



Application Note

Rolls Royce A250-C47 Series

Engine Vibration Survey

Part Number: 11-200-0271

AppNote Number: E-R0250C47-2020-VI (Rev. 5.01, Jan 2010)

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Application Note

Application Note Number	E-RO250C47-2020-VI
Revision	5.01 (From CSL6122 Rev. 8, Aug 2009)
Function	Engine Vibration Survey
Airframe	Various
Engine	Rolls Royce A250-C47 Series
E-Setup Number	e-ro250c47-2020-vi.asf
ACES Systems Analyzer	Model 2020 Series with EPS
Boot/App Version	5.xx/5.xx or later
Procedure	N/A

Introduction

This Application Note covers the required equipment, equipment installation, analyzer setup, and data acquisition process for using the ACES Systems Model 2020HR to perform an engine vibration survey on the Rolls Royce A250-C47 Series. General instructions for the use of the Model 2020HR can be found in the Model 2020HR User Manual #2020-OM-01 (P/N 75-900-2020). All procedures and adjustments should be made in accordance with the Engine Maintenance Manual.

A. Required Equipment

The following equipment is required to perform a Vibration Spectrum Survey*:

Item	Quantity	Description	Part Number
1.	1	Analyzer, Model 2020HR	10-100-2020HR
2.	3	Sensor, 6222S-20, W/510 Chg Conv & Cables	Z10-100-1510
3.	1	Mount, Sens, AGB, A250 (RR P/N 23032993)	22-430-0123
4.	1	Mount, Sens, T-type, A250 (RR P/N 23032992)	22-430-0124
5.	1	Mount, Sens, Comp, A250 (RR P/N 23034204)	22-430-0125

*This listing shows the latest design parts. It is acceptable to perform this task using previous designs with the appropriate accessories. For compatibility issues, contact ACES Systems.

Optional Equipment

The following equipment may be used as an alternate when accomplishing the job:

Item	Quantity	Description	Part Number
6.	2	Sensor, Vibration, Velocity, 991V	69-100-0064
7.	1	Mount, 991V Sens Comp	Locally Fabricated



8.	1	Mount, 991V AGB	Locally Fabricated
9.	As Req	Cable, Sensor, 991V – 2020/4040 25 ft	10-320-0158

Miscellaneous Equipment

Tape or tie wraps to secure cables to airframe.

B. Equipment Installation

1. Park the aircraft on a flat level surface with the nose into the wind. Place the analyzer ([Item 1](#)) in the flight compartment.

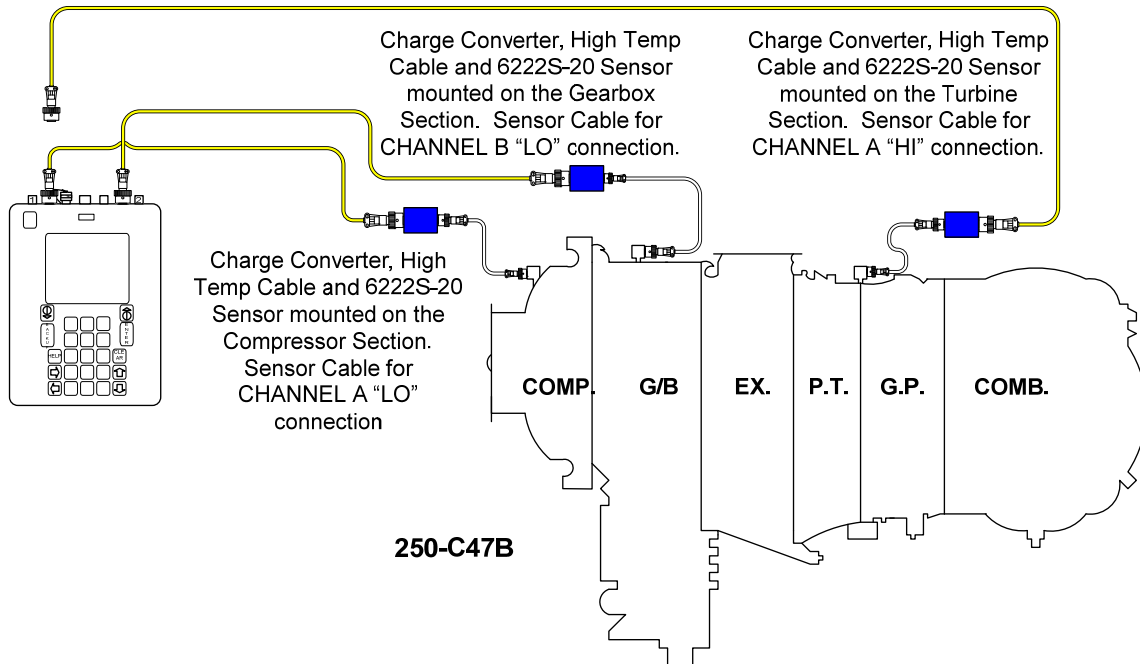
NOTE

Secure and route cables as not to interfere with hot or rotating components and aircraft controls. Insure there is adequate slack in the cables to allow full cyclic and collective inputs.

2. Compressor: Install a “T”-type mount ([Item 5](#)) on the front side of the compressor-to-inlet housing splitline at the 12 o’clock position. Install the High Temperature Sensor (component of [Item 2](#)) onto the Sensor Mount. Connect High Temperature Sensor Cable (component of [Item 2](#)) to the Sensor and to the 510 Charge Converter (component of [Item 2](#)). It is acceptable to use a 991V Vibration Sensor (Optional [Item 6](#)) in this location provide a suitable sensor mount is fabricated. Connect the 991V sensor cable (component of [Item 2](#) or Optional [Item 9](#)) to the Charge Converter or 991V Sensor, safely route the cable into the cabin area and connect the cable end to “CHANNEL A” on the analyzer during the LO conditions. ([Figure 1](#))
3. Gearbox: Install the Accessory Gearbox vibration sensor mount ([Item 3](#)) on the power and accessory gearbox top mounting pad. Install the High Temperature Sensor (component of [Item 2](#)) onto the Sensor Mount. Connect High Temperature Sensor Cable (component of [Item 2](#)) to the Sensor and to the 510 Charge Converter (component of [Item 2](#)). It is acceptable to use a 991V Vibration Sensor (Optional [Item 6](#)) in this location provide a suitable sensor mount is fabricated. Connect the 991V sensor cable (component of [Item 2](#) or Optional [Item 9](#)) to the Charge Converter or 991V Sensor, safely route the cable into the cabin area and connect the cable end to “CHANNEL B” on the analyzer during the LO conditions. ([Figure 1](#))
4. Turbine: Install Sensor Mount ([Item 4](#)) on the forward side of the gas producer-to-power turbine support split-line at the 12 o’clock position. Install the High Temperature Sensor (component of [Item 2](#)) onto the Sensor Mount. Connect High Temperature Sensor Cable (component of [Item 2](#)) to the Sensor and to the 510 Charge Converter (component of [Item 2](#)). Connect the end marked “991V” of the Vibration Sensor Cable (component of [Item 2](#) or Optional [Item 9](#)) to the Model 510 charge amplifier. Route the cable safely and securely into the cabin area. Connect the end marked “2020” to “CHANNEL A” on the analyzer when instructed to do so in [Section D below](#). ([Figure 1](#))
5. Reinstall any previously removed cowlings. Return aircraft to flying configuration.

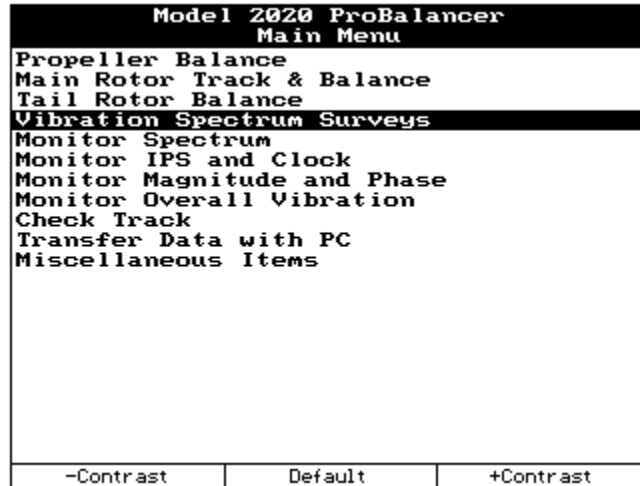
Equipment Installation Diagram

Figure 1

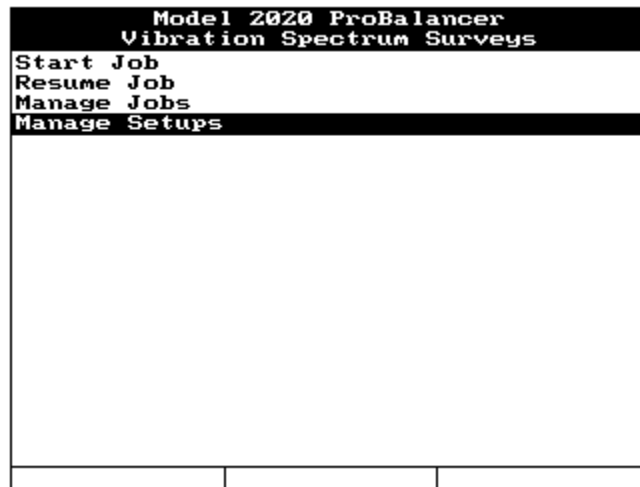


C. Analyzer Set Up

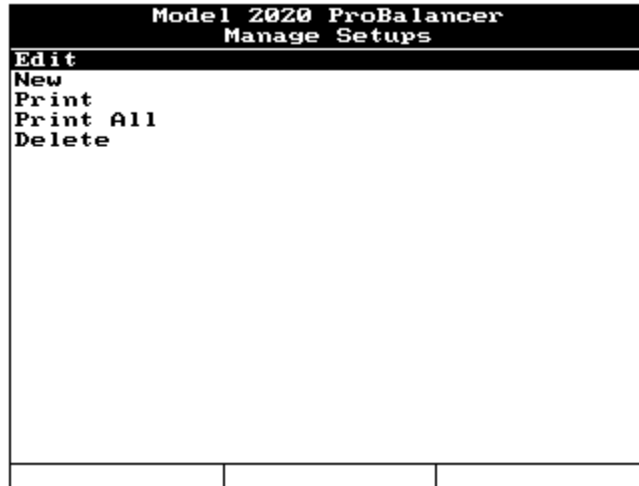
1. Insure the analyzer battery is charged prior to starting the job. See the Model 2020 User Manual #2020-OM-01 (P/N 75-900-2020) Chapter 2 for detailed instructions on battery charging.
2. Turn the analyzer ON by pressing the [ON/OFF] key.
3. From the Main Menu shown below, select "Vibration Spectrum Surveys" and press the [ENTER] key.



- From the Vibration Spectrum Surveys menu shown below, select “Manage Setups” and press the [ENTER] key.



- From the Manage Setups menu shown below, select “Edit” and press the [ENTER] key.



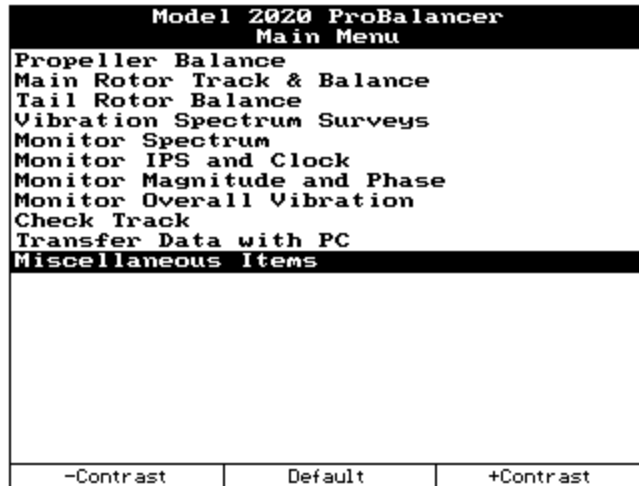
6. If the setups required for the Rolls Royce A250-C47 Series are already loaded in the analyzer it will display the Setup List similar to the one shown below. Press **[BACKUP]** to return to the “Vibration Spectrum Survey” menu and continue with [Section D](#) below.

If the setups for the Rolls Royce A250-C47 Series are not in the Setup List or if the analyzer displays a blank “Spectra Setup” screen, it will be easiest to create a “Sensor Setup” before proceeding, therefore, press **[MAIN MENU]** to return to the Main Menu and continue with [Step 7](#) below.

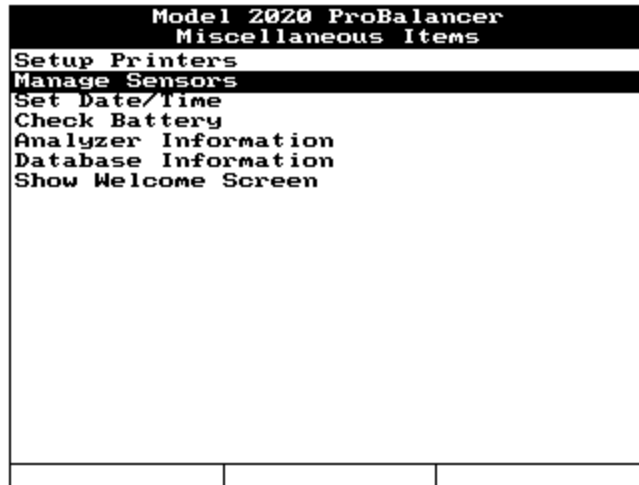


Sensor Setup

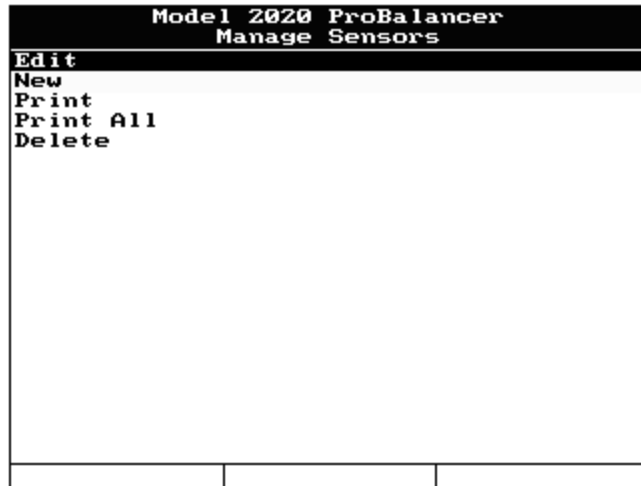
7. From the Main Menu, select “Miscellaneous Items” and press **[ENTER]**.



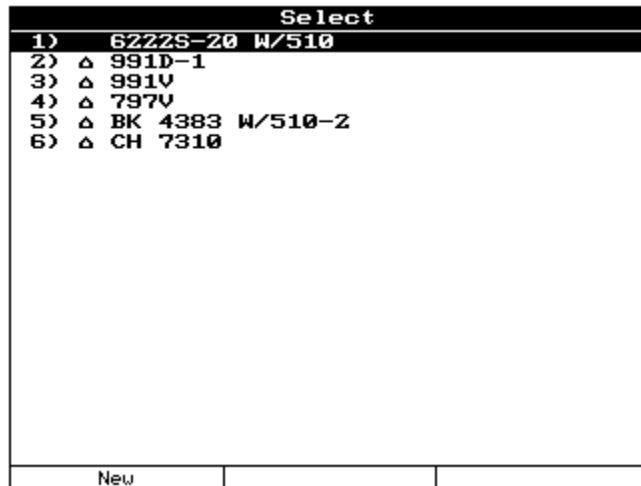
8. From the Miscellaneous Items menu select “Manage Sensors” and press [ENTER].



9. From the Manage Sensors menu select “Edit” and press [ENTER].



10. If the sensor is already displayed in the Sensor List, press the **[BACKUP]** key and continue at [Step 12 below](#). If the sensor is not listed, press the **[F1]** “New” key and continue at [Step 11 below](#).



11. Enter the sensor name and properties as displayed below. When you are finished press **[ENTER]** to save the new sensor definition.

Model 2020 ProBalancer Sensor Setup		
Name:	6222S-20 W/510	
Amplitude Units:	IPS	
Probe Sensitivity:	20.000	
Reverse Polarity:	No	

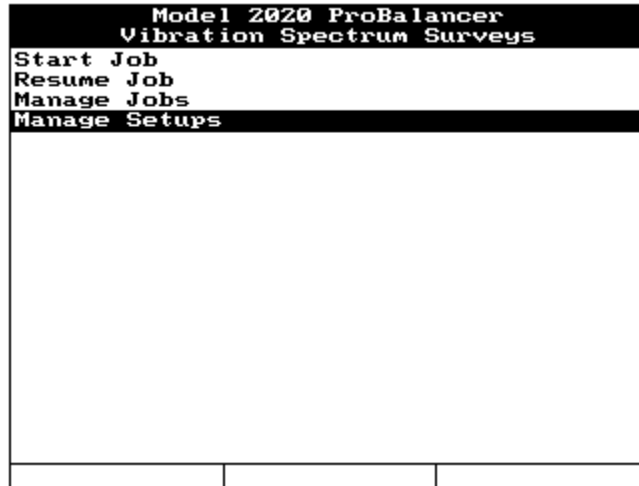
12. The analyzer will display the “Manage Sensors” menu again. Press the [MAIN MENU] key to return to the Main Menu.

Setup for Trend Monitor Points

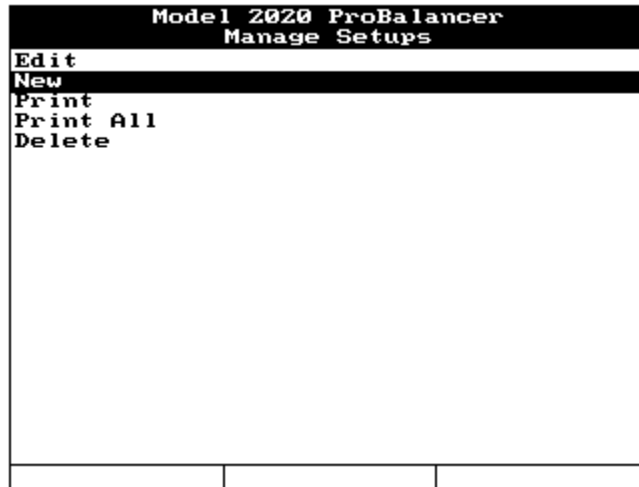
13. From the Main Menu shown below, select “Vibration Spectrum Surveys” and press the [ENTER] key.

Model 2020 ProBalancer Main Menu		
Propeller Balance		
Main Rotor Track & Balance		
Tail Rotor Balance		
Vibration Spectrum Surveys		
Monitor Spectrum		
Monitor IPS and Clock		
Monitor Magnitude and Phase		
Monitor Overall Vibration		
Check Track		
Transfer Data with PC		
Miscellaneous Items		
-Contrast	Default	+Contrast

14. From the Vibration Spectrum Surveys menu shown below, select “Manage Setups” and press the [ENTER] key.



15. From the Manage Setups menu shown below, select “New” and press the [ENTER] key.



16. The “Spectra Setup” screen now appears. Enter the Spectra Setup as shown below. You can enter any name that is convenient for locating the setup in the future. This setup will record data used when monitoring the engine trend. When completed press [F1] “Edit Conds” to define the power settings where data will be acquired.

Model 2020 ProBalancer Spectra Setup	
Name :	e-ro250c47tn-2020-vi
Min Frequency :	0.0
Max Frequency :	1000.0 Hz
Resolution :	400 lines
Average Type :	Normal
Blocks in Avg :	4
Measure Inputs :	A+B
Channel A Desc :	SENS A
Channel B Desc :	SENS B
Vibration :	IPS Mod: Avg
Full Scale Vibration :	2.00
Sensor :	62225-20 W/510
Edit Conds	

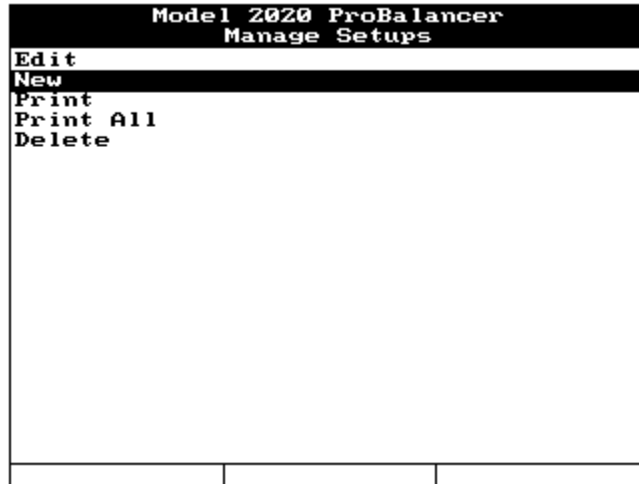
17. After pressing [F1] “Edit Conds” the “Spectra Conditions” screen will appear next as displayed below. Enter the information as indicated in the illustration below. These are the conditions indicated in the Maintenance Manual as points used for engine trend monitoring. The “LO” conditions will require that the sensors mounted in the low temperature sections of the engine, Compressor and Gearbox, are connected to the analyzer. The “HI” conditions will require that the sensor mounted in the high temperature section of the engine, Turbine, is connected to the analyzer. Press [ENTER] to continue.

Model 2020 ProBalancer Spectra Conditions	
Condition	
1)	FPG100% LO
2)	FPG100% HI
3)	95%100% HI
4)	95%100% LO
5)	
6)	
7)	
8)	
9)	
10)	

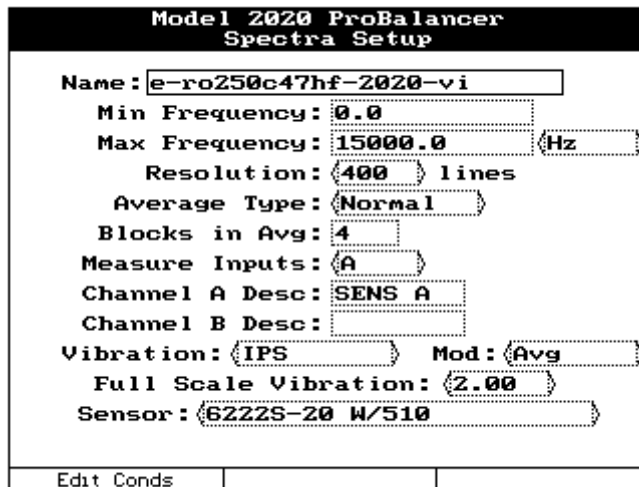
18. The screen will display the “Spectra Setup” screen as shown in [Step 16 above](#). Press [ENTER] to store the complete setup.

Setup for High Frequency Trend Monitor Points

19. From the Manage Setups menu shown below select “New” and press the [ENTER] key.



20. The “Spectra Setup” screen now appears. Enter the Spectra Setup as shown below. You can enter any name that is convenient for locating the setup in the future. This setup will be used to record the High Frequency measurements for 95% N1 and 100% N2 engine speeds for use when monitoring the engine trend. When completed press [F1] “Edit Conds” to define the power settings where data will be acquired.



CAUTION

The analyzer will attempt to change the Max Frequency value when the “Measure Inputs” selection is on the default selection of <A+B>. To avoid this, change the entry in the “Measure Inputs” line to <A> before attempting to define the “Max Frequency” entry. Make sure the “Max Frequency” line is displaying “15000.0” and that <Hz> is displayed to the right of this value before pressing [ENTER] to accept the entries on this screen.

21. The “Spectra Conditions” screen will appear next as displayed below. Enter the information as indicated in the illustration below. The “COM” condition indicates that the COMPRESSOR sensor is connected to CHAN A of the analyzer. The “GBX” condition indicates that the GEARBOX sensor is connected to CHAN A of the analyzer. The “TUR”

condition indicates that the TURBINE sensor is connected to CHAN A of the analyzer. Press **[ENTER]** to continue.

Model 2020 ProBalancer Spectra Conditions	
Condition	
1)	95%100%COM
2)	95%100%GBX
3)	95%100%TUR
4)	
5)	
6)	
7)	
8)	
9)	
10)	

22. The screen will display the “Spectra Setup” screen as shown in [Step 20 above](#). Press **[ENTER]** to store the complete setup.

Setup for Additional Data Points

23. From the Manage Setups menu shown below select “New” and press the **[ENTER]** key.

Model 2020 ProBalancer Manage Setups	
Edit	
New	
Print	
Print All	
Delete	

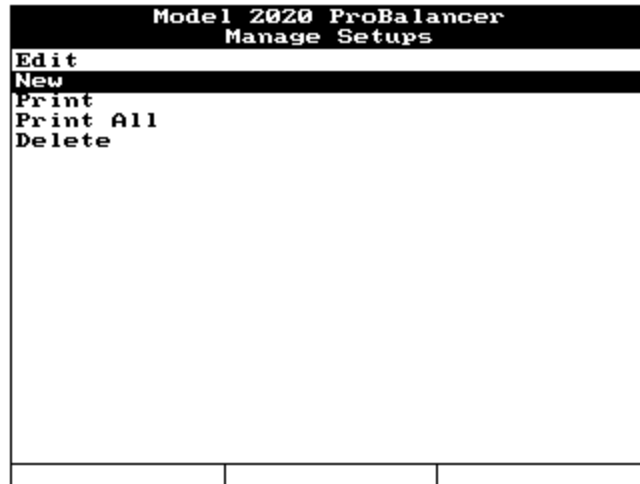
24. The “Spectra Setup” screen now appears. Enter the Spectra Setup as shown below. You can enter any name that is convenient for locating the setup in the future. This setup will record additional data points NOT marked for use when monitoring the engine trend. When completed press **[F1]** “Edit Conds” to define the power settings where data will be acquired.

Model 2020 ProBalancer Spectra Setup	
Name :	e-ro250c47ad-2020-vi
Min Frequency :	0.0
Max Frequency :	1000.0 Hz
Resolution :	400 lines
Average Type :	Normal
Blocks in Avg :	4
Measure Inputs :	A+B
Channel A Desc :	SENS A
Channel B Desc :	SENS B
Vibration :	IPS Mod: Avg
Full Scale Vibration :	2.00
Sensor :	62225-20 W/510
Edit Conds	

25. The “Spectra Conditions” screen will appear next as displayed below. Enter the information as indicated in the illustration below. These are the conditions indicated in the Maintenance Manual as points NOT used for engine trend monitoring. The “LO” conditions will require that the sensors mounted in the low temperature sections of the engine, Compressor and Gearbox, are connected to the analyzer. The “HI” conditions will require that the sensor mounted in the high temperature section of the engine, Turbine, is connected to the analyzer. Press [ENTER] to continue.

Model 2020 ProBalancer Spectra Conditions	
Condition	
1)	GND IDL HI
2)	GND IDL LO
3)	85% N2 LO
4)	85% N2 HI
5)	87%100% HI
6)	87%100% LO
7)	FLT100% LO
8)	FLT100% HI
9)	100%3000HI
10)	100%3000LO

26. The screen will display the “Spectra Setup” screen as shown in [Step 24](#) above. Press [ENTER] to store the complete setup.
27. From the “Manage Setups” menu shown below, press the [BACKUP] key to return to the “Vibration Spectrum Survey” menu.



D. Data Acquisition

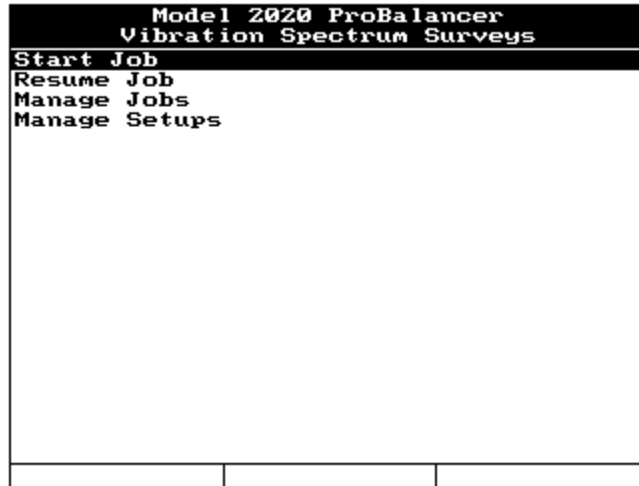
The complete survey will require starting three jobs using each of the setups created above. Follow the instructions below to acquire the correct data in each job. Recording measurements for engine trend monitoring data points requires using the “e-ro250c47tn-2020-vi” setup in a unique job. Recording measurements for the high frequency trend monitor data points requires using the “e-ro250c47hf-2020-vi” setup in a unique job. Recording the remaining measurements listed in the Maintenance Manual requires gathering data using the “e-ro250c47ad-2020-vi” setup in a unique job. You should review the flight conditions as defined in the Maintenance Manual. Due to limited space, not all engine/flight conditions can be completely described and abbreviations are sometimes used.

CAUTION

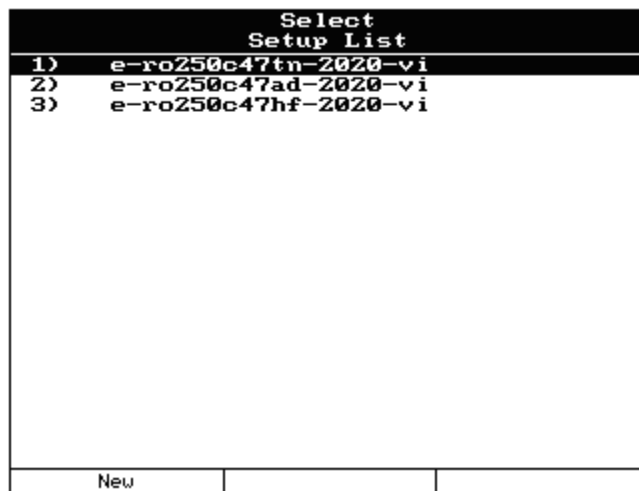
The engine speed settings in this procedure are only suggestions. Insure all N2 speed avoidance ranges applicable to the engine model are observed.

Data Acquisition for Trend Monitor Points

1. From the “Vibration Spectrum Surveys” menu, shown below, select “Start Job” and press [ENTER].



- From the "Setup List" screen, shown below, select "e-ro250c47tn-2020-vi" setup and press [ENTER].



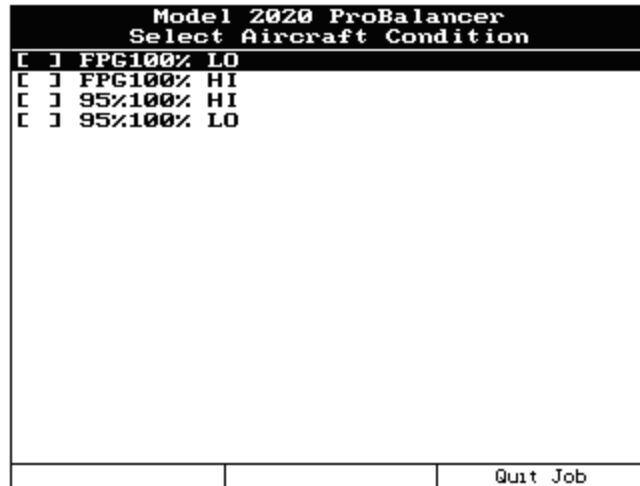
- The "Customer Information" screen will be displayed, as shown below. Use the analyzer keypad to enter a customer name in the "Name:" field. The analyzer will maintain a list of customer names as new names are entered. If names have been previously entered into this analyzer, you may press the [F1] "Names" key and select a customer's name from the provided list. Press the [↓] key to move to the next field and use the analyzer keypad to enter the optional aircraft registration and aircraft total time as required. When all fields are complete, press the [ENTER] key to accept and continue.

Model 2020 ProBalancer Customer Information		
Enter the following optional Customer Information.		
Name:	CUSTOMER NAME	
A/C Registration:	N1234	
A/C Total Time:	123.4	
Press ENTER to continue.		
Names		

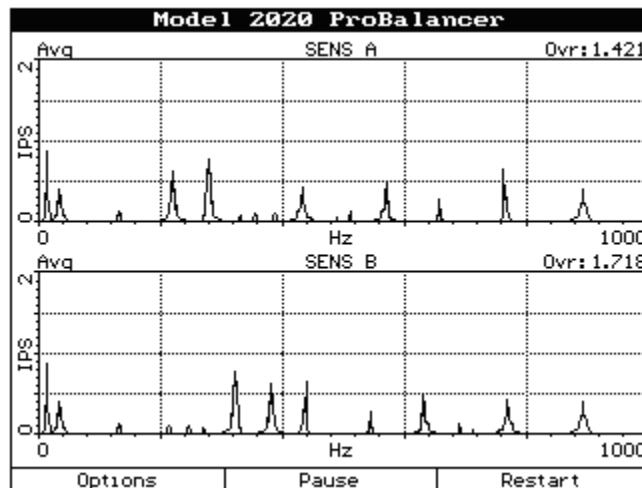
4. The next screen to be displayed will be the “Engine Information” screen as illustrated below. This screen gives the opportunity to enter information about the engine under test. Enter as much or as little information as necessary. This is for record keeping purposes only and will not influence the job in any way. Use the [F1] “Serial Nos” key to access a database of recently entered Serial Numbers as used in previous jobs. Press the [ENTER] key when finished to progress to the next screen.

Model 2020 ProBalancer Engine Information		
Engine 1 Info		Prop 1 Info
S/N:		
Type:		
Pos:	1	
ISO:	0	
TSN:	0	
Serial Nos		

5. The “Select Aircraft Condition” screen will appear. The first defined condition name should be highlighted. Configure the aircraft to match the indicated condition and press [ENTER] to begin data acquisition. The “LO” conditions will require that the sensors installed in the low temperature section of the engine, Compressor and Gearbox, are connected to the analyzer. The “HI” conditions will require that the sensor installed in the high temperature section of the engine, the Turbine, is connected to the analyzer.
- “FPG100%” means operate the aircraft at Flat Pitch on the Ground at 100% N2 engine speed.
 - “95%100%” means to operate the aircraft at 95% N1 and 100% N2 engine speeds.



6. The analyzer will present the data acquisition screen as shown. This screen allows you to monitor the vibration readings. While monitoring the measurement, you may press the **[F3]** “Restart” key to restart the averaging process. Use this feature as a way to validate the quality of the measurement. If the averaged readings return to a value similar to those prior to “Restart” being pressed the measurement can be considered good. If the measurement is not similar, you may choose to “Restart” the average again. When you are satisfied with the data quality, press the **[ENTER]** key to continue. The data displayed in the sample below is for illustrative purposes only, it is not actual data. Your survey data may vary.



See the Model 2020HR User Manual #2020-OM-01 (P/N 75-900-2020) Chapter 16 for detailed instructions on how to read the “Reading the X and Y Plotted Vibration Spectrum.”

7. The “Store Spectra?” screen will appear. This screen gives you the option of entering notes on the actual N1 and N2 speeds recorded during the run. You can enter values in RPM, Hz or Percent. An entry is not mandatory but can be used for later review. Answer the question “Store the spectral data?” by pressing the **[F1]** “Yes” key to save the data or the **[F3]** “No” key to retake the data and return to the “Select Aircraft Condition” screen as in [Step 5 above](#).

If this is the final condition in the job pressing **[F1]** on this screen will take you to [Step E.1 below](#).

Model 2020 ProBalancer Store spectra?		
Enter actual N1:	<input type="text" value="95.2"/>	
Enter actual N2:	<input type="text" value="100"/>	
Store the spectral data?		
Yes		No

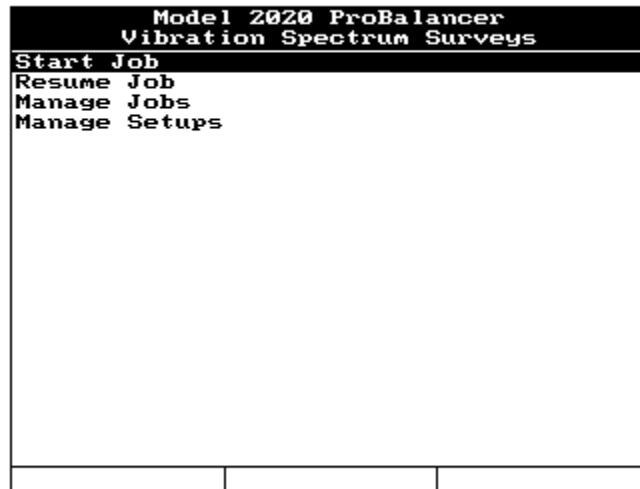
8. The “Select Aircraft Condition” screen will reappear. Use the [↓] arrow key to select the next condition, change the sensor cable connections as necessary, configure the aircraft at the next power setting, and press the **[ENTER]** key to begin acquiring data at the next condition. The “LO” conditions will require that the sensors installed in the low temperature section of the engine, Compressor and Gearbox, are connected to the analyzer. The “HI” conditions will require that the sensor installed in the high temperature section of the engine, the Turbine, is connected to the analyzer.

Model 2020 ProBalancer Select Aircraft Condition		
[x]	FPG100% LO	
[]	FPG100% HI	
[]	95%100% HI	
[]	95%100% LO	
		Quit Job

9. Continue to exchange cables and take readings until all defined conditions contain data. When completed, you must begin additional jobs to acquire all conditions defined in the Maintenance Manual. Follow the steps below to continue gathering data.

Data Acquisition for High Frequency Trend Monitor Points

10. From the “Vibration Spectrum Surveys” menu, shown below, select “Start Job” and press [ENTER].



11. From the “Setup List” screen, shown below, select “e-ro250c47hf-2020-vi” setup and press [ENTER].



12. The “Customer Information” screen will be displayed, as shown below. Use the analyzer keypad to enter a customer name in the “Name:” field. The analyzer will maintain a list of customer names as new names are entered. If names have been previously entered into this analyzer, you may press the [F1] “Names” key and select a customers name from the provided list. Press the [↓] key to move to the next field and use the analyzer keypad to enter the optional aircraft registration and aircraft total time as required. When all fields are complete, press the [ENTER] key to accept and continue.

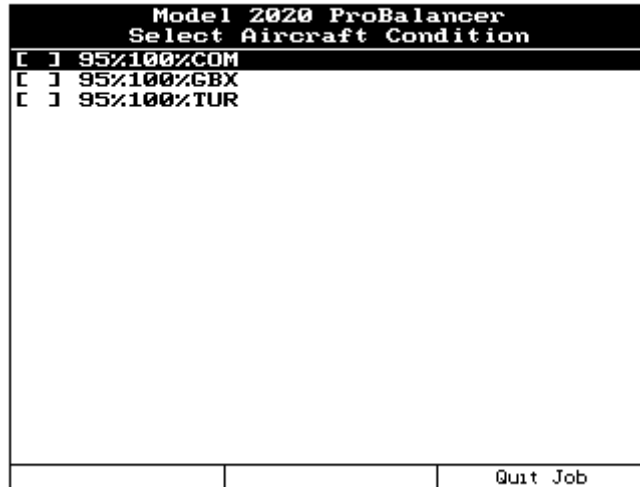
Model 2020 ProBalancer Customer Information		
Enter the following optional Customer Information.		
Name:	CUSTOMER NAME	
A/C Registration:	N1234	
A/C Total Time:	123.4	
Press ENTER to continue.		
Names		

13. The next screen to be displayed will be the “Engine Information” screen. Use the analyzer keypad to enter as much information as is applicable. This information is not mandatory, but all entries will appear on the final report.

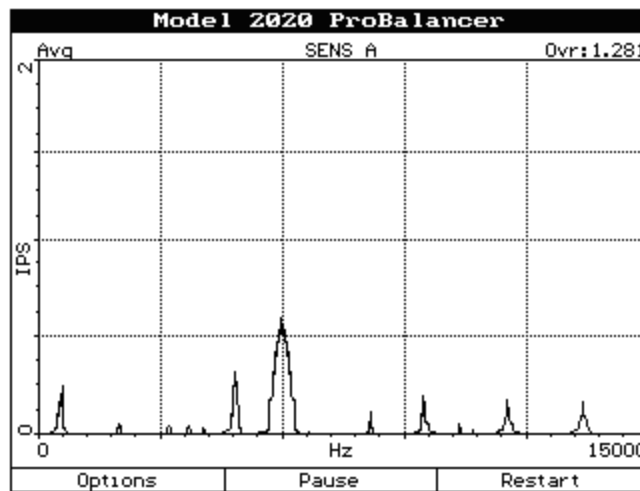
Model 2020 ProBalancer Engine Information		
Engine 1 Info		Prop 1 Info
S/N:		
Type:		
Pos:	{ 1 }	
TSO:	0	
TSN:	0	
Serial Nos		

14. The “Select Aircraft Condition” screen will appear. The first defined condition name should be highlighted. The cables should be connected correctly from the last point of the prior job. If not, change the sensor cable connections as necessary. Configure the aircraft to match the indicated condition and press [ENTER] to begin data acquisition. The “COM” condition indicates that the COMPRESSOR sensor is connected to CHAN A of the analyzer. The “GBX” condition indicates that the GEARBOX sensor is connected to CHAN A of the analyzer. The “TUR” condition indicates that the TURBINE sensor is connected to CHAN A of the analyzer.
- “95%100%” means to operate the aircraft at 95% N1 and 100% N2 engine speeds.
 - “COM” means to connect the COMPRESSOR sensor to CHAN A on the analyzer.
 - “GBX” means to connect the GEARBOX sensor to CHAN A on the analyzer.

- “TUR” means to connect the TURBINE sensor to CHAN A on the analyzer.



15. The analyzer will present the data acquisition screen as shown. This screen allows you to monitor the vibration readings. While monitoring the measurement, you may press the **[F3]** “Restart” key to restart the averaging process. Use this feature as a way to validate the quality of the measurement. If the averaged readings return to a value similar to those prior to “Restart” being pressed the measurement can be considered good. If the measurement is not similar, you may choose to “Restart” the average again. When you are satisfied with the data quality, press the **[ENTER]** key to continue. The data displayed in the sample below is for illustrative purposes only, it is not actual data. Your survey data may vary.



See the Model 2020HR User Manual #2020-OM-01 (P/N 75-900-2020) Chapter 16 for detailed instructions on how to read the “Reading the X and Y Plotted Vibration Spectrum.”

16. The “Store Spectra?” screen will appear. This screen gives you the option of entering notes on the actual N1 and N2 speeds recorded during the run. You can enter values in RPM, Hz or Percent. An entry is not mandatory but can be used for later review. Answer the question “Store the spectral data?” by pressing the **[F1]** “Yes” key to save the data or the **[F3]** “No”

key to retake the data and return to the “Select Aircraft Condition” screen as in [Step 14 above](#). If this is the final condition in the job pressing **[F1]** on this screen will take you to [Step E.1 below](#).

Model 2020 ProBalancer Store spectra?		
Enter actual N1:	<input type="text" value="95.2"/>	
Enter actual N2:	<input type="text" value="100"/>	
Store the spectral data?		
Yes		No

17. The “Select Aircraft Condition” screen will reappear. Use the **[↓]** arrow key to select the next condition, change the sensor cable connections as necessary, configure the aircraft at the next power setting, and press the **[ENTER]** key to begin acquiring data at the next condition. The “COM” condition indicates that the COMPRESSOR sensor is connected to CHAN A of the analyzer. The “GBX” condition indicates that the GEARBOX sensor is connected to CHAN A of the analyzer. The “TUR” condition indicates that the TURBINE sensor is connected to CHAN A of the analyzer.

Model 2020 ProBalancer Select Aircraft Condition		
<input checked="" type="checkbox"/>	95%100%COM	
<input type="checkbox"/>	95%100%GBX	
<input type="checkbox"/>	95%100%TUR	
		Quit Job

18. Continue to exchange cables and take readings until all defined conditions contain data. When completed, you must begin additional jobs to acquire all conditions defined in the Maintenance Manual. Follow the steps below to continue gathering data.

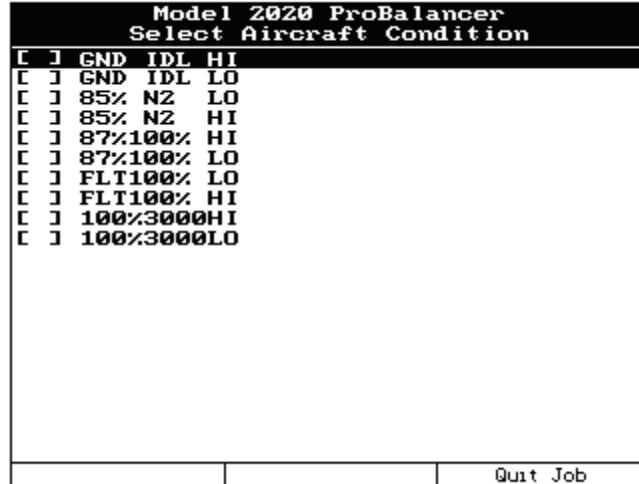
Model 2020 ProBalancer Customer Information		
Enter the following optional Customer Information.		
Name:	CUSTOMER NAME	
A/C Registration:	N1234	
A/C Total Time:	123.4	
Press ENTER to continue.		
Names		

22. The next screen to be displayed will be the “Engine Information” screen. Use the analyzer keypad to enter as much information as is applicable. This information is not mandatory, but all entries will appear on the final report.

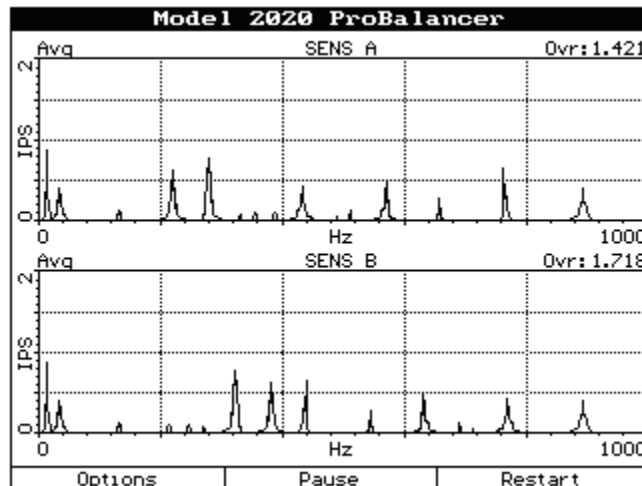
Model 2020 ProBalancer Engine Information		
Engine 1 Info		Prop 1 Info
S/N:		
Type:		
Pos:	1	
TSO:	0	
TSN:	0	
Serial Nos		

23. The “Select Aircraft Condition” screen will appear. The first defined condition name should be highlighted. The cables should be connected correctly from the last point of the prior job. If not, change the sensor cable connections as necessary. Configure the aircraft to match the indicated condition and press [ENTER] to begin data acquisition. The “LO” conditions will require that the sensors installed in the low temperature section of the engine, Compressor and Gearbox, are connected to the analyzer. The “HI” conditions will require that the sensor installed in the high temperature section of the engine, the Turbine, is connected to the analyzer.
- “GND IDL” means to operate the aircraft with the engine at ground idle.
 - “85% N2” means to operate the aircraft at 85% N2 engine speed with no defined N1 speed.
 - “87%100%” means to operate the aircraft at 87% N1 and 100% N2 engine speed.

- “FLT100%” means to fly the aircraft using maximum allowable power in level flight at a safe altitude with the engine at 100% N2.
- “100%3000” means to fly the aircraft at maximum allowable power in level flight 3000 feet above the altitude where readings for the condition above were obtained.



24. The analyzer will present the data acquisition screen as shown. This screen allows you to monitor the vibration readings. While monitoring the measurement, you may press the [F3] “Restart” key to restart the averaging process. Use this feature as a way to validate the quality of the measurement. If the averaged readings return to a value similar to those prior to “Restart” being pressed the measurement can be considered good. If the measurement is not similar, you may choose to “Restart” the average again. When you are satisfied with the data quality, press the [ENTER] key to continue. The data displayed in the sample below is for illustrative purposes only, it is not actual data. Your survey data may vary.



See the Model 2020HR User Manual #2020-OM-01 (P/N 75-900-2020) Chapter 16 for detailed instructions on how to read the “Reading the X and Y Plotted Vibration Spectrum.”

25. The “Store Spectra?” screen will appear. This screen gives you the option of entering notes on the actual N1 and N2 speeds recorded during the run. You can enter values in RPM, Hz or Percent. An entry is not mandatory but can be used for later review. Answer the question “Store the spectral data?” by pressing the [F1] “Yes” key to save the data or the [F3] “No” key to retake the data and return to the “Select Aircraft Condition” screen as in [Step 23 above](#). If this is the final condition in the job pressing [F1] on this screen will take you to [Step E.1 below](#).

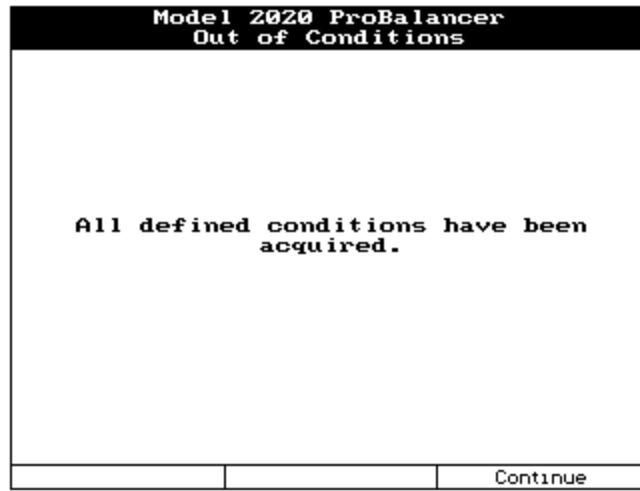
Model 2020 ProBalancer Store spectra?		
Enter actual N1:	<input type="text" value="95.2"/>	
Enter actual N2:	<input type="text" value="100"/>	
Store the spectral data?		
Yes		No

26. The “Select Aircraft Condition” screen will reappear. Use the [↓] arrow key to select the next condition, change the sensor cable connections as necessary, configure the aircraft at the next power setting, and press the [ENTER] key to begin acquiring data at the next condition. The “LO” conditions will require that the sensors installed in the low temperature section of the engine, Compressor and Gearbox, are connected to the analyzer. The “HI” conditions will require that the sensor installed in the high temperature section of the engine, the Turbine, is connected to the analyzer.

Model 2020 ProBalancer Select Aircraft Condition			
[x]	GND	IDL	HI
[]	GND	IDL	LO
[]	85%	N2	LO
[]	85%	N2	HI
[]	87%	100%	HI
[]	87%	100%	LO
[]	FLT	100%	LO
[]	FLT	100%	HI
[]	100%	3000	HI
[]	100%	3000	LO
			Quit Job

27. Continue to exchange cables and take readings until all defined conditions contain data.

28. When data have been gathered for all conditions the analyzer will present the “Out of Conditions” screen as shown below. Press [F3] to complete the job and continue.



E. Quit Job

1. Repeat [Steps D.1 above](#) through [D.28 above](#) as necessary until all desired conditions are gathered. Remove all test equipment and return the aircraft to airworthy condition.