

AN IBM PC-BASED CTD DATA ACQUISITION SYSTEM¹

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(Received October 30, 1986; accepted in revised form January 17, 1987)

ABSTRACT

A CTD data acquisition system was developed on an IBM PC micro-computer for simultaneously monitoring the operation of NBIS CTD in both graphics and numerical format, acquiring the binary CTD data, and providing a hardcopy of the CTD profile in real time. The real-time graphics display of vertical profiles of both temperature and salinity permits on-board decision on the proper sampling depths for the Rosette Water Sampler during a CTD cast. The program was written in C language and was optimized for using the IBM PC AT on board the R/V Ocean Researcher I. It can continuously acquire all the CTD data for a 6500 m CTD cast without manual interrupt. The adoption of high level computer language warrants the flexibility in future software modification in order to meet particular requirements.

INTRODUCTION

In the past three years, there were several CTD data acquisition systems (DAS) developed, using a micro-computer, to acquire the NBIS CTD data and to monitor the CTD operation on board the R/V Ocean Researcher I. The monitoring task of the DAS is essential because the NBIS CTD Deck Unit on the R/V is of Level 1, which only sends out CTD data without displaying their numerical values, like the depth of the CTD sensors. This and other tasks can be accomplished through a simple BASIC program using either an APPLE II or an IBM PC micro-computer. The data acquisition rate is 20% or less in either case. To have both the monitoring capability and a 50% data acquisition rate, one may adopt the strategy described in Wang and Chern (1986) which splits the computer's time to each task. Or if one prefers, he may split the tasks to two computers. With proper modification, Wang and Chern's method may be enhanced to run two micro-computers (8 or 16-bit machine) in parallel, one is dedicated to the near 100% data acquisition rate, while the other is dedicated to the numerical display and the monitoring of CTD cast. The limitation of this DAS configuration is the length of time for uninterrupted and unattended data acquisition. The time in seconds is approximately given by the usable memory size divided by 344.

In this note, we shall describe a software which not only has all the advantages mentioned above, but also provides vertical profiles of both temperature T and salinity S in real time for a normal 6500 m downcast. This real time graphics display of T and S helps the user to monitor the normality of CTD deployment, to make on-board decision on the triggering depths of Rosette Water Sampler, and to have hard copies of CTD profiles for on-board analyses.

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