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Design Considerations in Instrumentation for Flight Inspection — Data Acquisition Systems & Graphic Printers, Architectures, Operating Systems.

ABSTRACT

Flight inspection systems fall under the category of *hard* real-time systems. They have demanding requirements for very accurate data/time correlation of inputs from a variety of avionics receivers and navigation sensors, high reliability, resilience to shock, vibration and to demanding environmental conditions, electromagnetic compatibility, compactness, and light weight. Systems are also required to be highly stable in terms of their longevity and support, an issue particularly relevant in times when conventional PC hardware becomes obsolete a few months after introduction.

In this paper we address the issues above within the framework of the design and integration of hardware and software components for such systems. We discuss architectures, operating systems, and their impact on data/time synchronization. We present efficient distributed processing architectures for such systems, and discuss new advances in the graphic printer/chart recorder technology they include.