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**UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION  
WASHINGTON, DC 20549**

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**FORM 8-K**

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**CURRENT REPORT**

**PURSUANT TO SECTION 13 OR 15(d) OF THE  
SECURITIES EXCHANGE ACT OF 1934**

**Date of report (Date of earliest event reported): September 14, 2010**

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**Mercury Computer Systems, Inc.**

(Exact Name of Registrant as Specified in Charter)

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**Massachusetts**  
(State or Other Jurisdiction  
of Incorporation)

**000-23599**  
(Commission  
File Number)

**04-2741391**  
(IRS Employer  
Identification No.)

**201 Riverneck Road, Chelmsford, Massachusetts 01824**  
(Address of Principal Executive Offices) (Zip Code)

**Registrant's telephone number, including area code: (978) 256-1300**

**Not Applicable**

(Former Name or Former Address, if Changed Since Last Report)

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Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions (see General Instruction A.2. below):

- Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)
  - Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)
  - Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))
  - Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))
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**Item 5.02      Departure of Directors or Certain Officers; Election of Directors; Appointment of Certain Officers; Compensatory Arrangements of Certain Officers.**

Effective September 14, 2010, Mercury Computer Systems, Inc. (the “Company”) appointed Charles A. Speicher as Vice President, Controller, and Chief Accounting Officer. Prior to assuming his position with the Company, Mr. Speicher, age 51, had been Vice President of Business Operations and Enterprise Risk Management at Virtusa Corporation, a publicly-traded global IT services company, since December 2009. From September 2001 to December 2009, he was Vice President Global Accounting Operations and Corporate Controller at Virtusa Corporation. Mr. Speicher was Corporate Controller at Cerulean Technologies Inc., a private software product company, from 1996 to 2000 prior to its sale to Aether Systems Inc. where he served as Division Controller of Aether Mobile Government from 2000 to 2001.

Mr. Speicher was granted 25,000 shares of restricted stock under the Company’s 2005 Stock Incentive Plan in connection with his joining the Company.

**SIGNATURES**

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned thereunto duly authorized.

Dated: September 14, 2010

MERCURY COMPUTER SYSTEMS, INC.

By: \_\_\_\_\_ /s/ ROBERT E. HULT  
Robert E. Hult  
Senior Vice President, Chief Financial Officer, and Treasurer