

EMMON MCCRATH

26 APR 1983

April 18, 1983

Mr. Tashiro  
Asahi Building  
S-38-3, Kamata, Ota-Ku  
Tokyo, Japan 144

Dear Mr. Tashiro:

I must thank you again for your help and cooperation during my stay in Japan. We have implemented the changes that we talked about in our Pole Position boards and we have not had any recurring reset problems. However, I must request your company's assistance once again.

We are having problems with custom 07 chips recently. I would like to emphasize that this is not a small problem. Our recent shipment of fifty Pole Position games to one of our distributors had synchronization failures with all fifty games. Our distributor requested immediate replacement of failed chips and they are very upset about this incident. Immediately after this incident we started sampling our production line games for failures. To do this we tested 8 sample games for 1 day at room temperature. Within a couple of hours 3 games failed. By the end of 24 hours 5 of the 8 games had failed, all apparently due to custom 07 chip-related problems. My face is red; never in Atari's recent history has such an embarrassing situation as this happened.

Let me explain the problem in a more technical way in the following steps:

1. We are required to use a metal (RFI) cage to comply with F.C.C. rules in the USA. We have used this cage in all Pole Position games that we have shipped up until now.
2. In this cage there is a temperature build up because it is an enclosed box. The ambient temperature of 32°C inside the cabinet brings the temperature inside the cage up to 50°C. In the hotter arcades, of course, this could go higher but never over 70° C.
3. In the industry specification, operating temperature for IC's is 0° - 70°C. Most of the time IC's operate in ranges better than those given specs. However, we never push IC's over their operating specs.
4. The games are failing when they are turned on for an hour or two because of the custom 07 chips. Failure occurs when the temperature inside the cage is about 50°C ±5°C.
5. The custom 07 chips that are failing seem to have more than one date code. So far, the ones that are affected have the numbers 0798, 0792, and 0715. These parts seem to be your latest shipment to us. When we replace these failing chips with other

date codes, the problem goes away no matter how hot the chips get (by external heating up to 90°C). Of course, not all of the chips with the above date codes fail but the majority of them do.

6. I had a chance to study these failing custom 07 chips in the short time that I had and as far as I can see there is a propagation delay problem in the custom 07 chips. As you know the Hreset signal comes after every 384 counts and resets all of the counters. However, when it is hot and starts to fail it counts only to 380. There are two custom 07 chips in the Pole Position boards and when one starts resetting at 380 counts the problems start appearing.
7. I am convinced that you are getting some inferior parts from the Manufacturer that you are buying these custom chips from. You may have already seen the problem on your own boards but maybe not as bad as we have.

We have another production run coming up in a few weeks and I do not have any good solutions as to how to handle this problem. We have thousands of custom 07 chips in stock and every one of them could be bad. I do not have a good way to screen them and, as you know, I cannot ask our Q.A. Department to heat every board to 40°C to 50°C temperature to try to determine whether the problem occurs. Even if it fails, what will I tell them to replace the bad custom 07 chip with? You see my problem and why my face is red.

I urgently ask your assistance in this matter and hope to get some answers as soon as possible. I am confident that, as usual, your expertise and cooperation is going to help us once more, as it has in the past. Again, domo arrigatto for your help.

Yours truly,

*Sam Deus*

Sam Deus

SD/br

cc: Steve Calfee  
Darl Davidson  
Chris Downend  
John Farrand  
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