

8.2.10 MASTER TIMING UNIT (MTU) AND PAYLOAD TIMING BUFFER (PTB) INTERFACES

Small Payloads are allocated the use of the Orbiter Timing Buffer (OTB) or Payload Timing Buffer (PTB). Hereafter, the OTB only shall be described since the PTB characteristics are equivalent to the OTB. Figure 8.2.10-1 shows the OTB interface data flow.

The orbiter timing buffer shall accept single MET input signals from the MTU and provide one isolated MET output timing signal.

8.2.10.1 Time Accumulator Interface

8.2.10.1.1 (Reserved)

8.2.10.1.2 Mission Elapsed Time (MET)

The Mission Elapsed Time shall be reset to zero by the Orbiter at T-0 and shall be synchronized and updated from the ground. MET time error growth rate shall not exceed ± 10 milliseconds per 24 hours.

8.2.10.1.3 GMT/MET Electrical Characteristics

The MET output formats shall be a modified IRIG-B as shown in Figure 8.2.10.1.3-1. MET electrical characteristics shall be as shown in Table 8.2.10.1.3-1.

8.2.10.2 (Reserved)

8.2.10.3 Phase Relationship

No fixed phase relationship shall exist between the one second transitions occurring on the MET outputs.

8.2.10.4 Short-Circuit Protection

The OTB interface output drivers shall withstand indefinite line-to-line or line-to-ground short circuits.

8.2.10.5 Grounding and Shielding

8.2.10.5.1 GMT and MET

Grounding and shielding for MET signals shall be as shown in Figure 8.2.10.5.1-1.

8.2.10.5.2 (Reserved)

8.2.11 (Reserved)

8.2.12 (Reserved)

8.2.13 (DELETED)

8.2.14 (DELETED)

8.3 (Reserved)

TABLE 8.2.10.1.3-1 MTU GREENWICH MEAN TIME/MISSION ELAPSED,
ORBITER-TO-PAYLOAD, ELECTRICAL INTERFACE CHARACTERISTICS

Parameter	Dimension	Characteristics Orbiter/ Payload Interface	Notes
Time Code Format		Modified IRIG-B	See Figure 8.2.10.1.3-1
Type		Digital (Pulse Duration)	
Element Rate	Pulse/Sec	100	See Figure 8.2.10.1.3-1
Time Frame	Sec	1	
Time Accuracy	msec	±10 Max Error Per Day	
Signal Level	V pk-pk	3.4 to 6	(1)
Rise/Fall Time	Micro- Sec	< 50	Measured from 10 to 90 percent Point(1)
Skew	Nano-Sec	<20 at 50 percent Point	
Signal/Noise Ratio		NA	
Max Output Voltage	Volt	10	Under any Failure Condition
Impedance - Source (Orbiter)	OHM	≤ 100	
Impedance - Load (Payload)	OHM	70 to 80	
Impedance - Line	OHM	70 to 80	Per MP572-0328-0002
Capacitance Line	pF	2714	(1)

(1) Based on 118-ft cable length, from PTB to interface at the end of 30 ft SPAT extender cable.

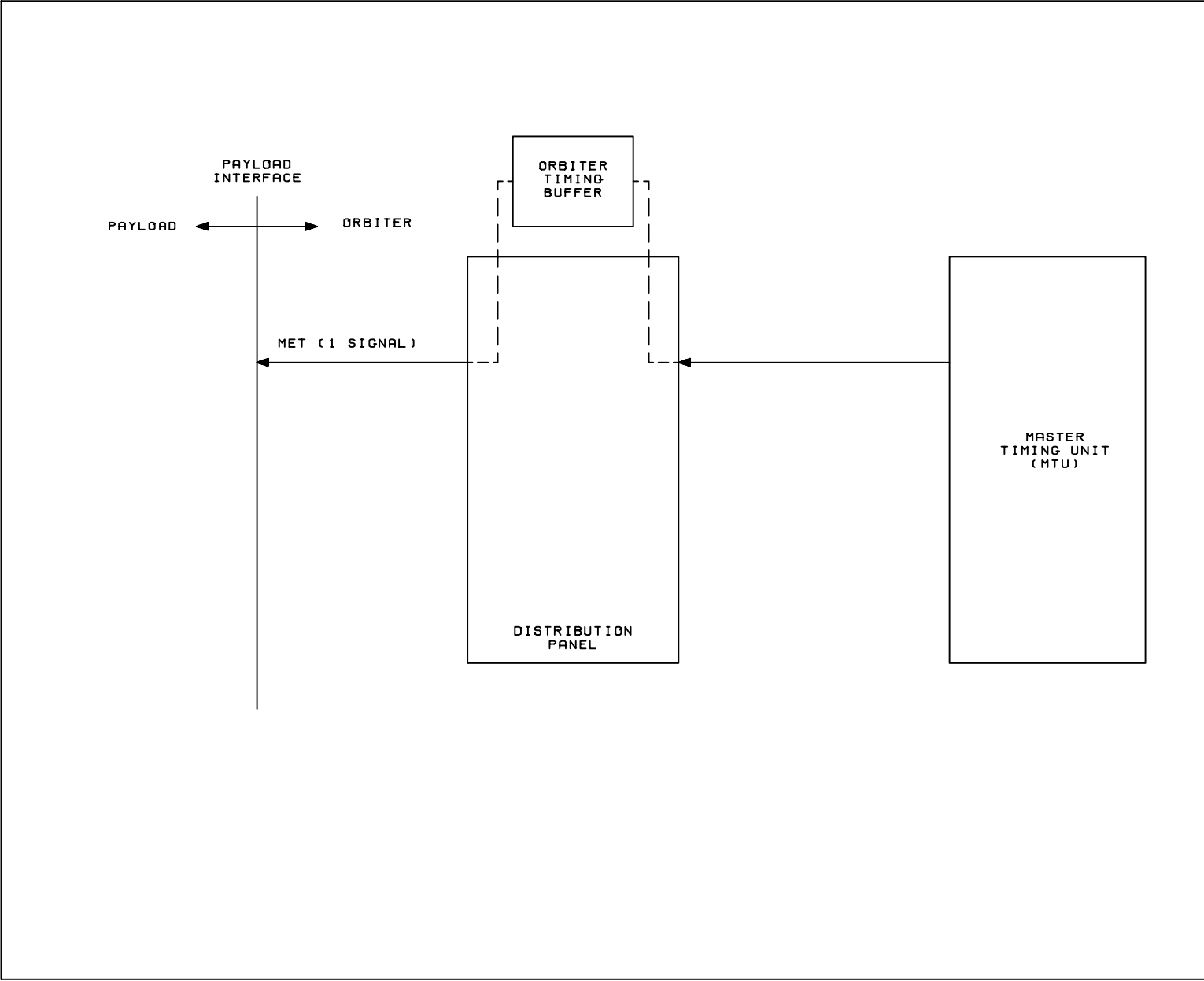
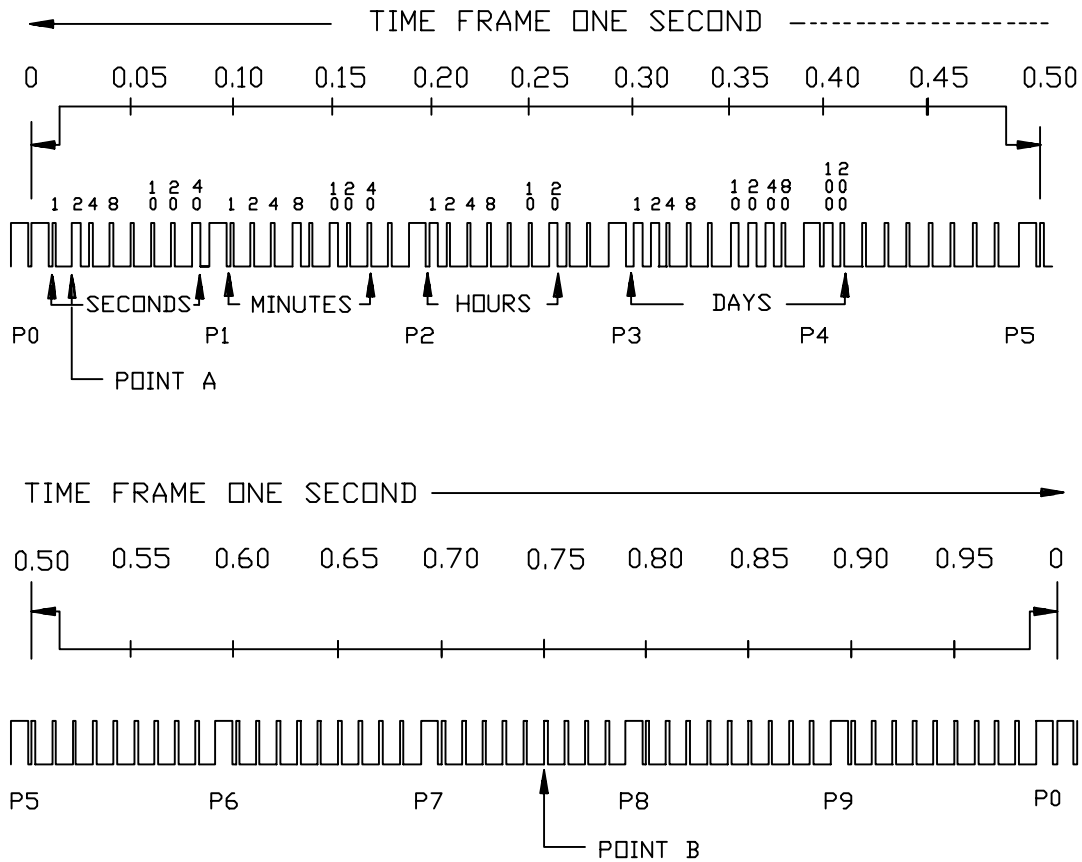


FIGURE 8.2.10-1 TYPICAL MASTER TIMING UNIT AND ORBITER TIMING BUFFER INTERFACE DATA FLOW

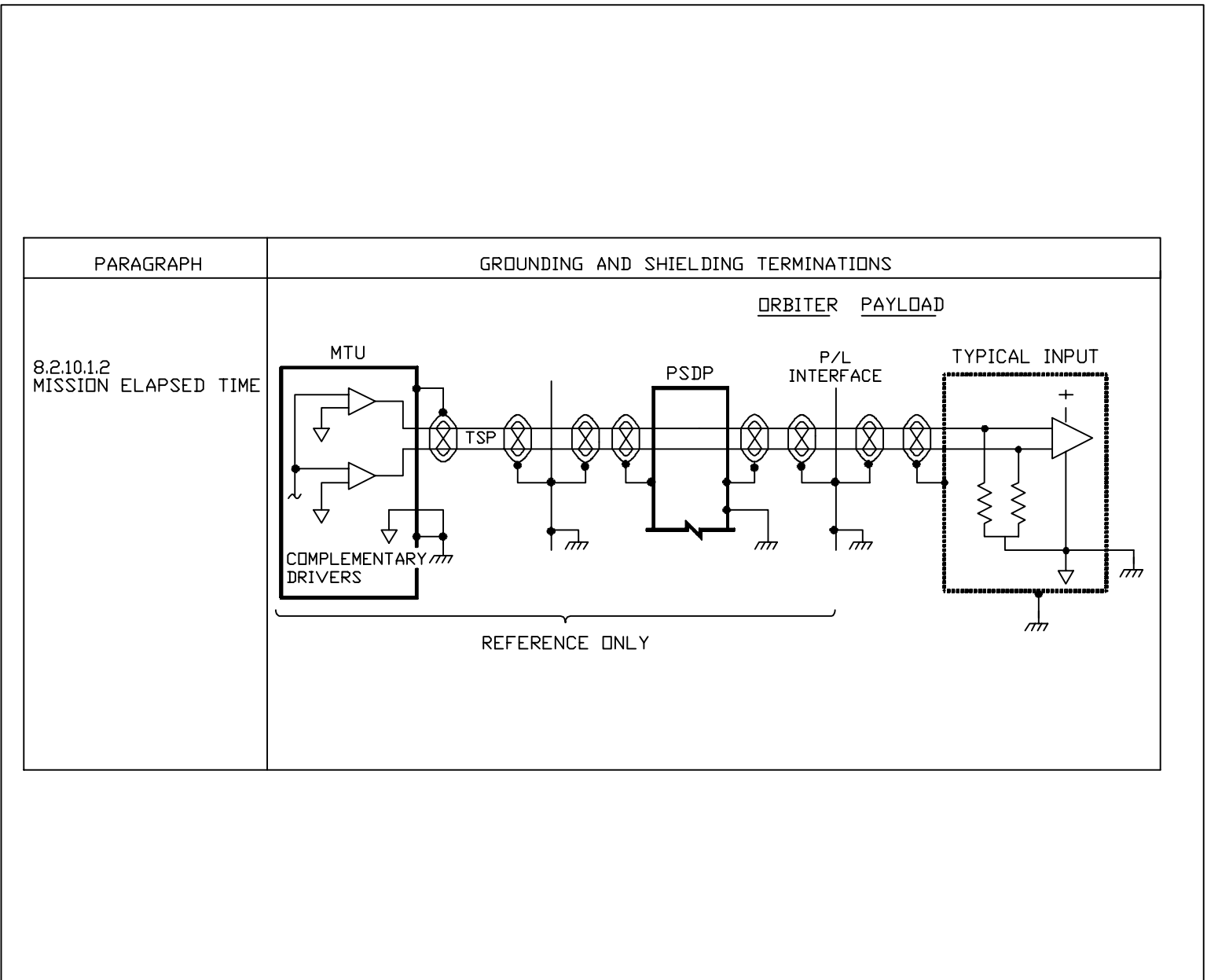


FRAME TIME - 1 SECOND
 100 PPS (10 MS BETWEEN PULSES)
 BCD
 "ON TIME" REF - LEADING EDGE
 POSITION IDENTIFIER = 8 MILLISEC DURATION ± 50 MICROSECONDS
 BINARY 0 = 2 MILLISEC DURATION ± 50 MICROSECONDS
 BINARY 1 = 5 MILLISEC DURATION ± 50 MICROSECONDS
 TIME AT POINT A = 173 DAYS, 21 HOURS, 18 MINUTES, 42.02 SECONDS
 TIME AT POINT B = 173 DAYS, 21 HOURS, 18 MINUTES, 42.75 SECONDS

NOTE: THE IRIG-B FORMAT IS MODIFIED SUCH THAT THE 1 KHZ MODULATED CARRIER AND THE "STRAIGHT BINARY SECONDS" ARE ELIMINATED. THE TIME SIGNAL IS TRANSMITTED SERIALY AT 100 PULSES PER SECOND WITH A RESOLUTION OF 10 MILLISECONDS AND WITH THE LEAST SIGNIFICANT BIT BEING TRANSMITTED FIRST.

FIGURE 8.2.10.1.3-1 MASTER TIMING UNIT GMT AND MET OUTPUT FORMATS

FIGURE 8.2.10.5.1-1 MFU: GMT AND MET GROUNDING AND SHIELDING INTERFACE



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