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

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POST-EFFECTIVE AMENDMENT NO. 1 TO

**FORM S-8**

REGISTRATION STATEMENT  
UNDER  
THE SECURITIES ACT OF 1933

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**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)

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**Anthony J. Medaglia, Jr., Esq.  
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. An aggregate of 2,449,981 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 during the period between the effective date of the 2005 Plan and October 31, 2006. The Additional Carried Forward Shares include 2,392,245 shares registered under the Registration Statement, which are hereby deregistered. Additional shares reserved for issuance under the 1997 Plan may become available in the future as a result of the forfeiture, cancellation or termination (other than by exercise) of grants previously made under the 1997 Plan, and these additional shares will be included in the shares reserved for issuance under the 2005 Plan.

Contemporaneously with the filing of this Post-Effective Amendment No. 1 to the Registration Statement, the Company is filing a Registration Statement on Form S-8 to register the Additional Carried Forward Shares 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. 1 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 30th day of November, 2006.

### 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. 1 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	President, Chief Executive Officer and Director (Principal Executive Officer)	November 30, 2006
<u>/s/ Robert E. Hult</u> Robert E. Hult	Senior Vice President and Chief Financial Officer (Principal Financial Officer)	November 30, 2006
<u>/s/ Alex N. Braverman</u> Alex N. Braverman	Vice President, Controller and Chief Accounting Officer (Principal Accounting Officer)	November 30, 2006
<u>/s/ Gordon B. Baty</u> Gordon B. Baty	Director	November 30, 2006
<u>/s/ Albert P. Belle Isle</u> Albert P. Belle Isle	Director	November 30, 2006
<u>/s/ George W. Chamillard</u> George W. Chamillard	Director	November 30, 2006
<u>/s/ Russell K. Johnsen</u> Russell K. Johnsen	Director	November 30, 2006
<u>/s/ Sherman N. Mullin</u> Sherman N. Mullin	Director	November 30, 2006
<u>/s/ Lee C. Steele</u> Lee C. Steele	Director	November 30, 2006
<u>/s/ Vincent Vitto</u> Vincent Vitto	Director	November 30, 2006
<u>/s/ Richard P. Wishner</u> Richard P. Wishner	Director	November 30, 2006

**EXHIBIT INDEX**

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

**CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM**

The Board of Directors  
Mercury Computer Systems, Inc.:

We consent to the use of our report dated September 12, 2006, with respect to the consolidated balance sheet of Mercury Computer Systems, Inc. and subsidiaries as of June 30, 2006, and the related consolidated statements of operations, changes in shareholders' equity and comprehensive (loss) income, and cash flows for the year ended June 30, 2006, and the related financial statement schedule II, which report appears in the annual report on Form 10-K of Mercury Computer Systems, Inc. dated September 13, 2006, and to the use of our report on management's assessment of the effectiveness of internal control over financial reporting and the effectiveness of internal control over financial reporting as of June 30, 2006. Both reports are incorporated herein by reference.

Our report on the consolidated financial statements and related financial statement schedule refers to a change in the method of accounting for stock-based compensation upon the adoption of Statement of Financial Accounting Standards No. 123(R), "Share-Based Payment."

/s/ KPMG LLP

Boston, Massachusetts  
November 30, 2006

**CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM**

We hereby consent to the incorporation by reference in this Post-effective Amendment No. 1 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, 2005.

/s/ PricewaterhouseCoopers LLP

Boston, Massachusetts

November 30, 2006