

RL-TR-91-87
In-House Report
April 1991

AD-A236 148



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A SURVEY OF RELIABILITY, MAINTAINABILITY, SUPPORTABILITY, AND TESTABILITY SOFTWARE TOOLS

Joseph A. Caroli

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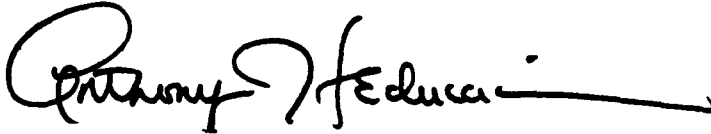
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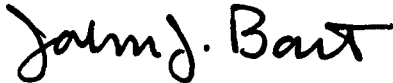
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REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY (Leave Blank)		2. REPORT DATE April 1991		3. REPORT TYPE AND DATES COVERED In-House Aug 90 - Jan 91	
4. TITLE AND SUBTITLE A SURVEY OF RELIABILITY, MAINTAINABILITY, SUPPORTABILITY, AND TESTABILITY SOFTWARE TOOLS				5. FUNDING NUMBERS PE - 62702F PR - 2338 TA - 02 WU - 2X	
6. AUTHOR(S) Joseph A. Caroli					
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Rome Laboratory (RBET) Griffiss AFB NY 13441-5700				8. PERFORMING ORGANIZATION REPORT NUMBER RL-TR-91-87	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) Rome Laboratory (RBET) Griffiss AFB NY 13441-5700				10. SPONSORING/MONITORING AGENCY REPORT NUMBER N/A	
11. SUPPLEMENTARY NOTES Rome Laboratory Project Engineer: Joseph A. Caroli/RBET/(315) 330-4205					
12a. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited.				12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) This report contains over 300 summaries of Reliability, Maintainability, Supportability, and Testability (R/M/S/T) software tools. Information is provided relative to tool name, description, operating environment and point of contact. The computer program summaries are unbiased and not based on actual evaluations of the products. The intent is to provide a complete (as possible) listing of all software that exists to help design for R/M/S/T.					
14. SUBJECT TERMS Reliability, Maintainability, Supportability, Testability, Software, Computer Programs				15. NUMBER OF PAGES 116	
				16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT UNCLASSIFIED	18. SECURITY CLASSIFICATION OF THIS PAGE UNCLASSIFIED	19. SECURITY CLASSIFICATION OF ABSTRACT UNCLASSIFIED	20. LIMITATION OF ABSTRACT UL		

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0.0 INTRODUCTION

Over the past decade the development of automated design techniques has proliferated at an alarming rate. This survey specifically addresses those in the disciplines of Reliability, Maintainability, Supportability and Testability (R/M/S/T). Brief abstracts are provided for as many R/M/S/T software tools that information could be obtained on. Various data sources were examined. Newsletter articles were published soliciting information on R/M/S/T software and several organizations responded by sending in their product brochures. Vendors were telephone surveyed, symposium proceedings were reviewed, literature searches were conducted, and software catalogs were examined. In total 233 summaries are contained in this report, 110 on reliability tools, 32 in the area of maintainability and supportability, 64 in the testability area, and 27 others.

Information is provided on the computer programs in the following format.

NAME: Program name or title

ABSTRACT: Brief explanation of what the tool does or is intended to do. This survey is unbiased and was not an attempt to evaluate the software programs in any way. The information presented in the abstracts was summarized or extracted from brochures or other publications. Claims made about the tools capabilities were not evaluated or verified. THE ROME LABORATORY DOESN'T NECESSARILY ENDORSE THE USE OF ANY OR ALL TOOLS LISTED IN THIS REPORT.

MACHINE: List of the computer(s) and/or operating system(s) that the tool is intended to work under.

POC: Company name, individual point of contact (POC), address and telephone number. This is either the developer and/or the tool vendor/distributor.

Note: Where information couldn't be obtained on a given tool for any of the above fields "No Data" was entered. Since the intent was to provide a compendium of as many tools as could be found, some of the tools have only sparse information provided on them. Tools weren't left out based on a lack of information relative to the above fields.

This report can be used in a number of ways. System designers and reliability engineers can use it to help search for the appropriate tool. R/M/S/T software developers can start here to see what has already been developed and by whom. This can help to avoid unnecessary duplication of effort. Comparative evaluations are at times conducted on software programs that are intended to perform the same or similar functions. Software evaluations would be a logical follow-on to this survey. It is highly

recommended that a more detailed compendium be developed and kept up-to-date on an annual or biannual basis. Information relative to cost, maturity, availability, source code, evaluated capabilities and weaknesses, etc. should be compiled and housed in a data base. This report could lay the groundwork for such a job.

0.1 LIST OF ACRONYMS

The following acronyms are used throughout this report. Software tool and company names are omitted from this listing.

AF	-	Air Force
ASIC	-	Application Specific Integrated Circuit
ATE	-	Automated Test Equipment
ATG	-	Automatic Test Generator
ATPG	-	Automatic Test Program Generator
AVIP	-	Avionics Integrity Program
BELLCORE	-	Bell Communications Research
BIT	-	Built-In-Test
BITE	-	Built-In-Test Equipment
CAD	-	Computer Aided Design
CAE	-	Computer Aided Engineering
CALS	-	Computer Aided Logistics Support
CMOS	-	Complementary Metal Oxide Semiconductor
CY	-	Controllability
DoD	-	Department of Defense
DFT	-	Design For Testability
ECL	-	Emitter Coupled Logic
ESS	-	Environmental Stress Screening
FI	-	Fault Isolation
FIG	-	Fault Isolation Group
FMECA	-	Failure Mode Effects and Criticality Analysis
FRACAS	-	Failure Reporting And Corrective Action System
IBM PC	-	International Business Machine Compatible Personal Computer
IC	-	Integrated Circuit
IDSS	-	Integrated Diagnostics Support System
IEEE	-	Institute of Electrical and Electronics Engineers
I/O	-	Input/Output
JTAG	-	Joint Test Action Group
LCC	-	Life Cycle Cost
LRU	-	Line Replaceable Unit
LSA	-	Logistics Support Analysis
LSAR	-	Logistics Support Analysis Reporting
MIL-HDBK	-	Military Handbook
MSI	-	Medium Scale Integration
MTBCF	-	Mean-Time-Between-Critical-Failure
MTBF	-	Mean-Time-Between-Failure

MTTF	-	Mean-Time-to-First-Failure
MTTR	-	Mean-Time-to-Repair
NASA	-	National Aeronautics Space Administration
NMOS	-	N Type Metal Oxide Semiconductor
O&M	-	Operations and Maintenance
OY	-	Observability
PCB	-	Printed Circuit Board
PLA	-	Programmable Logic Array
POC	-	Point Of Contact
RADC	-	Rome Air Development Center (now Rome Laboratory)
RAM	-	Reliability and Maintainability or Reliability, Availability and Maintainability
RBD	-	Reliability Block Diagram
RCM	-	Reliability Centered Maintenance
R/M/S/T	-	Reliability, Maintainability, Supportability and Testability
R(t)	-	Reliability Over Time Interval t
SE	-	Support Equipment
SRU	-	Shop Replaceable Unit
SSI	-	Small Scale Integration
TR	-	Technical Report
TRD	-	Technical Requirements Documentation
TPS	-	Test Program Set
TTL	-	Transistor-Transistor Logic
VLSI	-	Very Large Scale Integration
VHSIC	-	Very High Speed Integrated Circuit

1.0 R/M/S/T TOOL SUMMARIES

1.1 RELIABILITY TOOLS

- 1.101 Reliability Prediction Tools
- 1.102 Reliability Modeling Tools
- 1.103 Fault Tree Analysis Tools
- 1.104 Failure Mode Effects and Criticality Analysis Tools
- 1.105 Reliability Testing Tools
- 1.106 Sneak Circuit Analysis Tools
- 1.107 Failure Reporting and Corrective Action System (FRACAS) Tools
- 1.108 Environmental Stress Screening (ESS) Tools
- 1.109 Weibull Reliability Analysis Tools
- 1.110 Worst Case Circuit Analysis Tools
- 1.111 Reliability Centered Maintenance Tools
- 1.112 Nonoperating Failure Rate Analysis Tools
- 1.113 Circuit Stress Analysis Tools
- 1.114 Thermal Analysis Tools
- 1.115 Structural Reliability Evaluation Tools

1.101 RELIABILITY PREDICTION TOOLS

NAME: ARM - Advanced Reliability Modeling

ABSTRACT: Reliability prediction tool based on MIL-HDBK-217. Based on method wherein user creates a description file identifying their system against which the failure rate models of MIL-HDBK-217 are applied.

MACHINES: IBM PC, VAX/VMS, UNIX

POC: Confidence Enhancements Ltd.
Attn: Paul Sawyer
222 South Jefferson St
Batavia IL 60510
(708)406-9905

NAME: BELLCORE - Bell Communications Research

ABSTRACT: Performs reliability predictions in three ways: (1) A modified parts count method like MIL-HDBK-217, but incorporates infant mortality. (2) Reliability calculated from combined laboratory and 217 data. (3) Statistical estimates based on field data.

MACHINES: No Data

POC: Bell Communications Research
Attn: Mr. J.D. Healy
Room 2J-537
Holmdel NJ 07783

NAME: BelStress

ABSTRACT: Performs reliability prediction of commercial electronic system using Bellcore methods. Methods I and II in TR-TSY-00032 (Bellcore Technical Reference Handbook of Reliability). Developed by ITEM Software Ltd, Fareham, Hampshire, England, PO15 55U (0489) 885085

MACHINES: IBM PC, VAX/VMS

POC: Mitchell & Gauthier Associates
Attn: Peter Tarbox
73 Junction Square Drive
Concord MA 01742
(508)369-5115

NAME: Hardstress

ABSTRACT: Performs HRD4, an English standard similar to the US Department of Defense MIL-HDBK-217. Predicts reliabilities and performs reliability cost tradeoffs. Tool was developed by ITEM Software Ltd.

MACHINES: IBM PC, VAX/VMS

POC: Mitchell & Gauthier Associates
Attn: Peter Tarbox
73 Junction Square Drive
Concord MA 01742
(508)369-5115

NAME: IRAS - Interactive Reliability Analysis System

ABSTRACT: Performs reliability predictions based on MIL-HDBK-217, Section 5.2. It assumes a stress ratio of 0.5, laboratory environment (ground benign), and 30°C temperature, and does not allow modification of these factors. No U.S. vendors for this product have been identified.

MACHINES: No Data

POC: Twente University of Technology
Attn: Mr. A.C. Brombacher
Dept of Electronics
PO Box 217
7500 AE Enschede, The Netherlands

NAME: MILSTRESS

ABSTRACT: Automates MIL-HDBK-217 reliability predictions. Allows input of new component data not already recorded in 217. Tool was developed by ITEM Software Ltd.

MACHINES: IBM PC, VAX/VMS

POC: Mitchell & Gauthier Associates
Attn: Peter Tarbox
73 Junction Square Drive
Concord MA 01742
(508)369-5515

NAME: MRP - Mechanical Reliability Prediction

ABSTRACT: Program implements the draft "Handbook of Reliability Prediction Procedures for Mechanical Equipment" prepared under sponsorship of agencies of the DoD. Program calculates the reliability of equipment containing non-electronic parts such as seals, springs, solenoids, valves, bearings, gears, splines, pumps, filters, clutches, and brakes.

MACHINES: IBM PC

POC: Powertronics Systems Inc.
Attn: Mr. R.J. Fousch
PO Box 29109
New Orleans LA 70189
(504)254-0383

NAME: ORACLE - Optimized Reliability and Component Life Estimator

ABSTRACT: Automates the failure rate models from MIL-HDBK-217, "Reliability Prediction of Electronic Equipment." Levels of indenture exist to allow series and parallel configuration analysis. Inputs are a parts list and associated electrical and thermal stress factors.

MACHINES: IMB PC, VAX/VMS

POC: Rome Laboratory/RBET
Attn: George Lyne
Griffiss AFB NY 13441-5700
(315)330-3068

NAME: PC - COMMREL

ABSTRACT: Program is an electronic reliability prediction program designed for commercial, especially telecommunications manufacturers, based on BELLCORE (Bell Communications Research) failure behavior model for electronic and electromechanical parts.

MACHINES: IBM PC

POC: Management Sciences Inc.
Attn: Conrad Seagroves
6022 Constitution NE
Albuquerque NM 87110
(505)268-6696

NAME: PC - PREDICTOR

ABSTRACT: MIL-HDBK-217D and E methods rate estimator. Allows simultaneous access to 10 data bases for generic part data or cross references. Part of a comprehensive suite of integrated RAM and CAD software for personal and mainframe computers.

MACHINES: IBM PC

POC: Management Sciences Inc.
Attn: Conrad Seagroves
6022 Constitution NE
Albuquerque NM 87110
(505)268-6696

NAME: RAP 217 - Reliability Prediction 217

ABSTRACT: Does MIL-HDBK-217 calculations. Has enhanced library functions.

MACHINES: No Data

POC: PROMPT, The Software Company
4653 Powderborn Court
San Jose CA 95136
(408)978-1100

NAME: RBC - Industrial Reliability Program

ABSTRACT: Program is utilized for analysis of industrial equipment for which military requirements are not applicable. Program implements Bell Communications Research (Bellcore) Technical Report TR-TSY-000332.

MACHINES: IBM PC

POC: Powertronics Systems Inc.
Attn: Mr. R.J. Fousch
PO Box 29109
New Orleans LA 70189
(504)254-0383

NAME: REAP - Reliability Effectiveness Analysis Program

ABSTRACT: Performs MIL-HDBK-217 reliability predictions. Allows quality, power, current, voltage, temperature, and other parameters to be modified and the results analyzed.

MACHINES: VAX/VMS, Apollo Domain Workstations/Domain Operating System

POC: Systems Effectiveness Associates
Attn: Mr. R. Stratton
20 Vernon Street
Norwood MA 02062
(617)762-7252

NAME: REAPmate - Reliability Effectiveness Analysis Program for Personal Computer Environments

ABSTRACT: Performs the same MIL-HDBK-217 reliability predictions as REAP, only without the capability to input tree structures.

MACHINES: IBM PC

POC: Systems Effectiveness Associates
Attn: Mr. R. Stratton
20 Vernon Street
Norwood MA 02062
(617)762-7252

NAME: RELCALC2

ABSTRACT: Automates MIL-HDBK-217. Inputs include a system hierarchy, redundancy, and circuit data.

MACHINES: IBM PC

POC: T-Cubed Systems, Inc.
31220 La Baya Drive
Suite 110
Westlake CA 91362
(818)991-0057

NAME: RELE

ABSTRACT: Performs MIL-HDBK-217 predictions. Also incorporates programs which allow "what if?" analyses to be made concerning part quality, part number, and thermal and electrical stresses.

MACHINES: No Data

POC: Bendix, Energy Controls Division
Attn: Mr. R.E. Raymond
717 North Bendix Drive
(219)237-2100

NAME: RELEX - Reliability Excellence

ABSTRACT: MIL-HDBK-217 prediction program. Both parts stress and parts count predictions. Handles up to 10 levels of indenture. Enables simple redundancy computations.

MACHINES: IBM PC

POC: Innovative Software Designs, Inc.
Attn: Devin Van Fleet
One Kimball Ridge Court
Baltimore MD 21228
(301)747-8543

NAME: RELPRED 217

ABSTRACT: Reliability prediction for electronic components and systems according to MIL-HDBK-217. An integral component data library is provided, and can be updated by the user.

MACHINES: IBM PC, VAX/VMS

POC: RTP Software Ltd
Attn: D.J. Manro
Newnherms, W. St
Farnham England
GU9 7EQ
0252-711414

NAME: RELSS - Reliability of Small Systems

ABSTRACT: Calculates reliability based on the MIL-HDBK-217 method. The parts list must be input manually or taken from another program file.

MACHINES: No Data

POC: Prophet Software
Attn: Mr. A. Blackburn
1321 Bluesail Circle
Westlake Village CA 91361
(805)495-9324

NAME: RPC - Reliability Parts Count

ABSTRACT: Performs the parts count reliability method dictated in MIL-HDBK-217. This program is used when the parts stress analysis is not justified or possible.

MACHINES: IBM PC

POC: Powertronics Systems Inc.
Attn: Mr. R.J. Fousch
PO Box 29109
New Orleans LA 70189
(504)254-0383

NAME: RPP - Reliability Prediction Program

ABSTRACT: Performs MIL-HDBK-217 parts count and incorporates stress analysis.

MACHINES: IBM PC, VAX/VMS

POC: Powertronics Systems Inc.
Attn: Mr. R.J. Fousch
PO Box 29109
New Orleans LA 70189
(504)254-0383

NAME: TECMTBF

ABSTRACT: Various versions of this software perform MIL-HDBK-217 reliability predictions. Can communicate with other TECNASA software and has British or Portuguese menus.

MACHINES: IBM PC

POC: TECNASA
Attn: Jose L. Barletta
Electronica Professional SA
AV Brig Lima 811
Sao Jose Campus
SP CEP12.225 - CX Postal 201
Brasil
(0123)22-3344

NAME: 217 PREDICT - Electronic Part Reliability Prediction Program

ABSTRACT: Performs 217 reliability calculations including operating and dormant part failure rates and MTBF over differing environmental conditions. Provides analyses for the system, subsystem, assembly, and subassembly levels. Uses a series reliability model with exponential failure rates.

MACHINES: IBM PC, VAX/VMS

POC: SYSON Corporation
Attn: John H. Munson
10 John Clarke Rd
Middletown RI 02840
(401)849-6270

NAME: 217 Predicts

ABSTRACT: Reliability predictions in accordance with MIL-HDBK-217. Allows tree structured failure rate summations for sub-assemblies, hybrids, equipment, and systems. Macintosh program.

MACHINES: Macintosh

POC: Evaluation Associates, Inc.
Attn: Dr. Thomas Weir
GSB Building
1 Belmont Ave
Bala Cynwyd PA 19004
(215)667-3761

1.102 RELIABILITY MODELING TOOLS

NAME: A Closed Network Queue Model of Underground Coal Mining Production, Failure and Repair

ABSTRACT: Program was developed as a model of coal mining production, equipment failure, and equipment repair. A servicing and production crew interaction is modeled as a closed network of two queues in series and is solved as a classic Markov finite-state-birth-and-death process. Developed by Cal Tech/Jet Prop Lab.

MACHINES: UNIVAC 1108

POC: COSMIC
 382 E. Broad St
 Athens GA 30602
 404-542-3265

NAME: ADVISER

ABSTRACT: Program uses reliability graphs to compute system reliability.

MACHINES: No Data

POC: Kini and Siewiorek

NAME: AIRES - An Automated Reliability Interactive Estimation System

ABSTRACT: Uses a Markov approach in modeling systems comprised of independent homogeneous subsystems with differing types of hardware redundancies. Calculates system reliability as a function of time, maximum mission times for specific reliabilities, relative contributions of components to system unreliability, and a reliability improvement factor. Different factors may be applied to active and spare module failures.

MACHINES: VAX

POC: University of California/Com Sci Dept
 Attn: Dr. Al Avizienis
 Los Angeles CA 90024
 213-825-1400

NAME: A Mathematical Model for Reliability Trade Studies for Space Delivery System Design

ABSTRACT: Program was developed as an analytic tool to assess the effectiveness of competing redundant element designs in terms of their contributions toward forced mission termination and vehicle or function loss. Includes the ability to treat failure modes of system monitors and false alarms. Developed by Rockwell Int Company.

MACHINES: IBM 370

POC: COSMIC
382 E. Broad St
Athens GA 30602
404-542-3265

NAME: ANNE, ANSAR

ABSTRACT: Analytical programs for assessing the reliability of repairable and nonrepairable programs in the steady state.

MACHINES: IBM PC, VAX/VMS

POC: RTP Software Limited
Attn: D.J. Munro
Newnhems, W. St
Farnhem England
Surrey GU9 7EQ
0252-711414

NAME: ARAM - Automated Reliability/Availability/Maintainability

ABSTRACT: Program is designed to assess candidate space station data management system architectures. It evaluates the reliability, availability, and maintainability characteristics of the system concepts. Uses system redundancy diagram, the system maintainability characteristics, and the hardware component reliability parameters. Developed by Computer Sciences Corp.

MACHINES: IBM PC

POC: COSMIC
382 E. Broad St
Athens GA 30602
404-542-3265

NAME: ARM - Automated Reliability Modeling

ABSTRACT: This tool is presently under development. ARM will generate reliability and availability Markov models for arbitrary interconnection structures at the processor-memory-switch (pms) level. The ARM output will be a file containing state transition matrices of which can be used to serve as input to other evaluation programs.

MACHINES: No Data

POC: Carnegie Mellon University

NAME: Avail

ABSTRACT: No Data

MACHINES: IBM PC, VAX/VMS

POC: Mitchell & Gauthier Assoc
Attn: Peter Tarbox
73 Junction Square Dr
Concord MA 01742-3069
508-369-5115

NAME: CAME - Computer Aided Markov Evaluator

ABSTRACT: Program takes as input a graphical representation of the system and its operating requirements and automatically generates the Markov reliability model for analysis.

MACHINES: No Data

POC: Charles Stark Drake Laboratory

NAME: CARE III - Computer Aided Reliability Estimation III

ABSTRACT: Performs reliability predictions of complex, redundant, fault tolerant systems such as digital computers, aircraft, and nuclear and chemical control systems. Can accommodate 70 stages with dependencies, multiple modes of operation for the interdependent stages, and hazard rates which vary over time. Literature reviews indicate that this is a highly developed and validated package. Program was developed by Raytheon and NASA Langley.

MACHINES: VAX/VMS

POC: COSMIC
382 E. Broad St
Athens GA 30602
404-542-3265

NAME: CARMS - Computer Aided Reliability Modeling and Simulation

ABSTRACT: Uses Markov, Semi-Markov, and nonlinear Markov analysis with adaptive Runge-Kutta and backwards - difference solution techniques. Used for applications requiring fault tolerant, fail-safe, or maintenance modeling in addition to the reliability block diagram modeling. Outputs are presented in numerical form and as plots of reliability or probability of failure versus time.

MACHINES: IBM PC

POC: DAINA Corporation
Attn: P.R. Pukite
4111 Control Ave NE
Suite 212
Columbia Heights NM 55421
612-781-7600

NAME: CARSA

ABSTRACT: Computes system reliability as a function of time. Markov models which consider functional redundancy, module redundancy, and dependencies between stages are utilized. All fault rates are assumed to be constant. Developed by Boeing Commercial Airplane Company.

MACHINES: CDC 6000

POC: COSMIC
382 E. Broad St
Athens GA 30602
404-542-3265

NAME: CRAFTS - Computer Aided Reliability and Availability Analysis of Fault Tolerant Systems

ABSTRACT: Program grew out of research done on the ARIES tool. Can model both repairable and nonrepairable systems. Models large systems, imperfect coverage, dependencies among subsystems and multilevel redundancy. Outputs include MTFF, MTBF, R(t), Availability and Safety. An interesting feature is that input specification can be by one of three ways: configuration and failure rate parameters; symbolic reliability block diagrams; or Markov state diagrams with transition rate matrices.

MACHINES: No Data

POC: Raghavendra and Associates

NAME: DEEP - Duke Evaluator for Extended Stochastic Petri Nets

ABSTRACT: No Data

MACHINES: No Data

POC: Duke University

NAME: FASTER - Fault Tolerant Architecture Simulation Tool for Evaluating Reliability

ABSTRACT: Models repairable and nonrepairable fault tolerant systems. Uses a constraint directed assistant concept for system specification. Flexibility allows for modeling of most traits and scenarios inherent to fault tolerance. Outputs include R(t), MTFF, Avail, MTBCF or others which can be computed by tailoring program to needs. FASTER's solution technique is Monte Carlo simulation.

MACHINES: VAX/VMS

POC: Rome Laboratory/RBET
Attn: Joseph A. Caroli
Griffiss AFB NY 13441-5700
315-330-4205

NAME: FTAA - Fault Tolerant Architecture Assessment Tool

ABSTRACT: A family of Monte Carlo simulation software tools which have been developed to evaluate the reliability and mean-time-between-critical-failure of specific fault tolerant configurations considering the impacts of the switching mechanism (diagnostics and recovery).

MACHINES: VAX/VMS

POC: Rome Laboratory/RBET
Attn: Frank H. Born
Griffiss AFB NY 13441-5700
315-330-4726

NAME: GRAMP - Generalized Reliability and Maintainability Program

ABSTRACT: Allows the use of Markov and Boolean models in the calculation of redundant, fault tolerant system parameters. Performs some life cycle cost tradeoffs and maintenance calculations. Knowledge of Markov models is required.

MACHINES: No Data

POC: Systems Control Technology, Inc.
Attn: Mr. J. Joslen
PO Box 10180
Palo Alto CA 94303-0888
415-494-2233

NAME: GRAMS - Generalized Reliability and Maintainability Simulator

ABSTRACT: Computes reliability, maintainability, and life cycle cost for the same fault tolerant systems as GRAMP. The judicious use of a Markov (GRAMP) and a simulation model (GRAMS) for the same system takes advantage of both methodologies.

MACHINES: No Data

POC: Systems Control Technology, Inc.
Attn: Mr. J. Joslen
PO Box 10180
Palo Alto CA 94303-0888
415-494-2233

NAME: HARP - Hybrid Automated Reliability Predictor

ABSTRACT: Markov chains are utilized to analyze systems with as many as 20 components and 7 stages. Maximum run time is 4 to 8 hours for the largest systems. Computes reliability factors. Main strength of the package is its applicability to very large systems.

MACHINES: IBM PC, VAX/VMS

POC: NASA Langley Research Center
Attn: Mr. S.J. Bavuso
Hampton VA 23665-5228
804-865-3681

NAME: Mark 1 - Markov Modeling Package

ABSTRACT: Program models nonrepairable systems whose characteristics can be modeled using Markov chains. This program is a pure Markov analysis tool. The user specifies the number of states in the model, gives a description of each state and the occupancy probabilities and transition rates between states. Outputs include various plots, i.e. state probabilities as a function of time and plots of MTBF.

MACHINES: No Data

POC: No Data

NAME: METASAN - Michigan Evaluation Tool for the Analysis of Stochastic Activity Networks

ABSTRACT: Program was designed to treat reliability and performance in an integrated fashion - termed "performability". Models both repairable and nonrepairable systems.

MACHINES: No Data

POC: Industrial Technology Institute

NAME: METFAC

ABSTRACT: Models both repairable and nonrepairable systems. Outputs from METFAC include many reliability, performance and cost related figures.

MACHINES: No Data

POC: No Data

NAME: MIREM - MISSION RELiability Model

ABSTRACT: Program can model both repairable and nonrepairable systems. Models for imperfect testability and switching. Outputs include $R(t)$, phase-by-phase reliability, Avail, MTFF, MTBMA, reliability bounds and MTBCF under various repair scenarios.

MACHINES: IBM PC, VAX/VMS

POC: AFHRL/LRL
Attn: Capt D. Popkins
Wright-Patterson AFB OH 45433
AV 785-8418

NAME: OPT - Optimization and SIP - State Interpreter Program

ABSTRACT: Developed in 1965 for the Air Force Flight Dynamics Laboratory. Dealt with the redundancy of electromechanical components of the F-104 aircraft and the entire flight control system of the F-111 aircraft. Redundancy analysis based on failure mode effects and criticality (FMEC) analyses. Programs were designed to consider degraded modes of operation, different performance levels, and other system aspects.

MACHINES: No Data

POC: Air Force

NAME: PAWS/STEM - Pade Approximation with Scaling and Scaled Taylor Exponential Matrix

ABSTRACT: Program provides a language based interface for the input of Markov models describing the behavior of fault tolerant computer systems. Markov models can include both fault recovery via reconfiguration, and fault occurrence behaviors of such systems. Program produces probability of system failure and is intended to provide a conservative estimate of the number of significant digits in the solution. Developed by NASA Langley.

MACHINES: VAX/VMS

POC: COSMIC
382 E. Broad St
Athens GA 30602
404-542-3265

NAME: PC - Availability

ABSTRACT: Automates the process of modeling system availability using block diagrams and Markov analysis. Provides method for studying influence of alternative failure and repair rates, and logistics support on system availability.

MACHINES: IBM PC

POC: Management Sciences Inc.
Attn: Conrad Seagroves
6022 Constitution N.E.
Albuquerque NM 87110
505-208-6696

NAME: PRAISE - Parametric Reliability, Availability, Integrated System Evaluator

ABSTRACT: Uses graphics capabilities to allow user to perform reliability/availability evaluations and design tradeoff analyses for redundant systems.

MACHINES: IBM PC

POC: Naval Air Development Center
Code 7021
Warminster PA 18974-5000

NAME: RAM 4

ABSTRACT: Monte Carlo simulation with graphics for availability, reliability and maintainability analysis of redundant systems described by reliability block diagrams. The effects of queueing for repair and stock-out are analyzed.

MACHINES: IBM PC, VAX/VMS

POC: RTP Software Ltd
Attn: D.J. Munro
Newnhems, W. St
Farnham England
Surrey GU9 7EQ
0252-711414

NAME: RAP - Reliability and Availability Program

ABSTRACT: Program provides a means of predicting the availability of shipboard systems and the effects of altering the system environment, including changes in repair and operating strategies. Solution technique uses probabilistic behavior of a set of equipment as a continuous time, homogeneous, discrete state Markov process. Developed by Naval Ship Engineering Center.

MACHINES: IBM 360

POC: COSMIC
382 E. Broad St
Athens GA 30602
404-542-3265

NAME: RBDA - Reliability Analysis Using Block Diagrams

ABSTRACT: Program helps building and evaluation of reliability block diagrams. Editor allows user to build reliability block diagrams on the screen. Each block in RBD can be further developed as a nested fault tree or RBD.

MACHINES: IBM PC

POC: Science Applications International Company
Attn: Jim Koren or Blake Putney
5150 El Camino Real
Suite C-31
Los Altos CA 94022
415-960-5946 or 5948

NAME: RELAV - Reliability/Availability Analysis Program

ABSTRACT: Program determines the reliability or availability of systems which can be modeled as embedded k-out-of-n groups of items. Developed by NASA Jet Propulsion Labs.

MACHINES: IBM PC

POC: COSMIC
382 E. Broad St
Athens GA 30602
404-542-3265

NAME: RELCOMP - Reliability Computation

ABSTRACT: Used to calculate the reliability and MTBF of systems, sub-systems, and blocks using reliability block diagram techniques.

MACHINES: No Data

POC: Interstate Electronics Corp
Anaheim CA

NAME: Reliability Computation from Reliability Block Diagrams

ABSTRACT: Program calculates the probability of system success from an arbitrary reliability block diagram. Handles active/standby combinations and dormancy and switching considerations. Solution technique is based on an algorithm which extends probability tree usefulness to standby systems. Developed by Cal Tech/Jet Propulsion Lab.

MACHINES: UNIVAC 1100

POC: COSMIC
382 E. Broad St
Athens GA 30602
404-542-3265

NAME: RELICS

ABSTRACT: Calculates measures of system reliability, MTTF, and MTTR from reliability block diagrams, and MTTF and MTTR for each component. Maximum of 100 components allowed.

MACHINES: No Data

POC: COADE Engineering Software
Attn: Mr. M. Nourneay
952 Echo Lana, Suite 450
Houston TX 77024
1-800-231-0732

NAME: REL PLUS - Reliability Plus

ABSTRACT: Performs system reliability calculations from functional block diagrams with series or parallel components. Failure rates utilized can be either from MIL-HDBK-217 or input by the user. Comparisons can be made of reliability data for apportionments versus field or calculated data.

MACHINES: No Data

POC: Prophet Software
Attn: Mr. A. Blackburn
1321 Bluesail Circle
Westlake Village CA 91361
805-495-9324

NAME: REST - Reliability Simulation Tool

ABSTRACT: REST models both repairable and nonrepairable fault tolerant systems. It can account for failure rates and modes associated with switching and diagnostic circuitry. Outputs of REST include R(t), MTBCF, Avail, and MTTR. An interesting feature is the ability to reassess the decision risks of MIL-STD-781 "Reliability Design Qualification and Production Acceptance Tests" as they apply to fault tolerant/redundant systems. REST's solution technique is Monte Carlo simulation.

MACHINES: VAX/VMS

POC: Rome Laboratory/RBET
Attn: Frank H. Born
Griffiss AFB NY 13441-5700
315-330-4726

NAME: R&MA²T² - Reliability, Maintainability and Availability Analysis and Tradeoff Tool

ABSTRACT: This program is designed to calculate various reliability figures of merit for repairable systems with series-parallel configurations assuming perfect switching and diagnostics. Multiple levels of redundancy can be modeled. Obtainable figures of merit include: steady state availability; steady state Mean-Time-To-Failure (MTTF) or its equivalent steady state failure rate; Mean-Time-to-First-Failure and Mean-Time-To-Repair (MTTR).

MACHINES: IBM PC, VAX/VMS

POC: Rome Laboratory/RBET
Attn: Joseph A. Caroli
Griffiss AFB NY 13441-5700
315-330-4205

NAME: RMC-1 - Monte Carlo Multipurpose Code Package

ABSTRACT: RMC-1 is a package which contains three independent modules. The three modules are named AMIR, SPAR and ANAVA. AMIR is intended for the calculation of time dependent reliability, availability, sensitivities and mission success probability. SPAR is intended to calculate and analyze logistics requirements for a complex multisystem field. ANAVA is designed to conduct a statistical analysis of complex distributed communication lines.

MACHINES: No Data

POC: Malchi Science Ltd
Tel Aviv, Israel

NAME: SAVE - System Availability Estimator

ABSTRACT: SAVE models both repairable and nonrepairable systems. Typically used for high reliability and availability systems. Models can be solved both analytically and through Monte Carlo simulation. The Monte Carlo can be used either directly by generating random times to failure and repair or by simulating the Markov chain by generating state transitions randomly according to jump probabilities of the chain. Outputs include steady state availability, sensitivity analysis and system MTTF.

MACHINES: No Data

POC: No Data

NAME: SHARPE - Symbolic Hierarchical Automated Reliability and Performance Evaluator

ABSTRACT: Uses a hierarchical modeling technique to calculate reliability. Markov models and combinatorial techniques are used to simplify modeling complexity when appropriate.

MACHINES: No Data

POC: Duke University
Attn: Ms. R.A. Sahner
Dept of Computer Science
Durham NC 27706
919-684-3084

NAME: SPADE

ABSTRACT: No Data

MACHINES: No Data

POC: No Data

NAME: SNAP

ABSTRACT: Computes reliability, availability and maintainability. Also performs cost and spares analysis. Analytical tool that takes as input reliability block diagrams and failure rates, can handle different failure modes, models repairable systems and periodic maintenance, and multiple levels of redundancy. Graphical outputs are generated.

MACHINES: IBM PC

POC: COBRO
Attn: Joseph T. Buckel
4260 Shoreline Drive
Earth City MD 63045
314-291-8676

NAME: SUPER - System Used for Prediction and Evaluation of Reliability

ABSTRACT: SUPER can model both repairable and nonrepairable systems. Features which can be modeled include series, parallel and wheatstone bridge structures, k-out-of-n cold standby systems, and any hierarchical combination of these. Outputs include $R(t)$, instantaneous failure rate, mean and standard deviation of the time to first failure, availability and other maintenance information.

MACHINES: No Data

POC: AT&T Bell Laboratories

NAME: SURE - Semi-Markov Unreliability Range Evaluator

ABSTRACT: Performs reliability analyses on block diagrams through Markov chain modeling. Failure rates are assumed constant. Does not perform any availability analyses. Developed by NASA Langley Research Center and PRC Kentron Inc.

MACHINES: VAX/VMS

POC: COSMIC
382 E. Broad St
Athens GA 30602
404-542-3265

NAME: SURF
ABSTRACT: No Data
MACHINES: No Data
POC: Laboratoire d'Automatique et d'Analyse
des Systems du CNRS in France

NAME: SYSCALC
ABSTRACT: Calculates system reliability using block diagrams and circuit
and component data. Requires RELCALC2 to run.
MACHINES: No Data
POC: T-Cubed Systems, Inc.
31220 La Baya Drive
Suite 110
Westlake Village CA 91362
818-991-0057

NAME: SYSREL - System Reliability Program
ABSTRACT: Calculates system reliability from reliability block diagrams.
MACHINES: No Data
POC: No Data

NAME: TIGER - Various Reliability, Readiness, and Availability
Measures
ABSTRACT: Program uses Monte Carlo simulation technique to provide a
determination of system reliability, readiness, and avail-
ability estimates for complex systems, Developed by Naval Ship
Engineering Center.
MACHINES: CDC 6600
POC: COSMIC
382 E. Broad St
Athens GA 30602
404-542-3265

NAME: 756 PREDICT - System Reliability Prediction Program

ABSTRACT: Used to perform MIL-STD-756 system reliability predictions. Uses a deterministic combinatorial approach (reliability block diagrams) instead of Markov or Monte Carlo simulation techniques. Comparisons can be made of the impact of system configuration and maintenance policies on mission performance.

MACHINES: IBM PC, VAX/VMS

POC: SYSCON Corporation
Attn: John Munson
10 John Clarke Rd
Middletown RI 02840
401-849-6270

1.103 FAULT TREE ANALYSIS TOOLS

NAME: CAFTA - Computer Aided Fault Tree Analysis

ABSTRACT: Program is a fault tree analysis tool which provides for system analysis, documentation of fault tree models and maintenance of fault tree models. Includes reliability data base, plotting package (also available), cut set generation routine (also available) and a cut set results editor.

MACHINES: IBM PC

POC: Science Applications International Corporation
Attn: Jim Koren or Blake Putney
5150 El Camino Rd
Suite C-31
Los Altos CA 94022
415-960-5946 or 5948

NAME: Fault Tree

ABSTRACT: Program constructs and analyzes fault trees. Construction of the tree diagram is accomplished on the screen using the keyboard and mouse. Developed by ITEM Software Inc.

MACHINES: IBM PC, VAX/VMS

POC: Mitchell & Gauthier Assoc
Attn: Peter Tarbox
73 Junction Square Drive
Concord MA 01742
508-369-5115

NAME: FTC - Fault Tree Compiler

ABSTRACT: Program was designed to provide the user with a tool which can readily describe even the largest fault tree and then calculate the probability of the top event in the tree. The motivation of FTC began when it was observed that CARE III was being used to solve fault trees. FTC is a newer and faster method of solving fault trees.

MACHINES: No Data

POC: NASA Langley and NASA Washington

NAME: FTRAN

ABSTRACT: An interactive graphical package for defining and analyzing fault trees. The program handles multi-state prime events and carries out Monte Carlo analysis of gate and top event probabilities.

MACHINES: VAX/VMS

POC: RTP Software Ltd
Attn: D.J. Munro
Newnhems, W. St
Farnham England
Surrey GU9 7EQ
0252-711414

NAME: TRACE - Tree Analysis Code

ABSTRACT: Program is a computer simulation technique that was developed to analyze a fault tree, estimate the probability of tree failure, and identify the most probable causes. Utilizes Monte Carlo simulation with importance sampling. Developed by Aerojet General Corporation.

MACHINES: IBM 360/65

POC: COSMIC
382 E. Broad St
Athens GA 30602
404-542-3265

NAME: TREE-MASTER

ABSTRACT: PC based fault tree handling system designed to conduct risk analysis. Treats either fault or success trees.

MACHINES: IBM PC

POC: Management Sciences Inc.
Attn: Conrad Seagroves
6022 Constitution NE
Albuquerque NM 87110
505-268-6696

1.104 FAILURE MODE EFFECTS AND CRITICALITY ANALYSIS (FMECA) TOOLS

NAME: FAILMODE

ABSTRACT: Automates Tasks 101-102 of MIL-STD-1629, Failure Mode Effects and Criticality Analysis (FMECA). A hierarchical structure is used to describe the system and assign worksheet reference numbers, a phrase library is used to describe common modes and effects. Failure rate apportionment (from MIL-HDBK-338) is used to allocate failure rates to failure modes. Tool was developed by ITEM Software Inc.

MACHINES: IBM PC, VAX/VMS

POC: Mitchell and Gauthier Associates
Attn: Ms. B. Daniell
73 Junction Square Dr
Concord MA 01742
617-369-5115

NAME: FME - Failure Mode Effects and Criticality Analysis Program

ABSTRACT: Program implements MIL-STD-1629. Data files established with Powertronics RPP or MPP may be utilized when either of these analyses are performed in conjunction with the FMECA.

MACHINES: IBM PC, VAX/VMS

POC: Powertronics Systems Inc.
Attn: Mr. R.J. Fousch
PO Box 29109
New Orleans LA 70189
504-254-0383

NAME: FMECA-TA

ABSTRACT: Program performs both failure mode effects and criticality analysis and a task analysis. Program performs FMECA-TA IAW MIL-STD-1629 and 1388. It also performs hardware and functional analysis and can exchange data with LSA systems.

MACHINES: No Data

POC: Logistic Engineering Associates
2700 Navajo Rd
Suite A
El Cajon CA 92020
619-697-1238

NAME: PC - FMEA/FMECA

ABSTRACT: Interactive program, for the revision considerations inherent in the development of a FMECA. Part of a comprehensive package to automate the application of MIL-STD-1629A in designing a system.

MACHINES: IBM PC

POC: Management Sciences Inc.
Attn: Conrad Seagroves
6022 Constitution N.E.
Albuquerque NM 87110
505-268-6696

NAME: TECFMEA

ABSTRACT: Program performs a FMEA based on a matrix FMEA technique. It can communicate with other TECNASA software and has British or Portuguese menus.

MACHINES: IBM PC

POC: TECNASA
Attn: Jose L. Barletta
AV Brig Lima 811
Sqo Jose dos Campus
SP CEP 12.225 - CX Postal 201
Brasil
0123-22-3344

1.105 RELIABILITY TESTING TOOLS

NAME: Reliability Demonstration Technique for Fault Tolerant Systems

ABSTRACT: This software tool analyzes and synthesizes reliability demonstration plans for fault tolerant/redundant systems by evaluating and defining producer's risk, consumer's risk, and the expected test time required to make a decision for values of system Mean-Time-Between-Critical Failure (MTBCF) based on given MTBF characteristics of each component making up the system. The tool is based on the Monte Carlo simulation approach. This tool offers the option of either selecting a MIL-STD-781 sequential or fixed length test plan, or of tailoring a unique sequential or fixed length test plan to provide required risks under maximum allowable test time constraints. Systems can be evaluated which operate under either deferred maintenance policies (repair policies are not performed until a critical failure occurs) or periodic maintenance policies (scheduled maintenance is performed on a periodic basis to replace all failed components which have not yet caused a functional failure.

MACHINES: VAX/VMS

POC: Joseph A. Caroli
Rome Laboratory/RBET
Griffiss AFB NY 13441-5700
315 330-4205
AV 587-4205

NAME: Reliability Tools by Innovative Timely Solutions

ABSTRACT: Innovative Timely Solutions have developed a variety of reliability testing tools.

- Cumulative Poisson Exponential Distribution Test Planning: MIL-STD-781 Style
- Chi Square Test Analysis: MIL-STD-781 Style
- Poisson Exponential Sequential Test Planning MIL-STD-781 Style
- Cumulative Binomial Distribution Inspection Planning: MIL-STD-105 Style
- Cumulative Poisson Exponential Distribution Inspection Planning: MIL-STD-105 Style
- Binomial Sequential Inspection Planning
- Reliability Growth Planning (Duane Model)

MACHINES: IBM PC

POC: Innovative Timely Solutions
Attn: Tom Rooker
6401 Lakerest Court
Raleigh NC 27612
919-846-7705

1.106 SNEAK CIRCUIT ANALYSIS TOOLS

NAME: SCAT - Sneak Circuit Analysis Tool

ABSTRACT: Using the net list from an ORCAD/SDT schematic capture program, the user can perform sneak analyses for switch timing and capacitor models for up to groups of 300 devices.

MACHINES: IBM PC

POC: Rome Laboratory/RBER
 Edward DePalma
 315-330-2608

NAME: Sneak Circuit Analysis Program

ABSTRACT: Input to program consists of data representing the internal wiring. The data preparation method converts the internal schematic of the circuit into a "wire list". All switches are assumed closed with special circumstances, such as double throw switches, being noted as switchable continuity. The output consists of any paths that meet the criterion for sneak circuits. Developed by Boeing.

MACHINES: IBM 360/65/HASP

POC: COSMIC
 382 E. Broad St
 Athens GA 30602
 402-542-3265

1.107

FAILURE REPORTING AND CORRECTIVE ACTION SYSTEM TOOLS

NAME: FRACAS - Failure Reporting and Corrective Action System

ABSTRACT: Computerized reliability/maintainability tool which provides the means for recording, updating, retrieving and summarizing data on individual failures that occur in specific aircraft types or test set-ups. The data consists of the identification of equipment involved in the failure, the time and circumstances of the failure, description of the failure, maintenance activities related to failure and related information on engineering studies, solutions, etc. associated with the failure.

MACHINES: VAX

POC: IAI Tashan Engineering Center
Attn: N. Bernstein
Aircraft Division/Israel Aircraft Industries
Ben Gurion Int Airport Israel 70100
03-9713271

1.108 ENVIRONMENTAL STRESS SCREENING (ESS) TOOLS

NAME: Automated DOD-HDBK-344

ABSTRACT: On line guidance for conducting Environmental Stress Screening
in accordance with DOD-HDBK-344.

MACHINES: IBM PC

POC: Rome Laboratory/RBET
Attn: Gene Fiorentino
Griffiss AFB NY 13441-5700
315-330-3476

NAME: STRESS - System To Recommend Environmental Screening Strategies

ABSTRACT: Computes reliability as a function of burn-in time and temperature.

MACHINES: No Data

POC: AT&T Bell Labs
Attn: D.L. Jacobowitz
Crawfords Corner Rd
Holmdel NJ 07733
201-949-4801

1.109 WEIBULL RELIABILITY ANALYSIS TOOLS

NAME: WeibullSMITH

ABSTRACT: Generic weibull analysis tool.

MACHINES: IBM PC

POC: Fulton Findings
 1251 W. Sepulveda Blvd #800
 Torrance CA 90502
 213-548-6358

1.110 WORST CASE CIRCUIT ANALYSIS TOOLS

NAME: Software Tool for Worst Case Circuit Analysis Data Base

ABSTRACT: Tool facilities generation of uniform data base of part
 tolerances which is used for worst case circuit analysis.

MACHINES: IBM PC

POC: ECI
 Attn: David Graff
 41 Lynford Rd
 Richboro PA 18954
 215-357-1220

1.111 RELIABILITY CENTERED MAINTENANCE TOOLS

NAME: RCM AWS Reliability Centered Maintenance Automated Worksheets

ABSTRACT: Program automates the Reliability Centered Maintenance (RCM) worksheets and logic process of MIL-STD-2173 for the convenience and aid of RCM analysts.

MACHINES: IBM PC

POC: Naval Aviation Maintenance Office
 Attn: K. Gerred
 Patuxent River, MD 20670-5446
 301-863-4264

1.112 NONOPERATING FAILURE RATE ANALYSIS TOOLS

NAME: DORMACALC

ABSTRACT: Program addresses nonoperating electronic equipment reliability concerns. The mathematical models are appropriate for determining nonoperating failure rates for the application environments delineated in RADC-TR-85-91.

MACHINES: IBM PC

POC: Sendrian Resources Co
 Attn: Mark A. Smith
 42 San Lucas Ave
 Newbury Park CA 91320-4240
 805-499-7991

1.113 CIRCUIT STRESS ANALYSIS TOOLS

NAME: PC - STRESS

ABSTRACT: Program is a circuit stress analysis package for power and stress calculations of electronic designs. Provides required documentation for MIL-STD-785, Task 206 Stress Analysis. Provides direct input to PREDICTOR (MSI) for stress related failure rates.

MACHINES: No Data

POC: Management Sciences Inc.
Attn: Conrad Seagroves
6022 Constitution NE
Albuquerque NM 87110
505-268-6696

1.114 THERMAL ANALYSIS TOOLS

NAME: Auto Therm

ABSTRACT: Incorporates a finite element analysis solution method. Develops the thermal model of a printed circuit board by extracting board geometry and component placement from a Mentor Board Station.

MACHINES: Mentor Graphics Workstation

POC: Mentor Graphics Co.
ATTN: Brad Bloagh
15204 Omega Drive
Suite 110
Rockville MD 20850

NAME: BETA soft - Board-level Electronics Thermal Analyzer

ABSTRACT: Program is designed to predict the temperature distributions on both sides of electronic boards. Features the support of 2000-Component Thermal Library, graphical component placements, Graphical Thermal-boundary-condition setting at edge of boards, color-coded temperature displays of board, components, and IC junctions.

MACHINES: IBM PC

POC: Dynamic Soft Analysis, Inc.
ATTN: Dr. S.C. Yao
213 Gugasuta Road
Pittsburg PA 15215
412-781-3016

NAME: CERMAG - Certification Matrix Generator Program

ABSTRACT: Program is a heating assessment tool for use in evaluating various components or locations in a large, complex system during exposure to high temperatures. By using actual heating test values and historical data, the heating rate, heating load, and peak temperature can be analyzed at any location specified by the user. Developed by Rockwell International.

MACHINES: IBM 3080

POC: COSMIC
382 E. Broad St.
Athens GA 30602
404-542-3265

NAME: PCBHEAT

ABSTRACT: Based on finite element method, has 2D and 3D capabilities to analyze conduction heat flow, free convection heat flow and forced convection heat flow. Has color graphics display and automated data generation for printed circuit boards.

MACHINES: VAX, MICRO-VAX, Apollo, IBM PC

POC: Structural Analysis Technologies
ATTN: Dr. Hasan Kamil
10440 South DeAnza Boulevard, D7
Cupertino CA 95014
408-496-1120

NAME: PC Thermal Analyzer

ABSTRACT: Expert system based design verification tool used to calculate device junction temperatures on printed circuit boards.

MACHINES: IBM PC

POC: Rome Laboratory/RBES
Attn: James Vaccaro
Griffiss AFB NY 13441-5700
315-330-4205

NAME: RACK Thermal Evaluation Program For Electronic Equipment with Air Infiltration

ABSTRACT: Developed to calculate the air temperatures inside an electronic equipment rack. Racks consist of sub-racks which consist of PCBs. Program enables the user to configure the rack and establish data files on screen.

MACHINES: No Data

POC: ITT Corporation
ATTN: Dr. K. Su
Shelton CT

NAME: SINDA

ABSTRACT: Uses finite difference code for analyzing thermal systems represented in an electrical analog, lumped parameter form. Inputs: values of thermal resistances, and capacitances describing the thermal network. Outputs temperatures of the nodes specified within the thermal network.

MACHINES: No Data

POC: Westinghouse
Attn: Dr. Steven Miner

NAME: SPAR - Structural Performance Analysis and Redesign

ABSTRACT: Program is designed to perform stress, buckling, vibration, and thermal analysis of large finite element structural models while minimizing processing cost, execution time, central memory storage, and secondary data storage through use of spars matrix solution techniques. Developed by NASA Langley Research Center.

MACHINES: Many

POC: COSMIC
382 E. Broad St
Athens GA 30602
404-542-3265

NAME: Thermal Conductance of Component Mounting Panels

ABSTRACT: Program was written to aid in the heat transfer analysis of components on a mounting panel. Program was designed to use a simple but accurate model that allows approximate solutions to be quickly obtained. Developed by Rockwell International Corporation.

MACHINES: IBM 360 Series

POC: COSMIC
382 E. Broad St
Athens, GA 30602
404-542-3265

NAME: THERMAL - Thermal Effectiveness Analysis Program

ABSTRACT: No Data

MACHINES: No Data

POC: System Effectiveness Associates
20 Vernon St.
Norwood MA 02062
617-762-9252

NAME: THERMAX

ABSTRACT: 3D, 2.5D and 2D heat transfer CAE system that uses finite difference analysis to provide PCB designers with thermal analysis.

MACHINES: IBM PC, VAX/VMS, Apollo/Sun/UNIX

POC: Management Sciences Inc
6022 Constitution NE
Albuquerque NM 87110
505-268-6696

NAME: THERMO-STATS

ABSTRACT: Simulates a printed circuit board's thermal characteristics before design is finalized. Requires as input: the placements of components on a board, descriptions of the components thermal characteristics, and a description of the boards operating environment.

MACHINES: Sun and DEC color workstations

POC: Valid Logic Systems
ATTN: Mike La Bonte
2 Omni Way
Chelmsford MA 01824
617-256-2300

NAME: TYYBIRD

ABSTRACT: Uses a finite difference code for determining chip junction temperatures within a hybrid package. Inputs: package size, construction, and material properties, chip size, locations, power, and mounting technique. Ouptuts junction temperatures and plots.

MACHINES: No Data

POC: Westinghouse
Attn: Steven Miner

1.115

STRUCTURAL RELIABILITY EVALUATION TOOLS

NAME: Assessment of Nondestructive Evaluation Reliability Data

ABSTRACT: Program provides a method of calculating the probability of detection of defects at selected confidence levels from non-destructive evaluation data. Was developed to provide an alternate method of grouping sample data to obtain a reasonable value for the lower confidence limit with a small sample size. Developed by General Dynamics.

MACHINES: UNIVAC 1100

POC: COSMIC
382 E. Broad St
Athens GA 30602
404-542-3265

NAME: FLAINT - Determining Flaw Inspection Reliability of Non-destructive Evaluation Techniques

ABSTRACT: Program was developed to calculate and plot the flaw inspection reliability of a nondestructive evaluation technique (NDE). Applies binomial distribution to the number and size of detected flaws. The probability of detection at a specific confidence level is calculated for various flaw sizes. Results are plotted, along with a graph of number of flaws detected versus flaw size. Developed by Lewis Research Center.

MACHINES: PDP 11/84/RXS-11M

POC: COSMIC
382 E. Broad St
Athens GA 30602
404-542-3265

NAME: PERCEPT

ABSTRACT: Program identifies design material incompatibilities and recommends appropriate design solutions. It additionally incorporates a material life analysis expert system for estimating polymeric material lifes. Was developed to address material degradation, corrosion and aging concerns expressed in the AF R&M 2000 Program, AVIP (MIL-A-87244) and the Navy's Design Guidelines for Prevention and Control of Avionic Corrosion.

MACHINES: IBM PC

POC: Sendrian Resources Co
Attn: Mark A. Smith
42 San Lucas Ave
Newbury Park CA 91320-4240
805-499-7991

1.2 MAINTAINABILITY AND SUPPORTABILITY TOOLS

- 1.201 Maintainability Prediction Tools
- 1.202 Maintenance Scheduling Tools
- 1.203 Sparing Requirements Tools
- 1.204 Logistics Support Analysis (LSA)/Supportability Tools

1.201 MAINTAINABILITY PREDICTION TOOLS

NAME: MAINTAIN

ABSTRACT: Calculates predicted maintenance factors including MTTR, cost per maintenance level, and percent contribution to total maintenance cost.

MACHINES: No Data

POC: COADE Engineering Software
 Attn: Mr. M. Journeay
 952 Echo Lane
 Suite 450
 Houston TX 77024
 1-800-231-0732

NAME: MEAP - Maintainability Effectiveness Analysis Program

ABSTRACT: Automates MIL-HDBK-472. Predicts the mean time to perform tasks, MTTR, maximum corrective maintenance, and mean down time at each level of maintenance.

MACHINES: VAX/VMS, Apollo Domain Workstations/Domain Group System, Interpro 32 Series Workstations, VMS or UNIX op systems.

POC: System Effectiveness Assoc Inc.
 Attn: Mr. R. Stratton
 20 Vernon St
 Norwood MA 02062
 617-762-9252

NAME: MPP - Maintainability Prediction Program

ABSTRACT: Performs procedure 5 of MIL-HDBK-472. User must input system structure, and assign maintenance levels and repair action factors.

MACHINES: IBM PC, VAX/VMS

POC: Powertronic Systems Inc.
 Attn: Mr. R. Fousch
 PO Box 29109
 New Orleans LA 70189
 504-254-0383

NAME: MTTR Plus - Mean-Time-To-Repair Plus

ABSTRACT: Automates MIL-HDBK-472 procedures 2 and 5. Requires structure, skill level, rates, and reliability inputs.

MACHINES: No Data

POC: Prophet Software
Attn: Mr. A. Blackburn
1321 Bluesail Circle
Westlake Village CA 91361
805-495-9324

NAME: PC - Maintainability

ABSTRACT: Performs MIL-HDBK-472 calculations including multi-site, multi-task analyses caused by system, function, or component failures. Provides maintenance by task or work site, scheduled maintenance factors, and availability measures.

MACHINES: IBM PC

POC: Management Sciences Inc.
Attn: Conrad Seagroves
6022 Constitution NE
Albuquerque NM 87110
505-268-6696

NAME: PRO-V - Procedure V of MIL-HDBK-472

ABSTRACT: Uses generic data gathered from experience on similar equipment to predict MTTR. An automated version of MIL-HDBK-472 procedure 5. Provides maintainability analyses and predictions early in the design cycle.

MACHINES: No Data

POC: Westinghouse Electric Corp
Attn: Rhine Jager, George Krause, Jr.

NAME: TEC MTTR

ABSTRACT: Program performs a maintainability prediction in accordance with MIL-HDBK-472 procedure 5. Can communicate with other TEC NASA software and has British or Portuguese menus.

MACHINES: IBM PC

POC: TECNASA
Attn: Jose Barletta
AV Brig Lima 811
Sao Jose dos Campos
Sp. CEP 12.225 - CX Postal 201 Brasil
0123-22-3344

NAME: TIME - Testability Interfaced Maintainability Estimator

ABSTRACT: TIME is an automated maintainability prediction tool which takes into direct account the influence of testability/diagnostic design, and maintenance and repair philosophies on maintainability. Testability characteristics and maintenance philosophies are directly incorporated into the prediction model. These include fraction of faults isolatable/detectable, levels of ambiguity, application of secondary fault isolation means and troubleshooting concepts pertinent to various levels of system indenture. Six maintenance philosophies are available from which to choose. Each philosophy has separate models for computing elemental maintenance task times. The task models relate to values for average time required to detect, isolate, acquire, disassemble, interchange, align, reassemble, checkout, and start-up.

MACHINES: IBM PC, VAX/VMS

POC: Rome Laboratory/RBET
Attn: Joseph A. Caroli
Griffiss AFB NY 13441-5700
315-330-4205

1.202 MAINTENANCE SCHEDULING TOOLS

NAME: IDSS TIATA - Technical Information and Training Authority Tool

ABSTRACT: The TIATA is a software aid which uses weapon-specific data from an IDSS data base to generate maintenance procedures, tutorials, circuit schematics, or parts breakdown diagrams needed by the maintenance technician as part of the diagnostic process. This tool also has the capability to generate tailored training sessions, enhance maintenance reporting, and facilitate user interaction with the IDSS data bases.

MACHINES: VAX/VMS, SUN/UNIX

POC: NAVSEA
Attn: Bill Kiner
Washington DC 20362
202-692-2035

NAME: RAM

ABSTRACT: A process availability simulation program, intended for plant and process modeling, in order to maximize performance by minimizing down time and optimizing maintenance schedules.

MACHINES: VAX/VMS

POC: RTP Software Ltd
Attn: D.J. Munro
Newnhems, W. St
Farnham England
Surrey GU9 7EQ
0252-711414

1.203 SPARING REQUIREMENTS TOOLS

NAME: ACCLOGTROM - Army Communications Command Logistics Tradeoff Model

ABSTRACT: Inputs to this program include operational availability goal, equipment reliability block diagrams and LRU data consisting of cost, failure rate, density and repair information. Outputs include least cost set of LRUs required for sparing requirements on and off sites and other cost information relative to sparing.

MACHINES: No Data

POC: Army Communications Command

NAME: CORIDA - Computed Optimization of Replenishment and Initial Spares based on Demand Availability

ABSTRACT: Program computes initial and replenishment spare requirements for multiple levels of maintenance activities. Provides the ability to perform "what if" comparisons with real world logistics constraints to analyze existing or planned support organization.

MACHINES: IBM PC

POC: Management Sciences Inc.
Attn: Conrad Seagroves
6022 Constitution N.E.
Albuquerque NM 87110
505-268-6696

NAME: COVERS - Combat Vehicle RAM Simulation

ABSTRACT: Inputs: Mean-time-to-repair, parts information, maintenance manpower information, scenario usage rates, scenario damage rates, mean-time-between-failures.
Outputs: Parts needed, down time, operational availability.

MACHINES: No Data

POC: No Data

NAME: EMA - Eisenberger - Maiocco Algorithm for Spares Provisioning

ABSTRACT: Program entails a Markov sparing algorithm to aid in provisioning of spare parts. There are two calculations performed: (1) forecasting the availability of a system with a given spare parts pool, and (2) determining the most cost-effective spares package.

MACHINES: IBM PC

POC: COSMIC
382 E. Broad St
Athens GA 30602
404-542-3265

NAME: ERAMS - Electronic RAM Simulation

ABSTRACT: Inputs: Failure rates, repair times, maintenance manpower availability, usage rates.
Outputs: Manpower requirements, parts requirements, down times, operational availability.

MACHINES: No Data

POC: No Data

NAME: OASES - Operations and Support Equipment Synthesis

ABSTRACT: Inputs: FLight hours, assembly R&M, personnel skill requirements, SE requirements, available skill levels and SE, site scenario, spares.
Outputs: Availability, resource utilization, spares availability.

MACHINES: No Data

POC: No Data

NAME: OSAMM - Optimum Supply and Maintenance Manual

ABSTRACT: Inputs: MTBFs, MTTRs, support equipment costs, equipment weights and costs, available targets, military occupational specialty skill level and labor rate.
Outputs: Maintenance and repair task distribution, availability, sparing levels.

MACHINES: No Data

POC: No Data

NAME: SESAME - Selected Essential Item Stockage for Available Method

ABSTRACT: Inputs: System deployment information, turnaround time, repair task distribution, order ship time, repair times, failure factors.
Outputs: Sparing levels at each support echelon, total spares cost, availability achieved.

MACHINES: No Data

POC: US Army CECOM

NAME: SPARECOST

ABSTRACT: Calculates expected number of failures and performs spares holding optimization based on cost, weight, or volume. Predicts spare requirements for the site, repair, and replenishment loop. Tool was developed by ITEM Software Ltd.

MACHINES: IBM PC, VAX/VMS

POC: Mitchell & Gauthier Associates
Attn: Peter Tarbox
73 Junction Square Dr
Concord MA 01742
508-369-5115

NAME: STOCKOPT

ABSTRACT: A menu driven spares ranging and scaling program to optimize spares holdings in order to take account of total cost, weight, quantity, volume or any other parameter specified by the user.

MACHINES: IBM PC, VAX/VMS

POC: RTP Software Ltd
Attn: D.J. Munro
Newnhems, W. St
Farnham England
Surrey GU9 7EQ
0252-711414

1.204 LOGISTICS SUPPORT ANALYSIS/SUPPORTABILITY TOOLS

NAME: ABCAM - Air Base Capability Assessment Model

ABSTRACT: Program evaluates an air base's ability to generate sorties as a function of air base support parameters (reliability, maintainability, supportability). The analytical probabilistic model considers the effect air base support has on mission capabilities, under varying environmental and threat scenarios.

MACHINES: IBM PC

POC: USAFA/DFMS

NAME: ARLCAP - Army Logistics Capability Assessment

ABSTRACT: Inputs to this program include:

1. Flying program file (mission length, flying hours, hours per plane, etc.)
2. Parts data base (unit costs, administrative delays, order and ship time, repair costs, etc.)
3. Force file (number of aircraft per unit, description of unit, etc.)

Outputs of the program include:

1. Mission success rate
2. Repair cost
3. Aircraft availability
4. Repairable spare maintainability/reliability analysis

MACHINES: No Data

POC: Army

NAME: ASOAR - Achieving a System Operational Availability Requirement Methodology

ABSTRACT: Inputs: Operational availability requirements, system configuration end items, system support concepts planned, mean time to obtain an LRU spare, end item mean calendar time between failures, end item mean restored time, end item cost estimate. Outputs: Whether system will achieve desired availability, relative cost estimate for secondary spares, availability goals for end items, system mean restored times, MTBCF of a redundant network, parts needed, down time, operational availability.

MACHINES: No Data

POC: No Data

NAME: CALSA - Computer Aided Logistic Support Analysis

ABSTRACT: Inputs to this tool include MIL-STD-1388-2A input data sheets. Outputs are all MIL-STD-1388-2A report formats with capability for modifying and expanding.

MACHINES: No Data

POC: No Data

NAME: LEADS - Logistic Entry and Analysis Data Systems

ABSTRACT: Inputs to this tool include MIL-STD-1388-2A data elements and outputs include sheet 2 information from MIL-STD-1388-2A.

MACHINES: No Data

POC: No Data

NAME: LEAD - Logistics Engineering Analysis of Design

ABSTRACT: Inputs: Reliability block diagram with each block's failure rates, MTTR, preventive maintenance policy.
Outputs: Reliability estimates for user specified time intervals, system MTBF, system mean-time-between-unscheduled maintenance, availability.

MACHINES: No Data

POC: No Data

NAME: LISA

ABSTRACT: Program uses a relational data base management system and a structured query language to help meet all MIL-STD-1388-2A requirements.

MACHINES: IBM PC

POC: RFA Associates
11722 Sorrento Valley Rd
Suite C
San Diego CA 92121
619-259-1044

NAME: LSSAS - Logistics Support Simulator for Aircraft

ABSTRACT: Model can be exercised in a parametric fashion over a wide range of input data including: MTBF, MTTR, Not Operational Ready Supply (NORS) rates, ATE capability, pre-flight duration, launch activities, runway conditions, probability of ground and air abort, sortie and post flight duration, scheduled maintenance interval and duration, spare data.
Outputs are in terms of sortie rate in response to variations of input data.

MACHINES: No Data

POC: No Data

NAME: OREM - Operational Readiness Evaluation Model

ABSTRACT: Inputs: Reliability, maintainability, support and mission estimates.
Outputs: Daily listing of aircraft readiness data in terms of availability, ability to satisfy the mission requirements and sortie rates, time loss due to: parts delay, aircraft not fully equipped, delays in providing ground support, time spent in maintenance shops.

MACHINES: No Data

POC: No Data

NAME: PPCM - Predicted Primary Costs of Maintenance

ABSTRACT: Program provides ability to define the requirements of a maintenance program. Can compute maintenance costs, identify cost drivers and perform tradeoff analyses for various maintenance policies and concepts. Determines for each level of maintenance, the cost of personnel, support equipment and repair parts to restore to a serviceable condition all failed items.

MACHINES: IBM PC

POC: Management Sciences Inc.
Attn: Conrad Seagroves
6022 Constitution NE
Albuquerque NM 87110
505-268-6696

NAME: SLIC LSAR - Systems and Logistics Integration Capability LSAR

ABSTRACT: A management system for DoD type III integrated LSAR data. Creates and manages all 61 MIL-STD-1388-2A LSAR reports. Has enhanced help capabilities. Runs on 80286/386 computers only.

MACHINES: IBM PC

POC: Integrated Micro Systems
PO Box 1438
M/S D10
Seneca SC 29679-1438
1-800-528-9185

1.3 TESTABILITY TOOLS

- 1.301 Inherent Testability Analysis Tools
- 1.302 Automatic Test Program Generation Tools
- 1.303 Testability Design Tools
- 1.304 Fault & Logic Simulation Tools
- 1.305 Test Reports, Standards, and Documentation Tools
- 1.306 Diagnostic Aid Tools
- 1.307 Testability Allocation Tools

1.301 INHERENT TESTABILITY ANALYSIS TOOLS

NAME: CAFIT - Computer Aided Fault Isolation Testability

ABSTRACT: Program is used to do the following: Identify specific circuitry which inhibits or defeats fault detection, chooses optimal input and output test points, estimates maximum possible fault coverage, identifies feedback loops and fewest number of break points, provides an index of fault isolation test program complexity based on number of signals.

MACHINES: IBM PC, Mentor Graphics Idea Station

POC: Naval Ocean Systems Center
Code 936(B)
San Diego CA 92152-5000
619-553-3261

NAME: CAMELOT - Computer Aided Measure for Logic Testability

ABSTRACT: Assigns controllability and observability values for every node in the circuit and calculates testability. Can compute testability around feedback paths or reconvergent circuits. Provides interactive design for testability. May be used in a test generation strategy because of the path sensitizing approach included.

MACHINES: No Data

POC: Cirrus Computers, UK

NAME: COMET - Controllability and Observability Measurement for Testability

ABSTRACT: Measures testability from controllability and observability measurements for each node, as well as an overall testability statistic. A graphic statistics option is available. Statistical measures provided include combinatorial controllability/observability mean and standard deviation. Automated test point and logic inserters are available. A measure of ease of initializing the circuit for test is one of the outputs.

MACHINES: VAX

POC: United Technologies Microelectronics Center

NAME: COP - Controllability and Observability Program

ABSTRACT: Program has the following capabilities:

- Estimate fault coverage when pseudo random patterns are applied.
- Heuristics carry over for ATP generation.
- Testability assessment with or without test patterns.
- I/O with testability signatures can aid in design verification.

MACHINES: IBM

POC: Bell Northern Research

NAME: COPTR - Controllability, Observability, Predictability, Testability Reports

ABSTRACT: Performs controllability, observability and testability analysis for each node as well as for the entire circuit. Closely coupled with ATG. Points out changes that would make a circuit testable. This program is an enhanced version of the Sandia Controllability/Observability Analysis Program (SCOAP).

MACHINES: CALMA, Apollo Workstations

POC: CALMA Company
Attn: Thomas Poos
Milpatas CA 95035-7489
408-434-4870

NAME: DTA - DAISY Testability Analyzer

ABSTRACT: Program computes six controllability and observability values for each node. Boolean expressions are evaluated for ROMS, RAMS, and PLAs. Manual or automatic test point insertion is allowed.

MACHINES: Daisy Logician Workstation

POC: Daisy Systems Corp
Attn: Mark Fuccio
700 Midlefield Rd
Mountain View CA 94039
415-960-7168

NAME: FACE - Fault Coverage Estimation

ABSTRACT: Performs statistical fault analysis. Applicable to mixed levels, mos transistor level, gate level, and combinatorial functional block level. Its logic simulator deploys both event driven and circuit leveling techniques.

MACHINES: No Data

POC: University of California
Berkeley CA

NAME: HECTOR - Heuristic Controllability and Observability Analysis

ABSTRACT: Creates a weighted "and/or" graph based upon the circuit description. Calculates observability, controllability, and testability measures. These measures are assigned to the hyperarcs connecting the parent node with a set of successor nodes. Hyperarcs are ordered according to CY and OY measures. Provides guidance on how to select flip-flops to be included into an incomplete scan path.

MACHINES: VAX UNIX

POC: Siemens Corporate Research and Support
Princeton NJ

NAME: HITAP - Hi - Testability Analysis Program

ABSTRACT: HITAP is a testability analysis program for gate array and standard cell designs. HITAP is compatible with GenRad's HILO Universal Logic Simulation System. It allows the design engineer to integrate testability into the design process. With HITAP, areas that are difficult to test are revealed during, rather than after, the design process. HITAP provides the user with a relative figure of merit for each circuit node. The figures of merit are expressed in terms of observability and controllability. HITAP calculates a testability figure of merit for each item analyzed, as the product of the observability and controllability factors. These factors then provide a relative measure of the testability of the design.

MACHINES: DEC 32 bit machine

POC: GenRad Inc.
Attn: Michael Busch
37 Main St
Bolton MA 01740
508-779-6271

NAME: IDSS - WSTA - Weapons System Testability Analyzer

ABSTRACT: WSTA requires as inputs unit under test, digital or analog topology and logistic support analysis (LSA) data. WSTA then generates a test strategy which is near optimal in terms of minimizing average test times or test costs. A primary function of WSTA is to provide static (topological) testability figures of merit, such as average inherent ambiguity group size and feedback loop characteristics. WSTA also provides dynamic (test strategy based) figures of merit, such as mean or maximum time to fault isolate. WSTA provides guidance to the designer on the optimal placement of test points based on the fault isolation data each test point can provide. WSTA utilizes a system dependency model and the time-efficient sequencer of tests (TEST) algorithm to generate an optimal test strategy.

MACHINES: VAX/VMS, SUN/UNIX

POC: NAVSEA
Attn: Bill Kiner
Washington DC 20362-5105
202-692-2035

NAME: ITTAP - Interactive Testability Analysis Program

ABSTRACT: Measures are provided for 2 groups: difficulty to control and observe group, and test length group. Contains standard logic elements as primitives within the library as well as the ability to define controllability and observability.

MACHINES: Prime

POC: ITT-LSI Technology Center

NAME: LOGMOD - Logic Modeling

ABSTRACT: Program is a computerized maintenance and fault isolation algorithm. Tool provides testability outputs which come from a structured and organized form of a disciplined knowledge base that contains all interrelationships of functional elements. Outputs include: ambiguity group composition, fault isolation figure of merit, mean-time-to-isolate, mean-time-to-repair, feedback loop indicators, item involvement ratios.

MACHINES: IBM PC, WICAT-150

POC: DETEX Systems Inc.
Attn: Ralph DePaul
1574 N. Batavia #4
Orange CA 92669
714-637-9325

NAME: PROTEST - Probabilistic Testability Analysis

ABSTRACT: Using signal probabilities as input, the program will output the probability a fault will be detected. Determines the required test length to obtain specified fault coverage.

MACHINES: Siemens 7561

POC: University of Karlsruhe
Germany

NAME: SCOAP - Sandia Controllability/Observability Analysis Program

ABSTRACT: Calculates six functions that characterize controllability and observability properties of digital circuits. Identifies poor testability nodes. Makes test point recommendations. Evaluates design modifications.

MACHINES: DEC SYS 10

POC: No Data

NAME: STAMP - System Testability Analysis Maintenance Program

ABSTRACT: STAMP provides the following testability analyzer capabilities:

- testability improvement recommendations
- fault isolation evaluation
- test point evaluation
- test recommendations
- BIT effectiveness
- software self-test design validation

MACHINES: H-P 1000/A900, Apple

POC: ARINC Research Corporation
Attn: Randy Simpson
2551 Riva Road
Annapolis MD 21401
301-266-4066

NAME: STAT - System Testability Analysis Tool

ABSTRACT: STAT is a technique of systematic analysis combined with a computer software program which exercises hardware "nodes" in a diagnostic environment to help choose the "next best" test. Its base is derived from a technique of functional dependency modeling. STAT is system oriented and allows libraries of information to be linked. STATs is the successor to the LOGMOD program.

MACHINES: IBM PC, VAX

POC: DETEX Systems Inc.
1574 North Batavia St #4
Orange CA 92667
714-637-9325

NAME: TMEAS - Testability Measurement

ABSTRACT: Measures controllability and observability and thus derives testability of each node as well as the total circuit. Identifies poor testability locations. Provides test point selection and aids test generation.

MACHINES: IBM TSS/370, Amdahl 470 V/7

POC: AT&T Bell Labs
Attn: John Grason
IL 417
Holmdel NJ 07733
201-949-3000, ext 3086

NAME: VICTOR - VLSI Identifier Of Controllability, Testability, Observability, and Redundancy

ABSTRACT: See Title

MACHINES: No Data

POC: Electronics Research Lab
University of California
Berkley CA

1.302 AUTOMATIC TEST PROGRAM GENERATION TOOLS

NAME: AIDA - ATPG

ABSTRACT: As part of an integrated set of testability tools, the AIDA ATPG works in conjunction with the AIDA fault simulator and automatic scan generator to reduce the "testability overhead" during SCAN design and speeds up the generation of test vectors for manufacture. ATPG creates vectors to detect manufacturing defects and can achieve 100 percent coverage of the detectable single stuck-at fault in a SCAN design. When used in conjunction with the AIDA fault simulator, the set of required test vectors can be reduced to a small number. Often only a few hundred test vectors are required to adequately test a 30K gate design. Applicable to VLSI, PCB, and subsystem designs.

MACHINES: Apollo, Sun Workstations

POC: AIDA Corporation
 Attn: Pierre Wildman
 5155 Old Ironside Drive
 Santa Clara CA 95054
 408-980-5200

NAME: HITS - Hierarchical Integrated Test Simulator

ABSTRACT: Program is a Digital Automatic Test Program Generator (DATPG) System to be used in support of Test Program Set (TPS) development for digital boards and as a means to evaluate/verify digital designs.

MACHINES: VAX/VMS

POC: Naval Air Engineering Center
 ATE Software Ctr
 Code 52514, Bldg 551
 Lakehurst NJ 08733
 201-323-2414/7002

NAME: LASAR VERSION 6 - JUDGE

ABSTRACT: Provides a CAD simulation system for design verification and test program generation incorporating the testability sub-programs called Judge & Prosecutor.

MACHINES: IBM PC, VAX

POC: Teradyne Inc.
Attn: Fred Grant
31 Harrison Ave
Boston MA 02118
617-482-2700

NAME: MMST - Mimola Module For Self-Test

ABSTRACT: Program has automatic self-test program generation which can be implemented in micro or machine code. Optimized testability and cost tradeoffs. Reports poor CY and OY.

MACHINES: VAX/VMS, Sun & Apollos/UNIX

POC: Institute for Informatik
Attn: Dr. Peter Marwedel
Universitat Kiel
Olshausenstr
D-230kiel1

NAME: PROSECUTOR

ABSTRACT: An optimal component of LASAR Version 6, it automatically generates test vectors for CMOS, NMOS, TTL, and ECL gate arrays, standard SSI/MSI parts, fuse-programmable logic arrays and sequencers, and other digital parts of similar size and complexity. It uses a critical path sensitization technique, generating self-initializing stimulus vectors which cause circuit node faults to propagate to primary output pins. Testability problems such as non-initializable latches, redundant circuitry, and tristate outputs which need pull-up resistors are uncovered in the process. These problems are reported so they can be evaluated by the circuit designer who can interact if necessary.

MACHINES: No Data

POC: No Data

NAME: SOCRATES - Structure Oriented, Cost Reducing, Automatic Test Pattern Generation System

ABSTRACT: An ATG system providing random or deterministic test patterns for VLSI with scan and combinational circuits. It promises significant cost reductions by combining the following technical improvements to its ATG process:

- It uses a highly efficient fault simulation approach.
- It improves upon an already efficient algorithm, using special techniques that reduce the number of backtrackings and recognize conflicts early.
- It heuristically carries over information derived from the testability analysis and applies it to the ATG process.

MACHINES: Apollo DN 3000 Workstation

POC: Siemens-AG, W. Germany

NAME: TESTGRADE

ABSTRACT: Once a set of test vectors is developed, this program can create a fault dictionary, a listing of specific faults with associated responses to given test vector inputs. Test pattern grading determines the effectiveness of a test set.

MACHINES: Apollo, SUN Workstation, IBM mainframe, VAX

POC: Gateway Design Automation Co
Six Liberty Way
PO Box 573
Westford MA 01886
617-692-9400

NAME: Test Pattern Tools for the Personal Computer

ABSTRACT: Program is used primarily when test patterns for microcircuit device testing are to be changed, or need to be analyzed, or when WHAT IF conditions are to be imposed.

MACHINES: IBM PC

POC: Electronics Technology and Devices Laboratory
Attn: John Erickson/SLCET-RR
Fort Monmouth NJ 07703-5000
201-544-4840

NAME: TGIR - Test Generator Inferred Reasoning

ABSTRACT: Prototype system developed by the TGIR program uses FIS (a software system developed for general diagnosis) for the generation of test procedures, typically represented as diagnostic flowcharts. Although the system needs to be refined, a knowledge-based expert system has been demonstrated.

MACHINES: SUN, VAX, Symbolics and ISI Workstation

POC: Naval Air Engineering Center
Code 9013E
Lakehurst NJ 08733-5000
201-323-2462

NAME: THESEUS - ATG With Inherent Testability Analyzer

ABSTRACT: An ATG system capable of high fault coverage for complex sequential circuits without need to change design for testability. There is an optional interactive testability analyzer. Addresses controllability computations and provides list of feedback loops that cannot be initialized.

MACHINES: VAX

POC: HHB Systems
Mahwah NJ

NAME: TISSS - Tester Independent Support Software System

ABSTRACT: The primary function of TISSS is to automate the generation and maintenance of product specifications and test programs for Very High-Speed Integrated Circuits (VHSIC) and other complex Very Large-Scale Integrated (VLSI) devices. To accomplish this, TISSS provides a means of capturing computer-aided design (CAD) data sets and product specifications. TISSS also aids in the generation of these data sets. Once captured, the data is automatically loaded into the TISSS data base, where it is maintained in a standardized, transportable, and computer-accessible format. These data sets are accessed by TISSS to generate product specifications and test programs. TISSS also provides tools for validating the data sets to ensure completeness of data, proper syntax, semantics, and data intent.

MACHINES: VAX/VMS

POC: RL/RBR (Bill Russell)
Griffiss AFB NY 13441-5700
315-330-3974

NAME: TRD/ATLAS - Test Requirements Documentation and ATLAS Test Program Generation

ABSTRACT: Program provides support in documentation and execution of the testing process. The front end tool provides an interactive Test Requirements Document (TRD) data entry for MIL-STD-1519 & MIL-STD-1345. The final document is printed directly on a laser printer. TRD will then automatically generate IEEE-716 C/ATLAS source code which can be compiled and run on any MS-DOS machine using the source level debugger or on the ATE system for automatic instrument control. The TRD tool can run stand-alone without the C/ATLAS generation capability or function as a CASE tool by generating the C/ATLAS code.

MACHINES: IBM PC

POC: Texas Instruments
Attn: Nick Geise, MS: 8407
6500 Chase Oaks Blvd
PO Box 869305
Plano TX 75086
214-575-2581

NAME: ZYCAD Next Generation

ABSTRACT: Performs ATG tasks. It implements the simulation in hardware employing parallel pipeline processing techniques. This affords greater speed than possible with software routines which must retrieve instructions from external memory and execute them sequentially. Next generation features an enhanced implementation of extended backtrace algorithm. It can be applied to devices containing any mix of combinational and sequential logic and up to 65,000 gates. Allows for fault dictionary or guided probe fault isolation and enables the user to focus on those parts of the design that may be untestable, helping to achieve optimum testability.

MACHINES: No Data

POC: ZYCAD
3900 Northwoods Dr
Suite 200
St Paul MN 55112
612-490-2500

1.303 TESTABILITY DESIGN TOOLS

NAME: ADAS

ABSTRACT: Optimizes BIT including hierarchical hardware and software design. Applicable to VLSI/PCB/Subsystem/System.

MACHINES: No Data

POC: No Data

NAME: AI-Test - Artificial Intelligence Test

ABSTRACT: Program is an expert system that offers the following assistance during the testing process:

- Ranks modules according to their likelihood of being the cause of failure.
- Suggests diagnostic goals for the next stage of testing.
- Identifies and evaluates tests which may be used in achieving the diagnostic goals and proposes the most cost-effective test.

MACHINES: IBM PC, HP 350/UNIX

POC: IET - Intelligent Electronics Inc.
14 Esser Tachanut St
Ramat Machaual, Tel Aviv
Israel

NAME: ASSET - Advanced Support System For Emulation and Test

ABSTRACT: Program provides the capabilities of advanced test, debug and maintenance via a combination of Texas Instrument's advanced Test Octal Integrated Circuits, IEEE 1149.1 and Joint Test Action Group (JTAG) serial scan protocol, and T.I.'s ASSET software. Some of the capabilities the system provides are:

- SCAN Design Technology and its impact on Test Generation, Verification and Execution
- ASSET controllability of board and system level test and diagnostics
- Impact of SCAN architecture to augment embedded Built-In-Test (BIT)
- Improved debug capabilities available to the designer during the design process
- Reusable test software for manufacturing, depot, and field testing.

MACHINES: IBM PC

POC: Texas Instruments
Attn: Nick Geise, MS: 5407
6500 Chase Oaks Blvd
PO Box 869305
Plano TX 75086
214-575-2581

NAME: Automated Testability Encyclopedia

ABSTRACT: Provides on-line access to guidance for program managers and designers to aid in the specification, development, and evaluation of diagnostic capability of weapon systems.

MACHINES: IBM PC

POC: Rome Laboratory/RBET
Attn: Frank Born
Griffiss AFB NY 13441-5700
315-330-4726

NAME: CADBIT - Computer-Aided Design for Built-In-Test

ABSTRACT: Program will aid in incorporating BIT into electronic systems. Will provide automated access to BIT techniques, design options, and implementation strategies.

MACHINES: Workstation/UNIX

POC: Rome Laboratory/RBES
Attn: James Vaccaro
Griffiss AFB NY 13441-5700
315-330-4205

NAME: CATA - Computer-Aided Testability Analysis

ABSTRACT: CATA provides DFT guidance, FI strategy, and automatic generation of test list after testability evaluation. It is applicable to incoming inspection, manufacturing test, system manufacturing test, production verification, and system maintainability.

MACHINES: VAX

POC: Etudes et Productions Schlum Gerger

NAME: IDSS-ADS - Adaptive Diagnostic Subsystem

ABSTRACT: The ADS is a troubleshooting aid which provides a recommended "next best" test or a recommended repair action. The ADS contains logic to utilize the diagnostic resources (e.g. BIT, augmented BIT, guided manual test, technician inputs, etc.) and other diagnostic data (e.g., optimal Weapons System Testability Analyzer (WSTA) strategy, original dependency data, production rules, etc.) which will have the most likelihood of success based on the diagnostic session results up to that point. The ADS applies increasingly sophisticated "level of intelligence" to the problem, but only as needed. It remembers its successes and failures and automatically adapts its test strategy to changing failure rates and test environments. The ADS may be utilized as a diagnostic software shell for both embedded and off-line test program set (TPS) applications.

MACHINES: VAX/VMS, SUN/UNIX

POC: NAVSEA
Attn: Bill Kiner
Washington DC 20362-5105
202-692-2035

NAME: IDSS-FA - Feedback Analyzer

ABSTRACT: The FA is a software aid that gathers global feedback failure data (e.g. type of failure, fault symptoms, environmental conditions, etc.) and performs an analysis to determine the significance of the failure as it relates to enhancements of fault detection and isolation strategy. The IDSS-ADS utilizes the output of the FA to aid the user in authoring new production rules for addition to the existing diagnostic procedures.

MACHINES: VAX/VMS, SUN/UNIX

POC: NAVSEA
Attn: Bill Kiner
Washington DC 20362-5105
202-692-2035

NAME: PAWS

ABSTRACT: The PAWS program is made up of three integrated systems: (1) PAWS/TRD (Test Requirements Document System) - Develops and documents the strategy and structure of the test program. (2) PAWS/TPS (Test Program Set Development System) -Compiles, modifies, debugs, documents, and simulates the operation of ATLAS test programs. (3) PAWS/RTS (Run Time System) -Maintains control of the user's test station through the actual test program sequences.

MACHINES: IBM PC, VAX/VMS, Most UNIX based

POC: TYX Corporation
Attn: Damon Hart
1851 Alexander Bell Dr
Suite 200
Reston VA 22091-4384
703-264-1080

NAME: PCB Tester Selector

ABSTRACT: Tool determines the most appropriate PCB tester based on given PCB characteristics.

MACHINES: IBM PC

POC: Rome Laboratory/RBET
Attn: Roy Stratton
Griffiss AFB NY 13441-5700
315-330-4205

NAME: SILVAR - LISCO

ABSTRACT: Supports hierarchical BIT design. Supports development throughout the design process. Applicable to digital and/or analog design.

MACHINES: No Data

POC: No Data

NAME: TDES - Testable Design Expert System

ABSTRACT: A knowledge based expert system dedicated to the following design assistant services: Systematic design for testability methodology; applying measures and attributes (i.e. fault coverage, area overhead, etc.); partition total circuit into testable blocks; test strategy selection; design modification for improvement of testability.

MACHINES: SUN and DEC 20

POC: University of S. California

NAME: TEA - Test Engineers Assistant

ABSTRACT: Provides high level system testability design support in conjunction with high level functional design assistance provided by ADAS (Architecture Design and Assessment System). TEA consists of the following five modules: Design for Testability Guideline Checker, BIT Hardware Recommendation, BIT Cost Assessment Module, BIT Placement Recommendation, and Testability Facilities Cost Assessment.

MACHINES: DEC VAX Station 11/GPX, VMS

POC: US Army - CECOM
Attn: AMCPM-TMDE-LT
Ft Monmouth NJ 07703
201-532-1447

NAME: TESAP - Test Strategy Assessment Program

ABSTRACT: Program allows for the comparison of the costs of various testing strategies given varying fault spectra to make general assessments of what combination of tests are best.

MACHINES: IBM PC

POC: Hewlett Packard
Attn: Eileen N. Meenan
3 Crossways Park West
Woodbury NY 11797
516-682-7830

NAME: Testability Design Rating System

ABSTRACT: Tool will be used to assess and improve the inherent testability of a given design early in its life cycle.

MACHINES: No Data

POC: Rome Laboratory/RBET
Attn: Roy Stratton
Griffiss AFB NY 13441-5700
315-330-4205

1.304

FAULT & LOGIC SIMULATION TOOLS

NAME: AIDA - Fault Simulator

ABSTRACT: The AIDA Fault Simulator performs accelerated full or partial fault grading at workstations for test set evaluations. It also provides a fault dictionary, including a list of undetected faults and locations. Program can be used with the AIDA ATPG. When the ATPG creates a test vector, the Fault Simulator automatically checks what other fault classes can be detected by that vector.

MACHINES: Apollo, Sun Workstations

POC: AIDA Corporation
Attn: Pierre Wildman
5155 Old Ironsides Dr
Santa Clara CA 95054
408-980-5200

NAME: BITGRADE - Built-In-Test Grade

ABSTRACT: Program determines fault coverage for self-test designs, is interactive, and is not hindered by SCAN designs. Self-test random pattern generators can require hundreds of thousands of test patterns. This program is designed to deterministically fault grade these tests.

MACHINES: IBM, VAX, Apollo, SUN

POC: Gateway Design Automation Co
6 Liberty Way
PO Box 573
Westford MA 01886
617-692-9400

NAME: CADAT6

ABSTRACT: Program has the following capabilities:

- Fault simulation - evaluates the effectiveness of test vectors developed by the designer or the test department for manufacturing test of the final design.
- Logic simulation - verifies the base functionality of the designers concept and detailed logic design.
- Performance simulation - analyzes the circuit propagation characteristics of the design under worst case timing conditions.

MACHINES: IBM PC, Apollo/AUX, SUN/UNIX, VAX/VMS, VAX/ULTRIX

POC: HHB Systems
Attn: Mr. Kenneth Lipston
1000 Wyckoff Ave
Mahwah NJ 07430
201-848-8000

NAME: IKOS 800

ABSTRACT: A design verification system offering high-speed stimulus processing and accelerated logic simulation by means of special purpose hardware linked to a host computer. IKOS Waveform Capture Stimulus Generator allows the ASIC designer to create millions of simulation vectors that emulate real system operation. In addition to fault-free simulation for logic validation, the IKOS 800's Logic Simulation Hardware Accelerator supports high-speed stuck-at fault simulation in unit delay simulation mode. The user may specify a table of faults to be simulated or may elect to simulate all possible stuck-at faults. The fault coverage report lists all faults which have not been detected by the proposed test program and those faults may be recycled back into the fault table for rapid re-simulation.

MACHINES: IBM PC

POC: IKOS Systems Inc.
145 N. Wolfe Rd
Sunnyvale CA 94086
408-245-1900

NAME: QUICKFAULT

ABSTRACT: Program is an interactive deterministic fault simulator with the following features: Local area net acceleration, 12 simulation states, statistical projection, faults displayed on projection, reports actual and percent detected, possible detected, oscillatory, and undetected faults, fault detection charts, fault dictionary, "stuck-at" fault model, interactive fault selection, hierarchical selection, and graphical fault selection.

MACHINES: Mentor Graphics Workstations

POC: Mentor Graphics Corporation
Attn: Frank Binnenkyk
8500 S.W. Creekside Place
Beaverton OR 97005-7191
503-626-7000

NAME: STAFAN - Statistical Fault Analysis

ABSTRACT: Performs fault free logic simulation and the data collected is used to calculate the fault detection probability for stuck-at-one and stuck-at-zero faults. Program is limited to combinational circuits.

MACHINES: No Data

POC: Control Data Corporation
Attn: Robert Biggs, HQM274
ADAM Marketing
Minneapolis MN
612-853-3117

NAME: STATGRADE

ABSTRACT: Program estimates total fault coverage of test vectors through statistical fault analysis. After measuring controllability and observability values of simulated circuit nodes, the program will output the fault coverage of a given test vector. It also lists statistically undetected faults to promote interactive test generation for specific areas.

MACHINES: Apollo & SUN Workstations, IBM mainframe, VAX

POC: Gateway Design Automation Co
Six Liberty Way
PO Box 573
Westford MA 01886
617-692-9400

NAME: ZYCAD Fault Evaluator

ABSTRACT: Performs fault simulation tasks by implementing the simulation in hardware employing parallel pipeline processing techniques. The concurrent fault simulation algorithm is based on the event driven logic simulation algorithm.

MACHINES: VAX/VMS and UNIX, IBM/MUS and CMS, Apollo/AEGIS, SUN/UNIX

POC: ZYCAD
3900 Northwoods Dr
Suite 200
St Paul MN 55112
612-490-2500

1.305

TEST REPORTS, STANDARDS AND DOCUMENTATION TOOLS

NAME: MIL-STD-2165 Checklist Generator

ABSTRACT: The 2165 Checklist Generation tool automates the process of maintaining multiple MIL-STD-2165 Inherent Testability Checklists for one or more projects. The full text of the 114 generic MIL-STD-2165 questions is pre-entered into the data base as well as a text field explaining the ramifications of each question. Space is also included for text fields to explain question weighting justification, specific interpretation, and score analysis comments. The tool also generates summary and checklist reports suitable for use as a customer deliverable item. The tool is designed for use by a testability engineer, electronic design engineer or both.

MACHINES: IBM PC

POC: Texas Instruments
Attn: Nick Geise, MS: 8407
6500 Chase Oaks Blvd
PO Box 869305
Plano TX 75086
214-575-2581

NAME: TAD - Test Requirements Documentation & ATLAS Development

ABSTRACT: Constructs a full test requirements document in MIL-STD-1519 or MIL-STD-1345 format. Automatically generates ATLAS or HP-BASIC source code. Diagnostic flow charts and functional test flow diagrams are created automatically.

MACHINES: IBM PC

POC: VanderHeide Software Design
2076 Morley St
Simi Valley CA 93065
805-582-9452

NAME: TERS - Test Effectiveness Report System (TERS)

ABSTRACT: TERS assists the test engineer with data collection, data entry, and report generation associated with test effectiveness reports. Examples of these reports include Built-In-Test (BIT) allocation and effectiveness reports based on fault coverage and failure rates and functional test reports.

MACHINES: IBM PC

POC: Texas Instruments
Attn: Nick Geise, MS: 8407
6500 Chase Oaks Blvd
PO Box 869305
Plano TX 75086
214-575-2581

1.306

DIAGNOSTIC AID TOOLS

NAME: ASTEP - Advanced System Testability Program

ABSTRACT: Generates prioritized, failure rate weighted, Fault Isolation Group (FIG) lists (i.e., fault dictionary or ambiguity lists) and generates performance predictions of the following common diagnostic test characteristics. Fault detection, text execution/detect times, detected faults isolated, BITE overhead, fault isolation resolution, test cost.

MACHINES: IBM PC

POC: BITE Inc.
Attn: John Cunningham
9254 Center St
Manassas VA 22110
703-361-7050

NAME: CITS/CEPS - Central Integrated Test System/CITS Expert Parameter System

ABSTRACT: Developed for the B1-B program, CEPS is a rule based expert system, initially targeted to increase fault isolation through the use of expert system technology. As a ground based maintenance aid, it is intended to reduce maintenance manhours expended resolving ambiguous failures, false alarms, repeat/recurring write-ups, cannot duplicates, and retest okays. To accomplish this, CEPS accesses a significant amount of onboard recorded parametric data, and ground based maintenance historical data. The onboard recorded data is provided by the CITS system, and is augmented by design and maintenance expertise, and combined with the historical tracking mechanism that is part of the CEPS system. The provision of this type of tracking system provides a natural source of feedback from field experience which can be readily available for future design and development of weapon systems.

MACHINES: Microvax, Symbolics

POC: Rockwell International & USAF

NAME: I-CAT

ABSTRACT: Provides test strategy report in the form of a test and replace flow diagram report. Provides a testability analysis report which includes the average:

- Cost to diagnose
- Replacement cost
- Ambiguity group size
- Reports on test point effectiveness.

MACHINES: MacIntosh, Apollo and SUN Workstations

POC: Automated Reasoning Corp
Attn: Richard Cantone
290 W. 12th St
Suite 1-D
New York NY 10014
212-206-6331

NAME: IDSS-ADA - Adaptive Diagnostic Authoring

ABSTRACT: Performs those functions necessary to ensure the conversion of test strategies, procedures and heuristics information into a form suitable for use by the on-line diagnostician. ADA validates the model and optimal strategy generated by WSTA; organizes weapon system specific data from the IDSS data base; adds production rules to update existing strategy based on the analysis of on-going weapon system performance; and authors the diagnostic program which is then provided as input to the ADS.

MACHINES: VAX/VMS, SUN/UNIX

POC: NAVSEA
Attn: Bill Kiner
Washington DC 20362-5105
202-692-2035

NAME: MIDAS

ABSTRACT: Supports bottom up design of digital system diagnostics using "Best" technology. Best is similar to and compatible with boundary scan technology.

MACHINES: No Data

POC: No Data

NAME: PROFILE - A Generic Expert Diagnostician

ABSTRACT: When used as a design analysis tool, PROFILE projects the maintenance performance required for each of a sample of failures and keeps track of the reasons for excessive fault resolution time. Among its summary results, are the following:

- The distribution of repair times with mean-time-to-repair.
- An analysis of the utilities of all indicators and test points. This can highlight maintenance features which are redundant or of marginal value, considering their production cost.
- An analysis of false replacements, indicating those components which are likely to be consumed in quantities greater than their failure rates would indicate. This also focuses attention on needs for additional indicators and test points to discriminate between parts which produce identical symptoms under the current design.
- A summary of the types and frequencies of maintenance actions required to resolve the sample of faults and the proportion of time spent performing those functions.

MACHINES: Apollo, SUN, VAX

POC: Behavioral Technology Labs
1845 S. Elena Ave, 4th Floor
Redondo Beach CA 90277
213-540-3654

1.307

TESTABILITY ALLOCATION TOOLS

NAME: ATDT - Automatic Testability Decision Tool

ABSTRACT: Tool when complete will be able to allocate system level testability requirements down to lower levels of assembly while minimizing any negative impacts brought about by the addition of testability.

MACHINES: VAX/VMS

POC: Rome Laboratory/RBET
Attn: Frank Born
Griffiss AFB NY 13441-5700
315-330-4726

1.4

OTHER R/M/S/T TOOLS

- 1.401 Integrated R/M/T Tools, and Tool Interfacing Software
- 1.402 Life Cycle Cost (LCC) and other Cost Estimating Tools
- 1.403 Configuration Management Tools
- 1.404 Mil-Standard Tailoring Guidance Tools

1.401

INTEGRATED R/M/T TOOLS AND TOOL INTERFACING SOFTWARE

NAME: A/LICE - ADA Lattice Integrated Conceptual Environment

ABSTRACT: The CALS knowledge base must contain diverse and competing specialties, including reliability, maintainability, availability, ILS, support, design/build, planning, technical, documentation, etc. The CALS representation scheme is called an Integrated Conceptual Environment (ICE). A/LICE forms an outline for ICE.

MACHINES: IBM PC

POC: Sirius Incorporated
Attn: H.T. Goranson
1976 Munden Point
Virginia Beach VA 23457
804-463-9110

NAME: ASSIST - Abstract Semi-Markov Specification Interface to the SURE Tool

ABSTRACT: Program allows the user to specify the behavior rules of a model and then generates the semi-Markov model automatically. The semi-Markov model output of ASSIST is formatted so that it can be used for input to the SURE program (see Section 1.102). For programs requiring a different form of input than SURE, a simple program could be written to modify the model description file.

MACHINES: VAX/VMS

POC: COSMIC
382 E. Broad St
Athens GA 30602
404-542-3265

NAME: CALCE (Computer-Aided Life Cycle Engineering) Software

ABSTRACT: CALCE software provides an integrated design environment used to incorporate various tools associated with reliability, maintainability, supportability, producibility, and costing tasks into the design of electronic systems in the earliest stages of the design process.

MACHINES: IBM PC

POC: CALCE Center for Electronic Packaging
Attn: Dr. M. Pecht
University of Maryland
College Park MD 20742
301-454-8957

NAME: CARDS - Computer-Aided Reliability Diagnostics System

ABSTRACT: Expert rule based system electronics design rule checker that automatically identifies potential reliability performance problems, concurrent with the computer-aided design process. The CARDS rule base consists of recommended component application guidelines, optimum design practices, and criteria developed from sneak circuit analysis clue lists and experience.

MACHINES: Apollo Workstation

POC: General Dynamics
Attn: Steve Harbater
PO Box 85990
MZ 23-8750
San Diego CA 92138
619-547-4610

NAME: IDSS - Integrated Diagnostic Support System

ABSTRACT: When complete, will be an approach to diagnostics via an integrated set of software tools. All of these tools will function within the context of a standard common diagnostic data base (CDDB). The CDDB is a predefined set of logistic and technical data elements derived from weapon system design and logistics data. Preprocessors are required to input CAE and LSA data into the CDDB. Tools currently under development are:

- Weapon System Testability Analyzer (WSTA)
- Adaptive Diagnostic Subsystem (ADS)
- Adaptive Diagnostic Authoring Tool (ADA)
- Feedback Analyzer (FA)
- Technical Information and Training Authoring (TIATA) Tool

MACHINES: VAX/VMS, SUN/UNIX

POC: NAVSEA
Attn: Bill Kiner
Washington DC 20362-5101
202-692-2035

NAME: IRAT - Integrated Reliability Analysis Tool

ABSTRACT: Package consists of computerized supportability analysis tools (RAMCAD), integrated within the computer-aided design and engineering process (CAD/CAE). IRAT is a package of RAMCAD integrated tools for all reliability accounting and engineering tasks, safety analysis, BIT effectiveness, testability configuration management, etc.

MACHINES: IBM PC

POC: IAI Tashan Engineering Ctr
Attn: N. Bernsetin
Aircraft Division/Israel Aircraft Industries
Ben Gurion Int Airport
Israel 70100
03-9713271

NAME: PREDICTOR

ABSTRACT: Fully integrated suite of computer programs which provides design, reliability, safety, and maintenance engineers with prediction at any stage of system development.

MACHINES: No Data

POC: Management Sciences Inc.
Attn: Conrad Seagroves
6022 Constitution N.E.
Albuquerque NM 87110
505-268-6696

NAME: PSI Software

ABSTRACT: Engineers analyzing circuit schematics enter design data such as parts applied electrical and thermal stress into data input sheets. The PSI software consists of the following modules:

- Reliability Parts Count and Stress Predictions
- Reliability Modeling
- Maintainability Prediction
- Maintainability Modeling
- FMECA
- Derating Electrical and Thermal Stress Analysis
- Worst Case Analysis
- Testability Analysis
- Safety Analysis

MACHINES: IBM PC

POC: Probabilistic Software Inc.
Attn: Seymour L. Friedman
4536 Indianola Way
PO Box 714
LA Canada CA 91011
818-790-6412

NAME: RAMCAD (AFHRL) - Reliability, Availability, and Maintainability In Computer-Aided Design

ABSTRACT: A contract jointly funded by the Air Force Human Resource Laboratory (AFHRL) and the ARMY (AMCCOM), when complete the RAMCAD tool will be an integrated software package that will perform reliability, maintainability and supportability analyses. Such analyses will utilize CAD workstations and will be applicable to electronic, mechanical and structural designs.

MACHINES: No Data

POC: AFHRL/LRL (Capt Hanuschik)
Wright-Patterson AFB OH 45433

NAME: RAMCADTM (SEA) - Reliability and Maintainability CAD/CAE Interface

ABSTRACT: Provides a direct link between some of the SEA CAD/CAE/DBMS R&M software tools.

MACHINES: IBM PC, VAX, Apollo Workstations, Interpro 32 Workstations, MS-DOS, VMS, UNIX or Doamin Op Systems

POC: Systems Effectiveness Assoc
Attn: Mr. R. Stratton
20 Vernon St
Norwood MA 02062
617-762-9552

NAME: RAMTOOL

ABSTRACT: Program is used to conduct reliability predictions, modeling, failure mode, effects, and criticality analysis, maintainability predictions, and testability analyses. Tool was developed by Oerlikon Contraves Dynatec, Switzerland.

MACHINES: VAX

POC: JORI Corp
Attn: John House
419 Fontana Street
Orlando FL 32807

NAME: Reliability Tools by Innovative Timely Solutions

ABSTRACT: Although these aren't really integrated or interfaced, innovative timely solutions have developed a variety of tools:

- Design Tradeoff analysis between thermal budget and reliability
- Yield/failure rate performance model forecasting for manufacturing and customer environments
- Regression Analysis
- Warranty planning using reliability, product cost economics, and Monte Carlo simulation
- Arrhenius Equation/acceleration Factors/Activation Energy Reliability Applications
- Contingency Tables (2x2,2x3)
- Cost of system ownership analysis
- Fault tree analysis
- Static and dynamic system modeling
- Thermal analysis
- Burn-in planning (Markovian Approach)

MACHINES: No Data

POC: Innovative Timely Solutions
Attn: Tom Rooker
6401 Lakerest Court
Raleigh NC 27612
919-846-7705

1.402 LIFE CYCLE COST AND OTHER COST ESTIMATING TOOLS

NAME: CHEAP - Cost Effectiveness Analysis Program

ABSTRACT: Calculates system costs from development, acquisition operation, and support data. A library is used to store labor rates, sparing factors, transportation rates, energy costs, and other factors. Data such as requirements, cost, weight, reliability data, and other costs and factors are input during an application. A tree is used to depict system configuration and sublevel quantities. The calculations performed are cost total for each LRU or SRU and the system, sparing, maintenance, and deployment.

MACHINES: No Data

POC: Systems Effectiveness Associates, Inc.
Attn: Mr. R. Stratton
20 Vernon St
Norwood MA 02062
617-762-9252

NAME: COSTPRO - Cost Projection Management Information System for Life Cycle Costs

ABSTRACT: Inputs: Support item costs, maintenance codes, MTTR, MTBF, repair turnaround time, supply and maintenance hierarchy, indenturing hierarchy, repair labor costs, support equipment training and documentation costs.
Outputs: Summary by appropriation, cost and funding responsibility report, cost summary report.

MACHINES: No Data

POC: No Data

NAME: Family of LCC Models: LCC-2, -2A, -1, -AT, etc.

ABSTRACT: Inputs: Approximately 50 weapon and system input variables and approximately 25 input variables per flight line unit.
Outputs: Total logistic support cost with various options as to how they are classified and displayed.

MACHINES: No Data

POC: Air Force

NAME: FLEX 9

ABSTRACT: Inputs: Approximately 50 weapon and system input variables and approximately 25 input variables per flight line unit.
Outputs: Total logistic support cost with various options as to how they are classified and displayed.

MACHINES: No Data

POC: Navy

NAME: LCCA TM

ABSTRACT: Inputs: Approximately 50 weapon and system input variables and approximately 25 input variables per flight line unit.
Outputs: Total logistic support cost with various options as to how they are classified and displayed.

MACHINES: No Data

POC: The Analytic Sciences Corp

NAME: LOCAM 5 - Logistics Cost Analysis Model

ABSTRACT: Inputs include approximately 325 LRU, deployment, and common standard cost factors.
Outputs include: Life cycle cost of ownership for individual LRUs, cost totals for operating and maintenance, inherent and operational availability at both LRU and system levels, man-power requirements, provisioning requirements, test equipment requirements.

MACHINES: No Data

POC: No Data

NAME: LOGAM - Logistics Analysis Model

ABSTRACT: Inputs: LRU deployment and common standard cost factors, repair time, failure rates, false failure info, attrition rates, manpower requirements, supply factors and support costs. Outputs: LCC for the system and individual LRUs, O&M costs, availability, manpower requirements, provisioning requirements and support equipment usage.

MACHINES: No Data

POC: No Data

NAME: LSC

ABSTRACT: Inputs: Approximately 50 weapon and system input variables and approximately 25 input variables per flight line unit. Outputs: Total logistic support cost with various options as to how they are classified and displayed.

MACHINES: No Data

POC: AFALC/XTXC

NAME: MOD III, LOR - Level Of Repair Model

ABSTRACT: Developed to fulfill MIL-STD-1390B Appendix A. Inputs include parameters of WRAs, MTBF, MTTR, weight, etc. Outputs include intermediate/depot level logistic support costs.

MACHINES: No Data

POC: NAVAIR

NAME: NRLA - Network Repair Level Analysis

ABSTRACT: Inputs include weapon system data consisting of number of bases, system/bases operating hours and logistics data, LRU and SRU failure and repair rates.
Outputs include repair level decision recommendations to minimize cost, detailed repair level cost, sensitivity analysis information.

MACHINES: No Data

POC: AFALD/XRS
Wright-Patterson AFB OH 45433

NAME: PRICE - Parametric Review of Information for Costing and Evaluation

ABSTRACT: Consists of four related programs:

- (1) PRICE - Hardware - Input hardware design concept description: size, weight, component type, power dissipation, etc.
Outputs cost estimation of the development, production, and/or modification of hardware.
- (2) PRICE - Hardware LCC- Input MTBF, repair times, hardware costs, quantities, test equipment costs, number of modules and parts per unit.
Outputs cost estimation of supply and maintenance of hardware systems.
- (3) PRICE - Software - Provides cost estimation of the development, production, and/or modification of software.
- (4) PRICE - Software LCC Model - Provides cost estimation of supply and maintenance of software systems.

MACHINES: No Data

POC: RCA

NAME: REPS - Repairable Equipment Population System

ABSTRACT: Simulates a finite population deployed to meet a demand. Inputs include population size and unit MTBF and MTTR. Cost analyses for sparing and the system are also performed.

MACHINES: No Data

POC: Industrial Engineering & Ops Research Dept
Attn: Dr. W. Fabrycky
302 Whittemore Hall
Blacksburg VA 24061
703-961-7058

NAME: SCOPE - System/Cost Operational Performance Evaluation

ABSTRACT: Performs cost analyses on a comparison basis: baseline versus improved reliability and maintainability.

MACHINES: No Data

POC: USAF/LE-R0 (Lt Col Grant)
The Pentagon
Room 4E259
Washington DC 20330-5130
DSN 225-9876

NAME: TRITAC

ABSTRACT: Inputs: Approximately 50 weapon and system input variables and approximately 25 input variables per flight line unit.
Outputs: Total logistic support cost with various options as to how they are classified and displayed.

MACHINES: No Data

POC: Strategic Financial Planning Systems

1.403 CONFIGURATION MANAGEMENT TOOLS

NAME: BLOODHOUND

ABSTRACT: Program helps to track the status of configuration items throughout the life cycle. Provides a data base that is needed to manage configuration, specification, documentation, drawings, changes, and their associated status and approvals, are tracked.

MACHINES: IBM PC

POC: Management Sciences Inc.
Attn: Conrad Seagroves
6022 Constitution N.E.
Albuquerque NM 87110
505-268-6696

1.404 MIL-STANDARD TAILORING GUIDANCE TOOLS

NAME: R/M/L CATSOP - Reliability/Maintainability/Logistics Computer-Aided Tailoring Software Program

ABSTRACT: Automatic tailoring guidance for MIL-STD-785 "Reliability Program Plan", MIL-STD-470 "Maintainability Program Plan", and MIL-STD-1388 "Logistics Support Analysis".

MACHINES: IBM PC

POC: Rome Laboratory/RBER
 Attn: Duane Gilmour
 Griffiss AFB NY 13441-5700
 315-330-2540

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OF
ROME LABORATORY**

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