Subject: Communication interface between DCH and Science systems **Date:**4/24/1998

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Reviewed by:

Revision history:

Revision 1.0: Initial Draft

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1. Document Overview

This document describes the Dual Universal Asynchronous Receiver/transmitter (DUART) chip and RS-232 serial port combination as an interface option between the Data and Command Handling computer and the Science Team computer. A brief discussion of the benefits to this approach is also discussed.

2. Requirements

This system will fulfill the need for a means of communication between the two aforementioned systems. DCH needs to collect data from and also send commands to the Science Computer. The DUART is a serial interface by which this can be accomplished

3. Descriptions/Designs/Discussion

Some standard DUART features are:
1) Quad buffered receiver data registers
2) programmable data format
3) programmable baud rate for receiver and transmitter
4) parity, framing and overrun error detection
5) line break detection and generation
6) RTS and CTS hardware flow control

The Quad-buffered receiver data registers can store a 4 bits before sending information. Instead of sending four separate bits, the registers send up to four bits at a time. This cuts down some of the "back and forth" of moving data. The

programmable data formatting allows the number of data, stop and parity bits to be set. This makes for a more versatile form of communication. The programmable baud rate allows for a range of baud rates to be used and allows use with unknown baud rates. The three types of error detection are vital, particularly in satellite applications. Line break detection accounts for the possibility of a stop in communication for a number of reasons: Defective serial port or loss of power to transmitting system. Request to Send/Cleared to Send Hardware flow control is also known as "handshaking". This system avoids data being transmitted, when the one of the systems is not ready. This is also where the RS-232 serial port comes into play. The RS-232 is a cable that allows for RTS/CTS communication.

4. Lists

Purchase needs for interface system:
1) DUART chip(1)
2) RS-232 cables and ports (1 of each)

5. Interface Requirements and Specifications

See Design.

6. Current Status

The current status of this interface is still in the conceptual stage.

7. Test Plan

Compare and contrast other interface options with the DUART/RS-232 combination.

8. Concerns and Open Issues

1) Is this option the most efficient in the way of monetary resources?
2) Is the speed of modem communication going to be fast enough for our needs?
3) What about options like TCP/IP? How expensive is TCP/IP?
4) Will this work with the board designs we have considered?

9. References

[1] *http://www.ece.concordia.ca/~guy/COEN417/gizmorefguide/serial.txt*
[2] *68000 Family Assembly Language; Clements, Alan, International Thomson Publishing, 1994*