

July 1, 2009

Brian Cascio, Branch Chief
Division of Corporation Finance
United States Securities and Exchange Commission
100 F Street, N.E.
Washington, D.C. 20549

Re: Amtech Systems, Inc.
Form 10-K for the fiscal year ended September 30, 2008
Filed December 10, 2008
File No. 000-11412
Form 8-K/A filed November 2, 2007
Form 10-Q for the quarter ended March 31, 2009
Filed May 11, 2009
Form 8-K/A filed June 5, 2009

Dear Mr. Cascio:

This letter sets forth the responses of Amtech Systems, Inc. (the "Company") to your comment letter, dated June 17, 2009, relating to (i) the Form 10-K for the fiscal year ended September 30, 2008 of the Company filed with the Securities and Exchange Commission (the "Commission") on December 10, 2008; (ii) the current report on Form 8-K/A filed with the Commission on November 2, 2007; (iii) Form 10-Q for the quarter ended March 31, 2009 filed with the Commission on May 11, 2009 and (iv) Form 8-K/A filed with the Commission on June 5, 2009.

The Company is filing, via EDGAR, this letter setting forth the Company's responses to comments of the Staff of the Commission (the "Staff"). Enclosed as well are two hard copies of the Company's response letter. We have included your original questions in addition to providing our responses.

Form 10-K for the fiscal year ended September 30, 2008

Item 11. Executive Compensation

Determining Executive Compensation, page 7

1. We note your responses to prior comments 2 and 3. Please disclose in future filings, if true, that you do not know the names of the individual companies that comprise of the American Electronics Association Salary Survey.
- R. We will make the requested disclosure in future filings.

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Elements of Our Executive Compensation Program, page 8

2. With regard to your response to prior comment 4, please note that we would expect to see discussion in your future filing that addresses how individual performance and specific contributions by *each* named executive officer are evaluated by the compensation committee and how such appraisal translates into actual compensation. With regard to the quantitative contributions that are assessed by the committee in granting annual cash incentive bonuses, please expand your discussion in future filings to disclose how the performance objectives you cite on page 9 apply to each named executive officer. For example, it is unclear from your current disclosure whether these objectives are weighted equally and how your named executive officers may achieve these goals. Accordingly, please expand your discussion of your named executive officer's responsibilities and objective and how your compensation levels reflect those responsibilities and objectives. We refer you to Regulation S-K item 402(b)(xii).
- R. In future filings, we will discuss how individual performance and specific contribution by each named executive officer are evaluated by the compensation committee and how such appraisal translates into actual compensation. We will also expand the discussion in future filings to disclose how the performance objectives we cite are weighted and how our named executive officers may achieve these goals. In future filings, we will generally expand the discussion of the responsibilities and objectives of our named executive officers and how their compensation levels reflect those responsibilities and objectives.

Item 13. Certain Relationships and Related Party Transactions

3. Please note that you must include disclosure regarding policies for the review, approval or ratification of related person transactions under Item 404(b)(1) even when you do not have any reportable transactions under Item 404(a). See Question 130.06 of our Regulation S-K Compliance and Disclosure Interpretations, available on our website at <http://www.sec.gov/division/corpfin/guidance/regs-kinterp.htm>. Accordingly, please include the discussion of your policy regarding the review of related party transactions that you provided in response to prior comment 7 in your future filings.
- R. In future filings, we will disclose our policies for the review, approval or ratification of related person transactions, even when we do not have reportable transactions.

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Form 8-K/A dated November 2, 2007

4. We refer to your response to our prior comment number 15. Please tell us where you have presented the interim financial statements required by Rules 3-01, 3-02, 3-05 and Article 10 of Regulation S-X. In addition, tell us how the interim financial statement provided on pages 3 and 4 of the pro forma financial information meet these requirements.
- R. Item 2.01 of Form 8-K refers to the financials required by Item 9.01 of Form 8-K. Item 9.01 refers to Rule 3-05(b)(2)(ii), which required us to file audited financial statements of the acquired company for at least the most recent fiscal years and any interim periods specified in Rule 3-01 and 3-02. We filed two years of audited financial statements as Exhibit 99.3 to the referenced Form 8-K/A. Rule 3-01(e) required us to present the balance sheet of the acquired company as of June 30, 2007, which we filed in Exhibit 99.4 as part of the pro forma information. See the column labeled R2D Ingenierie SAS on page 3 of Exhibit 99.4, Unaudited Pro Forma Condensed Combined Balance Sheet as of June 30, 2007.

Rule 3-02(b) requires us to present, for any interim period between the latest audited balance sheet and the date of the most recent interim balance sheet being filed, and for the corresponding period of the preceding year, statements of income and cash flows of the acquired company. The statements of income and cash flows of the acquired company for the six month period between the December 31, 2006 audited balance sheet and the June 30, 2007 balance sheet were inadvertently omitted. Within the next 30 days, we will review the available information and prepare the inadvertently omitted interim financial statements and file them with the further amended Form 8-K/A referred to in our responses to comments number 6 and 7.

Form 10-Q for the quarter ended March 31, 2009

Critical Accounting Policies, page 25

5. In the interest of providing readers with a better insight into management's judgments into accounting for goodwill, please tell us and disclose the following in future filings:
- How you perform the two-step impairment test discussed in SFAS 142, including the reporting unit level at which you test goodwill for impairment and your basis for that determination;

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- Each of the valuation methodologies used to value goodwill (if multiple approaches are used), including sufficient information to enable a reader to understand how each of the methods differ, the assumed benefits of a valuation prepared under each method, and why management selected these methods as being the most meaningful for the company in preparing the goodwill impairment analysis.
 - How you weight each of the methods used including the basis for that weighting (if multiple approaches are used);
 - A quantitative and qualitative description of the material assumptions used and a sensitivity analysis of those assumptions based upon reasonably likely changes;
 - If applicable, how the assumptions and methodologies used for valuing goodwill in current year have changed since the prior year highlighting the impact of any changes.
- R. In future filings, we will expand our critical accounting policy for impairment of long-lived assets to provide better insight into management's judgments into accounting for goodwill, as follows:
- We performed the two-step impairment test discussed in SFAS 142. In the first step, we estimated the fair value of the reporting unit and compared it to the carrying value of the reporting unit. Most of our reporting units are operating segments that are one level below the reportable segment into which they are aggregated. The one exception is P.R. Hoffman Machine Products, Inc. which is a reportable segment. When the carrying value exceeds the fair value of the reporting unit, the second step is performed to measure the amount of the impairment loss, if any. In the second step, the amount of the impairment loss was determined to be the excess of the carrying amount of the goodwill and other intangibles not subject to amortization over their implied fair value.

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- The methods used to estimate fair value of the reporting unit for the purpose of determining the implied fair value of goodwill include the market approach and discounted cash flows, as follows:
 - i. One valuation methodology used is to determine the multiples of market value of invested capital ("MVIC") of similar public companies to their revenue for the last twelve months ("LTM") and next twelve months ("NTM"), and apply those multiples to the revenue for the comparable periods of the reporting unit being tested for impairment. One benefit of this approach is it is the closest to quoted market prices that are readily available. However, we generally give less weight to this method, because the market value of the minority interest of public companies may not be that relevant to the fair value of our wholly-owned reporting units, which are not public companies. Also, MVIC to revenue for the LTM uses a historical value in the denominator, while the market values tend to be forward looking; and MVIC of revenue for the NTM involves the use of projections for both the comparable companies and the reporting unit.
 - ii. Another market approach that we sometimes use is based upon prices paid in merger and acquisition transactions for other companies in the same industry, again applying the MVIC to revenue of those companies to the historical and projected revenue of the reporting unit. When we use both market prices determined as described in (i), above, and prices paid in merger and acquisition transactions, we weight them to determine an indicated value under the market approach.

- iii. As stated, we also use discounted cash flows as an indication of what a third-party would pay for the reporting unit in an arms-length transaction. This method requires projections of EBITDA (earnings before interest, taxes, depreciation and amortization) and applying an appropriate discount rate based on the weighted average cost of capital for the reporting unit.
- We generally give the greatest weight, often 75% or more, to the discounted cash flow method, due to difficulty in identifying a sufficient number of companies that are truly comparable to a given reporting unit. This is because two of our three reporting units are relatively small businesses serving niche markets.
 - The material estimates and assumptions used in the discounted cash flows method of determining fair value include (i) the appropriate discount rate, given the risk-free rate of return and various risk premiums, (ii) projected revenues, (iii) projected material cost as a percentage of revenue, and (iv) the rate of increase in payroll and other expense. Quantitatively, the discount rate is the assumption that has the most pervasive effect on the discounted cash flows. We believe the discount rate used is appropriate, as we determine the discount rate based on input from a valuation firm, which applies various approaches taking into account the particular circumstances of the reporting unit in arriving at a recommendation. For annual valuations, we test the sensitivity of the assumptions used in our discounted cash flow projection with the aid of a valuation firm, which utilizes a Monte Carlo simulation model, wherein various probabilities are assigned to the key assumptions.

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- In the current year, we performed a mid-year test of the impairment of the goodwill and other intangibles due to changing circumstances regarding the Bruce Technologies reporting unit. Specifically, Bruce Technologies continued to incur losses after a restructuring and cost reductions put into place during the prior fiscal year and expectations that semiconductor customers served by this reporting unit would not in the future achieve the kinds of growth rates they had in the past due to increased maturity of that industry. We used the same discount rate as used in the prior annual impairment test of this reporting unit, but the other assumptions became more conservative due to the changing circumstances. It was primarily the lowered projections of future revenue that resulted in a lower estimate of fair value and the impairment loss. The payroll and certain expense assumptions, however, were lowered to take into account a second restructuring of the reporting unit, which involved a significant reduction in the number of employees. The material cost assumption was also lowered to take into account a change in product mix.

Form 8-K/A filed June 5, 2009

6. We note that your amended Form 8-K only includes the revised audit report for the financial statements of R2D. Please further amend the Form 8-K to include a complete Exhibit 99.3, including the financial statements and the related audit report.
- R.** We will further amend the Form 8-K to include a complete Exhibit 99.3, including the financial statements and the related audit report. We expect to file the further amended Form 8-K along with the additional interim financials statements referred to in our response to comment number 4.
7. Please revise the audit report to specifically state that the audit was conducted in accordance with “generally accepted auditing standards in the United States”.
- R.** The auditor of the acquired company has revised their audit report to specifically state that the audit was conducted in accordance with generally accepted auditing standards in the United States. See response to comment number 6, above.

The Company acknowledges that it is responsible for the adequacy of the disclosure in the filings, that staff comments or changes to disclosure in response to staff comments do not foreclose the Commission from taking any action with respect to the filings; and the

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Company may not assert staff comments as a defense in any proceeding initiated by the Commission or any person under the federal securities laws of the United States.

We trust that the foregoing is responsive to your comments. If you have any questions or comments, please contact the undersigned.

Best regards,
Amtech Systems, Inc.

Robert T. Hass, CPA
Chief Accounting Officer

CC: Michael Garnreiter, Chairman of the Audit Committee of the Board of Directors
Robert F. King, Chairman of the Compensation and Stock Option Committee of the Board of Directors
Christopher Johnson, Squire, Sanders & Dempsey L.L.P.
