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# Chapter 1

## Introduction

**(Revision 1, Aug 2007)**

The ACES Systems' Viper 4040 Analyzer is a versatile tool that automates the task of turbine fan trim balance, propeller balance, provides automated rotor track and balancing adjustments or provides raw data for use with polar charts, performs vibration surveys, TFE731 Performance runs, (in conjunction with the ACES 1752B JEDA) and transient analysis.

Engine, airframe, propeller, or rotor-specific setups can be loaded and stored into the analyzer by the user, then recalled to automatically configure the analyzer for the task at hand. These "Setups" store influence coefficients for balancing functions, which the analyzer updates with each balance job to minimize the number of required runs for balancing fans, propellers, rotors, or shafts.

The analyzer is capable of true, four-channel simultaneous data acquisition and provides full graphic-spectrum capabilities including on screen display of limits and component identification taken from an installed fault frequency database.

The Viper 4040 allows you to print spectra and balance jobs directly to a serial printer, and with the use of a serial-to-parallel converter, to a parallel printer for inclusion in aircraft records or as file copies. (See chapter 21 of this manual for details on printing.) The analyzer also has a USB port if your PC is so equipped. Survey spectra and balance reports can be transferred directly to a personal computer for storage, trending, or manipulation for inspection or troubleshooting purposes via the companion software ACES AvTrend.

Overall, the analyzer is designed as a lightweight, portable unit with accuracy and ease of use as primary design goals.

The subsequent chapters of this manual explain the functions and features of the analyzer, supporting information, and troubleshooting. The remainder of this chapter presents tips on effectively using the manual.

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## 1.1 - Notes, Cautions, and Warnings

Throughout this manual you will encounter “notes, cautions, and warnings.” They will be in **BOLD** capital print centered above a short paragraph. The information in the paragraph is defined as follows for each of the three categories.

### **NOTE**

**Information considered essential to emphasize for clarity or to ensure the related procedure is correctly accomplished.**

### **CAUTION**

**Information that if not heeded, may result in the damage or faulty operation of equipment.**

### **WARNING**

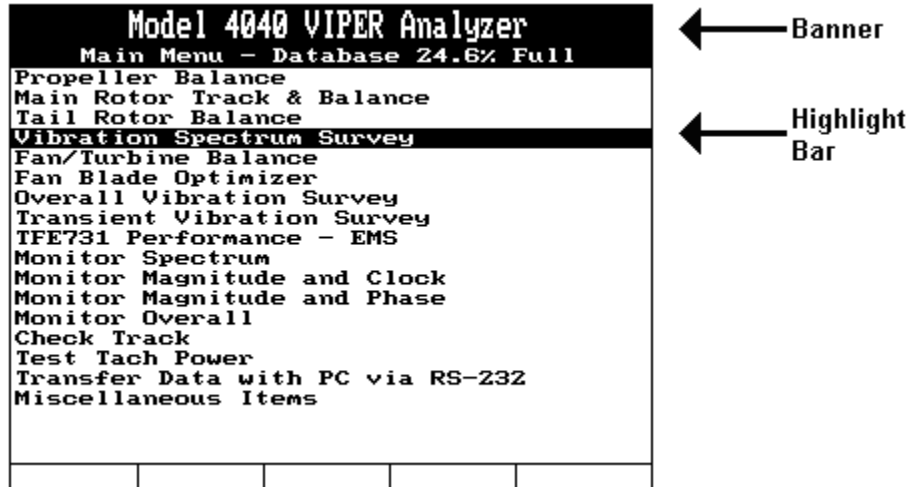
**Information that if not heeded, may result in damage or destruction of equipment and/or injury to personnel.**

## 1.2 - Conventions

The following are writing conventions used throughout the manual to describe certain concepts.

1. This manual indicates keys/keystrokes in square brackets. For example: [ENTER], [CLR], [5], [F1].
2. The term “select,” as used in this manual, means to highlight the item on the current menu by using the arrow keys, then pressing the [ENTER] key.
3. The term “Setup,” as used in this manual, means the complete set of information entered into the analyzer or created with AvTrend and electronically stored in the analyzer’s memory or in the AvTrend software files for the purpose of completing a balance, vibration analysis, or track function. This stored information may then be downloaded from AvTrend to the analyzer, or if stored in the analyzer already, recalled from a “Setup” menu presented for the various functions to rapidly configure the analyzer based on the information contained in the Setup.
4. The term “Job,” as used in this manual, means the stored Setup information plus the collected balance, vibration, track, and/or spectral data, and recorded corrective action taken (if applicable) to correct an undesirable condition. In other words, it is a record of the analyzer configuration, acquired data, computed data, and user entered data used in the course of completing the maintenance task.

5. The “Banner” is the uppermost portion of the screen display, which defines its relationship to the currently-running analyzer function. The “Highlight Bar” is the darkened bar (controlled by the use of the arrow keys, [↓] and [↑]) used to identify and select the current menu item. (See figure below.) These screens and their selection options are referred to as “banner screen menus” throughout the text of this manual. The example screen below, for instance, is the “Main Menu” banner screen.



6. The term “field” as used in this manual refers to an area that requires input. Fields appear on various screens as areas delineated by boxes with either pointed ends (< >) or square ends ([ ]). Data is entered into the field in one of two ways, either by using the keypad to type data or by using the [⇒] key to “toggle” or move among the selections that are preset for the field.
7. The term “Tracker,” as used in this manual refers to an ACES Systems’ optical blade Tracker.