

stat teaser

Workshop Schedule

Experiment Design Made Easy

June 20-22: Minneapolis, MN (Sold Out)

August 1-3: Detroit, MI

September 12-14: Minneapolis, MN

October 24-26: Philadelphia, PA

Study the practical aspects of Design of Experiments (DOE). Learn about simple, but powerful, two-level factorial designs.

Response Surface Methods for Process Optimization

November 7-9: Atlanta, GA

Find the optimum settings for your process. Generate 3D maps to identify peak areas and overlay plots to find your sweet spot.

Mixture Design for Optimal Formulations

July 11-13: Minneapolis, MN

September 19-21: Philadelphia, PA

Standard factorial designs don't work well for formulations. Learn all the skills you need for mixture design in this course.

Robust Design: DOE Tools for Reducing Variation

October 3-5: Minneapolis, MN

Use DOE to create products and processes that are robust to varying conditions. Factorial and RSM proficiency is required.

Real-Life DOE

August 22-23: Minneapolis, MN

Not your normal textbook data - analyze real data sets and learn how to deal with messy problems! Working knowledge of factorial designs is required.

Attendance limited to 20. Reserve your place by calling Sherry, ext. 18, at (800) 801-7191.



ABOUT STAT-EASE SOFTWARE, TRAINING, AND CONSULTING FOR DOE
Phone 612.378.9449 Toll-Free 800.801.7191 E-mail info@statease.com Web Site www.statease.com

Stat-Ease Releases Design-Expert® 6.0 Software - Experience the Power!

Stat-Ease announces the release of Design-Expert®, version 6.0 (DX6)! This major release offers greatly expanded design and analysis capabilities for mixture and/or process and/or categorical factors. Annotated outputs and a completely new help system provide novices with the interpretation guidance they need. At the same time, experts get all the statistical details they demand. Upgrade from Design-Expert 5 to Design-Expert 6 for only \$295. New copies can be purchased for \$995.

What's New in DX6?

*beta tester favorites!

New Design Options...

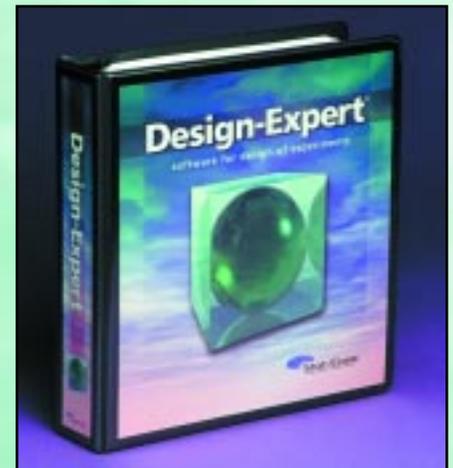
- Two-level factorials have been expanded to include up to 256 runs and up to 8 blocks for 2-15 factors
- General factorials now handle multilevel variables with ease*
- D-optimal option for multilevel categorical designs reduces the number of experimental runs*
- Taguchi orthogonal arrays
- Crossed Mixture/Process designs*

Flexibility in Design Modification...

- Insert factors into an existing design matrix
- Define generators for fractional factorial designs and blocking schemes
- Add categorical factors to response surface, mixture or crossed designs*
- Create a factorial candidate set for RSM designs where only specific factor levels are available

Statistical Analysis...

- Temporarily "ignore" a design point



DX6 Now Available!

FREE mousepad if ordered by 8/1/00.

Call Renee at 1-800-801-7191.
Fax the enclosed order form.
E-mail us at info@statease.com.

without deleting the data!*

- Annotated view of ANOVA explains output in easy to understand terms*
- New warning message for factorials with main effect or two-factor interaction aliasing
- Easily exchange aliased terms in the model
- Added 95% confidence intervals for coefficients
- Add your own terms (such as quartic) to models
- Advanced users can analyze split-plot and nested designs by specifying terms for the model, error, block and ignore

New Plots...

- Box-Cox transformation plot makes choosing the best power law trans-

- continued on page 2

- continued from page 1

- formation a snap!*
- Predicted versus Actual plot with 45 degree line
- Graph alternative aliased interactions

Numerical Optimization...

- Include categorical factors!*
- Set a factor equal to a constant value

Achieve "Six-Sigma" Goals...

- Explore propagation of error (POE) for mixtures, crossed designs and transformed responses as well as response surface designs
- For purposes of POE, enter your own factor and response standard deviation or set it at zero

All New Win2000-Style Help System...

- Context-sensitive help
- Suggested models
- "Getting Started" guidance
- User tips (our secrets revealed!)
- Comprehensive software reference

Do you have a specific question about the software? Give us a call, we'll be happy to help (800.801.7191).

International Distributor Spotlight

Stat-Ease is pleased to introduce you to our Manufacturer's Representative for Europe, Alan Collins of QD Consulting. Alan has been selling Stat-Ease products since 1989 and is our #1 distributor.

Alan was born in Cardiff, Wales and later moved to England. He received his education at Oxford University (Jesus College) and has a BA (Honors) in Chemistry and an MSc for his research work in Polymerisation Reactions. While at school, Alan distinguished himself not only in his studies, but also as a champion Contract Bridge player. In addition, it was at Oxford that he met and married his wife, Linda.

Alan was introduced to Design of Experiments (DOE) while working in R&D/Technical Service for a company in

DX6 Offers General Factorials

Have you ever set up a design only to realize that one or more of your factors has more than two levels? In this case a two-level factorial design won't work. You may try to trick the software into thinking you have a response surface design by simply calling the levels 1, 2, 3, etc. But you know this isn't really the right approach. What type of design can you use?

DX6 offers several alternatives. The first is the **General Factorial** design. This design allows you to specify the number of levels for each factor. The software then creates a full factorial based on those levels. So, you can have any combination of factors and levels. The disadvantage of this design is that it grows very big, very quickly. Consider a four-factor design where factors A and B each have 2 levels, factor C has 3 levels, and factor D has 5 levels. That will result in a full-factorial design with $2 \times 2 \times 3 \times 5 = 60$ runs! (Now

do you see why two-level factorials are encouraged?)

A second alternative is the **D-optimal** design for factorials. Again, you can specify any number of levels for each factor. **Then** you specify the model that you want to fit. The default is a 2FI (two-factor interaction) model. For the example given above, this will generate a fractional design with 35 runs. If you know specific interactions are unlikely to exist, you can further reduce the desired model, which will reduce the required number of runs.

These new design options will open up a whole new world of experimentation for you. Explore and Enjoy!

by Shari Kraber, Consultant



Alan Collins plays the concertina in Royston, England.

the UK doing emulsion polymers for coatings and textile applications. He then worked in Sweden for a number of years. (He found Sweden to be beautiful, but expensive!)

After returning to England, Alan joined PA Technology, a division of PA Management Consultants. While there, he developed DOE for use on internal projects and began training and consulting specifically on DOE. He wrote a simple spreadsheet to assist with DOE calculations, but in 1986/87 as a result of an evaluation of available DOE software, bought an early copy of Design-Ease® software. In 1988 Alan started QD Consulting, concentrating on DOE and Project Planning. In 1989 he began selling Stat-Ease products in

Europe. The rest is history!

Outside of work, Alan's interests are many. He collects antique pewter and likes folk music. He plays the concertina (a six-sided squeeze box) and his wife Linda sings. They often play at local pubs two or three times a week. Alan also enjoys traditional (English)

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Don't Miss the 2000 DOE Conference!

Stat-Ease will host its second annual DOE (Design of Experiments) conference in Minneapolis, MN July 27-28. The conference runs from 8 am Thursday morning to 3 pm Friday afternoon. On Thursday, the conference features two tracks, one for the DOE novice and one for the experienced experimenter.

Track A will be the roll-out of our newest workshop - *DOE Simplified - An Intro to Breakthrough Tools for Planned Experimentation*. This one-day workshop is directed toward the DOE novice. Participants with little or no previous experience with DOE are welcomed.

Track B teaches in-depth skills for the intermediate to advanced experimenter. It features topics that will advance your knowledge and understanding of various design and analysis techniques.

DOE Refresher

If you are experienced at doing DOE's but would like to brush up on your skills and learn new analysis tips and tricks, join us in August for our two-day **Real-Life DOE** workshop.

Polish your analysis skills on real-world case studies from the Stat-Ease files. This workshop explores the effects of missing data and how one outlier can confuse an entire analysis. Messy data abounds here - come and join the fun!

Cost is \$995.00 for the 2-day computer-intensive workshop. Call Sherry at 612.378.9449 x18 to enroll.

Real-Life DOE
August 22-23, 2000
Minneapolis, MN

Sessions on Friday are being presented by engineers, researchers and scientists who want to share their DOE experiences with you.

Each attendee will receive a proceedings manual that includes materials from all sessions in both tracks.

Thursday, July 27

Track A - DOE Simplified

- **Basic Tools for Breakthroughs:** An introduction to DOE, concentrating on factorial designs
- **Advanced Tools for Optimization:** Study general factorials, response surface and mixture designs

Track B - Advanced Sessions

- **Don't Throw That Data Away - How to Make Use of Design Augmentation**
- **Creating Optimal Designs - Combining Criteria to Achieve Robust Results**
- **Know Your Experimental Power - Size your DOE Correctly**
- **"What If" Optimization - Adding Cost Equations and Other Fun Tools!**

Friday, July 28 - Real-World Case Studies

- **"In Search of Optimum Antibiotic**

Production Using a Sequence of Designs by Luisa Sia, Wyeth-Ayerst Research

- **"Can We Top the Green Bean Casserole Recipe?"** by Alan F. Richter, Reckitt Benckiser
- **"Using DOE to Discover Process Effects on Possible Part Failures"** by Leslie Klar, UFE Inc.
- **"Formulation and Mixture Designs for Weathering Studies"** by L. Scott Crump, Cook Composites and Polymers
- **"DOE in the Courtroom"** by R.J. Del Vecchio
- **"Effect of Foam Properties on Hot-Ink Roller Performance"** by Jennifer Borkovich, ITW Coding Products
- **"A Configuration Generator Tool for System Compatibility Tests"** by Hamid Rasoulian, Dell Computers.

Sign up for the conference by using the fax-back form in this newsletter, or by calling Stat-Ease at 800.801.7191 or 612.378.9449. You'll find more detailed descriptions on our web site at www.statease.com.

Keynote Dinner Presentation by
Dr. Douglas Montgomery
Thursday, July 27, 6-8 pm

Important News for Intl. Readers

The Stat-Teaser newsletter, published

www.statease.com

quarterly, is now available online. Instead of waiting for snail mail and corporate routing systems to deliver your newsletter, you can now download the Stat-Teaser in .pdf format to your own computer. To try it out, simply go to our web site and select the publications button.

Attention International Readers: (U.S., Puerto Rico, Canada and Mexico excluded.)

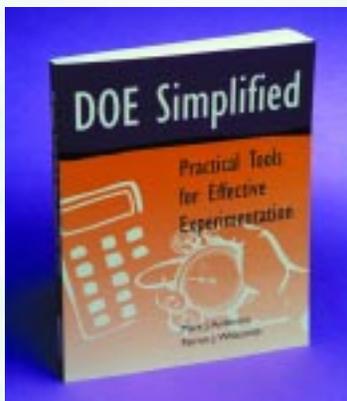
The Stat-Teaser will now be provided to you via our new online service. Quarterly we will notify you by e-mail that the latest

Stat-Teaser has been posted on our web site and is available for immediate download. This will eliminate typical delays of up to one month in getting you the latest news, articles and information. **To activate this service, you must provide your e-mail address** on the enclosed fax-back form or send an e-mail to info@statease.com. If you wish to continue to receive a printed copy via the normal mail service, please check the appropriate box on the enclosed fax-back order form and supply us with your name and current address. **Don't let this be your last issue!**

DOE Simplified: Practical Tools for Effective Experimentation

Can't get enough of "Mark's Experiment" in the Stat-Teaser? Try reading the new book - *DOE Simplified!* Mark Anderson and Pat Whitcomb have combined their talents and sense of humor to produce a new introductory text on experimental design. This book is geared toward readers with minimal statistical background. It presents a fresh and lively approach to learning the fundamentals of DOE. Filled with fun anecdotes and sidebars, *DOE Simplified* cuts through the complexities of this powerful tool for quality improvement. The book includes a CD-ROM with a 180-day trial version of Design-Ease version 6 DOE software. Topics in the book include:

- Basic statistics for DOE
- Methods for collecting and displaying data
- How to draw inferences from data
- The purpose of confidence intervals
- Comparative experiments for testing hypotheses
- Blocking sources of variation from analysis
- Two-level factorial design
- Analysis of variance.



"By taking situations from everyday life and using simple language to transfer them to manufacturing and laboratory environments, the authors have made an often dry, difficult subject attainable for even the uninitiated."

- Jay Youngless, Assistant Editor,
Quality in Manufacturing

Purchase *DOE Simplified* for \$39.95. To buy, fax back the enclosed order form or call 612.378.9449.

New Workshop!

Stat-Ease is offering a new one-day workshop, **DOE Simplified - An Intro to Breakthrough Tools for Planned Experimentation**, (based on the DOE Simplified book). Debuting at the DOE Conference, this workshop offers the perfect introduction to DOE, for everyone from technicians to engineers to managers. It provides an overview of DOE concepts and illustrates an array of tools and design types. Although this workshop is not a substitute for hands-on computer-intensive training, it provides an educational starting point. This workshop will be one of the keys to successfully implementing designed experiments in your business.

Contact Sherry at **612.378.9449 x18** for workshop pricing information. (Or e-mail sherry@statease.com.)

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Case Study #3: "Development of a Multicomponent Allergy Screen Assay" (by David Blattenberger and Mary Bertelson) Reprinted from BIOTECHNOLOGY INTERNATIONAL II. Researchers from the Immunodiagnostics Development Center used designed experiments to develop a five-component allergen assay for screening purposes. Their study determined whether a patient had monospecific allergenicity (reactive to one component) or multispecific allergenicity (reactive to any combination of components).

Case Study #24: "Computer-Aided Tools for Optimal Mixture Design" (by Mark Anderson and Pat Whitcomb) Reprinted from PAINT & COATINGS INDUSTRY, November 1999. This case study looks at formulating an automotive clearcoat using design of experiments. It shows how to combine mixture components and process factors in a single experiment.

Case Study #36: "Formulating By Design (of Experiment)" Reprinted from PHARMACEUTICAL FORMULATION & QUALITY, September/October 1999. Formulation is still approached as a craft in much of the pharmaceutical industry - the number of factors to be considered often makes it seem that only the instincts of a seasoned formulator can pilot some development projects safely to port. But statistical knowledge combined with the calculating power of modern desktop computers now gives formulators the option of systematically overcoming even extremely complex problems.

Case Study #37: "Eight Keys to Successful DOE" (by Mark Anderson and Shari Kraber) Reprinted from QUALITY DIGEST, July 1999. DOE provides an efficient path to improvement for those who know how to use it. In this overview learn the critical things you need to know to successfully use designed experiments.

Check out www.statease.com for a complete list of available case studies and order online.

Consultants & Trainers

Stat-Ease is here to support you in your efforts to teach design of experiments techniques. We offer a special Teaching License for qualified consultants and DOE trainers who want to use Design-Expert as part of their short courses*. The Teaching License includes one copy of Design-Expert and manual, and permission to install the software temporarily on classroom computers during your courses. Stat-Ease also has time-limited copies available to students for \$15 each. Call for more information about this special license, for technical support, or for a software quote.

*College and university faculty should contact J. Wiley & Sons. They offer an educational version of Design-Expert for semester-length classes with or without Douglas Montgomery's *Design & Analysis of Experiments* textbook. For more information, contact Penny Perrotto. (p: 212.850.6230, f: 212.850.6591, e-mail penny.perrotto@wiley.com).

Where can you find us?

June 26-28 - Joint Research Conference, Seattle, WA

*Talk - "Innovative Experiment Designs and Optimization Tools Find Optimal Settings for Mixture, Process and Categorical Variables", by Shari Kraber, Consultant

July 17-18 - BioMedical Focus Conference, Minneapolis, MN, Booth #46

July 27-28 - 2nd Annual Stat-Ease DOE Conference, Minneapolis, MN

August 14-16 - Joint Statistical Meetings, Indianapolis, IN, Booth #502

September 8-10 - Industrial Statistics in Action 2000 International Conference, University of Newcastle, UK

*Talk submitted by Mark Anderson

October 12-13 - Fall Technical Conference, Minneapolis, MN

*Talk - "A Unified Approach to Power Calculations for Designed Experiments" by Pat Whitcomb & Gary Oehlert

-Spotlight on Alan Collins cont. from page 2
rapper sword dancing. The rapper dance is performed by five men linked in a circle by 5 flexible swords. It originated in the mining villages around Newcastle upon Tyne. Hopefully Alan and Mark Anderson (Principal of Stat-Ease) will have a chance to view this dance in its home area while exhibiting at the Industrial Statistics in Action 2000 conference at the University of Newcastle, September 8-10, 2000.

Alan and Linda's family is made up of a son, Mark, two cats and a Golden Retriever. Mark, who is studying for a Biochemistry degree, is currently on a year abroad at the University of California - Santa Cruz. He loves California and is spending his time climbing, surfing, snowboarding and learning to speak American English!

We are very happy to have Alan represent us in Europe.

QD Consulting, 68 Station Road, Steeple Morden, Royston, Herts SG8 ONS, United Kingdom. p: +44 (0) 1763 852446, f: +44 (0) 1763 852576, e-mail acollins@qdconsult.co.uk.

Stat-Ease Fax-Back Registration/Order Form

Use this form to register for the DOE Conference, purchase Design-Expert 6.0 or DOE Simplified, or to order reprints.

Design-Expert 6.0 - Stat-Ease's newest experimental design software advances DOE analysis functionality and ease to a new level. It represents a significant improvement over previous versions and competitive packages. **Order by August 1, 2000 and receive FREE a colorful Stat-Ease mousepad!**

DOE Simplified Book - A lively presentation of the basic concepts behind designed experiments. Directed at the newcomer with little or no previous experience. The book comes with a 180-day time-limited CD-ROM of Design-Ease 6.

DOE Conference Registration - July 27-28, 2000, Minneapolis, MN

Registration fee includes the two-day conference, two continental breakfasts, two lunches, dinner Thursday evening, and a time-limited copy of Design-Expert 6. (Academic Discount - 50%) Please indicate which track you are likely to attend and confirm your attendance at the Thursday evening Keynote Dinner. Additional dinners (spouse, etc.) may be ordered for \$30 each. Register by June 30 for the best price!

International Readers (Non-North American) - If you would like to continue to receive the Stat-Teaser by regular mail service, please check the box below and fax this form back to us **with updated address information**. Or, if you would like to take advantage of our new online service (in which you are notified by e-mail when the latest newsletter is posted on our web site), please provide your current **e-mail address** below.

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Qty	Item	Other Required Information	Unit Cost	Ext. Cost
	2000 DOE Conference	<input type="checkbox"/> Track A <input type="checkbox"/> Track B <input type="checkbox"/> Yes, I'll Attend Dinner	\$395.00 (\$445.00 after 6/30)	
	Design-Expert 6.0 [Single license - for quantity discounts (3+ copies) or network licenses, call for a quote]			\$995.00
	Upgrade to DX6 from DX5	Old Serial # required:	\$295.00	
	Upgrade to DX6 from DX4 or earlier	Old Serial # required:	\$395.00	
	DOE Simplified Book (Comes with a 180-day CD-ROM of Design-Ease software)		\$39.95	
	DOE Case Studies (See the reverse side for descriptions.) Please circle the reprint #'s you would like sent: 3 24 36 37		FREE	FREE
	Shipping within the USA - Add \$15.00 for each software package & \$5.00 for each book. All others, please call for a quote.			
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