



DIVISION OF  
CORPORATION FINANCE

UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION  
WASHINGTON, D.C. 20549

May 3, 2013

Via E-mail

Mr. Jeffrey A. Graves  
President and Chief Executive Officer  
MTS Systems Corporation  
14000 Technology Drive  
Eden Prairie, Minnesota 55344

**Re: MTS Systems Corporation  
Form 10-K for the Fiscal Year Ended September 29, 2012  
Filed November 28, 2012  
Response Letter Dated April 24, 2013  
File No. 0-2382**

Dear Mr. Graves:

We have reviewed your response letter and have the following comments. In some of our comments, we may ask you to provide us with information so we may better understand your disclosure.

Please respond to this letter within ten business days by providing the requested information, or by advising us when you will provide the requested response. If you do not believe our comments apply to your facts and circumstances, please tell us why in your response.

After reviewing the information you provide in response to these comments, we may have additional comments.

Form 10-K for the Fiscal Year Ended September 29, 2012

Cash Flow Comparison, page 32

1. Please expand your response to prior comment 1 to confirm that any registration statement filed in connection with the sale of the shares you issue in settlement of the repurchase agreement will (1) disclose the circumstances under which the bank acquired the securities, and (2) identify the bank as an underwriter.
2. Your response to prior comment 2 does not provide authority that supersedes your obligations to file material contracts under the federal securities laws. Please file the "Agreement" as required under Regulation S-K Item 601(b)(10).

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Notes to Consolidated Financial Statements, page F-7

Note 1 – Summary of Significant Accounting Policies, page F-7

-Stock Purchases, page F-15

3. We note your response to prior comment 4 from our letter dated February 28, 2013. Please revise future filings, as appropriate, here and within MD&A to provide more information related to your accelerated share repurchase agreement similar to the one provided in your response that discloses why you are accounting for this arrangement as permanent equity.

You may contact Gary Newberry, Staff Accountant, at (202) 551-3761 or Tara Harkins, Reviewing Accountant, at (202) 551-3639 if you have questions regarding comments on the financial statements and related matters. Please contact Sally Brammell, Staff Attorney, at (202) 551-3779 or Russell Mancuso, Legal Branch Chief, at (202) 551-3617 if you have questions on any other comments. In this regard, do not hesitate to contact me at (202) 551-3643.

Sincerely,

/s/ Kevin L. Vaughn

Kevin L. Vaughn  
Accounting Branch Chief