This presentation was a tutorial and as such
was done as a series of slides with commentary.
Below is the basic text of the slides with a
general description of the remarks where
required.

note 'Users Guide: Basics';
note 'Users Guide: Statistics';
note 'SAS/AF Users Guide';
note 'SAS/ETS Users Guide';
note 'SAS/GRAPH Users Guide';
note 'SAS/FSF Users Guide';

Given the mass of documentation provided by the
Institute, and the application of the SAS
system to smaller and smaller machines, it
becomes more and more important for users to
make the most effective use of SAS possible.
This generally means thinking through your
use of the programming capabilities BEFORE you
write your program.

note 'The BY Statement';
note 'Benefits';
note '1. Run multiple procedures with one';
note 'extra statement.';
note '2. Provides tools useful in producing';
note 'reports and altering data.';
note '3. One of the simplest AND most';
note 'powerful facilities in SAS.';
note 'Costs:';
note 'SORTing data takes computer';
note 'time and space.';

Making effective use of the BY process requires
learning HOW to use it as well as WHEN. Simply
sorting your data to insure correctness leads
to incredibly slow response with small machines.

note 'BY: What it is.';
note "EXPLICIT":
note 'Use: The SORT Procedure';
note 'Means: REORDER the dataset into'
note 'the explicit order named.';
note 'IMPLICIT:'
note 'Use: Everywhere else.';
note 'Means: Apply special processing'
note 'while IMPLYING that the'
note 'dataset is in ORDER.';

A fundamental understanding of the BY statement:
That SORTing is an active process and all other
uses of the BY only require order, they do not
require SORTing. Additionally, SAS like most
other computing systems has basically a
sequential process once data is in an order,
normal use does not change that order.

NOTE 'EXPLICIT':
NOTE 'Ordering a dataset using the'
NOTE 'SORT procedure.';
NOTE 'BY V1 V2 V3 ...';
NOTE 'Primary order BY variable V1';
NOTE 'within V1, BY V2';
NOTE 'within V2, BY V3';

note 'BY RACE SEX AGE':
note 'Race SEX AGE';
note 'BLUE FEMALE 12';
note 'BLUE FEMALE 13';
note 'BLUE MALE 5';
note 'BLUE MALE 12';
note 'BLUE OTHER 12';
note 'ORANGE FEMALE 37';
note 'ORANGE MALE 22';
note 'ORANGE MALE 32';
note 'ORANGE MALE 999';
note 'ORANGE NONE 0';
note 'ORANGE SOME 4';

An example of an ordered dataset.

note 'Yes':
note 'BY Race Sex Age';
note 'BY Race Sex';
note 'BY Race';
note 'No';
note 'BY Sex';
note 'BY Race Age';

By statements that may/may not be used given the
order of the data above.

note 'NOTES:'
note '(1) Sorting data COSTS.'
note '(2) THINK through the problem.'
note 'FIRST.'
note '(3) If data is already in order.'
note 'Do not resort.'
note '(4) See 2 above.'

note 'Everything Else':
note 'The BY statement IMPLIES'
note 'that the data is in some order.'
note 'AND'
note 'SAS is to do something special.'

note 'NOTES:'
note '(1) The ORDER is IMPLIED. SAS
note 'does not know if - the data
note 'really is in order.'
note '(2) SAS will stop when it finds
note 'an observation OUT OF ORDER.'
note '(3) See (2) of EXPLICIT notes.'

note 'DATA MAIN'
Examples of normal, simple use of the BY.

Examples of a procedure that MAY not require the use of a BY to produce required tables.

An example where thinking before action, could save sorting.

The reordered example from above.

A replacement for either example above.