LASER RADAR SYSTEM, ON-LINE DATA PROCESSING, AND ITS APPLICATION TO AIR POLLUTION AND METEOROLOGICAL STUDIES

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ABSTRACT

On-line laser radar system has been developed at Osaka University for studies of air pollutions and of meteorological conditions. Figure A (next page) shows a block diagram of an on-line laser radar system. The system is composed of a Q - switched ruby laser radar, automatic control devices for direction of the radar and sequence of laser pulsing, and data processing systems. In this system the received echo signals are sampled, A/D converted and then transferred to a digital computer for processing in the form of either electrical signals or punched tapes.

The digital computer is programmed so as to obtain the relative concentrations of aerosols on the path of a laser beam, and the results are displayed on CRT in any of the time-height, range-height or plan-position indication.

A movable laser radar system is also developed for observations of air pollution at urban areas. Combination of the movable and the fixed stations makes it possible to analyze air pollution problems more effectively.

The system has been used for observing the time changes of smog layers and temperature inversion layers, and the power station plume. The data obtained by this system are also used for quantitative analysis of aerosol structures, and for construction of an air pollution model. The detailed results will be presented at the Conference.

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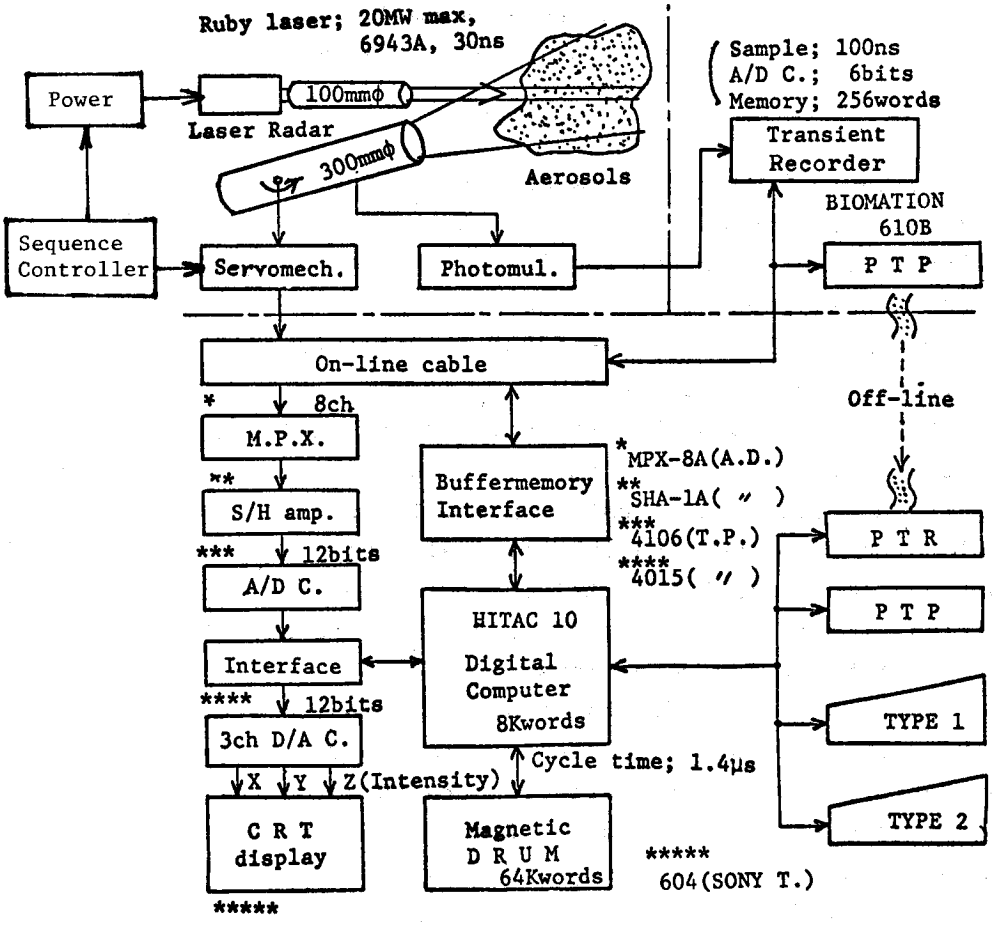

Fig. A : Block Diagram of Laser Radar System