

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 Office)

MERCURY COMPUTER SYSTEMS, INC.
DEFERRED COMPENSATION 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 Each Class of Securities to be Registered	Proposed Maximum Offering Price(1)(2)	Amount of Registration Fee
Deferred Compensation Obligations	\$1,500,000	\$190.50

- (1) This estimate is made pursuant to Rule 457(h) under the Securities Act of 1933, as amended, based on the estimated amount of compensation being deferred under the plan. Estimated for purposes of calculating the registration fee in accordance with Rule 457(o) under the Securities Act of 1933.
- (2) Pursuant to Rule 416(c) under the Securities Act of 1933, this registration statement also covers an indeterminate amount of obligations to be offered or sold pursuant to the deferred compensation plan described herein.

PART II
INFORMATION REQUIRED IN THE REGISTRATION STATEMENT

ITEM 3. INCORPORATION OF DOCUMENTS BY REFERENCE

Mercury Computer Systems, Inc. ("Mercury") hereby incorporates by reference the documents listed in (a) and (b) below. In addition, all documents subsequently filed with the Securities and Exchange Commission by Mercury pursuant to Sections 13(a), 13(c), 14 and 15(d) of the Securities Exchange Act of 1934 (prior to filing of a post-effective amendment which indicates that all securities offered have been sold or which deregisters all securities then remaining unsold) shall be deemed to be incorporated by reference in this registration statement and to be a part hereof from the date of filing of such documents.

(a) Mercury's annual report on Form 10-K for the fiscal year ended June 30, 2003.

(b) Mercury's quarterly reports on Form 10-Q for the quarters ended September 30, 2003 and December 31, 2003.

ITEM 4. DESCRIPTION OF SECURITIES

Under the Mercury Computer Systems, Inc. Deferred Compensation Plan (the "Plan"), Mercury Computer Systems, Inc. (the "Sponsor") will provide corporate officers or other key employees with significant management responsibilities or highly compensated employees of the Sponsor (each a "Participant") the opportunity to enter into agreements for the deferral of a specified percentage of their compensation. The securities being registered represent obligations (the "Obligations") of the Sponsor under the Plan to pay in the future to the Participants in the Plan the value of the deferred compensation. The Obligations may also represent amounts that the Sponsor credits to a Participant's account under the Plan.

Amounts credited to a Participant's account are credited with notional earnings based on investment measurement options under the Plan. The Obligations are payable in cash upon the occurrence of specified triggering events in a lump sum or upon retirement in a lump sum distribution or in installments, at the election of the Participant made in accordance with the Plan. There is no trading market for the Obligations.

The Obligations are unsecured general obligations of the Sponsor and rank PARI PASSU with other unsecured and unsubordinated indebtedness of the Sponsor. The Obligations may not be sold, assigned, hypothecated, alienated, encumbered or in any way transferred or conveyed in advance of receipt. Any attempt by any person to transfer or assign benefits under the Plan other than a claim for benefits by a Participant or his or her beneficiary(ies), will be null and void.

The Obligations are not convertible into any other security of the Sponsor. No trustee has been appointed to take action with respect to the Obligations and each Participant in the Plan will be responsible for enforcing his or her own rights with respect to the Obligations.

ITEM 5. INTERESTS OF NAMED EXPERTS AND COUNSEL

The validity of the authorization and issuance of the Deferred Compensation Obligations 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 Clerk of Mercury and owns 25,950 shares of Mercury common stock and options for the purchase of an additional 7,010 shares of Mercury common stock.

ITEM 6. INDEMNIFICATION OF DIRECTORS AND OFFICERS

Section 67 of Chapter 156B of the General Laws of the Commonwealth of Massachusetts provides as follows:

“Section 67. Indemnification of directors, officers, employees and other agents of a corporation, and persons who serve at its request as directors, officers, employees or other agents of another organization, or who serve at its request in any capacity with respect to any employee benefit plan, may be provided by it to whatever extent shall be specified in or authorized by (i) the articles of organization or (ii) a by-law adopted by the stockholders or (iii) a vote adopted by the holders of a majority of the shares of stock entitled to vote on the election of directors. Except as the articles of organization or by-laws otherwise require, indemnification of any persons referred to in the preceding sentence who are not directors of the corporation may be provided by it to the extent authorized by the directors. Such indemnification may include payment by the corporation of expenses incurred in defending a civil or criminal action or proceeding in advance of the final disposition of such action or proceeding, upon receipt of an undertaking by the person indemnified to repay such payment if he shall be adjudicated to be not entitled to indemnification under this section which undertaking may be accepted without reference to the financial ability of such person to make repayment. Any such indemnification may be provided although the person to be indemnified is no longer an officer, director, employee or agent of the corporation or of such other organization or no longer serves with respect to any such employee benefit plan.

No indemnification shall be provided for any person with respect to any matter as to which he shall have been adjudicated in any proceeding not to have acted in good faith in the reasonable belief that his action was in the best interest of the corporation or to the extent that such matter relates to service with respect to an employee benefit plan, in the best interests of the participants or beneficiaries of such employee benefit plan.

The absence of any express provision for indemnification shall not limit any right of indemnification existing independently of this section.

A corporation shall have power to purchase and maintain insurance on behalf of any person who is or was a director, officer, employee or other agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or other agent of another organization or with respect to any employee benefit plan, against any liability incurred by him in any such capacity, or arising out of his status as such, whether or not the corporation would have the power to indemnify him against such liability.”

Article 6 of the Articles of Organization, as amended, of Mercury reads as follows:

Article 6.

“Other lawful provisions for the conduct and regulation of the business and affairs of the Corporation, for its voluntary dissolution or for limiting, defining or regulating the powers of the Corporation, or of its directors or stockholders, or of any class of stockholders are as follows: [...]

No Director of the Corporation shall be liable to the Corporation or its stockholders for monetary damages for breach of fiduciary duty as a Director notwithstanding any statutory provision or other law imposing such liability, except for liability of a director (i) for any breach of the Director’s duty of loyalty to the Corporation or its stockholders, (ii) for acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law, (iii) under Section 61 or 62 of Chapter 156 of the Massachusetts General Laws, or (iv) for any transaction from which the Director derived an improper personal benefit.”

Article 7.

Indemnification of Directors and Officers

Section 7.1 Definitions

“For purposes of this Article 7:

(a) ‘Director/officer’ means any person who is serving or has served as a Director, officer or employee of the Corporation appointed or elected by the Board of Directors or the stockholders of the Corporation, or any Director, officer or employee of the Corporation who is serving or has served at the request of the Corporation as a Director, officer, trustee, principal, partner, employee or other agent of any other organization.

(b) ‘Proceeding’ means any action, suit or proceeding, civil or criminal, brought or threatened in or before any court, tribunal, administrative or legislative body or agency.

(c) ‘Expense’ means any fine or penalty, and any liability fixed by a judgment, order, decree or award in a Proceeding, any amount reasonably paid in settlement of a Proceeding and any professional fees and other disbursements reasonably incurred in connection with a Proceeding.

Section 7.2 Right to Indemnification

Except as limited by law or as provided in Sections 7.3 and 7.4 of this Article 7, each Director/officer (and his heirs and personal representatives) shall be indemnified by the Corporation against any Expense incurred by such Director/officer in connection with each Proceeding in which he or she is involved as a result of his or her serving or having served as a Director/officer.

Section 7.3 Indemnification Not Available

No indemnification shall be provided to a Director/officer with respect to a Proceeding as to which it shall have been adjudicated that he or she did not act in good faith in the reasonable belief that his or her action was in the best interests of the Corporation.

Section 7.4 Compromise or Settlement

In the event that a Proceeding is compromised or settled so as to impose any liability or obligation on a Director/officer or upon the Corporation, no indemnification shall be provided as to said Director/officer with respect to such Proceeding if such Director/officer shall have been adjudicated not to have acted in good faith in the reasonable belief that his or her action was in the best interests of the Corporation.

Section 7.5 Advances

The Corporation shall 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 or she is not entitled to indemnification pursuant to Sections 7.3 and 7.4 hereof, which undertaking may be accepted without reference to the financial ability of such person to make repayment.

Section 7.6 Not Exclusive

Nothing in this Article 7 shall limit any lawful rights to indemnification existing independently of this Article 7.

Section 7.7 Insurance

The provisions of this Article 7 shall not limit the power of the Board of Directors to authorize the purchase and maintenance of insurance on behalf of any Director/officer against any Expense whether or not the Corporation would have the power to indemnify such Director/officer against such Expense under this Article 7.”

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

ITEM 7. EXEMPTION FROM REGISTRATION CLAIMED

Not applicable.

ITEM 8. EXHIBITS

<u>Exhibit</u>	<u>Description</u>
4.1	Deferred Compensation Plan (incorporated herein by reference to Exhibit 10.16 to Mercury’s Annual Report on Form 10-K for the fiscal year ended June 30, 2003 (File No. 000-23599)).
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 on the signature page of this registration statement).

* 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.

(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 “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 this registration statement or any material change to such information in this registration statement;

provided, however, that paragraphs (a)(1)(i) and (a)(1)(ii) of this section do not apply if the registration statement is on Form S-3, Form S-8 or Form F-3, and the information required to be included in a post-effective amendment by those paragraphs is contained in periodic reports filed by the Registrant pursuant to Section 13 or Section 15(d) of the Securities Exchange Act of 1934 that are incorporated by reference in this 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 Section 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 this 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 Securities Act of 1933 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 Securities Act of 1933 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 Chelmsford, Massachusetts on February 20, 2004.

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 Joseph M. Hartnett 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 or 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 and Chief Executive Officer (Principal Executive Officer)	February 20, 2004
/s/ Joseph M. Hartnett _____ Joseph M. Hartnett	Vice President, Interim Chief Financial Officer, Controller and Chief Accounting Officer (Principal Financial Officer and Principal Accounting Officer)	February 20, 2004
/s/ Gordon B. Baty _____ Gordon B. Baty	Director	February 20, 2004
/s/ Albert P. Belle Isle _____ Albert P. Belle Isle	Director	February 20, 2004
/s/ Russell K. Johnsen _____ Russell K. Johnsen	Director	February 20, 2004
/s/ Sherman N. Mullin _____ Sherman N. Mullin	Director	February 20, 2004
/s/ Lee C. Steele _____ Lee C. Steele	Director	February 20, 2004
/s/ Richard P. Wishner _____ Richard P. Wishner	Director	February 20, 2004

INDEX TO EXHIBITS

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* Filed herewith.

February 20, 2004

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

Re: Registration Statement on Form S-8

Ladies and Gentlemen:

This opinion is furnished in connection with the registration statement on Form S-8 (the "Registration Statement") pursuant to the Securities Act of 1933, as amended (the "Securities Act"), relating to the registration of deferred compensation obligations (the "Obligations") of Mercury Computer Systems, Inc., a Massachusetts corporation (the "Company"). The Obligations will be offered under the Mercury Computer Systems, Inc. Deferred Compensation Plan (the "Plan") to corporate officers or other key employees with significant management responsibilities or highly compensated employees of the Company.

In connection with rendering this opinion, we have examined (i) the Articles of Organization of the Company, as amended and as on file with the Secretary of State of The Commonwealth of Massachusetts, (ii) the Bylaws of the Company, as amended, (iii) such records of the corporate proceedings of the Company as we deemed material, (iv) the Registration Statement and the exhibits thereto, (v) the Plan, and (vi) such other certificates, receipts, records and documents as we considered necessary for the purposes of this opinion. In our examination, we have assumed the genuineness of all signatures, the legal capacity of natural persons, the authenticity of all documents submitted to us as certified, photostatic or facsimile copies, the authenticity of the originals of such copies and the authenticity of telephonic confirmations of public officials and others. As to facts material to our opinion, we have relied upon certificates or telephonic confirmations of public officials and certificates, documents, statements and other information of the Company or representatives or officers thereof.

We are attorneys admitted to practice in The Commonwealth of Massachusetts. We express no opinion concerning the laws of any jurisdictions 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 on the foregoing, we are of the opinion that the Obligations, when established pursuant to the terms of the Plan, will be duly authorized and validly issued and will be legal, valid and binding unsecured general obligations of the Company enforceable in accordance with their terms and the terms of the Plan, except as and to the extent such enforceability (a) may be limited by bankruptcy, insolvency, reorganization or other similar laws affecting creditors' rights generally, and (b) is subject to general principles of equity (regardless of whether such enforceability is considered in a proceeding in equity or at law).

This opinion shall be interpreted in accordance with the Legal Opinion Principles issued by the Committee on Legal Opinions of the American Bar Association's Business Law Section as published in 53 Business Lawyer 831 (May 1998).

The opinions expressed herein are being furnished to you solely for your benefit in connection with the Registration Statement, and may not be used or relied upon by you for any other purpose, nor may this opinion be quoted from, circulated, relied upon or otherwise referred to, by any other person or entity without our prior written consent. This opinion is given as of the date first set forth above, and we assume no obligation to update this opinion. We hereby consent to the inclusion of this opinion as an exhibit to the Registration Statement.

Sincerely,

/s/ GOODWIN PROCTER LLP

GOODWIN PROCTER LLP

CONSENT OF INDEPENDENT ACCOUNTANTS

We hereby consent to the incorporation by reference in this Registration Statement on Form S-8 of our report dated July 28, 2003 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 fiscal year ended June 30, 2003.

/s/ PricewaterhouseCoopers LLP

Boston, Massachusetts
February 19, 2004