

SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, DC 20549

SCHEDULE TO
(Rule 13e-4)

TENDER OFFER STATEMENT UNDER SECTION 14(d)(1) OR 13(e)(1)
OF THE SECURITIES EXCHANGE ACT OF 1934
(Amendment No. 1)

MERCURY COMPUTER SYSTEMS, INC.

(Name of Subject Company (Issuer) and Filing Person (Offeror))

Options to Purchase Common Stock, Par Value \$.01 Per Share, of Mercury Computer Systems, Inc.
(Title of Class of Securities)

589378 10 8

(CUSIP Number of Class of Securities (Underlying Common Stock))

Alex A. Van Adzin, Esq.
Vice President, General Counsel, and Corporation Secretary
Mercury Computer Systems, Inc.
201 Riverneck Road
Chelmsford, Massachusetts 01824
(978) 256-1300

(Name, Address and Telephone Number of Person Authorized to Receive Notices and Communications on Behalf of Filing Person)

CALCULATION OF FILING FEE

Transaction Valuation*
\$1,555,516

Amount of Filing Fee**
\$86.80

* Calculated solely for purposes of determining the filing fee. This amount assumes that options to purchase 430,805 shares of common stock of Mercury Computer Systems, Inc., which options have an approximate aggregate value of \$1,555,516, will be exchanged pursuant to this offer. The aggregate value of such options was calculated based on the Black-Scholes option pricing model, as of May 7, 2009.

** The amount of the filing fee, calculated in accordance with Rule 0-11 under the Securities Exchange Act of 1934, as amended, equals \$55.80 per million dollars of the value of the transaction.

Check the box if any part of the fee is offset as provided in Rule 0-11(a)(2) and identify the filing with which the offsetting fee was previously paid. Identify the previous filing by registration statement number, or the Form or Schedule and the date of its filing.

Amount Previously Paid: \$86.80

Filing Party: Mercury Computer Systems, Inc.

Form or Registration No.: Schedule TO-I

Date Filed: May 14, 2009

Check the box if the filing relates solely to preliminary communications made before the commencement of a tender offer.

Check the appropriate boxes below to designate any transactions to which the statement relates:

- third party tender offer subject to Rule 14d-1.
 issuer tender offer subject to Rule 13e-4.
 going-private transaction subject to Rule 13e-3.
 amendment to Schedule 13D under Rule 13d-2.

Check the following box if the filing is a final amendment reporting the results of the tender offer:

Introductory Statement

This Amendment No. 1 to Schedule TO amends and supplements the Tender Offer Statement on Schedule TO filed by Mercury Computer Systems, Inc., a Massachusetts corporation ("Mercury"), with the Securities and Exchange Commission on May 14, 2009 in connection with Mercury's offer to exchange certain outstanding eligible options to purchase shares of Mercury's common stock, par value \$.01 per share, that were originally granted under Mercury's 1997 Stock Option Plan and Amended and Restated 2005 Stock Incentive Plan (the "2005 Plan") for a lesser number of shares of restricted stock, upon the terms and subject to the conditions set forth in the Offer to Exchange that was filed as Exhibit (a)(1)(A) to the Schedule TO. All capitalized terms used in this Amendment No. 1 to Schedule TO and not otherwise defined have the respective meanings ascribed to them in the Schedule TO.

ITEM 4. Terms of the Transaction

Item 4 of the Schedule TO is hereby amended and supplemented as follows:

"The Offer expired at 12:00 midnight, Eastern Time, on June 11, 2009. Pursuant to the Offer, Mercury accepted for exchange options to purchase an aggregate of 394,270 shares of Common Stock from 97 eligible employees, representing approximately 92% of the shares subject to all options that were eligible for exchange on that date. Subject to the terms and conditions of the Offer, on June 17, 2009, Mercury granted Replacement Awards under the 2005 Plan for an aggregate of approximately 153,545 shares of restricted stock in exchange for such tendered options."

