

Mail Stop 3720

January 19, 2007

Robert E. Horton, Esq.  
Vice President and General Counsel  
BigBand Networks, Inc.  
475 Broadway Street  
Redwood City, CA 94063

**Re: BigBand Networks, Inc.  
Form S-1  
Filed December 22, 2006  
File No. 333-139652**

Dear Mr. Horton:

We have reviewed your filing and have the following comments. We have limited our review to only your financial statements and related disclosures and do not intend to expand our review to other portions of your documents. Where indicated, we think you should revise your document in response to these comments. If you disagree, we will consider your explanation as to why our comment is inapplicable or a revision is unnecessary. Please be as detailed as necessary in your explanation. In some of our comments, we may ask you to provide us with information so we may better understand your disclosure. After reviewing this information, we may raise additional comments.

Please understand that the purpose of our review process is to assist you in your compliance with the applicable disclosure requirements and to enhance the overall disclosure in your filing. We look forward to working with you in these respects. We welcome any questions you may have about our comments or any other aspect of our review. Feel free to call us at the telephone numbers listed at the end of this letter.

Form S-1

Stock-Based Compensation, page 35

1. We note that you refer to a valuation performed by a third-party valuation firm here and at pages F-20 and F-21. While you are not required to make reference to this independent valuation, when you do you should also disclose the name of the expert and include the consent of the expert in your Form S-1. Please revise to comply or delete your references to third-party valuation specialists throughout the filing.

Note 2 – Significant Accounting Policies, page F-9

Revenue Recognition, page F-10

2. Describe for us in more detail your arrangements for trade-in credits and tell us your basis in the accounting literature for your accounting policy.
3. We note that you recognize the associated deferred costs as costs of sales when deferred revenues are recognized as revenues. Clarify for us your policy for accounting for costs that exceed the amount of deferred revenues. In addition, tell us where deferred costs are classified in your balance sheet.

Cumulative Effect of Change in Accounting Principle, page F-16

4. We note your disclosure here and at page F-26. Describe for us in more detail and disclose the terms of the warrants to purchase preferred stock, including the terms of the provision that allows the warrants to be settled through the issuance of warrants to purchase common stock or cash payment equal to the liquidation value upon the completion of a liquidation event. In addition, tell us how you considered the terms of the warrants in your application of FSP 150-5.

Note 10 – Stockholders' Equity (Deficit), page F-32

Stock Options, page F-33

5. Tell us what you mean by “reassessed value” in your disclosure regarding the weighted-average fair value of options granted below and equal to reassessed value.
6. Please revise your stock option footnote to disclose the following information for equity instruments granted during the 12 months prior to the date of the most recent balance sheet included in the registration statement:
  - For each grant date, the number of options or shares granted, the exercise price, the fair value of the common stock, and the intrinsic value, if any

per option (the number of options may be aggregated by month or quarter and the information presented as weighted average per-share amounts).

- Whether the valuation used to determine the fair value of the common stock was contemporaneous or retrospective.
- If the valuation specialist was a related party, a statement indicating that fact.

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As appropriate, please amend your registration statement in response to these comments. You may wish to provide us with marked copies of the amendment to expedite our review. Please furnish a cover letter with your amendment that keys your responses to our comments and provides any requested information. Detailed cover letters greatly facilitate our review. Please understand that we may have additional comments after reviewing your amendment and responses to our comments.

We urge all persons who are responsible for the accuracy and adequacy of the disclosure in the filing to be certain that the filing includes all information required under the Securities Act of 1933 and that they have provided all information investors require for an informed investment decision. Since the company and its management are in possession of all facts relating to a company's disclosure, they are responsible for the accuracy and adequacy of the disclosures they have made.

Notwithstanding our comments, in the event the company requests acceleration of the effective date of the pending registration statement, it should furnish a letter, at the time of such request, acknowledging that:

- should the Commission or the staff, acting pursuant to delegated authority, declare the filing effective, it does not foreclose the Commission from taking any action with respect to the filing;
- the action of the Commission or the staff, acting pursuant to delegated authority, in declaring the filing effective, does not relieve the company from its full responsibility for the adequacy and accuracy of the disclosure in the filing; and
- the company may not assert staff comments and the declaration of effectiveness as a defense in any proceeding initiated by the Commission or any person under the federal securities laws of the United States.

In addition, please be advised that the Division of Enforcement has access to all information you provide to the staff of the Division of Corporation Finance in connection with our review of your filing or in response to our comments on your filing.

We will consider a written request for acceleration of the effective date of the registration statement as confirmation of the fact that those requesting acceleration are aware of their respective responsibilities under the Securities Act of 1933 and the Securities Exchange Act of 1934 as they relate to the proposed public offering of the securities specified in the above registration statement. We will act on the request and, pursuant to delegated authority, grant acceleration of the effective date.

We direct your attention to Rules 460 and 461 regarding requesting acceleration of a registration statement. Please allow adequate time after the filing of any amendment for further review before submitting a request for acceleration. Please provide this request at least two business days in advance of the requested effective date.

You may contact Melissa Hauber, Senior Staff Accountant, at (202) 551-3368 or Carlos Pacho, Senior Assistant Chief Accountant, at (202) 551-3835 if you have questions regarding comments on the financial statements and related matters. Please contact me at (202) 551-3810 with any other questions.

Sincerely,

Larry Spigel  
Assistant Director

cc: Craig N. Lang, Esq.  
Wilson Sonsini Goodrich & Rosati  
Via Facsimile: (650) 493-6811