

DARPlus File Format

Rosemount Aerospace Inc. Model 8730L1

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NOTE: References to the company in this document will be made as *Rosemount Aerospace Inc.*

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1 INTRODUCTION

DARPlus is a data recording service hosted on the Collins Aerospace 8730L1 AID which can be configured to acquire specific ARINC 429 or ARINC 717 data words and record them to a file for later analysis.

The specific data words which are recorded are determined by subscription data which is included in a software configuration part which has been loaded onto the AID. The subscription data and the software configuration part are created by Collins, based on customer needs.

This document describes the format of the data contained in a DARPlus file.

2 DARPLUS FILE FORMAT

The DARPlus service stores received data in a file in CSV format, one line per data item. A DARPlus file will likely contain many lines.

Each line in the DARPlus file contains six comma-separated fields. Each line is terminated by a linefeed character. The general format for a line is:

```
<timestamp>,<line id>,<label>,<subframe>,<word>,<value><LF>
```

When a line contains ARINC 429 data, the timestamp, line id, label, and value fields are populated. The subframe and word fields are left empty.

ARINC 429 example:

```
1689206032542,8,75,,,673003
```

When a line contains ARINC 717 data, the timestamp, line id, subframe, word, and value fields are populated. The label field is left empty.

ARINC 717 example:

```
1506175217096,18,,3,364,03F8
```

See descriptions of each field in the following sections.

2.1 Timestamp

1689206032542, 8, 75, , , 673003

The timestamp field represents the time at which the data item was received by the AID. It is expressed in milliseconds since Unix Epoch (Jan 1, 1970). The above value represents July 12, 2023, 23:53:52.542, UTC.

2.2 Line ID

1689206032542, 8, 75, , , 673003

The line id identifies the logical interface on which the data item was received. Table 1 shows the relationship between line ids and physical interfaces:

Line ID	Interface	Line ID	Interface	Line ID	Interface
0	A429 RX 1	6	A429 RX 7	20	A429 RX 11
1	A429 RX 2	7	A429 RX 8	21	A429 RX 12
2	A429 RX 3	8	A429 RX 9	22	A429 RX 13
3	A429 RX 4	9	A429 RX 10	23	A429 RX 14
4	A429 RX 5	18	A717 BiPhase	24	A429 RX 15
5	A429 RX 6	19	A717 BiPolar	25	A429 RX 16

Table 1 - Line IDs and Physical Interfaces

2.3 Label

1689206032542, 8, 75, , , 673003

The label field indicates the octal label number of a received ARINC 429 data word, which along with the line id can be used to identify the data item.

2.4 Subframe and Word

1506175217096, 18, , 3, 364, 03F8

The subframe and word fields indicate the position of a received ARINC 717 data word within its data frame, which along with the line id can be used to identify the data item. The subframe and word representations are zero-based.

2.5 Value

1689206032542, 8, 75, , , 673003 (A429)

1506175217096, 18, , 3, 364, 03F8 (A717)

The value field contains the hexadecimal representation of the received data. The bit range contained in this field is explained below.

2.5.1 ARINC 429

An ARINC 429 word is received as a 32-bit value. The value field of a DARPlus line which contains ARINC 429 data represents bits 32-9 of the received word.

As an example, the value field in the DARPlus line shown below corresponds to the illustration in Figure 1. In this example, the data arrived on label 75 on line id 8. Line id 8 corresponds to the physical interface for ARINC 429 RX 9. This interface is often connected to an SDAC (but check your installation's wiring diagram to be sure).

1689206032542, 8, 75, , , **673003**

ARINC 429 Data Word																															
P	SSM		Data																		SDI		Label								
32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
6			7			3			0			0			3																

Figure 1 – Data Bits for an ARINC 429 word

2.5.2 ARINC 717

An ARINC 717 data word is received as a 12-bit value. The value field of a DARPlus line which contains ARINC 717 data represents bits 12-1 (all bits) of the received word.

As an example, the value field in the DARPlus line shown below corresponds to the illustration in Figure 2. In this example, the value was located in subframe 3, word 364 and arrived on line id 18. The subframe and word representations are zero-based.

Line id 18 corresponds to the physical interface for the ARINC 717 BiPhase receiver. This interface is often connected to the DAR output of an FDIMU (but check your installation's wiring diagram to be sure).

1506175217096, 18, , 3, 364, **03F8**

ARINC 717 Data Word												
	12	11	10	9	8	7	6	5	4	3	2	1
0	3			F			8					

Figure 2 – Data Bits for an ARINC 717 word

4.2 ARINC 717

ARINC 717 data words are transmitted as a continuous sequence of large data blocks known as a frame. The definition of the data types which are contained in the frame, the organization of the data within the frame, and the representation of the data is described in a frame definition specification. This content of an ARINC 717 data frame can be highly customized and depends entirely on the configuration of the specific data frame in use on the aircraft. It is therefore necessary to consult the relevant specification to identify and interpret the value field of received ARINC 717 data words.

As mentioned earlier, the subframe and word values in a DARPlus file are zero-based. A data frame specification will likely use one-based numbering.

The process for converting ARINC 717 data is basically the same as that shown for ARINC 429.