

APPENDIX J

Telemetry Attributes Transfer Standard Format Example

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Acronyms

FM	frequency modulation
LSB	least significant bit
MSB	most significant bit
PCM	pulse code modulation
RF	radio frequency
TMATS	Telemetry Attributes Transfer Standard
XML	extensible markup language

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APPENDIX J

Telemetry Attributes Transfer Standard Format Example

1.0 Introduction

The following example is for illustrative purposes and is by no means a complete attributes file; it is representative of the types of information likely to be transferred. Many attributes are purposely omitted to simplify the example. In some of the groups, only those entries necessary to link to other groups are provided. Attributes that link the various groups together are indicated in **boldface**.

2.0 Overview of Example

Selected attributes are described in text form as an aid to following the example. All text that describes the example is *printed in italics*. All text that is part of the example file is printed in plain text.

The example file being transferred consists of the attributes of a single radio frequency (RF) data source and a stored data source containing two channels of data. The RF data source is a pulse code modulation (PCM) signal, which contains an embedded asynchronous wave train. The two recorded channels of data are PCM signals: one is an aircraft telemetry stream, and the other is a radar data telemetry stream. [Figure J-1](#) shows the example file in terms of the attribute groups and their interrelationships. Refer to the attribute tables while reviewing the example.

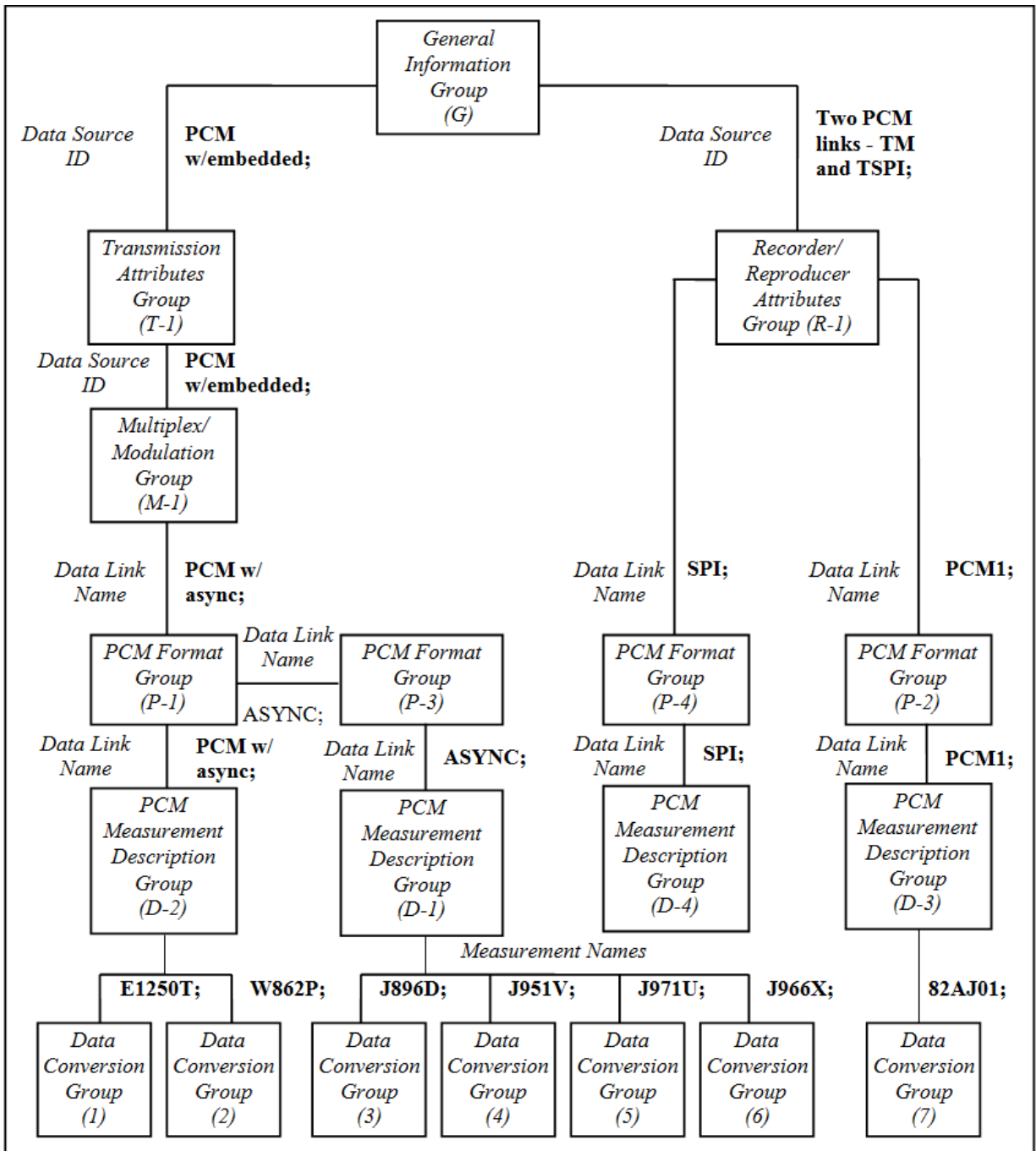


Figure J-1. Group Linkages

General Information Group (G)

Program name, test name, origination date, revision number: 0, test number: 13.

G\PN: TMATS example; G\TA: Wright Flyer; G\OD: 07-12-1903; G\RN:0; G\TN:13;
 G\POC1-1: Wilbur; G\POC2-1: Bikes,LTD; G\POC3-1: Dayton; G\POC4-1: 555-1212;

Live data source.

G\DSI-1:PCM w/embedded; G\DST-1:RF;

Data storage source.

G\DSI-2:Two PCM links - TM & TSPI; G\DST-2:STO;
G\COM: I hope this flies.; G\POC1-2: Orville;
G\POC2-2:Bikes,LTD; G\POC3-2: Dayton; G\POC4-2: 555-1212;

Transmission Attributes Group (T-1)

Frequency: 1489.5, RF bandwidth: 100, data bandwidth: 100; not encrypted, modulation type: frequency modulation (FM), total carrier modulation: 500, no subcarriers, transmit polarization: linear.

T-1\ID:PCM w/embedded; T-1\RF1:1489.5; T-1\RF2:100; T-1\RF3:100;
T-1\RF4:FM; T-1\RF5:500; T-1\SCO\N:NO; T-1\AN2:LIN;
T-1\AP\POC1: Pat Tern; T-1\AP\POC2:Transmissions,Inc.;
T-1\AP\POC3:Amityville,NY; T-1\AP\POC4:800-555-1212;

Recorder-Reproducer Attributes Group (R-1)

R-1\ID:Two PCM links - TM & TSPI;
R-1\R1:Recorded Data; R-1\TC1:MD;

Two channels of data, manufacturer: ZZ; model: 13, original: yes.

R-1\RI1:ZZ; R-1\RI2:13;R-1\N:2; R-1\RI3:Y;
R-1\RI4:07-12-2011-07-55-59; R-1\POC1:Mr. Tenn; R-1\POC2:Data Creations;
R-1\POC3:Anywhere,Ttown; R-1\POC4:555-1212;

Channel ID 2 contains aircraft telemetry PCM (w/subframe fragmented)

R-1\TK1-1:2;
R-1\DSI-1:PCM w/subframe fragmented;
R-1\CDT-1:PCMIN; **R-1\CDLN-1:PCM1;**

Channel ID 4 contains Space Position Information via PCM link

R-1\TK1-2:4; R-1\DSI-2:Space Position Information;
R-1\CDT-2:PCMIN; **R-1\CDLN-2:SPI;**

Multiplex/Modulation Group (M-1)

Baseband type: PCM, modulation sense: POS, baseband data: PCM, low pass filter type: constant amplitude

M-1\ID:PCM w/embedded; M-1\BB1:PCM; M-1\BB2:POS; M-1\BSG1:PCM;
M-1\BSF2:CA;
M-1\BB\DLN:PCM w/async;

PCM Format Attributes Groups (P)

P-1 is a live PCM signal and contains the asynchronous wave train (see [Table J-1](#)).

P-2 is a recorded signal (see [Table J-2](#)).

P-3 is the asynchronous wave train (see [Table J-3](#)).

P-4 is a recorded signal.

Table J-1. PCM Format for PCM w/ASYNC

	Sync	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	...	39	40	41	42	
1	20 bits	ID C o u n t e r					Embedded Format (Words 6-10)				8	12						a				
2																			a			
3																			a			
4																			a			
5																			a			
6																			a			
7																			a			
8																			a			
•																		•				
•																		•				
•																		•				
16																		a				

Major frame characteristics:
 One major frame = 16 minor frames
 Word lengths = 10 bits (default value) except Word 10 has 8 bits and Word 11 has 12 bits

a = measurement E1250T in word position 39
 b = measurement W862P in word position 42, frame position 8.

PCM Format Group = P-1
 PCM Measurement Description Group = D-2
 Data Link Name = PCM w/async

Table J-2. PCM Format for PCM1

	Sync	1	2	3	...	12	13	14	...	113	114	...	120	121	122	...	276		
1							ID C o u n t e r												
2	30 bits																		
3																			
4																			
5									M					L					
...																			
...																			
32														6 Bits	4 Bits				
...																			
...																			
37									M					L					
...																			
...																			
64																			

Major frame characteristics:
 One major frame = 64 minor frames
 ID counter counts 0 - 63
 Word lengths = 10 (default value) except Word 121 has 6 bits and Word 122 has 4 bits

Measurement 82AJ01 is 16 bits, which is fragmented with the 10 most significant bits (MSB) indicated as M and the 6 least significant bits (LSB) as L.
 Measurement 82AJ01 occurs twice in the major frame.
 The first location is in word positions 113 and 121, frame position 5.
 The second location is in word positions 113 and 121, frame position 37.

PCM Format Group = P-2
 PCM Measurement Description Group = D-3
 Data Link Name = PCM1

Table J-3. PCM Format for ASYNC

		Sync	1	2	3	...	11	...	14	...	20	...	29	...	33	...	39	...	45	46	47	48	49
16 B i t s	ID C o u n t e r	a	b	...	a	...	c	...	a	...	a	...	a	...	a	...	...	...	...			a	
		a		...	a	...		...	a	...	a	...	a	...	a	...	c	...				a	
		a		...	a	...		...	a	...	a	...	a	...	a	...		...	d			a	

Major frame characteristics:

One major frame = 3 minor frames

Word lengths = 16 bits (default value)

a = measurement J971U, supercommutated in word positions 2, 11, 20, 29, 33, and 47

b = measurement J951V in word position 3, frame position 1

c = measurement J896D in two locations: word position 14, frame position 1 and word position 39, frame position 2

d = measurement J966X in word position 45, frame position 3

PCM Format Group = P-3

PCM Measurement Description Group = D-1

Data Link Name = ASYNC

(Start of P-1)

Live PCM signal (host wave train): Class I

**P-1\DLN:PCM w/async; P-1\D1:NRZ-L; P-1\D2:44000; P-1\D3:U;
P-1\D4:N; P-1\D6:N; P-1\D7:N; P-1\TF:ONE;**

10 bits default word length, 16 minor frames/major frame, 43 words/frame

P-1\F1:10; P-1\F2:M; P-1\F3:NO; P-1\MF\N:16; P-1\MF1:43;
P-1\MF2:440; P-1\MF3:FPT; P-1\MF4:20;
P-1\MF5: 01111010011010110001; P-1\SYNC1:1; P-1\SYNC2:0;
P-1\SYNC3:1;P-1\SYNC4:0;

Word position #10, 8 bits, Word position #11, 12 bits

P-1\MFW1-1:10; P-1\MFW2-1:8; P-1\MFW1-2:11; P-1\MFW2-2:12;

One subframe ID counter in word position 1

P-1\ISF\N:1; P-1\ISF1-1:1; P-1\ISF2-1:ID; P-1\IDC1-1:1;

MSB starting bit location: 7, ID counter length: 4

P-1\IDC3-1:7; P-1\IDC4-1:4; P-1\IDC5-1:M;
P-1\IDC6-1:0; P-1\IDC7-1:1; P-1\IDC8-1:15; P-1\IDC9-1:16;
P-1\IDC10-1:INC;

Asynchronous embedded wave train information

Data Link Name (to be referenced in the format definition of the asynchronous wave train) is ASYNC.

Five contiguous minor frame word positions starting at location 6.

P-1\AEF\N:1; **P-1\AEF\DLN-1:ASYNC**; P-1\AEF1-1:5; P-1\AEF2-1:CW;
P-1\AEF3-1-1:6;

(End of P-1)

(Start of P-2)

Recorded PCM signal format attributes.

Data Link Name is PCM1, Data Format is NRZ-L, Bit rate is 2 Mbit/sec, Unencrypted, Normal polarity, class I, Common word length is 10, MSB first, No parity, 64 minor frames per major frame, 277 words per minor frame, Sync pattern length is 30. Word position 121 is 6 bits. Word position 122 is 4 bits.

P-2\DLN:PCM1; P-2\D1:NRZ-L; P-2\D2:2000000; P-2\D3:U; P-2\D4:N;
P-2\TF:ONE; P-2\F1:10; P-2\F2:M; P-2\F3:NO; P-2\MF\N:64;
P-2\MF1:277; P-2\MF4:30; P-2\MF5:101110000001100111110101101011; P-2\SYNC1:1;
P-2\MFW1-1:121; P-2\MFW2-1:6; P-2\MFW1-2:122; P-2\MFW2-2:4;

One subframe ID counter named 1. Sync type is ID counter. ID counter location is 13. ID counter MSB location is 5. ID counter length is 6. ID counter transfer order is MSB first. ID counter initial value is 0. ID counter initial frame is 1. ID counter end value is 63. ID counter end frame is 64. ID counter is increasing.

P-2\ISF\N:1; P-2\ISF1-1:1; P-2\ISF2-1:ID; P-2\IDC1-1:13;
P-2\IDC3-1:5; P-2\IDC4-1:6; P-2\IDC5-1:M;
P-2\IDC6-1:0; P-2\IDC7-1:1; P-2\IDC8-1:63; P-2\IDC9-1:64;
P-2\IDC10-1:INC;

(End of P-2)

(Start of P-3)

Asynchronous wave train PCM format attributes.

Data Link Name: ASYNC

Class I, Common word length: 16, LSB transfer order, no parity, 3 minor frames per major frame, 50 words/minor frame, 800 bits per minor frame, fixed pattern synchronization, 16 bit sync pattern.

P-3\DLN:ASYNC; P-3\TF:ONE; P-3\F1:16; P-3\F2:L; P-3\F3:NO;
P-3\MF\N:3; P-3\MF1:50; P-3\MF2:800; P-3\MF3:FPT; P-3\MF4:16;
P-3\MF5: 1111100110110001; P-3\SYNC1:1;

ID counter in word position 1.

P-3\ISF\N:1; P-3\ISF1-1:2; P-3\ISF2-1:ID; P-3\IDC1-1:1;
P-3\IDC3-1:15; P-3\IDC4-1:2; P-3\IDC5-1:L;
P-3\IDC6-1:0; P-3\IDC7-1:1; P-3\IDC8-1:2; P-3\IDC9-1:3;
P-3\IDC10-1:INC;

(End of P-3)

(Start of P-4)

P-4\DLN:SPI;

(End of P-4)

PCM Measurement Description (D)

D-1 contains the measurements that make up the asynchronous wave train,

D-2 contains the measurements that make up the live PCM signal (that hosts the asynchronous wave train),

D-3 contains the measurements that make up one of the recorded PCM signals, and

D-4 contains the measurements that make up the other recorded PCM signal.

(Start of D-1)

Asynchronous Wave Train: One measurement list, 4 measurements

D-1\DLN:ASYNC; D-1\ML\N:1; D-1\MLN-1:JUST ONE; D-1\MN\N-1:4;

Measurement Name: J896D, LSB first,

2 locations: word 14, frame 1 and word 39, frame 2.

D-1\MN-1-1:J896D; D-1\MN3-1-1:L; D-1\LT-1-1: WDFR;
D-1\MML\N-1-1:2; D-1\MNF\N-1-1-1:1; D-1\WP-1-1-1-1:14; D-1\WI-1-1-1-1:0;
D-1\FP-1-1-1-1:1; D-1\FI-1-1-1-1:0; D-1\WFM-1-1-1-1:FW; D-1\MNF\N-1-1-2:1;
D-1\WP-1-1-2-1:39; D-1\WI-1-1-2-1:0; D-1\FP-1-1-2-1:2; D-1\FI-1-1-2-1:0;
D-1\WFM-1-1-2-1:FW;

Measurement Name: J951V, LSB first, default parity, word 3, frame 1.

D-1\MN-1-2:J951V; D-1\MN1-1-2:DE; D-1\MN2-1-2:D; D-1\MN3-1-2:L;
D-1\LT-1-2: WDFR; D-1\MML\N-1-2:1; D-1\MNF\N-1-2-1:1; D-1\WP-1-2-1-1:3;
D-1\WI-1-2-1-1:0; D-1\FP-1-2-1-1:1; D-1\FI-1-2-1-1:0;
D-1\WFM-1-2-1-1:1111111100000000;

Measurement Name: J971U, LSB first,

supercommutated at 6 word positions: 2, 11, 20, 29, 33, and 47.

D-1\MN-1-3:J971U; D-1\MN1-1-3:DE; D-1\MN2-1-3:D; D-1\MN3-1-3:L;
D-1\LT-1-3: WDFR; D-1\MML\N-1-3:6;
D-1\MNF\N-1-3-1:1: D-1\WP-1-3-1-1:2; D-1\WI-1-3-1-1:0; D-1\FP-1-3-1-1:1;
D-1\FI-1-3-1-1:1; D-1\WFM-1-3-1-1:FW;
D-1\MNF\N-1-3-2:1: D-1\WP-1-3-2-1:11; D-1\WI-1-3-2-1:0; D-1\FP-1-3-2-1:1;
D-1\FI-1-3-2-1:1; D-1\WFM-1-3-2-1:FW;
D-1\MNF\N-1-3-3:1: D-1\WP-1-3-3-1:20; D-1\WI-1-3-3-1:0; D-1\FP-1-3-3-1:1;
D-1\FI-1-3-3-1:1; D-1\WFM-1-3-3-1:FW;
D-1\MNF\N-1-3-4:1: D-1\WP-1-3-4-1:29; D-1\WI-1-3-4-1:0; D-1\FP-1-3-4-1:1;
D-1\FI-1-3-4-1:1; D-1\WFM-1-3-4-1:FW;
D-1\MNF\N-1-3-5:1: D-1\WP-1-3-5-1:33; D-1\WI-1-3-5-1:0; D-1\FP-1-3-5-1:1;
D-1\FI-1-3-5-1:1; D-1\WFM-1-3-5-1:FW;
D-1\MNF\N-1-3-6:1: D-1\WP-1-3-6-1:47; D-1\WI-1-3-6-1:0; D-1\FP-1-3-6-1:1;
D-1\FI-1-3-6-1:1; D-1\WFM-1-3-6-1:FW;

Measurement Name: J966X, LSB first, word 45, frame 3.

D-1\MN-1-4:J966X; D-1\MN1-1-4:DE; D-1\MN2-1-4:D;
D-1\MN3-1-4:L; D-1\LT-1-4:WDFR; D-1\MML\N-1-4:1: D-1\MNF\N-1-4-1:1:
D-1\WP-1-4-1-1:45; D-1\WI-1-4-1-1:0; D-1\FP-1-4-1-1:3; D-1\FI-1-4-1-1:0;
D-1\WFM-1-4-1-1:FW;

(End of D-1)

(Start of D-2)

Live PCM signal: single measurement list, 2 measurements.

D-2\DLN:PCM w/async; D-2\ML\N:1; D-2\MLN-1:JUST ONE; D-2\MN\N-1:2;

Measurement name: E1250T, unclassified, unsigned, MSB first, word 39.

D-2\MN-1-1:E1250T; D-2\MN1-1-1:DE; D-2\MN2-1-1:D;
D-2\MN3-1-1:M; D-2\LT-1-1:WDFR;
D-2\MML\N-1-1:1: D-2\MNF\N-1-1-1:1: D-2\WP-1-1-1-1:39; D-2\WI-1-1-1-1:0;
D-2\FP-1-1-1-1:1; D-2\FI-1-1-1-1:1; D-2\WFM-1-1-1-1:FW;

Measurement name: W862P, unclassified, MSB first, word 42, frame 8, full word.

D-2\MN-1-2:W862P; D-2\MN1-1-2:DE; D-2\MN2-1-2:D; D-2\MN3-1-2:M;
D-2\LT-1-2: WDFR; D-2\MML\N-1-2:1: D-2\MNF\N-1-2-1:1: D-2\WP-1-2-1-1:42;
D-2\WI-1-2-1-1:0; D-2\FP-1-2-1-1:8; D-2\FI-1-2-1-1:0; D-2\WFM-1-2-1-1:FW;

(End of D-2)

(Start of D-3)

Recorded PCM signal: single measurement list: 1 measurement.

D-3\DLN:PCM1; D-3\MLN-1:ONLY ONE; D-3\MN\N-1:1;

Measurement name: 82AJ01, fragmented, in 2 locations: words 113 and 121, frame 5 and words 113 and 121, frame 37. Word 113 contains the most significant fragment and word 121 contains the least significant fragment.

D-3\MN-1-1:82AJ01; D-3\LT-1-1: WDFR; D-3\MML\N-1-1:1; D-3\MNF\N-1-1-1:2;
D-3\WP-1-1-1-1:113; D-3\WI-1-1-1-1:0; D-3\FP-1-1-1-1:5; D-3\FI-1-1-1-1:32;
D-3\WFM-1-1-1-1:FW;
D-3\WP-1-1-1-2:121; D-3\WI-1-1-1-2:0; D-3\FP-1-1-1-2:5; D-3\FI-1-1-1-2:32;
D-3\WFM-1-1-1-2:FW;

(End of D-3)

(Start of D-4)

Recorded PCM signal

D-4\DLN:SPI;

(End of D-4)

Data Conversion Groups (C)

C-1 and C-2 are measurements that are part of the live PCM signal (see also D-2).

C-3, C-4, C-5, and C-6 are from the asynchronous wave train (see also D-1).

C-7 is from the recorded PCM signal (see also D-3).

Measurement: E1250T, description: Inlet Temp Bellmouth, units: Deg C, binary format: unsigned; high value: 128, low value: -0.4, conversion type: pair sets, number of pair sets: 2, application (polynomial): Yes; order of fit: 1, telemetry value #1: 0, engineering unit value #1: -0.4, telemetry value #2: 1023, engineering unit value #2: 128.

C-1\DCN:E1250T; C-1\MN1:Inlet Temp Bellmouth; C-1\MN3:DEGC;
C-1\BFM:UNS; C-1\MOT1:128; C-1\MOT2:-0.4; C-1\DCT:PRS;
C-1\PS\N:2; C-1\PS1:Y; C-1\PS2:1; C-1\PS3-1:0; C-1\PS4-1:-0.4;
C-1\PS3-2:1023; C-1\PS4-2:128;

Measurement: W862P, description: Fuel Pump Inlet, binary format: unsigned; conversion type: pair sets, number of pair sets: 2, application (polynomial): Yes; order of fit: 1, telemetry value #1: 0, engineering unit value #1: -0.1 telemetry value #2: 1023, engineering unit value #2: 76.7

C-2\DCN:W862P; C-2\MN1:Fuel Pump Inlet; C-2\BFM:UNS;
C-2\DCT:PRS; C-2\PS\N:2; C-2\PS1:Y; C-2\PS2:1; C-2\PS3-1:0;
C-2\PS4-1:-0.1; C-2\PS3-2:1023; C-2\PS4-2:76.7;

Measurement: J896D, description: Altitude, units: Feet, binary format: two's complement; high value: 32768, low value: -32768, conversion type: pair sets; number of pair sets: 2, application (polynomial): Yes, order of fit: 1, telemetry value #1: -32768, engineering unit value #1: -32768, telemetry value #2: 32767, engineering unit value #2: 32767

C-3\DCN:J896D; C-3\MN1: Altitude; C-3\MN3:FEET;
C-3\BFM:TWO; C-3\MOT1:32768; C-3\MOT2:-32768; C-3\DCT:PRS;
C-3\PS\N:2; C-3\PS1:Y; C-3\PS2:1; C-3\PS3-1:-32768;
C-3\PS4-1:-32768; C-3\PS3-2:32767; C-3\PS4-2:32767;

Measurement: J951V, description: Throttle Command, units: VDC, high value: 10.164, low value: -10.164, conversion type: pair sets, number of pair sets: 2, application (polynomial): Yes, order of fit: 1, telemetry value #1: -128, engineering unit value #1: -10.164, telemetry value #2: 127, engineering unit value #2: 10.164, binary format: two's complement

C-4\DCN:J951V; C-4\MN1:Throttle Command; C-4\MN3:VDC;
C-4\MOT1:10.164; C-4\MOT2:-10.164; C-4\DCT:PRS; C-4\PS\N:2;
C-4\PS1:Y; C-4\PS2:1; C-4\PS3-1:-128; C-4\PS4-1:-10.164;
C-4\PS3-2:127; C-4\PS4-2:10.164; C-4\BFM:TWO;

Measurement: J971U; description: DISC, conversion type: discrete, binary format: unsigned.

C-5\DCN:J971U; C-5\MN1:DISC; C-5\DCT:DIS; C-5\BFM:UNS;

Measurement: J966X; description: Discrete, conversion type: discrete, binary format: unsigned.

C-6\DCN:J966X; C-6\MN1:Discrete; C-6\DCT:DIS; C-6\BFM: UNS;

Measurement: 82AJ01, description: LANTZ Norm acceleration, units: MTR/S/S, High value: 1023.97, Low value: -1023.97, conversion type: Coefficients. Order of curve fit: 1, derived from pair sets: No, Coefficient (0): 0, Coefficient(1): 0.03125, binary format: two's complement

C-7\DCN:82AJ01; C-7\MN1:LANTZ Norm acceleration; C-7\MN3:MTR/S/S;
C-7\MOT1:1023.97; C-7\MOT2:-1023.97; C-7\DCT:COE; C-7\CO\N:1;
C-7\CO1:N; C-7\CO:0; C-7\CO-1:.03125; C-7\BFM:TWO;

3.0 XML Version of Example

The entire example is presented beginning on the next page in the extensible markup language (XML) version of the Telemetry Attributes Transfer Standard (TMATS). The XML elements are commented with TMATS code names to aid in associating the XML version of the example with the code name version of the example given above.

```
<?xml version="1.0" encoding="utf-8"?>
<Tmats>

  <!-- G Group -->
```

Telemetry Standards, IRIG Standard 106-15 (Part 1), Appendix J, July 2015

```

<ProgramName>TMATS example</ProgramName><!--PN-->
<TestItem>Wright Flyer</TestItem><!--TA-->
<OriginationDate>1903-07-12</OriginationDate><!--OD must
follow XML date format-->
<Revision>
  <Number>0</Number><!--RN-->
</Revision>
<TestNumber>13</TestNumber><!--TN-->
<PointOfContact>
  <Name>Wilbur</Name><!--POC1-->
  <Agency>Bikes, LTD</Agency><!--POC2-->
  <Address>Dayton</Address><!--POC3-->
  <Telephone>555-1212</Telephone><!--POC4-->
</PointOfContact>

  <DataSource Name="PCM w/embedded" Type="RF"><!--DSI-1:PCM
w/embedded;DST-1:RF-->

    <!-- T Group -->
    <TransmissionAttributes>
      <SourceRFAttributes>
        <Frequency>1489.5</Frequency><!--RF1-->
        <RFBandwidth>100</RFBandwidth><!--RF2-->
        <DataBandwidth>100</DataBandwidth><!--RF3-->
        <ModulationType>FM</ModulationType><!--RF4
enumeration-->

<TotalCarrierModulation>500</TotalCarrierModulation><!--RF5-->
  <!--Subcarriers not needed SCO\N:NO-->
  <TransmitAntenna>
    <Polarization>Linear</Polarization><!--
AN2:LIN-->

    </TransmitAntenna>
    <AntennaPatterns>
      <PointOfContact>
        <Name>Pat Tern</Name><!--AP\POC1-->
        <Agency>Transmissions, Inc.</Agency><!--
AP\POC2-->

        <Address>Amityville, NY</Address><!--
AP\POC3-->

        <Telephone>800-555-1212</Telephone><!--
AP\POC4-->

      </PointOfContact>
    </AntennaPatterns>
  </SourceRFAttributes>
</TransmissionAttributes>

  <!-- M Group -->
  <!--M1\ID:PCM w/embedded is implicit-->
  <MultiplexModulationGroup>
    <CompositeSignalStructure>
      <SignalStructureType>PCM</SignalStructureType><!--
-BB1:PCM-->

```


Telemetry Standards, IRIG Standard 106-15 (Part 1), Appendix J, July 2015

```

        <ModulationSense>Positive</ModulationSense><!--
BB2:POS-->
        </CompositeSignalStructure>
        <BasebandSignal>
            <SignalType>PCM</SignalType><!--BSG1:PCM-->
            <LowPassFilter>
                <Type>Constant Amplitude</Type><!--BSF2:CA-->
            </LowPassFilter>
            <DataLinkName>PCM w/async</DataLinkName><!--
BB\DLN-->
            </BasebandSignal>
        </MultiplexModulationGroup>

        <DataLink Name="PCM w/async"><!--P-1\DLN-->

            <!-- P Group -->
            <PCMFormatAttributes>
                <InputData>
                    <PCMCode>NRZ-L</PCMCode><!--D1:NRZ-L-->
                    <BitRate>44000</BitRate><!--D2:44000-->
                    <Encrypted>Unencrypted</Encrypted><!--D3:U-->
                    <Polarity>Normal</Polarity><!--D4:N-->
                    <DataDirection>Normal</DataDirection><!--
D6:N-->
                    <DataRandomized>No</DataRandomized><!--D7:N--
>
                    </InputData>
                    <Format>
                        <TypeFormat>Class 1</TypeFormat><!--TF:ONE-->
                        <CommonWordLength>10</CommonWordLength><!--
F1:10-->
                        <WordTransferOrder>MSB
First</WordTransferOrder><!--F2:M-->
                        <Parity>None</Parity><!--F3:NO-->
                        <MinorFrame>

<NumberOfMinorFrames>16</NumberOfMinorFrames><!--MF\N:16-->

<WordsPerMinorFrame>43</WordsPerMinorFrame><!--MF1:43-->

<BitsPerMinorFrame>440</BitsPerMinorFrame><!--MF2:440-->
                        <SyncType>Fixed Pattern</SyncType><!--
MF3:FPT-->
                        <!--MF4:20 is implicit-->

<SyncPattern>01111010011010110001</SyncPattern><!--
MF5:01111010011010110001-->
                        </MinorFrame>
                    </Format>
                    <SyncCriteria>
                        <InSync>
                            <Criteria>1</Criteria><!--SYNC1:1-->
                            <NumberOfFSPBits>0</NumberOfFSPBits><!--
SYNC2:0-->

```

```

        </InSync>
        <OutOfSync>
            <NumberOfDisagrees>Not
Specified</NumberOfDisagrees><!--SYNC3:1-->
            <NumberOfFSPBits>0</NumberOfFSPBits><!--
SYNC4:0-->
        </OutOfSync>
    </SyncCriteria>
    <VariableWordLength>
        <Word>10</Word><!--MFW1-1-->
        <Length>8</Length><!--MFW2-1-->
    </VariableWordLength>
    <VariableWordLength>
        <Word>11</Word><!--MFW1-2-->
        <Length>12</Length><!--MFW2-2-->
    </VariableWordLength>
    <SubframeSynchronization>
        <IDCounter><!--ISF\N:1 is implicit-->
            <Name>1</Name><!--ISF1:1-->
            <SyncType>ID Counter</SyncType><!--
ISF2:ID-->
                <Location>1</Location><!--IDC1:1-->

    <CounterStartingBitLocation>7</CounterStartingBitLocation><!--
IDC3:7-->
                <CounterLength>4</CounterLength><!--
IDC4:4-->
                <TransferOrder>MSB
First</TransferOrder><!--IDC5:M-->
                <InitialValue>0</InitialValue><!--IDC6:0-
->

    <InitialSubframeNumber>1</InitialSubframeNumber><!--IDC7:1-->
                <EndValue>15</EndValue><!--IDC8:15-->

    <EndSubframeNumber>16</EndSubframeNumber><!--IDC9:16-->

    <CountDirection>Increasing</CountDirection><!--IDC10:INC-->
        </IDCounter>
    </SubframeSynchronization>
    <AsyncEmbeddedFormat>
        <!--AEF\N:1 is implicit-->
        <DataLinkName>ASYNC</DataLinkName><!--
AEF\DLN-1:ASYNC-->
                <Supercom>5</Supercom><!--AEF1-1:5-->
                <LocationDefinition>Contiguous
Words</LocationDefinition><!--AEF2-1:CW-->
                <Location>6</Location><!--AEF3-1-1:6-->
    </AsyncEmbeddedFormat>

    <!-- D Group -->
    <!--D-2\DLN:PCM w/async is implicit-->
    <PCMMeasurements>
        <!--D-2\ML\N:1 is implicit-->

```

```

<MeasurementList Name="JUST ONE"><!--MLN-
1:JUST ONE-->
    <!--MN\N-1:2 is implicit-->
    <Measurement Name="E1250T"><!--MN-1-
1:E1250T-->
    <Parity>Default</Parity><!--MN1-1-
1:DE-->
<ParityTransferOrder>Default</ParityTransferOrder><!--MN2-1-1:D--
>
    <MeasurementTransferOrder>MSB
First</MeasurementTransferOrder><!--MN3-1-1:M-->
    <LocationType>Word and
Frame</LocationType><!--LT-1-1:WDFR-->
    <!--MML\N-1-1:1 is implicit-->
    <MeasurementLocation>
        <!--MNF\N-1-1-1:1 is implicit-->
        <MeasurementFragments>
            <StartWord>39</StartWord><!--
WP-1-1-1-1:39-->
<WordInterval>0</WordInterval><!--WI-1-1-1-1:0-->
    <StartFrame>1</StartFrame><!--
-FP-1-1-1-1:1-->
<FrameInterval>1</FrameInterval><!--FI-1-1-1-1:1-->
    <BitMask>Full
Word</BitMask><!--WFM-1-1-1-1:FW-->
    </MeasurementFragments>
    </MeasurementLocation>
</Measurement>
<Measurement Name="W862P"><!--MN-1-
2:W862P-->
    <Parity>Default</Parity><!--MN1-1-
2:DE-->
<ParityTransferOrder>Default</ParityTransferOrder><!--MN2-1-2:D--
>
    <MeasurementTransferOrder>MSB
First</MeasurementTransferOrder><!--MN3-1-2:M-->
    <LocationType>Word and
Frame</LocationType><!--LT-1-2:WDFR-->
    <!--MML\N-1-2:1 is implicit-->
    <MeasurementLocation>
        <!--MNF\N-1-2-1:1 is implicit-->
        <MeasurementFragments>
            <StartWord>42</StartWord><!--
WP-1-2-1-1:42-->
<WordInterval>0</WordInterval><!--WI-1-2-1-1:0-->
    <StartFrame>8</StartFrame><!--
-FP-1-2-1-1:8-->
<FrameInterval>0</FrameInterval><!--FI-1-2-1-1:0-->

```

```

                                <BitMask>Full
Word</BitMask><!--WFM-1-2-1-1:FW-->
                                </MeasurementFragments>
                                </MeasurementLocation>
                                </Measurement>
                                </MeasurementList>
                                </PCMMeasurements>
                                </PCMFormatAttributes>

                                <!-- C Group -->
                                <DataConversionAttributes>
                                    <Measurement Name="E1250T"><!--C-1\DCN:E1250T-->
                                        <Measurand>
                                            <Description>Inlet Temp
Bellmouth</Description><!--MN1:Inlet Temp Bellmouth-->

                                <EngineeringUnits>DEGC</EngineeringUnits><!--MN3:DEGC-->
                                    </Measurand>
                                    <TelemetryValueDefinition>
                                        <BinaryFormat>Unsigned
Binary</BinaryFormat><!--BFM:UNS-->
                                    </TelemetryValueDefinition>
                                    <OtherInformation>
                                        <MeasurementValue>
                                            <Low>-0.4</Low><!--MOT2:-0.4-->
                                            <High>128.0</High><!--MOT1:128-->
                                        </MeasurementValue>
                                    </OtherInformation>
                                    <DataConversion Type="Pair Sets"><!--DCT:PRS-
->
                                        <PairSets>
                                            <!--PS\n:2 is implicit-->
                                            <Application>Polynomial Curve
Fit</Application><!--PS1:Y-->
                                        <OrderOfFit>1</OrderOfFit><!--PS2:1--
>
                                        <Pair>
                                            <TmValue>0</TmValue><!--PS3-1:0--
>
                                            <EuValue>-0.4</EuValue><!--PS4-
1:-0.4-->
                                        </Pair>
                                        <Pair>
                                            <TmValue>1023</TmValue><!--PS3-
2:1023-->
                                            <EuValue>128</EuValue><!--PS4-
2:128-->
                                        </Pair>
                                    </PairSets>
                                </DataConversion>
                                </Measurement>

                                <Measurement Name="W862P"><!--C-2\DCN:W862P-->
                                    <Measurand>

```

```

        <Description>Fuel Pump
Inlet</Description><!--MN1:Inlet Temp Bellmouth-->
        </Measurand>
        <TelemetryValueDefinition>
        <BinaryFormat>Unsigned
Binary</BinaryFormat><!--BFM:UNS-->
        </TelemetryValueDefinition>
        <DataConversion Type="Pair Sets"><!--DCT:PRS-
->
        <PairSets>
        <!--PS\N:2 is implicit-->
        <Application>Polynomial Curve
Fit</Application><!--PS1:Y-->
        <OrderOfFit>1</OrderOfFit><!--PS2:1--
>
        <Pair>
        <TmValue>0</TmValue><!--PS3-1:0--
>
        <EuValue>-0.1</EuValue><!--PS4-
1:-0.1-->
        </Pair>
        <Pair>
        <TmValue>1023</TmValue><!--PS3-
2:1023-->
        <EuValue>76.7</EuValue><!--PS4-
2:76.7-->
        </Pair>
        </PairSets>
        </DataConversion>
        </Measurement>
        </DataConversionAttributes>
</DataLink>

<DataLink Name="ASync"><!--P-3\DLN:ASync-->

        <!-- P Group -->
        <PCMFormatAttributes>
        <Format>
        <TypeFormat>Class 1</TypeFormat><!--TF:ONE-->
        <CommonWordLength>16</CommonWordLength><!--
F1:16-->
        <WordTransferOrder>LSB
First</WordTransferOrder><!--F2:L-->
        <Parity>None</Parity><!--F3:NO-->
        <MinorFrame>

<NumberOfMinorFrames>3</NumberOfMinorFrames><!--MF\N:3-->

<WordsPerMinorFrame>50</WordsPerMinorFrame><!--MF1:50-->

<BitsPerMinorFrame>800</BitsPerMinorFrame><!--MF2:800-->
        <SyncType>Fixed Pattern</SyncType><!--
MF3:FPT-->
        <!--MF4:16 is implicit-->

```

```

<SyncPattern>1111100110110001</SyncPattern><!--
MF5:1111100110110001-->
    </MinorFrame>
  </Format>
  <SyncCriteria>
    <InSync>
      <Criteria>1</Criteria><!--SYNC1:1-->
    </InSync>
  </SyncCriteria>
  <SubframeSynchronization>
    <IDCounter><!--ISF\N:1 is implicit-->
      <Name>2</Name><!--ISF1-1:2-->
      <SyncType>ID Counter</SyncType><!--ISF2-
1:ID-->
        <Location>1</Location><!--IDC1-1:1-->

<CounterStartingBitLocation>15</CounterStartingBitLocation><!--
IDC3-1:15-->
      <CounterLength>2</CounterLength><!--IDC4-
1:2-->
        <TransferOrder>LSB
First</TransferOrder><!--IDC5-1:L-->
        <InitialValue>0</InitialValue><!--IDC6-
1:0-->

<InitialSubframeNumber>1</InitialSubframeNumber><!--IDC7-1:1-->
      <EndValue>2</EndValue><!--IDC8-1:2-->

<EndSubframeNumber>3</EndSubframeNumber><!--IDC9-1:3-->

<CountDirection>Increasing</CountDirection><!--IDC10-1:INC-->
  </IDCounter>
</SubframeSynchronization>

  <!-- D Group -->
  <!--D-1\DLN:ASync is implicit-->
  <PCMMeasurements>
    <!--D-1\ML\N:1 is implicit-->
    <MeasurementList Name="JUST ONE"><!--MLN-
1:JUST ONE-->
      <!--MN\N-1:4 is implicit-->
      <Measurement Name="J896D"><!--MN-1-
1:J896D-->
        <MeasurementTransferOrder>LSB
First</MeasurementTransferOrder><!--MN3-1-1:L-->
        <LocationType>Word and
Frame</LocationType><!--LT-1-1:WDFR-->
        <!--MML\N-1-1:2 is implicit-->
        <MeasurementLocation>
          <!--MNF\N-1-1-1:1 is implicit-->
          <MeasurementFragments>
            <StartWord>14</StartWord><!--
WP-1-1-1-1:14-->

```

```

<WordInterval>0</WordInterval><!--WI-1-1-1-1:0-->
                                <StartFrame>1</StartFrame><!--
-FP-1-1-1-1:1-->

<FrameInterval>0</FrameInterval><!--FI-1-1-1-1:0-->
                                <BitMask>Full
Word</BitMask><!--WFM-1-1-1-1:FW-->
                                </MeasurementFragments>
                                </MeasurementLocation>
                                <MeasurementLocation>
                                <!--MNF\N-1-1-2:1 is implicit-->
                                <MeasurementFragments>
                                <StartWord>39</StartWord><!--
WP-1-1-1-1:39-->

<WordInterval>0</WordInterval><!--WI-1-1-1-1:0-->
                                <StartFrame>2</StartFrame><!--
-FP-1-1-1-1:2-->

<FrameInterval>0</FrameInterval><!--FI-1-1-1-1:0-->
                                <BitMask>Full
Word</BitMask><!--WFM-1-1-2-1:FW-->
                                </MeasurementFragments>
                                </MeasurementLocation>
</Measurement>
<Measurement Name="J951V"><!--MN-1-
2:J951V-->
                                <Parity>Default</Parity><!--MN1-1-
2:DE-->

<ParityTransferOrder>Default</ParityTransferOrder><!--MN2-1-2:D--
>
                                <MeasurementTransferOrder>LSB
First</MeasurementTransferOrder><!--MN3-1-2:L-->
                                <LocationType>Word and
Frame</LocationType><!--LT-1-2:WDFR-->
                                <!--MML\N-1-2:1 is implicit-->
                                <MeasurementLocation>
                                <!--MNF\N-1-2-1:1 is implicit-->
                                <MeasurementFragments>
                                <StartWord>3</StartWord><!--
WP-1-2-1-1:3-->

<WordInterval>0</WordInterval><!--WI-1-2-1-1:0-->
                                <StartFrame>1</StartFrame><!--
-FP-1-2-1-1:1-->

<FrameInterval>0</FrameInterval><!--FI-1-2-1-1:0-->

<BitMask>1111111100000000</BitMask><!--WFM-1-2-1-
1:1111111100000000-->
                                </MeasurementFragments>
                                </MeasurementLocation>

```

```

        </Measurement>
        <Measurement Name="J971U"><!--MN-1-
3:J971U-->
        <Parity>Default</Parity><!--MN1-1-
3:DE-->
        <ParityTransferOrder>Default</ParityTransferOrder><!--MN2-1-3:D--
>
        <MeasurementTransferOrder>LSB
First</MeasurementTransferOrder><!--MN3-1-3:L-->
        <LocationType>Word and
Frame</LocationType><!--LT-1-3:WDFR-->
        <!--MML\N-1-3:6 is implicit-->
        <MeasurementLocation>
        <!--MNF\N-1-3-1:1 is implicit-->
        <MeasurementFragments>
        <StartWord>2</StartWord><!--
WP-1-3-1-1:2-->
        <WordInterval>0</WordInterval><!--WI-1-3-1-1:0-->
        <StartFrame>1</StartFrame><!--
-FP-1-3-1-1:1-->
        <FrameInterval>1</FrameInterval><!--FI-1-3-1-1:1-->
        <BitMask>Full
Word</BitMask><!--WFM-1-3-1-1:FW-->
        </MeasurementFragments>
        </MeasurementLocation>
        <MeasurementLocation>
        <!--MNF\N-1-3-2:1 is implicit-->
        <MeasurementFragments>
        <StartWord>11</StartWord><!--
WP-1-3-2-1:11-->
        <WordInterval>0</WordInterval><!--WI-1-3-2-1:0-->
        <StartFrame>1</StartFrame><!--
-FP-1-3-2-1:1-->
        <FrameInterval>1</FrameInterval><!--FI-1-3-2-1:1-->
        <BitMask>Full
Word</BitMask><!--WFM-1-3-2-1:FW-->
        </MeasurementFragments>
        </MeasurementLocation>
        <MeasurementLocation>
        <!--MNF\N-1-3-3:1 is implicit-->
        <MeasurementFragments>
        <StartWord>20</StartWord><!--
WP-1-3-3-1:20-->
        <WordInterval>0</WordInterval><!--WI-1-3-3-1:0-->
        <StartFrame>1</StartFrame><!--
-FP-1-3-3-1:1-->
        <FrameInterval>1</FrameInterval><!--FI-1-3-3-1:1-->

```



```

                                <BitMask>Full
Word</BitMask><!--WFM-1-3-3-1:FW-->
                                </MeasurementFragments>
                                </MeasurementLocation>
                                <MeasurementLocation>
                                <!--MNF\N-1-3-4:1 is implicit-->
                                <MeasurementFragments>
                                <StartWord>29</StartWord><!--
WP-1-3-4-1:29-->

<WordInterval>0</WordInterval><!--WI-1-3-4-1:0-->
                                <StartFrame>1</StartFrame><!--
-FP-1-3-4-1:1-->

<FrameInterval>1</FrameInterval><!--FI-1-3-4-1:1-->
                                <BitMask>Full
Word</BitMask><!--WFM-1-3-4-1:FW-->
                                </MeasurementFragments>
                                </MeasurementLocation>
                                <MeasurementLocation>
                                <!--MNF\N-1-3-5:1 is implicit-->
                                <MeasurementFragments>
                                <StartWord>33</StartWord><!--
WP-1-3-5-1:33-->

<WordInterval>0</WordInterval><!--WI-1-3-5-1:0-->
                                <StartFrame>1</StartFrame><!--
-FP-1-3-5-1:1-->

<FrameInterval>1</FrameInterval><!--FI-1-3-5-1:1-->
                                <BitMask>Full
Word</BitMask><!--WFM-1-3-5-1:FW-->
                                </MeasurementFragments>
                                </MeasurementLocation>
                                <MeasurementLocation>
                                <!--MNF\N-1-3-6:1 is implicit-->
                                <MeasurementFragments>
                                <StartWord>47</StartWord><!--
WP-1-3-6-1:47-->

<WordInterval>0</WordInterval><!--WI-1-3-6-1:0-->
                                <StartFrame>1</StartFrame><!--
-FP-1-3-6-1:1-->

<FrameInterval>1</FrameInterval><!--FI-1-3-6-1:1-->
                                <BitMask>Full
Word</BitMask><!--WFM-1-3-6-1:FW-->
                                </MeasurementFragments>
                                </MeasurementLocation>
                                </Measurement>
                                <Measurement Name="J966X"><!--MN1-
4:J966X-->
                                <Parity>Default</Parity><!--MN1-1-
4:DE-->

```

```

<ParityTransferOrder>Default</ParityTransferOrder><!--MN2-1-4:D--
>
    <MeasurementTransferOrder>LSB
First</MeasurementTransferOrder><!--MN3-1-4:L-->
    <LocationType>Word and
Frame</LocationType><!--LT-1-4:WDFR-->
    <!--MML\N-1-4:1 is implicit-->
    <MeasurementLocation>
        <!--MNF\N-1-4-1:1 is implicit-->
        <MeasurementFragments>
            <StartWord>45</StartWord><!--
WP-1-4-1-1:45-->

<WordInterval>0</WordInterval><!--WI-1-4-1-1:0-->
    <StartFrame>3</StartFrame><!--
-FP-1-4-1-1:3-->

<FrameInterval>0</FrameInterval><!--FI-1-4-1-1:0-->
    <BitMask>Full
Word</BitMask><!--WFM-1-4-1-1:FW-->
    </MeasurementFragments>
    </MeasurementLocation>
    </Measurement>
    </MeasurementList>
    </PCMMeasurements>
    </PCMFormatAttributes>

    <!-- C Group -->
    <DataConversionAttributes>
        <Measurement Name="J896D"><!--C-3\DCN:J896D-->
        <Measurand>
            <Description>Terrain
Altitude</Description><!--MN1:Terrain Altitude-->

<EngineeringUnits>FEET</EngineeringUnits><!--MN3:FEET-->
    </Measurand>
    <TelemetryValueDefinition>
        <BinaryFormat>Two's
Complement</BinaryFormat><!--BFM:TWO-->
    </TelemetryValueDefinition>
    <OtherInformation>
        <MeasurementValue>
            <Low>-32768.0</Low><!--MOT2:-32768-->
            <High>32768.0</High><!--MOT1:32768-->
        </MeasurementValue>
    </OtherInformation>
    <DataConversion Type="Pair Sets"><!--DCT:PRS-
->
    <PairSets>
        <!--PS\N:2 is implicit-->
        <Application>Polynomial Curve
Fit</Application><!--PS1:Y-->

```

```

        <OrderOfFit>1</OrderOfFit><!--PS2:1--
>
        <Pair>
            <TmValue>-32768</TmValue><!--PS3-
1:-32768-->
            <EuValue>-32768.0</EuValue><!--
PS4-1:-32768-->
        </Pair>
        <Pair>
            <TmValue>32767</TmValue><!--PS3-
2:32767-->
            <EuValue>32767.0</EuValue><!--
PS4-2:32767-->
        </Pair>
    </PairSets>
</DataConversion>
</Measurement>

    <Measurement Name="J951V"><!--C-4\DCN:J951V-->
        <Measurand>
            <Description>Throttle
Command</Description><!--MN1:Throttle Command-->
<EngineeringUnits>VDC</EngineeringUnits><!--MN3:VDC-->
        </Measurand>
        <TelemetryValueDefinition>
            <BinaryFormat>Two's
Complement</BinaryFormat><!--BFM:TWO-->
        </TelemetryValueDefinition>
        <OtherInformation>
            <MeasurementValue>
                <Low>-10.164</Low><!--MOT2:-10.164-->
                <High>10.164</High><!--MOT1:10.164-->
            </MeasurementValue>
        </OtherInformation>
        <DataConversion Type="Pair Sets"><!--DCT:PRS-
->
        <PairSets>
            <!--PS\N:2 is implicit-->
            <Application>Polynomial Curve
Fit</Application><!--PS1:Y-->
            <OrderOfFit>1</OrderOfFit><!--PS2:1--
>
            <Pair>
                <TmValue>-128</TmValue><!--PS3-
1:-128-->
                <EuValue>-10.164</EuValue><!--
PS4-1:-10.164-->
            </Pair>
            <Pair>
                <TmValue>127</TmValue><!--PS3-
2:127-->
                <EuValue>10.164</EuValue><!--PS4-
2:10.164-->

```

```

        </Pair>
        </PairSets>
        </DataConversion>
    </Measurement>

    <Measurement Name="J971U"><!--C-5\DCN:J971U-->
        <Measurand>
            <Description>DISC</Description><!--
MN1:DISC-->
            </Measurand>
            <TelemetryValueDefinition>
                <BinaryFormat>Unsigned
Binary</BinaryFormat><!--BFM:UNS-->
            </TelemetryValueDefinition>
            <DataConversion Type="Discrete"><!--DCT:DIS--
>
                <!--what else goes here?-->
            </DataConversion>
        </Measurement>

        <Measurement Name="J966X"><!--C-6\DCN:J966X-->
            <Measurand>
                <Description>Discrete</Description><!--
MN1:Discrete-->
            </Measurand>
            <TelemetryValueDefinition>
                <BinaryFormat>Unsigned
Binary</BinaryFormat><!--BFM:UNS-->
            </TelemetryValueDefinition>
            <DataConversion Type="Discrete"><!--DCT:DIS--
>
                <!--what else goes here?-->
            </DataConversion>
        </Measurement>

        </DataConversionAttributes>
    </DataLink>

</DataSource>

<PointOfContact>
    <Name>Orville</Name><!--POC1-2: Orville-->
    <Agency>Bikes, LTD</Agency><!--POC2-2: Bikes, LTD-->
    <Address>Dayton</Address><!--POC3-2: Dayton-->
    <Telephone>555-1212</Telephone><!--POC4-2: 555-1212-->
</PointOfContact>
<DataSource Name="Two PCM links - TM & TSPI"
Type="Storage"><!--DSI-2:Two PCM links - TM & TSPI;DST-2:STO-->

    <!-- R Group -->
    <RecorderReproducerAttributes>
        <ID>Two PCM links - TM & TSPI</ID><!--R-1\ID:Two
PCM links - TM & TSPI-->

```

```

        <Description>Recorded Data</Description><!--
R1:Recorded Data-->
        <Characteristics>
            <Type>Magnetic Disk</Type><!--TC1:MD-->

<NumberOfTracksOrChannels>2</NumberOfTracksOrChannels><!--N:2-->
        </Characteristics>
        <RecorderReproducerInfo>
            <Manufacturer>ZZ</Manufacturer><!--RI1:ZZ-->
            <Model>13</Model><!--RI2:13-->
            <OriginalRecording>Yes</OriginalRecording><!--
RI3:Y-->
            <OriginalRecordingDateAndTime>2011-07-
12T07:55:59</OriginalRecordingDateAndTime><!--RI4:07-12-2011-07-
55-59-->
            <CreatingOrganizationPointOfContact>
                <Name>Mr. Tenn</Name><!--POC1:Mr. Tenn-->
                <Agency>Data Creations</Agency><!--POC2:Data
Creations-->
                <Address>Anywhere, Ttown</Address><!--
POC3:Anywhere, Ttown-->
                <Telephone>555-1212</Telephone><!--POC4:555-
1212-->
            </CreatingOrganizationPointOfContact>
        </RecorderReproducerInfo>
        <Data>

<TrackNumberOrChannelID>2</TrackNumberOrChannelID><!--TK1-1:2-->
        <DataSourceID>PCM w/subframe
fragmented</DataSourceID><!--DSI-1:PCM w/subframe fragmented-->
        <ChannelDataType>PCM Input</ChannelDataType><!--
CDT-1:PCMIN-->

<ChannelDataLinkName>PCM1</ChannelDataLinkName><!--CDLN-1:PCM1-->

<TrackNumberOrChannelID>4</TrackNumberOrChannelID><!--TK1-2:4-->
        <DataSourceID>Space Position
Information</DataSourceID><!--DSI-2:Space Position Information-->
        <ChannelDataType>PCM Input</ChannelDataType><!--
CDT-2:PCMIN-->
        <ChannelDataLinkName>SPI</ChannelDataLinkName><!--
-CDLN-2:SPI-->
        </Data>
    </RecorderReproducerAttributes>

</DataSource>

    <DataLink Name="PCM1"><!--P-2\DLN:PCM1-->

    <!-- P Group -->
    <PCMFormatAttributes>
        <InputData>
            <PCMCode>NRZ-L</PCMCode><!--D1:NRZ-L-->
            <BitRate>2000000</BitRate><!--D2:2000000-->

```

```

        <Encrypted>Unencrypted</Encrypted><!--D3:U-->
        <Polarity>Normal</Polarity><!--D4:N-->
    </InputData>
    <Format>
        <TypeFormat>Class 1</TypeFormat><!--TF:ONE-->
        <CommonWordLength>10</CommonWordLength><!--
F1:10-->
        <WordTransferOrder>MSB
First</WordTransferOrder><!--F2:M-->
        <Parity>None</Parity><!--F3:NO-->
        <MinorFrame>

<NumberOfMinorFrames>64</NumberOfMinorFrames><!--MF\N:64-->

<WordsPerMinorFrame>277</WordsPerMinorFrame><!--MF1:277-->
        <!--MF4:30 is implicit-->

<SyncPattern>101110000001100111110101101011</SyncPattern><!--
MF5:101110000001100111110101101011-->
        </MinorFrame>
    </Format>
    <SyncCriteria>
        <InSync>
            <Criteria>1</Criteria><!--SYNC1:1-->
        </InSync>
    </SyncCriteria>
    <VariableWordLength>
        <Word>121</Word><!--MFW1-1:121-->
        <Length>6</Length><!--MFW2-1:6-->
    </VariableWordLength>
    <VariableWordLength>
        <Word>122</Word><!--MFW1-2:122-->
        <Length>4</Length><!--MFW2-2:4-->
    </VariableWordLength>
    <SubframeSynchronization>
        <IDCounter><!--ISF\N:1 is implicit-->
            <Name>1</Name><!--ISF1-1:1-->
            <SyncType>ID Counter</SyncType><!--ISF2-
1:ID-->
            <Location>13</Location><!--IDC1-1:13-->

<CounterStartingBitLocation>5</CounterStartingBitLocation><!--
IDC3-1:5-->
            <CounterLength>6</CounterLength><!--IDC4-
1:6-->
            <TransferOrder>MSB
First</TransferOrder><!--IDC5-1:M-->
            <InitialValue>0</InitialValue><!--IDC6-
1:0-->

<InitialSubframeNumber>1</InitialSubframeNumber><!--IDC7-1:1-->
            <EndValue>63</EndValue><!--IDC8-1:63-->

<EndSubframeNumber>64</EndSubframeNumber><!--IDC9-1:64-->

```

```

<CountDirection>Increasing</CountDirection><!-- IDC10-1:INC-->
    </IDCounter>
    </SubframeSynchronization>

    <!-- D Group -->
    <PCMMeasurements>
    <!--D-3\DLN:PCM1 is implicit-->
        <MeasurementList Name="ONLY ONE"><!--MLN-
1:ONLY ONE-->
            <!--MN\N-1:1 is implicit-->
            <Measurement Name="82AJ01"><!--MN-1-
1:82AJ01-->
                <LocationType>Word and
Frame</LocationType><!--LT-1-1:WDFR-->
                <MeasurementLocation>
                    <MeasurementFragments>
                        <StartWord>113</StartWord><!--
-WP-1-1-1-1:113-->

<WordInterval>0</WordInterval><!--WI-1-1-1-1:0-->
                    <StartFrame>5</StartFrame><!--
-FP-1-1-1-1:5-->

<FrameInterval>32</FrameInterval><!--FI-1-1-1-1:32-->
                    <BitMask>Full
Word</BitMask><!--WFM-1-1-1-1:FW-->
                </MeasurementFragments>
            </MeasurementLocation>
            <MeasurementLocation>
                <MeasurementFragments>
                    <StartWord>121</StartWord><!--
-WP-1-1-1-2:121-->

<WordInterval>0</WordInterval><!--WI-1-1-1-2:0-->
                    <StartFrame>5</StartFrame><!--
-FP-1-1-1-2:5-->

<FrameInterval>32</FrameInterval><!--FI-1-1-1-2:32-->
                    <BitMask>FW</BitMask><!--WFM-
1-1-1-2:FW-->
                </MeasurementFragments>
            </MeasurementLocation>
        </Measurement>
    </MeasurementList>
    </PCMMeasurements>
</PCMFormatAttributes>

    <!-- C Group -->
    <DataConversionAttributes>
        <Measurement Name="82AJ01"><!--C-7\DCN:82AJ01-->
        <Measurand>
            <Description>LANTZ Norm
acceleration</Description><!--MN1:LANTZ Norm acceleration-->

```

```

<EngineeringUnits>MTR/S/S</EngineeringUnits><!--MN3:MTR/S/S-->
    </Measurand>
    <TelemetryValueDefinition>
        <BinaryFormat>Two's
Complement</BinaryFormat><!--BFM:TWO-->
    </TelemetryValueDefinition>
    <OtherInformation>
        <MeasurementValue>
            <Low>-1023.97</Low><!--MOT2:-1023.97-
->
                <High>1023.97</High><!--MOT1:1023.97-
->
                    </MeasurementValue>
                </OtherInformation>
            <DataConversion Type="Coefficients"><!--
DCT:COE-->
                <Coefficients>
                    <!--CO\N:1 is implicit-->

<DerivedFromPairSet>No</DerivedFromPairSet><!--CO1:N-->
                <Coefficient N="0">0</Coefficient><!--
-CO:0-->
                    <Coefficient
N="1">0.03125</Coefficient><!--CO-1:.03125-->
                </Coefficients>
            </DataConversion>
        </Measurement>
    </DataConversionAttributes>
</DataLink>

    <DataLink Name="SPI"><!--P-4\DLN:SPI-->
    <!-- P Group -->
    <PCMFormatAttributes>
        <!-- D Group -->
        <PCMMeasurements>
            <!--D-4\DLN:SPI is implicit-->
        </PCMMeasurements>
    </PCMFormatAttributes>
</DataLink>

    <Comment>I hope this flies.</Comment><!--COM: I hope this
flies.-->

</Tmats>
<!-- Last revised on: v3 2012/02/21 -->

```


****** END OF APPENDIX J ******