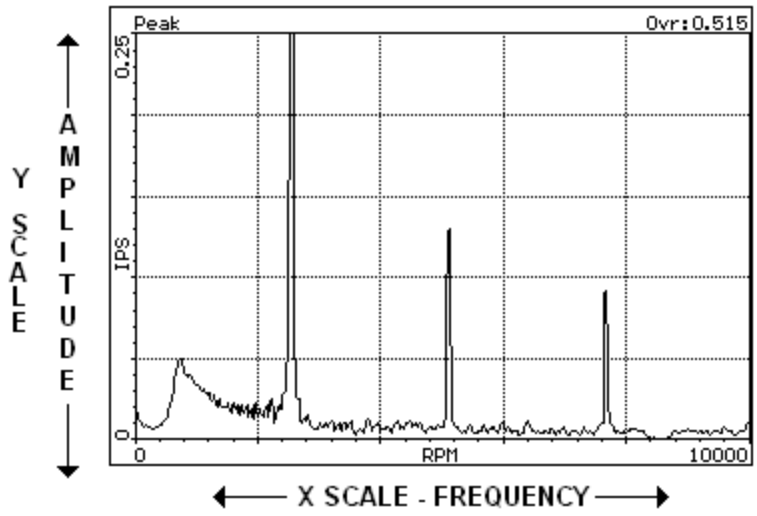
Chapter 20
Reading Spectrum and Scales

(Revision 1, Aug 2007)

The information in this chapter is provided to assist you in reading the graphical displays of the various types of data that can be acquired using the Viper 4040 Analyzer.

20.1 - Reading the X and Y Plotted Vibration Spectrum

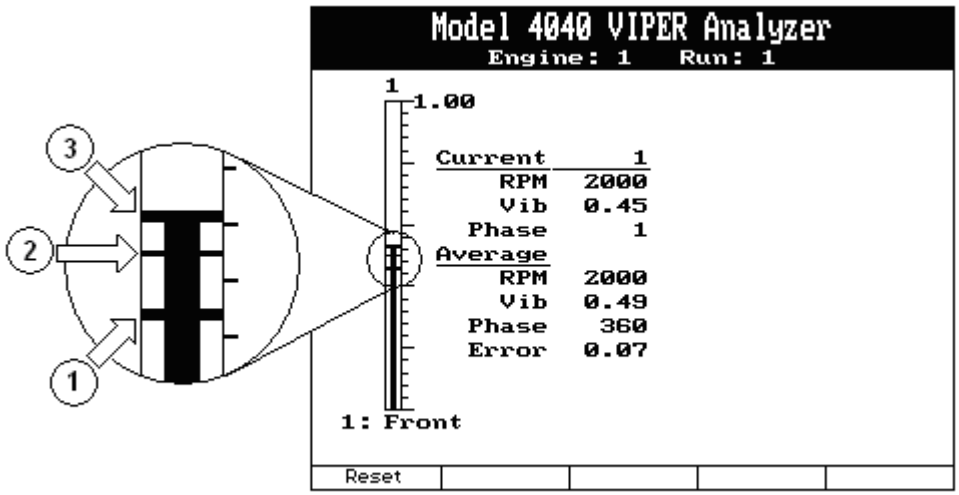


A graphic spectrum display allows the user to investigate all aspects of a rotating component related to vibration. In the figure above, the primary indicators are the plotted peaks that represent component vibrations.

The scale of the “X” axis, along the lower horizontal edge, displays the frequency of interest in Hertz (Hz), which is cycles per second, or in Revolutions per minute (RPM), as shown in the figure. The frequency scale is a means of locating a component operating at a known number of cycles per second (Hz) or minute (RPM).

The scale of the “Y” axis, along the left vertical edge, displays the amplitude or strength of the component’s expended energy in the specified engineering units which in the figure above are presented as IPS, or Inches Per Second, of movement.

20.2 - Reading the Converging Vibration Indicator and Scale.



The converging vibration indicator and scale, as shown in the illustration above, appears in several instances when using the analyzer. The Propeller Balance, Rotor Track and Balance, Fan Trim Balance, and IPS and Clock functions all use the converging vibration scale.

The scale is graduated along the right vertical side of the indicator from 0 at the bottom to the upper end of the scale which is determined by the FSR setting. The vertical indicator bar which begins at the bottom and continues upward in the center of the window indicates the current average amplitude by its upper end, relative to the adjacent scale. A thin horizontal line (see arrow 2 in the figure above) indicates the latest collected (non-averaged) amplitude. The lower error bar (see arrow 1 in the figure above) and the upper error bar (see arrow 3 in the figure above) will converge on the average indicator as errors are averaged out of the indication. Also notice that to the right of the indicator, the Error is reported as a numeric value. The value is an indication of the quality of the collected data to this point. When amplitudes are high, this error will average down to, or near 0.00 very quickly. As the amplitude is decreased due to the balancing process, the percent value will be slower to average down toward 0.00. This is not a fault or defect in the analyzer, but only an indication of the averaged data quality relative to the current vibration being produced by the component.

When collecting data with this indicator displayed, you should continue taking data until the upper and lower error bars converge on the average indicator. The reported error will also continue to decrease as the bars converge. Allow the unit to collect data as long as the error continues to decrease. This will insure you have the most accurate data possible. Remember that the percent error will be slower to reduce as the balance is improved. If you believe wind

gust, aircraft movement or other external influences have caused the indications to be corrupted, press the [F1] key for “Reset.” This will clear the averaged data and begin a new averaging. When satisfied that the data is acceptable, press [ENTER] to stop the data collection and accept the averaging.