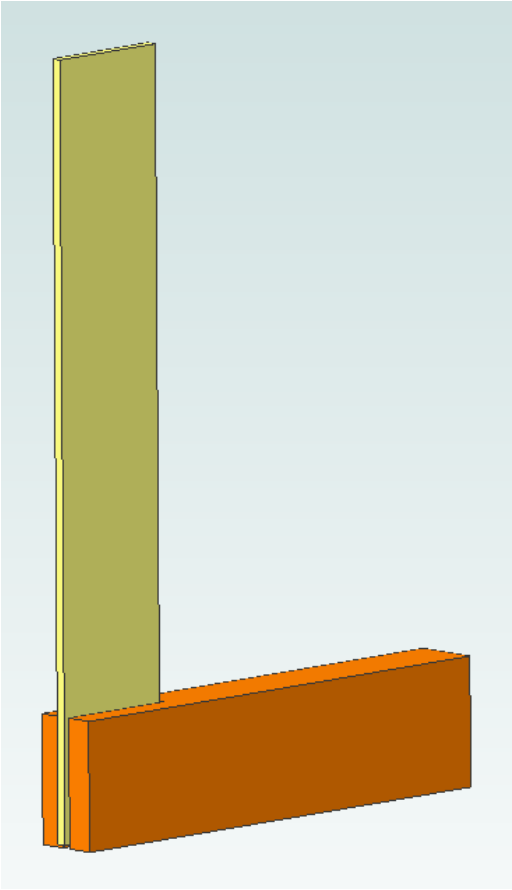
Adjusting a Machinist Square, version 2

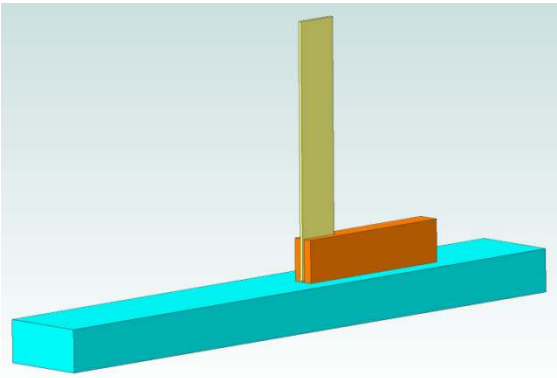
By R. G. Sparber with information from Ron Thompson



Machinist squares are an essential part of any serious metal working hobby shop. My smallest square is 2" x 2" and my largest one is 10" x 10". This larger square is used only to check the other squares and spends most of its time securely tucked away in a cabinet.

One feature of most machinist squares is that they can be adjusted. The blade is a press fit in the base. A gentle tap on the blade while holding the base will move it. You do not want to do this too often as the joint will loosen. But if needed, it sure is nice to have this option.

Of course, the blade can also move if you drop the square on the floor. So if dropped, it is good practice to verify it is still true.

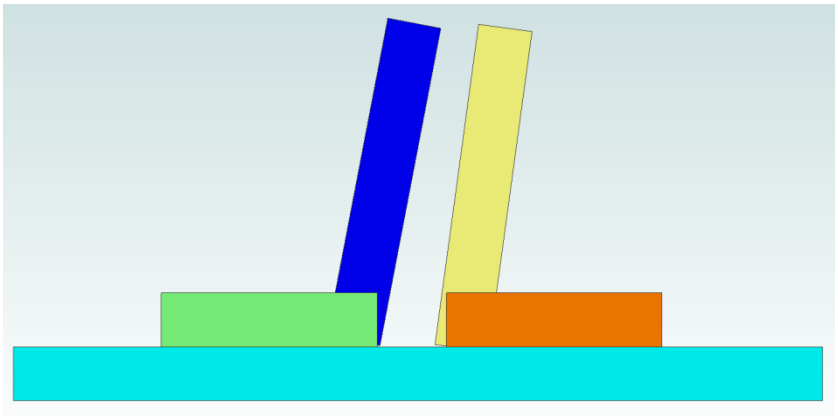


You will need a dead flat surface plus at least two other squares of unknown accuracy or one square known to be true.

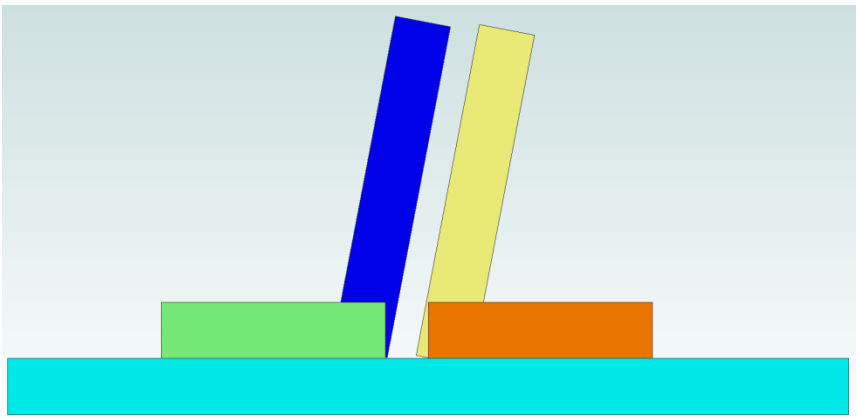
Suggestions for a flat surface include, but are not limited to, a granite surface plate, plate glass, a milling machine table, etc.

[1] You are free to copy and distribute this document but not change it.

Case 1: Using a Pair of Squares of Unknown accuracy to Check Your Square

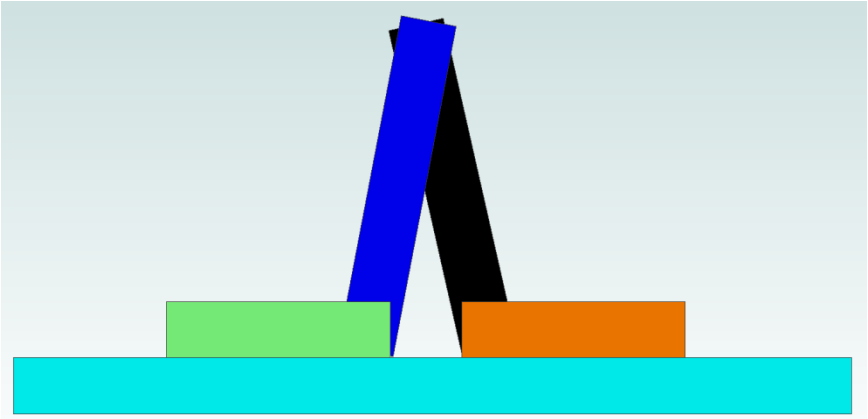


The yellow blade square we wish to set true is put up against a blue blade square of unknown accuracy. In this exaggerated view, they are both off in the same direction but neither is near true.

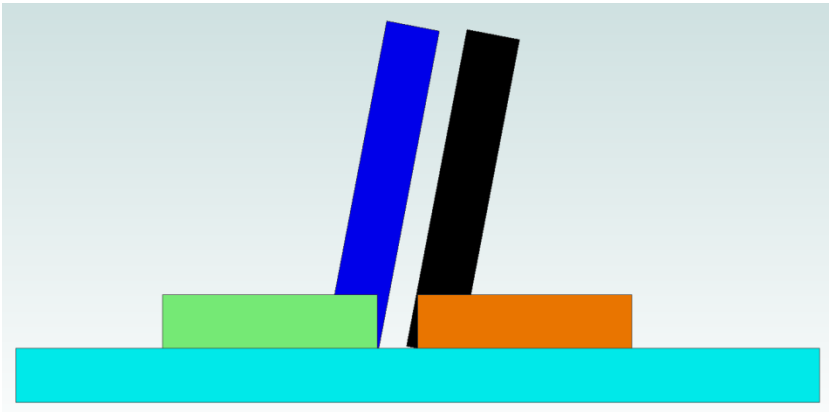


We adjust our blue square to match the yellow blade's angle.

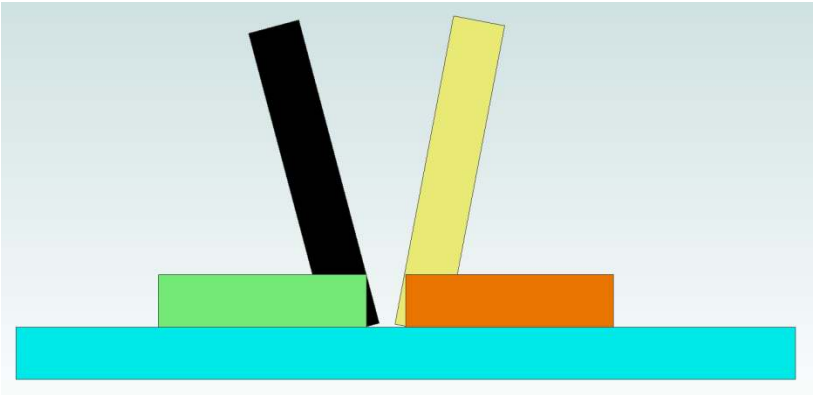
Our blue blade is now a copy of the yellow blade.



We then take the third square, shown with a black blade,



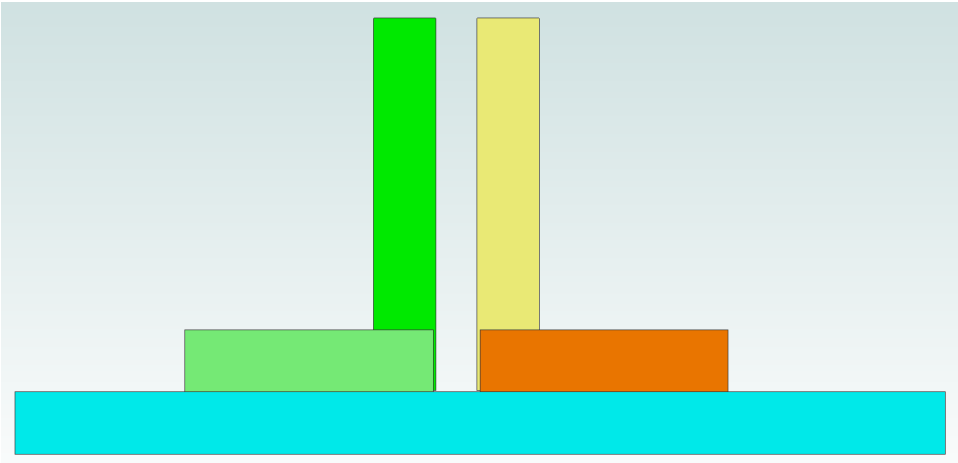
and adjust the black blade to match the angle of the blue blade.



When we flip around the black blade and put it up against the yellow blade, there is a gap. The angle formed by these two blades is twice the difference between the blade angle and true vertical. We move both blades roughtly the same amount so they are parallel. Then we repeat the sequence. If done right, you will end up with all three squares true. That is the only position where there is no gap in the process.

This procedure can be tedious but will produce excellent results.

Case 2: Using a Reference Square of Known accuracy to Check Your Square



My green reference square is used to set the angle of my yellow blade. The reference square is then carefully placed back in a safe place for future testing. I never use it for any other purpose. End of story.

Thanks to Bill Moll for finding a serious error in the case 1 sequence.

We welcome your comments and questions.

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