

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 issuer as specified in its charter)

Massachusetts (State of Incorporation) 04-2741391 (IRS Employer Identification Number)

199 Riverneck Road, Chelmsford, MA 01824
(Address of Principal Executive Offices)

(978) 256-1300
(Registrant's telephone number, including area code)

MERCURY COMPUTER SYSTEMS, INC.
1982 Stock Option Plan
1991 Stock Option Plan
1993 Stock Option Plan for Non-Employee Directors
1997 Stock Option Plan
1997 Employee Stock Purchase Plan
(Full title of the Plans)

Anthony J. Medaglia, Jr., Esquire
Hutchins, Wheeler & Dittmar
A Professional Corporation
101 Federal Street
Boston, Massachusetts 02110
(617) 951-6600
(Name, address and telephone number 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	Proposed Maximum Aggregate Offering Price	Amount of Registration Fee (6)
Common Stock (par value \$.01 per share)	2,052,958 (2)	\$ 3.1157 (3)	\$ 6,396,402	\$1,887
	1,472,042 (4)	\$ 16.5625 (5)	\$24,380,696	\$7,193
TOTAL AMOUNT	3,525,000 shares		\$30,777,098	\$9,080

(1) Also registered hereunder are such additional number of shares of Common Stock, presently indeterminable, as may be necessary to satisfy the antidilution provisions of the Plan to which this Registration Statement relates.

(2) Represents the sum of all shares reserved for issuance upon exercise of options under the 1982 Stock Option Plan, the 1991 Stock Option Plan, the 1993 Stock Option Plan for Non-Employee Directors and the 1997 Stock Option Plan (collectively, the "Option Plans") which are currently outstanding, plus all shares issued upon exercise of options granted under the Option Plans.

(3) Represents the weighted average exercise price of options which have been granted under the Option Plans which are either outstanding or have been exercised.

(4) Represents shares reserved for issuance upon exercise of options reserved for grant under the Option Plans and shares reserved for issuance under the 1997 Employee Stock Purchase Plan.

(5) Represents the average of the high and low prices reported on the NASDAQ National Market on May 18, 1998.

(6) Determined in accordance with Rule 457 of the Securities Act of 1933, as

amended.

PART II

INFORMATION REQUIRED IN THE REGISTRATION STATEMENT

Item 3. Incorporation of Documents by Reference

The Company hereby incorporates by reference the documents listed in (a) through (c) below. In addition, all documents subsequently filed by the Company pursuant to Section 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 thereof from the date of filing of such documents.

(a) The Company's latest Prospectus, dated January 29, 1998, filed pursuant to Rule 424(b) under the Securities Act of 1933 which contains audited financial statements for the Company's latest fiscal year for which such statements have been filed.

(b) All of the reports filed by the Company pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934 since the end of the fiscal year covered by the Prospectus referred to in (a) above.

(c) The description of the Company's Common Stock contained in the Company's Registration Statement on Form S-1, File No. 333-41139, filed on November 26, 1997, as amended on January 7, 1998, January 23, 1998 and January 28, 1998.

Item 4. Description of Securities

Not applicable.

Item 5. Interests of Named Experts and Counsel

The validity of the authorization and issuance of the Common Stock offered hereby will be passed upon for the Company by Hutchins, Wheeler & Dittmar, A Professional Corporation, Boston, Massachusetts. Anthony J. Medaglia, Jr., a stockholder of Hutchins, Wheeler & Dittmar, A Professional Corporation, and the clerk of the Company beneficially owns 27,750 shares of the Company's Common Stock. James Westra, who is a stockholder of Hutchins, Wheeler & Dittmar, A Professional Corporation, beneficially owns 5,150 shares of the Company's 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 Restated Articles of Organization, as amended, of the Company 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 of the Amended By-Laws of the Company provides as follows:

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."

Item 7. Exemption from Registration Claimed

Not Applicable.

Item 8. Exhibits

Number	Description
4.1	1982 Stock Option Plan (incorporated by reference to Exhibit 10.1 to the Company's Registration Statement on Form S-1 (333-41139))
4.2	1991 Stock Option Plan (incorporated by reference to Exhibit 10.2 to the Company's Registration Statement on Form S-1 (333-41139))
4.3	1993 Stock Option Plan for Non-Employee Directors (incorporated by reference to Exhibit 10.3 to the Company's Registration Statement on Form S-1 (333-41139))
4.4	1997 Stock Option Plan (incorporated by reference to Exhibit 10.4 to the Company's Registration Statement on Form S-1 (333-41139))
4.5	The First Amendment to the 1997 Stock Option Plan filed herewith
4.6	1997 Employee Stock Purchase Plan (incorporated by reference to Exhibit 10.5 to the Company's Registration Statement on Form S-1 (333-41139))
5.1	Opinion of Hutchins, Wheeler & Dittmar, A Professional Corporation
23.1	Consent of Independent Public Accountants
23.2	Consent of Hutchins, Wheeler & Dittmar, A Professional Corporation (included in Exhibit 5.1)

Item 9. Undertakings

The undersigned Registrant hereby undertakes the following:

(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;

(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 by the Registrant pursuant to Section 13 or Section 15(d) of the Securities Exchange Act of 1934 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 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 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) The undersigned Registrant hereby undertakes, that, 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 Chelmsford, Massachusetts on May 21, 1998.

MERCURY COMPUTER SYSTEMS, INC.

By /s/ James R. Bertelli

James R. Bertelli
President

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.

Signature	Title	Date
/s/ James R. Bertelli James R. Bertelli	President, Chief Executive Officer and Director	May 21, 1998
/s/ G. Mead Wyman G. Mead Wyman	Vice President, Chief Financial Officer and Treasurer	May 21, 1998
/s/ Gordon B. Baty Gordon B. Baty	Director	May 21, 1998
/s/ R. Schorr Berman R. Schorr Berman	Director	May 21, 1998
/s/ Albert P. Belle Isle Albert P. Belle Isle	Director	May 21, 1998
/s/ Sherman N. Mullin Sherman N. Mullin	Director	May 21, 1998
/s/ Melvin Sallen Melvin Sallen	Director	May 21, 1998

SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

EXHIBITS

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)

MERCURY COMPUTER SYSTEMS, INC.

First Amendment to the
Mercury Computer Systems, Inc. 1997 Stock Option Plan

In accordance with the provisions of Section 20 of the Mercury Computer Systems, Inc. 1997 Stock Option Plan (the "Plan"), the Plan is amended as follows:

1. Section 2 of the Plan is hereby amended by increasing the number of shares subject to the Plan from Five Hundred Seventy-Five Thousand (575,000) shares to One Million Three Hundred Twenty-Five Thousand (1,325,000) shares of the \$.01 par value common stock of the Corporation.

2. This Amendment shall take effect as of the date of its adoption by the Mercury Computer Systems, Inc. Board of Directors and upon its approval by the stockholders of Mercury Computer Systems, Inc. in accordance with the provisions of Section 20 of the Plan.

3. Except as hereinabove provided, the Plan is hereby ratified and confirmed in all respects.

MERCURY COMPUTER SYSTEMS, INC.

By: /s/ Anthony J. Medaglia, Jr.
Anthony J. Medaglia, Jr.
Clerk

Adopted by the Board of Directors October 20, 1997

Adopted by the Stockholders December 18, 1997

May 21, 1998

Mercury Computer Systems, Inc.
199 Riverneck Road
Chelmsford, MA 01824

Ladies and Gentlemen:

We are general counsel to Mercury Computer Systems, Inc., a Massachusetts corporation (the "Company"), and as such counsel we are familiar with the corporate proceedings taken in connection with the adoption of the Company's 1982 Stock Option Plan, 1991 Stock Option Plan, 1993 Stock Option Plan for Non-Employee Directors, 1997 Stock Option Plan and 1997 Employee Stock Purchase Plan (collectively the "Plans"). We are also familiar with the registration statement on Form S-8 to which a copy of this opinion will be attached as an exhibit.

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

Based upon the foregoing, and having regard for such legal considerations as we deem relevant, we are of the opinion that:

1. The Company is duly organized and validly existing under the laws of the Commonwealth of Massachusetts;
2. The Company has authorized the issuance of 25,000,000 shares of common stock having a par value of \$.01 per share and 1,000,000 shares of preferred stock having a par value of \$.01 per share.
3. The shares of common stock issuable pursuant to the Plans, when sold in accordance with the terms thereof, will be legally issued, fully paid and non-assessable.

Mercury Computer Systems, Inc.
May 21, 1998
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We hereby consent to the filing of this opinion as an exhibit to the Registration Statement on Form S-8 and to the reference to us under the caption "Interests of Named Experts and Counsel" in the Registration Statement.

Very truly yours,

/s/Hutchins, Wheeler & Dittmar
HUTCHINS, WHEELER & DITTMAR
A Professional Corporation

CONSENT OF INDEPENDENT ACCOUNTANTS

We consent to the incorporation by reference in the Registration Statement of Mercury Computer Systems, Inc. (the "Company") on Form S-8 of our report dated August 28, 1997, except for the information in the final paragraph of Note F, as to which the date is December 12, 1997, on our audits of the consolidated financial statements of the Company as of June 30, 1996 and 1997, and for the three years in the period ended June 30, 1997, which report is included in the Company's registration statement on Form S-1 (File No. 333-41139) filed with the Securities and Exchange Commission pursuant to the Securities Act of 1933.

Coopers & Lybrand L.L.P.

/s/Coopers & Lybrand L.L.P.

Boston, Massachusetts
May 21, 1998