

## PORTABLE ENGINE TEST SETS & TRIMMERS

### Cockpit Temperature Indicator Test

The tester provides a simulated thermocouple output to check the calibration of high impedance (null balance) or low impedance (current drawing) temperature indicators.

### Thermocouple Harness Tests

The accuracy of current drawing engine temperature indicators is dependent upon the resistance of the thermocouple harness. The BH112JD can be used to accurately measure the resistance of any harness to 40 ohms, as well as insulation resistance to 200,000 ohms.

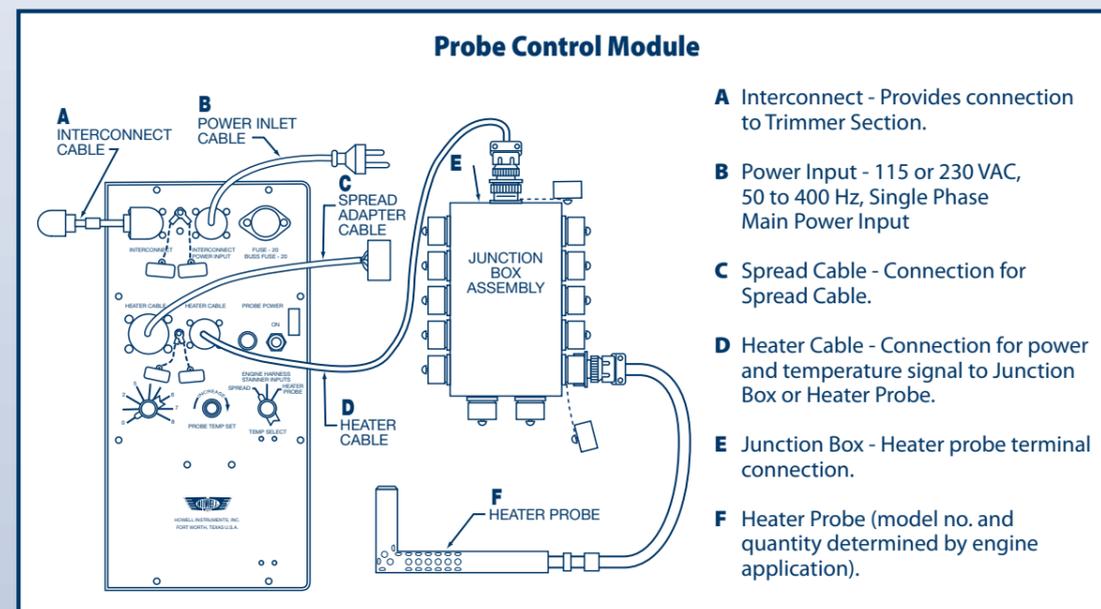
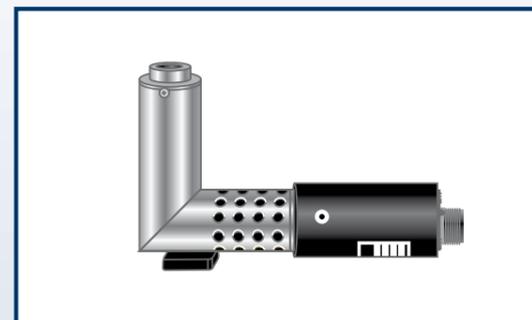
### Probe Control

The Probe Control Section contains the power supply and controls required for the operation of the heater probes, including the connector and switch required to perform spread tests.

To test the engine thermocouple harness, a heater probe is placed over each engine thermocouple. The BH112JD JETCAL® Analyzer controls the power applied to the probes to maintain them at a preselected test temperature. Since the probe is precisely fitted to the engine thermocouple, the probe and thermocouple are maintained at the same temperature. A thermocouple embedded in the probe accurately measures the probe temperature. If the aircraft thermocouple temperature displayed on the JETCAL® Analyzer or cockpit indicator is outside the acceptable probe temperature specified in the manual, a

malfunction is indicated. The JETCAL® Analyzer can then be used as a troubleshooting device to check cockpit temperature indicator calibration, thermocouple harness circuit and insulation resistance.

In addition to checking the engine thermocouple system, the JETCAL® Analyzer can be used to test continuous-wire fire detection systems and thermal switches. By using a special air leak detector, maintenance personnel can locate air leaks at engine parting surfaces, bleed air ports, and anti-ice and air conditioning ducts.



## PORTABLE ENGINE TEST SETS & TRIMMERS



## BH112JD Series JETCAL® Engine Analyzer

The BH112JD JETCAL® Engine Analyzer provides a superior combination of capabilities in a ruggedized, portable test set.

The BH112JD JETCAL® Engine Analyzer is designed to:

- Functionally check and troubleshoot the temperature measuring system in aircraft turbine engines without running the engines, saving fuel and engine life.
- Accurately monitor, record and print critical engine parameters during engine trim.

### Input Parameter Flexibility

Basic engine test parameters-temperature, speed and pressure-can all be scaled to the exact requirements of the engine being tested.

- Temperature can be displayed in °C or °F.
- Engine speed can be scaled in %RPM, direct RPM or in frequency (Hz).
- Externally measured pressure can be displayed in inHg, psi, ft-lb or %Torque.
- Internally measured pressure can be displayed in inHg or psi.
- Engine Select Switch allows the operator to select the specific calibration and scale factors appropriate for the engine under test.
- Scale factors can be easily entered into memory for up to ten different engine types.
- Instructional prompts are provided on the tester display throughout the scaling procedure.
- Scaling information is retained permanently in memory unless changed by the operator.



<sup>1</sup> JETCAL® is a registered trademark of Howell Instruments, Inc.

## PORTABLE ENGINE TEST SETS & TRIMMERS

## PORTABLE ENGINE TEST SETS & TRIMMERS

### Speed/Frequency Measurement

The speed/frequency measurement system is designed to display engine speed when supplied with input signals from standard aircraft tachometer generators or from monopole pickups. The RPM Select Switch allows any one of three speed inputs to be selected:

- %RPM
- RPM
- Hz

The speed/frequency circuits are designed to condition three different frequency inputs (30,000 Hz maximum). Each frequency channel can be scaled differently and can have different engineering units.

### Pressure/EPR System

The test set includes a pressure transducer capable of measuring ambient pressure or engine exhaust pressure (100 inHgA maximum). The range of the internal pressure transducer is 0 to 50 psia (0 to 100.00 inHg) in increments of 0.05.

External (optional) pressure transducers can be supplied to measure parameters such as engine torque, burner pressure or ambient pressure.

When calculating Engine Pressure Ratio (EPR), the engine exhaust pressure is measured on the internal transducer. The ambient pressure is either measured on an external transducer or manually entered when an external measurement is not available.

### Environmental

The BH112JD is a ruggedized unit capable of operating in severe environmental conditions (-40 to +70 °C ambient temperature) encountered on the flight line.

### Built-In Test

The Trim Module contains a comprehensive built-in-test feature. When the tester detects a fault, the display indicates which circuit has failed.

### Data Printout

The BH112JD is designed to store data for printout by an internal (optional) or remote printer. The engine serial number (or other I.D. number), date and trim target can be entered in memory prior to testing so that printed data can be easily identified.

The BH112JD provides an RS-232 or current loop output with a baud rate which is adjustable from 300 to 3600 BITS/SEC.

### Temperature/Standard Day Calculation

The engine's thermocouple harness output measures engine temperatures.

- Temperature: Displayed in units of °C or °F
- Maximum range: 0 to 1315 °C or 0 to 2400 °F in one degree increments
- Calibration: Chromel®-Alumel®<sup>2</sup> (ISA type K) or the special calibration required by the TF30 engine

When used in conjunction with the Probe Control Section, the Trim Module measures heater probe temperatures as well as the individual inputs from the engine spread thermocouples.

An RTD temperature probe is available as an accessory to accurately measure and display ambient temperature.

- Ambient temperature signals supplied by the RTD displayed in °C or °F
- Range: -60 to 100 °C or -75 to 212 °F in 0.1 degree increments

Should the engine test procedures require engine speed and temperature readings at standard day conditions, the input from the ambient temperature probe is used to automatically provide the standard day correction factor. If a probe is not available, the tester can calculate corrected temperature and speed readings using an ambient temperature, which is entered manually by the operator.

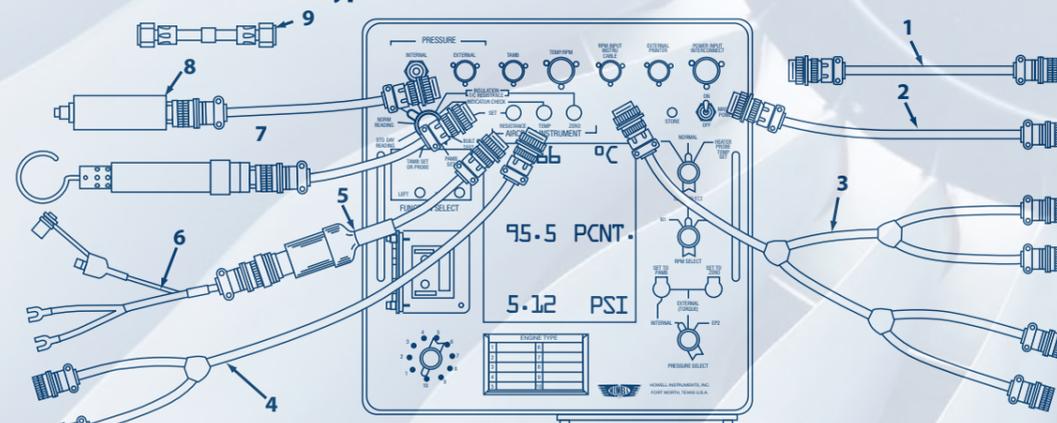
### Calibration

The tester software handles all calibration automatically, improving system reliability and eliminating potentiometer-type calibration adjustments.

# BH112JD Series JETCAL® Engine Analyzer

<sup>2</sup> Chromel® and Alumel® are registered trademarks of Hoskins Manufacturing, Co.

### Typical BH112JD Connection Scheme



### Trim Module

- 1 Power Input/Interconnect - Power cable connects here for independent operation of Trimmer Section. Interconnect cable is connected for use with Probe Control Section.
- 2 Cable to connect tester to remote printer.
- 3 RPM/Frequency Cable - Connects in parallel to aircraft system at tachometer generator or cockpit RPM indicator.
- 4 Temp/RPM Signal Cable - Capable of one temp input and three RPM inputs. Design of this cable depends upon application.

- 5 General Purpose Temperature Cable - Allows operator to monitor engine temperature, check cockpit indicator, measure thermocouple harness loop and insulation resistance.
- 6 Temperature Adapter for specific application.
- 7 Ambient Temperature Probe Assembly.
- 8 External Pressure Transducer Assembly.
- 9 Pressure Hose for Internal Pressure Transducer.