APPENDIX J

TELEMETRY ATTRIBUTES TRANSFER STANDARD FORMAT EXAMPLE

LIST OF FIGURES

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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, which 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, which describes the example, is *printed in italics.* All text, which is part of the example file, is printed in plain text.

The example file being transferred consists of the attributes of a single RF data source and an analog tape containing two data sources. The RF data source is a PCM signal, which contains an embedded asynchronous wave train. The two recorded data sources 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.

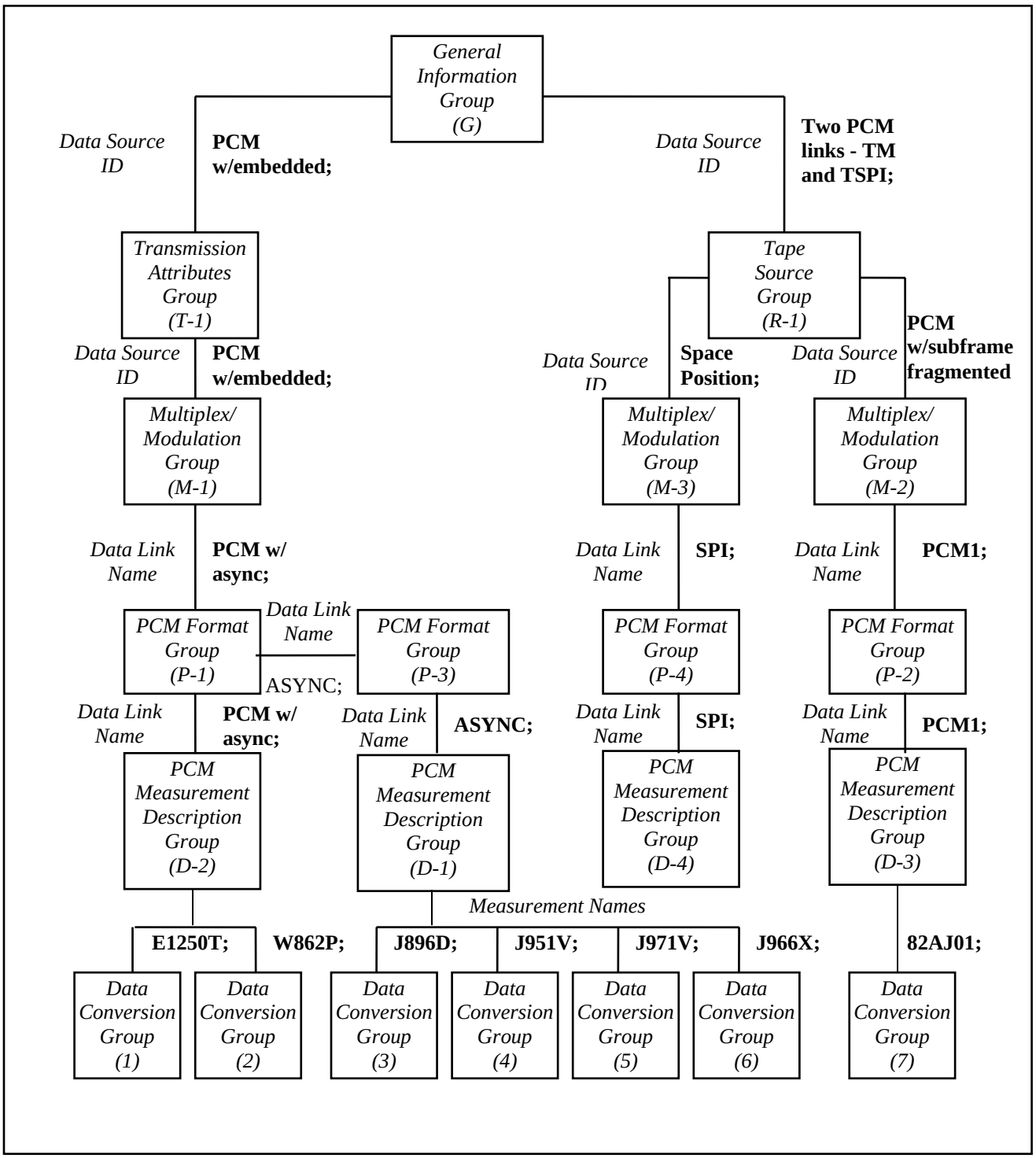


Figure J-1. Group linkages.

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: 07-12-41; 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;

Tape source.

G\DSI-2:Two PCM links - TM & TSPI; G\DST-2:TAP;
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: 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;

Tape Source Attributes Group (R-1)

R-1\ID:Two PCM links - TM & TSPI;
R-1\R1:Reel #1; R-1\TC1:ANAL; R-1\TC2:ACME; R-1\TC3:795;

Tape width: 1 inch, reel diameter: 14 inches, 14 tracks, record speed: 7.5 inches/second.

R-1\TC4:1.0; R-1\TC5:14.0; R-1\N:14; R-1\TC6:7.5;

Rewound: Yes, manufacturer: ZZ; model: 13, original: yes.

R-1\TC8:Y; R-1\RI1:ZZ; R-1\RI2:13; R-1\RI3:Y;
R-1\RI4:07-12-91-07-55-59; R-1\POC1:Mr. Reel; R-1\POC2:Tape Creations; R-1\POC3:Anywhere,Ttown; R-1\POC4:555-1212;

Track Number 2 contains aircraft telemetry PCM (w/subframe fragmented)

R-1\TK1-1:2; R-1\TK2-1:FM/FM;
R-1\DSI-1:PCM w/subframe fragmented; R-1\TK3-1:FWD;

Track Number 4 contains Space Position Information via PCM link

R-1\TK1-2:4; **R-1\DSI-2:Space Position Information;**

Multiplex/Modulation Groups (M-1, M-2, M-3)

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;

M-2\ID:PCM w/subframe fragmented; M-2\BB\DLN:PCM1;

M-3\ID:Space Position; M-3\BB\DLN:SPI;

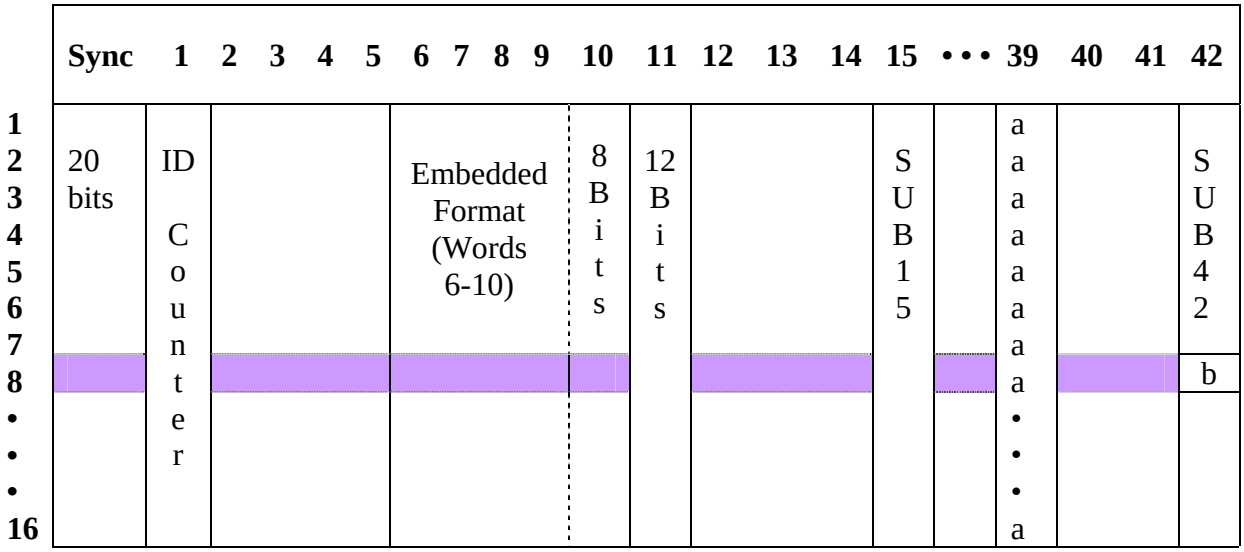
PCM Format Attributes Groups (P)

P-1 is a live PCM signal and contains the asynchronous wave train (see Figure J-2).

P-2 is a recorded signal (see Figure J-3).

P-3 is the asynchronous wave train (see Figure J-4).

P-4 is a recorded signal.



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 at minor frame position 39

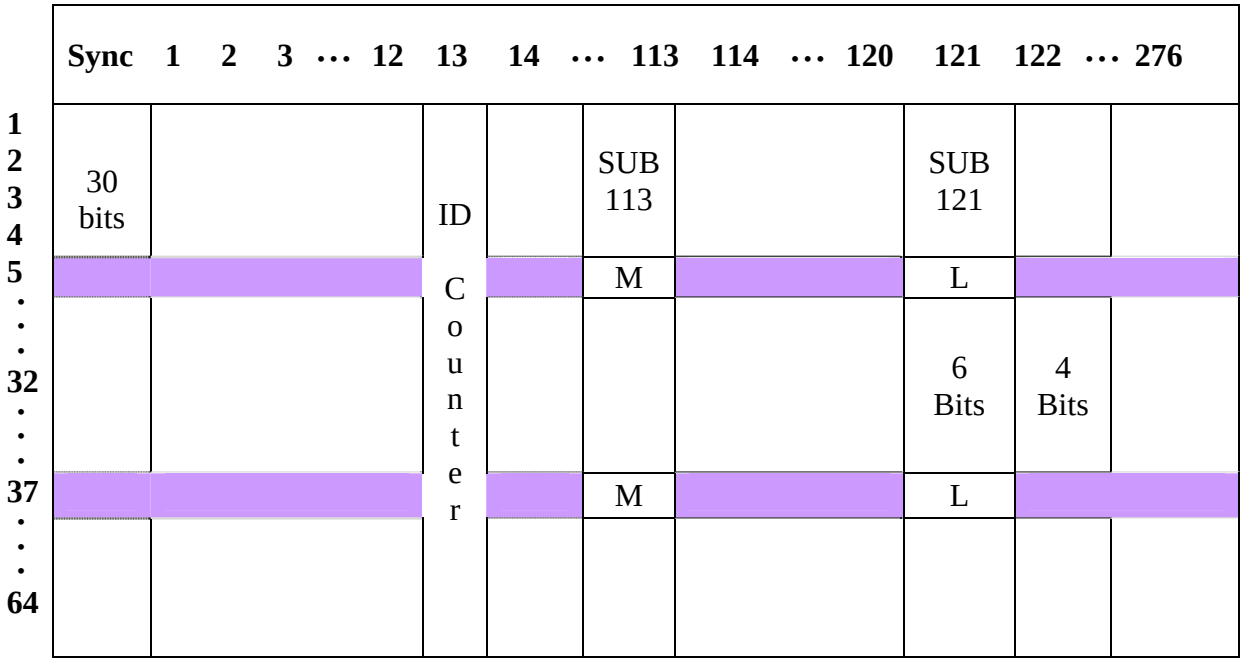
b = measurement W862P in subframe SUB42, position 8.

PCM Format Group = P-1

PCM Measurement Description Group = D-2

Data Link Name = PCM w/async

Figure J-2. PCM format for PCM w/async.



Major frame characteristics:

One major frame = 64 minor frames
Subframes SUB113 and SUB121 are 32 deep
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 indicated as M and the 6 least significant bits as L.
The measurement is located in position 5 of subframes SUB113 and SUB121 (minor frames 5 and 37 of the major frame).

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

Figure J-3. PCM format for PCM1.

	Sync	1	2	3	•••	11	•••	14	•••	20	•••	29	•••	33	•••	39	•••	45	46	47	48	49
1	16 Bits	ID Counter	a	b	•••	a	•••	c	•••	a	•••	a	•••	a	•••		•••	ASUB2		a		
2			a	ASUB1	•••	a	•••	ASUB3	•••	a	•••	a	•••	a	•••	cASUB3	•••			a		
3			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 at positions 2, 11, 20, 29, 33, and 47
b = measurement J951V in subframe ASUB1, position 1
c = measurement J896D in supercommutated subframe ASUB3, positions 1 and 4
d = measurement J966X in subframe ASUB2, position 3

PCM Format Group = P-3
PCM Measurement Description Group = D-1
Data Link Name = ASYNC

Figure J-4. PCM format for 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

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

ID counter word length : 10 bits,
MSB starting bit location : 7,
ID counter length : 4

P-1\IDC2-1:10; 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;

Subframe definition
SUB42 is located at 42, SUB15 at 15.
All have depth 16.

P-1\SF\N-1:2;

P-1\SF1-1-1:SUB42; P-1\SF2-1-1:NO;
P-1\SF4-1-1-1:42; P-1\SF6-1-1:16;
P-1\SF1-1-2:SUB15; P-1\SF2-1-2:NO;
P-1\SF4-1-2-1:15; P-1\SF6-1-2:16;

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\MF5:10111000000110011111010110101 1; P-2\SYNC1:1; P-2\MFW1-1:121; P-2\MFW2-1:6; P-2\MFW1-2:122;
P-2\MFW2-2:4;

Subframe characteristics:

One subframe ID counter named 1. Sync type is ID counter. ID counter location is 13. ID counter word length is 10. 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 subframe is 1. ID counter end value is 63. ID counter end subframe is 64. ID counter is increasing.

Two subframes. First subframe name is SUB121. Not supercommutated, subframe location = word position 121, depth = 32. Second subframe name is SUB113. Not supercommutated, location = 113, depth = 32.

P-2\ISF\N:1; P-2\ISF1-1:1; P-2\ISF2-1:ID; P-2\IDC1-1:13;
P-2\IDC2-1:10; 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; P-2\SF\N-1:2; P-2\SF1-1-1:SUB121;
P-2\SF2-1-1:NO; P-2\SF4-1-1-1:121; P-2\SF6-1-1:32;
P-2\SF1-1-2:SUB113; P-2\SF2-1-2:NO; P-2\SF4-1-2-1:113;
P-2\SF6-1-2:32;

(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;

Subframe definition.

Three subframes with ID counter word length 16 at 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\IDC2-1:16; 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;

ASUB1 is at word position 3.
ASUB2 is at word position 45.
ASUB3 is supercommutated at word positions 14 and 39.

P-3\SF\N-1:3; P-3\SF1-1-1:ASUB1; P-3\SF2-1-1:NO; P-3\SF3-1-1:NA;
P-3\SF4-1-1-1:3; P-3\SF6-1-1:3; P-3\SF1-1-2:ASUB2;
P-3\SF2-1-2:NO; P-3\SF3-1-2:NA; P-3\SF4-1-2-1:45; P-3\SF6-1-2:3;
P-3\SF1-1-3:ASUB3; P-3\SF2-1-3:2; P-3\SF3-1-3:EL;
P-3\SF4-1-3-1:14; P-3\SF4-1-3-2:39; P-3\SF6-1-3:3;

(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 which make up the asynchronous wave train,

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

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

D-4 contains the measurements which 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,

Subframe supercommutated, 2 locations: 1 and 4 of ASUB3.

D-1\MN-1-1:J896D; D-1\MN3-1-1:L; D-1\LT-1-1:SFSC;
D-1\SFS1-1-1:ASUB3; D-1\SFS\N-1-1:2; D-1\SFS2-1-1:E;
D-1\SFS6-1-1-1:1; D-1\SFS6-1-1-2:4; D-1\SFS7-1-1-1:FW;
D-1\SFS7-1-1-2:FW;

Measurement Name: J951V, LSB first, default parity, subframe ASUB1, location 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:SF;
D-1\SF2-1-2:1; D-1\SFM-1-2:1111111100000000;
D-1\SF1-1-2:ASUB1;

Measurement Name : J971U, LSB first,
supercommutated at 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:MFSC; D-1\MFS\N-1-3:6; D-1\MFS1-1-3:E;
D-1\MFSW-1-3-1:2; D-1\MFSW-1-3-2:11; D-1\MFSW-1-3-3:20;
D-1\MFSW-1-3-4:29; D-1\MFSW-1-3-5:33; D-1\MFSW-1-3-6:47;

Measurement Name : J966X, LSB first, subframe ASUB2, location 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:SF; D-1\SF1-1-4:ASUB2;
D-1\SF2-1-4:3; D-1\SFM-1-4: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\MLN-1:JUST ONE; D-2\MN\N-1:2;

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

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:MF; D-2\MF-1-1:39; D-2\MFM-1-1:FW;

Measurement name: W862P, unclassified, MSB first,
subframe name: SUB42, location 8 in subframe, 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:SF; D-2\SF1-1-2:SUB42; D-2\SF2-1-2:8; D-2\SFM-1-2: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, subframe fragmented, 2 fragments, subframes: SUB113 and SUB121, subframe location: 5.

D-3\MN-1-1:82AJ01; D-3\LT-1-1:SFFR; D-3\FSF\N-1-1:2; D-3\FSF1-1-1:16; D-3\FSF2\N-1-1:2; D-3\FSF3-1-1-1:SUB113; D-3\FSF3-1-1-2:SUB121; D-3\FSF4-1-1-1:E; D-3\FSF8-1-1-1-1:5;

(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 which 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: Terrian 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:Terrian 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;

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