is currently equipped with. Clothes, armor, weapons, and items being hauled are all visible, and scrolling through the list with the **plus** and **minus** will let you examine each item with a press of the **enter** key.

Don't be alarmed if you see dwarves wearing multiple layers of a similar type of clothing; by default, they will define their own style from available clothing stocks. Caps and hoods on heads are common, and in [Figure 6-4](#), it appears that mittens and gloves are required by this dwarf! The inventory view is useful when monitoring your military, to ensure that the troops have appropriately equipped themselves. Sending troops off to face goblins armed only with shields can lead to embarrassment!



Figure 6-4. Gloves and mittens seem to be required to haul pots of wine around

Dwarves will automatically equip themselves with clothes from your inventory and, this being Dwarf Fortress, every detail is modeled down to each sock, glove, shoe, and hood, and their relative states of wear and tear (which can be determined by selecting an item, pressing **enter**, and then **v** for *View*).

Although there is little reason to mess with the inventory of individual non-military dwarves, you may wish to recruit important dwarves into inactive military squads so that you can force them to wear protective clothing and armor. Any dwarf that has to range beyond the safety of the fortress is probably going to fare better in some leather and a little armor than silks.



Digging Deeper

With reliable food production established, it is time to look at expanding our fortress. The easiest way would be to simply dig further into the hillside, adding rooms and corridors as we go, but this isn't the most efficient way to build a fortress. Your fortress exists inside a 3D world, and it takes just as long for a dwarf to go up or down a level as it takes for a dwarf to move one step in any direction. We can use this fact to our advantage to make an efficient, productive, and manageable fortress. Besides, digging deeper is the *raison d'être* of being a dwarf, after all!

In this chapter, we will start to expand our fortress using features of the *Designate* and *Wall/Floor/Stairs* (Construction) menus. We will dig and build both below and above ground to secure and develop our site. In no time at all, fortifications, stairs, bridges, ramps, and vast subterranean halls will all fall within your masterful grip!

It is likely that you will be interrupted with various problems as you work through some of the material in this chapter. Perhaps your dwarves will inexplicably not start work you've ordered, perhaps traders will turn up, or perhaps a dwarf will be afflicted with a strange mood. Should you hit a stumbling block, you should skip ahead to a chapter and section that will help, and then continue working through this chapter when you are able. Mastering digging and construction is vital for the ongoing development and defense of your fortress.

Design Principles

Fortresses are commonly built around five or six functional areas. The entrance area encompasses outside farms, a trade depot, perhaps a defensive wall, and sometimes a barracks for your military. From there, descending underground, it is common to assign every level a separate function. For example, one level might just be bedrooms and a central dining room. Another, stockpiles; then workshops; and finally, a specialist layer of hospital, zoo, graveyard, and so on. To help you envision this, [Figure 7-1](#) shows a simple fortress layout sketched in 3D.

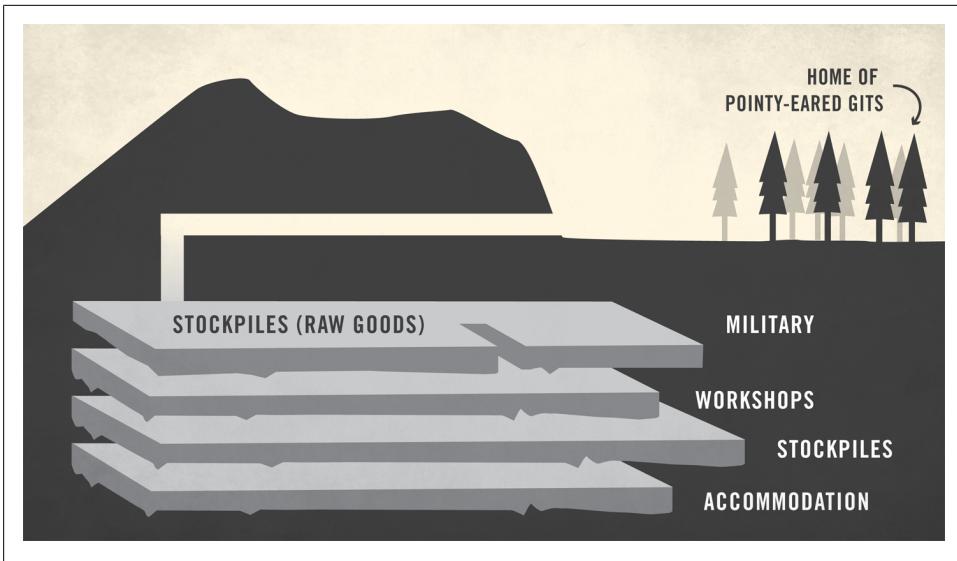


Figure 7-1. A sample fortress design

As we dig out and build these layers, it can be useful to leave a layer of unmolested rock between excavated areas. These untouched layers can be useful should we wish to plumb the fortress with water or magma. While keeping all these considerations in mind, we must also think about how to handle industry and stockpiles in our fortress. Ideally, every item a dwarf might need for a workshop order should be close at hand at all times, and every workshop output should have a handy destination stockpile. However, you will probably have to make compromises in the name of design simplicity.

Thinking about industry, it might not be unreasonable to sandwich a layer of workshops between two layers of stockpiles, where your industries are drawing from a stockpile above and outputs go to a stockpile below. You could then use these two central stockpile layers to feed other stockpiles throughout your fortress. For example, all raw food goods may go to the top stockpile, with all cooked food and brewed goods going to the bottom stockpile. From there, other food stockpiles could be set to *Take* from the bottom stockpile, distributing quality food and drink around the fortress to locations it may be required (to your dining hall and barracks, for example). The possibilities are truly endless, and half the fun in building a fortress is coming up with interesting and effective fortress designs.

Exactly how you configure your fortress is a matter of personal taste and is also likely to depend on the constraints of your site. In this chapter we will work at establishing a fortress designed along the above principles, but you are encouraged to try your own approaches once you are confident with the techniques outlined below.

Digging and Construction Fundamentals

Before we can start improving and adding to our fortress, we will need to master the *Designations* menu. Press **d** and examine the *Designations* menu options. In addition to mine, chop trees, and gather plants (which you should be quite familiar with by now), there are other menu options that you haven't encountered before. In particular, there are a number of stair options, the channel option you may have used to create an underground farm, the dig ramp option, and others we shall consider another time.

Like ramps, stairs offer another way of accessing levels above or below the one you're digging on. When you designate an area to be a stair, the raw rock is carved into a stair shape—be that a stair up to another level, down to a level below, or one that leads both up and down. Once a stair has been dug, let's say down, the material directly below the stair will become visible when you drop your view a level. You can now designate that revealed space to be a complimentary stair type, and in this way, begin excavating a new level. In order to access this new level, the stairs in the revealed space must connect to the stairs above, so if you dig a stair down, either an up stair or an up/down stair will be required on the level below.

The relationship between stairs, ramps, and the ground dug out can be a little confusing and it's easy to mess things up. For example, it is technically possible to build two down stairs one on top of each other, but if you do this your dwarves will not be able to reach the level of the bottom-most stair. In essence you've cut a hole in the floor, dug out the space below, and then cut another hole in the bottom floor, leaving a stairless, empty gap in the middle. Don't ask how dwarves achieve this feat; I believe it may involve rappelling using their beards.

Digging Explained

Perhaps the easiest way to understand the relationship between stairs, ramps, and different layers is with a simple diagram. In [Figure 7-2](#), the various digging designations are depicted from an imaginary side view. Before we examine the diagram closely, you should note that in the diagram, rock is divided into two zones: a digging space and a floor space. The digging space is what your dwarves dig out when they clear rooms or tunnels for you. The floor space is an area that sits between two different levels. Digging never disturbs this boundary, but stairs, ramps, and channeling do.

If you look at each type of stair and ramp designation in [Figure 7-2](#), you will see precisely how they each interact and what it takes to match a stair on one level with a stair on another level. We will review the digging options in detail in the following sections.

Up Stair

Up stairs are dug out of the digging space. They provide access to the floor area of the level above the current digging space. In order for a dwarf to use an up stair, the level

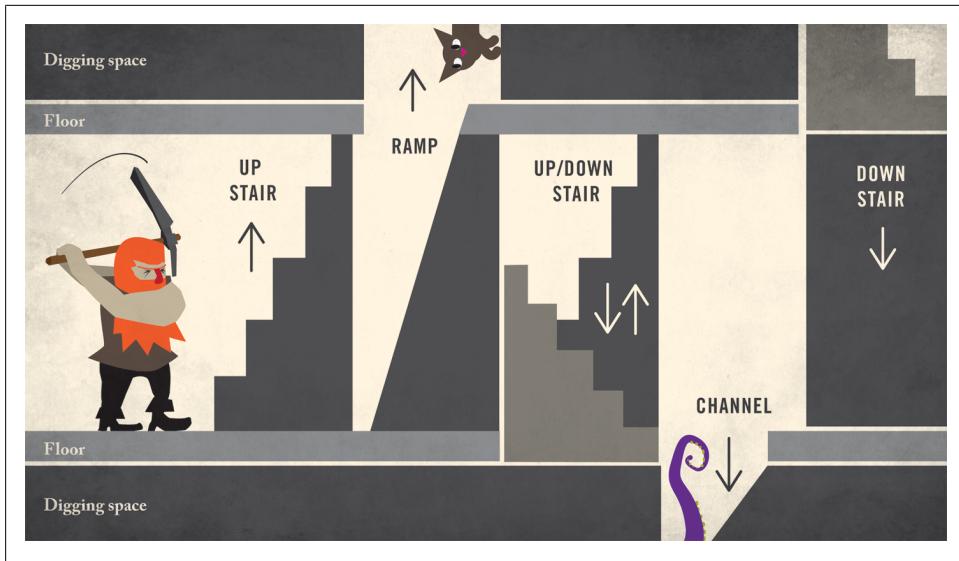


Figure 7-2. Digging designations, side view

above needs a designation or construction that crosses down into the floor space. A down stair or an up/down stair on the level above an up stair will do the trick.

Ramp

Ramps are dug from the level a miner is operating at. They provide access to the level above where the ramp was dug, and require no digging or construction on the higher level to be functional. When you designate a ramp on one level, the floor and digging space above the ramp is also cleared, allowing direct access to the surrounding upper tiles. Ramps must have solid terrain next to them in order to be functional. A designated ramp will vanish if all surrounding rock or dirt is dug away, and a constructed ramp without an adjacent wall or rock square will not allow your dwarves access to the higher level.

Up/Down Stair

An up/down stair creates an up stair at the level of the up/down stair's designation, and also cuts a down stair into the floor. This down stair can be met with an up stair on the level below, or indeed, another up/down stair, thus allowing long, multilevel staircases.

Channel

Dwarves channeling first dig out the current layer (if there is dirt or rock in the way), then cut a hole down through the floor, and then dig a ramp on the layer below. If the level below is already dug out, channeling will simply cut a hole in the floor and provide

vertical access between layers. Channeling on a tile with stairs will remove any stairs in the floor or digging space of the current layer. This will leave layers above and below the active one inaccessible from that level (unless new stairs are made using the construction menu options).



Channeling or digging ramps under trees can cause trees to cave in on your miners, causing death or injury. Be sure to cut down any trees before remodeling an area.

Down Stair

Down stairs connect with up stairs and up/down stairs to provide access to different layers. Down stairs can be designated from above, in which case any soil or rock in the way is cleared and stairs are dug in the floor to provide access to the layer below. Or, stairs can be designated from below, where an existing stair provides access to the higher level in which the down stair is designated.

You could not be faulted for being a little confused right now. Connecting stairs and ramps across levels can be difficult for new players. The best way to get over this is to jump in and do some digging...which we will do after we consider the construction menu!

Specify Multiple Levels

If you need to dig out multiple levels at once, you can easily start a designation on one floor, then drop or rise several floors and finish the designation. You could, for example, start an up/down stair on one level through **d-i**, then press **enter**, and then drop ten floors before pressing **enter** again. This will designate ten levels of up/down stairs to be dug, and your dwarves will then go ahead and complete the order.

You can also specify multiple floors of digging to be done in the same manner. This is great if you need to repeat a pattern of, say, workshop or stockpile floors across multiple levels. Once several floors are designated, you can simply return to the first and then connect each up by specifying staircases as you see fit.

Damp and Warm Stone

While digging, you may get a warning about damp or warm stone being detected. When this happens, the game will pause and the view will zoom to the digging location. These warnings indicate that water or magma is nearby—and as a result, the digging you have specified has been cancelled by the dwarves.

These warnings indicate that dangerous terrain is either above, below, or adjacent to the tile a digging job has just been cancelled on. Although you can redesignate the terrain and the dwarf will ignore the warning the second time, doing so is extremely dangerous if you don't know what is causing the warning. If you dig into a river or a magma tube, you will almost certainly flood (or cook) some or all of your fortress.

If you are unsure where the potential threat lies, it makes sense to back off a few tiles and to dig staircases up a couple of levels before trying to dig into approximately the same area as where the warning was on the layer below. Eventually you hope to come out on top of the threat and then, using channels or stairs, you can dig down and uncover the problem. Digging down into magma or water will not harm your dwarves (they usually won't fall into any discovered magma or water) and will provide visibility of the water or magma source across all levels, making further digging much safer.

Be very careful about digging up into water or magma. The dwarves will not be so kind as to cancel a staircase dig order, and flooding your fortress by digging into an aquifer or a magma pool will probably result in a great deal of fun.

Beware of Cave-Ins!

If you manage to dig a block of ground free from contact with ground on any of its sides (excluding any diagonal contact, which does not count), the unsupported block will drop, causing a cave-in. Cave-ins are highly likely to damage or kill any miner caught near them. Even miners above the cave-in, if they are close enough, will be sucked into the pit. Cave-ins also generate clouds of dust that will knock your dwarves unconscious and possibly push them around.

Cave-ins are common when digging out pits using multiple levels of dig ramp orders. The simplest way to avoid a cave-in is to channel or dig ramps on only one level at a time and not do any more designation until that level is cleared.

Smoothing and Engraving

Stone walls and floors can be designated for smoothing using **d-s** for *Smooth Stone*. Smoothed stone is inherently of higher value than unsmooth stone and helps contribute to a dwarf's happy thoughts by making their room and the dining room even more impressive. Smooth stone also looks nice.

Once stone has been smoothed, it can be engraved using **d-e** for *Engrave Stone*. Engraved stone walls and floors have pictures carved into them that you can view by pressing **k** and then ***enter** with the engraved object selected. Engraved walls and floors make a room even more valuable and again, this can contribute to happy thoughts in your dwarves. It can also be quite fun to see just what your dwarves will carve into their living space. Not only will you get pictures carved depicting the history of your world, but also the history of your fort. If you have had a streak of damaging goblin attacks, expect to see a lot of pictures of dwarves cringing and goblins laughing. I have no idea why dwarves wish to immortalize these tragedies!



Constructed walls and floors can not be engraved, but do count as smoothed for the purposes of adding value to a room.

Smoothing and engraving is undertaken by any dwarf with the *Stone Detailing* labor enabled. If you are smoothing a large section of your fortress (all your bedrooms, for example) then enabling the labor on a lot of dwarves makes sense, as smooth walls do not benefit from dwarf skill in stone detailing. If, however, you wish to engrave surfaces, you should only enable the labor on your best engravers. This will ensure that the engravings are of the highest quality and add the most value to your rooms.

If you get tired of looking at the engraved symbols and prefer the cleaner lines of smoothed walls, you can disable the display of engravings by pressing **d** and then **v** for *Toggle Engravings*.

Carving Fortifications

Smooth stone can also be carved into fortifications with **d-a**. Fortifications are walls with holes in them that allow your dwarves to shoot out—and potentially, others to shoot in! Marksdwarves that are behind fortifications have an unrestricted ability to shoot at enemies they can see, but enemies can usually only shoot at the dwarves if the enemy is directly adjacent to the fortification. For this reason, it is common to construct fortifications one level above ground level, or to simply dig a ditch in front of fortifications to prevent the enemy using the fortifications against the defender.

Fortifications, unlike walls, do not block liquids or gases, but they will block most creatures. Fortress Managers are advised to use a fortification between any source of water and an internal water supply. No need for any nasty swimming creatures to sneak into your fortress through the sewers! Believe me, getting the undead out of your waterworks can be a real pain in the neck; use fortifications as filters to keep the zombies out!

Constructions Explained

The construction menu (**b-c**) contains a list of options for the creation of artificial stairs, ramps, walls, and fortifications. Think of items in the construction menu as you think of the walls, stairs, and buildings around you—they are made of various materials and stand free of their surroundings. That is, they are not dug out of soil or rock. Items in the construction menu let you build castles, towers, defensive works, or simply walls around your fortress entrance. The construction menu items can also help you fix digging problems; for example, if you've dug out a space where you had hoped to designate an up/down stair, you can instead simply construct an up/down stair and have it function in precisely the same manner as a dug stair.

Constructions can be built out of a range of materials. Stone and wood are likely to be your most common material choices, but constructions can also be made of metal, glass, clay, and even soap! The material selected determines the labor required in the building of the construction—wooden constructions require carpentry; stone, glass, clay, and soap require masonry; and metal requires metalsmithing labor.

In [Figure 7-3](#), the construction options are outlined, along with their influence on each other. Construction can be confusing, so don't worry if you don't fully understand this section on your first pass. Practice will make all things clear in time. It took me a couple of fortresses before I felt truly confident creating free-standing constructions. Let's re-view these options now.

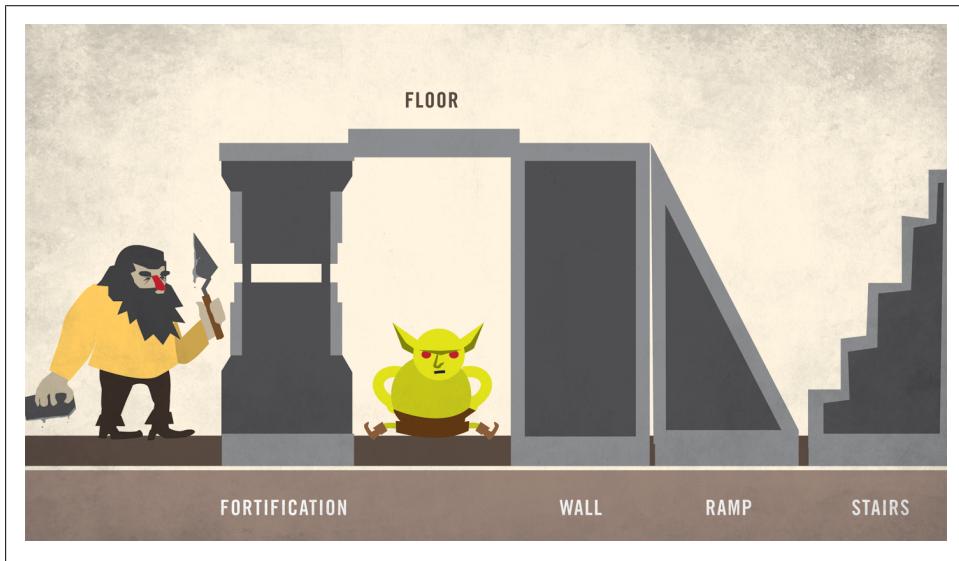


Figure 7-3. Constructions, side view

Wall

The building of walls can be particularly confusing to new players. It seems like an easy task; the construction menu is brought up, a wall selected, the length or width specified with the **u**, **m**, **k**, and **h** keys, and the wall placed. However, the happy player is soon sent into a rage when trying to build upwards and wishes to place walls on top of other constructions. Then, for reasons unknown, Dwarf Fortress sometimes refuses to cooperate and the player is left perpetually unable to build the enormous inverted obsidian pyramid of their dreams.

The non-obvious issue with constructed walls is that they seem, for want of a better phrase, to exert some influence over the surface they rest on. I'm sure it has something to do with whether or not a cat is alive. The basic rule is that a constructed wall can never be placed on top of a constructed floor. Walls can be placed on top of other walls or fortifications, and all constructions can be built over open air so long as they are directly (not diagonally) adjacent to another construction, but build a wall on top of a floor? Never!



Dwarves won't build the corner sections of a wall? Remove an adjacent wall section, place a floor tile if needed, then, when the corner is built, remove the floor and rebuild the missing wall section.

Although it is possible to build a floor on top of a wall, there is really no need, as dwarves are perfectly happy to walk on top of a wall and to treat them as a floor surface. Thus, it could be argued that walls come with their own floors on top of them, although the fact that a floor can then be built on top of the wall would seemingly contradict this statement. I bet it's those damn cats again.

Floor

Constructed floors, along with walls, are the bread and butter of any fortress manager who wishes to commit the dwarven heresy of building up towards the hot yellow thing in the sky. Floors can be placed in large areas of up to 10×10 squares so long as the dwarves can reach the level the floor is destined to be built on. If you are trying to cover a level with a ceiling, so to speak, you will need to construct stairs or a ramp to reach the higher level before the floor can be laid. If building a floor to make a ceiling seems confusing, remember that this is precisely how roofs and ceilings are built in real life.

Fortifications

Constructed fortifications work identically to carved fortifications, but they can be placed anywhere. Fortifications placed on top of walls make great raised defensive positions for your troops.

Fortifications, like walls, have a strange and unnatural relationship with the floors above and below them. Fortifications can only be built on solid ground, or on top of other fortifications and walls.

Ramps

Constructed ramps operate in much the same way as walls and fortifications, and can only be built over other non-floor constructed tiles. Ramps, however, do not interact with the floor space above them, which results in a peculiar problem: a ramp needs to be placed adjacent to a wall, fortification, or stair so that the top of the ramp can connect to something (namely, the magic quantum top of the wall element). Without this connectivity, you will see the ramp constructed just fine, but when you **k** (*Look*) at it, it will be named an *Unusable Ramp*.

More confusingly, even if the ramp does have an adjacent wall, if the top of that wall or fortification cannot be walked upon (another wall has been built on top of it, for example), the ramp will again be unusable. If this problem occurs, Dwarf Fortress will not inform you that the ramp is unusable—you will just notice stuck dwarves starving to death next to what looks to be a perfectly usable constructed ramp. For this reason,

it is probably best to stick to using constructed stairs instead of constructed ramps until you are quite confident in your building capabilities.

Stairs

Constructed stairs are almost identical to their designated cousins. Down stairs connect to up stairs and vice versa. Constructed down stairs can even be built right into existing, un-dug terrain (although this seems like a waste of resources when you could simply designate a down stair to be dug out of rock instead).

As with all other constructions, stairs can not be built on floors, but are happy to be built on top of walls, fortifications, or over open spaces. If you have floored an area and suddenly decide you need a stair going up or down, simply use **d-n** for *Remove Construction*, specify a tile, and then build your new stair in the open space.

Construction Tips

Construction is fraught with pitfalls (literal and figurative) for the unwary. Some tips are outlined below to help you get past the initial learning cliff and into the world of constructed mega-projects!

Interruptions

Any interruption to building (for example, sending all your dwarves to a “Panic Room” burrow or dwarves being interrupted by badgers) will inevitably result in large chunks of your construction being suspended. Pressing **q** and checking the planned construction tiles will indicate which are suspended or not. Pressing **s** will unsuspend any construction that has been placed on hold.

Unmovable Rock

When you tie up rock in planned construction, it becomes unmovable. Essentially, the rock has been “booked” to be used in construction and no dwarf other than the one due to build with it is allowed to move it. This can cause havoc when you are simultaneously trying to build walls and floors and place workshops, doors, or other pieces of furniture. If you try to place anything on a square containing a “booked” stone, the place order will be suspended, as the dwarves will be unable to move the rock to make space. You can resolve this problem by either cancelling vast construction orders and limiting how much you order built at once, or simply waiting for the rock to be used and then unsuspend the build order.

Hatch Covers

If you are concerned about sealing off a layer through the construction of walls and floors, then the fact that anything can move up and down the stairs may bother you. The last thing anyone needs is a Giant Lovefaced Birdman climbing down from the

roof and scaring all your dwarves! Thankfully, a solution is at hand: hatch covers. Hatch covers are made in a Mason's Workshop (although metal, wood, and glass covers are also possible and are made at their respective workshops), and can be placed over any tile to act like a vertical door. Hatch covers can be placed on any stair tile, over ramps, and over open holes. Hatch covers, like doors, can be locked and once installed, will prevent unfriendly creatures from moving between layers. Hatch covers can also be linked to levers or pressure plates, making them ideal for traps that involve dumping large amounts of magma or water on foes.

Last Is First

When you order construction jobs, you should remember that the last item ordered will go to the top of the job list, meaning that your dwarves will try and complete the most recent order first. This is yet another reason to be careful about ordering too many large construction jobs all at once.

Urist McMason Is Stuck!

Having a dwarf stuck on the wrong side of a wall they've built or a floodgate they have installed is extremely annoying and quite common. Usually you will not get an alert that the dwarf is stuck until they have died of dehydration and gone missing.

If a dwarf does get stuck, order the construction removed (**d-n**) or the building deconstructed (**q** over the object, then press **x**). You can prevent entrapment by placing your construction or build order, and then ordering the construction of a wall on the side you don't want your dwarves to stand. Quickly suspend the blocking construction so that it doesn't get built and then wait. Dwarves don't like to stand where construction is due to take place, and so will avoid standing on the suspended squares when they undertake their build orders. Once the desired wall or object is built, simply **q** over the suspended wall and press **x** to cancel the construction order.

Cave-Ins

Cave-ins can be caused by the removal of constructions. When you remove constructions, be very careful that further constructions or natural rock and soil do not hang off the tile, or you will cause a cave-in.

Get Your Pick Dirty

Now that we've covered the basics of digging and constructing, it is time to start expanding your fortress down into the earth. Use **d-j** for *Downward Stairway* and designate a block of stairs 2x2 squares in the rock at the end of the corridor leading from your entranceway. Your miners will now dig out four downward stairways. Drop a level, use **d-i** for *Up/Down Stairway*, and designate the same shape below your down

stairs. Before you press **enter** for the second time, drop ten levels. This will result in ten levels of up/down stairs being designated for your miners to dig.

Once the stairs have been dug, excavate a large space (approximately 30×30 squares should suffice) surrounding the stairs **two levels** below your entrance level. Repeat this on the next level down once the first is done. You now have a big storage space and a big space for workshops. In due course, you will want to remove workshops and piles from the top floor and build new ones down below where they can be more easily defended and readily accessed by your dwarves. The rooms on the top floor can, in due course, be used as barracks or archery training rooms. But, before you do any remodeling it would be wise to start creating a bedroom level to get your dwarves out of their cramped temporary quarters.



As with corridors, several stairs help alleviate congestion. Always use multiple stairs for any important thoroughfare.

Bedroom Design

To keep your dwarves as happy as possible, they each need individual living quarters, somewhere communal to eat, and perhaps a few places to entertain themselves. These features can be built on a single floor (or spread over two or three, as you see fit). For starters, let's look at building bedrooms. In Dwarf Fortress, bedrooms are a space defined from the **q** (*Set Building Tasks/Prefs*) option when a bed is highlighted. Dwarven bedrooms can be anything from a shared bed in a dormitory hall through a lavishly decorated series of rooms of the sort required to keep your nobles happy.

Fortunately, the majority of your dwarves will be quite happy with a simple bed in a tiny room. You can make a room as small as one square leading off from a corridor, but rooms of three or four squares are going to be more satisfying for your dwarves. In [Figure 7-4](#), a variety of rooms have been dug out for our dwarves. Some are quite small; others, larger. Most rooms feature a bed and a door. Lavish! There is also a suite for the expedition leader that is made up of four rooms: a bedroom, dining room, office, and a private tomb. We want the leader happy so they are able to work productively on important fortress tasks like bookwork and soothing angry dwarves.

To the left and right of the bedroom block, there are blocks of stairs leading up and down to various workshop and storage levels. Next, there is a communal dining room on the right and a communal sculpture garden to the left (which is decorated with coffins and statues) where dwarves can relax. This simple layout provides approximately thirty bedrooms (depending on how generous you are with space) and offers easy access to the rest of the fortress. It would be simple to repeat this pattern on more floors in order to rapidly expand the available living quarters for our dwarves.

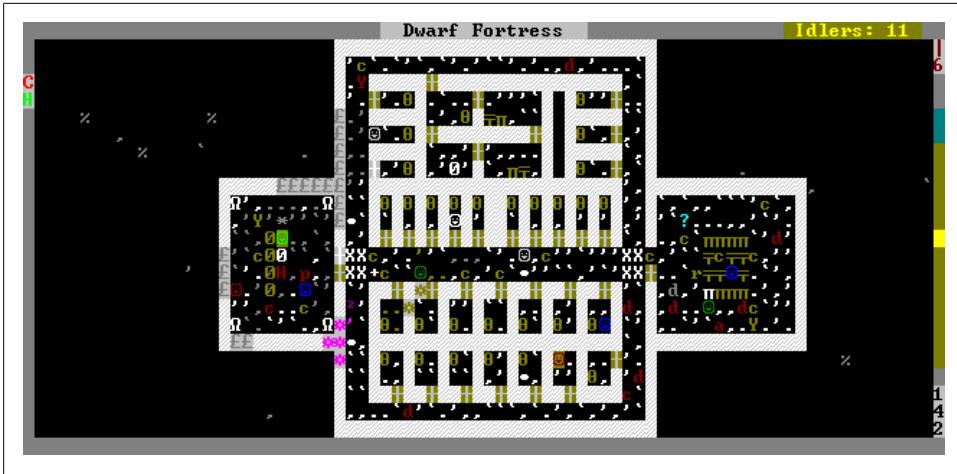


Figure 7-4. Bedrooms, sculpture garden, and dining room

Efficient bedroom design is something of an obsession for some Dwarf Fortress players. It is not uncommon to see players comparing fractal-based room layouts, highly efficient vertical stacks of “hive” bedrooms (my personal favorite), and players advocating simply placing hundreds of beds in a giant room and providing open plan living for all but noble dwarves. Designing fortress layouts is strangely addictive and is also a great way to use up all that graph paper left over from the Dungeons and Dragons campaigns of your misspent youth (Figure 7-5).



Third-party utilities QuickFort and ChromaFort allow you to replicate fortress designs across games by using pre-configured design templates.

Creating Rooms

As you may recall from earlier chapters, rooms aren’t created until we specify them using the **q** (*Set Building Tasks/Prefs*) option. In the case of building bedrooms, this means we have to place the beds and doors, then press **q** and move the highlight near a bed. The bed will flash and the option *Make Bedroom* will be available in the right info panel. Pressing **r** to create the bedroom will then show a flashing blue highlight box constrained by the walls and door. Pressing **enter** will create the bedroom (or we can adjust the size of the room using the **plus** and **minus** keys).

For general-purpose bedrooms, we don’t need to specify an owner; a dwarf in need of a room will come along and claim the bedroom in due course and use it to sleep in as required. If you are creating a lavish room for a noble, pressing **a** for *Assign Bed* once the bedroom has been created will let you select the bedroom owner from a list of

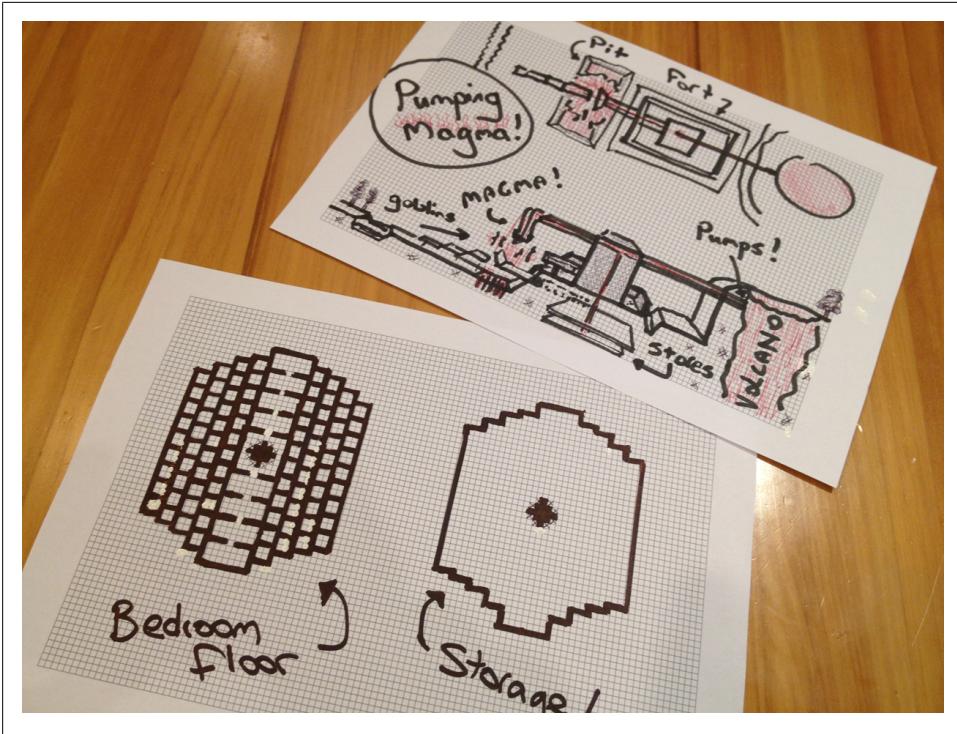


Figure 7-5. Dwarf Fortress: a great excuse to break out the graph paper!

dwarves and prevent the riff-raff from claiming the quarters. Nobles in need of rooms are usually at the top of the Assign list.

We create other rooms in a similar fashion. The communal dining room in [Figure 7-4](#) was created by using **q**, then **r** for *Make Dining Room* over a single table from any of the tables in the room. So long as the other tables and chairs in the room fall under the blue highlight (which can be resized), all will be considered part of the room and used by the dwarves. When creating a communal dining room, it is important to press **h** to toggle *Meeting Hall* to (Y) so that the room is used by all your dwarves and isn't claimed by the first dwarf to use it.

The sculpture garden is created in much the same way, but instead of basing the room off a table or bed, it was based off of one of the statues in the corner of the room. Sculpture gardens act like meeting halls, attracting off-work dwarves to socialize, and producing happy thoughts in the occupants' minds. A list of rooms and their seed furniture items are listed in [Table 7-1](#).

Table 7-1. Rooms

Room	Generated from	Use
Barracks	Bed, Armor Stand, Weapon Rack, Chest, or Cabinet	Space for soldiers to sleep, train, and store weapons.
Bedroom	Bed	Accommodation for a single dwarf, or a dwarf and their partner.
Dining Room	Table	A place for a dwarf to eat.
Dormitory	Bed (as an option)	Multiple-bed bedroom for citizens without a room.
Jail	Restraints (metal chain or cloth rope)	A room used in the dwarven justice system.
Meeting Hall	Table (as an option) or well	Communal socializing area. If there are tables and chairs, dwarves will eat here.
Memorial Hall	Memorials	Generates happy thoughts.
Sculpture Garden	Statue	Generates happy thoughts.

You do not need to worry about creating every single one of these rooms early on. Bedrooms and a communal dining room/meeting hall will suffice until you want to build an army, or need a justice facility to appease nobles. Sculpture gardens and memorial halls are entirely optional, but may serve as a good location to display artifact furniture that your dwarves create, and can help to keep the central dining room from becoming congested by bored off-duty dwarves and their pets. Furthermore, a variety of socialization spaces help spread dwarves out, which can reduce the chance that the vicious, fortress-destroying malady called “friendship” will rear its ugly head in the future.

The Depths

As you dig down, you will start to uncover seams of ore and gems. Digging these out will provide wonderful industrial supplies to your fortress. But before you race off and send a dozen miners into the dark, consider building some kind of airlock between the industrial and residential areas of your fortress and your mining operation. A bridge and doors between the mining access tunnels and your industrial floors will provide some peace of mind should you discover anything untoward in your explorations.

Eventually, as you dig down, you will discover caverns. You can immediately block any access off with a floor, wall, hatch, or door, or send in your military to explore the place. Caverns are often quite large—spanning multiple levels and sprawling across the map. It isn’t uncommon to find pools of water or even magma, along with creatures, plant life, and giant mushrooms that can be harvested for wood. Exploiting caverns presents an interesting challenge, but beware the beasts that may wander into your caverns as your fortress wealth grows.

Get Building!

Now that you have a handle on excavating and constructing an underground home, let's get to work and improve the fortress entrance area. In this section we're going to dig a ditch around our fortress entrance, and then put up a fortification behind which our dwarves will be protected from invading goblins. First, let's dig the ditch. As you know, digging channels is an easy way to excavate a hole or pit—digging some channels and then removing the ramps at the bottom of the hole (leaving just the hole) is how we'll build an impassable ditch.

Ditches and Walls

For a change, we are going to use *Channel* to dig the ditch around our fortress entrance, outside farms and pasture. You will need to ensure that this ditch continues on any levels above your fortress, or enemies will simply walk up to the next level and then descend into your entrance area from behind. We will also need to leave space for a gatehouse, and in due course, we will build walls and fortifications that will provide military dwarves with places to stand and shoot at any invading goblins.

Start designating double-width channels, using **d-h**, across the front of your fortress entrance, enclosing any outdoor farms and structures. If you have carelessly built fortress rooms directly below the surface (farms, for example) be *extremely careful* not to channel down into those rooms, or your defensive ditch will not really work as intended! Before you let your dwarves dig your designated channels, drop a level and ensure that the ditch will not cross into any useful rooms. If your channel designation is improperly placed, use **d-x** for *Remove Designation* to clear the channel order and then adjust as necessary.

If your fortress entrance was dug straight into a cliff, you should remove ramps that lead down to your fortress entrance level, so as to prevent enemies from simply walking up a hill, around your wall, and then down into your fortress. Using **d** and **z**, you should also remove all ramps that could lead to a bad guy coming in to the zone you wish to secure.

If you have sprawled over a large area, then digging ditches around all your holdings is going to take quite a while. Consider initially enclosing only a small area, accepting the potential loss of farmland or livestock in the event of a siege, and plan on enclosing a larger area in the future.

Once your ditch is dug, you will notice it is (unfortunately) entirely comprised of ramps, which will present little barrier to any invaders capable of walking up and down a hill (that's all of them, by the way, and let's worry about the flying ones some other time). Before we remove the ramps, let's build a drawbridge across the ditch so our dwarves won't be trapped on either side once the ramps are cleared.

To build a bridge, press **b-g** for *Bridge*. Your cursor will go green and be ready for placement. Don't hit **enter** just yet, as we need to set the size of the bridge and the direction it will retract to. Press **k** twice and then **u** twice to set the bridge to be 3×3 squares. Place it somewhere close to your entrance with a one square overlap placed on the inside of the ditch. Once you are ready to place, press one of **w**, **a**, **s**, **d**, or **x** to set the direction the drawbridge will retract to. You want it to rise toward your entrance, so it forms a wall behind which your dwarves can cover—just like in a real-world castle.

As you cycle through the raise directions, you will see an arrow at the top of the info panel change and the color of the bridge footprint change. The colors indicate whether the bridge is placeable or not. If an edge of the bridge does not rest on solid land, then the bridge can not be set to raise in that direction. Once you are happy with the bridge settings, press **enter** and select materials to build the bridge out of (stone is preferred). In due course, the bridge will be built and we will almost be ready to hide from invaders!

Once the drawbridge has been built, it's time to remove the ramps. Drop a level and using **d-z** for *Remove Up Stairs/Ramps*, mark all but one ramp for removal. The one you leave should be on the interior of your double-width ditch so only your defenders can access your pit if required. In [Figure 7-6](#), you can see a fortress entrance (the ramps in the middle of the screenshot), outside farms, and a refuse stockpile surrounded by a ditch. The drawbridge has been placed, allowing our dwarves access to the surrounding terrain. Note the single ramp on the top ditch, which provided our dwarves with an escape route from their ramp-clearing activities (and provides further secure access to the ditch should we require it).



Watch how your dwarves enter and exit your fortress as they go about their tasks to ensure that they haven't discovered an unplanned hole in your defensive perimeter.

A ditch is enough to prevent invaders reaching our entrance (so long as we raise the drawbridge; more on that later), but a ditch won't stop their missile weapons from turning our dwarves into bearded swiss cheese—for that, we need to build a wall. The *Wall/Floor/Stairs* menu offers two types of suitable constructions: walls and fortifications. As discussed, walls prevent anything moving through them, while fortifications allow bolts and arrows through if the firer is adjacent to the fortification or the firer is very highly skilled. Thus, if we build a fortification along the inside of the ditch, we will allow dwarves to shoot out (once we have a crossbow-wielding military) and the ditch will keep enemies away from our fortification, preventing all but the most skilled invaders from getting a shot back at our defenders.

To get started on our fortification, press **b-C** to bring up the construction menu. Either scroll or press **F** to select *Fortification*. Once you've pressed **enter**, you will be presented with the placement marker, which will turn green in valid placement locations. You can use the keys suggested at the bottom right of the screen to adjust the height or width

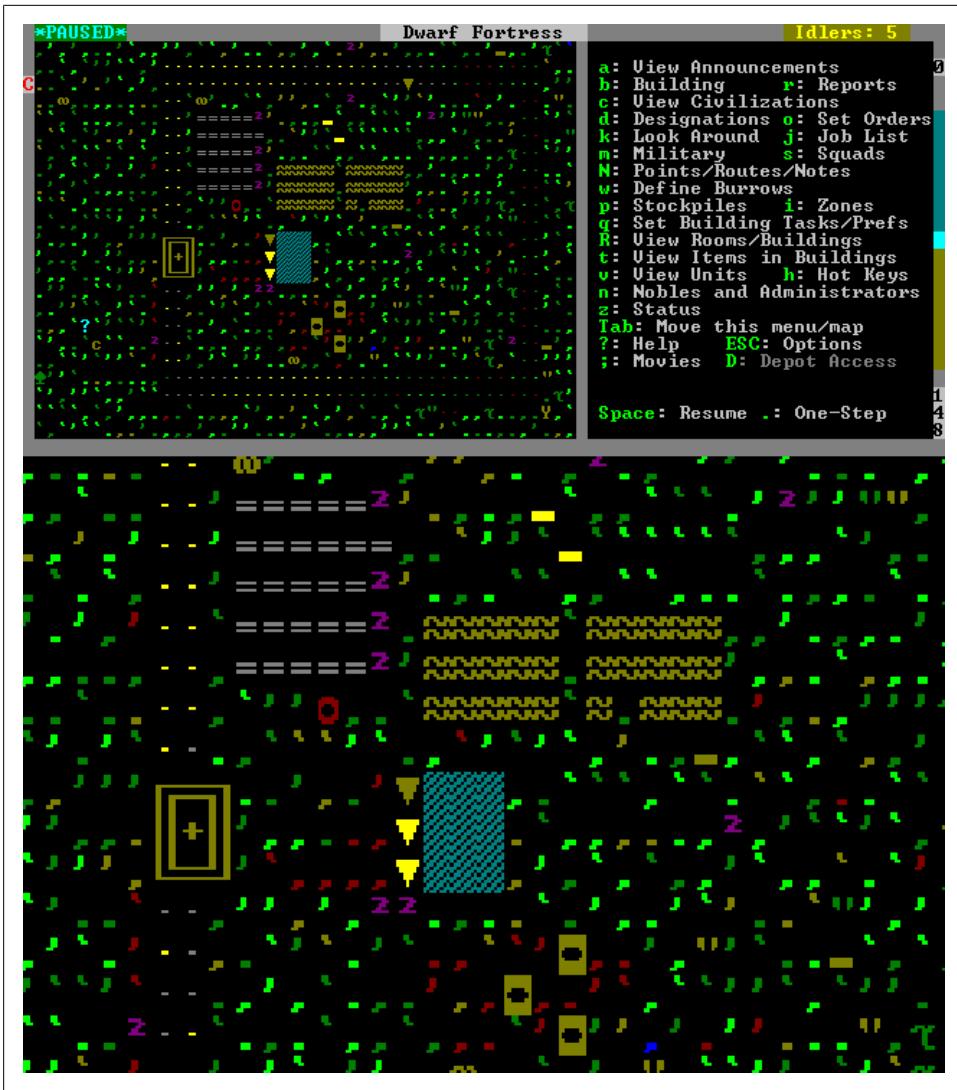


Figure 7-6. Fortress entrance surrounded by ditch and bridge

of your fortification, and then place it behind your ditch line. Your fortification only needs to be one square thick and any handy materials will suit for its construction. Remember to leave a gap three squares wide where the drawbridge is placed, so that traders and dwarves can make it in and out of your fortress.

If your fortification stops against a cliff face, you should remember that fortifications and walls can also act as floors. Go up one level and check whether the wall has created a new floor surface for anyone on that level to have a nice walk along. If this is the case, you will need to block off the top of your wall with another wall section. Place a wall

tile on top of your wall at the point where it comes close to your cliff to stop any invader going for a stroll. Remember the issues that can arise with dwarves getting trapped on the wrong side of constructions, and use the suspend construction tip to place a barrier guiding your dwarves to the side they should stand on to build the wall.



All creatures can walk diagonally between squares. This can make a mockery of your seemingly impassable walls. If in doubt, build more walls!

If you feel like increasing your mastery of the construction features, why not try building an up stair next to a fortification and then, from a level up, a connecting down stair? You will now have access to the level above your fortification and can create a secure shooting platform by stacking more fortifications on top of the ones below, with a length of floors behind the new fortifications (construct the floor first, by the way).

If you're worried about flying creatures, you could simply floor over your entire entrance from your access stair and seal yourself into your bunker with a floor hatch. Coming to grips with constructing structures can provide a lot of design flexibility and the chance to experiment with aboveground as well as underground fortresses. When you're not battling off goblins, kobolds, or badgers, take the time to experiment with constructed walls, floors, and stairs.

Once you've completed your defenses, it's time to wire the bridge up to a lever so you can raise it should enemies approach. By now, you should have a Mechanics Workshop built somewhere, and maybe a few mechanisms constructed out of rock ready for us to use in some dwarven machinery!

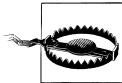
Basic Dwarven Engineering

We will look at dwarven engineering in more detail in later sections (it is a complex and involved topic), but for now, let's build a lever and connect it to our drawbridge so that a dwarf can raise the bridge and seal off the fortress during times of invasion. Levers are core to dwarven engineering and can be connected to many placed items, including doors, hatches, floodgates, bridges, grates, spikes, restraints, supports, gear assemblies, or cages. Levers provide ready access to amusingly complex traps and defensive machinery, as varied as your imagination. Throw in a few pressure plates, which can trigger other objects automatically, and the possibilities are endless!

Before we get carried away building complex magma death computers (this is no exaggeration; they do exist), let's build a lever and connect it to our drawbridge. Press **b-T** for *Traps/Levers* and select *Lever* using **1**. Place the lever wherever a lot of dwarves congregate, perhaps along the wall of your dining room. Place the lever, selecting one of the mechanisms you've constructed, and wait for it to be built. Once it is complete, press **q** and move the cursor to the lever. Select **a** for *Add new task* and then **b** for *Link up a Bridge*. Your view should immediately switch to your bridge, which will be

highlighted with a yellow **X**. Press **enter**. If you had multiple bridges, you can cycle through them with **plus** and **minus**. When selecting items to link, the newest are always at the bottom of the list. You will now be prompted to select the mechanisms you will use to build the bridge. The first choice is the mechanism to be used at the bridge; the second, for the mechanism to be installed at the lever. This is always the case no matter what you connect a lever or pressure plate to.

Once the mechanisms are selected, the lever will now list a new task generated by our choices: *Link a Building to Trigger*. In due course you will see the task cleared from the job queue, as it is completed, and you can now test your drawbridge! Using **a**, select *Pull the Lever* using **P**. Because we built the lever in a busy location, there should be a dwarf nearby able to quickly see to this task. Check the drawbridge and watch it flip to the raised position, and with that, your fortress is sealed off! Well, hopefully. In the raised position, the drawbridge should be flush with the wall. Lowering the bridge is as simple as issuing the pull command at the lever again and waiting for a dwarf to comply.



Anything on a bridge when it is raised may be thrown some distance. This can have hilarious and tragic consequences.

Having mastered the basics of digging, construction, and engineering, why not turn that ditch into a moat? In [Figure 7-7](#), a channel from the defensive works to a nearby stream has brought water to the ditch. The result is an attractive water feature around the fortress entrance. Tasteful landscaping goes a long way towards helping restore a sense of balance when the body parts of an invading goblin army are strewn in a bloody mess about the place.

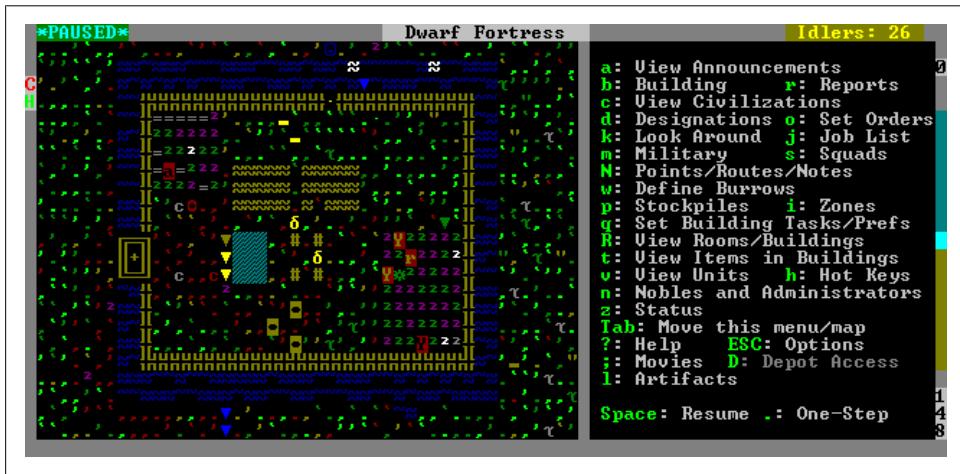


Figure 7-7. Fortifications, bridge, and moat

Bucket Irrigation

If you're ever in the position of not being able to find any soil on your map or you have committed to a particularly hostile embark, then you may need to irrigate a rocky surface by hand. With buckets and a water source, this can be achieved relatively painlessly.

The first task is to designate a zone as a water source from which our dwarves can fill their buckets. Find the closest pond or river, and press **i** to bring up the *Zones* menu. There are some options—in particular, **e**, which will switch between *Rectangle* and *Flow*. Make sure it is set to *Rectangle*. Place your cursor **next** to the water, press **enter**, move the cursor a square or two along the **edge** of the water, and then press **enter** again. You are telling your dwarves that if they stand on the zone you've created, they will be able to gather water from an adjacent square. You only need a few squares to get your point across, like the example in [Figure 7-8](#). Once you have created the zone, the *Activity Zone* menu appears and you can press **w** to set the zone as a *Water Source*.

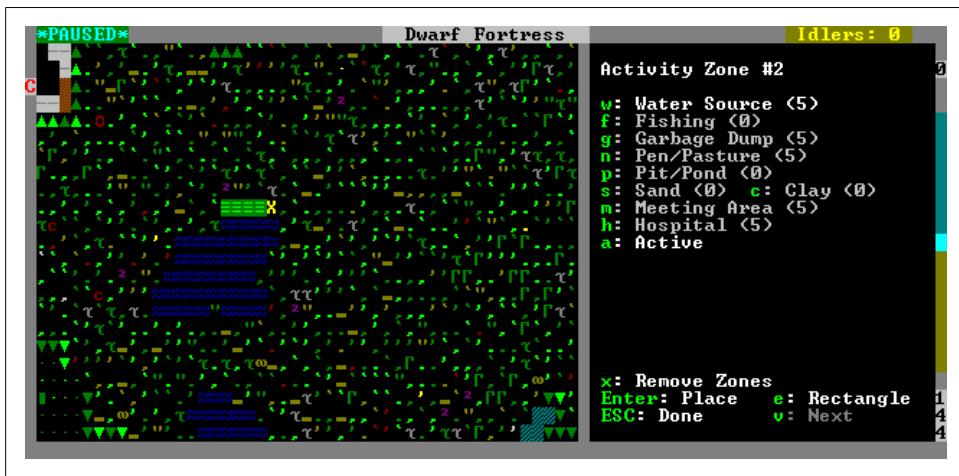


Figure 7-8. Water source zone

The next step is a little tricky. If you don't have a large spare room, dig one out (it should be about 20×20 squares). Once the room is dug, find the far corner and press **d-h** for *Channel*. Specify an area of about 6×6 squares. In [Figure 7-9](#), you can see the starting point of our exercise.

At this point, you are probably wondering, “why channel?” Well, in order to irrigate using buckets, we are going to use the *Fill Pit/Pond* feature, and this requires a pit into which water can be emptied. If you unpauses the game and watch, you will see your miners go to work digging out the area, and pretty soon you will have a large hole! How impressive! The ramps will allow easy access to the bottom of the pit, and we can now work on making the bottom of the hole a muddy surface we can farm on. You want to

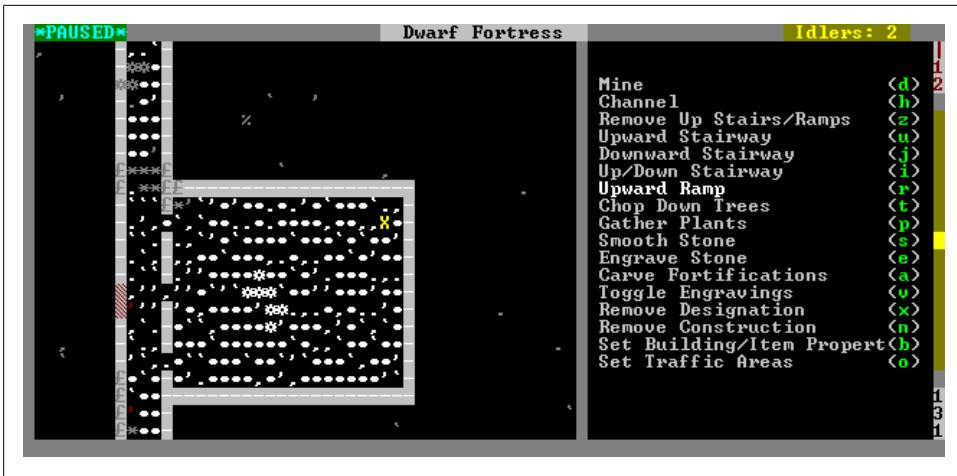
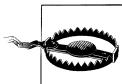


Figure 7-9. Large room, cursor ready

maximize the area available for farming, so remove all but one or two ramps by dropping to the level we placed ramps in, using **d-z** for *Remove Up Stairs/Ramps*, and then marking stray ramps for removal.

Next, press **i** to bring up the *Zones* menu and place eight separate one-square zones *over* the edge of your pit (above the empty space, around the edge of the hole). With the *Zones* select cursor still active, set each zone to **p** (for *Pit/Pond*). You then need to press **P** to set the *Parameters* for our ponds. You will note that in the subsequent menu, the **f** option at the bottom of the screen is set to *Is Pit*. Press **f** to switch the zone to a *Pond*. Once you have done this for each zone, you're almost ready!

The final task is to make some buckets so our dwarves can carry the water to our makeshift pond. Head to the Carpenter's Workshop and **a** (*Add*) five **e** (*Make wooden bucket*) orders to the task list. As the buckets are produced and stored, spare dwarves should pick them up and use them to collect water and dump it into the areas specified as pond zones. With multiple pond zones, multiple dwarves will undertake the pond-filling task. If we only had a single pond zone, only a single dwarf would undertake the task and it would take a very long time.



If you get the error message *dwarf cancels fill pond, inappropriate building*, then you have placed your pond zones on the floor around the edge of the pit and not over the edge of your pit over open space.

In Dwarf Fortress, water flows according to a physics model so that it will spread across the floor of our pit. We want there to be a single layer of water across the entire area, and to cancel the pond zones before we start to turn the pit into a real pond. Carefully watch the pond filling process and regularly drop a level to see how far the blue patches have spread. And be careful: rocks on your pond floor will mask the visual appearance

of water (consider dumping them). You can use **k** (*Look Around*) to spot the mud and water to see how far it has spread. Once the pond floor is covered with water, immediately start cancelling pond zones by selecting them with the **i** *Zones* key, then pressing **x** and then **X** to confirm the zone deletion. It takes a little time for water to spread across a zone, so starting to cancel zones early is a good idea. In [Figure 7-10](#), the pond floor is almost completely covered in water, indicating that it is time to delete pond zones.

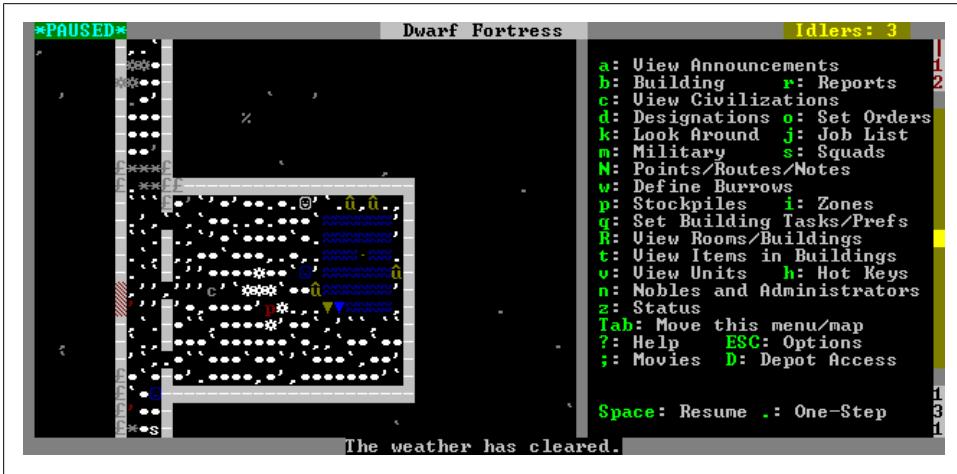
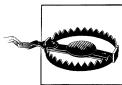


Figure 7-10. Water covers the pond floor



You may deplete a still water source such as a pond if you are trying to muddy a large area. If this happens, make sure you create another water source zone at a suitable location.

When all of the pond surfaces are muddied and the water has dried up, drop down to the muddy cavern floor and start placing farm plots. It's possible that one or two squares will not be muddy—that's fine, simply build your plot over them. In [Figure 7-11](#), two farm plots have been built with a gap between them. It is essential that you leave a gap, as if you do not, your dwarves will have nowhere adjacent to the plots to move rocks and other rubbish that cover the build site, and your build order will be suspended.

What's particularly handy about irrigating a farm is that it is very easy to establish food production precisely where we want it. Farms close to our food/seed stockpiles and dwarf living quarters make for short, efficient, secure trips for our workers.

If you have problems placing the plots (for example, you get messages about building being cancelled or suspended), it may be because there is still water on the build site. This is a common problem when building around water. You can get your dwarves working again by waiting for all the water to dry up, pressing **q**, moving the cursor over the farm plots, and then pressing **s** for *Suspend Construction* to unsuspend site building. You may need to do this several times before a construction or build order completes.

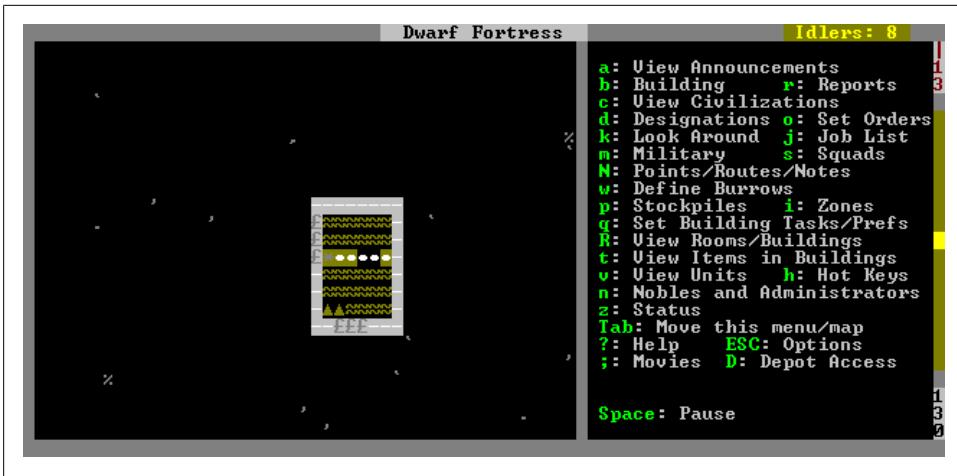


Figure 7-11. Two farm plots, ready for farming

If the water in your pit does not seem to be evaporating, use **k** (*Look Around*) and note the water depth of the squares in your pit. If the depth is consistently greater than 1 (on a scale of 1-7), you are going to have to reduce the water on your future fields. Do this by channeling another row or two of ramps. The water should now spread out onto this new rock and the overall depth of your pond will fall.

Challenge Mode

There will come a time when you feel you need more of a challenge than is provided by the serene biomes you've been encouraged to embark in so far. Do not fear, Dwarf Fortress will provide. Perhaps the most common and also most frustrating of challenges is the lowly aquifer, a layer of water-soaked rock or soil that can be difficult for new players to breach safely. But there are other challenges—evil areas with undead and noxious fumes, frozen areas where water is in very short supply, and areas overrun by dangerous wild beasts. All these and more await you in future fortresses!

Aquifers

An aquifer between the surface and the comfort of the deep underground can really cramp a dwarf's style. Breaching an aquifer is the solution, and it presents a fantastically dwarfy challenge, mixing both engineering, planning, digging, and the dangers of drowning. Before you embark to a location, you will be warned by Dwarf Fortress if there is an aquifer present...only embark if you are confident you can attempt an aquifer breach.

Perhaps the simplest way to break through an aquifer is to dig out a 5x5 tile area of dirt or rock and then, undermining it, drop it down into the aquifer. If you find this hard

to visualize, imagine dropping a golf ball into a glass of water. When the rock plug hits the aquifer layer, it will replace the aquifer material with the material that dropped and provide a safe area in the middle of the plug that dwarves can dig through into the rock below. The plug can be suspended above the aquifer by ensuring that it is connected to the mainland before the final tile is dug out. The tile can then be deconstructed or channeled to release the plug (at some risk of death to the dwarf engaged in this task). This technique was rather wonderfully illustrated by Tim Denee in an earlier Dwarf Fortress comic, “Oilfurnace” (<http://www.timdenee.com/oilfurnace.html>).

If, however, your aquifer is more than one layer deep, the plug method will not work (unless you make a massive plug and drop several rings in turn, from the outside in). Fortunately, there are other methods that you may wish to take advantage of. For starters, if you are in a freezing biome you can uncover the aquifer layer, wait for the water to freeze, and then dig through the middle. If there are multiple aquifer layers, then you may have to uncover several layers and dig down several times before you make it to stone. If there is any risk of the water melting (in, say, spring or summer), then you will need to build walls around the edge of your descending shaft; otherwise, when the ice thaws, the aquifer will drain into your fortress.

Another approach is to pump any available magma into your water hole, turning the magma and water into obsidian. Once the magma has cooled, simply dig down through the stone and into the next layer. Sadly, one seldom gets to use this technique, due to the relative rarity of magma at the surface on most maps.

Perhaps one of the most interesting ways to breach an aquifer is called the Two-Slit Method (<http://www.bay12forums.com/smf/index.php?topic=79224.15>), invented by QuantumMenace. This involves the careful use of pumps, walls, and precise digging and construction orders. This, and other methods, are described and linked on the DF Wiki page on aquifers (<http://dwarffortresswiki.org/index.php/Aquifer>).

Glaciers and Freezing Biomes

Glaciers present particularly tough challenges for Dwarf Fortress players. Dwarves embarking on glaciers will find no trees (better bring a lot of wood with you!), no soil to plant in, and no water to irrigate or drink. Worse, simply being outside may result in a dwarf freezing to death!

Discovering or making a source of water quickly becomes important on a glacier embark. There are two approaches to the problem. First, you could simply dig down to the caverns as quickly as possible, as caverns usually contain water. This comes with the risk of uncovering a forgotten beast or an aggressive local creature population. Another approach is to clear out a space under the aquifer and then cave in ice onto a rock floor. When ice caves in, it turns to water, allowing you to irrigate a stone floor or fill a pool.

A particularly dwarfy way to produce water is to run magma underneath a layer of ice. Ice with magma nearby will melt, and can then be drained into cisterns for use in wells or irrigation. When working with magma and water, be careful of mixing the two—the steam and obsidian generated when they mix are usually fairly lethal to any nearby dwarf.

Evil Biomes

Embarking in any evil area can be immensely challenging. There are three existential threats that must be overcome. Firstly, it can rain poisonous goo, which can have effects ranging from nauseating your dwarves to causing them to bleed out in mere seconds. In an evil area it is vital to get your dwarves underground as soon as possible. Covering any outside area you need to claim will be important if you wish your dwarves to work on the surface and want to prevent the ill effects of an evil rain constantly bothering your minions.

Secondly, evil fogs might drift across your map and produce any of the symptoms suggested above, or worse. A particularly dangerous fog is one that turns any living creature it touches into a husk or a zombie. These extremely aggressive creatures are very tough for your fortress to put down. You will not know what type of rain or fog your area enjoys until you start seeing the effects. Will your dwarves simply feel uncomfortable when they are on the surface? Or will they develop an unhealthy interest in brains? Only time will tell! To prevent fog from reaching your dwarves, build walls around any surface you wish to claim and secure entranceways with doors, hatches or bridges, locking them to keep dwarves in and fog out.

Finally, evil biomes are often replete with undead—or worse, can cause dead things to come back to unlife. Rapidly built walls (bring some wood) can keep the dead out, but should any of your dwarves die in an evil area, they need to be interred as soon as possible and their coffins walled in or locked behind doors. Undead can and will crawl out of coffins and start terrorizing your citizens if given half a chance.

As you can imagine, any kind of livestock-based food production is nearly impossible in an evil area. As soon as the animal is struck down, you are likely to get animal skins and hair coming back to life and scaring your dwarves. Don't laugh! Animal skins can suffocate a dwarf to death very quickly! If you plan to survive in an evil area, stick to farming plants. Not even fishing is safe: undead mussel shells are lethal in large numbers.



Embarking near a necromancer's tower (it will appear as *Tower* on the embark civilizations screen) may result in necromancer and undead attacks. Necromancers can raise corpses!

If you do embark in an evil area, consider building atom smashers near any location where a dwarf may get into a fight or die (for example, near your entrance, near the hospital, and so on). An atom smasher is a bridge built on top of the floor. When raised, the surface under the bridge is designated for corpse and refuse stockpiles. When the stockpile is full, a lever is pulled and the bridge lowers, smashing anything on the stockpiles out of existence. It is usually a good idea to put walls around an atom smasher and secure a door, so as to prevent unwanted access when the lever is pulled. As an atom-smashed dwarf cannot be buried, you will need to invest in memorial slabs to ensure that the dwarf's ghost does not come back to haunt you.

AKRULATOL, YEAR 270

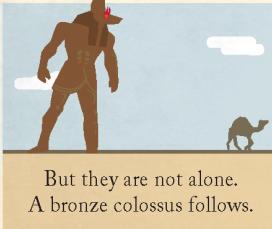
from James Wheatley



A thriving desert fortress, protected by the hero As Likotlular



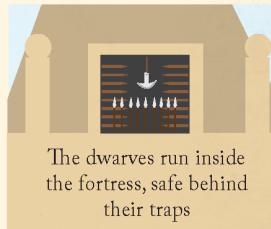
In 271, immigrants arrive



But they are not alone. A bronze colossus follows.



The immigrants are slaughtered



The dwarves run inside the fortress, safe behind their traps



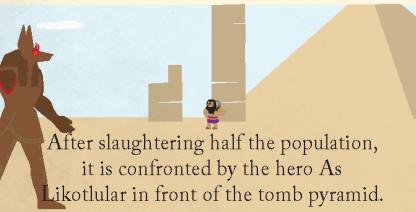
The colossus avoids the traps, entering through a construction site



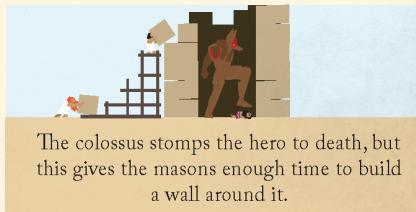
The militia confront him, but cannot pierce his hide



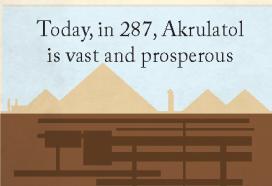
The commander hacks off its arm, and is kicked across the room into a wall



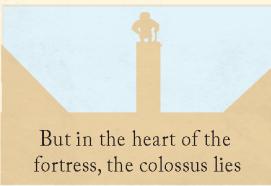
After slaughtering half the population, it is confronted by the hero As Likotlular in front of the tomb pyramid.



The colossus stomps the hero to death, but this gives the masons enough time to build a wall around it.



Today, in 287, Akkuratol is vast and prosperous



But in the heart of the fortress, the colossus lies



And waits...

Industry

By now you will have realized that dwarves are industrious creatures ready to work on difficult and dangerous tasks at the drop of a hat. Core to the day-to-day activities of most dwarves is working in one of the many industries available to fortress managers in Dwarf Fortress, as shown in [Table 8-1](#).

Table 8-1. Industries in Dwarf Fortress

Industry	Core Outputs
Wood	Furniture and fuel
Stone	Furniture and buildings
Food	Food, drink, and raw ingredients for the cloth industry
Meat	Raw food, leather, and bone
Metal	Weapons and armor, furniture
Cloth	Clothes, rope, and containers
Gem, Glass, and Ceramics	Decorations, trap weapons, containers, and crafts (quite optional)

The wood, stone, and food industries are key to running a successful fortress, as you require their outputs to get almost every fortress up and running smoothly. The meat, metal, and cloth industries are established in most fortresses you will run (to varying degrees). The gem, glass, and clay industries are far more optional than the other industries--and it is possible you won't even get close to setting them up before your first few fortresses collapse into madness and death.

Wood Industry

At this point, you will be well aware that wood is an important resource in Dwarf Fortress, so much so that new players are advised to never embark anywhere that doesn't have at least a few trees growing. Wood is required to build beds, and early on,

you will make bins out of wood as well. In due course, wood is also crucial in soap production and charcoal is always required for steel production.

Inputs

The core input for the wood industry is, no surprise, wood, which can be gathered through the designate *Chop Down Trees* command or traded for. Wood is often found on the surface of your world, but may also be found in caverns you uncover—usually in the form of giant mushrooms. Once cut down, timber is ready to be used by any workshop that requires wood.

Workshops

Primary and secondary wood industry workshops are described in [Table 8-2](#) and [Table 8-3](#).

Table 8-2. Wood industry primary workshops

Workshop	Description
Carpenter's Workshop	Produces beds, barrels, and other useful items such as training weapons and engineering components.
Wood Furnace	Found under the <i>Furnaces</i> menu (b-e), the Wood Furnace converts wood into charcoal (for use in smelters and kilns) and ash (for use in the production of soap and fertilizer).
Siege Workshop	Creates parts for ballistae and catapults out of wood.
Craftsdwarf's Workshop	Can produce wooden crafts (which seems a waste when rock crafts will do just fine) and wooden crossbow bolts, which are a cheap resource for training marksdwarves.
Bowyer's Workshop	Produces wooden crossbows, which are useful for the Fortress Guard.

Table 8-3. Wood industry secondary workshops

Workshop	Description
Ashery	Turns ash into lye (for making soap) or potash (for glazing ceramics or fertilizing plants). Lye production also requires a spare bucket to hold the mixture before it is turned into soap.
Soap Maker's Workshop	Combines a bucket of lye with tallow or rock nut oil to produce soap.
Kiln	Combines potash and fuel to make pearlash for use in making clear and crystal glass.
Glass Furnace	Combines pearlash with sand and fuel to make clear glass. Add rock crystal to the mix, and you will make crystal glass.

Wood can also be used directly in the construction of walls, floors, and stairs, and as components of machines such as windmills, water wheels, minecart tracks, and axles.

Wood Industry Strategies

Sometimes it can be difficult (if not impossible) to safely farm surface trees for timber, and cavern layers may not yet be safe enough to fell trees there. In these situations, it may be wise to plan for the future and create your own tree farm. This is easy, as once a cavern layer has been discovered, giant mushroom trees and cavern moss will rapidly colonize any underground mud or dirt surface. To take advantage of this feature, simply dig out a vast room in a dirt layer or muddy the floor of a huge rock room. All you need do then is simply wait for mushroom trees to spawn and grow—and then you can sit back and enjoy a steady, secure supply of timber.

If you can't wait the several seasons for trees to grow on their own, you can also trade with elves for timber (holding your nose the entire time, of course). Elves usually bring wood with their trade caravans, so as long as you remain on good terms with the elves, and can get them to your depot safely, modest but regular supplies of timber are guaranteed.

Stone

Stone is a useful primary resource and, fortunately for us, it is extremely common. In addition to the many metal ores, there are colorful varieties of stone (microline is a lovely blue, for example) and stones with other useful properties. Obsidian can make rock short swords, which are an acceptable early weapon for your military; bituminous coal and lignite can be processed into coke and used for fuel; gypsum can be turned into plaster powder for use in hospitals, and several types of stone can be used as a flux for making pig iron and steel. Tables detailing the ore stones and other useful stones can be found in [Appendix A](#).

Inputs

Stone is gathered wherever a dwarf digs deep enough. Stone is arranged in four types of layers: igneous extrusive layers, igneous intrusive layers, metamorphic layers, and sedimentary layers. The various types of rock will only occur in their own layer. Within these layers, ores and gemstones will occur in pockets and veins. If you wish to learn more, read a geology text book.

Workshops

Stone is widely used in Dwarf Fortress. Primary and secondary stone industry workshops are described in [Table 8-4](#).

Table 8-4. Stone industry workshops

Workshop	Description
Mason's Workshop	Produces a vast range of furniture and can turn stones into rock blocks, which are required for building wells, screw pumps, and Asheries. Blocks are stored in bins and more valuable than uncut rocks when used in construction.
Craftsdwarf's Workshop	Turns stone into rock crafts, which are crucial trade goods. Also turns rock into nest boxes and hives, which are important for food production. Makes rock pots, which can store food and drink. Makes jugs, which store honey and oil. Makes short swords out of obsidian and wood, which are a cheap, improvised weapon.
Mechanic's Workshop	Turns stone into mechanisms.
Smelter	Turns lignite or bituminous coal into coke (one stone produces three bars of coke). Uses flux stones for the production of pig iron and steel.

Only coke is a precursor to further industries, being used in smelters and forges as fuel.

Stone Industry Strategies

Earlier, you were warned against using stone stockpiles due to the heavy workload that stone-moving places on your dwarves. However, as you become a more experienced fortress manager, you may wish to break this rule in two ways: the first exception to this rule is in handling ores or specialized stone. In time, as you establish a metal industry, you may decide that the judicious use of stone stockpiles set to only contain metal ores is useful in improving forge and smelter efficiency. A team of forge and smelter dwarves with all hauling labors turned off can quickly process nearby ore stockpiles into bars, weapons, and armor while your unskilled peasants keep the ore stockpiles filled.

As stone is heavy and slow to move, you may wish to provide a small but ready supply of stone near your Mason's, Mechanics, and Craftsdwarf's Workshop. A small, handy stone stockpile can be set to give its stone to the nearby workshops and thus prevent skilled dwarves from wandering the map and slowly dragging rocks around, as they will always prefer the stone close at hand.

Stone stockpiles can also be useful as a way to force a worker to use a certain type of stone in their tasks. Place a small stone stockpile next to a Mason's Workshop that only accepts obsidian, set it to give to the Mason's Workshop, and your mason will grab these valuable stones in preference to all others, producing much more valuable furniture than goods made of more run-of-the-mill stones. Advanced stockpile control is covered later in this chapter.

Food

Much of the information you need for a productive food industry is covered in [Chapter 4](#). What you have hopefully realized by now is that there are a large range of potential inputs into the food industry and a large range of products that can pop out the other end, ready for consumption or use by your dwarves. Though [Chapter 4](#) covers food production in detail, this section will summarize the production chains for your reference.

Inputs

Food inputs, and the workshops they are processed in, are summarized in [Table 8-5](#) and [Table 8-6](#). Processing a plant always results in a seed, in addition to the subsequent goods.

Table 8-5. Food industry raw inputs

Food	Use
Plump helms	Usually can be eaten raw, brewed at a Still into dwarven wine, or cooked in a Kitchen with other ingredients.
Gathered plants	Same as plump helms.
Plant seeds	Can be cooked (are not available for cooking by default). Quarry Bush seeds (rock nuts) can be eaten raw.
Cave wheat	Can either be milled into dwarven wheat flour at a Quern or Millstone, or brewed into beer at a Still.
Quarry bushes	Processed at a Farmer's Workshop into one rock nut and five quarry bush leaves, which can be cooked.
Rock nuts	Rock nuts are what quarry bush seeds are called. Can be eaten raw, or milled at a Millstone or Quern into rock nut paste.
Sweet pods	Can be brewed into rum at a Still, processed at a Quern or Millstone into dwarven sugar, or processed into dwarven syrup at a Farmer's Workshop using the <i>Process Plants to Barrel</i> order.
Eggs	Gathered from nest boxes, they cannot be eaten raw and must be cooked in a Kitchen.
Honeycomb	Gathered from a hive and then pressed at a Screw Press to get honey and wax, which are stored in jars.
Fish	Gathered by fisher dwarves, fish must go through a Fishery to become processed fish.
Milk	Some creatures can be milked at a Farmer's Workshop. The milk can be drunk raw, turned into cheese at a Farmer's Workshop, or cooked at a Kitchen. No, you can't milk a cat.
Animals	Butchered at a Butcher's Shop into meat, prepared organs, fat, bones, skin, and leftover waste items.

Some food items, once processed, are either cooked, eaten, or processed again. Cooking combines two (easy meal), three (fine meal), or four (lavish meal) ingredients into a single food type stack, and is a great way to make use of all of the foods produced in

your fortress. Eating a meal comprised of several ingredients increases the chance that one of the ingredients is a favorite of your dwarves, producing happy thoughts.



Cooking plants destroys the seed; brewing or otherwise processing plants will save the seed for reuse in your farm plots.

Table 8-6. Food industry secondary inputs

Food	Use
Milk	Can be turned into cheese at a Farmer's Workshop, cooked at the Kitchen, or consumed raw.
Cheese	Can be eaten as is or cooked at the Kitchen.
Honey	May be eaten raw, brewed into mead at a Still, or cooked.
Dwarven Wheat Flour	Used as an ingredient in meals cooked at the Kitchen.
Quarry Bush Leaves	Used as an ingredient in meals cooked at the Kitchen.
Rock nut paste	Used as an ingredient in meals cooked at the Kitchen, or processed at a Screw Press into rock nut press cake and rock nut oil (requires jug).
Rock nut press cake	Used as an ingredient in meals cooked at the Kitchen.
Rock nut oil	Used as an ingredient in meals cooked at the Kitchen or used to make soap.
Dwarven Sugar	Used as an ingredient in meals cooked at the Kitchen.
Dwarven Syrup	Used as an ingredient in meals cooked at the Kitchen.
Fat	Used as an ingredient in meals or rendered into tallow at the Kitchen.
Tallow	Used to make soap or as an ingredient in meals cooked at the Kitchen.
Meat	Can be eaten raw or cooked into a meal at the Kitchen.
Organs	Can be eaten raw or cooked into a meal at the Kitchen.

Workshops

The food industry spans a range of workshops and facilities (see [Table 8-7](#)), and can seem quite daunting to the new player. If it all gets to be too much, just remember that all you really need are farm plots to reliably produce food for you and stills to make booze.

Table 8-7. Food industry workshops

Workshop	Description
Farm Plot	Strictly speaking, this is not a workshop, but farm plots ensure a reliable supply of food goods for your fortress.
Nest boxes	Will be claimed by nearby egg-laying creatures and used to lay eggs.
Beehives	Houses bee colonies until they are ready for harvesting.

Workshop	Description
Still	Turns a wide range of foods into alcohol. Essential to any fortress, a still should be kept occupied brewing drinks most of the time.
Kitchen	Produces cooked meals and allows the rendering of fat into tallow. Once you have a few immigrants, it isn't a bad idea to leave a cooking task on repeat.
Farmer's Workshop	Processes a range of foods and other goods into barrels, bags, or stacks. You are likely to need two or even three Farmer's Workshops to keep up with food and cloth industry inputs.
Millstone	Grinds various plants to sugar, flour, and dye. Bags are required to store the processed goods. Millstones need to be powered by mechanical power delivered by dwarven engineering.
Quern	Functionally identical to the Millstone, but is powered by dwarves instead of machinery. Does not work as fast as a Millstone.
Screw Press	Presses honeycomb to yield wax (can be used for crafts) and honey, and presses rock nut paste to produce oil and rock nut press cake.

Food Industry Strategies

The most complex part of dealing with food production is understanding how the Farmer's Workshop processes the various foods and other goods into ingredients and products.

Meat

Aside from the meat and prepared organs that butchering animals produces, there are a substantial range of other useful goods generated when a meat piñata is burst. It isn't common for a fortress to rely exclusively on a meat industry for food, but every fortress will find leather, bones, and meat useful to some degree.

Inputs

The central input in the meat industry is, no surprise, animals. Dwarves aren't picky and will happily process (and eat!) just about any creature they can get their hands on. Animals to be butchered are slaughtered at the Butcher's Shop and generate a range of goods. The list in [Table 8-8](#) is exhaustive, but precisely what is generated when an animal is butchered varies by species and the age of the animal.

Table 8-8. Animal butchery products

Product	Use
Meat	Can be eaten raw or cooked in a Kitchen.
Skull	Can be turned into a totem at a Craftsdwarf's Shop—useful only as a trade good.

Product	Use
Bones	Can be carved into bone crossbow bolts, crafts, or used to decorate other items at a Crafts dwarf's Workshop.
Fat	Can be cooked or rendered into tallow at a Kitchen. In turn, tallow can be cooked or used to make soap.
Skin	Processed into leather at a Tanner's Shop.
Horn/Hoof	Can be used to make horn crafts or to decorate an object with horn.
Ivory/Teeth	Teeth and Ivory can be turned into crafts at a Crafts dwarf's Workshop or used as item decorations.
Hair	Can be spun into thread at a Farmer's Workshop. Cannot be used to make cloth (no hair shirts for you, hippy!)
Organs	A variety of organs may be produced when creatures are butchered. These can be eaten raw or cooked in a Kitchen.



Different animals produce different quantities of products when butchered. For example, kittens will only produce bones when butchered, whereas a grown cat will produce meat, fat, bones, a skull, and skin. Stop looking at me like that.

Workshops

The meat industry only relies on a few workshops (Table 8-9), but these can quickly be overwhelmed with clutter due to the the many animal parts that drop when a butcher dwarf slaughters an animal. Many dwarves can be kept very busy cleaning up all the bones, organs, and bits and pieces—so it is advised that you don't slaughter too many animals at once, or animal pieces will begin rotting before they can be stored.

Table 8-9. Meat industry workshops

Workshop	Description
Butcher's Shop	Where animals are slaughtered. Butchery tasks are automatically added to the task list when a creature is selected for slaughter.
Tanner's Shop	Turns hides into leather. The task is automatically added to the task list if a hide is available.
Leather Works	Produces armor, backpacks, quivers, waterskins, clothes, and bags, and allows for items to be decorated with leather.
Crafts dwarf's Workshop	Bones, hooves, horns, teeth, and skulls can be turned into crafts or used to decorate items. Bones can also be turned into crossbow bolts, which are a great resource for training marksdwarves.
Kitchen	Can process fat to tallow, and cook meat and organs into meals.
Soap Maker's Workshop	Combines tallow and lye to make soap, which is vital for dwarf healthcare.
Farmer's Workshop	Will spin hair into yarn using the spin thread order.

Meat Industry Strategies

Elves often bring animals to trade. These animals come caged and tame, making them perfect to either farm or butcher. If you are planning to butcher the animal, it will be available from the *Animals* tab in the *Stocks* menu as soon as it is purchased and stored in an animal stockpile. If you wish to farm the animal, you will need to release it to a pasture, as caged animals will not breed. To move an animal to a pasture, use the pasture settings to add caged animals to the field; these will then be relocated by your dwarves.

If you love being efficient, you can make bone crossbow bolt production quicker by placing a refuse stockpile next to your Crafts Dwarf's Workshop that only accepts bones. This will reduce the need for your crafts dwarves to walk all the way to your external refuse pile.

Metal

It could be argued that a central aim of your fortress will be to support an efficient metal industry. Metal goods provide both weapons and armor to your guards and militia, as well as trap components and high-value furniture or decorations for your nobles. And, of course, forges smoking deep within a mountain are extremely dwarfy!

Inputs

Ore is the primary input required in the metal industry, and is dug up automatically by your miners as they dig out rock. By default, ore is not used for construction or masonry, so it will be left on cave floors until needed by a dwarf engaged in smelting. A single piece of ore, when smelted, is turned into a single bar of the same metal and stored in bins in a bar stockpile. The types of metal are listed in [Table 8-10](#).

Table 8-10. Ores and bars

Ore	Smelts into
Raw Adamantine	Adamantine strands ^a
Native Aluminum	Aluminum ^b
Bismuthinite	Bismuth
Malachite	Copper
Native Copper	Copper
Tetrahedrite	Copper, Silver ^c
Galena	Lead, ^d Silver ^c
Horn Silver	Silver
Native Silver	Silver
Cassiterite	Tin
Hematite	Iron

Ore	Smelts into
Limonite	Iron
Magnetite	Iron
Native Gold	Gold
Garnierite	Nickel
Native Platinum	Platinum
Sphalerite	Zinc

^a Processed at a crafts dwarf's workshop.

^b Valuable, but only as decoration of furniture. For obvious reasons, cannot be made into weapons or armor.

^c Will smelt into a bar of the first metal with a chance of a bar of the second metal also being created.

^d Low value and heavy, low priority to smelt.

In addition to ores being smelted into bars of metal, ores (and bars) can be alloyed to produce higher quality or simply different colored metals (shown in [Table 8-11](#)). Alloys offer alternative, perhaps stronger, materials with which your smiths can work. Steel is ideal, but if you lack the ores, charcoal, or flux stone, bronze and iron are suitable alternatives. What's more, bronze is efficient to make, as two ores (one copper, one tin) are turned into two bars of bronze for the cost of only one unit of fuel in your smelter.

Table 8-11. Alloys

Alloy	Ingredients
Billon	Copper, Silver
Bismuth Bronze	2 Copper, 1 Bismuth, 1 Tin ^a
Black Bronze	2 Copper, 1 Gold, 1 Silver ^a
Brass	Copper, Zinc
Bronze	Copper, Tin
Electrum	Gold, Silver
Fine Pewter	1 Copper, 3 Tin
Lay Pewter	1 Copper, 1 Lead, 2 Tin ^a
Nickel Silver	1 Copper, 2 Nickel, 1 Zinc ^a
Pig Iron	1 Iron, 1 flux stone, 1 fuel (produces one bar of pig iron) ^a
Rose Gold	1 Copper, 3 Gold ^a
Steel	1 Iron, 1 Pig Iron, 1 flux stone, 1 fuel (produces two bars of steel) ^a
Sterling Silver	1 Copper, 3 Silver
Trifle Pewter	1 Copper, 2 Tin

^a Bars of the metal, not ores, are required for the production of this alloy.



Many alloys require raw ores to produce. If you smelt all ores to bars of metal, you will not be able to make these alloys.

As you will have observed by now, flux stones are crucial in the production of steel—flux is required both to make pig iron bars, and then to turn pig iron into bars of steel. Flux stones are found on many (but not all) maps, and for new players, should be included in the site finder options used when searching for a fortress location.

Should you be unable to find any flux stone on your map, you can order some from dwarven traders. However, traders never bring large volumes of flux, so it is usually easier to buy steel items from the traders and then melt the items down at a smelter. You achieve this by finding steel items in your stocks menu and then pressing **m** for melt. You can also find items on the ground (such as metal weapons dropped by enemies) using **k**, and designate them for melting in the same way. From there, simply add the *Melt a metal object* job to a smelter (perhaps set it to **r**, *Repeat*), and metal items will be gathered, melted, and turned back into bars.



Flux stones include calcite, chalk, dolomite, limestone, and marble and may be found as rock layers, often alongside iron ore.

Workshops

Metal production is relatively straightforward, with ore being turned into bars at a smelter and the subsequent bars of metal then processed at a forge into other goods. But though this is straightforward, the resources consumed by your metal industry may be difficult to replace. For example, producing enough fuel to power your smelters and forges could result in the felling of all the trees on your map (which displeases the elves, by the way. How sad). For this reason, you should aim to discover a source of magma as soon as you are able, as magma can power a special class of workshops, replacing charcoal and coke as fuel. Magma will always exist at the bottom-most layer of your map, but may also appear as pools in caverns or in magma pipes.

Once magma is discovered, Magma Forges and Smelters will be unlocked, appearing in the **b-e** and **b-w** menus. Magma workshops need to be built over a source of magma in order to be functional. The simplest way to achieve this is to clear out a room a level over magma and then channel down in a single square, revealing the magma below. When you place a magma workshop, the workshop footprint will be green as long as there is access to magma. Once built, your magma workshop will allow for endless smelting, smithing, glass making, or pottery making—as long as the magma does not drop below 5/7 full. When presented with the green workshop build footprint, it is ideal to place any dark green square over the hole in the floor. The dark green square

indicates an impassable element in the workshop, so placing this directly over the magma provides some protection from accidents and unexpected fun.

The different types of metal workshops are outlined in [Table 8-12](#).

Table 8-12. Metal industry workshops

Workshop	Description
Smelter	Turns ore into bars or melts metal objects to bars (at the cost of one fuel).
Magma Smelter	Does the same job as a smelter, but at no fuel cost.
Metalsmith's Forge	You must have an anvil to build a forge. Turns metal bars into weapons, armor, anvils, and crafts a range of other metal goods (at the cost of one fuel).
Magma Forge	Operates the same way as a Metalsmith's Forge, but requires no fuel.

Metal Industry Strategies

Once you acquire skilled armor and weaponsmiths, you may wish to restrict the use of a forge to only skilled dwarves (more on that later). You then place your weapon and armor orders at this workshop, and in this way ensure that they are produced to the highest quality by your best dwarves.

Placing an ore and bars stockpile near your forges and smelters could save your metal workers time. To do this, simply place a stone stockpile; then using **q**, highlight the stockpile, press **s**, and then scroll down to stone, across to ores, and permit ores while forbidding other stones.

Adamantine hasn't been mentioned so far, and some would say that it shouldn't be mentioned in this book as it's part of the "Hidden Fun Stuff" (HFS) that all players should discover on their own. Those people do have a point, but this is a guide book, so let's summarize adamantine thusly: once mined, it must be extracted as "strands" at a Crafts Dwarf's Workshop by a dwarf with the *Extract Strands* labor enabled. From there, it can either be smelted into wafers at a Smelter or woven into cloth at a loom. Adamantine is very strong but nearly weightless, so it makes superb edged weapons and armor but terrible bashing weapons.

Cloth

A functioning cloth industry is quite important—bags and ropes are always useful, and clothes will help prevent your dwarves from going insane. Really. Dwarves hate being naked. Bags are used for efficiently storing seeds and some food products, rope for anchoring guard animals and troublesome dwarves, and clothes, well, that should be obvious. The cloth industry also lets you play dress-up with your dwarves, sewing finely decorated red cloaks for your guards, for example. Omigosh, doesn't the red go so well with their shiny steel armor?!

The pipeline from raw plant goods to cloth is simple enough, but there are complexities around the more unique materials that may trip you up. Focus on establishing a reliable plant-based cloth industry at first before you explore more unique fibers.

Inputs

Basic cloth industry inputs are easily grown and managed by any fortress controller, and are outlined in [Table 8-13](#).

Table 8-13. Cloth industry primary inputs

Input	Intermediary Product	Information
Pig tails	Processed into pig tail thread at a Farmer's Workshop	Grown on any underground farm plot in summer and autumn. May be brewed into dwarven beer at a Still.
Rope reeds	Processed into rope reed thread at a Farmer's Workshop	Grown on farm plots aboveground. May be brewed into river spirits at a Still.
Wool	Shorn off animals and spun into yarn at a Farmer's Workshop	Not as common as plant-based cloth in most fortresses, but a viable alternative.
Hair	Spun into thread at a Farmer's Workshop	A byproduct of the meat industry. Cannot be used to make cloth (ick!) but can be used in hospitals.
Spider silk	Woven into spider silk thread the moment they are collected	There are a variety of spiders from which you can harvest webs. So long as there is a loom in the fortress, webs will be collected automatically by any dwarf with the <i>Weaving</i> labor active. This may place your dwarves in some danger, as certain types of spiders are aggressive and quite lethal.

All primary inputs are converted into thread at a Farmer's Workshop (or automatically, in the case of spider silk). All thread (other than hair thread) will then be woven automatically into cloth at a loom, barring any thread that is secured by your dwarves for the hospital stocks. Cloth is also useful in a hospital and will be stored ready for your medics as required. Cloth can be processed into other goods at a Clothier's Shop or into crafts at a Craftsdwarf's Workshop. Cloth and thread may also be dyed at a Dyer's Shop.



Merchants, elves in particular, frequently bring many bins of cloth to trade making it relatively easy to acquire the raw materials you need to produce clothes, bags, crafts and rope.

If ever there is an optional extra in Dwarf Fortress (a game of optional extras!), it would have to be dye production and use. That being said, dyed cloth is more valuable than

plain cloth, and is therefore useful in decorating rooms and objects and keeping nobles happy. It's also kind of cool to make a squad of vampires and have them dress all in black.

There are four colors available, produced from four different plants (see [Table 8-14](#)). Dye plants are processed into a powder and bagged at a Millstone or Quern.

Table 8-14. Dye inputs

Dye plant	Color	Milled into	Information
Blade weed	Green	Emerald dye	Grown on aboveground farm plots.
Dimple cup	Blue	Dimple dye	Grown on subterranean farm plots.
Hide root	Red	Redroot dye	Grown on aboveground farm plots.
Sliver barb	Black	Sliver dye	Grown on aboveground farm plots, and can be brewed into gutter cruor at a Still.

Workshops

Primary cloth industry workshops convert raw materials to intermediary goods. Secondary workshops take those intermediary goods and further process them into finished goods. See [Table 8-15](#) and [Table 8-16](#) for a list of these workshops.

Table 8-15. Cloth industry primary workshops

Workshop	Description
Farm plot	Grows pig tails (subterranean farming) or rope reed (surface farming).
Farmer's Workshop	Used to thresh plants into thread, shear sheep, and spin wool into yarn.
Millstone or Quern	Mills dye plants into powders (requires a bag)
Loom	Causes any dwarf with the weaving labor to gather spiderwebs.

Table 8-16. Cloth industry secondary workshops

Workshop	Description
Loom	Weaves thread and yarn into cloth.
Dyer's Shop	Dyes cloth or thread.
Clothier's Workshop	Turns cloth into ropes, bags, and clothes. Can be used to sew a picture onto another item, increasing its value.
Craftsdwarf's Workshop	Turns cloth into cloth crafts.

Cloth Industry Strategies

It is important to have a surplus of clothing on hand at all times to prevent dwarven insanity. Dwarves arrive at your fortress clothed, but over time, their clothes will suffer wear and tear until they fall apart or are discarded by your dwarves. Dwarves will try

to replace worn clothing from your stockpiles—but if no clothes are available, dwarves will work naked (and unhappily). Producing trousers, dresses, cloaks, and tunics at a Clothier's Workshop will help to ensure that you will never have to deal with the horror of a naked, rampaging dwarf.



Consider creating a custom stockpile just for clothes so you can easily monitor at a glance just how much spare clothing you have to hand.

A Leather Works can also assist in the task of clothing your dwarves by turning surplus leather into boots, shoes, cloaks, and gloves, which some players claim protect your dwarves better than their cloth versions. Keep an eye on your dwarves—if you see a lot of worn clothing (the clothing in the dwarf's inventory will be bracketed with two X marks), start working on producing clothes and boots.

Gems, Glass, and Ceramics

The gem, glass, and ceramics industries are infrequently explored by new players, as the goods these industries produce are often duplicated by other trades. Nonetheless, in the interests of being thorough, these industries will be explored briefly to help you understand their role.

Gem Industry

The gem industry focuses on the cutting of raw gems uncovered during mining, and then decorating goods with the gems to increase their value. This industry is operated out of the Jeweler's Workshop (**b-w-j**) and involves a two-stage process. First, you must select the raw gems to be cut and second, once you have a stock of cut gems, specify the goods to be encrusted with gems.

Decorating items with gems is a great way to increase an item's value. You may wish to do this to increase the value of trade goods (although with a dedicated stone crafter, you are likely to be able to buy entire caravans at will within a few years)—or, more commonly, you may want to make fabulous furniture for your nobles.

For maximum value you want your best furniture decorated with gems. You can force a jeweler to pick only the best piece of furniture made from the best material by creating a small custom stockpile dedicated to high quality furniture near the Jeweler's Workshop. Place the stockpile and then under the **s**, *Settings* menu find *Furniture/Siege Ammo*, scroll across and then down to the *Total Quality* setting and unselect all but the bottom three quality settings using **enter**. You may also wish, under *Type*, to deselect hatch covers, floodgates, mechanisms and other items you don't plan to use to impress your dwarves.

With the stockpile set you can use **g**, *Give to a Pile/Workshop* from the stockpile's **q** options to precisely specify which Jeweler's Workshop will draw its supplies from the custom stockpile.

Similarly, you can also use a custom stockpile to determine the type of material that you wish to have decorated. You may decide that not only do you want high quality items decorated, but you only want items made out of gold to be gem encrusted. Under the stockpile's settings options for all or some metals allow further fine-grained control over the stockpile's contents.

Glass Industry

The glass industry only really becomes viable once you have Magma Glass Furnaces (**b-e-a**) established, as burning wood to make glass items in a Glass Furnace (**b-e-g**) when you could be smelting and forging iron or steel items seems fairly wasteful. Once you have Magma Glass Furnaces, however, churning out glass items can keep a dwarf or two occupied and also allow for the production of some handy goods.

However, before your furnaces can produce glass, you need to gather some sand. This task is achieved by setting a zone (a single tile zone is fine) over any patch of sand and then setting the zone for sand collection using the onscreen prompts. Next, add *Collect Sand* orders to your furnace, and dwarves will fill empty bags with sand. Finally, simply order the furnace to produce raw green glass, and these bags of sand will then be dragged to the furnace by dwarves with the glassmaking labor enabled and turned into raw glass.

Without extra additives, sand produces raw green glass. If you want to get fancy, you can make clear glass (which requires sand and pearlash)--or even crystal glass, where rock crystals (a gem) are combined with pearlash at the furnace. Once you have a supply of glass, you can use the glass furnace to turn the glass into further useful items. Green glass is often employed to make trap components, as it is cheap to produce (requiring only dwarf labor once a magma furnace is up and running) and quite effective.

Other uses for glass include turning it into blocks that can be used in construction, furniture for its decorative value, and even crafts for trading. Glass can even be made into windows and installed in place of walls, providing dwarves with line of sight into a room. This may assist in the identification of vampires, due to the increased chance of witnesses to a crime.

If you plan on producing a lot of glass products, establishing three furnaces may aid efficient production. One furnace can be set with the task *Collect Sand* on repeat, another with orders to produce green glass, and a third with orders to make glass blocks, furniture, trap components, or other goods. Dwarves with the *Hauling* labor enabled will happily fill spare bags with sand, and then glassmakers will turn the sand into raw glass (and the raw glass into goods). If you get a message that you have run out of bags,

suspend the *Collect Sand* order until your glassmakers have caught up with the industrious sand gatherers.

Ceramic Industry

Ceramics are clays fired in a Kiln (**b-e-k**) or Magma Kiln (**b-e-n**), and the ceramic industry focuses on the production of goods such as pots, jugs, blocks, crafts, and statues. As you will no doubt have realized, all of these goods can be produced at other workshops extremely easily, whereas the ceramics industry requires that clay be gathered from a zone specified for the purpose. In addition, if you want to store liquids in a clay container, it must be glazed (unless the item is made from fire clay).

There are two types of glaze: ash glaze, which is made using a bar of ash and applied at the time of glazing to an item, and tin glaze, which requires cassiterite (tin ore). Both glazing actions take place at a Kiln or Magma Kiln, and use the *Glazing* labor.

Ceramic goods have an inherently higher value than similar goods made from stone or wood, so for maximum bling factor, a fortress might wish to replace cheap rock pots and jugs with valuable ceramic ones. But aside from busy-work, there is little incentive (outside of facing an unusual embark) to engage in the production of ceramics.

Improving Industry Efficiency

Dwarf Fortress comes with some tools that make running a heavily industrialized fortress easier. These include precise controls over where a stockpile will take and deliver goods, wheelbarrow use, profiles to determine which dwarves can use workshops, and a method for bulk ordering goods from all workshops of a type at once.

Workshop Profiles

Once you have assigned a manager in the nobles screen, another feature that gives you greater control over your industry becomes available—workshop profiles. This tool, available at every workshop by using **P**, allows you to devote a workshop to a particular dwarf, or to only allow dwarves of a certain skill to use a workshop. Combined with custom stockpiles, workshop profiles will ensure that only the most highly skilled dwarves work on the best quality materials. The prompts from the *Workshop Profile* panel should be self-explanatory.

Advanced Stockpile Control

In addition to placing custom stockpiles that control only certain subsets of goods or certain quality levels, stockpiles can also be set to “take” and “give” to one another and to specific workshops. Taking and giving allows for some very precise control over the production and distribution of goods around your fortress.

To tell a stockpile to take or give, **q** over a stockpile and press **t** for *Take From a Pile/Workshop* or **g** for *Give to Pile/Workshop*. Next, move your cursor (you may move up and down levels if you need to) and press **enter** over a stockpile or workshop that you wish to take or give to. Then, simply press **enter**. Your stockpile's information panel will update to show this new link, along with the standard options and pile information. Multiple links into and out of a single stockpile are permitted.

The *Take* option will cause dwarves to always attempt to keep a “taking” stockpile full with goods collected from the stockpile target of the “take” command. This will usefully keep a small stockpile (say, ammunition at your target range, or high-quality furniture next to your jewelers) perpetually full.

Stockpiles can also take from a workshop, allowing you to create production chains where a series of outputs are carefully stored, in turn, at a series of workshop-specific piles. These goods can then be given to the next workshop in the chain, allowing you to closely monitor the goods flowing in and out of an industry. This may help you determine where there are bottlenecks in a long production chain (for example, clothes-making). Further, by pressing **a** with a stockpile's options in view, you can cycle through a setting that determines whether a stockpile will only be filled from sources set to give to it, or whether it is permitted to also be filled with goods gathered elsewhere—a useful option for precisely controlling a stockpile's inputs and outputs.

Telling a pile to *Give* to another acts in much the same way as a *Take* order would from the target stockpile. Things get interesting when the target of a *Give* link is a workshop. In this case, it will restrict the workshop to only being able to receive goods from the “giving” stockpile. This can allow you to control the quality or type of inputs to a specific workshop, as described in “[Gem Industry](#)” on page 123, or to come up with more complex and convoluted production control measures.

For example, you may decide that you have a surplus of certain foods. You could specify that a food stockpile only holds eggs and animal organs, and then set it to give to a specific Kitchen. Cooking easy meals at that Kitchen will result in both ingredients being exclusively chosen for the meals, productively utilizing the ingredients.

Some further potential uses for these advanced stockpile options include creating small food stockpiles in nobles' quarters that only take prepared food made at a Kitchen dedicated to the sole use of your most skilled chef, ensuring that your nobles always have the chance to eat the highest quality food. There is the potential for many more clever stockpile relationships, so use your imagination!

Wheelbarrows

In addition to production control, stockpile settings also allow you to specify whether wheelbarrows will be used at the stockpile. All stockpiles have a **w** (*Max wheelbarrow*) option, and pressing **w** will cycle the stockpile to use between zero and three wheelbarrows. Wheelbarrows are produced at a Carpenter's Workshop or Metal-

smith's Forge, and allow a dwarf to move goods around without any reduction in their movement speed from the weight of the object.

Wheelbarrows also restrict the number of dwarves who will work on a stockpile's tasks. If you set a stockpile to have one wheelbarrow, only one dwarf will ever move goods to or from the stockpile, and they will always use the wheelbarrow to do so. Wheelbarrows are particularly useful when dealing with stone stockpiles, as rocks are very heavy and slow to move, and a stone stockpile without any wheelbarrows specified will keep a large number of dwarves busy filling it. Set a stone stockpile to use two wheelbarrows, and only two dwarves will ever waste their time moving rocks around—and both will do so quickly with the aid of their wheelbarrows.

Conversely, there are a few scenarios one can imagine where a wheelbarrow would be detrimental to efficient production. For example, a food stockpile may suffer from the addition of wheelbarrows: food isn't heavy, getting food stored quickly is important, and the wheelbarrow-number-imposed limit on dwarves working with a food stockpile could seriously hamper the movement of food around your fortress.

The Manager

A manager, set from the **n** (*Nobles*) screen, also allows for greater automation of work orders. Once the manager is assigned, you will be able to press **j** (for *Job List*) and then **m** for *Manager*. From the subsequent screen, **q** will start a *New Order*. The list displayed can be scrolled through or filtered simply by typing. Type **door** and you will see a number of *Construct Door* options, including *Construct Rock Door*. Use the cursor keys to select this option, press **enter**, and then you will be prompted to enter a quantity of doors. Type a number (keep it under 20), and press **enter**.

The manager screen will now show your order, along with information on whether or not your manager has validated it. Once the order is validated (which may take a little time), the construction orders will be split among the available workshops and work will begin. You will be notified once the work order is complete.

One issue with using the manager is that orders are completed in sequence. Order thirty rock doors and then thirty rock tables, and all the doors will be completed before the tables are begun. However, the usefulness of the manager options—especially when you have a large fortress and simply want 80 units of booze made without fuss—is well worth the potential inconvenience of having the job filling all available workshops until completed.

Stocks

A final resource is your **z** (*Status*) menu. Examining the *Stocks* tab in the *Status* menu will provide a great sense of what goods are available in your fortress. In particular, keeping an eye on food stocks is important for newer players: starvation is the most common way that rookie Dwarf Fortress managers lose a fortress.

From your stocks list, you can examine the status of all items in your fortress—including which items are currently forbidden (marked with an *F*), which are set to be melted (*M*), and which are due to be dumped (*D*). Once dumped, goods are marked with *F* in the *Stocks* view and wrapped in curly brackets in the map views.

You can use your cursor keys to navigate the items and categories in the stock list, and use the hotkeys suggested onscreen to change the settings for the items. If you wish to see each individual items listed (rather than grouped together), press **tab** and the detail view will change. As you select each item, you will now be able to press **z** to *Zoom* to the location of any item selected.



Justice, Healthcare, and Vampires

Keeping your dwarves alive and happy involves more than simply feeding them, housing them, and keeping them safe from danger. Dwarves must also be punished for disobeying their betters and, if wounded, treated by a crack dwarven medical team led by a booze-addled maniac (a dwarf, in other words). If you still can't keep your dwarves alive, they need to be treated with respect and appropriately memorialized. This chapter covers all of these topics.

Justice

The justice system offers a way for your dwarves to punish criminal or tantruming dwarves before they become a risk to themselves or others. Justice is administered by the Sheriff (or the Captain of the Guard, as the Sheriff is known once your fortress has grown) and their squad. The justice options appear as a tab under the **z** (*Status*) page. You can also check the justice page for information on any crimes that have occurred in your fortress, along with information on convicted criminals.

How does a dwarf become a criminal? Easy! They can annoy a noble by being the one blamed for a failed mandate or for selling items part of an export prohibition; or they can have a tantrum and injure or kill another dwarf, or damage or destroy furniture and/or buildings. In [Figure 9-1](#), several unsolved murders await the player's attention.

When a criminal act is committed, you can use the justice screen to review the case and convict a dwarf. Each case file includes (where relevant) witnesses, dates, and victims. If the crime is simply failing to meet a production order or selling a mandated good, then the case file is simple and the criminal obvious. Where the case is a murder, the criminal will be trying to hide and may not be obvious. Vampires are notorious for trying to divert attention by accusing other people for crimes they are accused of. Multiple witnesses—or multiple cases—may be required to determine precisely who is to blame.

As you scroll through the cases, you can press **enter** to accuse someone. After you've exited the justice screen and the game resumes, the criminal will then be convicted to



Figure 9-1. Dwarf justice status screen

a punishment by the Sheriff or Captain of the Guard (you've appointed one, right?). The Sheriff or guards will then hunt down the crook and administer some justice. The justice may be a period in jail (Figure 9-2), or maybe a beating will be administered.



Figure 9-2. Olon is sentenced to 50 hammer strikes

Beatings can be fatal if the guards are too well-equipped or too skilled, so it is best to equip Team Justice with weak weapons. Wooden crossbows are often recommended, as the bows will never be used to shoot at criminals (merely to bash them), and who is frightened of being bashed with a wooden crossbow? Crossbows have the added benefit that should the guards face real enemies, they will lock and load crossbow bolts and make themselves useful in battle.



A fortress guard squad can be established and managed from the military menu, with the Captain of the Guard as their commander.

Jail

The lightest punishment a dwarf can face is being sent to jail. A jail is an area made up of restraints designated using the **q** option over an emplaced cage or rope. A dwarf sentenced to imprisonment will be dragged to the jail, and clapped in irons or tossed into a cage. This is all well and good, but being imprisoned causes unhappy thoughts and risks further tantrums, insanity, and death if we aren't careful. For this reason, we want to make sure that the dwarves are in comfortable surroundings (place some nice statues! Jail doesn't have to be depressing!). At the least, there should be a bed, table, and chair, and food and drink stored adjacent to the restrained. Naturally, caged dwarves will not be able to reach adjacent beds or other utilities, and so cages in your jails are not recommended.



Place restraints using the **b-v** (*Restraint*) menu options. Cloth ropes, sewn at a *Clothier's Shop*, are the easiest restraints to make.

Once you have placed the jail items, simply **q** over a restraint, set the room size to fill the space, and press **enter**. You then need to press **j** for *Used by Justice* to set the jail to be available for use by the Captain and guards. In [Figure 9-3](#), a tastefully arranged jail awaits its first customer. Each restraint is surrounded by a bed, table, and chair (along with two food stockpiles; one set for drink only, one for prepared meals), and graceful statues adorn the corners of the room. Truly, a home away from home!

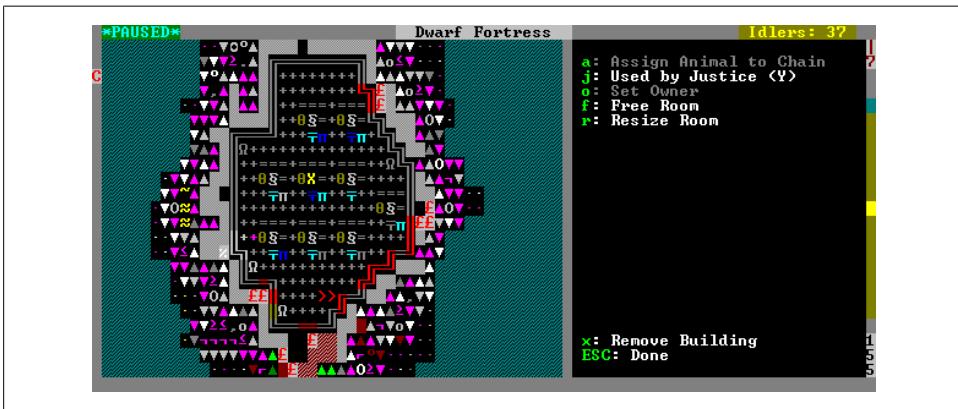


Figure 9-3. A dwarven jail in a rock spire

Vampires

Some dwarves have a dark secret that involves wearing a lot of black, being moody all the time, and making young female dwarves swoon. Yes, some dwarves are vampires! Vampire dwarves can turn up with any migrant wave and will disguise themselves by presenting a fake name and history when you view their thoughts and background.

Vampire dwarves can be useful: they don't need to eat, drink booze, or sleep, so they can work tirelessly without complaint. The only downside is that they will occasionally drain a dwarf of blood, usually leaving a pale corpse to be entombed. For some fortress managers, this can be disconcerting—losing skilled dwarves is frustrating and tantrum spirals are a perpetual risk.

A feeding vampire may be spotted by other dwarves and accused of the crime of murder (regardless of whether the victim dies, which they usually do). The clever vampire will often counter the claims of any witness and protest that another dwarf committed the crime, leaving you, the poor fortress manager, to figure out who really is to blame. If there are multiple witnesses, this job will be easy, but if there are not, you may need to do some detective work.



A recently squashed bug would sometimes result in vampires trying to accuse animals of their crime. This made finding vampires a lot easier as vampirism has never been detected in geese, for example.

Fortunately, there are some signs that will suggest to the savvy fortress manager that a dwarf is a vampire. Firstly, a dwarf's history may show that they have been a member of many different fortresses (vampires move around a lot). Second, a vampire dwarf may not remember having a good drink or meal in a very long time (for obvious reasons). Thirdly, if you have more bedrooms than dwarves, you can look at a bedroom's *Assign* menu and see who has yet to claim a room. Vampires do not need to sleep, so do not claim rooms. Their names will be green in the *Assign* list.

Various tests can also be administered to check for vampirism. Drop any dwarf down one level (using, say, a retractable drawbridge) and the dwarf will be momentarily stunned. Vampire dwarves will not show any stunned notification on their wounds info panel. Vampire dwarves cannot drown, so briefly submerging suspicious dwarves in water to see if they acquire the drowning notification status is another way to check for vampirism. One can also lock suspicious dwarves in a room and wait to see if they become hungry or thirsty. Vampires will never become hungry or thirsty and won't flash with the blue and brown down arrows associated with these statuses.

Some fortress managers choose to lock each immigrant wave into a room to test for thirst and hunger before letting them into the fortress. This is often achieved by assigning new migrants to a restrictive burrow and then locking access doors once all dwarves to be checked are in place. Burrows are discussed in [Chapter 10](#).



Dwarf Therapist, a utility bundled with the Lazy Newb Pack, has an option to highlight cursed dwarves. This makes finding vampires very easy, you dirty cheats.

Dwarves are remarkably lenient with vampires. Any you select for punishment will be jailed or beaten, and then set free to cause more problems in the future. In response to this, Dwarf Fortress players have come up with their own uses and punishments for vampires. Often, the vampire is drafted into their own military squad to allow for easier player control. From there the vampire may be:

- Sent to stand on a bridge over a pool of magma. Oops!
- Assigned to a small room that is then walled off from the rest of the fortress.
- Assigned to a private barracks where the vampire can train for eternity and be brought out only in emergencies.
- Walled into a private office and made Bookkeeper or Manager for all time.
- Walled into a room full of levers that become the vampire's sole responsibility.

It is tempting to wall a vampire into a room and to leave them as a Manager or Bookkeeper, but doing so is not without risk. The vampire will still want to have tidy clothes and can still throw tantrums if they are unhappy. A hole in the ceiling of the vampire's room with a dump zone over it may be required, into which fresh clothes can be dumped and then reclaimed for your vampire to collect. Vampires are also still addicted to alcohol, which it seems they absorb from the blood of their victims. Without a chance to feed, vampires will slow down and perform all tasks much more slowly. In time, this may result in inaccurate bookkeeping and slow activation of Manager tasks. Perhaps magma is the better solution. It is almost always the best medicine for any malady you suffer.



Vampires in Dwarf Fortress do not sparkle, unless they are covered in strange dust from a forgotten beast. Beast dust effects are often quite gruesome.

An alternative use for a vampire is to lock them at the bottom of a hole with a spear trap and then to activate the trap (by way of a lever), filling the vampire with holes and the pit with vampire blood. This will be fatal to the vampire, but if you then add water to the hole (using buckets, for example), and build a well over the top of the hole, you will have a water source laced with vampire blood. You can then burrow all dwarves to an area around the well—this will force them to drink from it when they get thirsty, turning the entire fortress vampire. Your newly-minted dwarf necropolis can then forget about food and booze production and make good use of any migrants while you enjoy a substantially darker game! Dwarf Fortress forum members have used this technique to create Evil Dwarf fortresses of terrifying evilness!

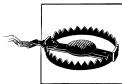
Healthcare

The modeling of the health and well being of your dwarves is exceptionally detailed. Dwarves may collect a vast range of injuries that your crack medical team will be tasked with diagnosing and treating. However, as this is Dwarf Fortress, it is just as likely that your doctors will forget to treat a dwarf due to incessant partying as it is for the dwarf to be successfully rehabilitated. Such are the hard lives of our short, cave-dwelling chums!

Sooner or later you are going to require hospital facilities to treat an injured dwarf or three. Or more. Without a hospital and medical team, your injured dwarf is going to languish in a bedroom hoping that time and good luck heal them. This can take an extremely long time, and your dwarf is likely to fall victim to untreated infections.

Establishing a Hospital

For this reason, it's a good idea to try to establish a hospital space relatively early; as soon as you've had a couple of immigration waves is probably a suitable occasion. Before we look at setting up the hospital zone, you will need to build a half-dozen beds and tables, a traction bench or two (made at a mechanic's workshop), and at least six containers (stone chests are fine). With these goods ready, you can prepare a space to be your hospital; a 10×10 room should be plenty.



Traction benches require a mechanism, a table, and a rope or chain to construct.

With your hospital space ready and goods prepared, it is time to place the furniture that our hospital will need. Place the beds around the the room as you see fit, with a table directly adjacent to each bed. The table is where your medical team will conduct any required surgery and should ideally be adjacent to where the injured dwarves will be resting. Next, place your traction bench and the chests nearby.

Now that the furniture is deployed, we can set up a hospital zone. Press **i** for *Zones* and make sure the word next to *e* is *Rectangle* (press **e** until it says *Rectangle* if it is not). Lay out a zone that covers the beds, tables, containers, and traction benches. Once the zone is set, press **h** for *Hospital* and then **H** for *Set Hospital Information*. In this screen, you will be informed of the current stocks and resources available to your hospital. At first you will only have beds, tables, containers, and traction benches listed, but in time your dwarves will fill the containers with the thread, cloth, soap, and other goods the hospital requires.

If you don't have any hospital supplies prepared, it is a good idea to make some stock as soon as possible. Easiest on the zone list to make are buckets, splints, and crutches, which can all be constructed at a Carpenter's Workshop. The other items range from

being easy to produce (thread and cloth), to more complex (plaster and soap). Production of these goods is outlined in [Chapter 8](#).

You can see a working hospital in [Figure 9-4](#).



Figure 9-4. A hospital (on the right) with a well to the north; an injured dwarf is highlighted

With items placed, stocks of hospital goods filling up, and a hospital zone created, you are now well on your way to having a functional dwarven medical system, except for two things: you're going to need some staff, and you really need a handy source of water for all the cleaning that medical procedures require.

Lets talk about the water problem first. Water is an important resource in Dwarf Fortress. Dwarves don't drink it by choice, but when injured, it is what the dwarf is brought by dwarves with the *Feed Patients/Prisoners* labor enabled. Water is also used in the

process of treating a dwarf for injuries, not only to clean wounds, but also to clean the medical dwarves doing the doctoring. To provide an adequate supply of water, we will want to bring water to our hospital so the dwarves playing nurse and the medical dwarves don't have to travel far to fill their buckets.

There are two approaches to this. The first is to dig a room next to the hospital and channel down a small space in this room (perhaps 2x2 squares), and using the gather water process outlined in “[Bucket Irrigation](#)” on page 101, slowly fill the pond with water from an outside source. One would then set a zone over the pond as a water source, and dwarves would use it to gather water for medical use. A more reliable method is to engage in a bit of dwarven engineering and have a sump several levels below the hospital fill with water tunneled in from a suitable source. You can then simply channel a single square in the floor and build a well over the hole, thus providing a large supply of suitable water for your medical team. You also need to ensure that your well is not connected directly to a river, or you will flood your fortress. See [Chapter 11](#) for tips on handling water.



Water for use in a hospital should come from a clean, flowing water source, such as a river or a stream. Other water sources may be “stagnant” and likely to cause infection.

Medical Staff

By now, you may be the proud owner of a wonderful, state-of-the-art medical facility replete with on-demand water, brand new beds, operating tables, and stores of medical supplies. Now would be a good time to establish a medical team ready to leap in and save the lives of any dwarf that needs their help. However, the first step you must take to build a medical team is to understand how the process of taking a wounded dwarf and turning them into a healthy one works.

There are seven labors associated with medical work, two of which are simple hauling labors that every dwarf has enabled by default. Specifically, *Feed Patients/Prisoners* and *Recovering Wounded*, both of which are low priority, may be ignored by extremely busy dwarves. The other skills are listed in [Table 9-1](#).

Table 9-1. Medical labors

Labor	Used
Diagnosis	Before a patient is treated, they are diagnosed.
Surgery	Repairing internal damage and infected wounds.
Suturing	Stitching up open wounds.
Dressing wounds	Bandaging wounds that have been sutured.
Setting bones	Setting broken or fractured bones

Before medical treatment can begin, the injured dwarf is usually dragged to the hospital and tossed into a bed by a dwarf with the *Recovering Wounded* labor enabled. Though, if you have no hospital, the dwarf may just be tossed into their own bed (or any bed) and left there to await medical attention. Once in the hospital, the Chief Medical Dwarf (whom you appointed in your Nobles screen) is likely to be the first dwarf that any patient sees. The diagnosis skill of the Chief Medical Dwarf is used to determine the treatment the injured dwarf requires; once diagnosed, the required medical tasks will be queued up. Other dwarves with the diagnosis labor enabled may assist the Chief Medical Dwarf in making diagnoses, and it is a good idea to provide this assistance if the Chief Medical Dwarf appears to be getting overwhelmed with patients.

After diagnosis, the patient will be treated by dwarves who have the appropriate medical labors enabled. To ensure rapid treatment, you may wish to turn off all other labors from these dwarves (excepting perhaps the Feed Patients labor). This will hopefully result in a treated dwarf ready to get back out into your fortress and return to their life of always-impending madness, mushrooms, and complete submission to alcoholism.



Skilled medical dwarves are valuable. Keep them safe by not allowing them to recover wounded, and free from any other labors that may cause them to leave the confines of your fortress.

But even if a treatment plan is followed quickly and accurately, recovery isn't guaranteed. It is very easy for your well-tuned medical machine to throw a metaphorical gear (and for that gear to lodge, fatally, in the head of a passing dwarf). The simple fact is that medicine is hard and, usually, your dwarves won't be particularly good at it. A common complication is infection, which is why it is essential to have clean water close at hand, as well as soap to aid the cleaning of wounds and of the medical staff. Even then, bad luck can still strike and a favored dwarf will succumb to infection. Don't get too attached to the little folks.



Soap is made at a Soap Maker's Workshop (**b-w-s**) by combining lye made at an Ashery (**b-w-y**) with tallow or rock nut oil. Lye is made from wood burned to ash at a Wood Furnace (**b-e-w**).

Monitoring Medical Conditions

There are several very detailed screens that allow us to carefully monitor, in excruciating detail, just how wounded our dwarves are and precisely how poor their medical care has been. You may have already discovered the first screen: the health status of each dwarf is accessible from the **v** (*View Units*) menu. If you haven't found this information panel, then simply press **v** near any dwarf and then **w** for *Wnd*. This panel will show you the health status of the selected dwarf (or enemy creature), with the state of their body parts on the left and any current effects (such as unconsciousness) on the right.

The color of the text of the body part listed will indicate the nature of the wound at that location. The handy [Table 9-2](#) provides a guide to the meaning behind the wound colors.

Table 9-2. Wound colors

Color	Meaning
White	No wound at this location.
Tan	Minor wound, no function loss.
Yellow	The highlighted body part has reduced function due to damage.
Cyan	The body part no longer works.
Red	Broken body part or loss of tissue.
Grey	Missing body part.

As a creature gathers wounds, the list will grow and you will need to scroll using the **plus** and **minus** keys. Wounds will also be reflected in the thoughts of the dwarf. Select an injured dwarf using **v**, press **z** for *Status*, and then **enter** for *Thoughts and preferences*. Wound descriptions will appear on this page in some detail, along with some dwarf thoughts that probably indicate just how the wounds were gained. In [Figure 9-5](#), the wounds collected by a brave dwarf who fought off a sock-wielding giant can be read in detail. Yes. A giant. Who beats up dwarves with socks.



Figure 9-5. Bruised at the hands of a giant armed with a sock. No, really.

A detailed review of the health of all your fortresses' inhabitants can be found under the *Health* tab in the **z** (*Status*) menu. This menu is only available once a Chief Medical Dwarf is appointed. The fortress health report is divided into a column of fortress inhabitants on the left and then seven columns of health status information for each

creature (scrolling off the screen to the right). The up and down cursor keys will let you scroll through the list of creatures, while the left and right cursor keys will move the cyan highlight at the top of the screen across the seven columns.

As you move the highlight, the column key text at the bottom of the screen will change to indicate what the status characters on that column mean. In [Figure 9-6](#), the first column is highlighted, and reviewing the key, it is clear that six dwarves require diagnosis and three of these dwarves require a crutch to get around. The other columns indicate that most of the dwarves are bleeding and some have suffered severe blood loss. It should be no surprise that three of these dwarves are in extreme pain and two of them are having trouble breathing. Further distressing information is available on the subsequent columns. It is probably fair to say that my management of this fortress has been a little suboptimal.

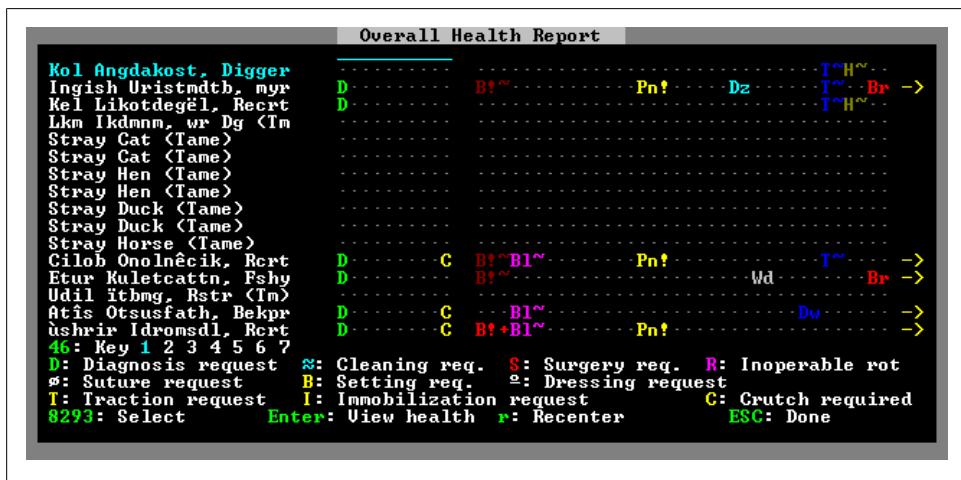


Figure 9-6. Health status screen; at least the cats are fine!



Injured pets will not be treated in hospitals. There is no medical care for pets in Dwarf Fortress at present.

Precise treatment history and further injury details can be found when you press **enter** with any creature selected on the health report screen. For each creature, there are tabs for their current status, wounds, treatment, and medical history. The medical history page can help pinpoint a healthcare bottleneck if you see several injured dwarves all waiting on the same kind of treatment. Bottlenecks are often caused by medical dwarves being distracted by other labors, or simply too few in number to keep up with demand. In [Figure 9-7](#), the medical history of a former recruit to the fortress military can be read (he failed selection during the “Can you kill this two-headed monster?”

The Health of Zulban Egathrith, Pumper				
46:	Status	Wounds	Treatment	History
21st Obsidian, 253:	Brought to rest in Bed		- Thob Oslanshetbêth, Administrator	
1st Slate, 254:	Evaluated		- Uucar Alaknish, chief medical dwarf	
14th Slate, 254:	Cleaned		- Mörul Mosusedtül, Diagnoser	
11th Felsite, 254:	Received pig tail fiber sutures on right upper leg		- Goden Lokumdallith, Wrestler	
14th Felsite, 254:	Received pig tail fiber sutures on left lower arm		- Goden Lokumdallith, Wrestler	
15th Felsite, 254:	Received pig tail fiber dressing on right upper leg		- Eríb íkthagkol, Presser	
18th Felsite, 254:	Received pig tail fiber dressing on left lower arm		- Etur Kuletcatten, Fishy	
8293:	Scroll		ESC:	Done

Figure 9-7. The medical records of Zulban Egathrith, unfortunate dwarf

trial phase). Unfortunately for this dwarf, treatment was so slow in coming that infection has set in, and it is probable that the Militia Commander will have to write another letter to the homelands.

Babies and Children

A busy fortress will inevitably become home to dwarf babies and children. Dwarves are babies from zero to twelve months, and children from their first birthday until they turn twelve. As babies, dwarves are usually carried by their mothers, who will automatically attend to their needs. Child dwarves will wander the fortress helping with basic jobs, but neither babies or children can be assigned labors. Children can, however, be struck by strange moods!

Babies can be born to any female dwarf with a lover or husband—even dwarves in combat, unconscious in the hospital, or locked up in jail. Upon giving birth, regardless of the dwarf’s current task or status, the dwarf will immediately cancel her current action, pick up her baby, and then carry on with her tasks. For soldier dwarves, this can be a problem, as babies make poor shields and even worse weapons. Furthermore, should anything happen to the baby, then the risk a tantruming mother soldier in full steel plate with a steel battle axe and years of training poses to the rest of the fortress is not inconsequential.

More tragically, should anything happen to the mother, the baby will be left to fend for itself. All the fortress manager can do in this circumstance is hope that the baby reaches childhood and the ability to move and feed itself before anything more unfortunate happens to it.

Death

It is inevitable that you will lose a few dwarves as you walk the path to greatness. What you do with the dead dwarves you accrue is quite important to the health and well-being of your fortress. There are three reasons for this: firstly, rotting dwarf bodies lying around your fortress tend to make living dwarves somewhat distressed. Secondly, rotting bodies cause miasma which, again, causes negative thoughts in those who encounter it. Finally, dead dwarves who aren't appropriately respected by their surviving brethren will come back as ghosts and haunt your fortress.

We can avoid the problems of traumatized dwarves and a haunted fortress by building coffins to place our dead dwarves in (at a Mason's Workshop) and installing the coffins somewhere convenient. Place coffins using the **b-n** for *Burial Receptacle*. Once the coffin is placed, use **q** to task the coffin to be used for **b** (*Burial*). Once this is done, you will probably also want to press **p** to toggle *Allow Pets* to (*N*) so that your coffins aren't filled with dead cats.

It is possible that you will not be able to recover a body for burial (perhaps the dwarf was dissolved by magma), leaving your fortress in danger of being haunted by a vengeful unmemorialized spirit—or worse, full of moody surviving dwarves ready to snap at the merest trigger. To get around this problem and help your dwarves work through their grief, you are able to make and engrave memorial slabs to the memory of the lost dwarf. There are two steps to this. First, add the *Construct Slab* task to a Mason's Workshop and once your slab (or slabs) are built, add the *Engrave Memorial Slab* task to a crafts-dwarf's workshop, selecting the dwarf (or monster!) to be immortalized. Suitable candidates are usually at the top of the list of creatures you can memorialize.



Ghosts can scare creatures to death, damage items, make sleep difficult, and generally be a nuisance. Don't let your fortress become a crypt!

Slabs are placed just like coffins, using **b** for *Build* and then **alt** and **s** for *Slab*. Once you have selected a location for your slab and pressed **enter**, press **x** to *Expand/Contract* the list of slabs, allowing you to choose the precise memorial slab you're after.

In [Figure 9-8](#), a rock spire has been dug out and is used as a burial place for dwarves. Coffins line the walls, and a number of statues surrounded by memorial slabs have been tastefully arranged in the center of the room. Using **q** on one of the statues, the room has been set as a sculpture garden and dwarves will find some solace in coming here to admire the statues and remember their friends.



Figure 9-8. Dwarves mourning their many, many dead

You may want to visit your memorials yourself and reminisce about the good old times when everyone wasn't dead. To view the memorial slabs and statues you placed, press **t** for *View items in Buildings*, and then select the object of interest. Press **enter** and then **v** to view the item's description. Figure 9-9 shows the words carved into a memorial slab of a dwarf lost in what I like to call "The Great Dying of '53" (which was followed by "The Great Dying of '54" and preceded by "The Great Dying of '52". There is a lot of dying in my fortresses).

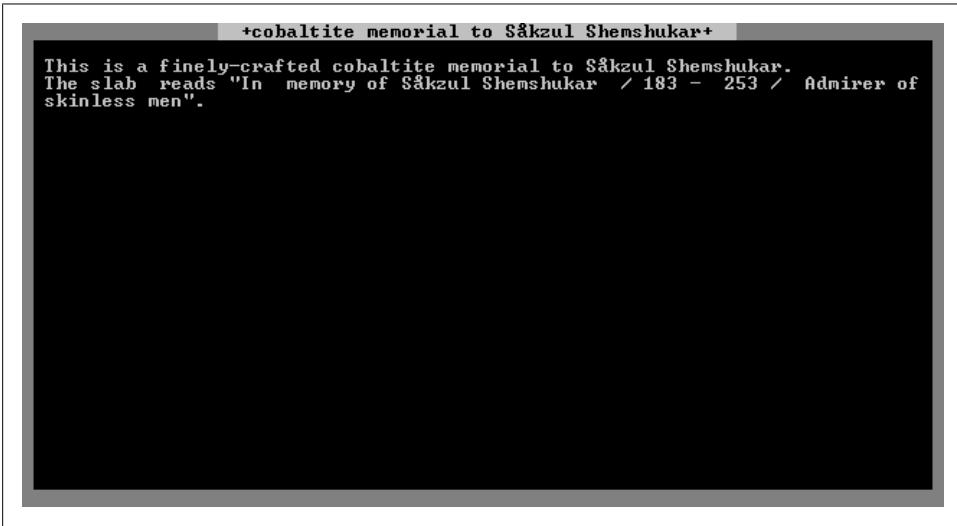


Figure 9-9. I really don't want to know what a skinless man is

In dire emergencies you may not have enough time to bury everyone before miasma and rot spread around your fortress. If you fear this could happen, it is advisable to place a corpse stockpile (**p, y**) somewhere secure and outdoors where bodies can be carried and dumped. This will also ensure that dead pets are tidied away and don't cause an unsightly mess. Don't worry: dead dwarves dumped in a stockpile will be moved to coffins once suitable accommodations can be found.

GOOD FOR THE GOOSE

from Vic Horsham

The dwarfs are all hiding out in the food stockpile, safely burrowed from an invading forgotten beast



A disguised vampire decides to attack



Due to the crowded location, there are plenty of witnesses.



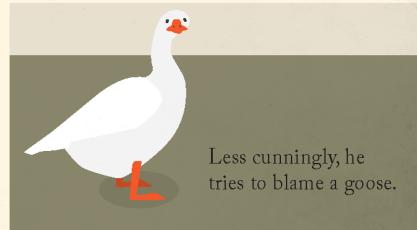
9 of them accuse the same dwarf, Urist McVampyfangs.



The final "witness" turns out to be Vampyfangs himself, who cunningly tries to lay the blame for the attack on someone else.



Less cunningly, he tries to blame a goose.



The



End

The Military

Perhaps the most complex subject in Dwarf Fortress is the military system. If any one game system has caused players to give up and run from `dwarffortress.exe` in terror, it is managing and maintaining a capable dwarven military. Although it is easy enough to throw a handful of recruits together and send them headlong at some invading goblins, keeping them alive so they can do it again is another matter. This chapter will cover getting your recruits trained and equipped to the point where they aren't turned to bloody chunks mere seconds after combat has begun.

Introduction

The military systems of Dwarf Fortress are powerful and deep, but also complex. The concepts the systems are based on are easy enough to understand, but navigating the military menus and actually making what you want to happen *happen* can be confusing. Let's break down some of the features we'll be playing with:

Squads

Your dwarven military are organized in squads of up to ten dwarves. These dwarves train together, wear the same uniform, equip the same weapons, and march to war together. Squads are led by Militia Captains, minor nobles who are appointed when the squad is formed, and who are subordinate to the Militia Commander.

Uniforms

Each squad can be assigned a uniform you've specified; a default one, or an individual uniform custom-configured for a dwarf you are particularly fond of. To the best of their ability, your military will try to equip themselves as instructed.

Weapons

Weapons are part of a dwarf's uniform, and consist of either a crossbow or a melee weapons such as a sword, axe, warhammer, or spear. Dwarves with crossbows can fire crossbow bolts at enemies on the other side of fortifications or in the air. Melee-equipped dwarves must chase down an enemy and destroy them face-to-face.

Training

Squads will spend most of their time training or patrolling, ready to be used in combat. You can also create “part-time” soldiers who spend some of the year training and the rest of the year engaging in their civilian jobs.

Barracks

The life of your military centers around their barracks, which is where they will go to train. Setting up a barracks is a simple but crucial task.

In subsequent sections, we will create a squad, set its training schedule and equipment, and then build a barracks for the squad to train in. With these tasks complete, we will set about using our machine of destruction to inflict some damage on the local flora and fauna—and maybe even some goblins!

First Steps

The best way to learn the military system is to build a military yourself. Let's walk through building a barracks and creating, equipping, training, and controlling your first military squad. Once you are able to effectively build one squad, you will have no trouble building a large and fearsome military force. But before you begin working through this chapter, you will need a few things: first, your fortress should have at least twenty dwarves in it, as you're going to draft five of them into the military and you don't want to deplete your labor force too greatly. Second, it would be nice if you had some armor and weapons lying around, either smelted yourself or traded for. Even wooden training weapons will do for learning the basics of the military system. Finally, you should have read [Chapter 6](#) and [Chapter 8](#) so you have a good baseline of knowledge to work from. Let's get started.

Create a Squad

Your first task is to select some dwarves for military service. In time-honored tradition, it is best to try and find dwarves who are entirely expendable. There are two methods you may use to find suitable dwarves. For the impatient, simply scan through your **u** (*Unit List*) for any dwarf who is idle or whose job title sounds unimportant. When you have found a suitable candidate, press **v** for *View Unit*, **y** for *Customize*, and then **p** for *Customize Profession Name*. Rename the profession of this individual to *Soldier*, hit **enter**, escape back to your unit list, and continue your hunt until you have changed the profession of five dwarves.

The slightly more time-consuming version of this task is to find candidate dwarves and then, using **c** for *Zoom-Cre* from the unit list, check if they have any existing combat skills and also whether they are male or female. In Dwarf Fortress, female soldiers perform just as ably as male soldiers—but if they give birth while in the military, the baby will be carried into battle. This can lead to unfortunate accidents and, potentially, the predictable tantrum spiral.



Dwarf Therapist makes selecting a number of candidates and setting a custom, memorable profession a breeze.

With candidates found and recognizably named, you can now head to the *Military* screen by pressing **m**. This screen is the engine room from which you direct your military. There are other screens where you can exert some control over your troops, but you will find yourself returning to the *Military* screen regularly in order to manage your squads.

The *Military* screen is divided into three sections. The top third of the screen is an information panel that provides summary information and contextual menu options. The middle third shows a list of squads on the left; the squad's current members in the middle (once a squad are selected); and on the right, the remaining dwarves in your fortress that you may appoint to your military. The bottom panel indicates hotkeys for the major military submenus.



Unlike many Dwarf Fortress screens, the *Military* screen can be entirely controlled with mouse clicks.

Start by ensuring that *Militia Commander* is highlighted. You could create a squad under the Captain of the Guard, but guard squads need to be equipped carefully lest dwarven justice result in fatalities. For now, let's create a standard military squad led by the Militia Commander. Don't worry if you haven't appointed a Militia Commander yet; the first dwarf in your squad will gain that title automatically.

As per the contextual menu at the top of the screen, press **c** for *Create Squad*. You will now be prompted to select a default uniform for your soldiers (Figure 10-1). If you have already made or bought some armor items, select the uniform that best matches your stocks and press **enter**. If you aren't sure which uniform to select, choose metal. Don't worry, you can precisely manage the armor worn by your troops later.

The framework for your squad is now created. On the left, you will see the new name of your squad (where *Militia Commander* used to be). In the middle of the screen, the current members of the squad will be listed (but there will be no dwarves listed here



Figure 10-1. Squad armor selection

yet). Using the cursor keys, move your highlight to the list of dwarves on the right and start scrolling down, looking for your soldier candidates. As you scroll through dwarves, their name will appear in the top left, and if they have any weapon skills, that will be noted. This is another way of finding soldier candidates that could work if you're in a hurry, but it does run the risk of recruiting female dwarves, those who may be infirm, or those who are vital to the success of your fortress (for example, your farmers).



As a new feature, you can name squads by pressing **N** from the squad list page of the military menu.

When you find one of your five recruits (they should be easily recognizable by their custom profession), press **enter**. You will then see them added to your squad list and removed from the candidate list. Keep scrolling through the list of dwarves and adding your recruits; eventually, your screen should look something like [Figure 10-2](#).

Equipping a Squad

If you've made it this far, congratulations! You have created your first military squad! But before you get too cocky, you're nowhere near done yet. Let's set up the squad's equipment and training regime. Start by pressing **e** for *Equip* from the *Military* screen. The right and top panels will now change to reflect what each dwarf has been ordered to equip. By default, they will all be ordered to grab a range of armor and then weapons based on individual choice. Were you to unpause the game, the dwarves would rush off and grab what equipment and weapons they could. However, you may wish for a little more control.

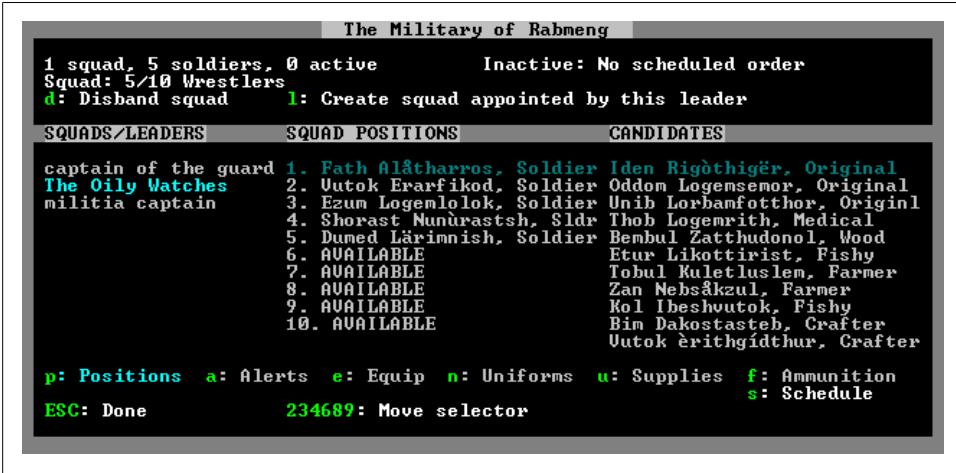


Figure 10-2. The brave Oily Watches! Good luck to every dwarf!

Let’s move on from the *Equip* screen and press **n** for the *Uniforms* screen. Your view will now switch to show the current available uniforms. We’re going to add a new uniform to this list.

First, press **c** for *Add Uniform* (you will note that the contextual menu at the top changes as we move through the screen options at the bottom of the window). Press **N** to *Name Uniform*, I’m naming mine “Bonebreakers”, and you can choose something appropriately amusing for your own uniform. The top option panel shows that, by default, armor is selected; and on the far-right side of the middle panel, all possible types of armor are available. Scroll through that far-right list and select some armor that you’d like your dwarves to wear—ideally, a type you own or plan to make soon.

Navigate the list with your cursor keys or the mouse. Add *Breastplates* and *Cloaks* (we want our military to look snazzy!). Then, press **L** for *Legs* and select *Greaves*. Now, let’s move on to *Helmets* (using **H**) and add *Helms* to our uniform. In a similar vein, add some *Low Boots*, *Shields*, and *Gauntlets* to your uniform using the other item categories listed at the top of the screen. Finally, add a weapon using **W**. If you have a stock of a certain type of weapon, such as battle axes, you can select them from the list. Alternatively, *indiv choice*, *melee*, will do the trick in a pinch.

We have now broadly specified a uniform for our dwarf soldiers to equip. If you have no idea if there are any armor stocks available in your fortress, you should skip the next part about specifying that the armor should be metal.

But if you are confident that you have enough armor lying around to equip your squad, press **M**, cursor across to the selection, highlight *metal*, and press **enter**. You will need to move through each item one-by-one, selecting *metal* for each in turn. The exception is the cloak, which can be left at *any material*. Once all your armor items are set to a material type, your uniform screen should look something like [Figure 10-3](#).

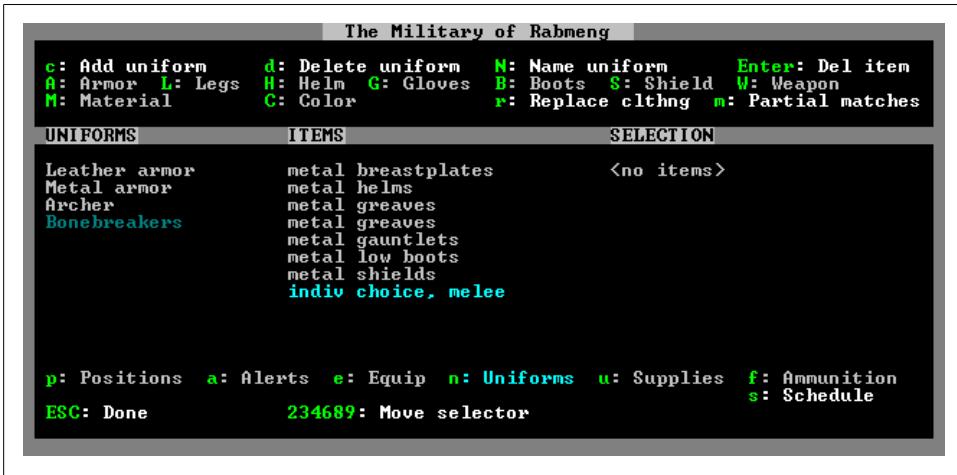


Figure 10-3. It's dress-up, but with dwarves!

At this point your first custom uniform is complete. If you wished, you could continue to tweak the uniform as you make suitable items—perhaps providing matching blue socks, thongs, and cloaks for everyone? Stylish! Or how about robes decorated with cloth images for all of the fortress guards? Impressive!

But wait! Before you rush off to grow more mushrooms, recall that we initially set our dwarves to have a different uniform than the one we just created. We want to change that now to our custom-made uniform. At the *Military* screen, press **e** for *Equip*. Your squad should be highlighted and the currently set uniform of the first dwarf will be described on the right. Let's assign our custom uniform by pressing **U** for *Assign Uniform*. The rightmost middle panel will change and you will see a list of available uniform settings. Scroll across and down to your custom uniform, and, per the onscreen instructions, press **shift** and **enter** to assign the uniform to the entire squad.

With that task complete, pressing **V** for *View/Customize* will take you back to the default *Equip* tab view. Each dwarf in your squad will now have the items you selected for the uniform listed against their name in the rightmost *Position Uniform* panel. When you exit the military menu, your squad should start searching for and wearing the items you have instructed them to equip. In a minute or two, when you check the *Equip* screen again, you should see green tick marks appear next to uniform items, indicating that they have been located and are being worn or equipped by your soldier.

In [Figure 10-4](#), our squad commander Fath Alatharros has managed to acquire all the items we ordered. Unfortunately for Fath, this fortress is somewhat short on metal armor and he has had to make do with wooden armor pieces he found lying around. Good luck, Fath, I'm sure your wooden gauntlet will deflect goblin axe blows just fine!

The *Equip* panel also lets you customize an individual's uniform on the fly. Perhaps you want to give the leader a special weapon—simply highlight the dwarf, scroll across

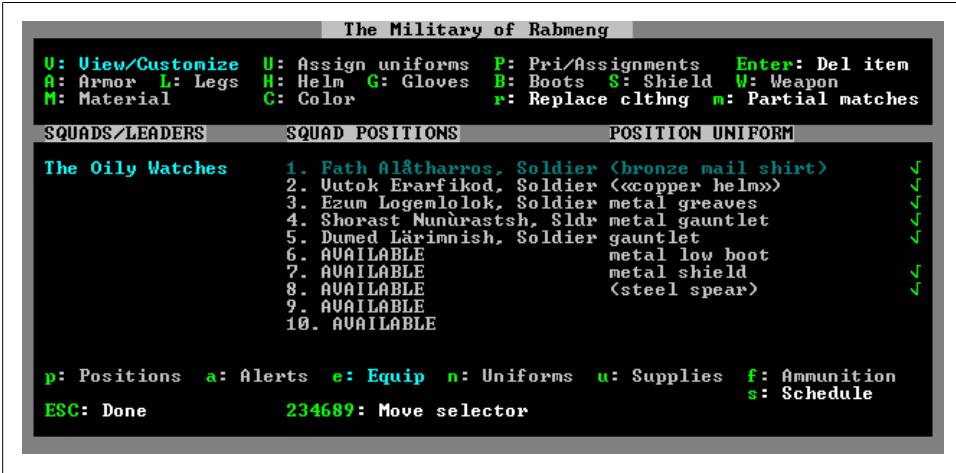


Figure 10-4. Fath is fearsomely armed

and down to the default, uniform-set weapon, press **enter** to remove it, then press **W** for *Weapon* to select something different. You can be extremely precise in your item selections. Press **enter** on *Specific Weapon*, and all weapons in the fortress will be available for you to flip through. If you are ever fortunate enough to get an artifact piece of armor or weapon, this is how you can select the dwarf to wield this boon. If you then cursor back across to the other dwarves in the squad, you will see that any change you make to equipment from the *Equip* menu is unique to the individual you have just modified, not the squad as a whole.

Build a Barracks

Your next task is to build a space for your soldiers to meet and train. It doesn't need to be big, but it should usually be located close to your fortress entrance so that your military are on hand to smite any invaders. Later on, once you have a few squads up and running, you may wish to station squads deeper underground where problems from caverns and...worse...may appear.

Dig out or repurpose an appropriate space and then place a coffer, an armor stand, or a weapon rack in the room. These items can all be built at a Mason's Workshop. Once the item is placed, simply press **q**, highlight the item, press **r** for *Make Barracks/Armory*, and resize the room so it encompasses a dozen-or-so squares. Once you are ready, press **enter** to set the room size and then review the room information panel.

The barracks options define how the room will be used by the squads in your military. Using the **plus** and **minus** keys, you can cycle through squads listed in your barracks information panel (if you have more than one), and then press the keys indicated at the bottom of the screen to apply settings to the highlighted squad. In [Figure 10-5](#), a

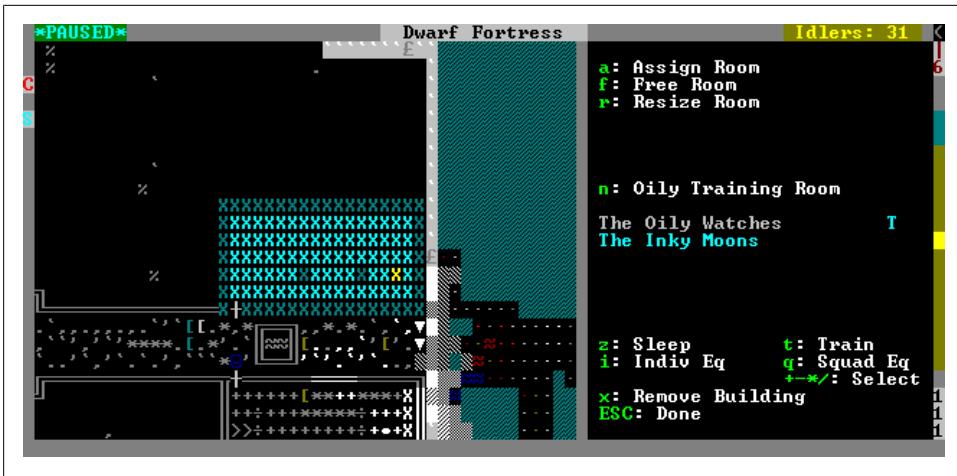


Figure 10-5. Setting up a barracks

barracks has been built just inside a fortress entrance (the entrance is a level below and through a waterfall, by the way!). The Oily Watches have been set to train in this barracks, whereas the Inky Moons aren't required to train here.

If you have enough beds placed in the barracks (one for each squad member), you may also choose to tell the military to sleep in the barracks with the **z** (*Sleep*) barracks option. However, so long as your barracks isn't more than a ten second walk away from your bedroom levels, it may be wiser to let the recruits sleep in their own room. My instinct is that the happy thoughts generated from the lavish bedrooms each dwarf in this fortress enjoys ("You get a chest! You get a chest! Everyone gets a chest!") are more valuable than the slight reduction in training time due to walking distance. But if you place a barracks a long way from your bedrooms, you might wish to insist that the dwarves sleep where they train, to prevent wasted time from dwarves walking to and from their bedrooms.

You may also choose to make a small dining room near your barracks, along with a stockpile for booze and stockpile for prepared food. This will encourage your military to dine locally rather than walking halfway across the map to find a good meal. The more time your military spends training, the better!

Keep in mind that barracks can provide a lot of useful control over your squads. A single squad can use multiple barracks, and multiple squads can use a single barracks. In this way you could have a communal sleeping area for all your squads, but separate training areas for each squad at various strategic locations around your fortress. For example, you may have your military train outside to ensure that they don't become cave-adapted, but bed them down near the workshops in case any dwarves with strange moods go crazy and need to have some justice immediately and vigorously applied to their foreheads.

Marksdwarves

In due course you may wish to start a squad of crossbow-wielding dwarves (marksdwarves) who can pepper your enemies with pain from behind your fortifications. The process to set this up occurs in much the same manner as with melee-focused squads, but with a few minor differences. You will need to create a uniform for your marksdwarves that includes a crossbow, and we're going to need to ensure that marksdwarves squads are appropriately armed with ammunition.

Assuming you've set up a uniform for your marksdwarves that includes a crossbow, created a squad, and equipped them, the next step is to assign ammunition. From the *Military* screen, press **f** for *Ammunition* and select the marksdwarf squad from the subsequent menu using the cursor keys. Press **c** to *Add item*, and then press **enter** with *Bolts* highlighted. By default, your dwarves will now fill their quivers with any bolts they can find and use them in both combat and training (indicated by the *C* and the *T* next to *Bolts*). You can adjust the quantity of bolts assigned to the squad with the **plus** and **minus** keys. See [Figure 10-6](#).

You can assign different types of bolts to your squads, and this is usually a good idea. For example, you may wish to assign wooden or bone bolts to your squads for use in training and reserve metal bolts for combat. To set this scenario up yourself, add another stack of ammunition to your squad. Next, press **M** to set the *Material* of the bolts. If you have made (or plan to make) wooden or bone bolts (fabricated at a *Craftsdwarf's Workshop*), select the appropriate material for one stack and then remove the *Use in Combat* flag by pressing **C**. Next, select the remaining stack of bolts and set the material to *Metal* and toggle off their use in training using **T**. Metal bolts are made at a *Metal-smiths' Forge* and are going to do more damage than wood or bone bolts.



Figure 10-6. Ammunition settings established, and some bolts collected already

It is important to remember that the total bolts assigned to a squad are split across each member. You should try not to confuse your dwarves by assigning more bolts than their quivers will hold; thirty per dwarf should be enough. Adjust your bolt numbers appropriately until the ratios are correct for your squad.

You are going to need a lot of bolts if your marksdwarves are training regularly. If you have butchered a few creatures, you will have a good source of resources in the bones that may be lying around in a corpse stockpile outside. A couple of Crafts Dwarf's Workshops can be set to produce bone bolts and wood bolts, and these make great supplies for your marksdwarves. As you establish a metal industry, you may wish to start producing iron (or even steel) bolts, which will enhance the damage your marksdwarves inflict on their foe. Consider speeding the rearmament of your marksdwarves by building ammunition stockpiles in your barracks, and even near where they are likely to be deployed when defending your fortress. These smaller stockpiles, perhaps set to take from a central stockpile, will help keep training running smoothly for our crossbow dwarves and make visually checking stock levels much easier.

An important part of equipping your marksdwarves is to ensure they have a quiver each. They will all automatically collect a quiver if one is available, but if you suspect you are short of quivers, order some made at a Leather Works. While you're at it, add backpacks and waterskins to the queue. Each military dwarf will carry spare food and drink in backpacks and waterskins, making them able to stay out on patrol longer.



The alcohol stored in waterskins and flasks can catch fire and cover your dwarves in flaming booze. It's tragic, *and* funny...until your booze stockpile explodes.

Once you have given your marksdwarves enough time to pick up their equipment, locate them in your unit list and press **c** to view them. From the **g** *Gen* information panel, press **i** for *Inv* and you will be able to examine the progress your dwarves have made in equipping themselves—something I find myself doing frequently with marksdwarves. I'm always nervous that my marksdwarves aren't stocking up on bolts, so I often scroll through their inventories looking for bolts in their quivers (select the quiver with **plus** and **minus**, and then press **enter** to examine it). In [Figure 10-7](#), one of the marksdwarves has managed to find some ammunition and is ready for battle!

Archery Targets

Marksdwarves need specialized equipment (an archery target) in order to develop their crossbow skills. Archery targets are built using **b-A** and placed where you fancy, perhaps in a room near the rest of your military. Once placed (and you will want to place several targets so that all your marksdwarves have a chance to practice), use **q** over each and every archery target and press **r** for *Make Archery Range*. Ensure that the archery target "room" allows enough space for a dwarf to stand a couple of tiles away from the target so the bolts have some distance to cover when fired. You also need to ensure that you



Figure 10-7. Dwarf Fortress: We turn the bones of lovebirds into ammunition

specify the direction the bolts will be fired in. With the room size set, you can press one of the indicated keys to set the target direction.

With the room specified on each target, you will now need to **q** through each target and—using **plus** and **minus** to scroll the squad list—press **t** to tell the squad to train in that location. If you don't tell the marksdwarf squad to make use of every target for training, they won't. Once the targets are set as training facilities, marksdwarves should start turning up and filling the air with bolts (Figure 10-8). As you will soon notice, bolts are expended in training and are unrecoverable, so you will need to ensure that you have dwarves producing enough wooden or bone bolts for training to keep the marksdwarves busy.

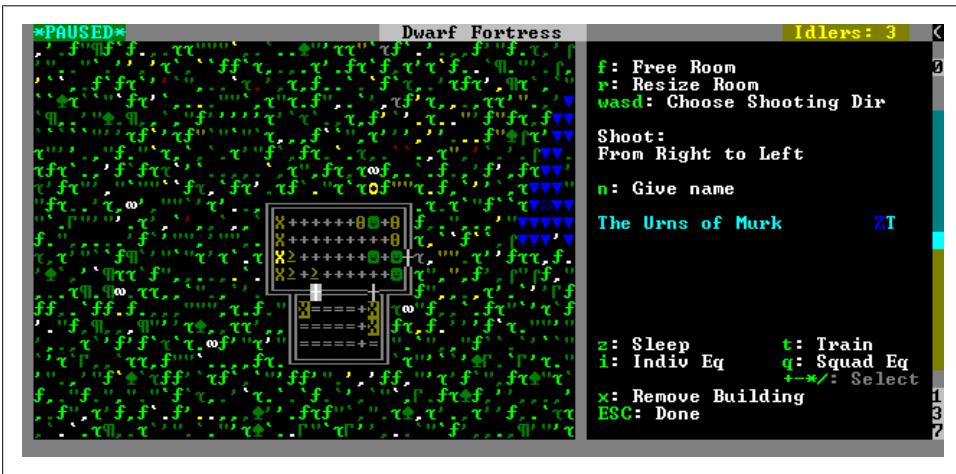


Figure 10-8. Marksdwarves train at a small military outpost

If you are concerned that you will run out of bolts due to resource constraints, you can put a line of channels in front of your targets and some of the training bolts will end up at the bottom of the pit. You can then recover these bolts by dropping a level, using **k** for *Look Around*, and then pressing **f** to unforbid the bolts you discover. Use the **plus** and **minus** keys to scroll through all items in a square if there is more than one bolt to reclaim. Alternatively, master the **d-b-c** sequence to reclaim everything in a set area at once.

To help keep your marksdwarves from roaming all over the map, you should also allocate the squad to train at a barracks you've defined near the archery targets. Marksdwarf squads need to be told to train both at a barracks and on a number of archery targets in order to properly train their weapon and defensive skills.

Training Schedules

By now you have created a military squad, designed a uniform for them, made them equip it, and given the squad a room to train in. However, what you won't see yet is your soldier dwarves engaged in individual practice, or attending or organizing training. First of all, you will need to activate your squad from the **s** (*Squads*) menu. Once the squads panel appears, select your squad with the appropriate letter key and press **t** to toggle between *Inactive* and *Active/Training*. Escape out and enjoy the flood of messages about dwarves becoming recruits. Congratulations! You now have the start of a functional military! Your dwarves will now set about practicing their skills and, over time, become capable soldiers.

But, before you race off to the next interesting challenge, it would be a good idea to have a look at the training schedule screen. Press **m-s** for *Schedule*. The Schedule screen lets you manage the default behavior of your military dwarves and specify what activities they engage in month-by-month. You do not need to touch anything in this screen right now, but you should understand what the screen in [Figure 10-9](#) is telling you.

First, the months are listed on the lefthand side of the screen; then, the activity each squad is ordered to undertake is listed under the squad's name. By default, your squad will be set to train each month with a minimum of 10 dwarves. You can also use the *Schedule* screen to specify whether your dwarves will sleep in their rooms or the barracks, and whether the dwarves will keep their uniform on when they are inactive—leave these options at their default settings. There is little reason to have dwarves changing equipment, and we have already addressed how dwarves will sleep via the barracks screen.

Using the cursor keys, explore the training columns and press **e** for *Edit Order*. With an order edit screen listed, press **o** to cycle through the orders you can give to your dwarves. As you can see, you can set your dwarves to train, patrol, station themselves (wherever you have placed a note), and defend a burrow (more on that later).

```

Squad Schedules: Active/Training
Months <-- Squads: The Oily Watches The Inky Moons +-->
Granite Train Train
Slate Train Station
Felsite Train Train
Hematite Train Station
Malachite Train Train
Galena Train Train
Limestone Train Station
Sandstone (Current) Train Train
Timber Train Train
Moonstone Train Station
Opal Train Train
Obsidian Train Station
n: Name grid cell s: Sleep in room at will u: Inactive = Uniformed
Station at Defend the Depot!, 10 minimum

o: Give order e: Edit order x: Cancel order c: Copy orders p: Paste orders
234689: Move selector Tab: Order list /*: View alerts

ESC: Done Shift+Tab: Swap squads/months

```

Figure 10-9. Scheduling squads



Small squads train skills quicker. Two-dwarf squads train the fastest due to frequent sparring sessions, but tiny squads do require more micro-management.

In due course, you may wish to have dwarves train for part of the year and spend the rest of the time patrolling a route (or even going off-duty for a period of time). You may also wish to have some dwarves in a squad always off-duty, and reducing the minimum number of dwarves ordered to engage in an activity will make this happen.

Shuffling troops in and out of training does come with some risk, however: if your military dwarves are not dabbling in a military skill or a civilian trade, they will get an unhappy thought when drafted, and then unhappy thoughts when released from the military! In most circumstances, it is better to have a military force training full-time, and only adjust the orders schedule screen if you wish to create an armed home defense force. In time, you may also get military dwarves unhappy at being on duty for a long time. In this situation, either provide the unhappy dwarves with extremely lavish rooms decorated with containers and statues, or perhaps make a squad inactive for a period of time until happiness levels stabilize.

Directing your Troops

You now understand the basics of establishing and training a functional military force. What we need to cover now is how to order that force around so you can start inflicting pain on the bad guys. From the main screen, press **s** for the *Squads* menu. The *Squads* menu provides immediate control over your dwarves. By pressing the key corresponding to the squad (or **shift** and several keys to select multiple squads), a range

of options open up to you. Of immediate interest should be **m** for *Move*, which presents a cursor you can place (and to which the squad will try to move), and **k** for *Kill*, which presents a cursor you can place on a creature you wish to mark for doom (shown in [Figure 10-10](#)). You can also select creatures from a list using **l** or mark a rectangle of targets by pressing **r**.

In addition to placing a cursor where you want your troops to go, the *Move* command lets you quickly send your squads to any area where a note has been set. You could, for example, place notes (using **N**) at all locations of interest around your fortress and then, using the hotkey from the *Move* order, rapidly send troops to various locations. In a particularly large fortress, this could be a little easier than manually scrolling around the map—especially if you’ve developed a “standard” defensive posture you want to repeat at every goblin attack.

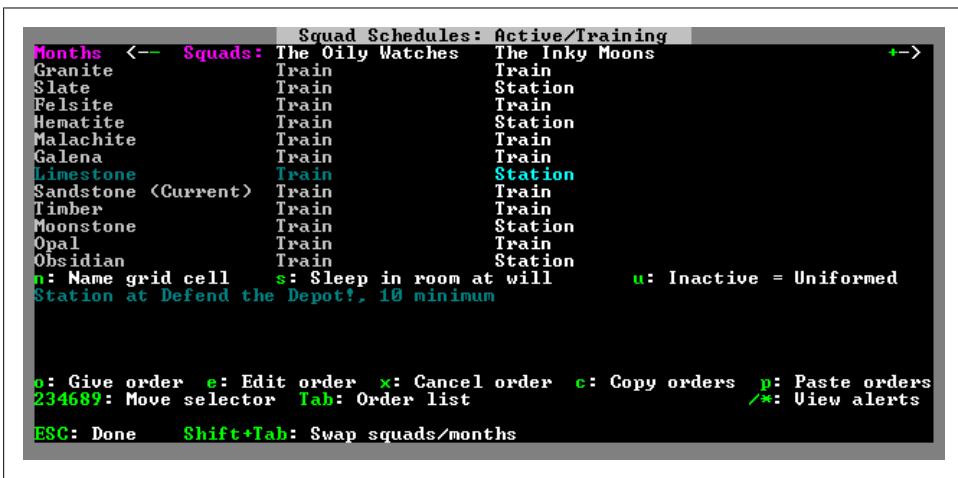


Figure 10-10. One squad is ordered to the edge of a frozen river, another to kill a rodent man

Direct orders issued from the *Squads* menu will be acted upon immediately—although if your dwarves are asleep or perhaps distracted by a tastefully arranged door, they might take a little longer than you would like to respond to your commands. For this reason, it is usually a good idea to rally the troops at a safe location close to the threat before you send them in at that bronze titan. In this way, as many troops as possible will arrive at the target at the same time, rather than in easily squished dribs and drabs.



Placing a dwarf in a one-dwarf squad is a great way to gain direct control over a dwarf for a period—useful for telling vampires to go stand on that bridge over the magma sea.

You can cancel a current order at any time by selecting a squad (using its key from the *Squads* menu) and pressing **o**. You will need to do this after successful kill orders, as

the dwarves will still list the order as active when the target is no longer alive. You will also need to remember to cancel *Station* orders, as dwarves will dutifully stand around and ignore training commands while under direct command from the *Squads* menu.

Enemies

You will face a range of enemies during your time as a fortress manager, ranging from the mundane and annoying to the downright terrifying. Your most basic threats include animals, goblin thieves and snatchers, and various kinds of beast men. Tougher enemies include the armed and armored goblins that come with sieges, and various entities that you can discover in deep caves—or who may arrive at your fortress and discover you! As your map is explored and creatures spotted, you can review the list of creatures under the *Others* tab in the **u** *Unit List*. Let's review some threats that your fortress may face.

Wild Animals

Depending on where you embark, you may have any number and variety of creatures on your map. Most of the time these will be benign, but some, like keas, monkeys and bears, can be pests. Many creatures love to get in among your stocks, and either steal something shiny or eat or drink from your supplies—often scaring your dwarves and causing building cancellations in the process. Wild animals make great target practice for your troops, but keep in mind that some are more fierce than you would expect. Elephants, bears, and unicorns, for example, can be significant threats to poorly trained or equipped dwarves, and you should exercise caution in taking on these larger beasts.

Thieves and Snatchers

Kobold thieves and goblin snatchers will arrive at your fortress solo or in small groups from as early as your first year. By default, thieves and snatchers are hidden until spotted by one of your animals or dwarves. Thieves will often attempt to enter your fortress to steal a valuable item, whereas snatchers will try and steal any child they can reach, stabbing anything that gets in their way. While thieves can slip past traps and locked doors, snatchers cannot; a well-trapped entrance is an important part of your defensive planning.

You should also take measures to increase the chance that you will spot these skulking filth. Animals secured near your entrance are a cheap and easy defense that is simple to set up. First, place ropes or chains (**b-v**) near your entrance, and then use **q** over the rope to attach a dog to the rope. Ideally, any snatcher or thief must walk past your guard creatures and will be spotted before they can cause any trouble. Traps will be covered in the next chapter.

Once spotted, thieves and snatchers will usually try to leave the map. If you are lucky, you will see them early and be able to send in your military to get some easy training (neither thieves nor snatchers are terribly threatening to well armed dwarves). If you are unlucky, they will only be spotted after they have already snatched something (or worse, someone), and you will be hard-pressed to catch them before they exit the map.

While thieves can usually be classified as merely annoying (although if they steal an artifact you will have a very upset dwarf), snatchers can cause unhappiness in parents due to the loss of their children. In due course, snatchers will cause another problem: snatched children develop some sort of dwarven Stockholm Syndrome and may come back to attack your fortress along with their goblin kidnappers!

Ambushes

Once your fortress grows wealthy and houses more than a few dozen dwarves, enemies are going to start taking an interest. Your most likely opponent will be goblins. Goblins usually arrive well-armed and armored, but trained military dwarves will usually see them off without too much trouble. Untrained or outnumbered dwarves will find defeating goblins much harder, and you will often have a few deaths and injuries from an ambush (especially if the goblins bring archers).

Encouraging goblins to approach your fortress through a minefield of traps will help thin their numbers, but you will often need to clear the last few attackers out yourself should the goblins refuse to advance into your inviting, attractive, and deceptively named “Fun Hall”.



Ambushing goblins will often be discovered as a caravan arrives. If you can, save the caravan and its people—otherwise, collect the free loot later!

At first, attacks will be ambushes of about a half-dozen goblins. The goblins will move about the map—hidden until spotted—whereupon the ambush will be announced and your view snaps to the attacking goblins. Unfortunately, it is often a dwarf of yours doing the spotting while out collecting plants, bees, or stray socks, and it isn't uncommon for this dwarf to meet an unfortunate end on the point of a goblin spear. Upon discovering an ambush, it is wise to engage your burrow rules (more on that later) to make all of your dwarves run to a safe zone while you activate your military.

Goblin ambushes aren't hard to put down and, as with all ambushes and sieges, once you've done some damage to the attackers, the enemy is likely to run. Unfortunately, goblins can do quite a bit of damage on their own. They will kill any pets and livestock they can reach, and cause non-military dwarves to flee in terror and cancel jobs. Extensive traps and walled-off pastures will almost certainly blunt any attack, especially if your defences are stiffened with marksdwarves on the walls and waiting soldiers.

Sieges

Sieges are more significant than ambushes and are announced as soon as the sieging troops enter the map. Sieges may consist of several squads of enemy (commonly goblins), some of whom (squad leaders) can be extremely dangerous. The sieging troops may bring friends, such as building-destroying trolls or ogres who can bash down doors. These huge beasts are fearsome in battle.

Siege troops may be mounted on other creatures—even flying creatures—and the combination of enemy and aggressive animal should not be underestimated. A sieging force can be quite a threat if your military is sent charging into their midst, and so it is common to let much of a siege dash itself against your defensive traps and engineering before mopping up with the troops.

Beasts and Monsters

As your fortress grows and you dig deeper, you may face strange and terrifying beasts. Some will appear on the surface, and present a significant threat to any dwarf they encounter. Some will be uncovered as you dig into underground caves. The powers of these unique creatures can easily be game-ending. The “forgotten beasts” you uncover underground can be particularly threatening, due to the randomized combination of qualities and features they possess. Poison sprays, necrosis-inducing dust, and webs are some of the weapons that may be at a beast’s disposal—and with their ability to destroy doors, forgotten beasts can be hard to hold back. Until you are confident you can take a beast on, it is often best to try and wall them off from access to your fortress. No need to take any chances!

If you fear that your military has come into contact with poisonous blood, dust, venom, or excretions, you will need to promptly quarantine and then decontaminate your troops. Examine your soldiers and look carefully for any odd substances in their inventory. If you see something suspicious, do not let your military dwarves mingle with your civilians and keep civilians away from the contaminated area—possibly for good.

Next, you will need to decontaminate your dwarves. Having them walk through water (dwarves will pass through water no deeper than 3/7) or be washed by a waterfall should clean off any nasty goop. Any water used to wash your contaminated dwarves may become permanently dirtied so be mindful of how you clean your troops. If none of these options are available to you the dwarves will clean themselves in due course, but a few strays pets and dwarves may be injured through contamination along the way.

The Undead

The various forms of undead can present a significant threat to your fortress. Undead have a tendency to be hard to kill and even if you do kill them (again), they are likely to come right back at you (although often in pieces). The easiest way to avoid many

undead problems is to avoid any evil biomes when you embark. Evil areas are highly likely to have nasty undead, and may even cause anything freshly killed to come back to life. There's nothing more harrowing for your dwarves than being beaten to death by the reanimated skin of the yak they just killed.

Even if you avoid evil zones, it is still possible that you will face a necromancer and their minions as an invading force—especially if you embark near a necromancer's tower. If this happens, you need to be extremely careful, as it is possible the necromancer will cause already dead things to spring to life and attack your dwarves. Yes, it is possible to lose a fortress because undead mussel shells from your refuse stockpile are savaging your dwarves' ankles to death. If a necromancer besieges your fortress, it is best take extreme caution in attacking the invaders with your military—instead, try to rely on traps and magma to destroy the invaders.

Happy Fun Stuff

You will be pleased to learn that there are things down in that depths that are even worse than forgotten beasts. The Dwarf Fortress community considers revealing spoilers about these features bad form, and so has termed this category of threat “Happy Fun Stuff” or “Hidden Fun Stuff” (HFS for short) as a way of protecting the secrets. There are other great terms adopted by the community: for example, “clowns” are associated with the HFS, and are often discovered when digging for “candy”, a nickname for adamantine.

As you may now have realized, I also believe in leaving a few secrets untouched by the tentacles of this guide, so I will leave you with these words of wisdom: be careful of digging too greedily, too deeply.

Advanced Tips

You are now perfectly equipped to establish a military force and to defend yourself against a range of opponents. At least, most opponents. Well, perhaps some lightly armed hamster-people might present a suitable foe. But do not fear! If you face worse and it all goes wrong, remember that Losing is Fun! If at first you fall to a horde of undead ravens, pick yourself up and try again. Next time you will probably lose to organ-liquifying dust that spreads on contact among your dwarves, but you will have made progress! Each loss makes you stronger!

Enough with the pep talk: let's look at some advanced military topics that will help give you an edge against the many foes you will face.

Danger Rooms

If you get impatient with the speed at which your military trains, you could employ the “Danger Room” training technique. Although some in the Dwarf Fortress community

consider these to be something of an exploit, Danger Rooms are a useful tool and should be considered when you need to train troops in a hurry. A Danger Room is a small barracks that is filled with upright spears (**b-T-S**) and stocked with wooden training spears. A lever is then linked to each spear set ([Chapter 11](#) will cover machinery in more detail) and dwarves are ordered to pull the lever on repeat. The training spears will then pop up and down, and the dwarves training in the Danger Room will spend their time dodging spears (in addition to dodging each other). This results in the rapid growth of a range of military skills.

But (there's always a but!), dwarf pets, babies, and children who end up in the Danger Room are likely to end up hurt, if not killed, by all the spikes. Danger Rooms must be used with extreme caution and some degree of micromanagement. Locking the door to your Danger Room and checking each tile for stray children or babies is a good idea before dwarves are ordered to pull the lever!

Arena Combat

A fun way to give your dwarves combat experience is to provide them with an arena in which to beat on captured creatures. Of course, we will work hard to ensure that the fight is completely one-sided in favor of our recruits! No one wants a fair fight!

To establish an arena, you are first going to need to dig out a space in which the gladiatorial combat can take place. A small room of no more than 10×10 squares is ideal. Your arena should have an entrance guarded by two sets of doors, which provide an “airlock” of sorts, in case any training victims try to escape. If you plan to train dwarves on large creatures like ogres or trolls, you may want to upgrade your doors to ditches and bridges in order to prevent these building destroyers from bashing down your doors and escaping. For extra safety, add some cage traps just outside your arena as insurance against escaped training partners.

Once you have a room dug out, why not smooth (**d-s**) the stone walls and then carve fortifications (**d-a**) into these smooth walls so passing dwarves can admire the martial prowess of your recruits? Of course, many common dwarves will run in terror at the sight of monsters roaming around the fortress (even if securely contained in your arena), but I like to think that this helps build moral fiber!

Your next task is to place captured creatures in the arena. For this you are going to need cage traps with some victims caught in them. Traps are covered in [Chapter 11](#), and cages are some of the most simple and effective traps available to you. Before we let the victims out, we place their cages using **b-j** for *Cage*. When presented with the list of cages to place, press **x** so you can see a full description of each available cage. Place a few goblin cages, for example, in the middle of the room. Don't place too many captives (and no sneaking thieves)--you don't want your squads to be overwhelmed. Plan for two recruits to one cage and your dwarves should be fine.

With a few suitable training buddies emplaced, the next step is to ensure that all of the weapons and armor the caged creatures carry and wear are stripped off by your dwarves. Press **d-b-c** for *Reclaim Items*. Designate a zone over your emplaced cages. You probably won't notice anything happening, but trust me, anything marked *Forbidden* (and unavailable to your dwarves) will now be available.

The nigh-final step is to designate the cages and contents for dumping. Again, from the main menu, press **d-b-d** for *Dump Items*. Designate an area covering the cages again—but before you escape out and unpause the game, press **t** and look at each cage. The cage will be marked with a *D*, indicating that it will be dumped. But you **do not** want this to happen, as the dwarf will then pick up the cage and dump the occupant on the floor! Press **d** to toggle the cage so it isn't set for dumping, repeat for the remaining cages, and then unpause the game. You should see a horde of dwarves rushing to the cages, ripping the armor, weapons, and clothes off your victims, and taking their goods to a dump zone.

You are almost ready to unleash the fun! As per the instructions on using levers in [Chapter 11](#), build a lever somewhere handy and then link it to each cage in turn. Now, when the lever is pulled, the cages will open and the naked inhabitants will be freed. Before you do this, station a squad in the room that is armed to the teeth and ready for action. Then, once the lever is pulled, sit back, and enjoy a live-fire training session!



If you wish to train marksdwarves in a similar way, put your targets on the other side of some fortifications so that the dwarves can shoot but can't be engaged in melee.

Once your training session is over and the bodies dragged out of the arena ([Figure 10-11](#)), **q** over each empty cage and have them removed. When you again have a few full cages, repeat the process and cheer on your mighty dwarves! When you have mastered this technique, consider changing a squad's uniform so that they wield wooden training weapons for the duration of the arena training. Combat will take significantly longer, skill gains will be greater, and a good show will be enjoyed by all. There is a risk with this tactic, however—should you need to defend your fortress in a hurry, your dwarves may not replace their weapons with cold steel rapidly enough.

Home Defense Force

If you have a good stock of armor and weapons, you may wish to induct every dwarf in your fortress into a military squad, so that in times of emergency you have a huge armed and armored force ready to defend the fortress. The “Home Defense” model is to draft every dwarf and assign them a uniform, but then to head to the schedule screen and clear all their orders. You will then have multiple squads that will pick up their

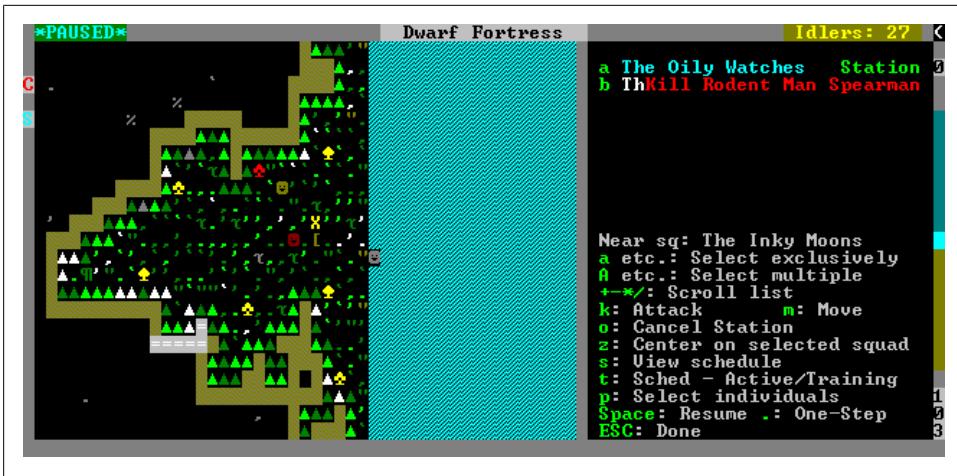


Figure 10-11. Blood and goblin corpses—all in a day's work

uniform and weapon as instructed but who, because there are no training orders, will then go back to their civilian jobs.

What is particularly effective about this strategy is that when your Home Defense dwarves go on break, they may end up practicing individual combat drills and gain some small degree of military skill. Even better, they are likely to do this in their own bedrooms, away from the dangers of (horror!) socializing.



Keep miners and carpenters out of the Home Defense Force. Assigning them a uniform can mess with them wielding their job-assigned picks and axes.

When creating a uniform for your Home Defense Force, any handy armor will do (although obviously, metal plate armor provides the greatest protection). For weapons, crossbows are ideal, as hopefully dozens of bolts fired by your conscripts will drop a foe before they get close enough to engage in risky hand-to-hand combat with your reserves.

Taming and Training War Animals

If you have dogs breeding in your fortress, it is worth training the stray beasts (and other suitable critters) for war. Once trained, war creatures can be assigned to your dwarves from the **p** (*Prf*) menu on any selected dwarf. The most readily available war animal is the dog, and a small army of war dogs attached to your military dwarves can be a useful force multiplier. War dogs not only distract enemies from your dwarves, but they can also do quite a bit of damage on their own, especially to unarmored foes.

Unfortunately, should a war animal be injured, there is no way to heal them at present. You will have to put up with their slow shuffling around the map and their pitiful blinking icons until they either recover or die, having given their lives in the service of your fortress.

Training war creatures is a two-step process: first, if a creature is wild, it needs to be tamed. Second, tamed creatures are taken to an animal training zone, fed treats, and hopefully taught how to be useful in war or hunting.

Orders to tame and train creatures are given in the animals tab of the **z** (*Status*) menu. Most creatures you possess will be marked with a *D* for *Domesticated*. This represents the ultimate trained state you should aim for, and indicates that an animal will not revert to being a wild creature. Other status indicators include a yellow *W* for wild creatures and *T* for *Trained*.

Any creature without a marking has probably not had a visit from your animal trainer dwarves. Pressing **t** will let you assign a specific trainer (assuming you have some dwarves with the animal training labor enabled) or simply set a creature to be tamed by any available trainer.

Taming takes time, and involves the trainer regularly visiting the animal and taking it food. As you tame an animal you may learn more about animal taming, making it easier to tame that animal in the future. From the animals tab in *Status*, you can use the left and right cursor keys to toggle between your civilization's creature knowledge page.

As creatures are tamed, you will receive alerts about the changing status of the creature. You would be wise to leave all untame creatures in cages until they are entirely tame, as creatures will often revert taming steps over time.

Once tame, you may be able to toggle a creature for war training using **w**. Many (but not all) animals can be trained for war. Besides dogs, some favorites include bears, large cats, and, of course, dragons!

But before any training can take place, you need an animal training zone. Place a small zone using the **i** menu and then set it as an animal training zone using **t**. Animals to be tamed will now be moved to the training zone and put through their paces by your dwarves. Placing this zone next to an animal stockpile—where caged creatures are stored—would make the most sense.

Military Supplies

Military dwarves will automatically pick up a backpack and flask if any are available. These containers are used to store food and drink to sustain your dwarves through long patrols or battles. You can review the status of your squads' supplies by pressing **u** from the *Military* screen. The default settings are quite sufficient, and it's only worth bumping the quantity of food up if you expect your dwarves to spend a lot of time patrolling or stationed in far-flung locales.

Burrows

During an attack, your dwarves will inevitably wander around the map like suicidal sheep, leaving you frustrated at their seeming desire to get themselves stabbed by the nearest goblin. Thankfully, the burrows feature exists to give you control over where dwarves will and will not walk.

To designate a burrow, press **w** and then **a** for *Add new burrow*. A burrow will now be created and its name will appear in the top-right area of the screen. To define the burrow, press **enter** and examine the options that now present themselves. For starters, you can name your burrow (which is useful, as burrows can be part of a squad's orders and naming burrows makes them easier to remember), and change color and symbol according to the onscreen instructions.

Once you have selected a name and color, you need to define the size of your burrow. Find the area you want to designate (for example, a food and bedroom level) and then move the cursor to the far top-left corner of this location. Press **enter** and move the cursor; you will now begin marking out a zone to be covered by your burrow. When marking out large areas like this, **shift** and the cursor keys can help you cover large areas quickly. If you want to designate a huge multi-level space for your burrow, you can start marking in the top-left corner of your top level, drop to the bottom of your fortress, move the cursor to the bottom-right, and press **enter** again. Don't worry if you miss some areas that need to be included; you can keep pressing **enter** and marking out areas until you have all the stairs, bedroom areas, and facilities you need.

Once you are happy with your burrow, you have two choices. If you press **z**, you can assign dwarves to the burrow. Then, when you unpauses the game, the assigned dwarves will immediately move to and stay within the confines of the burrow. All those dwarves (except military dwarves) will cancel jobs outside the burrow and eat, sleep, and work inside the areas you have designated.

Your other option is to not assign dwarves to the burrow, but to use the *Alerts* feature from the *Military* screen to restrict all non-military dwarves to a burrow you have defined, at a time of your choosing (and for as long as you wish). In this way, you can let the dwarves roam and work as they see fit—and when an attack occurs, order civilians to the burrow in order to keep them out of harm's way.

To manage the alerts state, press **m** for the *Military* screen, then **a** for *Alerts*. You will see a list showing alert states (*Inactive* and *Active/Training*) on the left, current squads in the middle, and burrows on the right.

Use the cursor keys to move between *Inactive* and *Active/Training*. If you have squads training, they should show an *A* when *Active/Training* is highlighted. By default, the word *[CIV]* will appear next to *Inactive*, indicating that your civilians do not have an alert state. However, if you scroll down, highlight *Active/Training*, press **enter** *[CIV]*, then scroll right and press **enter** again with the burrow highlighted, all dwarves will enter a new alert state and be restricted to the burrow you defined (Figure 10-12).



Figure 10-12. Fortress civilians are restricted to the Panic Room!

To return your civilians to normal duty, just select *Inactive* and press **enter** again. Your dwarves will then return to roaming the map at will (though you may have to find suspended build tasks and unsuspend them). Perhaps the easiest way to do this is to press **j** for *Jobs* from the main menu and then to scroll to suspended jobs, zooming to them with the **b** key.

It is likely that you are now moderately confused. Unfortunately, the burrows and alert system is moderately confusing, but it is quite easy to experiment with setting up and using burrows, so I encourage you to give the system a try. Burrows can be useful for more than just an emergency alarm. You may, for example, end up with magma forges operating many, many levels below the rest of your fortress, and assigning all the metal industry dwarves to a burrow at the bottom of a world will ensure that they remain focused on churning out high-quality metal items for your fortress. You will, of course, want to provide the team with their own bedrooms, dining room, and food stockpile to prevent starvation, madness, and skulls on sticks.

Traffic Management

Another method to control the movement of your dwarves is to set traffic restrictions using the **d-o** (*Set Order*) options. Should you have an area you do not wish dwarves to cross, simply press **r** for *Restricted Traffic Area* from this menu, and then using **enter**, mark a zone on the map. Dwarves will now prefer to take any other route to their destination rather than cross the area you have marked. You can also use traffic designations to encourage your dwarves to follow particular routes. The **h** (*High Traffic Area*) designation can be used to mark main thoroughfares in your fortress and will cause dwarves to prefer the route you have marked.

Traffic restrictions are often used to discourage dwarves from walking near waterfalls, or near rivers or ponds with dangerous creatures in them. Traffic restrictions are very useful, but by no means a guaranteed method of controlling where your dwarves roam. If a dwarf decides it needs to get to a stray sock and the only route is through a restricted zone, it will still cross the area if no other route is available.

Goblinite

Goblinite is the Bay12 Forum users name for all the metal items that drop on the ground from defeated invaders, be they goblin or otherwise. These metal items can be claimed by your dwarves and then melted or stockpiled for re-use. By default, items dropped by dead enemies are marked *Forbidden*, which is indicated by curly brackets around the item when you spot it on the ground with **k** (*Look Around*). To claim and then set an item for melting, you need to highlight the item with the **plus** and **minus** keys and then press **f** to toggle the *Forbid* status off. If you then wish to mark the item to be melted, simply press **m**, and the item will be scheduled to be melted back to bar form at any Smelter with the melt object task. Of course, this can be a time- and fuel-intensive process, so it is best reserved for when magma forges are running and able to provide limitless smelting.

You can reclaim (or mark for melting) a large number of items at the same time by designating a large area with **d-b-c** (*Reclaim Items*), followed by **d-b-m** (*Melt Items*). This will result in all dropped items in the specified area being hoovered up by your dwarves. You will end up claiming far too many worthless goblin socks, but these can always be traded away to passing merchants. Items marked for melting are turned into bars at any Smelter using the *Melt a Metal Object* order. It's usually easiest to claim and mark all invader corpses for melting before placing a melt order at a smelter on repeat.

Notes and Routes

The **N** (*Notes*) menu provides you with powerful features that not only let you tag interesting areas in your fortress (adding a note to each lever you build is highly recommended), but also plot routes for patrolling military to follow. To create a route from the *Notes* menu, first place (using **p**) a series of notes on the general path you would like your dwarves to follow. Give the notes names (using **n**) that you can recognize.

Next, press **r** (*Routes*) from the *Notes* menu and then **a** (for *Add Route*). Find the first point (your first note) on the patrol route. Then, press **e** for *Edit waypoints* and, with your cursor over the first note, press **a** for *Add waypoint*. Move the cursor to subsequent notes on your route and keep pressing **a** over each one. When done, **escape** out to the menu.

With your first route established, press **m** for the *Military* menu and then **s** for *Schedule*. Find a squad you wish to patrol and the month you wish them to patrol in, and press **e** for *Edit order*. Press **o** until *Patrol Route* appears, and then **shift** and **enter** to confirm your order. Be careful of setting dwarves to continually patrol, as they will get

unhappy thoughts if they patrol year-round. Break up patrolling with training sessions to vary their routine.

Siege Engineering

Your dwarves have access to two types of siege engine: ballistae and catapults. Parts for these mighty weapons are built in Siege Workshops (**b-w-s**) and then constructed at a location using **b-i** and the three parts for the weapon you chose.

Siege weapons are set to fire in a direction specified on construction, and they will not rotate to fire at threats from any another arc. Siege engines are operated by dwarves with the *Siege Operator* labor enabled, and if the weapon is set to *Fire at Will*, the operators will load and fire the weapon continuously (engaging in practice fire, if you will).

Ammo is destroyed when fired, unless the ammo is able to drop one level. This has led players to develop training room designs where siege weapons fire into walls with a channel in front of them, so that the practice ammo can be recovered. Advanced fortress managers build siege weapons that face down long tunnels (the range of these weapons is enormous) with a bridge that, when raised, blocks practice fire, but when lowered, allows live fire down the fortress accessway.

Siege weapons only fire at the level they are on. You cannot place a siege weapon on top of walls or towers and have it fire down on your foes. Even catapults only fire on the level they are on, and you can, in fact, safely roof over your catapults without any adverse effect on their performance.



Catapults use stone as ammunition, while ballistae use wooden ballista ammo made at a Siege Workshop (optionally tipped with metal arrowheads made at a Metalsmith's Forge).

There are currently two big drawbacks to using siege weapons: first, they are wildly inaccurate, and second, siege operators are civilians and will run from any enemies that get close (a dozen squares or so). For these reasons, siege engines are not often relied upon for fortress defense.

FORGED IN LOVE

From Talvieno

The fortress of Naugaridge was built into the side of a mountain, and was built for design and beauty more than anything else.

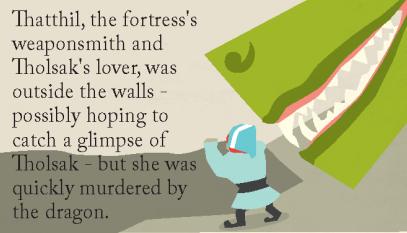


This got the attention of the elves, who came to raid the mountainhome.

Tholsak, the captain of the guard, led the army. They broke full upon the ranks of the elves and slaughtered many in the defense of their home.



At the height of the battle, a dragon appeared on the opposite side of the fortress.



Thatthil, the fortress's weaponsmith and Tholsak's lover, was outside the walls - possibly hoping to catch a glimpse of Tholsak - but she was quickly murdered by the dragon.



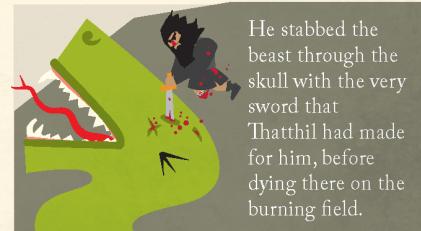
The dragon dispatched the elves, setting their precious forests ablaze in the process.



It turned on the dwarves.



Tholsak himself had been mortally wounded in the fight, and had lost one of his legs. Despite this, he dragged himself through the ranks of his dying comrades.



He stabbed the beast through the skull with the very sword that Thatthil had made for him, before dying there on the burning field.

Engineering

Constructing fantastic traps, machines, and weapons of mass destruction is a particularly fun part of Dwarf Fortress. After all, without bridges, giant saw blades, mincart railguns, and jets of magma, you wouldn't so much have a dwarf fortress as a tastefully designed hole in the ground.

At its simplest, dwarven engineering is the artful arrangement of traps and walls to funnel your enemies into kill zones for easy elimination. At its most complex, a sequence of bridges, pumps, magma, levers, and pressure plates will jet fiery death at your foes, toss them into the air, or encase them in obsidian. How complex and involved the engineering in your fortress will get is entirely up to you, and even experienced fortress managers find fresh challenge in some new arrangement of floodgates, levers, and weaponized kittens.

Dwarf-Made Traps

Traps are a superb defensive system for your fortress, being both quite lethal and easy to set up. Traps simply require mechanisms, a dwarf with the *Mechanics* labor enabled, and some kind of weapon appropriate to the trap type. For stone-fall traps, a rock will suffice, while cage traps require cages, and weapon traps require any type of spare weapon (or, alternatively, special oversized trap weapons).

Traps will trigger when any enemy steps on the square on which they are set up, as well as if a creature falls unconscious into them. This can result in caged dwarves or worse, if they pass out in a field of traps!



Some creatures, such as forgotten beasts, are immune to traps and will ignore them. Never rely on a single form of defense!

It is a good idea to lay traps across your fortress entrance and to use constructions or tunnels to guide enemies through a field of traps. In this way, you combine your own design cunning with the ruthless efficiency of blades appearing out of nowhere to dissect your foe. A common design that takes advantage of traps is to use a bridge to block the main entrance to your fortress, leaving only a long, labyrinthine path as the access to your interior. This single-width path then has traps built all along its route, so that any horde of enemies has dozens of blades, stones, and cages to dodge. A single pet might be tethered at the end closest to your fortress interior to ensure that even if this secondary entrance is sealed, the enemy still has reason to try and pass down your Hallway of Death.

In Figure 11-1, you can see an example of traps in action. The cage traps, indicated by the green ^ icons, are having a hard time holding back a horde of undead (all the N characters). Some traps are flashing with exclamation points, indicating that they have caught a creature. An undead goblin has been caught in the highlighted trap.

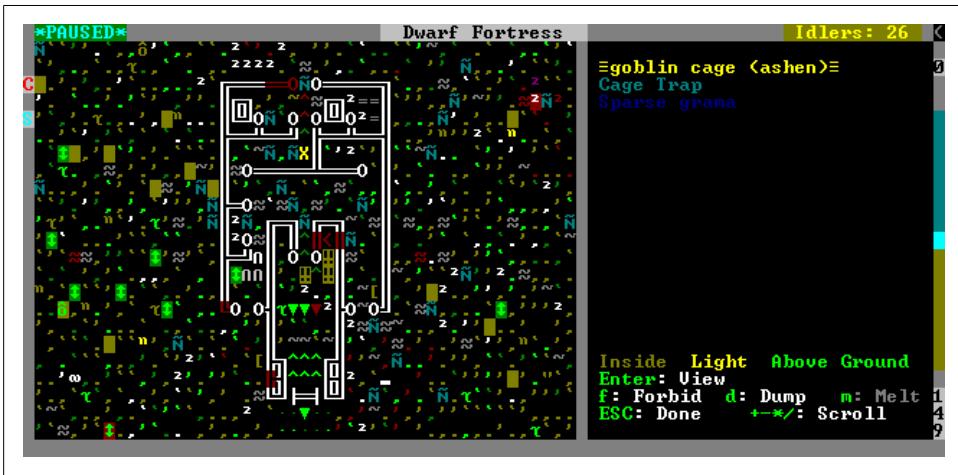


Figure 11-1. The undead overrun the defenses

All traps are available from the **b-T** menu. Let's look at each trap type in detail.

Stone-Fall Traps

Stone-fall traps are the simplest traps, requiring just a mechanism and any stone. They trigger just once, dropping a large stone on an enemy, and then need to be reset by a dwarf with the *Mechanic* labor. They will break limbs, but seldom kill and should not be relied upon as your sole form of defense. Stone-fall traps make great, simple defenses when your fortress is just getting started, but transitioning to weapon and cage traps as soon as possible should be a priority.

One of the big risks with a stone-fall trap is that your mechanics will rush right into a horde of enemies to reset the traps after they are triggered. Forbidding the traps is one way to prevent this, as is locking doors or enabling burrow restrictions to prevent access.

Cage Traps

Cage traps require a mechanism and a cage (made from wood at a Carpenter's Workshop or metal at a Metalsmith's Forge). Cage traps are extremely effective, removing a single enemy combatant from battle and trapping them in the attached cage. Unfortunately, they only do this once before they need to be reset with an empty cage (and the full cage hauled away to your animal stockpile). Of course, these tasks will invariably lead to dwarves rushing into the enemy force with empty cages in an effort to complete this task.

As cage traps only work once before needing to be reset, you will need a great deal of them if you are relying on them to defeat an invading goblin army. It is usually wise to mix your traps—perhaps placing a number of weapon traps first, before placing cage traps as a last line of defense. Cage traps are also great at choke points where you fear a single enemy may break through and cause problems. If you are likely to face necromancers or fear the dead coming back to life, then cage traps near your tombs and refuse stockpile may be life savers, catching any raised corpses before they can terrorize your citizens.



Keep a large surplus of cages ready so you will never have to wait for cages to be reset after a battle has been won.

Once a cage trap is triggered, it will blink and a task will be issued for the cage to be hauled away and a new one placed in the trap. A cage trap without a cage in it will appear a darker green than a loaded trap. It is important to keep an eye on a trap's readiness lest you be caught by surprise when foes breeze right past them!

Weapon Traps

Weapon traps are your most reliable form of automated defense, and, when fully loaded with weapons, your most lethal. A weapon trap attacks once with each normal weapon (and more with some of the giant trap weapons), meaning that each weapon trap can potentially land a large number of attacks on a foe. Constructing a weapon trap requires a mechanism and some weapons to place in the trap. These can be weapons you have created yourself but perhaps aren't good enough for your military, weapons you have recovered from the battlefield, or special trap weapons made at a Metalsmith's Forge, Carpenter's Workshop, or Glass Furnace.

Constructing weapon traps can be a little confusing. To start, press **b-T** to bring up the *Traps/Levers* menu. Select *Weapon Trap* with **w**, press **enter**, and select a mechanism. At this point, it makes sense to press **x** so you can choose precisely which mechanism you use in the trap. The quality of the mechanism used in a weapon trap will determine the skill with which the weapons attack the enemy, so try to select the highest quality mechanism possible. If you're not sure which mechanisms are higher quality than others, review [Table A-19](#) in [Appendix A](#).

With a mechanism selected, you will now be able to review the weapons you can place in your trap. For now, avoid bows and crossbows, as your dwarves will need to periodically reload the trap with arrows and bolts. As a new player, ensuring that there are both enough bolts—and that your dwarves can safely reset the trap—can be challenging.

Using the **plus** and **minus** keys, scroll through your list of available weapons and press **enter** on any you wish to load into the trap (you can press **enter** multiple times on the same weapon type to select multiples of a weapon). Always aim for at least four or five weapons in each trap, though more would be ideal if you have weapons to spare. Once you are satisfied with your weapon selection, press **d** and your trap will be added to the job queue.

There are three issues you should be aware of with weapon traps: firstly, they do take a little time to reset between attacks. If two goblins march over a weapon trap one after the other, the first will be hit but the second probably won't (though the fourth or fifth may well be struck). For this reason, defense in depth is more important than a single line of fully-loaded weapon traps.

Secondly, weapon traps can jam if any of the weapons in the trap get stuck in a wound they create. Jammed traps need to be cleaned by any dwarf with the *Cleaning* labor enabled before they will work properly again. Jamming is yet another reason why it may be advantageous to have more half-equipped traps than only a few fully equipped traps, as there's a higher chance that one of ten weapons will get stuck than one of five. Another mitigation for this problem is to use a lot of bashing weapons in some of your weapon traps. Bashing weapons don't get stuck as easily as pointy, stabby weapons.

The final problem with weapon traps is that enemies can dodge and block weapon trap attacks. While you can't do much about blocking, you can use enemies dodging to your advantage. An entrance that snakes along a thin walkway over a pit that is four or five levels deep can result in enemies dodging off the edge, right into your pit. This is extremely satisfying to watch. For extra style points, magma or lots of upright spikes at the bottom of your pit make for a fun surprise for your enemies.

Specialist Trap Weapons

Weapon traps are able to equip large, specialized weapons made at a Metalsmith's Forge, Carpenter's Workshop, or Glass Furnace. Production of these weapons is found

under the *Trap Components* menu on the Metalsmith's Forge, and at the bottom of the order list in a Carpenter's Workshop and Glass Furnace.

If at all possible, you should be using metal or glass weapon components, as wooden trap components won't do the damage of glass or metal. That being said, if metal is in short supply and wood is not, then traps of wooden menacing spikes and spiked balls will have value in your defenses. See [Table 11-1](#) for a list of specialized weapons.

Table 11-1. Specialist trap weapons

Weapon	Notes
Giant Axe Blade	Chops enemies into bits. This may cause problems if you face undead, as their bits may come back to life.
Enormous Corkscrew	Piercing weapon, may damage internal organs. Also used in making screw pumps.
Large, Serrated Disc	Similar to the giant axe; attacks three times.
Menacing Spike	Similar to the enormous corkscrew; may also be used in upright spike traps.
Spiked Ball	Bashes the enemy, breaks bones.

Upright Spear/Spike

Upright spike traps do not require a mechanism to be built, and can be constructed out of spears or menacing spikes. Short of enemies falling (at least two levels) onto them, the upright spear trap will not do any damage without being activated in some manner. Activation can come from a lever (set it on repeat and make a goblin tenderizer!) or a pressure plate (perhaps a pressure plate triggered by a repeater). One advantage of upright spear traps is that they do not jam.

Dwarven Machinery

There are more tools at a fortress manager's disposal than simple point defense traps. Traps are usually best combined with constructed features and machinery to produce fearsome contraptions of death and destruction, otherwise known as "fun." First, let's examine some of the components of dwarven machinery, and then we can address how they can be profitably included in our fortress defenses and systems.

Levers and Pressure Plates

Under the *Trap* menu are two items that haven't been addressed: levers and pressure plates. Both are constructed using mechanisms, and both can act as triggers for machinery such as doors, flood gates, bridges, gears, and pumps.

Levers

Levers are commonly used to raise or lower a bridge, or to open and close doors and floodgates. To achieve this effect, one builds a lever from the *Trap* menu and then, once it is constructed, adds the task *Link up with*, selecting the feature you wish to link the lever to. If you chose to link to a bridge, for example, **plus** and **minus** will scroll through the available bridges and mark the current selection with an **X**. With the correct bridge selected, **enter** will take you to an option panel where you can select the two mechanisms that will be used for the task.

The link tasks will now be listed on the lever task panel and will vanish once completed. With a successfully linked lever, adding the task *Pull Lever with P* will cause a dwarf to walk over and yank the lever, triggering the effect a second or two later. Choosing where to place the lever in the first place is extremely important. If you place it near the object you wish to trigger, you risk being overrun before a dwarf can flip the switch. If you place it in a quiet corner, chances are a dwarf will have to walk some distance to the lever, causing unnecessary delay in lever activation.

A popular option is to place levers in busy locations, such as fortress dining rooms. Note, however, that dwarves who throw tantrums may pull levers, which could cause problems if the lever is connected to the single support keeping the mountain up. Worse, tantrums are more likely to take place in busy locations, as there is simply a higher chance of any crazy dwarf being there.

Some fortress managers, conscious of this threat, create dedicated lever rooms in which a single dwarf is locked, surrounded by lavish furniture to keep the dwarf happy. Vampires are ideal for this role as they don't need food or booze and won't sleep, meaning they are always ready to lend a hand. They do, however, require clothes and so regular clothing drops to replace their tattered rags may be required. A hole in the ceiling with a dump zone on it will suffice to allow dumped goods into the space.

Pressure Plates

Pressure plates are similar to levers in that they trigger other devices, but unlike levers, pressure plates will trigger automatically depending on how they are set up. Upon triggering, pressure plates will send an “open” command to whatever they are linked to—and then, when an off condition is met, a “closed” command. Pressure plates allow you to automate your fortress defensive systems or to simply keep a well system topped up automatically.

Before placing a pressure plate, you must first configure the plate. Pressure plate options start with defining the conditions under which the pressure plate will trigger. Triggers can be magma, water, or creatures (or any combination of the three).

If *Creatures* is selected then, by default, all creatures dwarf-sized and larger will trigger the pressure plate. You can adjust the minimum and maximum weights as directed onscreen, but there are few situations where you would wish to adjust the default settings. If you press **1**, then the plate will trigger when your own dwarves or pets step on the plate instead of enemy and neutral creatures. The pressure plate will toggle off a short time after being triggered, whereupon it will be available for triggering again.

Whether you chose water, magma, or creatures, pressing **o** will toggle the pressure plate between being one-use-only or repeat use. A one-use-only pressure plate will disassemble itself once triggered, whereas the repeat setting (the default) will result in the plate triggering on and off when the trigger condition is met. One-shot pressure plates can be useful for triggering defenses (such as drawbridges) if you are concerned that a lever will fail for some reason.

If you chose the pressure plate to trigger using water or magma, you need to define how full the square above the plate must be before the plate will activate. Water depths range from 1, barely a splash; to 7, completely full. If, for example, you set the trigger to be water between level 1 and 5, the pressure plate will send the “open” command to whatever it is connected to as long as the water above the plate is between those two numbers. As soon as the water hits level 6 or 7, the plate will flip and send the “close” command. Caution must be used if you are plumbing your fortress with pressure plate-controlled doors or floodgates, as pressure plates take some time to activate. It is entirely possible that a cistern of water could overflow before the plate has triggered the floodgate or door to close and stop the water flowing. For this reason, it is always a good idea to dig overflow tanks when dealing with pressure plate-controlled liquids so that any excess will flow safely away without causing problems.



Dwarves will walk through level 1-3 water, paddle in 3-6, and drown in level 7 water.

Supports

Supports (**b-s**) are constructed pillars that can hold up constructions or rock above them, or rock hung below them. Supports are sometimes used to create cave-in traps where a cube of rock is cut clear of all surrounding rock, but held up by a single support connected to a pressure plate or lever. When triggered, the support disassembles and the rock cube comes crashing down (potentially through several floors), completely destroying anything caught in the cave-in.

Obviously, a cave-in trap is a one-shot affair and any dwarf caught close to it will also be killed. But, in certain circumstances, building such a doomsday device can ensure that a deadly foe is destroyed rather than left to rampage through your fortress.

Screw Pumps

Screw pumps are a special type of machinery that can be used to move liquids from one level up to another. Screw pumps are often used with gears, axles, and a power source such as a windmill or water wheel, but may also be dwarf-powered.



Screw pumps will desalinate any salt water and clean any stagnant water that is pumped through them.

Screw pumps are constructed from a block, a pipe section, and an enormous corkscrew. Blocks are easily constructed at any Mason's Workshop, and so long as you're not working with magma, a corkscrew and a pipe section made at a Carpenter's Workshop will suffice for the remaining two parts.

If you are working with magma, you will want to construct your pump components out of magma-safe materials. Glass, iron, and steel are always safe, as are most stones. If you're unsure whether a material is magma-safe, build the part with iron to be safe.

Screw pumps are placed using **b-M-s** (Figure 11-2). Screw pumps are two tiles long, but utilize an area of four tiles when placed. When placing, you can follow the onscreen directions to orient the pump appropriate to your needs. The two different colors of the screw pump placement footprint indicate the orientation of the pump. If your pump is oriented vertically, the space above the light green square is where liquid will be drawn from, and the space below the dark green square is where liquid will exit the pump.

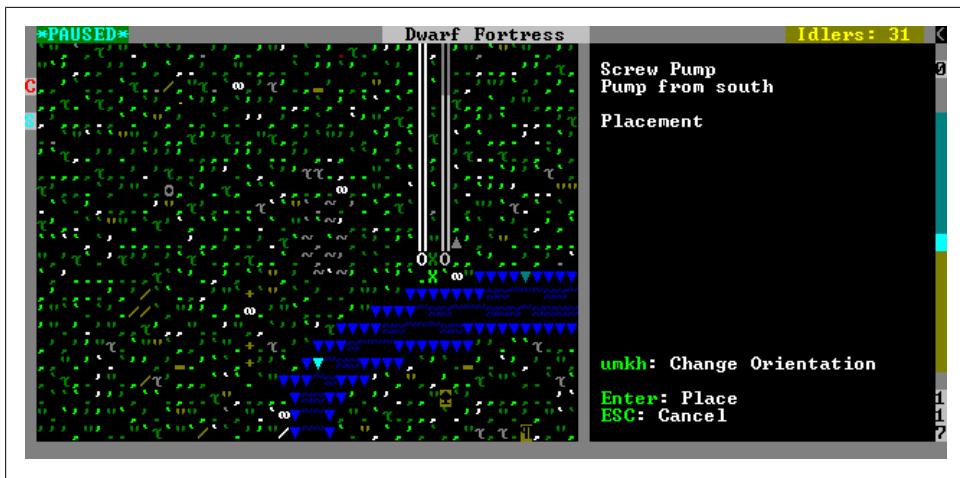


Figure 11-2. Placing a pump to draw from the river and pump into the constructed channel

The key feature of a screw pump, raising a fluid one level, takes place at the input end, where liquid is raised from a level below the pump entry square. This tile needs to be a channeled-out space or a ramp that provides access to the liquid below (see [Figure 11-3](#)). The output square is at the level of the pump, and unless constrained by walls or tunnels, the liquid will then flow naturally—potentially spreading to the pump itself and back down the input hole.

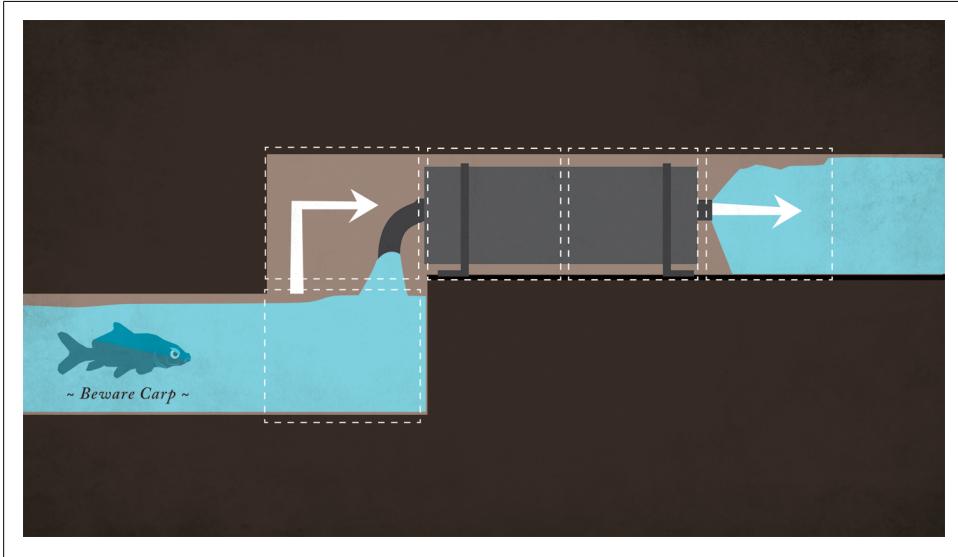


Figure 11-3. Side view of a screw pump showing channeled access to water, pump, and pump output

Pumps can be powered by a dwarf with the *Pump Operator* labor enabled. The pump must be switched to manual activation by using **q** and then pressing **enter**. Once set to manual operation, a dwarf will work the pump until exhausted. Manual activation is great for short liquid-moving tasks, such as flooding a room for irrigation purposes, but if you need to move liquid constantly or activate a pump quickly, then automating the pump operation is ideal. See [Figure 11-4](#) for different ways to power a pump.

Windmills and Waterwheels, Gears and Axles

Automating screw pumps is a matter of delivering power from a power source to any square directly adjacent to a pump. Adjacency includes the squares above and below the pump. Pumps may also share power with each other so long as the pumps are adjacent to each other. The simplest way to power a pump is to build a windmill directly above a pump—power will be transmitted down through the central hole in the windmill's footprint to the pump square below. You will want to make sure that the windmill rests on at least a single floor or wall, or the windmill will deconstruct should you ever deconstruct the pump.

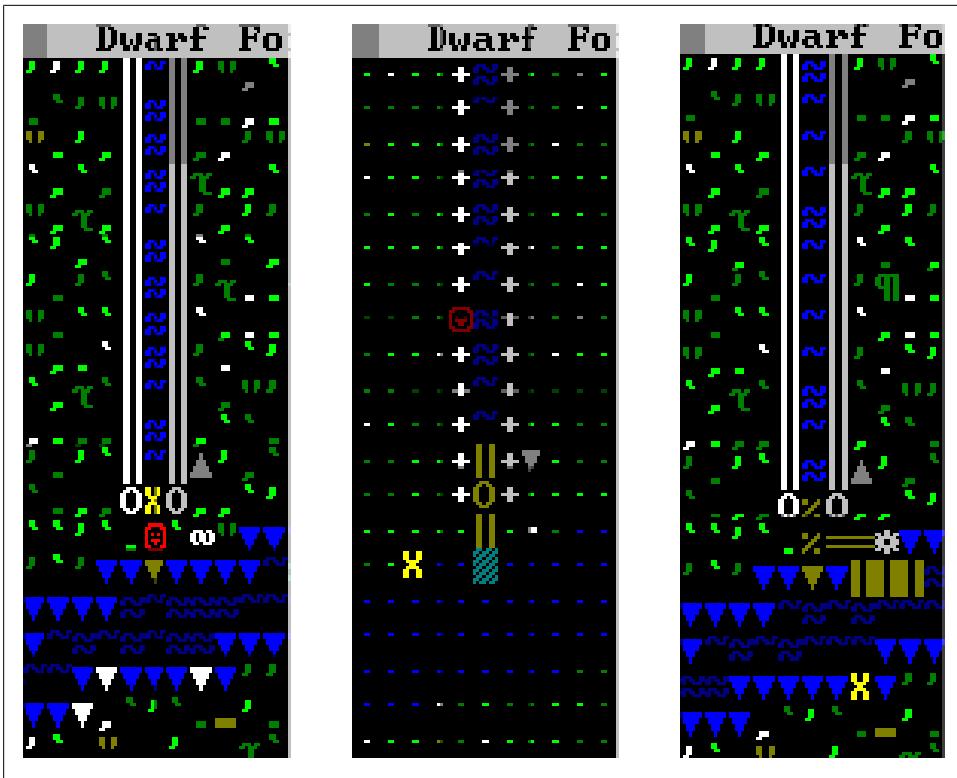


Figure 11-4. Pump manually operated by a dwarf (top), dwarf replaced by a windmill (middle), and windmill replaced by a water wheel that delivers power via a gear and an axle (bottom)

You can also use a water wheel, which functions identically to a windmill but delivers power horizontally from its center tile. Water wheels may require connecting to your pump via an axle or gear assembly.

Often, you won't be able to build a windmill or water wheel directly above or adjacent to the pump you wish to power. In these situations, you will need to transmit power to your pump using axles and gears. Axles transmit power in a straight line, vertically or horizontally, from a source. Gears allow you to connect vertical and horizontal axles, so as to move power around corners. Both gears and axles are made from wood from the *Machinery* menu.

If you wish to move power from the surface to a pump below the ground, you will need to ensure that there is an open vertical shaft between the pump and the center of the windmill. Digging an access tunnel on each level and then channeling down to connect the tunnels vertically will create the shaft. Then, it is simply a matter of building a vertical axle in each open tile for power to be transmitted.



Before you are permitted to place a windmill, a gear or axle assembly must be built underneath where the central square of the windmill will be.

Even if you don't need to use a gear assembly, it is often a good idea, as gear assemblies can be linked to levers (axles can't be linked), allowing you to switch off your power assembly if required. In [Figure 11-5](#), three screw pumps have been stacked one on top of another to create the classic Dwarf Fortress pump stack. The pump stack is powered by a windmill, and power transmission happens vertically through channeled spaces, putting the screw pumps in direct contact with each other.

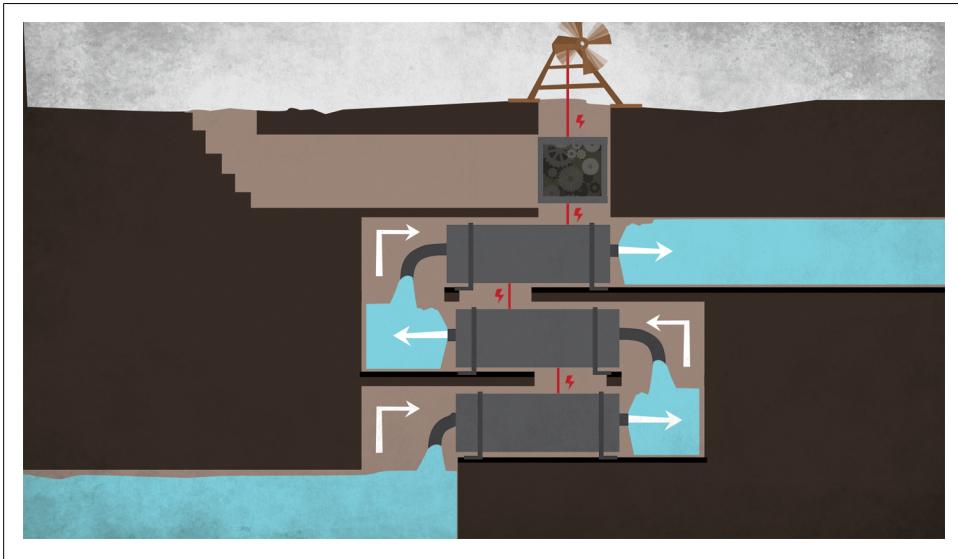


Figure 11-5. The classic pump stack connected to a windmill on the surface by a gear

In truth, there is a good chance that the pump stack depicted in [Figure 11-5](#) would not work, as there might not be enough power generated by the windmill to power each pump. Each site you embark on will have either 0, 20, or 40 units of wind power a windmill can harness. In this example, the windmill only generates 20 wind power. Were the windmill to be on top of the pump stack, then the stack would not activate: as each pump uses 10 units and the gear axle uses 5 units, a total of 35 units is required but only 20 units are generated.

Attaching another windmill via a horizontal axle (which uses 1 energy unit per tile) and another gear would not suffice to power the stack, as the additional gear and even a single axle length would put the power requirements for the contraption over 40 units. Instead, three windmills will be required to provide more power than is consumed by the axles, gears, and screw pumps.



Water wheels and windmills can be destroyed by large, aggressive creatures. Encasing them in walls and floors will not prevent them from functioning, but will protect them from attack.

If it is possible to use a waterwheel, then the power they generate (100, with 90 delivered from the water wheel to adjacent machinery) can greatly simplify your construction needs. Water wheels generate energy so long as water is flowing past them or over them. Water wheels can also be constructed directly adjacent to each other, greatly increasing the power available for transmission to the rest of the fortress.

You may have noticed that some windmills in the screenshots in this section are “hanging.” This means that the windmill considers itself unsupported. This often happens when a windmill is built after the machinery under it is constructed. Hanging windmills will deconstruct themselves if they are disengaged from this supporting machinery or the machinery is destroyed. If you plan to attach a lever to a gear under a windmill, ensure that you build the windmill before the gear so as to avoid this problem.

Fluid Dynamics

I bet you never thought you would read about fluid dynamics in a game guide, did you? Well, that’s because you’ve never read a book about Dwarf Fortress! It is very important to understand fluid dynamics in the world of Dwarf Fortress, lest your fortress become a multilevel swimming pool.



If you’ve flooded your fortress, console yourself by noting that there’s a good chance your dwarves will die with a happy thought from being “comforted by a lovely waterfall recently.”

It is important to understand the difference between pressurized and unpressurized liquids. By default, water has pressure and magma does not, and this has an enormous impact in how the two behave when handled by ambitious fortress managers. In essence, a pressurized liquid in Dwarf Fortress will try to fill up to the level it came from, whereas unpressurized liquid will stop at the lowest level it is delivered to.

In [Figure 11-6](#), a river has been tapped to fill a cistern. However, without lever controlled doors or floodgates, the cistern will soon overflow and flood the levels above it (and the water will quickly fill the fortress up to approximately the level of the river). On the righthand side of [Figure 11-6](#), magma has been tapped to fill the space under a workshop floor in order to power magma forges and smelters. Magma is not pressurized, so it will not fill up to the level of the source magma.

To keep liquids from filling your fortress, use lever-controlled doors or floodgates to stop and start liquid flows as required. If in doubt, add more doors and overflow sumps

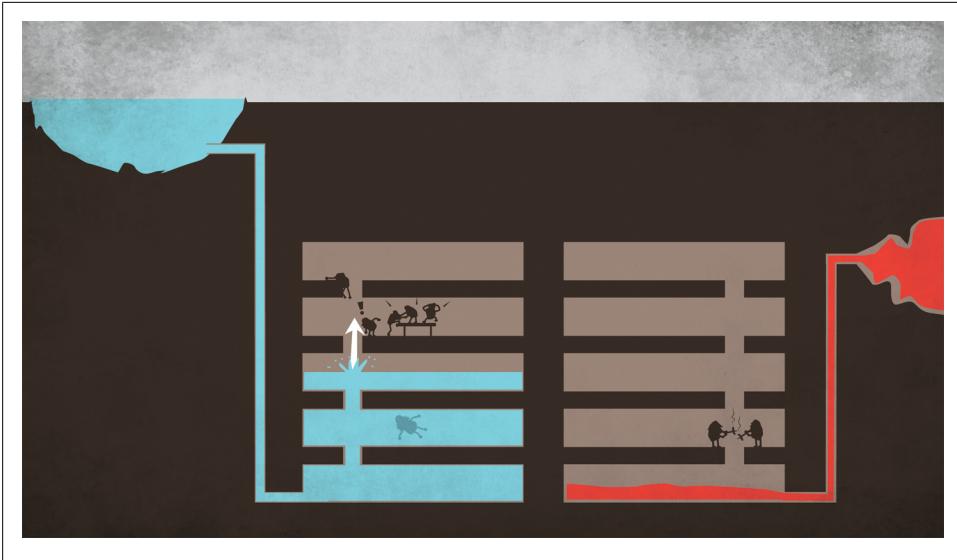


Figure 11-6. The effects of pressurized water versus unpressurized magma

that will allow any excess fluid to bleed off safely. The cost of getting fluid control wrong can be hilarious for you—but for your fortress, fatal.

Although water is pressurized by default and magma is not, it is possible to change these default behaviors. To remove water pressure, simply cut a diagonal access to the water supply. Water will flow across a diagonal, but only slowly, and without pressure. If you wish to pressurize the water again, run it through a pump. Pumped liquids are always pressurized and the resulting water or magma will always try to rise to the level of the pump.

Pressurized magma flows a lot more quickly than unpressurized magma, and so pumps are often used in magma-based engineered traps in order to give the trap a little more “surprise” factor for the foe.

Minecarts

A new system still undergoing much scientific experimentation by the Dwarf Fortress community is minecarts. Minecarts, and the tracks they ride, allow your dwarves to move large quantities of goods around your fortress with relative ease—and at dangerously high velocity! Minecarts are operated by dwarves with the *Push/Haul Vehicles* labor enabled, which is found under the *Hauling* category and is active by default on all dwarves.

To establish a system of tracks and minecarts, you first need to build minecarts at a Carpenter’s Workshop or Metalsmith’s Forge, carve or construct tracks and track stops, and then define the routes and conditions under which your carts will operate.

You may also (optionally) add powered rollers to your track, which can make carts go hilariously fast. Assuming you have managed to build a minecart or two, let's look at how you can make tracks and track stops before detailing how routes are specified.

Making Tracks

There are two ways of making tracks for minecarts. If you wish your track to run over rock, then you can simply designate a track to be carved into the the rock floor using **d-T** (*Carve Track*). Designating lengths of track will cause dwarves with the *Stone Detailing* labor enabled to rush to carve your tracks into the rock. Where tracks cross (and you must designate over existing tracks to join two tracks together) intersections, corners, and junctions will be carved. Tracks can be carved into stone ramps (designate at the bottom of the ramp, not the top) and will connect with tracks on the level above them.

The other method for creating tracks is to construct the track using the **b-C-T** construction menu option. This allows you to make track out of common materials to lengths specified in the same manner in which one builds walls—that is, by using the **u**, **m**, **k**, and **h** keys to change track length. Before you can lay the track, you need to choose a track type that matches your requirement. If your track is one-way (for example, if you just want the minecarts to travel north), select just the (*N*) track from the construction menu. In most cases you will want the option for a minecart to travel both ways on a track, and so choosing a (*NS*) track would be more common. You can also construct tracks with intersections and ramps that allow a minecart to rise or descend a level.



Constructed track can be removed using **d-n** (*Remove Construction*).
Carved track can be removed by smoothing the track over, using **d-s**.

Track has some interesting properties. First of all, it is possible to build doors, flood-gates, and pressure plates (which will activate) over tracks, allowing clever fortress managers to create secure, airlocked tunnels for minecarts to operate in. Track is also not destroyed when a bridge is lowered, and bridges act as tracks, allowing a minecart to continue across a bridge in the direction it entered on. In this way, bridges can be used to alter a track on the fly, and it seems likely that particularly clever fortress managers will be able to establish complex minecart routing systems based on bridges and pressure plates.

Track Stops

Once you have a track built (and I encourage you to start with small experiments at first, as this is a complex system), it is time to add stops to your track. Stops are points

where a cart will slow or stop, and to which a minecart is returned before restarting a route. They take a single mechanism to construct, and are placed using **b-C-S** directly over existing track. Upon placement, you can set the friction the track stop imparts on passing minecarts. The default is *Highest*, which will stop any passing cart. You can also specify that a minecart at that stop should dump all goods it contains in a specified direction, which you can change using **d**. If you use this option, any goods in the cart will be placed in the square adjacent to the stop (in the direction specified).

Interestingly, once dumped, the goods are exempted from needing to be placed in stockpiles, but are still accessible to your dwarves for use in industry and construction. This allows for some handy possibilities, such as using a minecart track on the surface to collect timber and dump the logs down a deep hole to your production floor where it will pile up neatly, ready for use by your carpenters.

Track Routes

With minecarts prepared, track laid out, and stops in place, it is time to define your routes. Press **h** for *Hauling* from the main menu and then **r** for *New route*. Press **v** to assign a minecart to the route, move your cursor over a track stop you have placed, and press **s** for *New Stop*. Although it isn't strictly necessary to define your routes over track stops, these are natural starting and ending points due to the default high friction they impart on carts, stopping them in place.

The stop will now be listed under the route and can be defined by pressing **enter**. A number of options are presented by default, demonstrating the range of control you can exert over minecart operation. In essence, you can determine which direction a minecart moves (**d**), the condition under which the cart will be moved (**c**), and whether the cart will be pushed, guided, or ridden (**p**). You can access even more granular control by pushing **C** (and back out of these new options by pressing **C** again).

You can also link your minecart to a stockpile using **s**, but before you press **s**, you must move the cursor over the stockpile you wish to take from. You then press **enter** to define the goods from that stockpile that will be placed in the minecart. If you were moving wood from a wood stockpile, you would need to scroll down to *Wood* and then press **e** for *Enable* before escaping out of the menu. With luck, dwarves will now dash about gathering goods and shoving them into the minecart, and will activate the minecart when conditions permit—perhaps when the minecart is full.

In [Figure 11-7](#), a simple circular track has been constructed with a single track stop at the top of it. A route has been created which specifies that the cart is to be filled with garbage from the nearby refuse stockpile and pushed by a dwarf to the east whenever the cart is half-full. This causes the cart to shoot off around the track before stopping back at the beginning of the route when it has completed its circuit, whereupon a nearby dwarf comes back to give it another kick (as I haven't told the stop to dump the cart's contents).

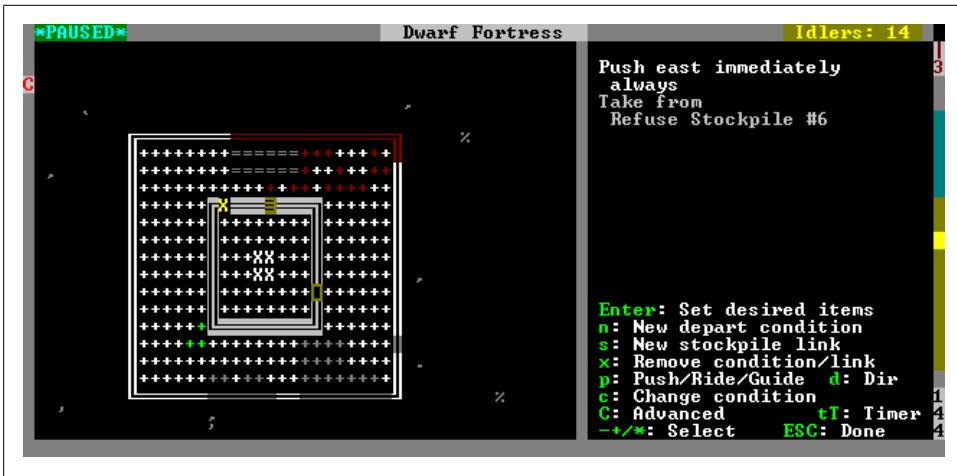


Figure 11-7. A minecart on a circular track with one track stop

If you wanted to create a linear track with a stop at each so that a cart would travel back and forth, you would need to construct a length of track, build stops on each end (one of which might have a dump command), and then create a new route with two stops. The first stop might have a “gather from stockpile” order before being pushed, and the second stop might have a “push back in the other direction when empty” order. This simple route will see a minecart filled, pushed, dump its goods, and then be returned to the starting position to repeat the process.

Track Rollers

Using **b-M-r**, it is possible to build *Rollers* over track. When rollers are placed, an acceleration direction, speed, and the length of the rollers are specified via the onscreen prompts. Rollers must be connected to a power source such as a windmill or waterwheel: either directly, or by using gears and axles. Rollers can accelerate a minecart to quite high speeds, and are required to force a minecart back up a hill without a dwarf personally guiding the cart.

Rollers can also be laid after a steep track descent to turn minecarts into high-speed missiles capable of killing enemies (or, if driven into a fortification, minecart “shotguns” that fire their contents across a wide area at high speed). This is an exceptionally complex defensive system, but also quite funny to watch in action. (See the illustration at the end of [Chapter 8](#).)

Observations on Minecarts

The minecart system is so new that many players are still coming to terms with what the system offers fortress managers. What is obvious to anyone who has conducted

experiments with minecarts is that in almost all situations, you want your dwarves to guide the minecart rather than push or ride it. Guided carts are slower than pushed or ridden minecarts, but do have the advantage of not turning pets, who seem oblivious to minecarts, into a red paste.



Tracks are automatically designated as a low traffic area (**d-o**) to discourage dwarves from standing on them. Pets and enemies aren't so clever.

Guiding carts may seem pointless, as a dwarf could simply move the goods themselves if they are going to walk with the cart anyway. But don't forget that a minecart can carry a lot more goods than a single dwarf (even a dwarf with a wheelbarrow), and that the minecart-generated stockpiles are awesome space-savers. Further, one thing you are unlikely to be short of is dwarves to push minecarts around your fortress. Guided carts can be pushed uphill far more simply than the work required to establish a powered roller system that does the same task.

As for minecart uses, there are many ideas for weaponization (see below) but only a few practical, industrial uses right now (this is wonderfully typical of the Dwarf Fortress community!). One idea is to use minecarts as part of a hub-and-spoke system of track and ore stockpiles for moving goods such as ore from a mining operation back to the smelters and forges. Such a network would reduce the need for many dwarves to travel vast distances hauling ores to the forges.

Another use for minecarts is in creating repeaters. Repeaters are arrangements of machinery that send a regular "pulse" to other pieces of machinery in your fortress. A basic use is to trigger the spikes in a Danger Room, but repeaters are also useful in dwarven computing and other complex systems. Repeaters have traditionally involved pressure plates and smashing water, but a single loop of track, a cart, a no friction stop, a single roller, a pressure plate, and a windmill will do the same job a little easier. A track-based repeater also allows for easily configurable delays between pulses by simply building longer or shorter loops. Now you know why they call them "computing cycles". It's all to do with tiny minecarts, I tell you!

Weaponized Minecarts

Various science experiments with minecarts have led to some early forays into using minecarts for fortress defense. Some of these experiments are summarized here, and perhaps will give you some inspiration for your own experiments:

- Minecarts can be filled with magma and water (but only with 2 units).
- Minecarts rushing down a series of ramps and then powered by rollers can go so fast as to skip across water like a flung stone.

- Very high-speed minecarts that hit fortifications will send small items the cart carries (such as rock blocks or weapons) through the fortification and into foes on the other side, causing terrible injuries.
- Enemies will try to dodge minecarts in motion, potentially creating the opportunity to force enemies to dodge into dangerous pits.
- Dwarves riding minecarts off cliffs will land safely when the cart stops.

Inspiring Engineering

With the simple set of machine components available, great projects can be undertaken by ambitious fortress managers. Some inspirational projects that other fortress managers have constructed are presented below in order to give you a sense of what is possible in Dwarf Fortress

Building a Dam

Screw pumps can pump water faster than it flows. A wall of screw pumps across a river (pointing upstream) will pump the water back into the river, resulting in a wall of water and a dry riverbed. Dwarves can then be sent to construct walls and other constructions in the riverbed as required. Once construction is done, the pumps can be disengaged and the water will flow again and fill up to the level of the river.

Sphalerite, from the Dwarf Fortress forums, used this technique to create a standing wall of water into which he had dwarves fire ballistae bolts in an effort to hunt whales with siege weapons.

Dwarven Water Reactors

Water wheels generate far more energy than it costs to raise water one level. This has led to the creation of Dwarven Reactors (or, Dwarven Perpetual Motion Machines) to provide abundant, secure power. Dwarven water reactors are comprised of a two-story room with a pump at the top pumping water from the bottom level to the top, over a waterwheel on the ground floor. Power from the waterwheel can be harnessed to power the pump, as well as a lot of other fortress machinery.

Magma Landmines

Dwarf Fortress forum user Frogwarrior has invented an ingenious trap using pressurized magma, hatches, and pressure plates. Frogwarrior dug a grid of tunnels under the surface, filled them with magma, and linked exit hatches to pressure plates. The pumps filling the tunnels are higher than the surface, so the magma is pressurized and will try to rise to the level of the pumps. When the hatches are triggered, magma shoots into the air, raining down on the foe.

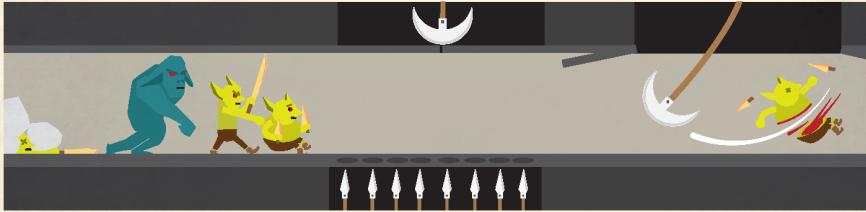
Dwarven Computers

Functional computers have been built in Dwarf Fortress capable of determining the winner in a game of Tic Tac Toe, doing basic arithmetic, displaying hexadecimal and binary values, and operating on them. A computer has also been designed and built that automatically floods an area with magma just long enough to kill creatures before cleaning up and resetting itself, preserving the metal items carried by the enemy for melting and reuse!



- A SHORT GUIDE TO TRAPS -

1. Stonefall traps



2. Weapon traps



3. Cage traps



4. Retractable bridges



5. Kitten bombs

Afterword: Farther

I hope you have enjoyed reading this book, and that it has kindled a love for this unique and marvelous game. There are few games as ambitious as Dwarf Fortress, and few developers as dedicated and single-minded as Tarn and Zach Adams. We are lucky to be able to play in the worlds they help us create.

The joy of Dwarf Fortress lies in the game’s remarkable depth and the stories that unfold from the interactions between its many elements. From world and history generation through to the individual personalities of your dwarves, each component of Dwarf Fortress involves us in amazing stories making each fortress experience a unique one.

By now, I hope you too have a few stories to share with your confused and somewhat concerned friends and family. When they get tired of your story about the time Urist McCrazydwarf pulled your “End the World” lever, why not join the wider Dwarf Fortress community—on the Dwarf Fortress forums (<http://www.bay12forums.com/smf/>), reddit (<http://www.reddit.com/r/dwarffortress/>), Twitter, and the many blogs and tumblr sites—and share your tales, questions, and ideas? You will find the Dwarf Fortress community to be full of fun, helpful people just as enthusiastic about this game.

If you’ve enjoyed Dwarf Fortress, don’t forget to pass on a donation to Tarn and Zach so they can keep working on the game. Tarn and Zach have a development plan mapped out that should keep them busy for the next twenty years, and who doesn’t want to see where this wonderful world generator will end up in 2032?

—Peter Tyson

APPENDIX A

Appendix

The tables in the appendix include those from the body of the book and some extra tables that were too large to include in the text.

Introduction

Table A-1. Common Dwarf Fortress key commands

Key	Binding
Cursor keys	Moves focus around the map and controls some menus.
Plus and minus keys	Cycles through secondary menu options.
Enter	Selects an option.
Esc	Backs out of a menu.
Shift and left-angle-bracket	Drops player view by one layer.
Shift and right-angle-bracket	Raises player view by one layer.
Mouse wheel	Zooms and scales the map and interface.
Left click	Designates where the mouse pointer is located.
Right click	Moves the designation X.
F12	Toggles TrueType fonts (on is advised).

Playing God

Table A-2. Create A World settings

Option	Setting	Determines
World Size	Medium	Physical size of the world, from a few small islands to enormous sprawling continents.
History	Medium	Longer histories take much longer to generate.
Number of Civilizations	Medium	How many different dwarf, human, goblin, and elf civilizations exist at the start of world generation.
Maximum Number of Sites	Medium	Maximum number of cities and towns.
Number of Beasts	Medium	Number of megabeasts, dragons, and titans at the start of world gen. Some will die off during history generation.
Natural Savagery	Very Low	How much of the map contains savage zones with aggressive creatures.
Mineral Occurrence	Everywhere	Increases the chance that a suitable site will have several different minerals.

Table A-3. World map key

Graphic	Translates to	Contains
	Savanna, shrubland or grassland	Grass, some trees.
	Badlands	Barren, some soil.
	Conifer forest	Heavily wooded.
	Mountains	Pointy, rocky things. You can't embark to an area that only contains mountains.
	Brook or river	Only major rivers appear on the region map, but many brooks and smaller rivers can be found on the local map.
	Ocean	Salt water, whales—you know the deal.
	Tundra	Frozen, devoid of trees.
	Desert	Sand, few trees.
	Rocky wasteland	Barren, little or no soil.
	Road	Connects cities and towns. No effect on gameplay.
	Volcano	Magma! On the surface! It's so wonderful! On the local map, volcanos are a single, red, water-like tile.
	Human city or town	Human settlements lie along coasts and in wet areas.
	Elf retreat	Elves live in forests and near rivers.
	Dwarf fortress or mountainhome	Dwarves settle close to mountains.
	Goblin fortresses	Goblins prefer dry, barren areas.
	Necromancer's tower	Embarking within ten squares of a tower is likely to result in a challenging game.

Table A-4. Civilization colors and preferences

Civilization	Color
Dwarf	Blue
Elf	Yellow
Goblin	Purple
Human	Grey

Table A-5. Site Finder settings

Option	Setting	Determines
X Dimension	4	Width of your deployment box.
Y Dimension	4	Height of your deployment box.
Savagery	Low	Whether you are searching for benign (low), neutral (medium), or savage (high) areas.
Evil	N/A	Whether you are searching for good (low), neutral (medium), or evil (high) areas.
Elevation	N/A	How hilly the site will be, from mostly flat to mostly mountainous.
Temperature	Medium	Whether the site will be cold, warm, or hot.
Rain	N/A	How much rain falls at your site.
Drainage	N/A	How dry a site is. Deserts and glaciers are very dry.
Flux Stone	Yes	Whether a site contains flux stones—required for steel production.
Aquifer	No	Whether areas with water-loaded rock or soil layers are selected.
River	Yes	Whether a site needs to have a brook or river in it.
Shallow Metal	Multiple	Whether a site has metal or metals in the first few layers below ground.
Deep Metal	Multiple	Whether a site has metal or metals deep underground.
Soil	≤Some	Whether a site has soil.
Clay	N/A	Whether a site has clay.

Table A-6. Surroundings

	Benign	Neutral	Savage
Good	Serene	Mirthful	Joyous Wilds
Neutral	Calm	Wilderness	Untamed Wilds
Evil	Sinister	Haunted	Terrifying

Table A-7. Site temperatures

Site Temperature	Effect
Scorching	Rivers will not dry up, but surface pools will. Exposed dwarves and livestock may die due to the heat.
Hot	Pools may evaporate during summer.
Warm	Water available from pools and rivers all year round, little risk of freezing or drying pools.

Site Temperature	Effect
Temperate	Surface pools and rivers will freeze in winter, but thaw in spring.
Cold	Surface pools and rivers will be frozen most of the year, but may thaw in summer.
Freezing	Pools and rivers remain frozen throughout the year. Dwarves and livestock exposed to the cold may freeze to death.

Table A-8. Expedition goods summary

Item	Quantity
Copper Picks	2
Copper Battle Axe	1
Iron Anvil	1
Cats	1 Male / 2 Female
Dogs	1 Male / 2 Female
Rooster	1
Hens	4
Plump Helmet Spawn (seeds)	15
Dimple Cup Spawn (seeds)	10
Rock Nuts (seeds)	10
Sweet Pod Seeds (seeds)	10
Cave Wheat Seeds (seeds)	10
Pig Tail Seeds (seeds)	10
1 of each type of meat	1x40
1 of each type of fish (fish)	1
Plump Helmets	20
Dwarven Rum	30
Dwarven Ale	30
Dwarven Beer	30
Dwarven Wine	30

Table A-9. Expedition dwarf skills summary

Dwarf	Primary Skills	Other skills
1	Miner (Proficient)	Mason (Skilled)
2	Miner (Proficient)	Stone Crafter (Skilled)
3	Wood Cutter (Proficient)	Carpenter (Skilled)
4	Grower (Proficient)	Cook (Skilled)
5	Grower (Proficient)	Brewer (Skilled)

Dwarf	Primary Skills	Other skills
6	Herbalist (Competent), Animal Trainer (Competent)	Building Designer (Novice), Butcher (Novice), Fisherman (Novice), Fish Cleaner (Novice)
7	Mechanic (Competent)	Negotiator (Novice), Appraiser (Novice), Record Keeper (Novice), Conversationalist (Novice), Comedian (Novice), Consoler (Novice), Leader (Novice)

First Steps

Table A-10. Map key view

Icon	Object
	Grasses
	Trees
	Tree sapling
	The top of a tree, one level down
	Shrubs
	Boulder
	Upward slope
	River bank slope
	Downward slope
	Surface of water
	Body of water
	Brook
	Dwarves (colors correspond to profession)
	Cat
	Dog
	Chicken
	Open air, but ground one level down
	Open air, no ground one level down
	Solid sand wall
	Solid marble wall (each type of rock is different)
	Magma! ... Or red sand
	Ice
	Snow, trees, and shrubs will get colored white by snow

Table A-11. Container summary

Container	Can store	Made from	Made at
Bag	Seeds, quarry bush leaves, flour, sugar, dye, sand	Leather or cloth	Leather Works, Clothier's Shop
Barrel	Alcohol, plants, bags of food or dye, fish, fat and tallow, meat and organs	Wood or metal	Carpenter's Workshop, Metalsmith's Forge
Bin	Crafts, blocks and bars, ammunition, armor, gems, leather, cloth and clothes, weapons	Wood, metal	Carpenter's Workshop, Metalsmith's Forge
Jug	Honey, royal jelly, rock nut oil	Rock, clay, metal, or glass	Craftsdwarf's Workshop, Kiln, Metalsmith's Forge
Pot	Same goods as a barrel	Rock, metal, or clay	Craftsdwarf's Workshop, Kiln, Metalsmith's Forge

Filling Dwarf Bellies

Table A-12. Poultry pointers

Poultry	Notes
Blue Peafowl	Low number of eggs per bird. One year to maturity.
Chickens	Average number of eggs per bird. Two years to maturity.
Ducks	Large number of eggs per bird. Two years to maturity.
Geese	Low number of eggs per bird. One year to maturity.
Guineafowl	Average number of eggs per bird. One year to maturity.
Turkeys	Large number of eggs per bird. Two years to maturity.

The following table lists all of the items that can be grown in a *subterranean* farm (a farm with a natural earth or stone roof overhead). Most items grown underground can be processed at a still into alcohol, and some have other uses (such as a raw food or base resource for cloth, dye, or cooked food).

Table A-13. Subterranean farm production

Seeds	Grows into	Alcohol made	Also makes
Cave Wheat Seeds	Cave Wheat	Dwarven Beer	Dwarven Wheat Flour
Dimple Cup Spawn	Dimple Cups	<i>None</i>	Dimple Dye
Pig Tail Seeds	Pig Tails	Dwarven Ale	Pig Tail Thread
Plump Helmet Spawn	Plump Helmets (<i>edible</i>)	Dwarven Wine	<i>(None)</i>
Rock Nuts (<i>edible</i>)	Quarry Bushes	<i>(None)</i>	Quarry Bush Leaves

Seeds	Grows into	Alcohol made	Also makes
Sweet Pod	Sweet Pod Seeds	Dwarven Rum	Dwarven Sugar, Dwarven Syrup

In the course of trading or your dwarves eating gathered plants, many seeds may become available for you to plant in aboveground farms. Aboveground farms do not, strictly speaking, need to be above ground. Simply digging an open pit and then covering it with a constructed floor is enough to convince Dwarf Fortress that the surface beneath has access to sun and rain, and will be counted as aboveground for the purpose of farming.

Table A-14. Aboveground farm production

Seeds	Grow into	Alcohol made	Also makes
Longland Grass Seeds	Longland Grass	Longland Beer	Longland Flour
Whip Vine Seeds	Whip Vine	Whip Wine	Whip Wine Flour
Sun Berry Seeds	Sun Berry ^a	Sunshine	None
Fisher Berry Seeds	Fisher Berry ^a	Fisher Berry Wine	None
Bloated Tuber	Bloated Tuber ^a	Tuber Beer	None
Prickle Berry Seeds	Prickle Berry ^a	Prickle Berry Wine	None
Muck Root	Muck Root ^a	Swamp Whiskey	None
Wild Strawberry Seeds	Wild Strawberry ^a	Strawberry Wine	None
Rope Reed Seeds	Rope Reed	River Spirits	Rope Reed Thread
Rat Weed Seeds	Rat Weed ^a	Sewer Beer	None
Sliver Barb Seeds	Sliver Barb	Gutter Cruor	Black Dye
Valley Herb	Valley Herb	None	Golden Salve ^b
Kobold Bulb	Kobold Bulb	None	Gnomeblight ^b
Hide Root Seeds	Hide Root	None	Redroot Dye
Blade Weed Seeds	Blade Weed	None	Emerald Dye

^a Can be eaten raw.

^b Only useful as a valuable trade good.

Dwarf Resource Management

Table A-15. Strange moods

Mood	Notes
Fell	The moody dwarf will claim a workshop and then kill the nearest dwarf for their parts. Results in a legendary bone carver or leatherworker. Only strikes particularly unhappy dwarves.
Fey	Makes the dwarf happy. The dwarf will clearly express their ingredient demands. Dwarf will become legendary in the associated skill.

Mood	Notes
Macabre	Similar to a fell mood. Only available to unhappy dwarves and likely to require animal pieces, but does not result in a dwarf being murdered. Does provide legendary skill.
Possessed	Possessed dwarves have ambiguous ingredient requests and do not get a skill increase once the artifact is completed.
Secretive	Ingredient requirements are unclear. Does provide legendary skill.

Table A-16. Ingredient demands

Demand	Meeting the Demand
Bars	Smelt ores into bars of metal at a <i>Smelter</i> .
Blocks	Turn rocks to blocks at a <i>Mason's Workshop</i> .
Bones	Butcher animals to provide bones.
Cloth	The demand may be for plant, silk, or yarn cloth. Manufacture at a <i>Loom</i> .
Gems	Raw or cut gems may be required. Gems can be cut at a <i>Jeweler's Workshop</i> .
Glass	Process sand into glass at a <i>Glass Furnace</i> .
Leather	Butcher animals and process their skins into leather at a <i>Tanner's Shop</i> .
Shell	Some seafood, when processed at a <i>Fishery</i> , produces a shell. Raw turtles and fish cannot be traded for, only bought at embark or collected by fishing dwarves.
Wood	Cut down trees.

Table A-17. Artifact uses

Artifact	Possible Use
Furniture (bed, table, chairs, etc.)	Place in a room owned by your most important noble, or build into the communal dining room in order to spread the happiness around.
Barrel	Use in a <i>Dyer's Shop</i> or <i>Ashery</i> .
Bucket	Use in building a <i>Well</i> , <i>Soap Maker's Workshop</i> , <i>Ashery</i> or <i>Dyer's Shop</i> .
Mechanism	Build a lever with a mechanism or use the mechanism in a trap for an extremely deadly surprise.
Weapon	Assign to a dwarf or use in a weapon trap.
Shield, Armor, Clothing	Assign to a dwarf.
Gems	Add as a decoration to furniture and place the furniture.
Toys and Trinkets	No known use.

Table A-18. Player-specified nobles

Position	Benefit
Mayor	Required to appoint other nobles. Will often be appointed automatically from among the dwarves with leadership skills. May issue mandates and demands. Meets with foreign dignitaries.

Position	Benefit
Sheriff/Captain of the Guard	Dispenses justice and leads the fortress guards.
Militia Commander	In charge of the fortress military, and may lead up to ten soldiers.
Manager	Allows for the creation of production orders from the <i>Jobs</i> menu.
Chief Medical Dwarf	Enables the <i>Health</i> page under the <i>z (Status)</i> screen when appointed. Leads the fortress's medical staff.
Broker	Trades with visiting caravans.
Bookkeeper	Keeps track of all the goods in your fortress.
Militia Captain	This position only appears once you have a Militia Commander. Can lead a squad of dwarves. You can have multiple militia captains.

Table A-19. Quality and item markings

Description	Marking
<i>No description</i>	Item
Well Crafted	-Item-
Finely Crafted	+Item+
Superior Quality	*Item*
Exceptional	≡Item≡
Masterwork	⊛Item⊛
Artifact	Unique Item Name
Decorated (with gems, for example)	«Item»
Somewhat worn clothing	XItemX
Very worn clothing	XItemX
Clothing about to disintegrate	XXItemXX
Item forbidden	{Item}
Item is foreign-produced	(Item)

Digging Deeper

Table A-20. Rooms

Room	Generated from	Use
Barracks	Bed, Armor Stand, Weapon Rack, Chest, or Cabinet	Space for soldiers to sleep, train, and store weapons.
Bedroom	Bed	Accommodation for a single dwarf, or a dwarf and their partner.
Dining Room	Table	A place for a dwarf to eat.

Room	Generated from	Use
Dormitory	Bed (as an option)	Multiple-bed bedroom for citizens without a room.
Jail	Restraints (metal chain or cloth rope)	A room used in the dwarven justice system.
Meeting Hall	Table (as an option) or well	Communal socializing area. If there are tables and chairs, dwarves will eat here.
Memorial Hall	Memorials	Generates happy thoughts.
Sculpture Garden	Statue	Generates happy thoughts.

Industry

Table A-21. *Industries in Dwarf Fortress*

Industry	Core Outputs
Wood	Furniture and fuel
Stone	Furniture and buildings
Food	Food, drink, and raw ingredients for the cloth industry
Meat	Raw food, leather, and bone
Metal	Weapons and armor, furniture
Cloth	Clothes, rope, and containers
Gem, Glass, and Ceramics	Decorations, trap weapons, containers, and crafts (quite optional)

Table A-22. *Wood industry primary workshops*

Workshop	Description
Carpenter's Workshop	Produces beds, barrels, and other useful items such as training weapons and engineering components.
Wood Furnace	Found under the <i>Furnaces</i> menu (b-e), the Wood Furnace converts wood into charcoal (for use in smelters and kilns) and ash (for use in the production of soap and fertilizer).
Siege Workshop	Creates parts for ballistae and catapults out of wood.
Craftsdwarf's Workshop	Can produce wooden crafts (which seems a waste when rock crafts will do just fine) and wooden crossbow bolts, which are a cheap resource for training marksdwarves.
Bowyer's Workshop	Produces wooden crossbows, which are useful for the Fortress Guard.

Table A-23. Wood industry secondary workshops

Workshop	Description
Ashery	Turns ash into lye (for making soap) or potash (for glazing ceramics or fertilizing plants). Lye production also requires a spare bucket to hold the mixture before it is turned into soap.
Soap Maker's Workshop	Combines a bucket of lye with tallow or rock nut oil to produce soap.
Kiln	Combines potash and fuel to make pearlash for use in making clear and crystal glass.
Glass Furnace	Combines pearlash with sand and fuel to make clear glass. Add rock crystal to the mix, and you will make crystal glass.

Table A-24. Stone industry workshops

Workshop	Description
Mason's Workshop	Produces a vast range of furniture and can turn stones into rock blocks, which are required for building wells, screw pumps, and Asheries. Blocks are stored in bins and more valuable than uncut rocks when used in construction.
Craftsdwarf's Workshop	Turns stone into rock crafts, which are crucial trade goods. Also turns rock into nest boxes and hives, which are important for food production. Makes rock pots, which can store food and drink. Makes jugs, which store honey and oil. Makes short swords out of obsidian and wood, which are a cheap, improvised weapon.
Mechanic's Workshop	Turns stone into mechanisms.
Smelter	Turns lignite or bituminous coal into coke (one stone produces three bars of coke). Uses flux stones for the production of pig iron and steel.

Table A-25. Food industry raw inputs

Food	Use
Plump helms	Usually can be eaten raw, brewed at a Still into dwarven wine, or cooked in a Kitchen with other ingredients.
Gathered plants	Same as plump helms.
Plant seeds	Can be cooked (are not available for cooking by default). Quarry Bush seeds (rock nuts) can be eaten raw.
Cave wheat	Can either be milled into dwarven wheat flour at a Quern or Millstone, or brewed into beer at a Still.
Quarry bushes	Processed at a Farmer's Workshop into one rock nut and five quarry bush leaves, which can be cooked.
Rock nuts	Rock nuts are what quarry bush seeds are called. Can be eaten raw, or milled at a Millstone or Quern into rock nut paste.
Sweet pods	Can be brewed into rum at a Still, processed at a Quern or Millstone into dwarven sugar, or processed into dwarven syrup at a Farmer's Workshop using the <i>Process Plants to Barrel</i> order.
Eggs	Gathered from nest boxes, they cannot be eaten raw and must be cooked in a Kitchen.

Food	Use
Honeycomb	Gathered from a hive and then pressed at a Screw Press to get honey and wax, which are stored in jars.
Fish	Gathered by fisherwarves, fish must go through a Fishery to become processed fish.
Milk	Some creatures can be milked at a Farmer's Workshop. The milk can be drunk raw, turned into cheese at a Farmer's Workshop, or cooked at a Kitchen. No, you can't milk a cat.
Animals	Butchered at a Butcher's Shop into meat, prepared organs, fat, bones, skin, and leftover waste items.

Table A-26. Food industry secondary inputs

Food	Use
Milk	Can be turned into cheese at a Farmer's Workshop, cooked at the Kitchen, or consumed raw.
Cheese	Can be eaten as is or cooked at the Kitchen.
Honey	May be eaten raw, brewed into mead at a Still, or cooked.
Dwarven Wheat Flour	Used as an ingredient in meals cooked at the Kitchen.
Quarry Bush Leaves	Used as an ingredient in meals cooked at the Kitchen.
Rock nut paste	Used as an ingredient in meals cooked at the Kitchen, or processed at a Screw Press into rock nut press cake and rock nut oil (requires jug).
Rock nut press cake	Used as an ingredient in meals cooked at the Kitchen.
Rock nut oil	Used as an ingredient in meals cooked at the Kitchen or used to make soap.
Dwarven Sugar	Used as an ingredient in meals cooked at the Kitchen.
Dwarven Syrup	Used as an ingredient in meals cooked at the Kitchen.
Fat	Used as an ingredient in meals or rendered into tallow at the Kitchen.
Tallow	Used to make soap or as an ingredient in meals cooked at the Kitchen.
Meat	Can be eaten raw or cooked into a meal at the Kitchen.
Organs	Can be eaten raw or cooked into a meal at the Kitchen.

Table A-27. Food industry workshops

Workshop	Description
Farm Plot	Strictly speaking, this is not a workshop, but farm plots ensure a reliable supply of food goods for your fortress.
Nest boxes	Will be claimed by nearby egg-laying creatures and used to lay eggs.
Beehives	Houses bee colonies until they are ready for harvesting.
Still	Turns a wide range of foods into alcohol. Essential to any fortress, a still should be kept occupied brewing drinks most of the time.
Kitchen	Produces cooked meals and allows the rendering of fat into tallow. Once you have a few immigrants, it isn't a bad idea to leave a cooking task on repeat.

Workshop	Description
Farmer's Workshop	Processes a range of foods and other goods into barrels, bags, or stacks. You are likely to need two or even three Farmer's Workshops to keep up with food and cloth industry inputs.
Millstone	Grinds various plants to sugar, flour, and dye. Bags are required to store the processed goods. Millstones need to be powered by mechanical power delivered by dwarven engineering.
Quern	Functionally identical to the Millstone, but is powered by dwarves instead of machinery. Does not work as fast as a Millstone.
Screw Press	Presses honeycomb to yield wax (can be used for crafts) and honey, and presses rock nut paste to produce oil and rock nut press cake.

Table A-28. Animal butchery products

Product	Use
Meat	Can be eaten raw or cooked in a Kitchen.
Skull	Can be turned into a totem at a Crafts Dwarf's Shop—useful only as a trade good.
Bones	Can be carved into bone crossbow bolts, crafts, or used to decorate other items at a Crafts Dwarf's Workshop.
Fat	Can be cooked or rendered into tallow at a Kitchen. In turn, tallow can be cooked or used to make soap.
Skin	Processed into leather at a Tanner's Shop.
Horn/Hoof	Can be used to make horn crafts or to decorate an object with horn.
Ivory/Teeth	Teeth and Ivory can be turned into crafts at a Crafts Dwarf's Workshop or used as item decorations.
Hair	Can be spun into thread at a Farmer's Workshop. Cannot be used to make cloth (no hair shirts for you, hippy!)
Organs	A variety of organs may be produced when creatures are butchered. These can be eaten raw or cooked in a Kitchen.

Table A-29. Meat industry workshops

Workshop	Description
Butcher's Shop	Where animals are slaughtered. Butchery tasks are automatically added to the task list when a creature is selected for slaughter.
Tanner's Shop	Turns hides into leather. The task is automatically added to the task list if a hide is available.
Leather Works	Produces armor, backpacks, quivers, waterskins, clothes, and bags, and allows for items to be decorated with leather.
Crafts Dwarf's Workshop	Bones, hooves, horns, teeth, and skulls can be turned into crafts or used to decorate items. Bones can also be turned into crossbow bolts, which are a great resource for training marksdwarves.
Kitchen	Can process fat to tallow, and cook meat and organs into meals.

Workshop	Description
Soap Maker's Workshop	Combines tallow and lye to make soap, which is vital for dwarf healthcare.
Farmer's Workshop	Will spin hair into yarn using the spin thread order.

Table A-30. Metal industry workshops

Workshop	Description
Smelter	Turns ore into bars or melts metal objects to bars (at the cost of one fuel).
Magma Smelter	Does the same job as a smelter, but at no fuel cost.
Metalsmith's Forge	You must have an anvil to build a forge. Turns metal bars into weapons, armor, anvils, and crafts and a range of other metal goods (at the cost of one fuel).
Magma Forge	Operates the same way as a Metalsmith's Forge, but requires no fuel.

Table A-31. Cloth industry primary inputs

Input	Intermediary Product	Information
Pig tails	Processed into pig tail thread at a Farmer's Workshop	Grown on any underground farm plot in summer and autumn. May be brewed into dwarven beer at a Still.
Rope reeds	Processed into rope reed thread at a Farmer's Workshop	Grown on farm plots aboveground. May be brewed into river spirits at a Still.
Wool	Shorn off animals and spun into yarn at a Farmer's Workshop	Not as common as plant-based cloth in most fortresses, but a viable alternative.
Hair	Spun into thread at a Farmer's Workshop	A byproduct of the meat industry. Cannot be used to make cloth (ick!) but can be used in hospitals.
Spider silk	Woven into spider silk thread the moment they are collected	There are a variety of spiders from which you can harvest webs. So long as there is a loom in the fortress, webs will be collected automatically by any dwarf with the <i>Weaving</i> labor active. This may place your dwarves in some danger, as certain types of spiders are aggressive and quite lethal.

Table A-32. Dye inputs

Dye plant	Color	Milled into	Information
Blade weed	Green	Emerald dye	Grown on aboveground farm plots.
Dimple cup	Blue	Dimple dye	Grown on subterranean farm plots.
Hide root	Red	Redroot dye	Grown on aboveground farm plots.
Sliver barb	Black	Sliver dye	Grown on aboveground farm plots, and can be brewed into gutter cruor at a Still.

Table A-33. Cloth industry primary workshops

Workshop	Description
Farm plot	Grows pig tails (subterranean farming) or rope reed (surface farming).
Farmer's Workshop	Used to thresh plants into thread, shear sheep, and spin wool into yarn.
Millstone or Quern	Mills dye plants into powders (requires a bag)
Loom	Causes any dwarf with the weaving labor to gather spiderwebs.

Table A-34. Cloth industry secondary workshops

Workshop	Description
Loom	Weaves thread and yarn into cloth.
Dyer's Shop	Dyes cloth or thread.
Clothier's Workshop	Turns cloth into ropes, bags, and clothes. Can be used to sew a picture onto another item, increasing its value.
Craftsdwarf's Workshop	Turns cloth into cloth crafts.

Dwarf Healthcare

Table A-35. Medical labors

Labor	Used
Diagnosis	Before a patient is treated, they are diagnosed.
Surgery	Repairing internal damage and infected wounds.
Suturing	Stitching up open wounds.
Dressing wounds	Bandaging wounds that have been sutured.
Setting bones	Setting broken or fractured bones

Table A-36. Wound colors

Color	Meaning
White	No wound at this location
Tan	Minor wound, no function loss
Yellow	The highlighted body part has reduced function due to damage
Cyan	The body part no longer works
Red	Broken body part or loss of tissue
Grey	Missing body part

Engineering

Table A-37. Specialist trap weapons

Weapon	Notes
Giant Axe Blade	Chops enemies into bits. This may cause problems if you face undead, as their bits may come back to life.
Enormous Corkscrew	Piercing weapon, may damage internal organs. Also used in making screw pumps.
Large, Serrated Disc	Similar to the giant axe; attacks three times.
Menacing Spike	Similar to the enormous corkscrew; may also be used in upright spike traps.
Spiked Ball	Bashes the enemy, breaks bones.

Plant Processing

In addition to simply eating a plant or turning it into alcohol at a still, many plant products have further uses that additional processing may unlock. With a few exceptions, most processable plants either end up as thread, an ingredient for cooking, or a dye for use in clothing manufacture.

Table A-38. Plant processing chain

Plant	Processed At	Makes	Used At
Pig Tail	Farmer's Workshop	Pig Tail Thread	Loom to make cloth
Rope Reed	Farmer's Workshop	Rope Reed Thread	Loom to make cloth
Kobold Bulb	Farmer's Workshop	Gnomeblight ^a	Trade good
Valley Herb	Farmer's Workshop	Golden Salve ^a	Trade good
Quarry Bush	Farmer's Workshop	Quarry Bush Leaves ^b	Kitchen to make food
Sweet Pods	Mill Stone or Quern	Dwarven Sugar ^b	Kitchen to make food
Sweet Pods	Farmer's Workshop	Dwarven Syrup ^c	Kitchen to make food
Dimple Cup	Mill Stone or Quern	Dimple Dye	Dyer's Shop to dye cloth or thread
Blade Weed	Mill Stone or Quern	Emerald Dye	Dyer's Shop to dye cloth or thread
Hide Root	Mill Stone or Quern	Redroot Dye	Dyer's Shop to dye cloth or thread
Sliver Barb	Mill Stone or Quern	Sliver Dye	Dyer's Shop to dye cloth or thread
Whip Vine	Mill Stone or Quern	Whip Vine Flour	Kitchen to make food
Longland Grass	Mill Stone of Quern	Longland Flour	Kitchen to make food
Cave Wheat	Mill Stone or Quern	Dwarven Wheat Flour	Kitchen to make food

Plant	Processed At	Makes	Used At
Rock Nuts	Mill Stone or Quern	Rock Nut Paste	Kitchen to make food
Rock Nut Paste	Screw Press	Rock Nut Press Cake and Rock Nut Oil ^d	Kitchen; both can be cooked
Rock Nut Oil	Soap Maker's Workshop	Soap	Hospital

^a Requires an empty vial.

^b Requires an empty bag.

^c Requires an empty barrel.

^d Requires an empty jug.

Stones and Ores

Table A-39. Ores and bars

Ore	Smelts into
Raw Adamantine	Adamantine strands ^a
Native Aluminum	Aluminum ^b
Bismuthinite	Bismuth
Malachite	Copper
Native Copper	Copper
Tetrahedrite	Copper, Silver ^c
Galena	Lead, ^d Silver ^c
Horn Silver	Silver
Native Silver	Silver
Cassiterite	Tin
Hematite	Iron
Limonite	Iron
Magnetite	Iron
Native Gold	Gold
Garnierite	Nickel
Native Platinum	Platinum
Sphalerite	Zinc

^a Processed at a crafts-dwarf's workshop.

^b Valuable, but only as decoration of furniture. For obvious reasons, cannot be made into weapons or armor.

^c Will smelt into a bar of the first metal with a chance of a bar of the second metal also being created.

^d Low value and heavy, low priority to smelt.

Table A-40. Alloys

Alloy	Ingredients
Billon	Copper, Silver
Bismuth Bronze	2 Copper, 1 Bismuth, 1 Tin ^a
Black Bronze	2 Copper, 1 Gold, 1 Silver ^a
Brass	Copper, Zinc
Bronze	Copper, Tin
Electrum	Gold, Silver
Fine Pewter	1 Copper, 3 Tin
Lay Pewter	1 Copper, 1 Lead, 2 Tin ^a
Nickel Silver	1 Copper, 2 Nickel, 1 Zinc ^a
Pig Iron	1 Iron, 1 flux stone, 1 fuel (produces one bar of pig iron) ^a
Rose Gold	1 Copper, 3 Gold ^a
Steel	1 Iron, 1 Pig Iron, 1 flux stone, 1 fuel (produces two bars of steel) ^a
Sterling Silver	1 Copper, 3 Silver
Trifle Pewter	1 Copper, 2 Tin

^a Bars of metal, not ores, are required for the smelting of this alloy.

Table A-41. Useful non-ore stones

Stone	Use
Alabaster	Makes plaster powder (at kiln)
Bituminous coal	Makes coke (at smelter)
Calcite	Makes pig iron or steel bars (is a flux stone)
Chalk	Makes pig iron or steel bars (is a flux stone)
Dolomite	Makes pig iron or steel bars (is a flux stone)
Gypsum	Makes plaster powder (at kiln)
Lignite	Makes coke (at smelter)
Limestone	Makes pig iron or steel bars (is a flux stone)
Marble	Makes pig iron or steel bars (is a flux stone)
Satinspar	Makes plaster powder (at kiln)
Selenite	Makes plaster powder (at kiln)

Dwarf Labors

Table A-42. Dwarf labor list

Group	Labor	Use
Mining	(no subtasks)	Digging, channeling, digging ramps, and stairs—requires a pick.
Woodworking	Carpentry	Making items at the Carpenter’s Workshop and constructing items out of wood.
	Crossbow-making	Making wooden or bone crossbows at the Bowyer’s Workshop.
	Wood Cutting	Cutting down trees—requires an axe.
Stoneworking	Masonry	Making items at the Mason’s Workshop and constructing items out of stone.
	Stone Detailing	Smoothing and engraving stone walls, carving fortifications, carving track, and engraving memorial slabs.
Hunting/Related	Animal Training	Training hunting or war animals at the Kennels.
	Animal Care	Currently not implemented.
	Hunting	Used by hunters to hunt animals for food.
	Trapping	Trapping small animals using a Kennel or Butcher’s Shop task.
	Small Animal Dissection	Required to make extracts (useful only as trade goods) from dead creatures at the Butcher’s Shop.
Healthcare	Diagnosis	Before a patient can be treated, they must receive a diagnosis.
	Surgery	Repair of internal damage or rot.
	Setting Bones	Immobilization of broken or fractured bones.
	Suturing	Stitching up open wounds.
	Dressing Wounds	Bandaging wounds.
	Feed Patients/Prisoners ^a	Taking food and water to prisoners and patients, as needed.
	Recovering Wounded ^a	Attempt to take wounded dwarves to the hospital.
Farming/Related	Butchery	For the slaughtering and butchery of animals at a Butcher’s Shop.
	Tanning	Turns hide into leather at a Tanner’s Shop.
	Farming (Fields)	Required to plant seeds and fertilize a farm plot.
	Dyeing	Dyes cloth and thread at a Dyer’s Shop.
	Soap Making	Makes soap at the Soap Maker’s Workshop.
	Wood Burning	Turns wood into ash or charcoal at the Wood Furnace.
	Potash Making	Makes potash out of ash at an Ashery.
	Lye Making	Makes lye out of ash at an Ashery.
	Milling	Processes plants at a Quern or Millstone.
Brewing	Processes plants or honey into alcohol at a Still.	

Group	Labor	Use
	Plant Gathering	Gathers plants, usually from the surface, to supplement food production.
	Plant Processing	Covers the processing jobs undertaken at a Farmer's Workshop.
	Cheese Making	Turns milk into cheese at a Farmer's Workshop.
	Milking	Milk creatures at the Farmer's Workshop.
	Shearing	Wool is sheared from sheep, alpacas, llamas, and trolls at the Farmer's Workshop.
	Spinning	Wool is spun into yarn at a Farmer's Workshop.
	Cooking	Required for meal production at the Kitchen.
	Pressing	Honeycomb is pressed for honey and rock nut paste for rock nut oil at a Screw Press.
	Beekeeping	Tends hives and gathers hive products.
Fishing/Related	Fishing	Fishes at any available pond or river.
	Fish Cleaning	Processes raw fish at a Fishery
	Fish Dissection	Gathers extracts from certain fish at a Fishery.
Metalsmithing	Furnace Operating	Smelts ores or fires clay at Furnaces and Kilns.
	Weaponsmithing	Makes weapons and trap components at a Metalsmith's Forge.
	Armoring	Makes armor and shields at a Metalsmith's Forge.
	Blacksmithing	Makes furniture, bins, buckets, blocks, chains, and other goods at a Metalsmith's Forge.
	Metalcrafting	Make crafts, flasks, and chains at a Metalsmith's Forge.
Jewelry	Gem Cutting	Turns raw gems into cut gems.
	Gem Setting	Encrusts furniture and other goods with cut gems.
Crafts	Leatherworking	Turns leather into clothes, backpacks, waterskins, and quivers.
	Woodcrafting	Makes wooden crafts, bolts, nest boxes, and other goods at a Craftsdfwarf's Workshop.
	Stonecrafting	Makes stone crafts, nest boxes, pots, and other goods at a Craftsdfwarf's Workshop.
	Bone Carving	Makes bone or shell crafts, bolts, armor, and totems at a Craftsdfwarf's Workshop.
	Glassmaking	Makes green, clear, or crystal glass at a Glass Furnace.
	Weaving	Turns thread into cloth at a loom and gathers silk spider webs.
	Clothesmaking	Can make cloth or silk clothes, ropes, and bags at a Clothes Maker's Shop.
	Strand Extraction	Processes raw adamantine into strands at a Craftsdfwarf's Workshop.
	Pottery	Produces clay jugs, pots, crafts, and other goods at a Kiln.
	Glazing	Applies glazes to clay jugs so that they can store liquids.
	Wax Working	Makes wax crafts at a Craftsdfwarf's Workshop.

Group	Labor	Use
Engineering	Siege Engineering	Makes catapult and ballista parts and ballista ammo in a Siege Workshop.
	Siege Operating	Loads and fires siege engines.
	Mechanics	Makes mechanisms at a Mechanic's Workshop, builds and links levers and bridges, constructs and loads traps.
Hauling	Pump Operating	Operates any pump set to manual operation.
	Stone Hauling ^a	Hauls stones, ores, and uncut gems.
	Wood Hauling ^a	Hauls logs.
	Item Hauling ^a	Hauls goods and will gather sand for a Glass Furnace.
	Burial ^a	Will move dead dwarves and pets to corpse stockpiles or coffins.
	Food Hauling ^a	Hauls food and drink.
	Refuse Hauling ^a	Hauls refuse to a refuse stockpile.
	Furniture Hauling ^a	Hauls furniture to stockpiles or places furniture in rooms.
	Animal Hauling ^a	Will haul caged animals.
Other Jobs	Push/Haul Vehicles ^a	Moves and activates minecarts.
	Architecture	Many workshops and constructions require an architect to visit the site before construction will proceed.
	Alchemy	Currently has no function.
	Cleaning ^a	Dwarves will clean blood or other substances that get spread around your fortress.

^a This labor is on by default for all dwarves.

The following table will help you determine why a workshop isn't being built (a dwarf with an associated labor is required to build a workshop), or to determine which workshop is the best place to go order a job you wish to be completed.

Table A-43. Workshops and associated labors

Workshop	Associated Labors
Ashery	Potash Making, Lye Making
Bowyer's Workshop	Crossbow-Making
Butcher's Shop	Butchery
Carpenter's Workshop	Carpentry, Trapping
Clothier's Shop	Clothesmaking
Craftsdwarf's Workshop	Stonecrafting, Woodcrafting, Bonecrafting, Strand Extraction
Dyer's Shop	Dyeing
Farmer's Workshop	Plant Processing, Milking, Cheesemaking
Glass Furnace	Glassmaking
Hive	Beekeeping

Workshop	Associated Labors
Fishery	Fish Cleaning
Kitchen	Cooking
Kiln	Potter, Furnace Operating
Quern	Milling
Leather Works	Leatherworking
Loom	Weaving
Millstone	Milling
Jeweler's Workshop	Gem Cutting, Gem Setting
Mason's Workshop	Masonry
Mechanic's Workshop	Mechanics
Metalsmith's Forge	Weaponsmithing, Armoring, Blacksmithing, Metalcrafting
Screw Press	Presser
Siege Workshop	Siege Engineering
Smelter	Furnace Operating
Soap Maker's Workshop	Soap Making
Still	Brewing
Tanner's Workshop	Tanning

New Fort Checklist

Here are some goals you should aim for (in rough order of completion) as you start a new fortress.

Table A-44. Goal chart

Task	Details
Dig in	Get your miners busy clearing out some initial rooms to live in.
Cut local trees and gather plants	Harvest nearby resources.
Plant first fields	Ideally securely indoors. Move any fowl indoors as well.
Create first stockpiles	Get your goods out of the rain!
Build Mason's and Carpenter's Workshops	Build a few beds and tables and place them. Set them for public use.
Build a Crafts Dwarf's Workshop	Build and place nest boxes and, optionally, hives. Any spare dwarf can make rock crafts.
Construct initial defenses	Wall an enclosure or simply put doors or hatches on your underground entrance.
Lay out your fortress bedrooms, storage, and workshop floors	Keep the miners busy by digging out the huge space you will need soon.

Task	Details
Begin to brew your own alcohol	Dying of thirst sucks.
Add more fields and crops if possible	Keep your farmers permanently busy.
Build a trade depot	Ensure that you keep it separate from your main fortress, in case traders trigger an ambush.
Start producing beds, doors, tables, and chairs	Decorate and set up all the rooms you have dug out!
Use the Nobles screen	Make your expedition leader the broker and bookkeeper. Give this dwarf the bedroom, office, and dining room they require.
Place bridges linked to levers and place traps	Improve your defenses as early as you can.
Assign tasks to migrants	Migrants will arrive with many useless skills. Reassign them!
Begin developing workshop and stockpile floors	Destroy existing workshops and stockpiles, and reestablish them on the huge floors you have excavated.
Build intermediate workshops to process goods	Start to mill or process your plants into foods and cloth.
Establish a fantastic dining room and hospital	Create the large dining and hospital rooms you will need as your fortress grows. Equip them.
Establish a jail and look at ennobling another dwarf or two	Create nobles when you have decorated rooms available to keep them happy. Create a bookkeeper and adjust their accuracy settings.
Begin sending miners to prospect for magma and ores	Build a bridge between your main fortress and the accessway your exploratory miners use. You don't want any nasty surprises!
Establish a well	Water is crucial for the functioning of your hospital. Pipe water to a cistern, stop the flow, cut a hole in the top, and build a well over the hole.
Start your military	Even if your military dwarves don't have weapons or armor just yet, it is important to get them training early.
Find magma, and build magma forges and smelters	Magma!
Make weapons and armor for your military	Equip your military in the best weapons and armor you can make or buy
And remember . . .	Losing Is Fun!

