

SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

SCHEDULE 13G
(Rule 13d-102)

INFORMATION TO BE INCLUDED IN STATEMENTS FILED PURSUANT
TO RULES 13d-1 (b) (c), AND (d) AND AMENDMENTS THERETO FILED
PURSUANT TO RULE 13d-2 (b)

Mercury Computer Systems, Inc.

(Name of Issuer)

Common Stock, \$0.01 par value

(Title of Class of Securities)

589378108

(CUSIP Number)

November 6, 2006

(Date of Event which Requires Filing of this Statement)

Check the appropriate box to designate the rule pursuant to which this Schedule is filed:

- Rule 13d-1(b)
 Rule 13d-1(c)
 Rule 13d-1(d)

*The remainder of this cover page shall be filled out for a reporting person's initial filing on this form with respect to the subject class of securities, and for any subsequent amendment containing information which would alter disclosures provided in a prior cover page.

The information required on the remainder of this cover page shall not be deemed to be "filed" for the purpose of Section 18 of the Securities Exchange Act of 1934 ("Act") or otherwise subject to the liabilities of that section of the Act but shall be subject to all other provisions of the Act (however, see the Notes).

CUSIP No. 589378108

13G

Page 2 of 8 Pages

1. NAMES OR REPORTING PERSONS
S.S. OR I.R.S. IDENTIFICATION NOS. OF ABOVE PERSONS

Renaissance Technologies Corp. 13-3127734

2. CHECK APPROPRIATE BOX IF A MEMBER OF A GROUP (SEE INSTRUCTIONS):
(a)
(b)

3. SEC USE ONLY

4. CITIZENSHIP OR PLACE OF ORGANIZATION

Delaware

5. SOLE VOTING POWER

1,200,300

NUMBER OF
SHARES
BENEFICIALLY
OWNED BY

6. SHARED VOTING POWER

0

EACH
REPORTING
PERSON
WITH

7. SOLE DISPOSITIVE POWER

1,200,300

8. SHARED DISPOSITIVE POWER

0

9. AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON

1,200,300

10. CHECK IF THE AGGREGATE AMOUNT IN ROW (9) EXCLUDES CERTAIN SHARES
(SEE INSTRUCTIONS)

11. PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (9)

5.42%

12. TYPE OF REPORTING PERSON (SEE INSTRUCTIONS)

IA

1. NAMES OR REPORTING PERSONS
S.S. OR I.R.S. IDENTIFICATION NOS. OF ABOVE PERSONS

James H. Simons

2. CHECK APPROPRIATE BOX IF A MEMBER OF A GROUP (SEE INSTRUCTIONS):
(a)
(b)

3. SEC USE ONLY

4. CITIZENSHIP OR PLACE OF ORGANIZATION

United States

	5. SOLE VOTING POWER
	1,200,300
NUMBER OF SHARES BENEFICIALLY OWNED BY EACH REPORTING PERSON WITH	6. SHARED VOTING POWER
	0
	7. SOLE DISPOSITIVE POWER
	1,200,300
	8. SHARED DISPOSITIVE POWER
	0

9. AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON

1,200,300

10. CHECK IF THE AGGREGATE AMOUNT IN ROW (9) EXCLUDES CERTAIN SHARES
(SEE INSTRUCTIONS)

11. PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (9)

5.42%

12. TYPE OF REPORTING PERSON (SEE INSTRUCTIONS)

IN

Item 1.

(a) Name of Issuer.

Mercury Computer Systems, Inc.

(b) Address of Issuer's Principal Executive Offices.

199 Riverneck Road
Chelmsford, MA 01824

Item 2.

(a) Name of Person Filing.

This Schedule 13G is being filed by Renaissance Technologies Corp. ("RTC") and James H. Simons ("Simons").

(b) Address of Principal Business Office or, if none, Residence.

The principal business address of the reporting persons is:

800 Third Avenue
New York, New York 10022

(c) Citizenship.

Dr. Simons is a United States citizen and RTC is a Delaware corporation

(d) Title of Class of Securities.

Common Stock, \$0.01 par value

(e) CUSIP Number.

589378108

Item 5. Ownership of Five Percent or Less of a Class.

If this statement is being filed to report the fact that as of the date hereof the reporting person has ceased to be the beneficial owner of more than five percent of the class of securities, check the following

Item 6. Ownership of More than Five Percent on Behalf of Another Person.

Certain funds and accounts managed by RTC have the right to receive dividends and proceeds from the sale of the securities which are the subject of this report. RIEF Trading LLC holds of record more than 5% of such securities.

Item 7. Identification and Classification of the Subsidiary Which Acquired the Security Being Reported on by the Parent Holding Company or Control Person.

Not applicable.

Item 8. Identification and Classification of Members of the Group.

Not applicable.

Item 9. Notice of Dissolution of Group.

Not applicable.

Item 10. Certification.

By signing below I certify that, to the best of my knowledge and belief, the securities referred to above were not acquired and are not held for the purpose of or with the effect of changing or influencing the control of the issuer of the securities and were not acquired and are not held in connection with or as a participant in any transaction having that purpose or effect.

SIGNATURE

After reasonable inquiry and to the best of my knowledge and belief, I certify that the information set forth in this statement is true, complete and correct.

Date: February 12, 2007

/s/ James H. Simons

James H. Simons

Renaissance Technologies Corp.

By: /s/ Mark Silber

Mark Silber
Vice President

Attention: Intentional misstatements or omissions of fact constitute Federal criminal violations (see 18 U.S.C. 1001).

AGREEMENT REGARDING JOINT FILING UNDER
UNDER RULE 13D-1(K) OF THE EXCHANGE ACT

In accordance with Rule 13d-1(k) under the Securities Exchange Act of 1934, as amended, each of the undersigned agrees to the filing on behalf of each of a Statement on Schedule 13G, and all amendments thereto, with respect to the shares of Common Stock of Mercury Computer Systems, Inc.

Date: February 12, 2007

/s/ James H. Simons

James H. Simons

Renaissance Technologies Corp.

By: /s/ Mark Silber

Mark Silber
Vice President