

February 3, 2011

VIA EDGAR AND OVERNIGHT COURIER

Division of Corporation Finance
Securities and Exchange Commission
Mail Stop 3030
100 F Street, N.E.
Washington, D.C. 20549

Attention: Julie Sherman
Martin James

Re: Mercury Computer Systems, Inc.
Form 10-K for the year ended June 30, 2010
Filed August 19, 2010
File No. 000-23599

Ladies and Gentlemen:

This letter is submitted by Mercury Computer Systems, Inc. (the “Company” or “Mercury”) in response to the comments of the staff of the Division of Corporation Finance of the Securities and Exchange Commission (the “Staff”) as set forth in your letter to Robert E. Hult dated January 31, 2011 with respect to the Company’s Form 10-K for the fiscal year ended June 30, 2010 (the “Comment Letter”). For reference purposes, the text of your letter has been reproduced herein with responses below each numbered comment.

Form 10-K for the year ended June 30, 2010Comment 1:Note O. Product Warranty Accrual, Page 82

“We noted from your table that your warranty accrual decreased significantly during fiscal 2010 and that appears to be primarily a result of less accruals for warranties issued during the fiscal 2010 period, however, we noted that your sales increased during this period. Please explain.”

Response to Comment 1:

In response to the Staff’s comment, at the end of fiscal 2010 we performed an assessment of our trailing 12 month historic warranty expense and our outstanding product sales still under warranty to determine the potential exposure for future periods, consistent with the Company’s historical practice. As part of this analysis the Company observed that we had experienced higher warranty expenditures in prior years as a direct result of a discontinued product line for which the warranty period expired during fiscal 2010. This specific product line’s warranty called for full replacement rather than less expensive repairs.

The Company made improvements in product designs and sales of these improved products have led to fewer warranty claims. Additionally, the Company has improved its warranty fulfillment process making

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it more efficient. The combination of these factors resulted in our warranty accrual decreasing significantly during fiscal 2010 despite increased sales during this period.

Comment 2:

Note P. Discontinued Operations, Page 82

“Please revise future filings to disclose the carrying amounts of the major classes of assets and liabilities included as part of each disposal group or tell us why you do not believe such disclosure is necessary. We refer you to FASB ASC 205-20-50-1.”

Response to Comment 2:

In response to the Staff’s comment, the Company will ensure that, to the extent we have material assets and liabilities included as part of a disposal group, we will disclose the carrying amounts of the disposal group’s assets and liabilities as required under FASB ASC 205-20-50-1. These disclosures will be made in future reporting periods if applicable.

Comment 3:

Note O. Income Tax (Benefit) Expense, page 84

“We note from your disclosure on page 40 that your effective income tax rate for fiscal 2010 was (50.2%), as a result of releasing a portion of your valuation allowance on your resulted U.S. deferred tax assets. You state on page 40 that the change in the valuation allowance resulted in a benefit of \$14.8 million, which included a June 30, 2010 release of \$7.4 million of your valuation allowance. We note from page 86 that the remaining change in the valuation allowance that resulted in a tax benefit of approximately \$7.4 million was due to the current year changes in net deferred taxes. Giving specific consideration to negative evidence such as cumulative losses in recent years, provide us in more detail the positive and negative evidence considered by you in determining that it is more likely than not that the deferred tax assets net of the existing valuation allowance at June 30, 2010 will be realized, which caused you to decrease your valuation allowance by approximately \$14.8 million. In this regard, please explain to us the facts and circumstances the caused the change in the valuation allowance of approximately \$7.4 million that was due to current year changes in net deferred taxes as discussed on page 86, which appeared to be recognized as a tax benefit in your statement of operations. Refer to the guidance provided in paragraphs 30-5(e), 30-17 through 30-19, and 30-21 through 30-23 of FASB ASC 740.10.30.”

Response to Comment 3:

In response to the Staff’s Comment, the Company notes that each quarter throughout 2010 it evaluated the positive and negative evidence available in assessing the need for its existing valuation allowance as required by FASB ASC 740-10-30. The Company’s analysis included giving specific consideration to negative evidence including cumulative losses in recent years.

The Company noted that in the fourth quarter of fiscal 2010 cumulative historical domestic operating results for the past 12 quarters transitioned from negative to positive. This was attributable to fourth quarter fiscal 2010 operating income of \$9.6 million and the drop off of a significant loss quarter at the

beginning of the 12 quarter period. The Company's evaluation of negative and positive evidence available during fiscal 2010 resulted in the Company decreasing its valuation allowance by \$7.4 million at June 30, 2010.

The cumulative historical domestic operating results for the past 12 quarters is presented below:

Quarter	Rolling Twelve Quarters – Cumulative Historical Results of Domestic Operations	
	Operating Results (\$ millions)	Change from Prior Quarter
Q4 FY09	(\$ 38.9)	\$ 9.0
Q1 FY10	(\$ 24.1)	\$ 14.8
Q2 FY10	(\$ 17.5)	\$ 6.6
Q3 FY10	(\$ 9.5)	\$ 8.0
Q4 FY10	\$ 13.9	\$ 23.4

Negative and Positive evidence considered by the Company in determining that it was more likely than not that the deferred tax assets, net of the existing valuation allowance at June 30, 2010, would be realized included the following:

- **Negative evidence:** Cumulative losses in recent years.
 - The cumulative losses resulted in negative evidence which precluded the Company from being able to realize the benefits of its deferred tax assets prior to the fourth quarter of fiscal 2010. Accordingly, the Company maintained its valuation allowance against the majority of its deferred tax assets until June 30, 2010.
 - The Company's cumulative losses in recent years were driven in part by non-core, non-performing businesses which were divested in fiscal 2008 and 2009.
- **Positive evidence:** Rolling 12 quarter cumulative profitability, divestitures of certain non-core businesses, income from continuing operations before income taxes in fiscal 2009 and 2010, net income in fiscal 2010 and forecasted profitability for fiscal 2011, 2012 and 2013.
 - As referenced in the table above, in the fourth quarter of fiscal 2010 cumulative historical domestic operating results including permanent items for the past 12 quarters transitioned from negative to positive.
 - During fiscal 2008 and 2009, the Company divested its non-core, non-performing businesses.
 - The Company forecasted profitability for fiscal years 2011, 2012 and 2013.
 - The Company continues to meet and exceed its guidance through the first six months of fiscal 2011.
 - The Company had income from continuing operations before income taxes for fiscal 2009 and 2010 and net income for fiscal 2010.

Based on the weight of positive evidence in the analysis in the quarter ended June 30, 2010 the Company reversed \$7.4 million of its valuation allowance.

In addition, the Company adopted ASU 2009-13 on July 1, 2009 for book purposes, but elected to defer adoption for tax purposes until July 1, 2010. As a result of this tax position, a net increase in the Company's deferred tax liabilities arose from the resultant deferred revenue for tax. These deferred tax liabilities offset a similar amount of deferred tax assets, thereby decreasing the Company's valuation allowance by \$7.4 million (i.e. in addition to the \$7.4 million referenced above) during 2010. The combination of these two separate items resulted in the decrease of the Company's valuation allowance by approximately \$14.8 million.

As requested in the Comment Letter, the Company acknowledges that:

- the Company is responsible for the adequacy and accuracy of the disclosure in the filing;
- 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.

If you should have any questions concerning the enclosed matters, please contact the undersigned at (978) 967-1990.

/s/ Robert E. Hult

Robert E. Hult
Senior Vice President, Chief Financial Officer, and Treasurer