

NASA TECH BRIEF



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SEAL (Subnetwork Enumeration and Listing)

The problem:

To find the thousands of unique configurations realizable for large networks of up to eight terminals.

The solution:

A computer program which uses combinatorial techniques to generate all of the nonredundant subnetwork configurations derivable from an asymmetrical network or device.

How it's done:

This is accomplished by a systematic shorting and opening of accessible terminals to obtain the desired allowable configurations.

The program is divided into three parts. First the I external terminals are constrained to form the necessary x-terminal subnetwork where the I external terminals are accessible testpoints, each consisting of either a single terminal of the parent network or a group of terminals from the parent network constrained to form the single external terminal. Partition numbers and permutations are used to constrain the terminals and the results are stored. The program then enumerates and stores the various combinations of z-1 internal terminals where internal terminals are un-

cessible testpoints in the subnetwork configurations. Finally, the stored combinations of external and internal terminals for the particular I and x are integrated, or interwoven, to form the H(z,x) configurations.

Notes:

1. This program is written in Fortran IV for use on the UNIVAC 1108 computer.
2. In applying this program to the fields of testing and network analysis, the computer printout may be utilized to construct test programs for use in testing devices and networks with a small number of terminals.
3. Inquiries concerning this program may be made to:
COSMIC
Computer Center
University of Georgia
Athens, Georgia 30601
Reference: B68-10227

Patent status:

No patent action is contemplated by NASA.
Source: Francis J. McIntosh and W. W. Happ
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