

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

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

**CALCULATION OF REGISTRATION FEE**

Title of Securities to be Registered	Amount to be Registered(1)	Proposed Maximum Offering Price Per Share(2)	Proposed Maximum Aggregate Offering Price(2)	Amount of Registration Fee(2)
Common Stock	1,000,000 shares	\$25.40	\$25,400,000	\$2,989.58

- (1) This registration statement also relates to such indeterminate number of additional shares of Common Stock as may be necessary to satisfy the antidilution provisions of the employee benefit plan described herein or which may otherwise become issuable under such plan by reason of any stock dividend, stock split, recapitalization or other similar transaction which results in an increase in the number of outstanding shares of Common Stock.
- (2) Calculated in accordance with Rule 457(c) and (h) under the Securities Act of 1933 solely for the purpose of determining the amount of the registration fee. The registration fee has been calculated based on the average of the high and low prices on the NASDAQ National Market on April 20, 2005.

## NOTE

This registration statement is being filed solely for the purpose of registering 1,000,000 additional shares of common stock, par value \$.01 per share ("Common Stock"), of Mercury Computer Systems, Inc. ("Mercury") issuable pursuant to the Mercury Computer Systems, Inc. 1997 Stock Option Plan, as amended (the "Plan"), originally adopted in 1997. The total number of shares issuable under the Plan is 8,650,000 shares, of which 7,650,000 shares were previously registered on Form S-8 (Reg. Nos. 333-53291, 333-101993 and 333-112990). Pursuant to General Instruction E of Form S-8, the contents of these registration statements are incorporated herein by reference, except as otherwise noted below.

## PART II

### INFORMATION REQUIRED IN THE REGISTRATION STATEMENT

#### ITEM 5. INTERESTS OF NAMED EXPERTS AND COUNSEL.

The validity of the Common Stock offered hereby will be passed upon for Mercury by Goodwin Procter LLP, Boston, Massachusetts. Anthony J. Medaglia, Jr., a partner of Goodwin Procter LLP, is Secretary of Mercury and owns 25,950 shares of Common Stock and options for the purchase of an additional 7,010 shares of Common Stock. Lisa R. Haddad, also a partner of Goodwin Procter LLP, is an Assistant Secretary of Mercury.

#### ITEM 6. INDEMNIFICATION OF DIRECTORS AND OFFICERS.

Section 2.02(b)(4) of Chapter 156D of the Massachusetts General Laws allows a corporation to eliminate or limit the personal liability of a director of a corporation to the corporation or its shareholders for monetary damages for a breach of fiduciary duty as a director notwithstanding any provision of law imposing such liability, except where the director breached his duty of loyalty, failed to act in good faith, engaged in intentional misconduct or knowingly violated a law, authorized the payment of an improper distribution or obtained an improper personal benefit. Mercury has included a similar provision in its articles of organization.

Section 8.51(a) of Chapter 156D of the Massachusetts General Laws provides that a corporation may indemnify its directors against expenses (including attorneys' fees), judgments, fines and amounts paid in settlement reasonably incurred in connection with any litigation or other legal proceeding brought against any director by virtue of his position as a director of the corporation unless he is deemed to have not acted in good faith in the reasonable belief that his action was in the best interest of the corporation. As noted below, Mercury has provided for director indemnification in its articles of organization and bylaws.

Section 8.52 of Chapter 156D of the Massachusetts General Laws provides that a corporation must indemnify a director who is wholly successful, on the merits or otherwise, in the defense of any proceeding to which the director was a party because he was a director of the corporation against reasonable expenses incurred by him in connection with the proceeding.

Section 8.56(a) of Chapter 156D of the Massachusetts General Laws ("Section 8.56") provides that a corporation may indemnify its officers to the same extent as its directors and, for officers that are not directors, to the extent provided by (i) the articles of organization, (ii) the bylaws, (iii) a vote of the board of directors or (iv) a contract. In all instances, the extent to which a corporation provides indemnification to its officers under Section 8.56 is optional. As noted below, Mercury has provided for officer indemnification in its bylaws.

Mercury's bylaws, as amended, provide that, except as limited by law or otherwise provided in the bylaws, each director or officer of Mercury (and his heirs and personal representatives) shall be indemnified by Mercury against any expense incurred in connection with each proceeding in which he is involved as a result of his serving or having served as a director or officer. The bylaws further provide that no indemnification shall be provided to a director or officer with respect to a proceeding as to which it shall have been adjudicated that he did not act in good faith in the reasonable belief that his action was in the best interests of Mercury. Mercury will pay sums on account of indemnification in advance of a final disposition of a proceeding upon receipt of an undertaking by the director/officer to repay such sums if it is subsequently established that he is not entitled to indemnification.

The bylaws do not limit the power of the board of directors to authorize the purchase and maintenance of insurance on behalf of any director or officer against any expense whether or not Mercury would have the power to indemnify such director or officer against such expense under the bylaws. Mercury maintains directors' and officers' liability insurance.

Mercury has entered into indemnification agreements with its directors. The indemnification agreements require, among other matters, that Mercury indemnify its directors to the fullest extent provided by law and advance to directors certain expenses, subject to reimbursement if it is subsequently determined that indemnification is not permitted.

**ITEM 8. EXHIBITS.**

<u>Exhibit</u>	<u>Description</u>
4.1	Restated Articles of Organization, as amended (incorporated herein by reference to Exhibit 3.1 of Mercury's annual report on Form 10-K for the fiscal year ended June 30, 2003).
4.2	Amendment to Restated Articles of Organization dated November 15, 2004 (incorporated herein by reference to Exhibit 3.2 of Mercury's quarterly report on Form 10-Q for the fiscal quarter ended December 31, 2004).
4.3	By-laws, as amended (incorporated herein by reference to Exhibit 3.2 of Mercury's quarterly report on Form 10-Q for the fiscal quarter ended September 30, 2004).
4.4	1997 Stock Option Plan, as amended (incorporated herein by reference to Exhibit 10.1 to Mercury's current report on Form 8-K, dated November 15, 2004, and filed on November 18, 2004).
5.1*	Opinion of Goodwin Procter LLP.
23.1	Consent of Goodwin Procter LLP (included in Exhibit 5.1).
23.2*	Consent of PricewaterhouseCoopers LLP.
24.1	Power of Attorney (included in signature page to this registration statement).
99.1	Form of Stock Option Agreement under 1997 Stock Option Plan (incorporated herein by reference to Mercury's quarterly report on Form 10-Q for the fiscal quarter ended September 30, 2004).

\* Filed herewith

**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 registration statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the city of Chelmsford, the Commonwealth of Massachusetts on this 25th day of April, 2005.

**MERCURY COMPUTER SYSTEMS, INC.**

By: /s/ James R. Bertelli

James R. Bertelli, President and Chief Executive Officer

**POWER OF ATTORNEY**

KNOW ALL MEN BY THESE PRESENTS that each person whose signature appears below constitutes and appoints James R. Bertelli and Robert E. Hult his true and lawful attorneys-in-fact and agents, each acting alone, with full powers of substitution and resubstitution, for him or in his name, place and stead, in any and all capacities to sign any and all amendments or post-effective amendments to this registration statement (or any registration statement for the same offering that is to be effective upon filing pursuant to Rule 462(b) under the Securities Act of 1933), and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, each acting alone, full power and authority to do and perform each and every act and thing requisite or necessary to be done in and about the premises, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents, each acting alone, or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act of 1933, this 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>
/s/ James R. Bertelli _____ James R. Bertelli	President, Chief Executive Officer and Director (Principal Executive Officer)	April 25, 2005
/s/ Robert E. Hult _____ Robert E. Hult	Senior Vice President and Chief Financial Officer (Principal Financial Officer)	April 25, 2005
/s/ Joseph M. Hartnett _____ Joseph M. Hartnett	Vice President and Chief Accounting Officer (Principal Accounting Officer)	April 25, 2005
/s/ Gordon B. Baty _____ Gordon B. Baty	Director	April 25, 2005
/s/ Albert P. Belle Isle _____ Albert P. Belle Isle	Director	April 25, 2005

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/s/ George W. Chamillard	Director	April 25, 2005
George W. Chamillard		
/s/ Russell K. Johnsen	Director	April 25, 2005
Russell K. Johnsen		
/s/ Sherman N. Mullin	Director	April 25, 2005
Sherman N. Mullin		
/s/ Lee C. Steele	Director	April 25, 2005
Lee C. Steele		
/s/ Richard P. Wishner	Director	April 25, 2005
Richard P. Wishner		

## EXHIBIT INDEX

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\* Filed herewith

[Goodwin Procter LLP Letterhead]

April 25, 2005

Mercury Computer Systems, Inc.  
199 Riverneck Road  
Chelmsford, Massachusetts 01824-2820

**Re: Registration Statement on Form S-8 for Additional Shares**

Ladies and Gentlemen:

We are furnishing this opinion to you in our capacity as counsel to Mercury Computer Systems, Inc., a Massachusetts corporation (the "Company"), in connection with the preparation and filing of the Registration Statement on Form S-8 to which a copy of this opinion will be attached as an exhibit (the "Registration Statement"), relating to an additional 1,000,000 shares of the Company's common stock, par value \$.01 per share (the "Shares"), that the Company may issue pursuant to its 1997 Stock Option Plan, as amended (the "Plan").

As such counsel, we have examined the corporate records of the Company, including its Restated Articles of Organization, as amended, Bylaws, as amended, minutes of meetings of its Board of Directors and shareholders, and such other documents as we have deemed necessary as a basis for the opinions herein expressed.

We are attorneys admitted to practice in The Commonwealth of Massachusetts. We express no opinion as to the laws of any jurisdiction other than the laws of the United States of America and The Commonwealth of Massachusetts, and also express no opinion with respect to the blue sky or securities laws of any state, including Massachusetts.

Based upon the foregoing, and having regard for such legal considerations as we deemed relevant, we are of the opinion that, upon issuance and delivery of the Shares against payment therefor in accordance with the terms of the Plan and any agreement thereunder, the Shares will be validly issued, fully paid and nonassessable.

The foregoing assumes all requisite steps will be taken to comply with the requirements of the Securities Act of 1933, as amended (the "Securities Act"), and applicable requirements of state laws regulating the offer and sale of securities.

We hereby consent to the reference to our firm in the Registration Statement and to the filing of this opinion as an exhibit to the Registration Statement. In giving this consent, we do not admit that we are within the category of persons whose consent is required under Section 7 of the Securities Act.

Very truly yours,

/s/ GOODWIN PROCTER LLP

GOODWIN PROCTER LLP

**CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM**

We hereby consent to the incorporation by reference in this Registration Statement on Form S-8 of our report dated August 31, 2004 relating to the financial statements and financial statement schedule of Mercury Computer Systems, Inc., which appears in Mercury Computer Systems, Inc.'s Annual Report on Form 10-K for the year ended June 30, 2004.

/s/ PricewaterhouseCoopers LLP

Boston, Massachusetts

April 25, 2005