

ESCAPE Cloud Microphysics Data Release : Scattering Probe Datasets

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Dataset Description

This document accompanies the uploaded scattering probe data collected during the ESCAPE flight campaign (May – June 2022) onboard NRC's Convair-580 aircraft. This document provides basic information about the sensors and brief notes on the data.

The dataset contains measurements collected by 2 scattering probes (Table 1). The instruments and their detection size ranges are shown in **Table 1**.

Table 1. Optical probes and their detection size ranges.

Instrument Name	Detection Size Range (um)	Manufacturer	Detection method	Reference
Cloud Droplet Probe (CDP-2)	2-50	DMT	Light Scattering	Lance et. al. 2010
Fast Cloud Droplet Probe (FCDP)	1-50	SPEC	Light Scattering	SPEC 2019

The uploaded dataset is comprised of thirteen flights, each at 1Hz resolution as seen in **Table 2**.

Table 2. Summary of ESCAPE flights information.

NRC Flight Number	Start Date (UTC)	Start Time (UTC)	End Time (UTC)	Flight Duration
C-RF01	31-May-22	13:36	18:41	5.1
C-RF02	02-Jun-22	14:31	19:24	4.9
C-RF03	02-Jun-22	20:40	01:21	4.7
C-RF04	04-Jun-22	18:58	22:59	4
C-RF05	08-Jun-22	14:58	18:54	4
C-RF06	09-Jun-22	20:01	23:52	3.9
C-RF07	10-Jun-22	20:19	00:46	4.5
C-RF08	11-Jun-22	19:44	00:24	4.7
C-RF09	12-Jun-22	17:12	21:47	4.5
C-RF10	14-Jun-22	16:42	21:39	5
C-RF11	16-Jun-22	15:09	19:23	4.3
C-RF12	16-Jun-22	21:05	01:07	4
C-RF13	17-Jun-22	15:05	19:38	4.5

Instrument Placement On The Aircraft

In **Figure 1**, a frontal view of the NRC Convair-580 aircraft is shown with labeled locations indicating placement of probes. **Table 3** provides a list of the scattering probe locations on the aircraft exterior. **Figure 2** contains a photograph of the Convair during flight, with the underwing probes in view.

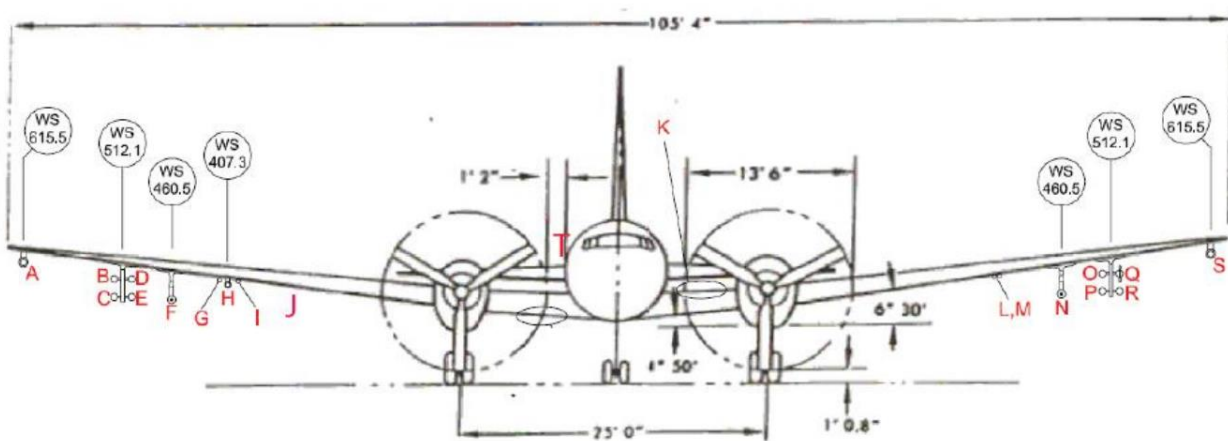


Figure 1. A diagram of the NRC Convair with instrumentation locations labeled.

Table 3. List of instruments located on the aircraft wing and fuselage as indicated in Figure 1.

Diagram Label	Instrument	Location acronym
D	CDP-2	Starboard Inner Upper (SIU)
E	NRC 2D-S & FCDP combo	Starboard Inner Lower (SIL)



Figure 2. NRC Convair-580 research aircraft instrumented with underwing cloud probes.

References

- Lance, S., Brock, C. A., Rogers, D., and Gordon, J. A.: Water droplet calibration of the Cloud Droplet Probe (CDP) and in-flight performance in liquid, ice and mixed-phase clouds during ARCPAC, *Atmos. Meas. Tech.*, 3, 1683–1706, <https://doi.org/10.5194/amt-3-1683-2010>, 2010.
- Droplet Measurement Technologies. Data Analysis User's Guide, Chapter 1 : Single Particle Light Scattering, DOC-0222 Rev A. (2009)
- Stratton Park Engineering Company Inc. Fast Cloud Droplet Probe Technical Manual Rev. 2.0 (2019)