

Speicher Charles A  
 Form 3  
 September 16, 2010

**FORM 3 UNITED STATES SECURITIES AND EXCHANGE COMMISSION**  
**Washington, D.C. 20549**

OMB APPROVAL

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**INITIAL STATEMENT OF BENEFICIAL OWNERSHIP OF SECURITIES**

Filed pursuant to Section 16(a) of the Securities Exchange Act of 1934,  
 Section 17(a) of the Public Utility Holding Company Act of 1935 or Section  
 30(h) of the Investment Company Act of 1940

(Print or Type Responses)

|   |         |                                      |  |  |
|---|---------|--------------------------------------|--|--|
| 1. Name and Address of Reporting Person * |         | 2. Date of Event Requiring Statement | 3. Issuer Name <b>and</b> Ticker or Trading Symbol                     |  |
| Â Speicher Charles A                      |         | (Month/Day/Year)                     | MERCURY COMPUTER SYSTEMS INC [MRCY]                                    |  |
| (Last)                                    | (First) | (Middle)                             | 09/14/2010   |  |
| 201 RIVERNECK ROAD                        |         |                                      | 4. Relationship of Reporting Person(s) to Issuer                       | 5. If Amendment, Date Original Filed(Month/Day/Year) |
| (Street)                                  |         |                                      | (Check all applicable)   |  |
| CHELMSFORD,Â MAÂ 01844                    |         |                                      | <input type="checkbox"/> Director                                      | <input type="checkbox"/> 10% Owner                   |
| (City)                                    | (State) | (Zip)                                | <input checked="" type="checkbox"/> Officer                            | <input type="checkbox"/> Other                       |
|   |         |                                      | (give title below)   | (specify below)                                      |
|   |         |                                      | VP, Controller, and CAO  |  |
|   |         |                                      | 6. Individual or Joint/Group Filing(Check Applicable Line)             |  |
|   |         |                                      | <input checked="" type="checkbox"/> Form filed by One Reporting Person |  |
|   |         |                                      | <input type="checkbox"/> Form filed by More than One Reporting Person  |  |

**Table I - Non-Derivative Securities Beneficially Owned**

| 1. Title of Security (Instr. 4) | 2. Amount of Securities Beneficially Owned (Instr. 4) | 3. Ownership Form: Direct (D) or Indirect (I) (Instr. 5) | 4. Nature of Indirect Beneficial Ownership (Instr. 5) |
|---------------------------------|---|--|---|
| No Shares Beneficially Owned    | 0   | D  | Â   |

Reminder: Report on a separate line for each class of securities beneficially owned directly or indirectly.

SEC 1473 (7-02)

**Persons who respond to the collection of information contained in this form are not required to respond unless the form displays a currently valid OMB control number.**

**Table II - Derivative Securities Beneficially Owned (e.g., puts, calls, warrants, options, convertible securities)**

| 1. Title of Derivative Security (Instr. 4) | 2. Date Exercisable and Expiration Date (Month/Day/Year) | 3. Title and Amount of Securities Underlying Derivative Security (Instr. 4) | 4. Conversion or Exercise Price of Derivative Security | 5. Ownership Form of Derivative Security: Direct (D) or Indirect | 6. Nature of Indirect Beneficial Ownership (Instr. 5) |
|--|--|---|--|--|---|
|  | Date Exercisable   | Expiration Date   | Title  | Amount or Number of  |   |

Shares (I)  
(Instr. 5)

## Reporting Owners

| Reporting Owner Name / Address                                   | Relationships |           |                         |       |
|--|---------------|-----------|-------------------------|-------|
|  | Director      | 10% Owner | Officer                 | Other |
| Speicher Charles A<br>201 RIVERNECK ROAD<br>CHELMSFORD, MA 01844 |               |           | VP, Controller, and CAO |       |

## Signatures

Charles A. Speicher 09/16/2010

\*\*Signature of Reporting Person Date

## Explanation of Responses:

- \* If the form is filed by more than one reporting person, *see* Instruction 5(b)(v).
- \*\* Intentional misstatements or omissions of facts constitute Federal Criminal Violations. *See* 18 U.S.C. 1001 and 15 U.S.C. 78ff(a).

Note: File three copies of this Form, one of which must be manually signed. If space is insufficient, *See* Instruction 6 for procedure. Potential persons who are to respond to the collection of information contained in this form are not required to respond unless the form displays a currently valid OMB number.