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BE EXPERT WITH MAP & COMPASS

THE COMPLETE ORIENTEERING HANDBOOK

Third Edition

BJÖRN KJELLSTRÖM

Revised and Updated by

CARINA KJELLSTRÖM ELGIN

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MAP & COMPASS

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WILEY
John Wiley & Sons, Inc.

Ilustrated by Newt Heisley and Associates; maps by U.S. Geological Survey and Silva Orienteering Services; photo on page 6 ©Autumn Manka, SkyWideDesign.com; photos on pages 11, 103, 105 by Katherine Elgin.

Published by John Wiley & Sons, Inc., Hoboken, New Jersey
Published simultaneously in Canada

ISBN 978-0470-40765-3

Printed in the United States of America

10 9 8 7 6 5 4 3 2 1

Contents

Preface to the Third Edition

Björn Kjellström at his beloved cabin in Sweden in the 1960s.

This book has been around for longer than I have, and I am "no spring chicken," as they say, having just crossed that notorious half-century mark. First published in 1955, *Be Expert with Map & Compass* has become an institution as a guide for generations of people seeking important basic navigational skills. Over 500,000 copies have been sold in English-language editions, and it has been published in French, Italian, and Chinese.

I am always pleased when I meet people from all walks of life who are familiar with, and indeed fond of, this book. From former Boy Scouts to Marines to avid deer hunters to 4-H leaders to search-and-rescue dog teams, I have been impressed by the number of people who become animated when the book is brought up. For many, it rekindles memories of the great outdoor opportunities it led them to; for others, it seems to remind them of younger, simpler days spent fidgeting with the dials and trying to master the mystery of magnetism.

Many things are different from when my late father, Björn Kjellström, last updated this book in 1994, with the help of one of my dear brothers, Tord. International and national-level orienteering has continued to develop into a highly technical sport, utilizing the most modern techniques and materials. Global Positioning Systems, known as GPS, were certainly not a readily available consumer item just a few years ago. This book, however, is still the ideal for anyone who wants to learn the basics of compass navigation, as it helps you get comfortable with map and compass skills and gets you ready to participate in or organize a local orienteering event.

It was "Green Bar Bill," Bill Hillcourt, a hero in American scouting circles, who initially encouraged my father to write this guide. My father had been a Championship Orienteer, on foot and on skis, in his native Sweden, though his passion was admittedly for nature and the compass, not for trophies and medals. An entrepreneur from the start, he registered the company that was to become known the world over as Silva at the ripe age of nineteen.

A few years later, in 1933, he and his brother, Alvar, joined forces with another young orienteer named Gunnar Tillander. Together they made history by producing and marketing the first protractor-compass, the concept of which still defines the modern orienteering compass today. Silva compasses became the standard, selling over 500,000 a year in the United States alone.

In 1946, my father took his first business trip to the United States, during which he helped Scout leaders organize the first orienteering event in the United States, at Indiana Dunes State Park, near Lake Michigan. He is credited with introducing the sport of orienteering to North America, and even with coining the English word "orienteering."

He moved permanently to Westchester County, New York, in the late 1950s. He had the 4,700-acre Ward Pound Ridge Reservation as his backyard, so to speak, and quickly made it a point to clear and mark cross-country ski and hiking trails. A professional orienteering map followed, and soon training events were a regular occurrence one hour north of New York City. He somehow found time to be vice-president of the International Ski Federation and was actively involved in the Swedish, U.S., and International Orienteering Federations.

When the time came to update the book, I took the project on with trepidation. How could you improve upon what was considered a classic? Even though newer books have appeared on the market, it seems there is none better at providing a simple, step-by-step guide to success. I quickly realized there wasn't much I needed to change, though I had a good time modernizing some of the content and some of the Swinglish (Swedish-English) language.

Going through this book page by page reminded me of many days spent by his side in "the Reservation," training scout leaders and other

Carina Elgin with her father, Björn Kjellström.

willing participants. As I retyped the various "practices" given in the book, I remembered being a young girl and doing them all, under his kind, patient eye. He hiked or skied the trails daily, and often, as a child, I would go along, slowing down his six-foot-three pace notably. Frequently, we would stop at a "coffee place" in the middle of the woods, enjoy some juice and cookies, and marvel at the beauty around us. I thank him for so many things, including that love of nature and a very useful innate sense of direction.

In his eighties, the "gentle giant" with the warm wit was slowed by Parkinson's disease. I know he was frustrated when his long legs stopped being able to handle those daily walks through the woods. One of the last days we spent together was on the deck of our summer cabin in Sweden. It was a beautiful day, the kind Swedes wait all year for, with a bright, warming sun and a fresh, gentle breeze. On days like that, the sun has a special way of warming up the scents over there (maybe it's the lack of humidity?), and I clearly remember the soft wafts of the pines and the delicate vapors of the dry, gray moss clinging to the Baltic rocks. Seagulls cawed overhead, and the line from the flagpole clanged a consistent beat.

We sat there relaxing, the soft sun on our faces, savoring, with every one of our senses, this moment of true pleasure put on by Mother Nature. With his eyes closed, he started talking, calmly wondering which way we should go. Should we try that trail? Or maybe that way, where we just saw that deer? He spoke happily, as if he were exploring some wonderful new orienteering terrain. I don't know whether it was the medicines he was taking, or if the Parkinson's was making him delusional, but I sat quietly and listened to the contentment in his voice.

To this day, it has given me peace that in his last days he could continue enjoying his greatest passion. And, I truly believe, he is orienteering still, somewhere.

Carina Kjellström Elgin
The Plains, Virginia

INTRODUCTION

The Art (and Science) of Orienteering

Primitive maps have guided man since our earliest days on this planet. What led us on trade routes, ensured our return from exploration, and helped locate opposing forces in war eventually evolved into the modern map and compass.

In the 1930s, two Swedish brothers, Björn and Alvar Kjellström, were at the top of the sport of orienteering, which requires accurate and fast use of a map and compass to find various markers, or control points, in the terrain. Together with engineer Gunnar Tillander, they developed the Silva compass, and established the Silva Company in Stockholm, Sweden, to manufacture and market their product. What was so different about the Silva system was the clear base, the built-in protractor, and the liquid-filled compass capsule that offered a

faster reading. All modern field compasses are based on these developments, which provide speed and accuracy in the taking of bearings, especially key in the sport of orienteering.

Today, most people have learned to understand a map and the directional arrows of a compass in order to navigate city streets, interstate highways, and subway system maps. Now many depend on Global Positioning Systems (GPS), which may make the use of maps and compasses seem outdated and irrelevant.

However, understanding and being able to use these "traditional" tools is as important as ever. Total dependence on GPS-type navigation tools removes the important fundamental skill of independently being able to position oneself in one's environs. What if you exit a hotel on a trip to New York City and have no clue on how to orient yourself? Even if we all soon carry a personal GPS in our cell phone so we "never get lost," a lack of geographical sense locally and globally would sadly leave you dependent on machine or fellow man as you move about.

It is empowering to know where you are, especially through a constant innate sense of direction. By learning to use a map and compass, navigating skills are ingrained and useful in everyday "personal orientation." You can figure out where that bus stop should be or how to get home after a bike ride.

GPS systems can break down, malfunction, or become lost. They do not perform well in foggy conditions and in places where trees, mountains, canyons, and other obstructions block your line to the orbiting satellites that a GPS needs to accurately pinpoint its position. Many of us have television service that is dependent on a satellite and know how bad weather or technical malfunctions can interrupt your favorite movie. Similarly, your GPS could leave you high and dry . . . or low and wet! There are just too many scenarios where a GPS could fail, especially when you are out in nature.

It is imperative to have a backup system to your GPS if you are out hiking, hunting, or otherwise enjoying the great outdoors. Because of their simple, nonmechanical, nonelectrical construction, compasses seldom break. The red arrow very, very rarely loses its ability to point north, as it depends on nature's magnificent, unbreakable magnetic field. At the very least, learn to follow a compass and you won't be

wandering aimlessly around in circles. Walk in a straight line, and you may eventually find a familiar landmark, a road to rescue, or a place to ask for help.

Being able to use a map and compass effectively certainly provides an important safety factor, but it also opens up a huge world of fun and recreation. With a map and compass as steady companions, and the ability to use them properly, the art of orienteering—the skill of finding your way not only along the highways and country roads but also through woods and fields, through mountainous territory and around lakes—becomes a useful skill, an intriguing hobby, and perhaps even a new sport.

The sport of orienteering on the elite, international level continues to evolve as a highly technical challenge, beyond the scope of this book. However, *Be Expert with Map & Compass* will teach you the skills you need for safe outdoor navigation, for fun, for hiking and hunting. And it may pique your interest in getting involved in the sport of orienteering at the local level.

The Map and Compass in Your Everyday Life

We all make use of maps and compass directions in our everyday lives, consciously or unconsciously.

When you sit down to plan out a trip, whether it's on foot or by automobile, train, ship, or air, you get out maps and charts and try to figure out the shortest way to go or the best way to go to see whatever interests you, be it historical sites, shopping malls, or fishing holes. Asking a source like MapQuest is useful for many things, and a car or handheld GPS can tell you a lot, but perusing a good old map is still often best. During the trip, you repeatedly consult the map or GPS to check where you are and where you are going (and perhaps, to answer that age-old question "Are we there yet?").

When someone asks you for directions, or when someone gives them to you, your brain automatically attempts to draw an imaginary map of the location. In your mind you see roads as lines, rivers as bands, buildings as small squares, just as they are represented on a map. Just walking or driving to the grocery store involves a mental image of the routes available, and just like in orienteering, you may

refer to obstacles that might hinder you and choose a better way. Best avoid that construction at that corner and take a different path. It may be longer, but given the terrain (construction blocking the road), the alternate route should get you there most efficiently.

Orienteering is becoming more and more popular as a challenging cross-country sport for youth groups, such as Boy Scouts and Girl Scouts.

In family orienteering, children may sometimes like a piggyback ride.

Backpackers use orienteering to find their way through wilderness areas.

The Map and Compass in the Outdoors

Thanks to foresighted ancestors, most places in the world today have and will continue to have protected parklands and wilderness areas. People in North America have huge areas of open land and wilderness, national, state, and county parks where outdoor sports of all kinds can be enjoyed. An ever-increasing number of nature-conscious people look forward to meeting the challenge of traveling in unfamiliar territory, striking out on their own explorations along little-used paths, or making their own way cross-country.

These people have discovered that they can have a good idea of what to expect in any geographical area by studying a well-developed map. To interpret and understand the map in the field, they can use a simple compass. They will be confident to leave numbered roads and well-marked trails, and leave the GPS for the highways they are most suited for.

Experienced outdoor enthusiasts have no fear or uncertainty about traveling through strange territory—their ability to use their map and compass will get them safely there and back again.

Foresters, surveyors, engineers, prospectors, and men and women in the armed services all require thorough training in orienteering with map and compass. Many organizations, such as the Virginia Search and Rescue Organization (www.vsrda.org), have *Be Expert with Map & Compass* on their required reading list, so that members always are able to consult a map and compass in the wilderness. Hikers, hunters, and riders need to pay heed and learn to use that map and compass, so that those wonderful dogs don't need to search for you!

If you hunt or fish, you will have done much traveling to your favorite hunting spot or trout stream by map and compass—or paid a guide who knows how to use them. In territory you know well from having traversed it again and again, the lay of the land and the different directions will have become part of your memory. In new territory, however, you will have to pore over maps and use your compass skills to find the best hunting ground or best-stocked stream.

If you are a backpacker, your map and compass will give you a sense of complete independence and freedom of movement. How wonderful to "go where no man has gone before," or at least to feel

that way. Whenever you feel like breaking away from the trail, you can travel cross-country with confidence. You can explore your way to the hidden lake or mountain waterfall, knowing that your map, compass, and know-how will get you back to the trail.

If you are an athlete interested in cross-country running, orienteering will add new spice and new dimensions to your pursuit. In addition to the mental and physical stamina involved in running, orienteering calls for mental exercise in using a map and compass to determine the route most suited to your style. If you are fleet of foot,

Search-and-rescue teams are required to have excellent map and compass skills before attempting to find people lost in the wilderness.

maybe taking the longer but flatter trail around the mountain will get you to the control point the quickest. If you enjoy the challenge of clambering up a steep, unmarked hillside, you might prefer to go the shorter but more difficult route over the mountain. You choose your own route instead of following a designated trail by deciding which shortcuts you can handle.

If you happen to be a leader of Boy Scouts or Explorers or of Girl Scouts or Camp Fire Girls, or you're a camp counselor on a cross-country hike, or maybe a teacher with pupils on a field trip nature study, you will readily recognize the need to know the proper use of a map and compass. Passing this vital skill on to the boys and girls in your charge will help them get along safely and securely in the outdoors—a genuine way to build their self-esteem. Map study and compass use can be a great source of a number of interesting games, projects, and competitions, whether you are indoors or around a campfire.

If you are none of the above, but are simply a vacationer in a state or national park or a Sunday stroller in the woods, you will quickly discover that knowing how to use a map and compass will increase the fun of your outdoor experience more than that annoying voice on the GPS.

Map and Compass for the Family

A relaxed hike in the woods or participation in a local orienteering event is the perfect outdoor activity for the whole family, an enjoyable and healthy leisure-time activity for all ages. Young children quickly take to orienteering, as it is a lot like a special treasure hunt! In fact, one company uses the treasure hunt format to teach orienteering skills (see the Map and Compass Resources, page 231). Learning to read a map is fun and can quickly teach children that symbols can be used as a quick way to convey ideas and represent all sorts of things. Using a map and compass puts your imagination to work with life-long benefits.

Teenagers find the combination of mental and physical challenge used in exploratory hikes using a map and compass and in the sport of orienteering particularly rewarding. It's not just testing and growing

physical skills, but deciding which route to take that helps decision-making skills evolve. Parents find relaxation in orienteering, as a mental break from work and household chores. Even the older generation can join in the wholesome fun of getting away from it all, where speed does not outweigh wisdom.

The vast majority of American families enjoys weekend outings and spend summer vacations together. Why not encourage a trip to the woods or parklands, instead of a trip to the shopping mall? Why not encourage physical activity with a hike in the woods, and combine it with the cerebral exercise of finding your way with map and compass? Day trips or longer vacations are all the more exciting when you have been where no path goes . . . where you have discovered natural beauties the average visitor misses by staying on the worn trail.

Family orienteering is not just about taking a hike with a purpose—it is learning about nature and the world around us. It is one of the best ways to teach young and old to appreciate the environment in which they live. Get people to know and to love nature, and they will become determined to help save our natural resources.

Map and Compass Bringing People Together

People unfamiliar with map and compass sports, such as orienteering, believe it to be a solitary endeavor—one man running through the woods in search of red and white control points, with only a map and compass in hand.

Actually, it is fun to learn how to use a map and compass as a group. Even if you explore and test your skills alone (though it's best to begin with a partner), getting back together and discussing your route choices and what you saw often becomes a rowdy social event. You'll meet others with a passion for nature and can join various clubs.

There are orienteering clubs all around the world to join, if you want to. Helping organize training sessions and race meets is a great way to interact with other like-minded people. As strong as individual competition is in the sport of orienteering, team events also

attract many people to the sport. Faced with the numerous mental and physical challenges of navigating unfamiliar terrain, teammates and competitors alike form new friendships and strengthen old ones.

Proof of the bonding that orienteering fosters can most easily be seen before and after organized events. The five-day orienteering championship in Sweden (Oringen) annually draws 8,000 participants in 170 different classes. Participants, not spectators! Most camp out near the event site, from families to elite competitors. They live in extremely close proximity for a week or two, sharing food, stories, and friendship. It becomes a festival of nationalities, cultures, and ideas, tied together by a passion for the map and compass.

After an orienteering event at any level, or even a beginner's map and compass course, check out the attitude of the competitors. They may be tired, or perhaps even angry at themselves for picking a slower route, but typically they sit down and compare notes with others. Which way did you go? What was that like? What could I have done better? You may be competing with others, but everyone is there to improve their own skills, and comparing notes makes for new friendships and new knowledge.

Using the Map and Compass in Education

During the Persian Gulf War of 1990–1991, newspaper articles revealed that an overwhelming number of people had little or no knowledge of the geography of that region. This fact was particularly unsettling because it applied not only to adults but to young students in the U.S. school system.

Learning to use a map and compass, to "orienteer," can be a key to resolving this problem. The sport of orienteering at its most basic, introductory level, is a wonderful hands-on tool for teaching map reading skills, map creation, understanding symbols, direction, the magnetic field, the compass, the relationship of geographical features to how they are utilized by mankind, and more. By getting out into nature, students can also learn to appreciate the environment. In Scandinavia, orienteering is taught in schools. Teaching orienteering in the schools is a wonderful way to get students mentally and physically involved in many disciplines,

including geography, environmental studies, mathematics, and history, in a very direct way. Consider encouraging your local school system or your child's teacher to incorporate orienteering into the curriculum or as an after-school program. They'll either say "Yes," or "Get lost!"

The "Romance" of Orienteering

Learning how to use a map and compass can indeed provide all sorts of enjoyment of nature, of your friends and family, of the competitive spirit. Mastery of the art of outdoor navigation also provides a real sense of satisfaction and self-esteem. There has always been a romantic fascination with people who could find their way through the wilderness and over hidden trails: the Native American, the pioneer scout, explorers, trackers, cowboys on cattle drives. There seems to be an almost mysterious power behind path finding and navigation.

In the old days, path finding was well worth admiration. It was based on a highly developed power of observation and memory—reading the signs of mountain ridges, rivers and vegetation, wind direction and cloud movements, animal tracking, the position of sun, moon, and stars.

Today, of course, it is much simpler. Turn on the Global Positioning System! Obey it, and you should eventually reach your destination. However, gain the knowledge of how to use a good map and a dependable compass, and you will have gained a lifelong skill, and possibly that innate sense of where you are on this planet.

What took old-timers a long time to learn, enthusiasts of today can learn in a matter of hours with this book. When you master the skill, it sticks. You will be able to feel safe on all your outdoor urban, suburban, rural, and wilderness journeys. You will be able to choose the best routes, and alternates when they become necessary. You will be encouraged to explore new places, new campsites, fishing lakes, and hunting grounds. And you may, if you choose, become involved in the exciting sport of orienteering.

Whichever route you choose, you'll be more prepared for the challenges ahead.

PART 1

DISCOVERY

Fun with Maps Alone

There are many ways to imagine looking down upon Earth from above. You've probably peered down through an airplane window and tried to figure out where you were; or you've fooled around on Google Earth (www.googleearth.com) and been fascinated as you've been able to zoom in closer and closer and get more and more detail.

Photos from the Space Shuttle are equally intriguing, as one can see shifting sands and the boot of Italy from so far away. It is also fun to imagine what birds see, especially hawks as they use the currents way up in the sky to glide seemingly effortlessly over our planet.

Imagine you are that hawk, or are in an airplane or even on a magic carpet. It is a bright day, with unlimited visibility. The sky above is blue. Below, the ground spreads out like a multicolored quilt. First, everything is just a jumble, but soon you are able to make out details.

That straight ribbon down there, for example, could be a highway—Route 66, or whatever it happens to be. The wide, winding band must be a river. You can even make out a railroad track, as two parallel lines—the rails. The smaller rectangles are rooftops, the blue spots are clearly swimming pools, and those brown and green diamonds are obviously baseball fields. The dark green masses must be forests. Things look different from what you are accustomed to, and yet you can recognize them.

What Is a Map?

If you took a picture of what you saw on your adventure in the sky, and later printed it out, you would have a photographic "map" of sorts of the area over which you flew. There would be a lot of confusing details that would be hard to interpret, and there would be some distortion near the edges because of perspective. Nevertheless, it would be a map: a reduced representation of a portion of the surface of Earth.

Modern mapmakers use aerial and satellite photographs and then check them using surveying equipment from the ground. In the final version of the map, they simplify details into representative signs they call map *symbols*. They also flatten out the perspective so the map looks the way it would appear looking straight down on it, so that all the distances are in the same proportion on the map as they are in the landscape.

How Were the Earliest Maps Made?

It wasn't very easy for the earliest mapmakers to get a good base for their maps. They couldn't even dream of being up in an airplane to get the bird's-eye view. According to historians in this field, some people today, including the Inuit tribes of the North and indigenous desert tribesmen, show an incredible natural ability to make map sketches showing relative locations and distances between points in an area known to them. Instead of using longitude and latitude lines and compass directions as we do, they usually use a landmark they are familiar with—a road, a shoreline, a ridge, or some other terrain feature—as their orienting baseline for such a map.

The oldest known maps are something like those sketches. The earliest maps were probably first etched in dirt with sticks to show prime hunting grounds. These early maps were very generalized, showing major trails, coastlines, mountain ridges, and possible settlements. The maps would have been greatly affected by the mapmaker's impressions. Ever notice how one member of your family remembers that intersection because that's where the auto parts store is, while another remembers it because of the nail salon?

It wasn't until the discovery of magnetism and the subsequent invention of magnetic compasses that mapmakers could more precisely relate the location of a mapped area to the corresponding land and give precise, scientific information on directions and distances between different points on the map. The first maps or charts produced with the help of magnetic compasses appeared near the end of the thirteenth century, providing a great improvement in accuracy. Improvements in production methods followed with the further technical development of compasses. Mapping methods improved step-by-step until the revolutionary new method based on aerial photography became the standard, now joined by satellite technology.

What Kind of Map to Get

Today there are many kinds of maps to suit a variety of purposes. Almost every person has to make use of city maps, general road maps, or geographic maps. Global Positioning Systems in our cars

and cell phones and computer programs such as MapQuest have revolutionized how we find our way around every day, but the ability to read a map will never lose its significance.

Anyone can use a city map or a street map with a little practice. The major streets are named, as are most buildings of interest, such as public offices and churches, or places of special interest to camera-toting tourists. Bus and subway maps are everyday necessities in larger cities.

The majority of road maps are designed to cover a whole state, while others may cover several states or the main cities of a state. In designing state maps, the scale (the proportion of the distance between points on the map and the actual distance between the corresponding points in the field) is decided so that the map will fold (after several attempts) into the familiar rectangles that fill so many automobile glove compartments. A map of New Jersey, for example, may be scaled so that 1 inch on the map equals 5.2 miles of highway. On a New York map, 1 inch may equal 11.2 miles of roads. A Michigan map may have a scale of 1 inch equaling 14 miles, while a map of California may have 1 inch on the map equaling 21 actual miles.

Such maps will help you find your way from town to town, but they will not tell you if you have to travel uphill or downhill. Nor will they provide any information on the topography, the elevations and depressions on the land's surface. Automobile maps are all *planimetric*—from the Latin *planum*, "flat ground," and *metria*, "measurement." Usually these maps do not show elevations, such as hills or mountains. They contain enough detail to help you navigate the highways and roads in your car, but they will not be of enough assistance when you are hiking or involved in the sport of orienteering.

Topographic Maps

The type of map that will best serve you in the great outdoors is called a *topographic* map—from the Greek *topos*, "place," and *graphein*, "to write"—hence, to write or draw a picture of a place or area.

Topographic maps are available for large areas of the United States and Canada. In the United States, they are prepared by the U.S. Geological Survey of the Department of the Interior and are

called USGS maps. In Canada, they are prepared by the Surveys and Mapping Branch of the Department of Mines and Technical Survey.

Generally, map symbols on topographical maps (nicknamed "topos") from different countries are similar. If you learn to read U.S. topographical maps, you'll be able to interpret maps from other countries.

Orienteering or Recreation Maps

As the sport of orienteering grew internationally, it became necessary to standardize the maps used for competitions. The representatives from forty-eight member nations belonging to the International Orienteering Foundation (IOF) decided on specific rules and standards for the production of orienteering maps, including colors, symbols, and scales used. They provide much greater detail than regular topographical maps, such as reference to vegetation cover and landforms. They show many small but clearly identifiable terrain features, including small depressions and knolls, streambeds, and distinct vegetation changes, even boulders 6 to 8 feet in diameter.

The development of these internationally standardized maps not only contributed to the growing popularity of the sport among orienteers, but also has increased the interest in map and compass use for hiking, hunting, and backpacking. To indicate their practical use for a variety of purposes, some mapmakers call them recreation maps. Information on areas covered by such detailed orienteering maps can be obtained from the orienteering association of the country you are in. They can also refer you to local orienteering clubs. See the Map and Compass Resources on page 231.

It is no exaggeration to say that it is more fun to travel in unknown terrain with an orienteering map than with a regular topographical map, because it is easier to identify a wide range of features that will help you pinpoint your travels.

What Scale to Pick

Most maps are drawn to a specific scale. A scale is the proportion of the distance between points on the map and the actual distance between the corresponding points in the field. Stated another way, it is the amount that a distance in real life has been reduced for inclusion on the map.

For the sake of simplicity, these map scales have been developed in such a way that it is easy to measure map distances using an ordinary ruler—inches and fractions of inches in the United States; decimeters, centimeters, and meters in countries where the metric system is used. One unit measured on the map represents so many units in the field.

The three most commonly used scales for U.S. topographical maps have been 1 unit to 250,000 units, 1 unit to 62,500 units, and 1 unit to 24,000 units. (Canadian topographic maps are drawn to the scale 1:50,000.) On the map, these proportion scales are indicated by ratios: 1:250,000 and so on. The larger the fraction (1 divided by 24,000 is obviously larger than 1 divided by 250,000), the larger and clearer the details shown on the map. The larger the fraction, the smaller the territory covered by the same-size map sheet, enabling greater detail.

You may be working with an older USGS map, and that is okay, but today you can get USGS maps in the 1:24,000 scale of the forty-eight contiguous states, Hawaii, and the territories. It takes 57,000 maps in that scale to cover that area! Most of Alaska is still covered by the less-detailed 1:63,360 scale.

The scale for an orienteering map has been internationally standardized by the IOF to be 1:15,000. For maps covering small areas and used by schools and for instruction, even larger-scale maps, 1:5,000 and 1:10,000 are being used. They make the maps easier for a beginner to understand, because they are able to show more detail. It is like zooming in and getting a closer look at something.

Why these specific fractions? The reason is simple, and it helps suggest the map scale best suited to your needs.

1:250,000 Maps

The scale of 1 inch to 250,000 inches is almost exactly the scale of 1 inch to 4 miles. The precise figure is 253,440—a number that would require lot of unnecessary work in surveying. Each map covers an area of 6,346 to 8,668 square miles. They were originally done by the U.S. Army Map Service in the 1950s, but are now managed by the U.S. Geological Survey. Later you will be shown how to check the date a