



COMPTROLLER GENERAL OF THE UNITED STATES  
WASHINGTON, D.C. 20548

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Smith

B-163074

November 30, 1979

Mr. Robert R. Donaldson  
Vice President  
Federal Systems Operation  
Honeywell Information Systems, Inc. C436  
7900 Westpark Drive  
McLean, Virginia 22102

R Dear Mr. Donaldson:

U In your letter to me of November 7, 1979, you requested  
that I provide the Chairman, Subcommittee on Research and  
Development, House Armed Services Committee, corrections H505  
to my letter of October 1, 1979. Your request is based  
upon three issues.

First, you claim that your company has completed agreements  
with the General Accounting Office that represent a substantially  
different posture as it relates to certain Honeywell computer  
equipment supplied to the ~~Department of Defense~~. These are the  
Honeywell 6060 and 6080 computers, which are the World Wide  
Military Command and Control System (WWMCCS) standard computers.  
Thirty-five of these systems have been installed at 27 WWMCCS  
sites, based upon a contract signed on October 15, 1971.

We have made changes to our report based, in part, on  
verbal suggestions furnished by representatives from your  
company, in lieu of written comments on these matters. The  
changes did not result in any substantial redirection of the  
report or a substantially different posture relating to the  
WWMCCS standard computers furnished by Honeywell.

Second, you state that the alleged agreements include  
recognition of the fact that the prior commentary by the  
General Accounting Office concerning the Honeywell equipment's  
"lack of on-line interactive capability" was in error. Our  
April 23, 1979 testimony to the Chairman indicated that the  
WWMCCS standard computers are batch or sequence processing  
oriented and were not designed to operate in an on-line real-  
time manner as required in a command and control environment.

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A definition of the term "interactive" from the National Bureau of Standards Federal Information Processing Standards Publication 57 (August 1, 1978) follows:

"Interactive - A mode of operation wherein the computer and user communicate with each other through on-line keyboard terminals. In this mode of operation, each unit of transmission from the terminal is processed immediately and a response returned to the user. A "dialog" is said to exist between the user and computer. Interactive computer utilization may be used for programming, problem solving, inquiry, file update, text editing, or other data processing tasks."

Our report states that the principal reason for WWMCCS ADP problems is that the WWMCCS standard computer system's circuitry was not designed to operate in an on-line interactive mode as required in a command and control environment.

In addition to circuitry limitations, we state in our report that the control software or operating system for the WWMCCS standard computers is an efficient single-site batch oriented software, which does not provide an efficient and effective means for processing data in an on-line interactive environment.

We also state that the World Wide Data Management System (WWDMS) was based on batch processing oriented Honeywell software. Therefore, the major problems with WWDMS stem from its batch oriented architecture for use in an interactive environment. We do not maintain that there are intrinsic defects in the Honeywell software but that its application was inappropriate.

You maintain that the Honeywell computers used in WWMCCS are specifically designed to meet the requirements of a multi-dimensional environment, not a batch sequential environment. Your company states that the operating system integrates concurrent processing dimensions--time sharing, batch, and transaction processing.

Our report demonstrates that the basic design of the WWMCCS standard computers and software is batch oriented. WWMCCS standard computers and software can appear to be a satisfactory time sharing system, including transaction processing, for a limited number of routine applications and terminals--even though they are batch oriented in the internal hardware and software operations. The WWMCCS

standard computers do not support paging--the division of computer programs into small segments or blocks. Paging can be used for hardware support of an interactive environment by bringing into computer memory at a given instant only those instructions that are required to process a request. The instructions can be placed in non-contiguous blocks for optimum memory utilization and processing to support many remote computer terminals.

The WWMCCS operating software is batch oriented and requires that each program be completely sequence loaded in contiguous blocks of memory. The time required to move large blocks of characters or an entire program into and out of space in main memory seriously limits the computer's processing capabilities and its responsiveness, particularly during a time of crisis.

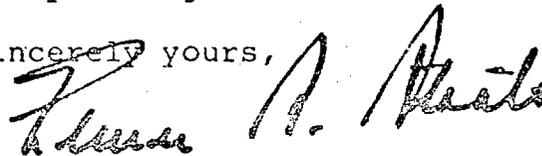
We demonstrate in our report that the WWMCCS standard computers and software have not effectively supported interactive processing in command and control exercises and in crisis situations. We also show that additional computer systems have been acquired at WWMCCS computer sites to try to overcome the capability problems of the WWMCCS standard computers and software.

Third, you state the major problem is the manner in which the WWMCCS standard computers are implemented, i.e. predominantly in a batch environment. We found that the WWMCCS standard computers and software do operate in a batch environment to meet Department of Defense specifications. However, we reported that several unique file access facilities have been implemented or are in final planning stages. These facilities are necessary to meet needs for interactive processing, because the WWMCCS standard operating system and data base management system are not responsive to mission requirements. Examples of command software to meet these interactive needs include: (1) the Force Management Information System, Strategic Air Command, (2) Storage and Retrieval System, Military Airlift Command, and (3) SCN5, U.S. Army Forces Command. Also, the North American Air Defense Command was directed to use the WWMCCS standard computers, which failed to meet its information processing needs.

In summary, the three issues you present do not constitute any basis for changing my October 1, 1979 letter to the Chairman, Subcommittee on Research and Development, House Armed Services Committee.

We trust that the above explanation of our positions in these matters adequately addresses your objections.

Sincerely yours,

A handwritten signature in cursive script, appearing to read "Thomas A. Beale". The signature is written in dark ink and is positioned to the right of the typed name.

Comptroller General  
of the United States