Approved by _____ date 7-29-2015

CSBF Seatpack Telemetry System for Use in Aircraft

Introduction

This document summarizes the electrical loads imposed on provided aircraft by the CSBF Seatpack Telemetry System

System Description:

The CSBF Seatpack provides command and control in support of the NASA balloon program. Functions are provided for reception of telemetry from mission systems on balloons, and commanding uplink to various CSBF and science subsystems.

Equipment Description:

The CSBF seatpack is designed to operate from a single 28V DC supply. Nominal current when operating is 10 Amps with a maximum draw, when radios are transmitting, of 16.7 Amps. The system is comprised of a CSBF built aluminum enclosure, with a rack mounted 8U dual computer, a monitor and related KVM Switch, 3 Radios, a command encoder system, and miscellaneous support items.

	UNIT	Current	BUS
1	RACK		
2	Cooling Fans, CMD Encoder	2.2 Amps	Main 28V
3	DC Convertor 1 (primary)	200 milliamps (minimal load)	Main 28V
4	DC Convertor 2 (backup)	200 milliamps (minimal load)	Main 28V
5	8U Dual Computer	7 Amps	Main 28V
6	UHF Radio (Primary)	3.7 Amps	Conv Bus
7	UHF Radio (Backup)	3.7 Amps	Conv Bus
8	VHF Radio	2.8 Amps	Conv Bus
9	Computer LCD Monitor	1.5 Amps	Main 28V

Loads:

Actual testing of loads was completed on July 28, 2015. The testing resulted in the following loads on the main 28V supply bus.

ITEM	Cumulative Actual Load on Main 28V Bus
Main Switch ON	2.2 Amps
DC1 Convertor ON, All Radio on Standby	2.4 Amps
DC2 Convertor ON, All Radio on Standby	2.5 Amps
Computer Monitor ON, Computers OFF	4.0 Amps
Computers ON and Fully Booted/Configured	9.9 Amps
VHF Radio Transmitting	12.7 Amps
UHF Primary Radio Transmitting	13.6 Amps
VHF/UHF Primary Transmitting **	16.7 Amps

**Note – Primary UHF and Backup UHF and VHF Transmitting at same time is possible but not a flight configuration and not normally seen

Loads Analysis:

The Main 28V supply is controlled on the CSBF Seatpack via a 25 Amp breaker/switch. The two independent (but diode or output to a 15V Bus) DC-DC are controlled by separate 15 Amp breaker/switches fed from the 28V Main breaker. The monitor is controlled via a 10 Amp switch/breaker on the 28V Bus. Each UHF radio is controlled via a 25 Amp breaker/switch fed from the common 15V Bus. Lastly the VHF radio is controlled via a 10 Amp breaker/switch fed from the common 15V Bus.

The feed from the airplane is from a pilot actuated 25 Amp breaker (C441) or a 30 Amp breaker (E90/200)

Wiring in aircraft is M22759 12 gauge with a capacity of 24 Amps

Component	Calculation	Margin
Aircraft 28V Supply Cable	24 Amp - 16.7/24	30%
15V DC-DC Bus (Only 1 DC/DC operating, two radios transmitting)**	15 Amp - 6.5/15	56%
15V DC-DC Bus (Both Units Operating, three radios transmitting)***	30 Amp - 10.2/30	66%
Seatpack in flight mode, Not transmitting	24 Amp - 9.9/24	58%
Seatpack in flight mode, Two Radios transmitting	24 Amp - 16.7/24	30%

** Current when transmitting. Duty cycle is 10% nominally
*** Three radios transmitting is not a normal configuration