Biomedical Wireless Ambulatory Crew Monitor

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A compact, ambulatory biometric data acquisition system has been developed for space and commercial terrestrial use. BioWATCH (Biomedical Wireless and Ambulatory Telemetry for Crew Health) acquires signals from biomedical sensors using acquisition modules attached to a common data and power bus. Several slots allow the user to configure the unit by inserting sensor-specific modules. The data are then sent real-time from the unit over any commercially implemented wireless network including 802.11b/g, WCDMA, 3G.

This system has a distributed computing hierarchy and has a common data controller on each sensor module. This allows for the modularity of the device along with the tailored ability to control the cards using a relatively small master processor. The distributed nature of this system affords the modularity, size, and power consumption that betters the current state of the art in medical ambulatory data acquisition.

Inquiries concerning rights for the commercial use of this invention should be addressed to NASA Glenn Research Center, Innovative Partnerships Office, Attn: Steve Fedor, Mail Stop 4–8, 21000 Brookpark Road, Cleveland, Ohio 44135. Refer to NPO-44470.

Wireless Avionics Packet To Support Fault Tolerance for Flight Applications

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In this protocol and packet format, data traffic is monitored by all network interfaces to determine the health of transmitter and subsystems. When failures are detected, the network interface applies its recovery policies to provide continued service despite the presence of faults. The protocol, packet format, and interface are independent of the data link technology used. The current demonstration system supports both commercial off-the-shelf wireless connections and wired Ethernet connections. Other technologies such as 1553 or serial data links can be used for the network backbone.

The Wireless Avionics packet is divided into three parts: a header, a data payload, and a checksum. The header has the following components: magic number, version, quality of service, time to live, sending transceiver, function code, payload length, source Application Data Interface (ADI) address, destination ADI address, sending node address, target node address, and a sequence number.

The magic number is used to identify WAV packets, and allows the packet format to be updated in the future. The quality of service field allows routing decisions to be made based on this value and can be used to route critical management data over a dedicated channel. The time to live value is used to discard misrouted packets while the source transceiver is updated at each hop. This information is used to monitor the health of each transceiver in the network.

To identify the packet type, the function code is used. Besides having a regular data packet, the system supports diagnostic packets for fault detection and isolation. The payload length specifies the number of data bytes in the payload, and this supports variable-length packets in the network. The source ADI is the address of the originating interface. This can be used by the destination application to identify the originating source of the packet where the address consists of a subnet, subsystem class within the subnet, a subsystem unit, and the local ADI number. The destination ADI is used to route the packet to its ultimate destination. At each hop, the sending interface uses the

A new company was created to market this technology.

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