

NEXT Requirements for New Cabling

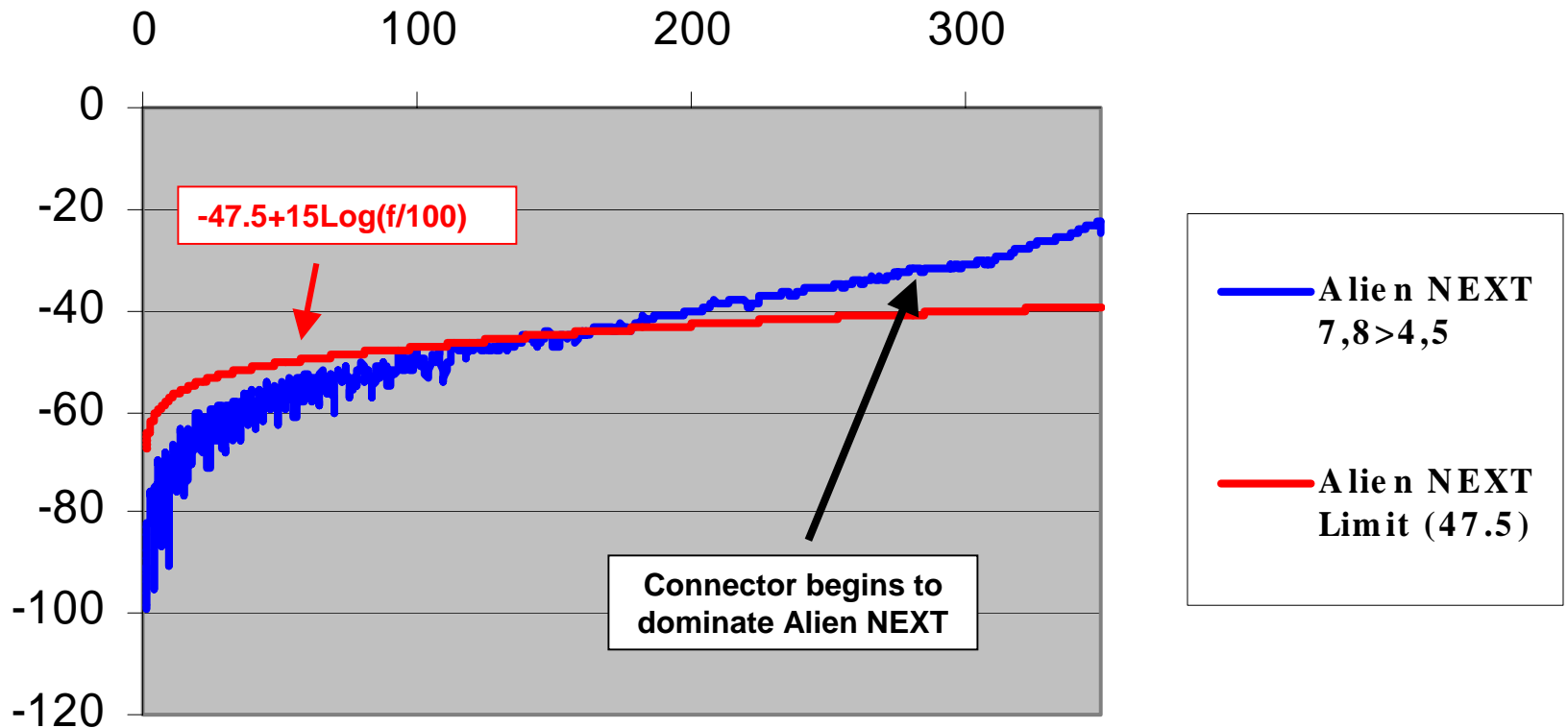
Terry Cobb
Systimax

Presentation

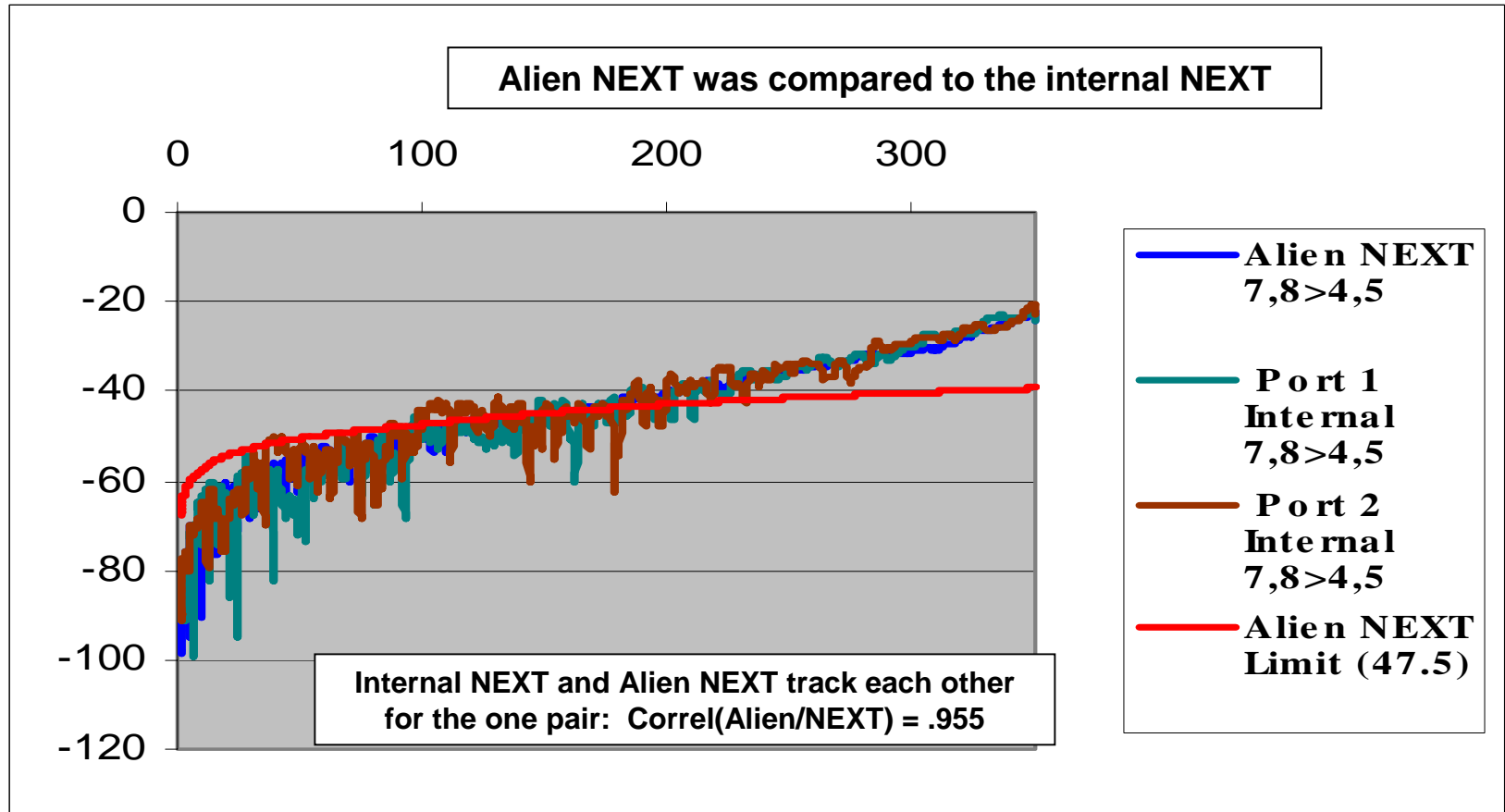
- **Comparison of Alien NEXT and Internal NEXT for a multi-port panel.**
- **Comparison of the worst case Alien NEXT and Internal NEXT to a limit.**
- **Conclusion**

Alien NEXT on a Cat 5e 36 port panel

This was found during a test that was conducted to characterize a typical installation.

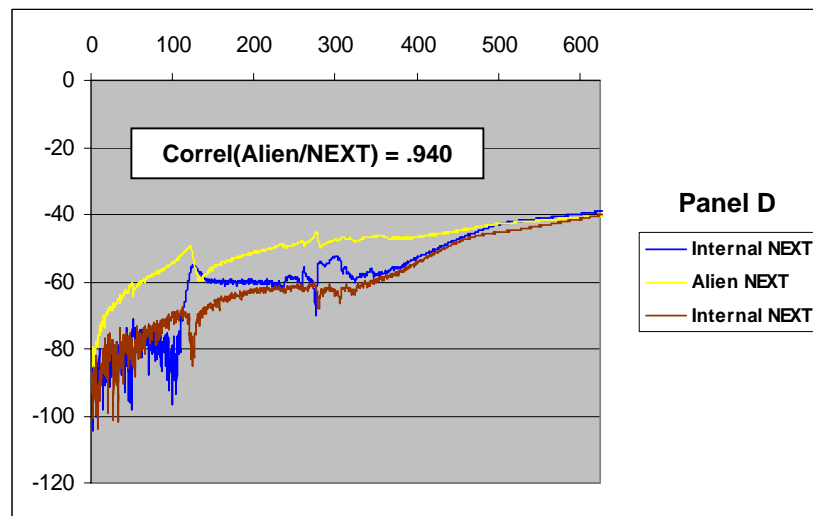
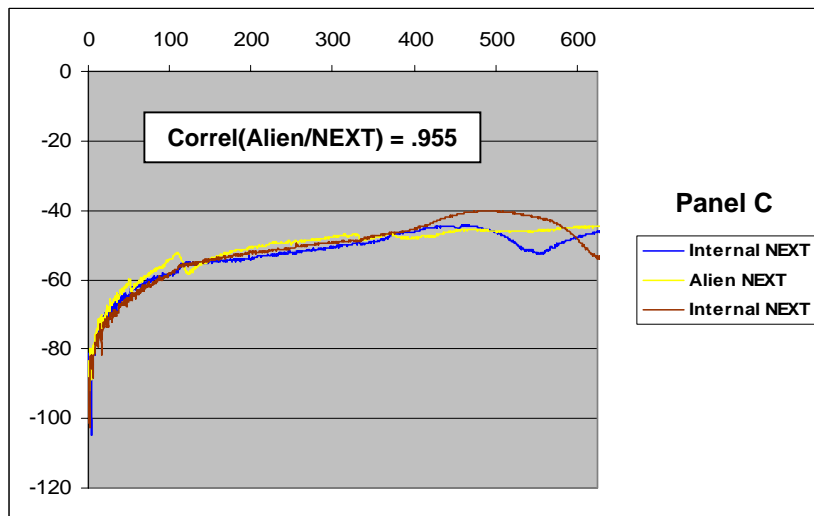
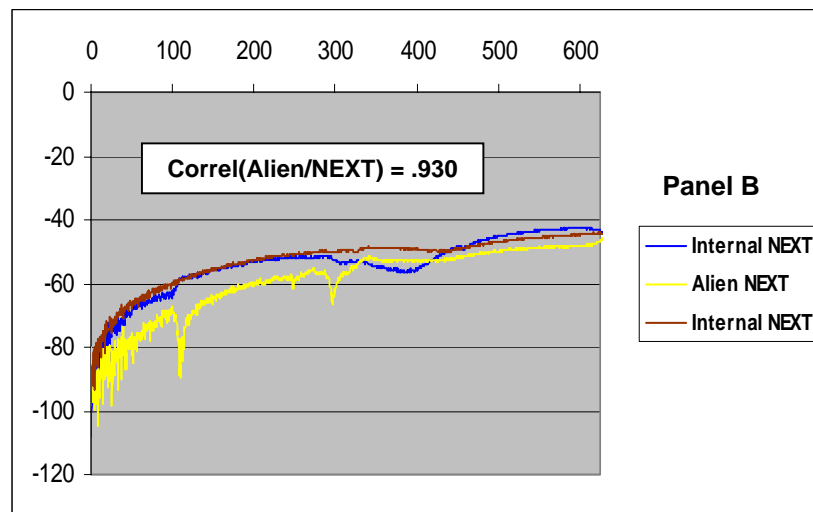
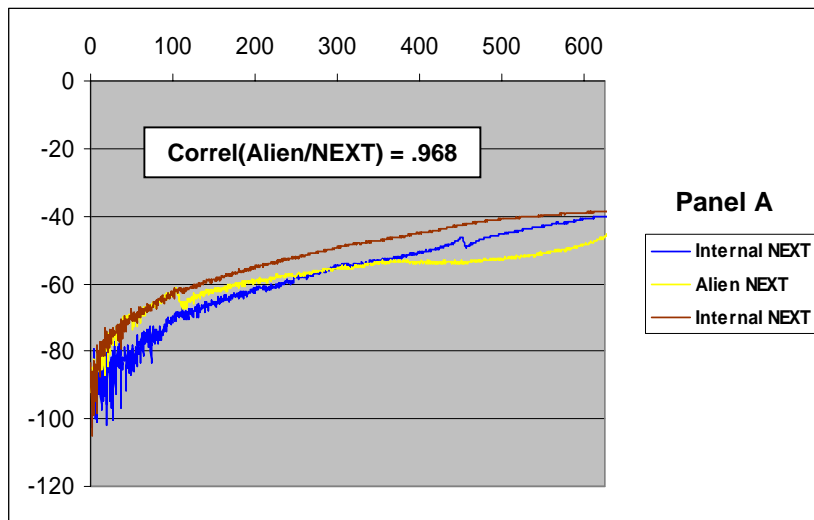


Internal NEXT and Alien NEXT on a 36 port panel

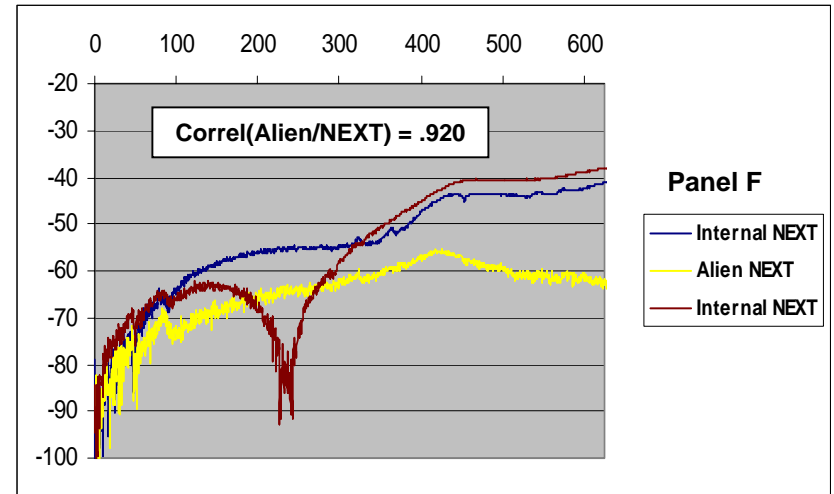
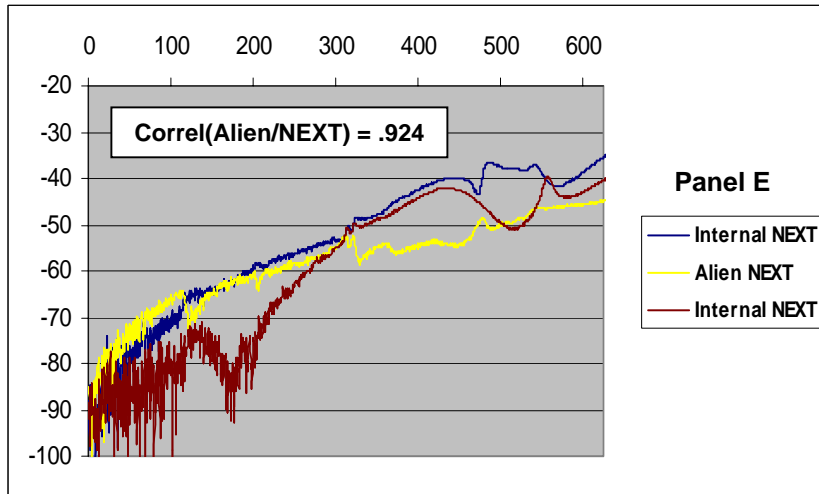


$$\text{Correl}(x,y) = \text{correlation coefficient} = \frac{\frac{1}{n} \sum_{i=1}^{i=n} (x_i - \mu_x)(y_i - \mu_y)}{\sigma_x \sigma_y}$$

Comparison with a Cat 6 Panel



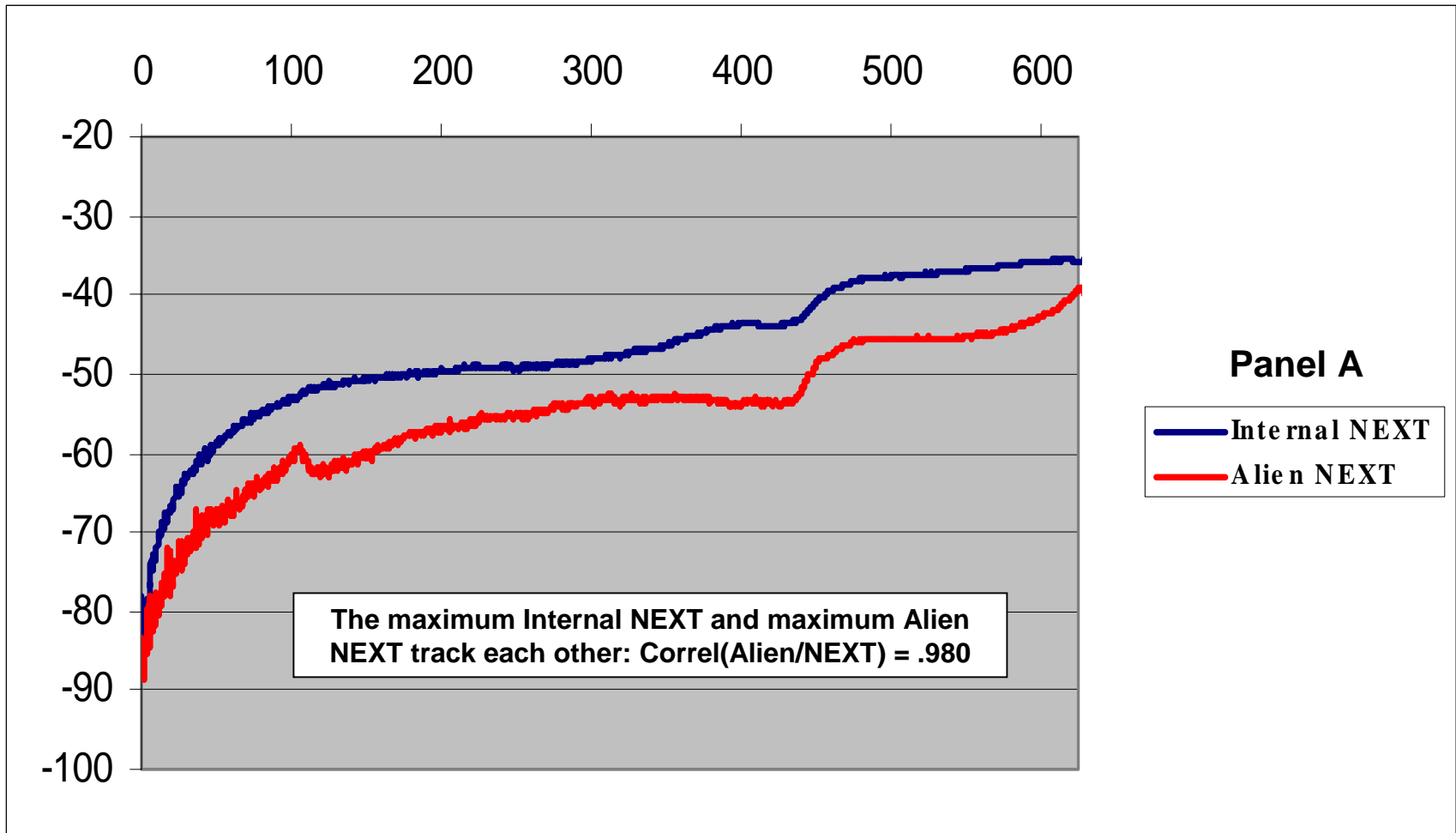
Comparison with Cat 6 Panel



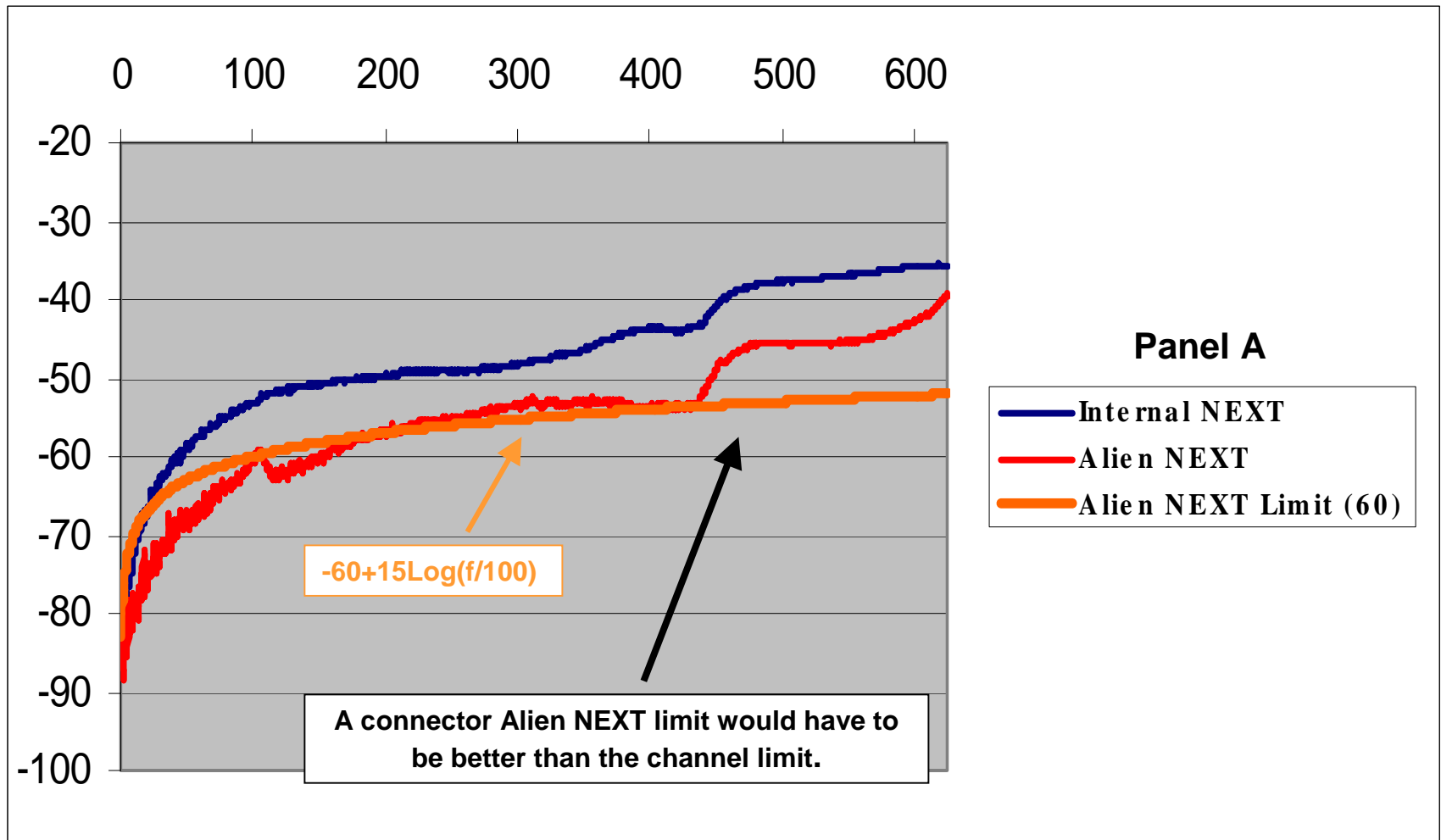
Comparison to a Limit

- It appears that most connector panel designs can have some relationship between internal NEXT and Alien NEXT.
- Can an appropriate limit for the Internal NEXT be determined if the Alien NEXT requirement is known?
- Compare the maximum Alien NEXT to a limit and then determine the maximum internal NEXT.

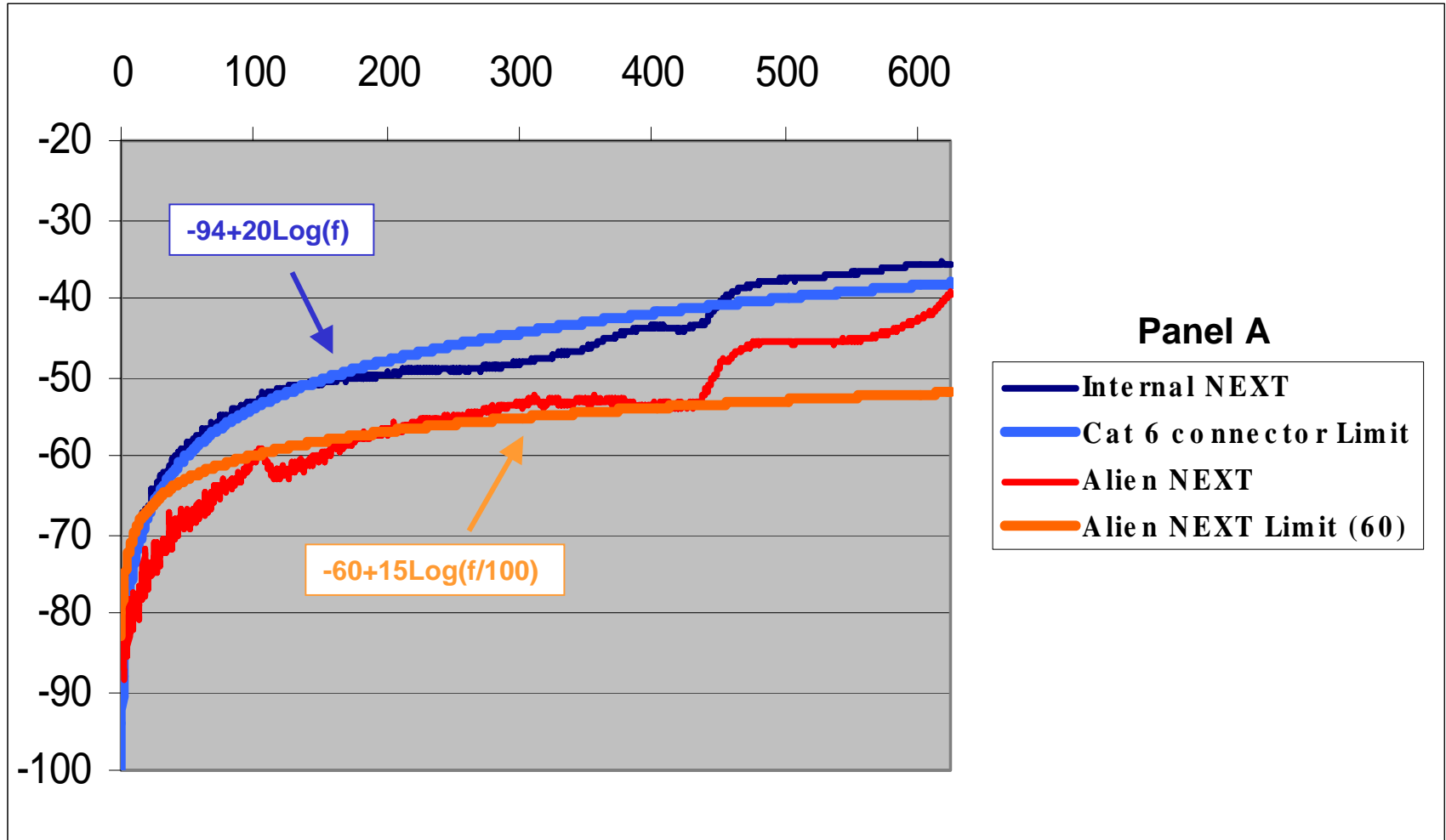
The maximum Internal NEXT and the maximum Alien NEXT from any pair at each frequency



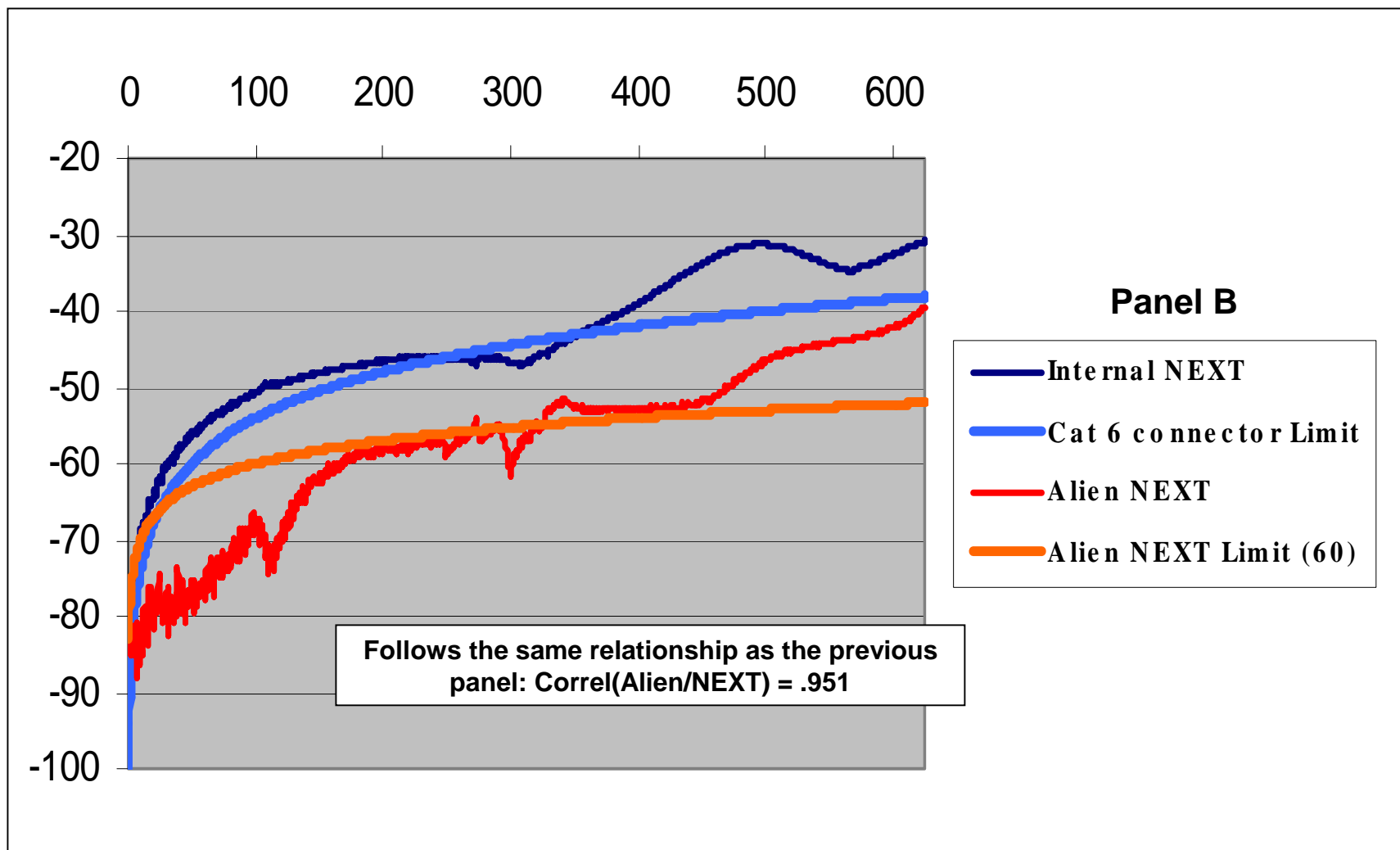
The maximum Alien NEXT is then compared to the channel Alien NEXT limit



The extrapolated Cat 6 connector limit is included in the comparison

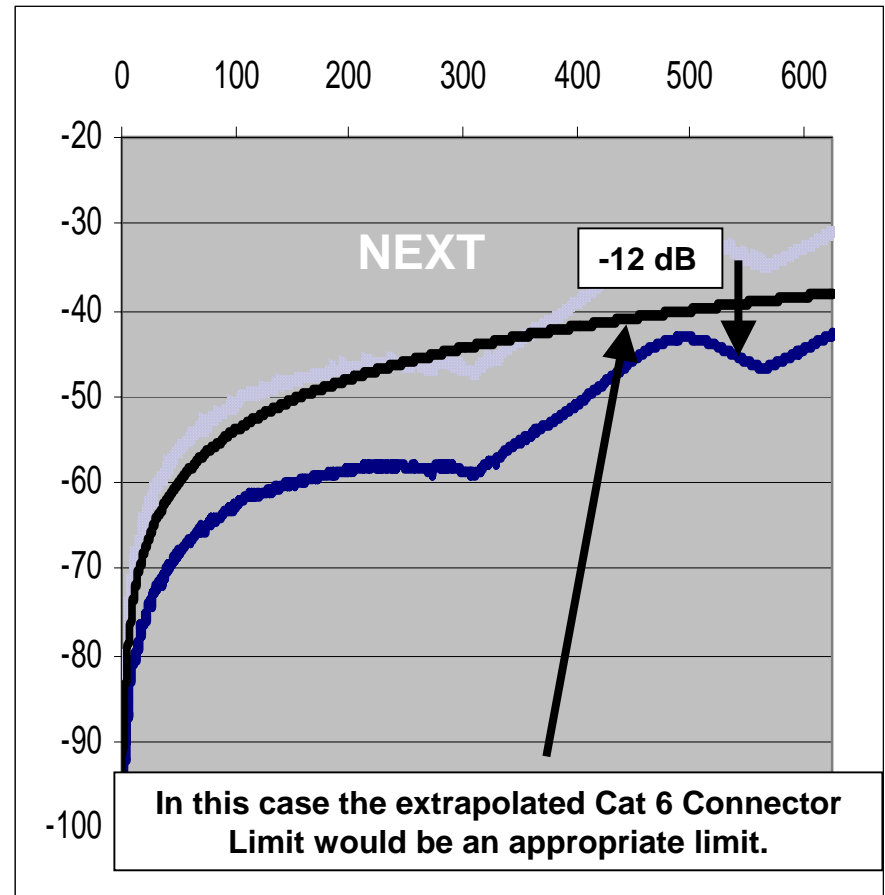
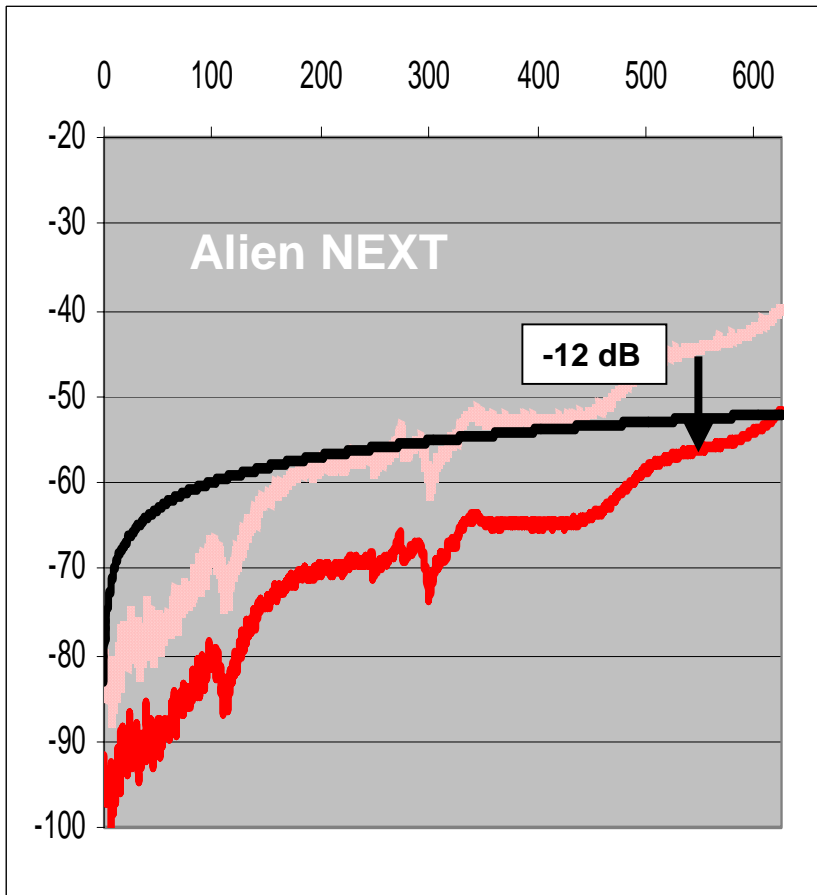


A second panel is compared to the extrapolated Cat 6 connector limit and the channel Alien NEXT limit

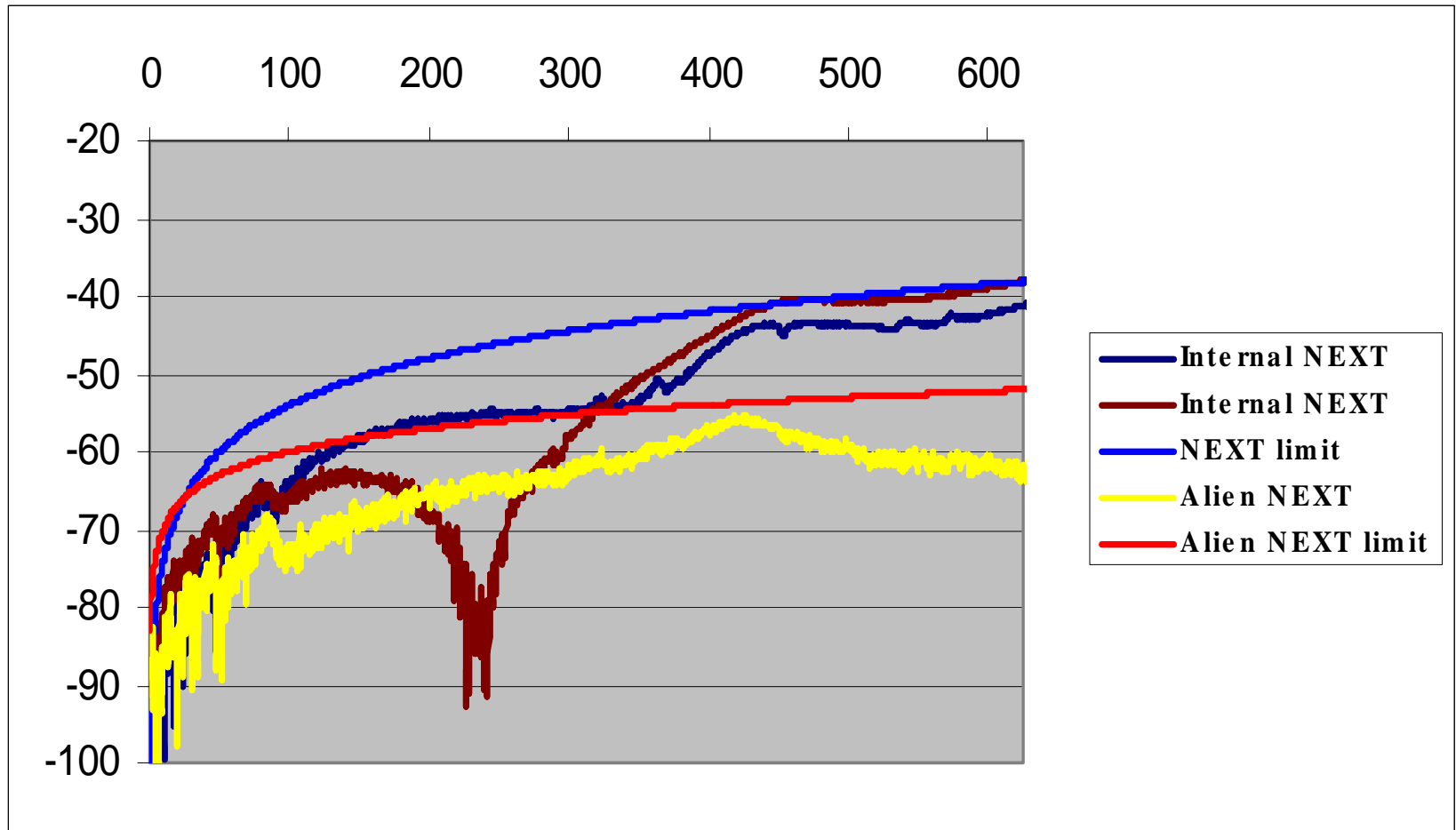


Improving Alien NEXT to meet a requirement should result in an improvement in Internal NEXT

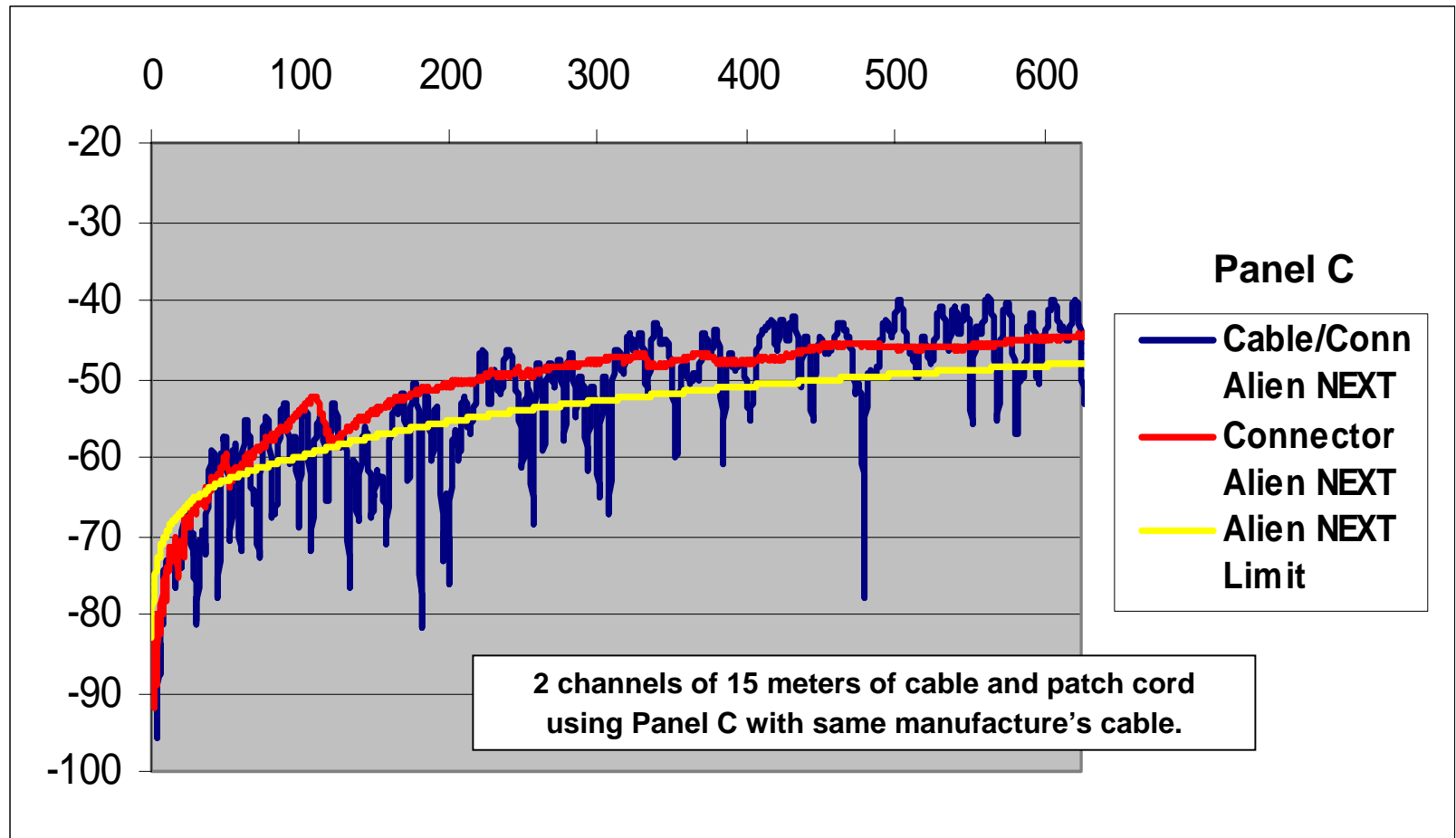
Both requirements should be improved



Panel F was able to meet both NEXT and Alien NEXT limits for the pair shown



As in the 36 port panel test a connector can have a significant impact on Alien NEXT



Conclusion

- The internal requirements for 100 meters should be the best possible due to the increased insertion loss compared to the 55 meter channel.
- The Alien NEXT on the panel connectors shown will have to be improved to meet a new requirement.
- An improved Alien NEXT design should improve the Internal NEXT.
- The extrapolated Cat 6 Limit is a reasonable limit.
 - A connector that meets Cat 6 extrapolated limits is more likely to meet the Alien NEXT requirement.