

Synthetic Data Generator Interface Control Document

1. Summary

2. Terms

3. IRIG 106 Data File Channels

A synthetic IRIG 106 data file will be a complete and properly formed data file in compliance with IRIG 106. The data in the data file will be formed and formatted in one of the “Channel Layouts” defined below.

Each MIL-STD-1553 channel will be defined by a set of messages occurring at a specified rate. Each 1553 message will represent a specific command word (or words in the case of RT to RT). Command words shown below will be represented as an RT, T/R, Subaddress, and Word Count. This will be abbreviated as R-T-S-W where “R” is the RT number, “T” is either “T” for transmit and “R” for receive, “S” is the subaddress, and “W” is the word count. So “7-T-27-32” is RT 7, transmit, subaddress 27, and word count 32.

3.1. IRIG File Layout 1

3.1.1. IRIG Channel ID 0 – Data Type “Computer Generated Data Packet Format 1 (TMATS) (0x01)”

3.1.2. IRIG Channel ID 1 – Data Type “Time Data Format 1 (0x11)”

3.1.3. IRIG Channel ID 10 – Data Type “Video Data Format 0 (0x40)”

3.1.4. IRIG Channel ID 20 – Data Type “PCM Format 1 (0x09)”

3.1.5. IRIG Channel ID 30 – Data Type “MIL-STD-1553 Format 1 (0x19)”

7-T-29-32 – RT->BC Synthetic GPS/INS Navigation Message Type 1 at 1 Hz rate

27-R-26-32 / 7-T-29-32 – RT->RT Synthetic GPS/INS Navigation Message Type 1 at 25 Hz rate

4. Synthetic Data Source Formats

- 4.1. Synthetic Time Source Type 1
- 4.2. Synthetic Video Source Type 1
- 4.3. Synthetic PCM Source Type 1
- 4.4. Synthetic GPS/INS Navigation Message Type 1

Word 1 – Status

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
										V					

Bit 5 – Nav data valid

0 = Not Valid

1 = Valid

Word 2 – Not used

Word 3, 4 – X Velocity

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
X Velocity MSW															
X Velocity LSW															

32 bit two's-complement signed integer representing aircraft inertial velocity in the local X (North) direction in feet per second.

LSB = 4 feet per second

Word 5, 6 – Y Velocity

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Y Velocity MSW															
Y Velocity LSW															

32 bit two's-complement signed integer representing aircraft inertial velocity in the local Y (East) direction in feet per second

LSB = 4 feet per second

Word 7, 8 – Z Velocity

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Z Velocity MSW															
Z Velocity LSW															

32 bit two's-complement signed integer representing aircraft inertial velocity in the local Z (Down) direction in feet per second

LSB = 4 feet per second

Word 9 – Azimuth

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Aircraft Azimuth															

16 bit two's-complement signed integer aircraft azimuth from True North in degrees
MSB = 180 degrees

Word 10 – Roll

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Aircraft Roll															

16 bit two's-complement signed integer representing aircraft roll from local level in degrees
MSB = 180 degrees
Positive = Left wing up

Word 11 – Pitch

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Aircraft Pitch															

16 bit two's-complement signed integer representing aircraft pitch from local level in degrees
MSB = 180 degrees
Positive = Nose up

Word 12 – True Heading

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
True Heading															

16 bit two's-complement signed integer aircraft heading from True North in degrees
MSB = 180 degrees

Word 13 – Magnetic Heading

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Magnetic Heading															

16 bit two's-complement signed integer aircraft heading from Magnetic North in degrees
MSB = 180 degrees

Word 14 – X Acceleration

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
----	----	----	----	----	----	---	---	---	---	---	---	---	---	---	---

X Acceleration	Not Used
----------------	----------

Bits 5 - 15 – 11 bit two's complement signed integer representing aircraft acceleration local X (North) direction in feet / second².

LSB = 1 foot / second²

Word 15 – Y Acceleration

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Y Acceleration											Not Used				

Bits 5 - 15 – 11 bit two's complement signed integer representing aircraft acceleration local Y (East) direction in feet / second².

LSB = 1 foot / second²

Word 16 – Z Acceleration

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Z Acceleration											Not Used				

Bits 5 - 15 – 11 bit two's complement signed integer representing aircraft acceleration local Z (Down) direction in feet / second².

LSB = 1 foot / second²

Word 17 to 20 – Not used

Word 21, 22 – Latitude

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Latitude MSW															
Latitude LSW															

32 bit two's-complement signed integer representing aircraft latitude in semi-circles.

MSB = 180 degrees

Word 23, 24 – Longitude

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Longitude MSW															
Longitude LSW															

32 bit two's-complement signed integer representing aircraft latitude in semi-circles

MSB = 180 degrees

Word 25 – Altitude

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Altitude															

16 bit two's-complement signed integer representing aircraft MSL altitude in feet.

LSB = 4 feet

Word 26 to 32 – Not used