Development of Ignition System for a Demonstrative Prototype of Multiple Launch Rocket System using Microcontroller

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Abstract

This paper presented the controller design of the ignition system for a demonstrative prototype of Multiple Launch Rocket System (MLRS) to improve the operating performance, reliability, and safety. The ignition system was developed using microcontroller, mainly including the communication, state, and ignition modules. In order to ensure the reliability and safety of ignition, a ignition protection and a rocket detection circuits in the launch tube were designed to prevent unexpected ignition and improve the reliability of the system. The experiment results of the operation was indicated that the ignition system met both operation and safety requirements. In case of preventing false ignition and improving the reliability of the system, it is recommended to conduct a comprehensive inspection of the ignition device before operating the system. The investigation includes checking each signal line and connector to make sure that the connection is reliable and also checking each impedance loop resistance to make sure that it is in normal range. In order to ensure the reliable operation of the system.

Keywords: Ignition System, Microcontroller design, Multiple Launch Rocket System.

1. INTRODUCTION

This paper aims to develop the ignition system of a demonstrative prototype for platform of Multi-Launcher Rocket System (MLRS) as shown in Fig.1. The platform of MLRS consists of the turning mechanism, elevating mechanism, cradle, rocket pod, automatic aiming system, and ignition system. The ignition system developed by microcontroller, mainly includes the communication module, state module, and ignition module. In order to ensure the reliability and safety of ignition, a protection circuit of the ignition and a rocket detection circuit in the launch tube were designed to prevent false ignition and improve the reliability of the system. This paper is organized in the following manner: Section 2 Composition of ignition system; Section 3 Controller design; Section 4 Experiment results; finally, Section 5 is the conclusion.