

Mail Stop 6010

December 8, 2006

Mr. Robert E. Hult
Senior Vice President and Chief Financial Officer
Mercury Computer Systems, Inc.
199 Riverneck Road
Chelmsford, MA 01824

**RE: Mercury Computer Systems, Inc.
Form 10-K for the fiscal year ended June 30, 2006
Filed September 13, 2006
File No. 0-23599**

Dear Mr. Hult:

We have reviewed your filing and have the following comments. Where indicated, we think you should revise your document in future filings in response to these comments. If you disagree, we will consider your explanation as to why our comment is inapplicable or a revision is unnecessary. Please be as detailed as necessary in your explanation. In some of our comments, we may ask you to provide us with information so we may better understand your disclosure. After reviewing this information, we may raise additional comments.

Please understand that the purpose of our review process is to assist you in your compliance with the applicable disclosure requirements and to enhance the overall disclosure in your filing. We look forward to working with you in these respects. We welcome any questions you may have about our comments or on any other aspect of our review. Feel free to call us at the telephone numbers listed at the end of this letter.

FORM 10-K for the period ending June 30, 2006

Certifications

1. We note that the identification of the certifying individual at the beginning of the certification required by the Exchange Act Rule 13a-14(a) also includes the title of the certifying individual. In future filings the identification of the certifying

individual at the beginning of the certification should be revised so as not to include the individual title.

FORM 8-K dated October 26, 2006

2. We note that you present your non-GAAP measures and reconciliation in the form of non-GAAP statements of operations. This format may be confusing to investors as they also reflect several non-GAAP measures, including non-GAAP cost of revenue, non-GAAP gross profit, non-GAAP selling, general and administrative, non-GAAP research and development, non-GAAP operating expenses, non-GAAP (loss) income from operations' non-GAAP (loss) before income taxes, non-GAAP net (loss) income and non-GAAP basic and diluted income per share, which have not been described to investors. In fact, it appears that management does not use these non-GAAP measures but they are shown here as a result of the presentation format. Please note that Instruction 2 to Item 2.02 of Form 8-K requires that when furnishing information under this item you must provide all the disclosures required by paragraph (e)(1)(i) of Item 10 of Regulation S-K, including a reconciliation to the directly comparable GAAP measure for **each** non-GAAP measure presented and explain why you believe the measures provide useful information to investors.
 - To eliminate investor confusion, in future filings please remove the non-GAAP statements of operations from all future filings and instead disclose only those non-GAAP measures used by management that you wish to highlight for investors, with the appropriate reconciliations.
 - Please note that in the event that your Form 8-K is incorporated by reference into a 33 Act registration statement, we may have additional questions relating to the appropriateness of this information being included in a document filed with, and not just furnished to, the Commission. At that time, we may request an amendment to the Form 8-K.

As appropriate, please respond to these comments within 10 business days or tell us when you will provide us with a response. Please furnish a cover letter with your response that keys your responses to our comments and provides any requested information. Detailed cover letters greatly facilitate our review. Please file your cover letter on EDGAR. Please understand that we may have additional comments after reviewing your responses to our comments.

We urge all persons who are responsible for the accuracy and adequacy of the disclosure in the filing to be certain that the filing includes all information required under the Securities Exchange Act of 1934 and that they have provided all information investors require for an informed investment decision. Since the company and its

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management are in possession of all facts relating to a company's disclosure, they are responsible for the accuracy and adequacy of the disclosures they have made.

In connection with responding to our comments, please provide, in writing, a statement from the company acknowledging that:

- the company is responsible for the adequacy and accuracy of the disclosure in the filings;
- staff comments or changes to disclosure in response to staff comments do not foreclose the Commission from taking any action with respect to the filing; and
- the company may not assert staff comments as a defense in any proceeding initiated by the Commission or any person under the federal securities laws of the United States.

In addition, please be advised that the Division of Enforcement has access to all information you provide to the staff of the Division of Corporation Finance in our review of your filing or in response to our comments on your filing.

You may contact Dennis Hult, Staff Accountant, at (202) 551-3618 or me at (202) 551-3554 if you have questions regarding comments on the financial statements and related matters. In this regard, do not hesitate to contact Martin James, Senior Assistant Chief Accountant, at (202) 551-3671.

Sincerely,

Angela J. Crane
Accounting Branch Chief