

Ground Detection System for Re-entry Vehicle' s Telemetry

Lu-Ji san Zhou-Jian yu

KEYWORD

Re-entry Telemetry, Signal Detection, CAMAC Standard Bus

ABSTRACT

This paper abstractly introduces the configuration, main modules, and software of the ground detection system for re-entry vehicle' s telemetry. It focuses on introducing intellegent high bit rate CAMAC(Computer Automic Mete And Control) modules, high frequency CAMAC modules, adaption between CAMAC bus and telemetry bus, and writing high bit rate data into disk under the control of CCU (Central Control Unit), etc.

MAIN FUNCTION OF GROUND DETECTION SYSTEM

The ground detection system has two main function:

- (1) Sample, process and analysis the re-entry vehicle' s on-board status and other important signals then anslysis the status of the re-entry vehicle for helping people to get a conclusion of vehicle.
- (2) Real-timely record all PCM frames of telemetry, for afterwards evaluting and trouble analysis and shooting.

CONFIGURATION OF GROUND DETECTION SYSTEM

The configuration of the system is designed according to the following demands:

- (1)The configuration should adapt the variance of function, be available and convenient for extension, be flexible for using.
- (2)The hardware and software of the system has module construction, and each module has its own function, and can carry it out independently.

(3)The system uses three kinds of buses. The meting subsystem has its own bus, meting bus; the detection subsystem uses CAMAC bus; the interface between detection subsystem and the computer uses computer bus.

(4)The whole system should have high reliability, because the onboard meting system works only one time and works under odious condition, and it is difficult to be repaired.

Ground detection system consists power, power supply subsystem, telemetry subsystem and detection subsystem, etc.

Figure 1 shows the structure of the ground detection system.

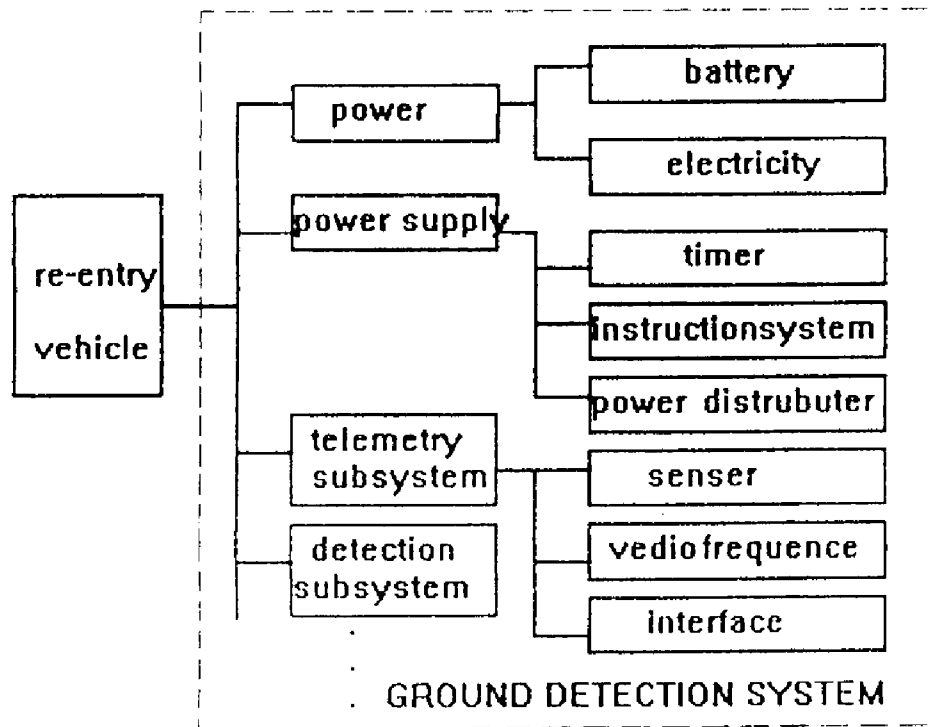


Figure 1. STRUCTURE OF THE GROUND DETECTION SYSTEM

Each subsystem consists some individual modules. Figure 2 shows main modules of the System. (Please see next page)

CONCLUSION

This system has been successfully used in some different re-entry vehicles' telemetry. Because of using CAMAC bus, the system has the following advantages:

(1) The interface between CAMAC bus and computer is independent, when we change computer, we need not to change senser bus and CAMAC bus, the system is highly adaptive.

- (2) When a series of CAMAC modules are designed, the ground detection system becomes unified and integrated, in stead of being distributed, it includes telemeting, receiving and modulating subsystem, and it can be extended easily.
- (3) The system uses unified modules, that reduced the cost of the system, and increased the uniformity of the system.

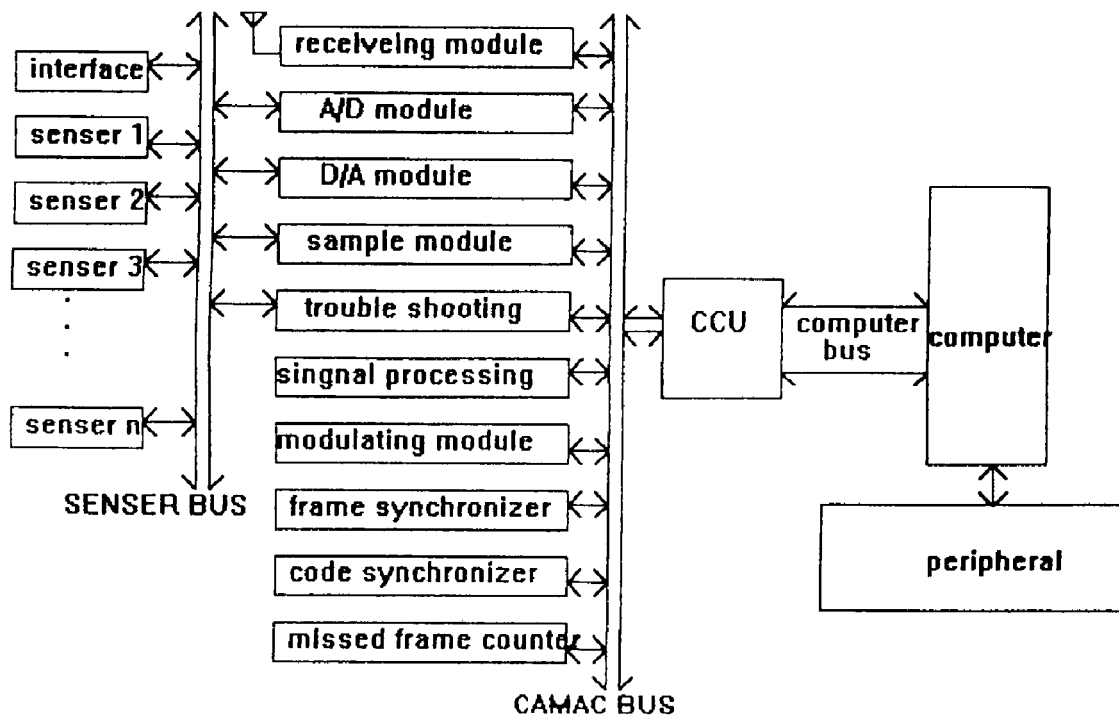


Figure 2. MAIN MODULES OF GROUND DETECTION SYSTEM

THE TRENDENCY OF DEVELOPMENT OF THE SYSTEM

In order to adapt the ground system to the development of on-board system, it should improve in the follwing way:

(1) HIGH RELIABILITY

Under a defined level of cost, uses various kind of redundancy check algorithms to improve the system's reliability. The reliability of on-board system should be higher than that of subsystems being detected, the reliability of ground detection system should be higher than that of the on-board system. At the same time the on-line trouble shooting ability should he imporved.

(2) USAGE OF MULTI CPU TECHNIQUE

The re-entry vehicle's on-board system is a multi-CPU system which focuses on computer, it can carry out various kind of work, such as telemete control, data process, and communicate, etc. According to above the ground detection system should use multi-CPU technique to adapt to high bit rate multi data flow.

(3) IMPORVE THE ABILITY OF REAL-TIME PROCESS

This ability is one of the main target of the system. In order to process and analysis data real-timely, the processing rate and capacity of input and output should be increased.

(4) USAGE OF EXPERT SYSTEM

In order to increase the ability of trouble analysising and shooting, expert system should be used in ground detection system, this can detect and inditify trouble more perfectly than present system.