
SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 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**

MERCURY COMPUTER SYSTEMS, INC.

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

Options to Purchase Common Stock, Par Value \$0.01 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 Persons)

CALCULATION OF FILING FEE

Transaction Valuation

Not applicable*

Amount of Filing Fee

Not applicable*

* A filing fee is not required in connection with this filing as it relates solely to preliminary communications made before the commencement of a tender offer.

Check the box if any part of the fee is offset as provided by 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: Not applicable

Filing Party: Not applicable

Form or Registration No.: Not applicable

Date Filed: Not applicable

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:

This Tender Offer Statement on Schedule TO is being filed by Mercury Computer Systems, Inc. ("Mercury") pursuant to General Instruction D to Schedule TO.

Mercury has not commenced the exchange program referred to in the exhibit hereto. If the exchange program is approved by shareholders, Mercury will provide eligible employees with written materials explaining the full terms and conditions of the program, and will also file these materials with the Securities and Exchange Commission. WHEN THESE MATERIALS BECOME AVAILABLE, EMPLOYEES ELIGIBLE FOR THE EXCHANGE PROGRAM SHOULD READ THEM CAREFULLY, AS WELL AS ANY AMENDMENTS OR SUPPLEMENTS TO THOSE DOCUMENTS, BECAUSE THEY WILL CONTAIN IMPORTANT INFORMATION ABOUT THE PROPOSED OPTION EXCHANGE PROGRAM.

Once the materials are filed with the Securities and Exchange Commission, they will be available free of charge at www.sec.gov and by contacting Mercury's Investor Relations department at 201 Riverneck Road, Chelmsford, MA 01824, telephone (978) 256-1300.

EXHIBIT INDEX

<u>Exhibit No.</u>	<u>Description</u>
99.1	Excerpts from Mercury Computer Systems, Inc. Quarterly Conference Call held on April 28, 2009.

Excerpts from Mercury Computer Systems, Inc. Quarterly Conference Call held on April 28, 2009:

Mark Aslett, President and Chief Executive Officer:

“Before I hand it over to Bob, I’d like to briefly note the special meeting of shareholders scheduled for Friday, May 8th. As outlined in our April 13th proxy statement, the purpose of the meeting is to approve a stock option exchange program, which we feel is critical to employee retention as we execute on our turnaround. The program is structured to provide our employees with meaningful performance incentives while also being shareholder friendly in its design. Bob will provide some of the details in a few minutes. We encourage those of you who are shareholders to vote your shares in favor of this proposal.”

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

“I’d like to call your attention to a couple of important corporate items.... Second is the recently mailed proxy statement related to our proposed stock option exchange program for employees. Mark discussed the reasons for the proposal earlier. I’ll expand briefly on the mechanics, which we believe are shareholder friendly in their design. Our executive officers and board of directors are not eligible for the program. It has been structured as a value-for-value exchange for the participants, so it’s FAS-123R neutral to the extent practicable with minimal impact on the P&L. And it only includes stock options with exercise prices that exceed the 52-week high price of our stock. In addition, assuming full participation by the eligible participants, the program would represent approximately a 1.3% net reduction in the company’s equity award overhang. We believe the program is in the best interest of all of our shareholders, and we encourage you to vote in favor of the proposal.”