TIMED GENERAL INSTRUMENT INTERFACE SPECIFICATION

Section 1.0
General Information

TECHNICAL CONTENT APPROVAL (PAGE 1 OF 1)

D. Y. Kusnierkiewicz TIMED Spacecraft System Engineer	J. Miller SABER Program Manager (LaRC)
K. J. Heffernan TIMED Science Payload System Engineer	B. Roettker SABER Instrument Manager (LaRC)
A. S. El-Dinary TIMED Interface Control Document Technical Editor	S. Brown SABER System Engineer (SDL)
T. Pardoe GUVI Program Manager	M. Anfinson SEE Program Manager (LASP)
B. Ogorzalek GUVI System Engineer	G. Ucker SEE System Engineer
W. Crain GUVI Proram Manager (Aerospace)	C. Edmonson TIDI Program Manager (SPRL)

TIMED GENERAL INSTRUMENT INTERFACE SPECIFICATION

Section 1.0
General Information

REVISION APPROVAL (PAGE 1 OF 5)

TIMED Spacecraft Approval Page

Rev #	Date	D. Kusnierkiewicz	K. Heffernan	A. El-Dinary	
A					
B					
C					
D					
E					
F					
G					
H					
I					
J					

TIMED GENERAL INSTRUMENT INTERFACE SPECIFICATION

Section 1.0
General Information

REVISION APPROVAL (PAGE 2 OF 5)

GUVI Instrument Approval Page

Rev #	Date	T. Pardoe	B. Ogorzalek	W. Crain	
A					
B					
C					
D					
E					
F					
G					
H					
I					
J					

TIMED GENERAL INSTRUMENT INTERFACE SPECIFICATION

Section 1.0
General Information

REVISION APPROVAL (PAGE 3 OF 5)

SABER Instrument Approval Page

Rev #	Date	J. Miller	B. Roettker	S. Brown	
A					
B					
C					
D					
E					
F					
G					
H					
I					
J					

TIMED GENERAL INSTRUMENT INTERFACE SPECIFICATION

Section 1.0
General Information

REVISION APPROVAL (PAGE 4 OF 5)

SEE Instrument Approval Page

Rev #	Date	M. Anfinson	G. Ucker		
A					
B					
C					
D					
E					
F					
G					
H					
I					
J					

TIMED GENERAL INSTRUMENT INTERFACE SPECIFICATION

Section 1.0
General Information

REVISION APPROVAL (PAGE 5 OF 5)

TIDI Instrument Approval Page

Rev #	Date	C. Edmonson			
A					
B					
C					
D					
E					
F					
G					
H					
I					
J					

1. GENERAL

The intent of this specification is to completely define and control all of the interfaces between the payload instruments and the TIMED spacecraft. This document specifies and defines the mechanical, electrical and thermal interfaces in such a way that the experimenters can design their experiments within the constraints and limitations imposed by the TIMED spacecraft and its subsystems.

1.1 PURPOSE OF DOCUMENT

The purpose of this document is to define the interface of the payload instruments with the TIMED spacecraft. The requirements set forth in this document shall be met except where precluded by engineering limitations or scientific requirements. Such exceptions shall be negotiated and, when approved, documented in the appropriate Specific Instrument Interface Document (SIIS).

1.2 MISSION DESCRIPTION

The Thermosphere, Ionosphere, and Mesosphere Energetics and Dynamics (TIMED) mission consists of a single spacecraft with four instruments flown in a 625 km circular, 74.1° inclination orbit. The scientific objectives of the mission are to determine the temperature, density, and wind structure (state parameters) in the Mesosphere, Lower Thermosphere and Ionosphere (MLTI) region (60-180 km), including seasonal and latitudinal variations; and to determine the relative importance of the various radiative, chemical, electrodynamic, and dynamic sources (input) and sinks (output) of energy for the thermal structure of the MLTI. The instruments include Sounding of the Atmosphere using Broadband Emission Radiometry (SABER), TIMED Doppler Interferometer (TIDI), Solar EUV Experiment (SEE), and the Global Ultraviolet Imager (GUVI).

1.3 TIMED SYSTEM BLOCK DIAGRAM

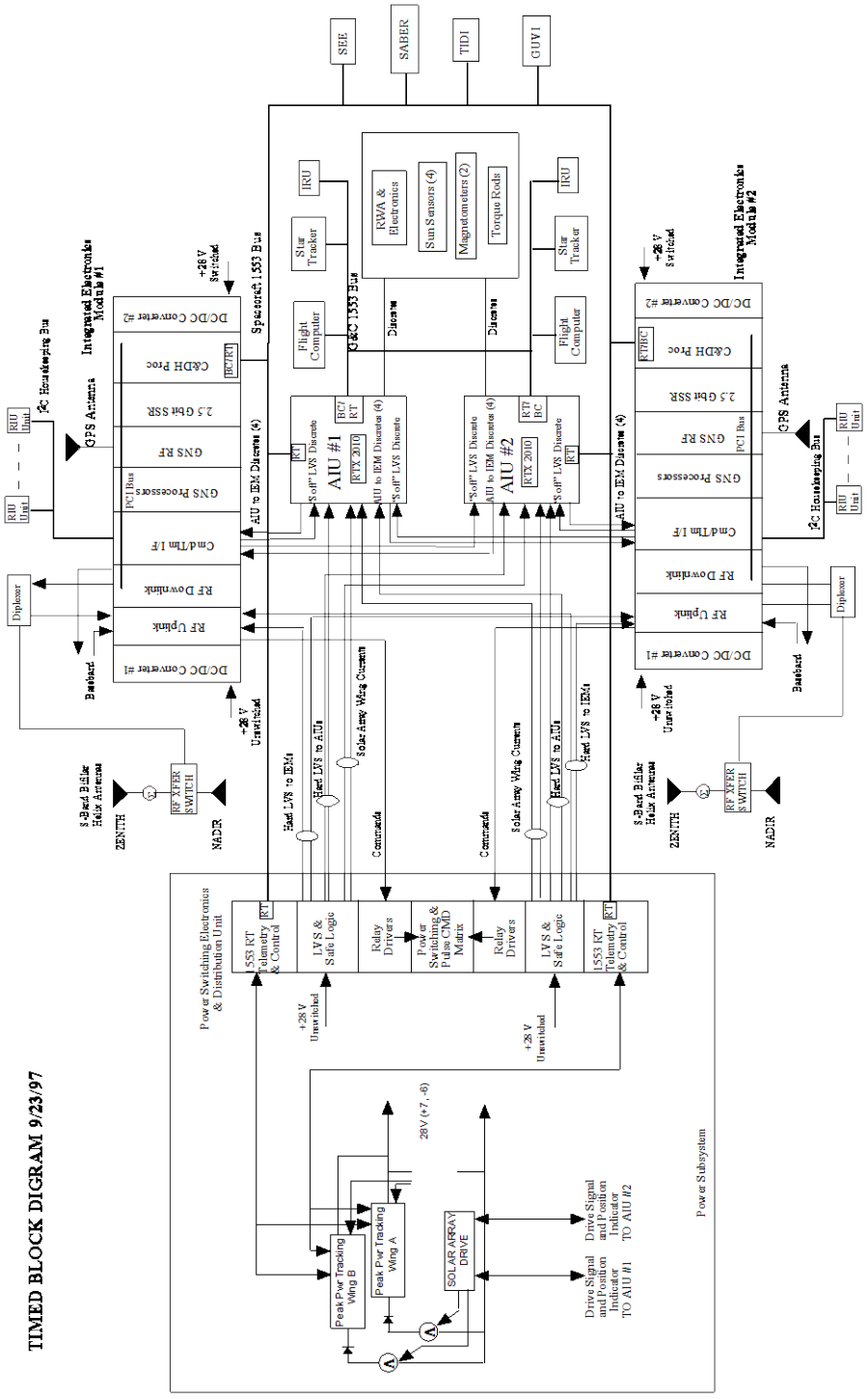
The TIMED System Block diagram is given in Figure 1.3-1.

1.4 END-TO-END DATA SYSTEM

The TIMED End-to-End Data System is given in Figure 1.4-1.

FSCM NO.	SIZE	DWG. NO.
88898	A	7363-9050
		10/15/97
SCALE	DO NOT SCALE PRINT	SHEET 1-8

Figure 1.3-1 TIMED System Block Diagram



TIMED BLOCK DIGRAM 9/23/97

FSCM NO.	SIZE	DWG. NO.
88898	A	7363-9050
		10/15/97
SCALE	DO NOT SCALE PRINT	SHEET 1-9

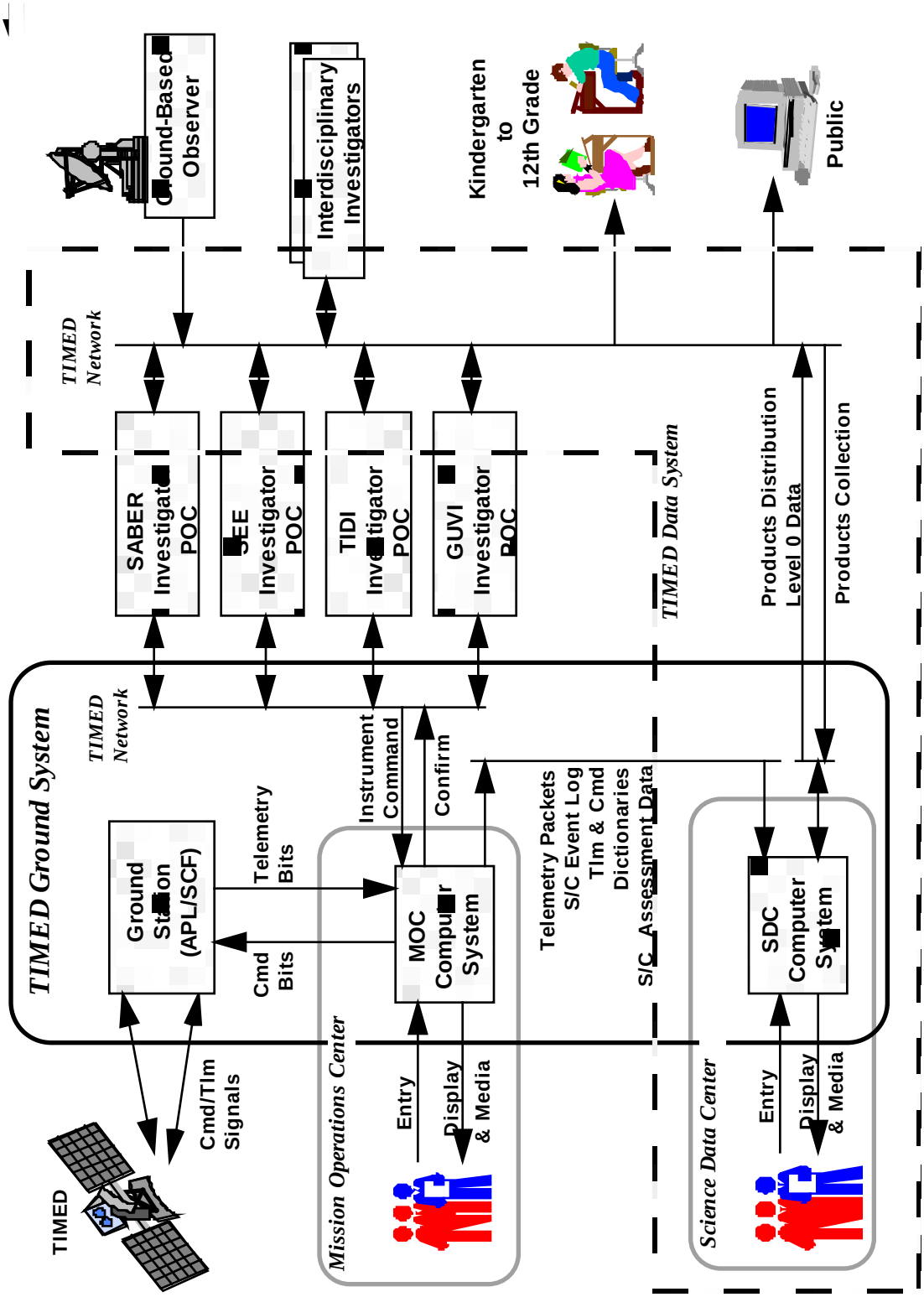


Figure 1.4-1. TIMED End-To-End Data System

FSCM NO.	SIZE	DWG. NO.
88898	A	7363-9050
		10/15/97
SCALE	DO NOT SCALE PRINT	SHEET

1.5 APPLICABLE DOCUMENTATION

Document	Document Title
CCSDS 102.0-B-4	Recommendation for Space Data System Standards for Packet Telemetry
MIL-STD-1553B	Aircraft Internal Time Division Command/Response Multiplex Data Bus
CCSDS 301.0-B-2	Recommendation for Space Data System Standards for Time Code Formats (see section 3.1.2)
7363-9010	TIMED Component Environmental Specification
7363-9020	TIMED Spacecraft Integration Test Plan
7363-9022	TIMED Spacecraft Harness Design Specification
7363-9031	TIMED Contamination Control Plan
7363-9038	TIMED EMC Control Plan and EMI Performance Requirements Specificaiton
7363-9100	TIMED Performance Assurance Implementation Plan

1.6 DOCUMENT CONFIGURATION

1.6.1 Update and Change Control

The data contained in this document represent the current definition of the TIMED spacecraft interface characteristics and limitations. After formal release, this document shall be revised only through the formal change control procedures.

1.7 DELIVERABLES

Each instrument provider shall deliver items for, or in support of, spacecraft integration. Ground support equipment (GSE), consisting of hardware, software and procedures,

shall be shipped simultaneously with or prior to the delivery of flight hardware. Safety rules, handling constraints and procedures, analytical models, analyses, drawings, test plans and procedures, test results, etc., shall be required prior to instrument delivery or as specified in the SIIS. Deliverables for each instrument and their respective deadlines are listed in the appropriate SIIS.

At a minimum, each Instrument Design Team (IDT) shall provide the items listed in Table 1.7-1 for integration and test.

TABLE 1.7-1

INSTRUMENT DELIVERABLES FOR INTEGRATION AND TEST

1. Flight instrument with flight software;
2. Sealed instrument case (as required);
3. Shipping container (as required);
4. Red-tag items;
5. Green-tag items;
6. Handling fixtures;
7. Electrical GSE;
8. Mechanical, electrical and thermal interface control drawings;
9. Written procedures, which shall address:
   a. instrument transport, handling, and storage procedure;
   b. special mounting concerns;
   c. bench test procedure;
   d. operations manual;
   e. pre-launch close-out procedure;
   f. spacecraft integration, functional, performance and alignment procedures.
10. Acceptance test data, consisting of:
    a. Electrical test data;
    b. Environmental test data.