Replace Three Legacy Systems with One:
Modernizing Aerospace/Defense Test Cells with PBS eXpress

A cost-effective, drop-in replacement for tracking filters, signal conditioners, and vibration monitoring systems.

Introduction

Many military/defense and commercial aerospace test cells still rely on aging analog instruments that, while functional, introduces risk through calibration challenges, legacy components, and lack of digital data access. As testing demands evolve, the industry is moving toward compact, digital platforms that simplify workflows and improve data usability.

A Vitrek customer faced this challenge across multiple engine test cells. Their solution: replace two legacy systems with a single PBS eXpress R+, enabling faster setup, digital data acquisition, and automated reporting.

The Challenge

The customer's test cells were built around a mix of aging instrumentation, including TrigTek tracking filters, Endevco 6634C signal conditioners, and a Dactron vibration monitoring system. While functional, these systems were increasingly difficult to support and lacked the flexibility required for modern workflows.

The goal was not a complete redesign, but a practical, drop-in modernization—a system that could integrate into existing environments while delivering expanded capability.

Key requirements included:

- **2 speed (tachometer) inputs and 4 vibration channels**
- **(3) 0–10 V DC order-tracked outputs**
- **Pre-con igured engine parameter sets**
- **In-place calibration**
- **Starting at $20K**

Beyond specifications, the customer needed a system that could scale across multiple test cells and simplify technician workflows without adding complexity.

Phase 1 - Replacing Legacy Tracking Filters

The PBS eXpress R+ (MTI Instruments, a Vitrek brand) replaced obsolete tracking filters across five test cells. Built on PBS 4100+ technology, it delivers digital order tracking, vibration analysis, and one-shot balancing in a compact system.

The platform not only replicated legacy functionality but improved usability and added digital data output. It was also deployed in additional test cells, replacing existing signal conditioners and standardizing the environment.

Phase 2 - Replacing Dactron Monitoring

With PBS already generating digital vibration data, the customer expanded its role. Vitrek developed a custom software enhancement to support monitoring and reporting workflows previously handled by Dactron.

This transformed PBS eXpress R+ into a centralized data acquisition and reporting platform.

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RESULTS

Legacy tracking filters were replaced with digital order tracking, improving measurement flexibility and consistency across test cells. At the same time, vibration monitoring capabilities were expanded into additional test environments, allowing the customer to standardize operations across their facility.

By consolidating multiple legacy systems into a single platform, the PBS eXpress R+ reduced setup time and overall operational complexity. The transition to digital data acquisition also enabled automated reporting, improving both efficiency and data accessibility.

In addition, new capabilities such as remote access, Ethernet-based control, and seamless integration with existing reporting tools provided a more connected and scalable test environment.

Modernizing without Rebuilding

Drop-in replacement — Fits existing test cells while replicating legacy functionality—now with digital performance.

System consolidation — Replace tracking filters, signal conditioners, and monitoring systems with one platform.

Digital workflows — Automate data collection, storage, and reporting for faster, more reliable results.

Fast deployment — Quick to implement with minimal training and disruption.Implementation is straightforward, with minimal disruption to existing operations. Most teams are fully operational within days using intuitive software tools like Trim Balance Wizard™, reducing training time and accelerating ROI.

CONCLUSION

The PBS eXpress R+ enabled the customer to modernize their test cells without the cost, risk, or disruption of a full system overhaul. By replacing multiple legacy analog systems with a single, flexible digital platform, they simplified their test architecture while improving measurement capability and workflow efficiency.

The transition reduced setup time, eliminated dependence on obsolete hardware, and introduced automated data acquisition and reporting—creating a more consistent and repeatable process across all test cells. Just as importantly, the platform provides the flexibility to adapt as testing requirements evolve, supporting new engines, configurations, and data needs without additional system complexity.

Result: a streamlined, cost-effective, and scalable test environment built for long-term reliability and future growth.

View Vitrek's full line of MTI Engine Balancing Solutions at Vitrek.com.