

MERGING TELEMETRY DATA FROM MULTIPLE RECEIVERS

Michael J. Wilson
Weapons and Materials Research Directorate
US Army Research Laboratory
Aberdeen Proving Ground, MD

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ABSTRACT

Multiple receiver telemetry systems are common in the aeroballistics test and evaluation community. These systems typically record telemetry data independently, requiring post-flight data processing to produce the most accurate combination of the available data. This paper addresses the issues of time synchronization between multiple data sources and determination of the best choice for each data word. Additional filtering is also developed for the case when all available data are corrupted. The performance of the proposed algorithms is presented.

KEY WORDS

Merging Telemetry Data, Telemetry Data Processing, Multiple Receivers

INTRODUCTION

The United States military is a major employer of telemetry systems for test and evaluation purposes. Such systems typically acquire data from various sensors, such as accelerometers, magnetometers, and GPS, and then transmit that data from the projectile or moving body to a ground station. The sensor readings are sampled and quantized for digital transmission. In practice, the telemetry community relies on legacy PCM/FM systems [1,2], usually without any channel coding or equalization. As a result of such a system, telemetry data are prone to bit errors that must be dealt with.

To add redundancy, multiple receivers are used, which connect to antennas that cover different portions of the projectile flight. This helps to compensate for problems an individual receiver