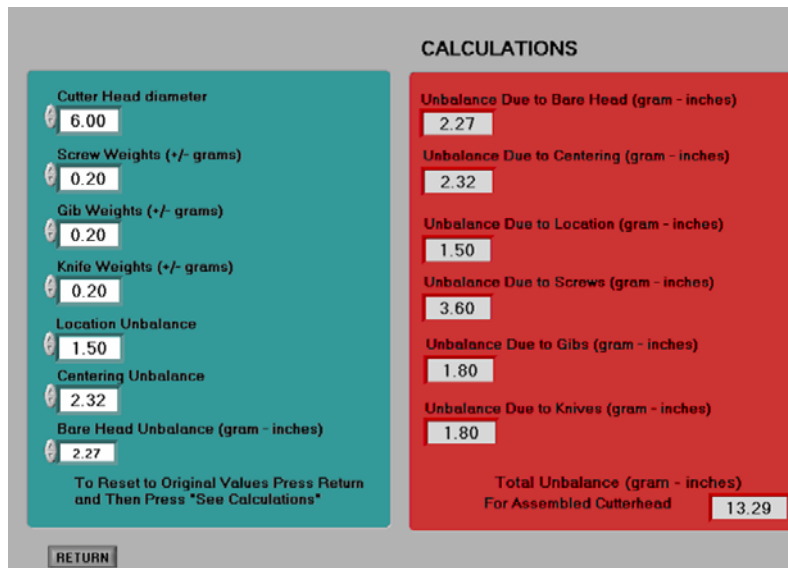


## WOOD MACHINING &amp; TOOLING RESEARCH

## MACHINE DYNAMICS RESEARCH – Moulder Cutterhead Balance Guidelines

In response to industry requests, guidelines for moulder head balance tolerances were developed by the WMTRP. These guidelines help both cutterhead manufacturers and cutterhead users understand balance limitations imposed by cutterhead components, including the effect of centering error from various type of centering (clamping) devices and the effect of cutterhead knife, gib, and screw weight and location variations. The cumulative effect of these factors is critical in defining achievable balance tolerances and clarifying the effect of different variables.

The WMTRP balance guideline for moulder heads is in the form of a LabView™ computer program, which allows the user to define the particular cutterhead application of interest and determine the resulting total unbalance that will result as a function of knife, gib, and screw weight and location errors. Balance tolerances are recommended based on machine and operational data (input by the user) and criticality of the surface quality. A calculation screen (shown below) allows the user to test the effect of changing head weight, changing clamping accuracy, and changing gib, knife, and screw weight variation and location error.



CALCULATIONS	
Cutter Head diameter	6.00
Screw Weights (+/- grams)	0.20
Gib Weights (+/- grams)	0.20
Knife Weights (+/- grams)	0.20
Location Unbalance	1.50
Centering Unbalance	2.32
Bare Head Unbalance (gram - inches)	2.27
Unbalance Due to Bare Head (gram - inches)	2.27
Unbalance Due to Centering (gram - inches)	2.32
Unbalance Due to Location (gram - inches)	1.50
Unbalance Due to Screws (gram - inches)	3.60
Unbalance Due to Gibs (gram - inches)	1.80
Unbalance Due to Knives (gram - inches)	1.80
<b>Total Unbalance (gram - inches) For Assembled Cutterhead</b>	<b>13.29</b>

To Reset to Original Values Press Return and Then Press \*See Calculations\*

RETURN

Calculation screen from LabView™ balance guideline program

*The Wood Machining & Tooling Research Program (WMTRP) is a multidisciplinary program involving the fields of Mechanical Engineering, Industrial Engineering, Manufacturing Engineering, Material Science, and Wood Science. The program mission is to provide the woodworking industry with personnel educated in machining and tooling technology and provide applied research results aimed at improving efficiency and wood utilization. Major program support is provided by the U.S. Department of Agriculture.*

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