

Jan. 22, 2003, T. Kozu, Shimane University

## APPENDIX 1

### Major Engineering Parameters of the 2-D Video Disdrometer (2DVD)

#### Outline

A collaborative Indonesia-Japan project has been initiated to study the Coupling Processes in Equatorial Atmosphere (CPEA) utilizing the Equatorial Atmosphere Radar (EAR), located at Koto Tabang, west Sumatra, Indonesia. Observation of tropospheric convective activities in maritime continents, most intense in the world, is an essential part of the CPEA project, because they are powerful atmospheric wave sources and heat engines affecting the upper atmosphere and global circulation. Our goal is to reveal dynamical behavior of such convective activities through continuous and systematic observations by the EAR, various remote sensors and in-situ measurement instruments. The 2-D video disdrometer (2DVD), developed by JOANNEUM RESEARCH, Austria, in cooperation with ESA/ESTEC (European Space Agency / European Space and Technology Centre), can measure details of rain and other precipitation particles such as drop size distribution, shape and fall speed. The information from the 2DVD will be very useful to study the details of microphysics within the tropical convection, to assess the accuracy of radar remote sensing of precipitation, and to calibrate the EAR. This system will be shipped to Koto Tabang between the beginning and middle of February 2003, and the installation works will be done by middle March. The 2DVD observation will be made continuously.

#### System Description

The 2DVD consists of three main units: (1) the Sensor Unit (SU) housing two video systems for measuring the front and the side view of the hydrometeors, (2) Outdoor Electronics Unit (OEU) that controls the video cameras, acquires the raw data and performs preprocessing and data compression, and (3) Indoor User Terminal (IUT) that stores the data and gives a graphic display. Overall block diagram and major system parameters are shown in Fig.1 and Table 1, respectively. Fig.2 give the picture of the SU and OEU at the roof of a building of Shimane University, Japan.

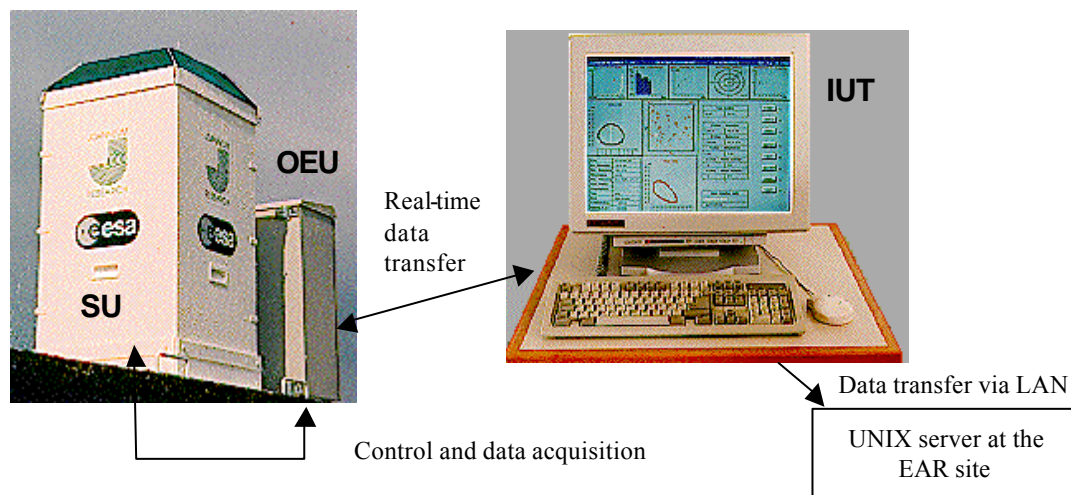


Fig. 1. Overall block diagram of 2DVD.

Table 1. Major parameters of 2DVD.

Horizontal resolution	better than 0.22 mm
Vertical resolution	better than 0.3 mm (vert. vel. < 10 m/s)
Vertical velocity accuracy	better than 5 %
Sampling area	approx. 100 x 100 mm
Rain rate accuracy	better than 10 %
Integration time	15 sec. to 24 hours
Data rate	1 - 2 MB/mm rain (typ.)
Mains voltage	110/220/240 V at 50/60 Hz
Power consumption	500 W
Length (SU with OEU mounted)	1500 mm width 600 mm
Height	1100 mm
Weight SU + OEU	approx. 130 kg



Fig. 2 Picture of 2DVD (SU and OEU).

Reference: <http://www.distrometer.at/>