

April 19, 2005

**VIA EDGAR AND OVERNIGHT COURIER**

Mr. Daniel Gordon  
Branch Chief  
Division of Corporation Finance  
Securities and Exchange Commission  
450 Fifth Street, N.W.  
Washington, DC 20549

**Re: Mercury Computer Systems, Inc.  
Form 10-K for the fiscal year ended June 30, 2004  
Filed September 10, 2004  
Form 10-Q for the quarter ended December 31, 2004  
File No. 0-23599**

Dear Mr. Gordon:

This letter is submitted on behalf of Mercury Computer Systems, Inc. (the "Company") in response to the further comments of the staff of the Division of Corporation Finance (the "Staff") of the Securities and Exchange Commission raised in your letter of April 5, 2005 to Robert E. Hult, Senior Vice President and Chief Financial Officer of the Company (the "Comment Letter"). For reference purposes, the text of the Comment Letter has been reproduced herein with responses below each numbered comment.

Concurrently herewith, the Company is filing amendments to its Form 10-K for the fiscal year ended June 30, 2004 (the "Form 10-K") and Form 10-Q for the fiscal quarter ended December 31, 2004 (the "Form 10-Q") in response to the Staff's comments in the Comment Letter and the previous letter to the undersigned dated March 1, 2005. For your convenience, enclosed please find a copy of each of Amendment No. 1 to the Form 10-K and Amendment No. 1 to the Form 10-Q.

**Form 10-K as of June 30, 2004**

Note G – Acquisitions – Page 53

*Comment 1:*

*We note your response to prior comment 1. We note that you included a discussion of the factors that contributed to a purchase price that resulted in the recognition of goodwill for each of the acquisitions*

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*under the headings "Unallocated Purchase Price" for each acquisition in your response dated March 29, 2005. Revise future filings to include these disclosures in your financial statements in accordance with paragraph 51(b) of SFAS No. 141.*

Response 1:

In response to the Staff's comment, the Company will revise its future filings to include such disclosures in its financial statements in accordance with paragraph 51(b) of SFAS No. 141.

Item 9A. Controls and Procedures – Page 68

Comment 2:

*We note your response to prior comment 3. The language that appears after the word "effective" does not appear to include the full definition of disclosure controls and procedures contained in Rule 13a-15(e) of the Exchange Act. Please revise your conclusion to state simply whether your disclosure controls and procedures were effective. In the alternative, revise to clarify, if true, that your officers concluded that your disclosure controls and procedures were also effective to ensure that information required to be disclosed in the reports that you file or submit under the Exchange Act is accumulated and communicated to your management, including your chief executive officer and chief financial officer, to allow timely decisions regarding required disclosure. Refer to Rule 13a-15(e) of the Exchange Act.*

Response 2:

The Company has revised the disclosure in Item 9A of Amendment No. 1 to the Form 10-K in response to the Staff's comment.

\* \* \* \* \*

If you should have any questions concerning the enclosed matters, please contact the undersigned at (978) 256-1300.

Very truly yours,

/s/ Robert E. Hult

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Robert E. Hult  
Senior Vice President and  
Chief Financial Officer

Enclosures

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cc: Martin James  
Kevin Vaughn  
*Securities and Exchange Commission*  
Lisa R. Haddad  
*Goodwin Procter LLP*  
Michael D. Poirier  
*PricewaterhouseCoopers LLP*