
**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION**
Washington, D.C. 20549

POST-EFFECTIVE AMENDMENT NO. 2 TO

FORM S-8

**REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933**

MERCURY COMPUTER SYSTEMS, INC.

(Exact Name of Registrant as Specified in its Charter)

Massachusetts
(State of Incorporation)

04-2741391
(I.R.S. Employer Identification Number)

**199 Riverneck Road
Chelmsford, Massachusetts 01824
(978) 256-1300**
(Address of Principal Executive Offices)

**MERCURY COMPUTER SYSTEMS, INC.
1997 STOCK OPTION PLAN**
(Full Title of the Plan)

**Anthony J. Medaglia, Jr.
Goodwin Procter LLP
Exchange Place
Boston, Massachusetts 02109
(617) 570-1000**
(Name, Address and Telephone Number, Including Area Code, of Agent for Service)

EXPLANATORY NOTE

Mercury Computer Systems, Inc. (the "Company") is filing this post-effective amendment to deregister certain of the securities originally registered pursuant to the Registration Statement on Form S-8 (File No. 333-101993), filed with the Securities and Exchange Commission on December 19, 2002 (the "Registration Statement") with respect to shares of the Company's common stock, par value \$0.01 per share ("Common Stock"), thereby registered for issuance under the Company's 1997 Stock Option Plan, as amended (the "1997 Plan"). An aggregate of 4,000,000 shares of Common Stock were registered for issuance under the 1997 Plan pursuant to the Registration Statement.

On November 14, 2005, the Company's shareholders approved the Company's 2005 Stock Incentive Plan (the "2005 Plan"), which replaced the 1997 Plan as of the date of approval. Following the approval of the 2005 Plan, no future awards may be made under the 1997 Plan. The maximum number of shares of Common Stock reserved and available for issuance under the 2005 Plan includes the shares available for grant under the 1997 Plan as of the effective date of the 2005 Plan, plus the number of shares underlying any grants previously made under the 1997 Plan that are forfeited, canceled or terminated (other than by exercise) from and after the effective date of the 2005 Plan. The total number of shares available for grant under the 1997 Plan as of the effective date of the 2005 Plan was 1,942,264 shares. Additional shares (the "Additional Carried Forward Shares") have been included in the shares reserved for issuance under the 2005 Plan as a result of the forfeiture, cancellation or termination (other than by exercise) of previously-made grants under the 1997 Plan. The Additional Carried Forward Shares included 2,392,245 shares registered under the Registration Statement, which were deregistered pursuant to Post-Effective Amendment No. 1 to the Registration Statement filed on November 30, 2006. The Additional Carried Forward Shares also include an additional 229,978 shares registered under the Registration Statement, which are hereby deregistered.

Contemporaneously with the filing of this Post-Effective Amendment No. 2 to the Registration Statement, the Company is filing a Registration Statement on Form S-8 to register an additional 229,978 shares of Common Stock for issuance pursuant to the 2005 Plan.

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, the registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-8 and has duly caused this Post-Effective Amendment No. 2 to the Registration Statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the town of Chelmsford, the Commonwealth of Massachusetts on this 4th day of February, 2008.

MERCURY COMPUTER SYSTEMS, INC.

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

Pursuant to the requirements of the Securities Act of 1933, this Post-Effective Amendment No. 2 to the Registration Statement has been signed by the following persons in the capacities and on the dates indicated.

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ James R. Bertelli</u> James R. Bertelli	Chairman of the Board of Directors	February 4, 2008
<u>/s/ Mark Aslett</u> Mark Aslett	President, Chief Executive Officer and Director (Principal Executive Officer)	February 4, 2008
<u>/s/ Robert E. Hult</u> Robert E. Hult	Senior Vice President and Chief Financial Officer (Principal Financial and Principal Accounting Officer)	February 4, 2008
<u>/s/ Gordon B. Baty</u> Gordon B. Baty	Director	February 4, 2008
<u>/s/ Albert P. Belle Isle</u> Albert P. Belle Isle	Director	February 4, 2008
<u>/s/ George W. Chamillard</u> George W. Chamillard	Director	February 4, 2008
<u>/s/ Russell K. Johnsen</u> Russell K. Johnsen	Director	February 4, 2008
<u>/s/ Sherman N. Mullin</u> Sherman N. Mullin	Director	February 4, 2008

/s/ Lee C. Steele
Lee C. Steele

Director

February 4, 2008

/s/ Vincent Vitto
Vincent Vitto

Director

February 4, 2008

/s/ Richard P. Wishner
Richard P. Wishner

Director

February 4, 2008

EXHIBIT INDEX

<u>Exhibit No.</u>	<u>Description</u>
23.1	Consent of KPMG LLP
23.2	Consent of PricewaterhouseCoopers LLP

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

The Board of Directors
Mercury Computer Systems, Inc.:

We consent to the use of our reports dated September 7, 2007, with respect to the consolidated balance sheets of Mercury Computer Systems, Inc. and subsidiaries as of June 30, 2007 and 2006, and the related consolidated statements of operations, shareholders' equity and comprehensive (loss) income, and cash flows for each of the years in the two-year period ended June 30, 2007, and the related consolidated financial statement schedule, and the effectiveness of internal control over financial reporting as of June 30, 2007, which reports appear in the annual report on Form 10-K of Mercury Computer Systems, Inc. dated September 7, 2007. Both reports are incorporated herein by reference.

Our report dated September 7, 2007 on the effectiveness of internal control over financial reporting as of June 30, 2007, expresses our opinion that Mercury Computer Systems, Inc. did not maintain effective internal control over financial reporting as of June 30, 2007 because of the effect of a material weakness on the achievement of the objectives of the control criteria and contains an explanatory paragraph that states: A material weakness related to accounting for income taxes has been identified and included in management's assessment.

/s/ KPMG LLP

Boston, Massachusetts

February 4, 2008

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the incorporation by reference in this Post-effective Amendment No. 2 to the Registration Statement on Form S-8 of our report dated September 13, 2005 relating to the financial statements and financial statement schedule, which appears in Mercury Computer Systems, Inc.'s Annual Report on Form 10-K for the year ended June 30, 2007.

/s/ PricewaterhouseCoopers LLP

Boston, Massachusetts
February 4, 2008