

**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.
2005 STOCK INCENTIVE PLAN**

(Full Title of the Plan)

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)

CALCULATION OF REGISTRATION FEE

Title of Securities to be Registered	Amount to be Registered(1)(2)	Proposed Maximum Offering Price Per Share	Proposed Maximum Aggregate Offering Price	Amount of Registration Fee(5)
Common Stock	5,500	\$19.81(3)	\$108,955(3)	\$0
	1,936,764	\$18.99(4)	\$36,779,149(4)	\$0
TOTAL AMOUNT	1,942,264		\$36,888,104	\$0

- (1) All of the 1,936,764 shares of the registrant's common stock listed were part of the shares previously registered by the registrant on Form S-8 (File No. 333-124294 filed on April 25, 2005 and File No. 333-112990 filed on February 20, 2004) in connection with the registrant's 1997 Stock Option Plan, as amended (the "Original Registration Statements").

- (2) In addition, pursuant to Rule 416(a) under the Securities Act of 1933, as amended (the "Securities Act"), this registration statement also covers an indeterminate number of additional shares of common stock to be offered or sold as a result of the anti-dilution provisions of the employee benefit plan described herein, including to prevent dilution resulting from any reorganization, recapitalization, reclassification, stock dividend, stock split or other similar change.
- (3) Represents the exercise price of outstanding options which have been granted under the 2005 Stock Incentive Plan.
- (4) Calculated in accordance with Rule 457(c) and (h) under the Securities Act solely for the purpose of determining the amount of the registration fee, based on the average of the high and low prices on the NASDAQ National Market on November 21, 2005.
- (5) The total registration fee for the shares being registered hereby is \$4,341.73. An aggregate filing fee of \$6,528.74 previously paid by the registrant in connection with the registration of the shares being carried forward from the Original Registration Statements is offset against the filing fee for this registration statement.

EXPLANATORY NOTE

This Registration Statement on Form S-8 (the "Registration Statement") is being filed for the purpose of registering shares of common stock, par value \$0.01 per share ("Common Stock"), of Mercury Computer Systems, Inc. (the "Company") to be offered to participants under the Company's 2005 Stock Incentive Plan (the "2005 Plan"). The maximum number of shares of Common Stock reserved and available for issuance under the 2005 Plan includes the shares available for issuance under the Company's 1997 Stock Option Plan, as amended (the "1997 Plan"), as of the effective date of the 2005 Plan. As of such effective date, there were 1,942,264 shares available for grant under the 1997 Plan, which shares were previously registered with the Securities and Exchange Commission (the "Commission") on Form S-8 (File No. 333-124294 filed on April 25, 2005 and File No. 333-112990 filed on February 20, 2004) in connection with the 1997 Plan. Such shares are carried forward and deemed covered by this Registration Statement in connection with the 2005 Plan. Additional shares reserved for issuance under the 1997 Plan may become available in the future as a result of the forfeiture, cancellation or termination of awards (other than by exercise) under the 1997 Plan, and these additional shares will be included in the shares reserved for issuance under the 2005 Plan.

PART I

INFORMATION REQUIRED IN THE SECTION 10(a) PROSPECTUS

The documents containing the information specified in Part I of Form S-8 will be sent or given to participants as specified by Rule 428(b)(1) under the Securities Act.

PART II

INFORMATION REQUIRED IN THE REGISTRATION STATEMENT

ITEM 3. INCORPORATION OF DOCUMENTS BY REFERENCE.

The following documents are incorporated herein by reference:

- (a) The Company's Annual Report on Form 10-K for the fiscal year ended June 30, 2005, as filed with the Commission on September 13, 2005;
- (b) The Company's Quarterly Report on Form 10-Q for the fiscal quarter ended September 30, 2005, as filed with the Commission on November 9, 2005;
- (c) All other reports filed by the Company with the Commission pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), subsequent to the date of the fiscal year covered by the annual report referred to in (a) above; and
- (d) The description of the Company's Common Stock contained in the Company's Registration Statement on Form 8-A dated January 7, 1998, as filed with the Commission pursuant to Section 12 of the Exchange Act, including any amendment thereto or report filed for the purpose of updating such description.

All documents subsequently filed by the Company pursuant to Section 13(a), 13(c), 14 and 15(d) of the Exchange Act, prior to the filing of a post-effective amendment which indicates that all securities offered hereby have been sold or that deregisters all securities then remaining unsold, shall be deemed to be incorporated by reference herein and to be a part hereof from the date of the filing of such documents.

ITEM 4. DESCRIPTION OF SECURITIES.

Not applicable.

ITEM 5. INTERESTS OF NAMED EXPERTS AND COUNSEL.

The validity of the Common Stock offered hereby will be passed upon for the Company by Goodwin Procter LLP, Boston, Massachusetts. Anthony J. Medaglia, Jr., a partner of Goodwin Procter LLP, is Secretary of the Company and owns 31,950 shares of Common Stock and options for the purchase of an additional 1,010 shares of Common Stock. Lisa R. Haddad, also a partner of Goodwin Procter LLP, is an Assistant Secretary of the Company.

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. The Company 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, the Company 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, the Company has provided for officer indemnification in its bylaws.

The Company's bylaws, as amended, provide that, except as limited by law or otherwise provided in the bylaws, each director or officer of the Company (and his heirs and personal representatives) shall be indemnified by the Company 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 the Company. The Company 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 the Company would have the power to indemnify such director or officer against such expense under the bylaws. The Company maintains directors' and officers' liability insurance.

The Company has entered into indemnification agreements with its directors. The indemnification agreements require, among other matters, that the Company 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 7. EXEMPTION FROM REGISTRATION CLAIMED.

Not applicable.

ITEM 8. EXHIBITS.

<u>Exhibit</u>	<u>Description</u>
4.1	Articles of Organization (incorporated herein by reference to Exhibit 3.1 of the Company's Annual Report on Form 10-K/A for the fiscal year ended June 30, 2002, as filed with the Commission on September 27, 2002).
4.2	Articles of Amendment (incorporated herein by reference to Exhibit 3.2 of the Company's Quarterly Report on Form 10-Q for the fiscal quarter ended December 31, 2004, as filed with the Commission on February 8, 2005).
4.3	By-laws, as amended (incorporated herein by reference to Exhibit 3.2 of the Company's Quarterly Report on Form 10-Q for the fiscal quarter ended September 30, 2004, as filed with the Commission on November 1, 2004).
4.4	Mercury Computer Systems, Inc. 2005 Stock Incentive Plan (incorporated herein by reference to Exhibit 10.1 of the Company's Current Report on Form 8-K, as filed with the Commission on November 16, 2005).
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 the 2005 Stock Incentive Plan (incorporated herein by reference to Exhibit 10.2 of the Company's Current Report on Form 8-K, as filed with the Commission on November 16, 2005).
99.2	Form of Restricted Stock Agreement under the 2005 Stock Incentive Plan (incorporated herein by reference to Exhibit 10.3 of the Company's Current Report on Form 8-K, as filed with the Commission on November 16, 2005).
99.3	Form of Restricted Stock Agreement for James R. Bertelli under the 2005 Stock Incentive Plan (incorporated herein by reference to Exhibit 10.4 of the Company's Current Report on Form 8-K, as filed with the Commission on November 16, 2005).

*Filed herewith

ITEM 9. UNDERTAKINGS.

(a) The undersigned registrant hereby undertakes:

(1) To file, during any period in which offers or sales are being made, a post-effective amendment to this registration statement:

(i) To include any prospectus required by Section 10(a)(3) of the Securities Act of 1933, as amended;

(ii) To reflect in the prospectus any facts or events arising after the effective date of the registration statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in the

registration statement. Notwithstanding the foregoing, any increase or decrease in volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the Commission pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than a 20 percent change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective registration statement;

(iii) To include any material information with respect to the plan of distribution not previously disclosed in the registration statement or any material change to such information in the registration statement;

provided, however, that paragraphs (a)(1)(i) and (a)(1)(ii) do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in periodic reports filed with or furnished to the Securities and Exchange Commission by the registrant pursuant to Section 13 or Section 15(d) of the Securities Exchange Act of 1934, as amended, that are incorporated by reference in the registration statement.

(2) That, for the purpose of determining any liability under the Securities Act of 1933, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

(3) To remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering.

(b) The undersigned registrant hereby undertakes that, for purposes of determining any liability under the Securities Act of 1933, each filing of the registrant's annual report pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934 (and, where applicable, each filing of an employee benefit plan's annual report pursuant to Section 15(d) of the Securities Exchange Act of 1934) that is incorporated by reference in the registration statement shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

(c) Insofar as indemnification for liabilities arising under the Securities Act of 1933 may be permitted to directors, officers and controlling persons of the registrant pursuant to the foregoing provisions, or otherwise, the registrant has been advised that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer or controlling person of the registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Act and will be governed by the final adjudication of such issue.

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 23rd day of November, 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, Robert E. Hult and Alex N. Braverman 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>
<u>/s/ James R. Bertelli</u> James R. Bertelli	President, Chief Executive Officer and Director (Principal Executive Officer)	November 23, 2005
<u>/s/ Robert E. Hult</u> Robert E. Hult	Senior Vice President and Chief Financial Officer (Principal Financial Officer)	November 23, 2005
<u>/s/ Alex N. Braverman</u> Alex N. Braverman	Vice President, Controller and Chief Accounting Officer (Principal Accounting Officer)	November 23, 2005
<u>/s/ Gordon B. Baty</u> Gordon B. Baty	Director	November 23, 2005
<u>/s/ Albert P. Belle Isle</u> Albert P. Belle Isle	Director	November 23, 2005

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ George W. Chamillard</u> George W. Chamillard	Director	November 23, 2005
<u>/s/ Russell K. Johnsen</u> Russell K. Johnsen	Director	November 23, 2005
<u>/s/ Sherman N. Mullin</u> Sherman N. Mullin	Director	November 23, 2005
<u>/s/ Lee C. Steele</u> Lee C. Steele	Director	November 23, 2005
<u>/s/ Richard P. Wishner</u> Richard P. Wishner	Director	November 23, 2005

EXHIBIT INDEX

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*Filed herewith

November 23, 2005

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

Re: Securities Being Registered Under Registration Statement on Form S-8

Ladies and Gentlemen:

This opinion is furnished to you in connection with your filing of a Registration Statement on Form S-8 (the "Registration Statement") pursuant to the Securities Act of 1933, as amended (the "Securities Act"), relating to an aggregate of 1,942,264 shares (the "Shares") of common stock, par value \$0.01 per share, of Mercury Computer Systems, Inc., a Massachusetts corporation (the "Company"), that may be issued pursuant to the Company's 2005 Stock Incentive Plan (the "2005 Plan").

For purposes of the opinion expressed below, we have reviewed such documents and conducted such investigation as we deemed appropriate. For certain matters of fact, we have relied on certificates or telephonic confirmations of public officials and certificates and statements of officers or representatives of the Company. We have not independently established the facts so relied on.

The opinion expressed below is limited to the laws of the Commonwealth of Massachusetts.

Based on the foregoing, we are of the opinion that the Shares have been duly authorized and, upon issuance and delivery against payment therefor in accordance with the terms of the 2005 Plan and any agreement thereunder, will be validly issued, fully paid and nonassessable.

We hereby consent to the inclusion of this opinion as an exhibit to the Registration Statement. In giving such consent, we do not admit that we are within the category of persons whose consent is required under Section 7 of the Securities Act, or the rules and regulations thereunder.

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 September 13, 2005 relating to the financial statements, financial statement schedule, management's assessment of the effectiveness of internal control over financial reporting and the effectiveness of internal control over financial reporting, 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, 2005.

/s/ PricewaterhouseCoopers LLP

Boston, Massachusetts
November 23, 2005