

Weibull News



Third Edition

June, 1990

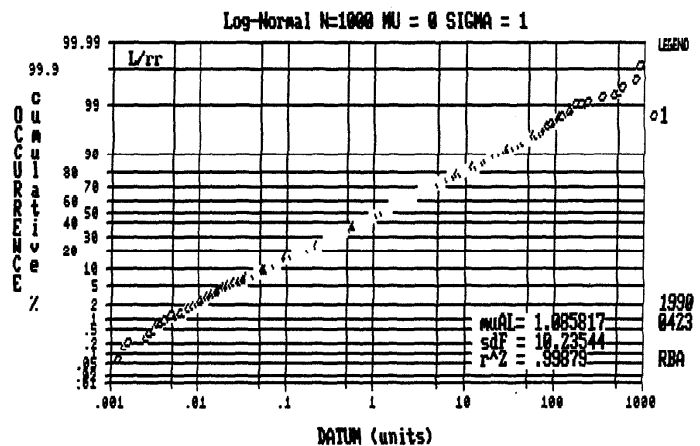
Log Normal Analysis...called LogNormalSMITH!! Wes Fulton has created a new program that does the good things WeibullSMITH does with the Log Normal distribution. For the first time we can easily determine which distribution, Weibull or Log Normal fits best. Two and three parameter versions of both distributions are available at a key stroke. The format, the options, editing, input and output, are identical to WeibullSMITH. But the best news is that after Wes created LogNormalSMITH, he figured out how to **Marry LogNormalSMITH to WeibullSMITH!** Now we have one program that does it all, so you don't have to load and reload data. Most of us have looked at curved Weibulls and t_0 corrections and wondered if the Log Normal distribution would be a better choice. And most of us concluded it would be too much work. Now there is an easy solution. Look at all the options and let the data tell us which is the most appropriate distribution. The Materials Engineers, the Metallurgists, and Bearing Engineers should be pleased with this new capability. (Use Main Menu Option E for Equations) to switch from WeibullSMITH to LogNormalSMITH.

Log Normal Parameters...If log x is normally distributed, x is said to be log normally distributed. The two parameters of the Log Normal, the mean (μ) and the standard deviation (σ), are in logs. Most engineers would prefer to talk in terms of the antilog so LogNormalSMITH prints out both: μ and σ as antilogs, and as log values. You may also be interested in the mean and standard deviation of x before we transform to logs...so LogNormalSMITH also provides that pair of values. Remember the antilog of μ and σ of log x do not equal μ and σ of x.

Output... WeibullSMITH Plots... With the WeibullSMITH hardcopy utility, (Main Menu Option A), my HP Laser IIP makes bigger plots (5" high) when I use the EGA & VGA resolution than CGA resolution (3" high"). However, my the Word Perfect 5.0 & 5.1 function called "Grab.Com" makes more legible plots if I select CGA resolution on my monitor (as I did for this WeibullNEWS plot). Word Perfect plots can be scaled to any dimensions.

Let the Presentation Begin...The newest WeibullLogNormalSMITH feature is the View Option, (Main Menu View). The first step is to make a list of data sets you want to present, selecting Weibull or LogNormal plots as you go. During your presentation single keystrokes will bring up the plots on the monitor (or overhead viewer if you have that capability), one after another.

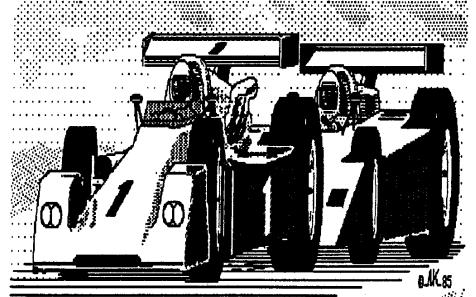
Did I Mention the New On-Line User Manual Capability?...WeibullSMITH is so friendly you'll never need help, but if you do...it's now just a keystroke away...(Main Menu Additional features).



The State-of-the-Art...LogNormalSMITH

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Weibull Rally... Wes Fulton and I have been discussing the idea of a WeibullSMITH User Conference. The objectives would be to (1) present and demonstrate all the new WeibullSMITH options, (2) let you try them out on PCs with a specially prepared "Playtime tutorial" and (3) present interesting Weibull problems and applications, a forum to exchange new Weibull Methodology. (4) Wes & I would really like to meet you all and have an opportunity for you to tell Wes what improvements you would like to add to WeibullSMITH. With sufficient time, we could invite you all to present papers on interesting applications and problems. SAE might sponsor the "Rally". I would appreciate it if you would call or write to me, and share your thoughts on this. Are you interested? When & where? How about Detroit, Los Angeles or Palm Beach? Would you give a presentation and/or a paper?



Start your Engines...for a Weibull Rally !

Public Weibull-LogNormal Workshops... ■ ASME (212) 705 7123, Denver, August 20-22, 1990
■ SAE (412) 776 4841, Detroit, October 29-31, 1990

On-Site Workshops & Consulting... Allison, U.S. Navy Corona, JPL, General Electric Evendale and Lynn, Garrett, Rolls Royce, SAAB, Volvo, Ford, Martin Marietta, John Deere, Florida Power & Light, McDonnell-Douglas, Union College, Texaco, Duke Power, PACAR, Teleflex, FN Bower Bearings, Copeland, NASA Cape Kennedy, The Society of Reliability Engineers, Union College, University of Tennessee Space Institute. *The first On-Site Weibull Rally has been scheduled..*

From the Editor... Thank you for your many calls and your interest. Please feel free to duplicate the Weibull News for your group. Tell your friends to send their address to me labeled "WeibullNews" if they would like to receive their own copy.

Some of the new applications are intriguing. The Dentists at the University of Kansas are using WeibullSMITH to measure the life of filling adhesives in the mouth. On Madison Avenue, Weibulls are used now to measure the life remaining of intangible assets like advertising and subscriber lists. Paul Barringer of Hydril sent me a raft of papers on Weibulls used in manufacturing for tool life and machine tool maintenance. Thank you Paul.

Questions to the Editor... Why do you prefer Binomial Confidence Intervals over other methods? There are at least three other methods described in books or papers by Wayne Nelson, Jerald Lawless and Neville Durrant. The Binomial or more properly, the Beta intervals were suggested by Leonard Johnson. They are related and derived from the same equations that provide the median ranks. Advantages: (1) The Beta bounds extend to a horizontal line drawn through the first point where the other types of intervals end at a vertical line drawn through the first point. As the area to the left of the first point is the area of maximum interest this is a big advantage. (2) The same Beta method works for the Log Normal as well as other probability distributions. Therefore, we can compare Weibull bounds with Log Normal bounds, "apples to apples". This is significant. (3) My comparisons with the other methods indicate good agreement, with the Beta values equal to or slightly more conservative than the other methods. I like to be a little conservative.

What is the most frequent question? What is Wes Fulton's telephone number? (213) 548 6358. (I find 7am and 6pm LA good times to find Wes at home...otherwise leave a message and he will return your call.)... How can I obtain a copy of the U.S. Air Force Weibull Analysis Handbook? Send the Editor a check for \$43 for domestic mailing, \$53 for overseas. Don't call. How can I obtain a copy of the Weibull Training VHS Video tape? Same answer: Send the Editor a check for \$43 for domestic mailing, \$53 for overseas for a VHS copy.

Call the Editor at (407) 842 4082 or write:

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The Log Normal Distribution
is Skewed Before Transforming to Logs
DISTRIBUTION OF X: MU = 1.00, SIGMA = 2.

