Then David gave his son Solomon the plans for the portico of the temple, its buildings, its storerooms, its upper parts, its inner rooms. . .
(1 Chronicles 28:11 NIV)

Introduction

From DREAM. . .
Everything starts with an idea or concept in your mind.

To DRAWING. . .
Your thoughts are given form by sketching them out.

To REALITY. . .
The construction process begins.

Bringing Your Model Design Ideas to Life

Do you have an idea in your head you want to get on paper – or into the computer? Then, the next logical step is to make a *drawing* of your design. Being able to sketch out ideas is crucial in the overall process of turning your dream into a finished project. For sure, it's nearly always the *first step* in getting a design out of the idea stage and on the road to becoming a reality.

NOTE: Underlined terms appear in the Glossary.

Just keep in mind, working drawings aren't simply nifty illustrations that are pleasing to the eye. Rather, they provide vital construction information you need in order to get the job done. For this reason, having a good set of *blueprints* can be very important to the success of your project.

In fact, the information contained in this volume lays the *foundation* for a whole new world of modeling opportunities. Once you know how to make accurate plans and construction patterns for your projects, new levels of capability and productivity are just around the corner – thanks to new and exciting technologies. Armed with a good set of plans and some high-tech "digital power tools," just imagine what you can accomplish.

The concepts and techniques presented here apply not only to building models, but also to other design tasks as well. For example, these same methods can be used in many types of do-it-yourself projects. The only limit is your own imagination. . .

What You Need to Know

Written specifically for modelers, craftsmen, and other hobbyists, this book was created to present the model design and blueprinting process in a format that is both easy to understand and to apply. With this volume as your guide, you'll learn powerful techniques and concepts that can help you with just about any project.

You'll quickly get up to speed on the basics, including how to read and interpret blueprints and lay out plan views. Later, you will delve into more advanced

topics such as making construction patterns and creating developments and intersections. Before long, you'll be ready to create drawings and patterns for building your own models completely from scratch.

2D Design Basics

Having a set of blueprints is often the starting point for any model design project. Such drawings can help streamline the construction process in many different ways. Being able to create blueprints requires a basic understanding of 2D design fundamentals. For this reason, the material in this book can be considered *foundational* to the model design process.

This foundation involves what is known as drafting. While this may sound technical, don't worry. Rather than assuming any particular level of proficiency, the material covered here will be explained from the point of view of the beginner. With an easy-to-follow format and numerous, detailed illustrations on nearly every page, you'll find plenty of helpful hints and tips along the way.

Until now, the methods for making your own blueprints have been explained only in textbooks and coursework on drafting and engineering graphics. Such material is really intended for engineers, architects, and industrial designers. In contrast, this book was written specifically for modelers, craftsmen, and hobbyists.

2D Tools for 3D Artists

Having a good set of plans can be critical if you want to build a physical model from scratch. But, did you know 2D drawings can also be valuable for many 3D modeling tasks as well? For example, you can extract a great deal of information from a set of blueprints that will aid you in building not only the overall form of your 3D model, but also the individual parts. This is particularly true if you are into "hard surface" or "hardware" subjects such as vehicles, buildings, etc.

Before you begin, you may need to determine one or more of the following:

- What is the correct size and shape of my subject?
- Can I determine the cross section I need to build?
- How long and how wide should it be?
- Do I have the correct proportions?

Do you build physical models you can hold in your hand or 3D models that exist only inside the computer? Perhaps you are interested in *both* kinds of modeling. No matter what type or genre of modeling you prefer, this book was written for you.

Having a good set of 2D blueprints can jumpstart and then streamline the process of building something in 3D. For example, the complex 3D locomotive model seen on the front cover of this book was made in only a few days. This was possible because 2D plans were used as a starting point.

When you're working on a 3D project, these are just a few of the questions a good set of 2D plans can help you answer. Remember, *you always need a starting point*. This is true even when you are creating something entirely in virtual space.

Traditional vs. Digital Tools

In order to provide a useful design course for *all* modelers, the goal here is to cover the general principles of making blueprints. These principles apply whether you want to draw with a pencil and paper or with a computer program.

Whichever approach you choose, this book will equip you with what you need to know to start making blueprints and patterns for your next project.

You may find, however, that computer-based drawing is extremely powerful and efficient. That's why a number of tips and hints in this book are geared towards using digital design tools. If you've never tried drawing with a computer before, you may want to consider the benefits of this approach.

You don't have to use a computer to get a lot out of the material in this book. The basic techniques presented here will work quite well – even if you want to make your drawings on paper the good, old-fashioned way. In that event, all you need to get started is some graph paper, a pencil, a drawing compass, and a good ruler.

For example, imagine a carpenter going about his work producing something from wood using "basic" hand tools such as a hammer, saw, tape measure, and block plane. As an experienced craftsman, he can do a fine job with these tools and produce beautiful, quality work.

Yet, what if you gave this same craftsman power tools like a table saw, router, and drill? He could not only accomplish his work much faster, but he could do it with more precision and with greater ease. More importantly, even someone who is not an experienced craftsman could produce quality work using this kind of equipment.

In a similar fashion, the advent of computer technology has provided new "digital power tools" for the modeler. Whether you are new to designing model projects or you have a good deal of experience under your belt, just imagine what these digital tools could do for you. Why not open the door to new levels of proficiency, craftsmanship, and productivity?

Being able to draw in digital format is vital if you want to explore the high-tech world of modeling capabilities made possible by *3D design* and *rapid prototyping*.

Computer Design Basics

There are two different approaches for making blueprints using a computer. CAD software is the traditional choice for draftsmen and engineers. In contrast, graphic artists employ *illustration programs* to make their drawings. Both types of applications are designed for very different purposes. Yet, either can be used to make plans for your projects. Just keep in mind, the process of drawing will be slightly different depending on which path you choose.

Keep in mind, this is not a book on how to draw with a computer. A separate title is available from the publisher that can help get you up to speed on the basics of doing that. Instead, this volume focuses on how to create blueprints and construction patterns for your projects. Many of the tips and hints included here, however, focus on computer-based drawing for both speed and efficiency.

Because illustration software is much easier to learn, most of the tips on computer-based drawing in this book will be geared toward using these programs. Refer to **Appendix A** for more detailed information that can help you get up to speed on the basics.

How to Use This Volume

A lot of effort has gone into the design of this book to make it a useful and efficient reference. As an example, the text is fairly large and easy to read. For maximum clarity, illustrations are generous in both size and layout. Most appear on a left-facing page while the accompanying description appears on a right-facing page. Whenever possible, text describing a particular illustration is placed opposite the corresponding figure.

In addition, substantial margins have been included on the outside edges of every page. Special margin notes appear here. Whenever possible, these are located next to the relevant discussion in each chapter. Keep in mind, these notes *do not* simply repeat key points in the accompanying text. Rather, they provide additional information to enhance some of the points being made. The remaining margin space can then be used for you to write your own notes if desired.

Each chapter begins with an overview that explains what is being discussed and how it can be helpful. Then, it closes with a brief summary of everything that has been covered and how it relates to what will be presented next. The information included is quite extensive.

The information covered in this volume has the potential to open up a whole new world of modeling opportunities. Some of the concepts and techniques covered here can prove invaluable for a variety of different model design applications. For more information on some of these exciting possibilities, be sure to read the **Afterword** at the end of this book.

It all starts with what you are learning here in this volume. Once you know how to make drawings for your projects, the sky will indeed be the limit on what you an accomplish.

First, you'll review the basics of how to make blueprints. This is discussed in **Section 1** and includes **Chapters 1-3**. Then, you'll see how to create accurate construction patterns from your finished plans. This is covered in **Section 2**, encompassing **Chapters 4-7**.

The appendices in the back of the book contain lots of useful information as well. Example topics include how art is created in the computer and how to share data between different types of programs. You'll also learn more about how to scan template images and incorporate them into your drawings, as well as how to print your plans on paper.

In addition, you'll find lots of underlined terms throughout this book. These words are defined in the **Glossary**. A detailed **Index** has also been provided.

Be sure to look at the last pages of this volume for more information about related books, as well as future volumes in this series. You'll also find references to some of these titles in the margin notes.

Let's Get Started

You now have a good idea of what this volume is all about and what it can do for you. As you will see, the ability to draw lays the *foundation* for many incredible modeling possibilities. Because blueprints represent the beginning step of just about every model design project, being able to create something completely from scratch – be it in "virtual space" or in the physical realm – may depend on your ability to make drawings and construction patterns.

If you have a dream or concept in mind, this book will show you how to get started bringing your ideas to life. By the time you've read through this material, you will know exactly how to make practical working drawings for your next project. Before you know it, you'll be able to take your ideas from *dream* to *drawing* to *reality*.

Are you ready to dive in and get started? Then, roll up your sleeves and let's get to work!