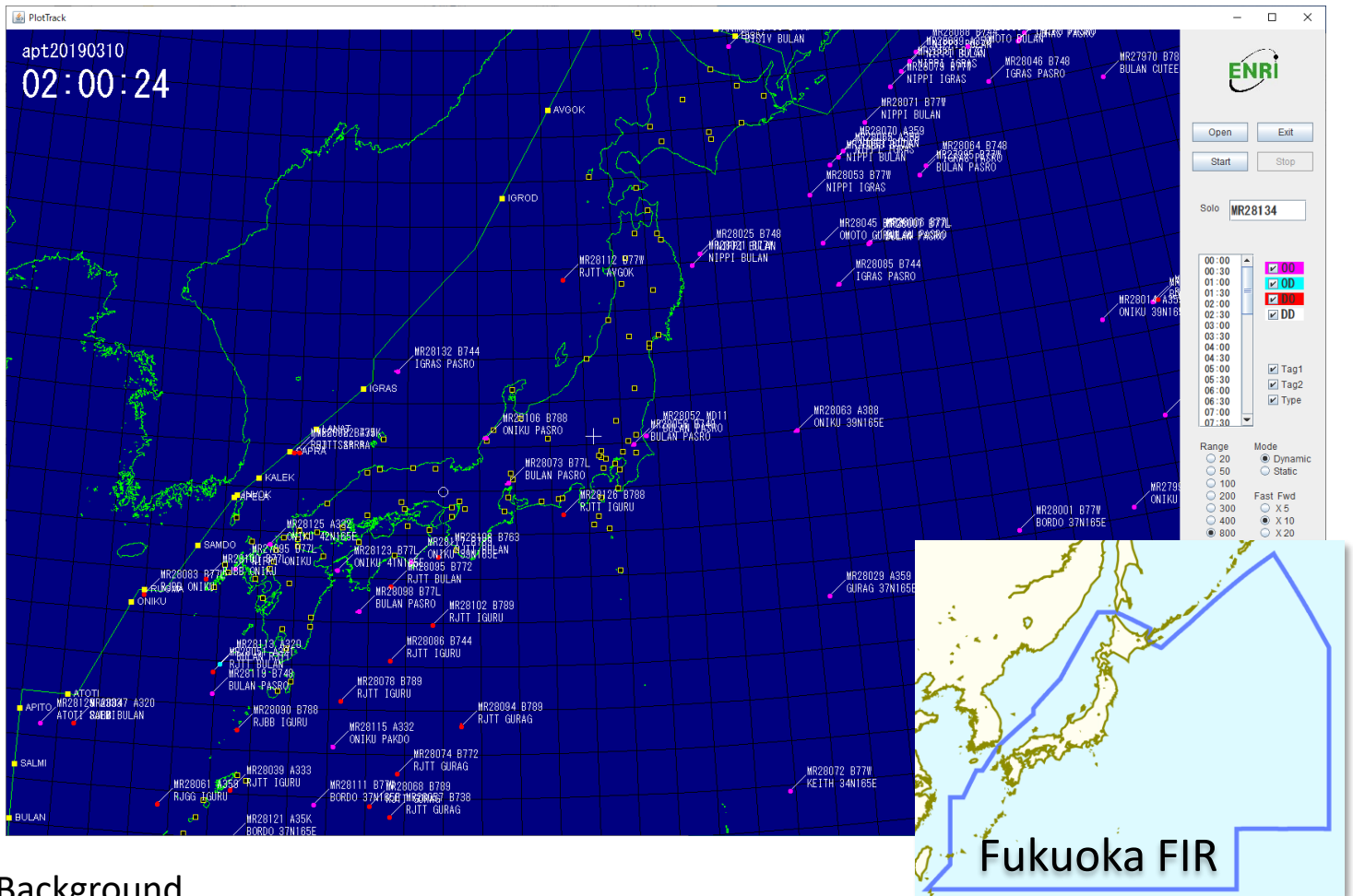


CARATS Open Data for Research & Development



Background

With an increase in the global air traffic demand, the accompanying social infrastructures, namely air traffic systems, are expected to improve for safer and more efficient air traffic management. A long-term vision, which is known as collaborative actions for renovation of air traffic systems (CARATS), has been established with the committee comprising academic experts, manufacturers, and related ministries and agencies including Japan Civil Aviation Bureau, promoting the renovation and modernization of the current air traffic systems. One of the committee's activities constitutes the distribution of a series of commercial aircraft track data possessed by air traffic control centers, CARATS open data, to accelerate the research and development in the fields of air traffic management and communication, navigation, and surveillance, and facilitate their improvement through a wider participation of government bodies, industries, and academia. Electronic Navigation Research Institute (ENRI) has extended its support to create data and promote the activity, given its experience in using radar data for research including performance analysis.

What is CARATS open data?

CARATS open data are a series of track data and weather data while the contents have been expanded. A series of track data are converted from the actual instrument-flight-rules (IFR)-scheduled-flights data recorded in the radar information and flight plan databases. The data have been processed to remove the need for confidentiality and are intended for general release. Currently, a total of 1.58 million flights data are available, which are provided to applicants for the sole purpose of research and development or academic-related objectives. Till date, the annual number of users from various fields, such as industry, academia, and government including foreign organizations, has significantly increased. It is considered that the CARATS open data will be utilized for activities that will foster the development of air transportation.

CARATS Open Data for Research & Development

Specification

twelve-weeks-a-year (a week of each month a year) data containing time histories of latitude, longitude, pressure altitude, and aircraft types provided in a comma-separated value format are collected for CARATS open data. Since the scope of the data has gradually expanded, they may have different contents with respect to a given year.

Period	2012 to 2018 (1,580,000 flights)
Source	Radar / ADS-C / MLAT
Coverage	Fukuoka FIR, IFR scheduled flights (including international flights)

Fukuoka FIR:

Radar control area: 10 sec interval

2012 2013 2014 2015 2016 2017 2018

Oceanic control area: 1 min interval

2015 2016 2017 2018

Terminal area: 8 sec interval

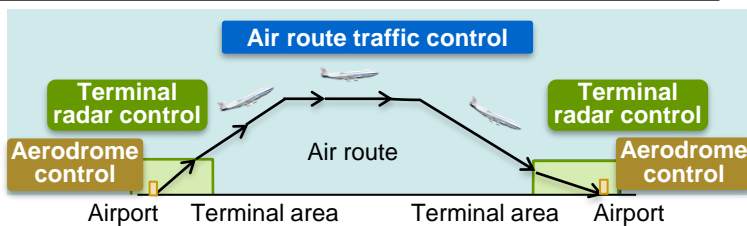
Tokyo international airport, Fukuoka airport

2013 2014 2015 2016 2017 2018

Airport surface: 1 sec interval

Tokyo international airport, Fukuoka airport

2016 2017 2018

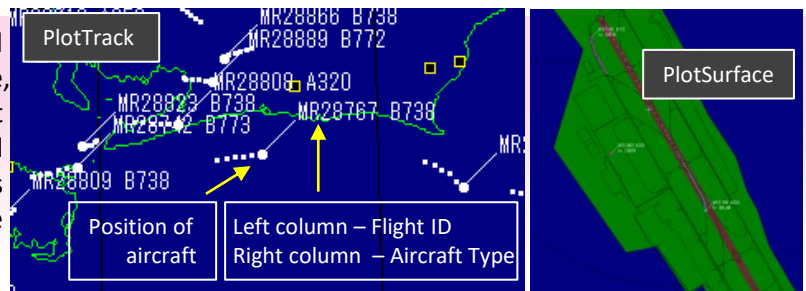


Data contents

Trajectory viewer "PlotTrack" and "PlotSurface"

With its joint collaboration, ENRI has developed and provided the trajectory viewer, PlotTrack and PlotSurface, to support the open data. It can display aircraft movements with fast forwarding capabilities and visualize images of all radar tracks. Moreover, it helps entrants catch a glimpse of traffic flow over the Japanese airspace easily.

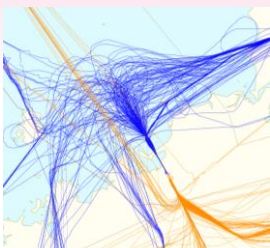
※Flight ID is given as a virtual ID due to confidentiality reasons.



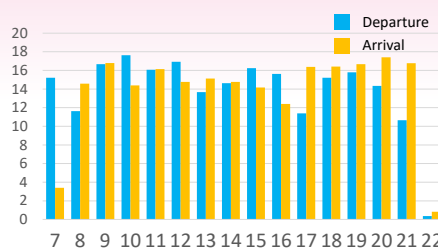
Display image

Application of CARATS open data

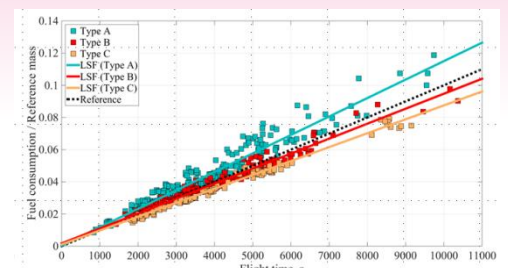
It is an extremely valuable source providing the data of most flights within the radar scope of the Japanese air traffic control, enabling users to conduct various analyses, such as the traffic flow tendency in a specific control area, and furthermore, flight efficiency through the combination of additional data, including weather forecast and aircraft performance.



Radar tracks



Traffic volume



Fuel consumption



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CARATS Open Data Information website



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