

---

---

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

---

**FORM 8-K**

---

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

Date of report (Date of earliest event reported): February 4, 2009

---

**Mercury Computer Systems, Inc.**

(Exact Name of Registrant as Specified in Charter)

---

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

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

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

**199 Riverneck Road, Chelmsford, Massachusetts**  
(Address of Principal Executive Offices)

**01824**  
(Zip Code)

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

**Not Applicable**

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

---

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))
- 
-

---

**Item 8.01 Other Events.**

On February 4, 2009, Mercury Computer Systems, Inc. (the "Company") repurchased \$119,688,000 (face value) aggregate principal amount of its 2.00% Convertible Senior Notes due 2024 (the "Notes") from the holder of such Notes. The Company repurchased the Notes for aggregate consideration equal to the principal amount of the Notes, plus accrued interest. The Company paid the consideration for the Notes from a combination of cash on hand and the proceeds from the sale of certain U.S. Treasury securities held by the Company. The Company originally sold \$125,000,000 principal amount of the Convertible Senior Notes in April 2004.

**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: February 4, 2009

MERCURY COMPUTER SYSTEMS, INC.

By: /s/ Alex A. Van Adzin  
Alex A. Van Adzin  
Vice President, General Counsel,  
and Corporation Secretary