

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))

Craig Barrows, Esq.
Vice President and General Counsel
Mercury Computer Systems, Inc.
199 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)

Copies of all communications should be sent to:

Anthony J. Medaglia, Jr., P.C.
Goodwin Procter LLP
Exchange Place
Boston, Massachusetts 02109
(617) 570-1000

CALCULATION OF FILING FEE

Transaction Value*	Amount of Filing Fee**
\$15,311,708	\$1,638.36

* Calculated solely for purposes of determining the filing fee. This amount assumes that options to purchase 2,188,434 shares of common stock of Mercury Computer Systems,

Inc., which options have an approximate aggregate value of \$15,311,708, 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 July 31, 2006.

** The amount of the filing fee, calculated in accordance with Rule 0-11 under the Securities Exchange Act of 1934, as amended, equals \$107.00 per million dollars of the value of the transaction. The filing fee was previously paid on August 11, 2006 in connection with the initial filing of this Schedule TO.

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: 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:

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 August 11, 2006 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 for shares of restricted stock or phantom stock units that will be granted under Mercury's 2005 Stock Incentive Plan, 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.

This Amendment No. 1 is being filed solely to add an additional exhibit to the Schedule TO. Attached as Exhibit (a)(1)(O) hereto is a PowerPoint presentation regarding the exchange program.

ITEM 12. EXHIBITS.

The Exhibit Index included in this Amendment No. 1 to Schedule TO is incorporated herein by reference.

SIGNATURE

After due inquiry and to the best of my knowledge and belief, I certify that the information set forth in this statement is true, complete and correct.

MERCURY COMPUTER SYSTEMS, INC.
(Registrant)

Date: August 11, 2006

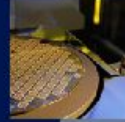
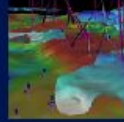
By: /s/ Robert E. Hult
Robert E. Hult
Senior Vice President,
Chief Financial Officer

EXHIBIT INDEX

Exhibit Number	Exhibit Description	Incorporated by Reference				Filed Herewith
		Form	File No.	Exhibit	Filing Date	
(a)(1)(A)	Offer to Exchange, dated August 11, 2006, including Transmittal Letter, form of Election to Participate and form of Notice of Withdrawal.	TO-I	005-52823	(a)(1)(A)	August 11, 2006	
(a)(1)(B)	Form of Personnel Grant Status.	TO-I	005-52823	(a)(1)(B)	August 11, 2006	
(a)(1)(C)	Email dated August 11, 2006 announcing the commencement of the election period for the exchange program.	TO-I	005-52823	(a)(1)(C)	August 11, 2006	
(a)(1)(D)	Form of email reminder of option exchange program expiration date.	TO-I	005-52823	(a)(1)(D)	August 11, 2006	
(a)(1)(E)	Preliminary Proxy Statement.	14A	000-23599	N/A	June 27, 2006	
(a)(1)(F)	Definitive Proxy Statement.	14A	000-23599	N/A	July 10, 2006	
(a)(1)(G)	Mercury's 2005 Stock Incentive Plan, amended and restated through August 7, 2006.	8-K	000-23599	10.1	August 8, 2006	
(a)(1)(H)	Form of Restricted Stock Award Agreement under Mercury's 2005 Stock Incentive Plan.	8-K	000-23599	10.3	November 16, 2005	
(a)(1)(I)	Form of Deferred Stock Award Agreement under Mercury's 2005 Stock Incentive Plan.	10-Q	000-23599	10.1	May 9, 2006	
(a)(1)(J)	French Guidelines for Stock Free Awards to employees and corporate officers of Mercury's French subsidiaries.	TO-I	005-52823	(a)(1)(J)	August 11, 2006	
(a)(1)(K)	Mercury's Annual Report on Form 10-K for the fiscal year ended June 30, 2005.	10-K	000-23599	N/A	September 13, 2005	
(a)(1)(L)	Mercury's Quarterly Report on Form 10-Q for the quarter ended September 30, 2005.	10-Q	000-23599	N/A	November 9, 2005	
(a)(1)(M)	Mercury's Quarterly Report on Form 10-Q for the quarter ended December 31, 2005.	10-Q	000-23599	N/A	February 9, 2006	
(a)(1)(N)	Mercury's Quarterly Report on Form 10-Q for the quarter ended March 31, 2006.	10-Q	000-23599	N/A	May 9, 2006	
(a)(1)(O)	PowerPoint Presentation Regarding the Exchange Program.					X
(b)	Not applicable.					
(d)(1)	Mercury's 1997 Stock Option Plan, as amended and restated.	8-K	000-23599	10.1	November 18, 2004	
(d)(2)	Form of Option Agreement under Mercury's 1997 Stock Option Plan.	10-Q	000-23599	10.1	November 1, 2004	
(d)(3)	Form of Restricted Stock Award Agreement under Mercury's 1997 Stock Option Plan.	8-K	000-23599	10.1	August 17, 2005	

<u>Exhibit Number</u>	<u>Exhibit Description</u>	<u>Incorporated by Reference</u>				<u>Filed Herewith</u>
		<u>Form</u>	<u>File No.</u>	<u>Exhibit</u>	<u>Filing Date</u>	
(d)(4)	Form of Restricted Stock Award Agreement with James R. Bertelli under Mercury's 1997 Stock Option Plan.	10-K	000-23599	10.2.4	September 13, 2005	
(d)(5)	Form of Stock Option Agreement under Mercury's 2005 Stock Incentive Plan.	8-K	000-23599	10.2	November 16, 2005	
(d)(6)	Form of Restricted Stock Award Agreement under Mercury's 2005 Stock Incentive Plan.	8-K	000-23599	10.3	November 16, 2005	
(d)(7)	Form of Restricted Stock Award Agreement with James R. Bertelli under Mercury's 2005 Stock Incentive Plan.	8-K	000-23599	10.4	November 16, 2005	
(d)(8)	Form of Stock Option Agreement under Mercury's 2005 Stock Incentive Plan.	8-K	000-23599	10.1	June 2, 2006	
(d)(10)	Form of Change in Control Severance Agreement.	8-K	000-23599	10.1	February 23, 2006	
(g)	Not applicable.					
(h)	Not applicable.					

Computer Systems, Inc.
MERCURY
Challenges Drive Innovation



Stock Option Exchange Program

- Equity Compensation Philosophy
- Program Overview
- Key Dates
- Eligibility
- Things To Consider
- What You Need to Do
- Questions and Answers

- Equity Compensation is a reward based on the long term future performance of the company.
- Equity Compensation should align the actions and behaviors of Mercury associates with the interests of Mercury shareholders.
- Equity Compensation should foster a sense of ownership among Mercury participants.
- Equity Compensation should be cost efficient.
- This is a voluntary program.

- Eligible associates can elect to exchange certain underwater stock options for replacement awards to be granted promptly after the close of the election period.
- Elections to participate must be done on a grant-by-grant basis. Grants can not be partially exchanged.
- Options are eligible to be exchanged if their per share exercise price is greater than the “threshold price.”
- The “threshold price” is the greater of (1) \$23.00 or (2) the closing price of our common stock reported on the Nasdaq Global Select Market on the date the election period for the exchange program expires.

- All eligible options will be exchanged for restricted stock rights in accordance with a fixed 4-to-1 exchange ratio. As an example, if you elect to exchange an eligible option representing the right to purchase 1,000 shares of common stock, you will receive a replacement award consisting of 250 restricted stock rights. We will not issue any fractional restricted stock rights.
- Restricted stock rights means either shares of restricted stock subject to a restricted stock award, or phantom stock units subject to a deferred stock award.

- Restricted stock awards consist of shares of our common stock that will be issued on the date the awards are granted. Restricted stock awards will be subject to vesting based on continued employment for a specified period. Until shares of restricted stock have vested, they remain subject to (1) forfeiture upon termination of employment and (2) restrictions on transfer.
- Deferred stock awards consist of phantom stock units that are not actual shares of our common stock. Rather, they represent the right to receive our common stock at a future date. Phantom stock units are subject to (1) forfeiture upon termination of employment and (2) restrictions on transfer prior to vesting and the related issuance of our common stock.
- All replacement awards will be granted under our 2005 Stock Incentive Plan, and will be subject to the terms of that plan and an award agreement between you and us.

- **United States, Japan and United Kingdom**

- Options will be exchanged for restricted stock awards. The new grants will vest over three years. Generally, one third of the grant will vest on the first, second and third grant anniversary date, provided you are employed by us on the vesting date.

- **United Kingdom**

- Associates will be responsible for paying the Company portion of National Insurance costs.

- **France and Germany**

- Options will be exchanged for deferred stock awards. The new grants will vest over three years. Two thirds of the grant will vest on the second grant anniversary date and the remaining one third will vest on the third grant anniversary date, provided you are employed by us on the vesting date.

Date	Milestone
August 11, 2006	Election Period begins
September 8, 2006	Election Period Ends/Expiration Date
September 11, 2006	Estimated Replacement Award Grant Date

- Employees are “eligible employees” if they are employed by Mercury on the date the election period commences *and* on the date on which the tendered options are cancelled and the replacement awards are granted.
- Members of our Board of Directors and our five most highly compensated executive officers are not eligible to participate in the exchange program.
- You must be an active employee on the replacement award grant date to be eligible to receive a replacement award.
- In general, employees on approved leaves of absence are eligible.
- If you receive or submit a notice of termination on or before the replacement award grant date, you will not be eligible to participate. In these cases you will retain your outstanding options subject to their existing terms.

- Mercury is not able to advise you on what course of action is right for you.
- Participation in this program is voluntary.
- See Section 14 and 15 and Appendix B of the Offer to Exchange for a description of certain tax consequences of the exchange program. These descriptions do not discuss all the tax consequences that may be relevant to you in light of your particular circumstances and are not intended to be applicable in all respects to all categories of option holders.
- You should check with your personal financial/tax advisor prior to deciding whether to participate.

- Read all materials provided to you.
- Review your option holdings via your personnel grant status statement or on-line via your eTrade account.
- If you choose to participate, complete and submit the Election Form on or before midnight “Boston Time” on the expiration date. Follow the instructions in Appendix C of the Offer to Exchange.
- You may change or revoke your election at any time prior to midnight “Boston Time” on the expiration date. Follow the instructions in Appendix C or D, as applicable, of the Offer to Exchange.
- Additional copies of the Offer to Exchange, the Election Form and the Notice of Withdrawal are available at <http://hr.mc.com/optionexchange>.

- You can find the materials relating to the Stock Option Exchange Program at <http://hr.mc.com/optionexchange>.
- If you have questions that have not been answered during this presentation, please refer to the Q&A section of the Offer to Exchange.
- You can also ask additional questions by sending an e-mail to MCS Stock Option Exchange.