

Chapter 1

Measurement Tools, Layout & Job Planning

*Where observation is concerned,
chance favors the prepared mind.*

—Louis Pasteur

Introduction

Fewer than twenty-five different tools are required to perform basic machine shop layout and measurement. Many of the hundreds of other tools are merely special-purpose versions of these that speed, simplify, or improve the accuracy of a particular task. We will examine these basic twenty-five, see what they do, and how to use them. Each machinist will add more tools to these based on his specific needs.

We will also cover the use of digital slide calipers, which for many jobs are easier and faster than traditional vernier calipers, and their cousins, inside and outside calipers. Toolmakers' buttons and gage blocks, common to high-precision work, are also presented.

We will then look at layout methods, and finally, we will present work planning rules. Although these rules are not universally valid, they can often prevent problems.

Section I – Basic Measurement Tools

Measuring & Marking Tools for Layout

What are the *essential* measuring and marking tools and how are they used?

- *Layout fluid* puts a deep-blue background on the workpiece so scribed layout lines and punch marks stand out sharp and clear. It is applied to clean, dry metal from a brush or spray can and dries quickly. Remove it by wiping it off with denatured alcohol on a rag. Tip: Using a black marker