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SYSTEM VERIFICATION AND VALIDATION REPORT FOR THE TMAD CODE

1.0 INTRODUCTION

1.1 PURPOSE

This document serves as the System Verification and Validation Report (SVVR) for the TMAD code system, which includes the TMAD code and the LIBMAKR code. In this case, the SVVR also includes the test plan and the test results for the TMAD system.

1.2 SCOPE

The TMAD code was commissioned to facilitate the interpretation of moisture probe measurements in the Hanford Site waste tanks. In principle, the code is an interpolation routine that acts over a library of benchmark data based on two independent variables, typically anomaly size and moisture content. Two additional variables, anomaly type and detector type, can also be considered independent variables, but no interpolation is done over them. The dependent variable is detector response. The intent is to provide the code with measured detector responses from two or more detectors. The code will then interrogate (and interpolate upon) the benchmark data library and find the anomaly-type/anomaly-size/moisture-content combination that provides the closest match to the measured data.

1.3 OVERVIEW

The primary purpose of this document is to provide the results of the system testing and the conclusions based thereon. The results of the testing process are documented in the body of the report. Appendix A gives the test plan, including test procedures, used in conducting the tests. Appendix B lists the input data required to conduct the tests, and Appendices C and D list the numerical results of the tests.

1.4 DEFINITIONS

The following definitions will help the reader understand the neutron probe measurement process and the TMAD code:

TMAD	-	The name of the code being developed. The name was derived from the phrase "tank moisture and anomaly detection." TMAD also refers to the system of codes, including TMAD and LIBMAKR.
LIBMAKR	-	The name of the auxiliary code being developed in conjunction with TMAD as part of the TMAD code system. LIBMAKR assembles the benchmark data into a library file.

Benchmark data	-	Predictions of detector response to different moisture contents, anomaly types, and anomaly sizes. These data are produced by using the MCNP code to model the waste tank and probes.
Neutron probe	-	A device consisting of a neutron emitter and a neutron detector. The device is lowered to the bottom of an LOW and then slowly raised. While being raised, it continuously emits neutrons. At predetermined intervals it measures the number of neutrons per second reaching the detector.
Scan	-	The raw data recorded by the neutron (or other type) probe. It typically consists of a series of pairs of data points, with each pair consisting of a depth and a detector response.
Liquid observation well (LOW)	-	A pipe, closed at the bottom and open at the top, that has been inserted into the waste. By means of the LOW, probes can be lowered into the waste without coming into direct contact with the waste. Use of the LOW precludes the need to decontaminate the probe after every scan.
MCNP	-	The name of the code that will be used to model the detector response in the waste tank, thereby producing the benchmark data. The name is derived from the phrase "Monte Carlo neutron photon."

2.0 VERIFICATION AND VALIDATION OF THE TMAD CODE

Verification and validation for the TMAD code comprised a series of tests that exercised the various functions of the code and demonstrated its ability to meet the design requirements. The purpose and procedure of those tests are described in Appendix A. The numerical output of the tests is shown in Appendices C and D. The tests are summarized and the results described in the following sections.

2.1 CREATING A LIBRARY

This test was designed to demonstrate the capability of the LIBMAKR code to create a benchmark data library, a key function in the system. This test showed that the code met all of the criteria identified in the test plan.

2.2 DELETING A DATA SET FROM AN EXISTING LIBRARY

This test was designed to demonstrate the capability of the LIBMAKR code to delete a data set that had been added to a library file. This function adds to the flexibility and ease of use of the code. This test showed that the code met all of the criteria identified in the test plan.

2.3 ADDING DATA TO AN EXISTING LIBRARY

This test was designed to demonstrate the capability of the LIBMAKR code to add a data set to a previously created library file. This function adds to the flexibility and ease of use of the code. This test showed that the code met all of the criteria identified in the test plan.

2.4 MODIFYING THE ANOMALY LIMITS OF AN EXISTING LIBRARY

This test was designed to demonstrate the capability of the LIBMAKR code to modify the anomaly limits specified in a previously created library file. This function adds to the flexibility and ease of use of the code. This test showed that the code met all of the criteria identified in the test plan.

2.5 MODIFYING THE DETECTOR WEIGHTING FACTORS FOR AN EXISTING LIBRARY

This test was designed to demonstrate the capability of the LIBMAKR code to modify the detector weighting factors specified in a previously created library file. This function adds to the flexibility and ease of use of the code. This test showed that the code met all of the criteria identified in the test plan.

2.6 LISTING A DATA SET FROM AN EXISTING LIBRARY

This test was designed to demonstrate the capability of the LIBMAKR code to list a data set from a previously created library file. This function adds to the flexibility and ease of use of the code. This test showed that the code met all of the criteria identified in the test plan.

2.7 LISTING A SCAN DATA SET

This test was designed to demonstrate the capability of the TMAD code to list a previously entered scan data set. This function adds to the flexibility and ease of use of the code. This test showed that the code met all of the criteria identified in the test plan.

2.8 DELETING A SCAN FROM MEMORY

This test was designed to demonstrate the capability of the TMAD code to delete a previously entered scan data set. This function adds to the flexibility and ease of use of the code. This test showed that the code met all of the criteria identified in the test plan.

2.9 CHANGING A SCAN DETECTOR TYPE DESIGNATION

This test was designed to demonstrate the capability of the TMAD code to change the detector type specified for a previously entered scan data set. This function adds to the flexibility and ease of use of the code. This test showed that the code met all of the criteria identified in the test plan.

2.10 ANALYZING A SET OF SCANS

This test was designed to demonstrate the primary function of the TMAD code, i.e., the prediction of moisture content and anomaly size based on two or more scan data sets.

In this test, six different detector measurements were selected to constitute a scan. Measurements were selected for each of three detectors. These values, selected from actual detector measurements, represent a range of data likely to be encountered in the application of TMAD.

The results of this test are summarized in the tables below; the first table represents moisture content, the second anomaly size. The first column in each table gives the value (for each point) predicted by the code. The second and third columns give the results of hand calculations and the error. The fourth and fifth columns give the results of hand calculations based on the curve coefficients calculated by the curve fit routine of the code, (rather than by linear interpolation), and the error associated with it.

Table 1. Moisture Content.

<u>Case</u>	<u>Code</u>	<u>Hand</u>	<u>Error</u>	<u>Hand2</u>	<u>Error</u>
1	0.00	0.00	0.00	0.00	0.00
2a	0.23	0.47	0.24	0.23	0.00
2b	6.43	NA	NA	6.43	0.00
3	18.12	18.27	0.15	18.12	0.00
4	20.61	21.54	0.93	20.61	0.00
5a	23.67	23.01	0.66	23.67	0.00
5b	34.80	NA	NA	34.80	0.00
6	34.88	36.78	1.90	34.88	0.00

Table 2. Anomaly Size.

<u>Case</u>	<u>Code</u>	<u>Hand</u>	<u>Error</u>	<u>Hand2</u>	<u>Error</u>
1	0.00	0.00	0.00	0.00	0.00
2a	19.62	19.66	0.04	19.62	0.00
2b	27.06	NA	NA	27.06	0.00
3	8.80	8.55	0.25	8.80	0.00
4	11.76	11.87	0.11	11.76	0.00
5a	2.27	0.45	1.82	2.27	0.00
5b	0.00	NA	NA	0.00	0.00
6	0.49	1.20	0.71	0.49	0.00

Two cases need additional clarification. Both case 2 and case 5 show two points reported in the tables. By the nature of fitting points to a second order curve, it is common to have two intersections between curves and therefore two possible solutions. This result only rarely happens with the linear interpolation approach. In most of these cases, the code (and the hand calculations based on the curve fit) predicted two solutions, one of which corresponded to the solution found by the hand calculation and one that did not. In the two cases of interest, the best solution was not the one found by

the hand calculations; therefore, it could not be compared directly to the hand calculation. Consequently, in these two cases, the second point is also listed in the tables to make the verification process easier.

The requirement that the code match hand calculations to within 1% moisture content was met by all but case 6. The requirement that the code match anomaly size to within 1 cm was met by all but case 5. In both of these cases, however, the hand calculation based on a curve fit did meet the requirements, a result indicating that the larger differences resulted from the change in approach (from linear interpolation to curve fitting). All cases, therefore, satisfied the design requirements.

3.0 CONCLUSIONS

All of the tests specified in the test plan have been completed and the code passed all tests. These tests serve to demonstrate that the TMAD code has meets all design criteria specified in the system design description. The code therefore is considered satisfactory for release to use.

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APPENDIX A
SYSTEM TEST PLAN FOR THE TMAD CODE

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1.0 INTRODUCTION

This appendix provides the System Test Plan (STP) for the TMAD code.

1.1 PURPOSE

The TMAD code was commissioned to facilitate the interpretation of moisture probe measurements in the Hanford Site waste tanks. In principle, the code is an interpolation routine that acts over a library of benchmark data based on two independent variables, typically anomaly size and moisture content. Two additional variables, anomaly type and detector type, can also be considered independent variables but no interpolation is done over them. The dependant variable is detector response. The intended application of the code is to provide it with measured detector responses from two or more detectors. The code will then interrogate (and interpolate upon) the benchmark data library and find the anomaly-type/anomaly-size/moisture-content combination that provides the closest match to the measured data.

1.2 SCOPE

This test plan covers the entire TMAD system. Specifically, the two codes (TMAD and LIBMAKR) will be tested to ensure that the functional and performance requirements are met (as outlined in the System Design Description).

1.3 OVERVIEW

The results of the tests described here are presented in the body of the Verification and Validation Report.

2.0 TEST PLAN

2.1 TEST ITEMS

This test plan includes tests of both the TMAD code and the LIBMAKR code.

2.2 FEATURES TO TEST/NOT TEST

The following features of the TMAD system will be tested:

- Creating a library
- Deleting a data set from an existing library
- Adding data to an existing library
- Modifying the anomaly limits of an existing library
- Modifying the detector weighting factors for an existing library
- Listing a data set from an existing library
- Listing a scan data set

- Deleting a scan from memory
- Changing a scan detector type designation
- Analyzing a set of scans.

To perform these tests the following data will need to be generated:

- Benchmark data files representing two anomalies, three detectors, three anomaly sizes, and three moisture contents.
- Scan data files, representing appropriate moisture contents, for each of the three detector types.
- Predicted moisture contents and anomaly sizes resulting from hand calculations based on the test data.

2.3 DELIVERABLES

All of the documentation pertinent to the system tests will be included in the verification and validation report. This will include the test design, the test cases, the test procedures, the test logs, the test incident reports, and the test summary data.

2.4 ACCEPTANCE CRITERIA

The first requirement for all tests is that the code actually perform the designated function.

For all library tests, the resulting library must contain the correct data. This shall be determined by comparing the library to the test benchmark data.

The scan analysis shall be tested by comparing the resulting moisture content and anomaly size to the results of hand calculations performed on the same test data. For acceptance, the results must be the same to 1% moisture content and 1 cm in anomaly size. Any larger differences must be demonstrably the result of changes in the algorithm used by the code as compared to the hand techniques.

2.5 TESTING TASKS

No special preparatory tasks or skills are required to perform the testing. All tasks necessary to complete the tests are included in the test procedures.

2.6 ENVIRONMENTAL NEEDS

To complete the tests it will be necessary to have available: a UNIX workstation, the code executables, and one person (the code developer) to perform the testing. Estimated time requirements are 4 hours.

2.7 RESPONSIBILITIES

All aspects of the test design and performance will be the responsibility of the code developer, Scott Finrock. The test results (as documented in the verification and validation report) will be reviewed by the code independent reviewer, Ralph Crowe.

2.8 STAFFING AND TRAINING

The code testing will require one person (the code developer) for approximately four staff hours.

2.9 SCHEDULE

The code testing can be subdivided into two tasks: the test performance and the test documentation. The test performance will require four staff hours and is to be complete by September 8, 1995. The test documentation will require approximately one staff week. The documentation should be ready for review by September 1, 1995 and ready for release by September 29, 1995.

2.10 RISKS AND CONTINGENCIES

No high risk assumptions or contingency needs have been identified for this test plan.

3.0 TEST DESIGN

3.1 APPROACH

This test plan will provide for acceptance testing. Specific component, integration, and system testing will not be performed, except to the extent that it is included in the acceptance testing. Operational testing will be assumed to be covered by the acceptance testing. The tests will be accomplished by following the test procedures. No special tools or test techniques are required. The analysis of the test results will be accomplished by directly comparing them to the appropriate test data.

3.2 PASS/FAIL CRITERIA

The pass/fail criteria is the same as the acceptance criteria.

4.0 TEST CASES

4.1 TMAD TEST 1 - CREATING A LIBRARY

This test will verify the LIBMAKR code's ability to create a library data file.

This test will require the test benchmark data files. Additional required inputs will be specified in the test procedures.

The output of this test will be a library file (named tmadtest1.lib). The data in this file will be compared to the data in the test benchmark data files. The data in the benchmark files must be reproduced precisely (format and trailing zeros can be ignored) in the library file. Additionally, the following points must be checked:

- The title must match the one specified in the test procedure.
- The month, day, and year entry must match those in the test procedure.
- The library must include three detector type names, matching, and in the same order as, those in the test procedure.
- The library must include two anomaly type names, matching, and in the same order as, those in the test procedure.
- The library must include a minimum and maximum weight factor for both anomaly types, and these must match, and be in the same order as, those in the test procedure.
- The number of detector types must be 3.
- The number of anomaly types must be 2 for each detector.
- The library must contain a detector weighting factor for each detector/anomaly combination.
- The library must contain three curve coefficients, a chi squared value, and a goodness of fit value, for each curve.

4.2 TMAD TEST 2 - DELETING A DATA SET

This test will verify the LIBMAKR code's ability to delete a data set from an existing library data file.

This test will require the benchmark data library (named tmadtest1.lib) produced in the test case TMAD TEST 1. Additional required inputs will be specified in the test procedures.

The output of this test will be a library file (named tmadtest2.lib). The data in this file will be compared to the data in the input data file (tmadtest1.lib). The data in the input file must be reproduced exactly in the library file, except that the number of detectors should now be 2 and the third data set should be missing.

4.3 TMAD TEST 3 - ADDING DATA

This test will verify the LIBMAKR code's ability to add a data set to an existing library data file.

This test will require the benchmark data library (named tmadtest2.lib) produced in the test case TMAD TEST 2. Additional required inputs will be specified in the test procedures.

The output of this test will be a library file (named tmadtest3.lib). The data in this file will be compared to the data in the output data file (named tmadtest1.lib) from TMAD TEST 1. The data in tmadtest1.lib must be reproduced exactly in the output library file.

4.4 TMAD TEST 4 - MODIFYING THE ANOMALY LIMITS

This test will verify the LIBMAKR code's ability to modify the anomaly limits in an existing library data file.

This test will require the benchmark data library (named tmadtest1.lib) produced in the test case TMAD TEST 1. Additional required inputs will be specified in the test procedures.

The output of this test will be a library file (named tmadtest4.lib). The data in this file will be compared to the data in the output data file (named tmadtest1.lib) from TMAD TEST 1. The data in tmadtest1.lib must be reproduced exactly in the output library file except that the anomaly limits must match, and be in the same order, as those specified in the test procedures.

4.5 TMAD TEST 5 - MODIFYING THE DETECTOR WEIGHTING FACTORS

This test will verify the LIBMAKR code's ability to modify the detector weighting factors in an existing library data file.

This test will require the benchmark data library (named tmadtest1.lib) produced in the test case TMAD TEST 1. Additional required inputs will be specified in the test procedures.

The output of this test will be a library file (named tmadtest5.lib). The data in this file will be compared to the data in the output data file (named tmadtest1.lib) from TMAD TEST 1. The data in tmadtest1.lib must be reproduced exactly in the output library file, except that the detector weighting factors must match, and be in the same order, as those specified in the test procedures.

4.6 TMAD TEST 6 - LISTING A DATA SET

This test will verify the LIBMAKR code's ability to list the data in an existing library data file.

This test will require the benchmark data library (named tmadtest1.lib) produced in the test case TMAD TEST 1. Additional required inputs will be specified in the test procedures.

The output of this test will be a data listing to the screen. These data must be recorded, either by hand or with a screen capture utility. The resulting data will be compared to the data in the input data library file. The data in tmadtest1.lib must be reproduced exactly in the output data (ignoring format and trailing zeros).

4.7 TMAD TEST 7 - LISTING A SCAN

This test will verify the TMAD code's ability to list the data read in from scan data files.

This test will require the benchmark data library (named tmadtest1.lib) produced in the test case TMAD TEST 1 and the test scan data files. Additional required inputs will be specified in the test procedures.

The output of this test will be a data listing to the screen. These data must be recorded, either by hand or with a screen capture utility. The resulting data will be compared to the data in the input scan data files. The data in these files must be reproduced exactly in the output data (ignoring format and trailing zeros).

4.8 TMAD TEST 8 - DELETING A SCAN

This test will verify the TMAD code's ability to delete a scan data set from memory.

This test will require the benchmark data library (named tmadtest1.lib) produced in the test case TMAD TEST 1 and the test scan data files. Additional required inputs will be specified in the test procedures.

The output of this test will be a data listing to the screen. These data must be recorded, either by hand or with a screen capture utility. The resulting data will be compared to the output data from TMAD TEST 7. The output data from TMAD TEST 7 must be reproduced exactly in the output data from this test.

4.9 TMAD TEST 9 - CHANGING A SCAN DETECTOR TYPE

This test will verify the TMAD code's ability to modify the detector designation for a scan data set already in memory.

This test will require the benchmark data library (named tmadtest1.lib) produced in the test case TMAD TEST 1 and the test scan data files. Additional required inputs will be specified in the test procedures.

The output of this test will be a data listing to the screen. These data must be recorded, either by hand or with a screen capture utility. The resulting data will be compared to the output data from TMAD TEST 7. The output data from TMAD TEST 7 must be reproduced exactly in the output data from this test.

4.10 TMAD TEST 10 - ANALYZING A SET OF SCANS

This test will verify the TMAD code's ability to analyze a set of scans and predict moisture contents and anomaly sizes.

This test will require the benchmark data library (named tmadtest1.lib) produced in the test case TMAD TEST 1 and the test scan data files. Additional required inputs will be specified in the test procedures.

The output of this test will be a data file named tmadtest10.results. The data in this file will be compared to the results of the hand calculations (see Section 6). The results of the hand calculations must be reproduced in the output file to 1% in moisture content and 1 cm in anomaly size. Any differences larger than that must be demonstrably the result of changes in the algorithm between what is used in the code and what was used in the hand calculations.

5.0 TEST PROCEDURES

This section provides the exact procedures for conducting the tests. In all cases, the requirements for initiating the testing are that the following be present: the test personnel, a UNIX workstation, the code executables, and the test data files. The test data sets are described in Section 6 and these data sets must be entered into computer files prior to the commencement of testing. All test data files must be in a computer directory in which the testing will take place. The code executables, or script files referencing them, should also be present, or else aliases must be established referencing them. In all cases the TMAD code should be executable by entering the command "tmad.x" and the LIBMAKR code should be executable by entering the command "libmakr.x."

5.1 TMAD TEST 1 - CREATING A LIBRARY

This test will verify the LIBMAKR code's ability to create a library data file.

From the UNIX prompt, enter the command:
libmakr.x

When prompted for a library file name, enter:
tmadtest1.lib

When given the 'file not found' menu, enter:
2 (to create a library)

When prompted to enter a title, enter:
TMAD test library

When prompted to enter a date, enter:
1 1 1995

When given the "Tmad Library Options" menu, enter:
1 (to add data)

When prompted to enter the data file name, enter:
tmadtest.d1a1.bm

When prompted to enter name of new detector type, enter:
detector type 1

When prompted to enter the decay constant for the detector, enter:
7.18838e-4

When prompted to enter name of new anomaly type, enter:
anomaly type 1

When prompted to enter the minimum possible anomaly size, enter:
0.0

When prompted to enter the maximum possible anomaly size, enter:
50.0

When given the 'Tmad Library Options' menu, enter:
1 (to add data)

When prompted to enter the data file name, enter:
tmadtest.d2a1.bm

When prompted to select appropriate detector type, enter:
2 (for new detector type)

When prompted to enter name of new detector type, enter:
detector type 2

When prompted to enter the decay constant for the detector, enter:
7.18838e-4

When prompted to select appropriate anomaly type, enter:
1 (for anomaly type 1)

When given the 'Tmad Library Options' menu, enter:
1 (to add data)

When prompted to enter the data file name, enter:
tmadtest.d3a1.bm

When prompted to select appropriate detector type, enter:

3 (for new detector type)

When prompted to enter name of new detector type, enter:
detector type 3

When prompted to enter the decay constant for the detector, enter:
7.18838e-4

When prompted to select appropriate anomaly type, enter:
1 (for anomaly type 1)

When given the 'Tmad Library Options' menu, enter:
1 (to add data)

When prompted to enter the data file name, enter:
tmadtest.d1a2.bm

When prompted to select appropriate detector type, enter:
1 (for detector type 1)

When prompted to select appropriate anomaly type, enter:
2 (for new anomaly type)

When prompted to enter name of new anomaly type, enter:
anomaly type 2

When prompted to enter the minimum possible anomaly size, enter:
0.0

When prompted to enter the maximum possible anomaly size, enter:
100.0

When given the 'Tmad Library Options' menu, enter:
1 (to add data)

When prompted to enter the data file name, enter:
tmadtest.d2a2.bm

When prompted to select appropriate detector type, enter:
2 (for detector type 2)

When prompted to select appropriate anomaly type, enter:
2 (for anomaly type 2)

When given the 'Tmad Library Options' menu, enter:
1 (to add data)

When prompted to enter the data file name, enter:
tmadtest.d3a2.bm

When prompted to select appropriate detector type, enter:
3 (for detector type 3)

When prompted to select appropriate anomaly type, enter:
2 (for anomaly type 2)

When given the 'Tmad Library Options' menu, enter:
0 (Done)

Test is now complete.

5.2 TMADE TEST 2 - DELETING A DATA SET

This test will verify the LIBMAKR code's ability to delete a data set from an existing library data file.

From the UNIX prompt, enter the command:
cp tmadtest1.lib tmadtest2.lib

From the UNIX prompt, enter the command:
libmakr.x

When prompted for a library file name, enter:
tmadtest2.lib

When given the 'Tmad Library Options' menu, enter:
2 (to delete data)

When given the 'Possible Detector Types' menu, enter:
2 (for detector type 2)

When given the 'Possible Anomaly Types' menu, enter:
1 (for anomaly type 1)

When given the 'Tmad Library Options' menu, enter:
0 (Done)

Test is now complete.

5.3 TMADE TEST 3 - ADDING DATA

This test will verify the LIBMAKR code's ability to add a data set to an existing library data file.

From the UNIX prompt, enter the command:
cp test2.lib tmadtest3.lib

From the UNIX prompt, enter the command:
libmakr.x

When prompted for a library file name, enter:
tmadtest3.lib

When given the 'Tmad Library Options' menu, enter:
1 (to add data)

When prompted to enter the data file name, enter:
tmadtest.d2a1.bm

When prompted to select appropriate detector type, enter:
2 (for detector type 2)

When prompted to select appropriate anomaly type, enter:
1 (for anomaly type 1)

When given the 'Tmad Library Options' menu, enter:
0 (Done)

Test is now complete.

5.4 TMA TEST 4 - MODIFYING THE ANOMALY LIMITS

This test will verify the LIBMAKR code's ability to modify the anomaly limits in an existing library data file.

From the UNIX prompt, enter the command:
cp tmadtest1.lib tmadtest4.lib

From the UNIX prompt, enter the command:
libmakr.x

When prompted for a library file name, enter:
tmadtest4.lib

When given the 'Tmad Library Options' menu, enter:
5 (to modify anomaly limits)

When given the 'Possible Anomaly Types' menu, enter:
1 (for anomaly type 1)

When prompted to enter a new minimum size, enter:
5.0

When prompted to enter a new maximum size, enter:
78.0

When given the 'Tmad Library Options' menu, enter:
0 (Done)

Test is now complete.

5.5 TMA TEST 5 - MODIFYING THE DETECTOR WEIGHTING FACTORS

This test will verify the LIBMAKR code's ability to modify the detector weighting factors in an existing library data file.

From the UNIX prompt, enter the command:
cp tmadtest1.lib tmadtest5.lib

From the UNIX prompt, enter the command:
libmakr.x

When prompted for a library file name, enter:
tmadtest5.lib

When given the 'Tmad Library Options' menu, enter:
3 (to modify weights)

When prompted to enter the new weight value, enter:
2.

When given the 'Possible Detector Types' menu, enter:
2 (for detector type 2)

When given the 'Possible Anomaly Types' menu, enter:
1 (for anomaly type 1)

When given the 'Tmad Library Options' menu, enter:
0 (Done)

Test is now complete.

5.6 TMAD TEST 6 - LISTING A DATA SET

This test will verify the LIBMAKR code's ability to list the data in an existing library data file.

From the UNIX prompt, enter the command:
cp tmadtest1.lib tmadtest6.lib

From the UNIX prompt, enter the command:
libmakr.x

When prompted for a library file name, enter:
tmadtest6.lib

When given the 'Tmad Library Options' menu, enter:
4 (to list data)

When given the 'Possible Detector Types' menu, enter:
0 (for all)

When given the 'Possible Anomaly Types' menu, enter:
0 (for all)

When given the 'Tmad Library Options' menu, enter:
0 (Done)

Test is now complete.

5.7 TMAD TEST 7 - LISTING A SCAN

This test will verify the TMAD code's ability to list the data read in from scan data files.

From the UNIX prompt, enter the command:
tmad.x

When prompted for a library file name, enter:
tmadtest1.lib

When given the 'Tmad Options' menu, enter:
1 (to select scan data)

When given the 'Tmad Scan Data Options' menu, enter:
1 (to select a scan)

When prompted to enter a scan file name, enter:
tmadtest.d1.scan

When given the 'Possible Detector Types' menu, enter:
1 (for detector type 1)

When given the 'Tmad Scan Data Options' menu, enter:
1 (to select a scan)

When prompted to enter a scan file name, enter:
tmadtest.d2.scan

When given the 'Possible Detector Types' menu, enter:
2 (for detector type 2)

When given the 'Tmad Scan Data Options' menu, enter:
1 (to select a scan)

When prompted to enter a scan file name, enter:
tmadtest.d3.scan

When given the 'Possible Detector Types' menu, enter:
3 (for detector type 3)

When given the 'Tmad Scan Data Options' menu, enter:
4 (to list scan data)

When given the 'Currently Selected Scan' menu, enter:
1 (to select scan 1)

When given the 'Tmad Scan Data Options' menu, enter:
4 (to list scan data)

When given the 'Currently Selected Scan' menu, enter:
2 (to select scan 2)

When given the 'Tmad Scan Data Options' menu, enter:
4 (to list scan data)

When given the 'Currently Selected Scan' menu, enter:
3 (to select scan 3)

When given the 'Tmad Scan Data Options' menu, enter:
0 (to return)

When given the 'Tmad Options' menu, enter:
0 (Done)

Test is now complete.

5.8 TMAD TEST 8 - DELETING A SCAN

This test will verify the TMAD code's ability to delete a scan data set from memory.

From the UNIX prompt, enter the command:
tmad.x

When prompted for a library file name, enter:
tmadtest1.lib

When given the 'Tmad Options' menu, enter:
1 (to select scan data)

When given the 'Tmad Scan Data Options' menu, enter:
1 (to select a scan)

When prompted to enter a scan file name, enter:
tmadtest.d1.scan

When given the 'Possible Detector Types' menu, enter:
1 (for detector type 1)

When given the 'Tmad Scan Data Options' menu, enter:
1 (to select a scan)

When prompted to enter a scan file name, enter:
tmadtest.d2.scan

When given the 'Possible Detector Types' menu, enter:
2 (for detector type 2)

When given the 'Tmad Scan Data Options' menu, enter:
1 (to select a scan)

When prompted to enter a scan file name, enter:
tmadtest.d3.scan

When given the 'Possible Detector Types' menu, enter:
3 (for detector type 3)

When given the 'Tmad Scan Data Options' menu, enter:
2 (to un-select a scan)

When given the 'Currently Selected Scan' menu, enter:
2 (to select scan 2)

When given the 'Tmad Scan Data Options' menu, enter:
4 (to list scan data)

When given the 'Currently Selected Scan' menu, enter:
1 (to select scan 1)

When given the 'Tmad Scan Data Options' menu, enter:
4 (to list scan data)

When given the 'Currently Selected Scan' menu, enter:
2 (to select scan 2)

When given the 'Tmad Scan Data Options' menu, enter:
0 (to return)

When given the 'Tmad Options' menu, enter:
0 (Done)

Test is now complete.

5.9 TMAD TEST 9 - CHANGING A SCAN DETECTOR TYPE

This test will verify the TMAD code's ability to modify the detector designation for a scan data set already in memory.

From the UNIX prompt, enter the command:
tmad.x

When prompted for a library file name, enter:
tmadtest1.lib

When given the 'Tmad Options' menu, enter:
1 (to select scan data)

When given the 'Tmad Scan Data Options' menu, enter:
1 (to select a scan)

When prompted to enter a scan file name, enter:
tmadtest.d1.scan

When given the 'Possible Detector Types' menu, enter:
1 (for detector type 1)

When given the 'Tmad Scan Data Options' menu, enter:
1 (to select a scan)

When prompted to enter a scan file name, enter:
tmadtest.d2.scan

When given the 'Possible Detector Types' menu, enter:
3 (for detector type 3)

When given the 'Tmad Scan Data Options' menu, enter:
3 (to change scan detector type)

When prompted to enter number of scan to be changed, enter:
2 (for scan 2)

When given the 'Possible Detector Types' menu, enter:
2 (for detector type 2)

When given the 'Tmad Scan Data Options' menu, enter:
1 (to select a scan)

When prompted to enter a scan file name, enter:
tmadtest.d3.scan

When given the 'Possible Detector Types' menu, enter:
3 (for detector type 3)

When given the 'Tmad Scan Data Options' menu, enter:
4 (to list scan data)

When given the 'Currently Selected Scan' menu, enter:
1 (to select scan 1)

When given the 'Tmad Scan Data Options' menu, enter:
4 (to list scan data)

When given the 'Currently Selected Scan' menu, enter:
2 (to select scan 2)

When given the 'Tmad Scan Data Options' menu, enter:
4 (to list scan data)

When given the 'Currently Selected Scan' menu, enter:
3 (to select scan 3)

When given the 'Tmad Scan Data Options' menu, enter:
0 (to return)

When given the 'Tmad Options' menu, enter:
0 (Done)

Test is now complete.

5.10 TMAD TEST 10 - ANALYZING A SET OF SCANS

This test will verify the TMAD code's ability to analyze a set of scans and predict moisture contents and anomaly sizes.

From the UNIX prompt, enter the command:
tmad.x

When prompted for a library file name, enter:
tmadtest1.lib

When given the 'Tmad Options' menu, enter:
1 (to select scan data)

When given the 'Tmad Scan Data Options' menu, enter:
1 (to select a scan)

When prompted to enter a scan file name, enter:
tmadtest.d1.scan

When given the 'Possible Detector Types' menu, enter:
1 (for detector type 1)

When given the 'Tmad Scan Data Options' menu, enter:
1 (to select a scan)

When prompted to enter a scan file name, enter:
tmadtest.d2.scan

When given the 'Possible Detector Types' menu, enter:
2 (for detector type 2)

When given the 'Tmad Scan Data Options' menu, enter:
1 (to select a scan)

When prompted to enter a scan file name, enter:
tmadtest.d3.scan

When given the 'Possible Detector Types' menu, enter:
3 (for detector type 3)

When given the 'Tmad Scan Data Options' menu, enter:
0 (to return)

When given the 'Tmad Options' menu, enter:
2 (to analyze data)

When given the 'Tmad Options' menu, enter:
0 (Done)

From the UNIX prompt, enter the command:
mv tmad.out tmadtest10.results

From the UNIX prompt, enter the command:
mv tmad.debug tmadtest10.debug

Test is now complete.

6.0 TEST ITEM TRANSMITTAL REPORT

The TMAD system testing will be performed by the system developer, therefore, no item transmittals are required.

7.0 TEST LOG AND TEST INCIDENT REPORT

The System Verification and Validation Report will serve as the test log and will include a listing of all pertinent results and conclusions. Any test incident reports that may be necessary (representing rejected test cases) will also be included as part of this document.

APPENDIX B

TEST LOGS

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1. TMAD TEST 1 - CREATING A LIBRARY

Test completed: ✓

Library file compared to input data: ✓

Test: ✓ passed failed

Scott Zupka 9/12/95
Tester's signature date

2. TMAD TEST 2 - DELETING A DATA SET

Test completed: ✓

Output library file compared to input library file: ✓

Test: ✓ passed failed

Scott Zupka 9/12/95
Tester's signature date

3. TMAD TEST 3 - ADDING DATA

Test completed: ✓

Output library file compared to input library file: ✓

Test: ✓ passed failed

Scott Zupka 9/12/95
Tester's signature date

4. TMAD TEST 4 - MODIFYING THE ANOMALY LIMITS

Test completed: ✓

Output library file compared to input library file: ✓

Test: ✓ passed failed

Scott Zupka 9/12/95
Tester's signature date

5. TMAD TEST 5 - MODIFYING THE DETECTOR WEIGHTING FACTORS

Test completed: ✓

Output library file compared to input library file: ✓

Test: ✓ passed _____ failed

Scott Fulbrook 9/12/95
Tester's signature date

6. TMAD TEST 6 - LISTING A DATA SET

Test completed: ✓

Output data compared to input library file: ✓

Test: ✓ passed _____ failed

Scott Fulbrook 9/12/95
Tester's signature date

7. TMAD TEST 7 - LISTING A SCAN

Test completed: ✓

Output data compared to input scan file: ✓

Test: ✓ passed _____ failed

Scott Fulbrook 9/12/95
Tester's signature date

8. TMAD TEST 8 - DELETING A SCAN

Test completed: ✓

Output data compared to output data from test 7: ✓

Test: ✓ passed _____ failed

Scott Fulbrook 9/12/95
Tester's signature date

9. TMAD TEST 9 - CHANGING A SCAN DETECTOR TYPE

Test completed: ✓

Output data compared to output data from test 7: ✓

Test: ✓ passed failed

Scott Fisher 9/12/95
Tester's signature date

10. TMAD TEST 10 - ANALYZING A SET OF SCANS

Test completed: ✓

Output data compared to results of hand calculations: ✓

Test: ✓ passed failed

Scott Fisher 9/12/95
Tester's signature date

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APPENDIX C

TEST DATA

This appendix documents the data required to perform the TMAD verification testing. There are two categories of data required: the benchmark data and the scan data. There are six files of benchmark data required, representing three detector types and two anomaly types. The scan data consists of three files representing the three different detector types.

B.1 BENCHMARK DATA

B.1.1 File tmadtest.d1a1.bm

tmad test benchmark data, detector type 1, anomaly type 1

9

0. 9

0. 1947. 20.
10. 3363. 25.
20. 4571. 33.
30. 5596. 50.
40. 6474. 49.
50. 7241. 64.
70. 8143. 77.
80. 8473. 80.
100. 8907. 61.

1. 9

0. 1701. 18.
10. 2981. 28.
20. 4050. 30.
30. 4944. 36.
40. 5683. 51.
50. 6526. 54.
70. 7362. 74.
80. 7632. 77.
100. 8076. 69.

2. 9

0. 1478. 16.
10. 2602. 20.
20. 3532. 33.
30. 4359. 41.
40. 5066. 38.
50. 5701. 44.
70. 6492. 53.
80. 6711. 54.
100. 7230. 54.

4. 5

0. 1095. 14.
10. 1973. 19.
20. 2729. 23.
30. 3320. 26.
50. 4355. 30.

8. 5

0. 695. 12.
10. 1286. 16.
20. 1695. 19.
30. 2077. 20.
50. 2677. 25.

11. 5

0. 521. 7.
10. 921. 17.
20. 1260. 23.
30. 1477. 26.
50. 1929. 22.

15. 5

0. 261. 5.
10. 655. 9.
20. 843. 11.
30. 1031. 13.
50. 1304. 25.

20. 5

0. 200. 5.
10. 443. 9.
20. 574. 10.

30. 695. 15.
50. 904. 19.
25. 5
0. 141. 5.
10. 309. 7.
20. 419. 11.
30. 478. 12.
50. 570. 12.

B.1.2 File tmadtest.d2a1.bm

tmad test benchmark data, detector type 2, anomaly type 1

9
0. 11
0. 730. 8.
10. 769. 10.
20. 803. 12.
30. 766. 15.
40. 782. 15.
50. 797. 18.
60. 833. 20.
70. 861. 21.
80. 889. 18.
90. 927. 28.
100. 973. 21.
1. 9
0. 716. 8.
10. 803. 12.
20. 868. 14.
30. 895. 13.
40. 898. 18.
50. 940. 16.
70. 1060. 20.
80. 1074. 19.
100. 1169. 22.
2. 9
0. 693. 9.
10. 836. 10.
20. 959. 16.
30. 1017. 15.
40. 1080. 19.
50. 1106. 16.
70. 1244. 23.
80. 1286. 25.
100. 1428. 21.
4. 5
0. 624. 10.
10. 863. 14.
20. 1008. 13.
30. 1130. 17.
50. 1312. 17.
8. 5
0. 439. 6.
10. 713. 7.
20. 866. 9.
30. 1008. 11.
50. 1260. 20.
11. 5
0. 365. 5.
10. 608. 7.
20. 747. 8.
30. 852. 9.
50. 1069. 10.
15. 5
0. 261. 5.
10. 466. 6.
20. 572. 6.
30. 675. 8.
50. 826. 9.
20. 5
0. 167. 4.
10. 329. 6.
20. 439. 7.

30.	504.	8.
50.	628.	9.
25.	5	
0.	117.	3.
10.	247.	4.
20.	322.	5.
30.	382.	7.
50.	464.	7.

B.1.3

File tmadtest.d3a1.bm

tmad test benchmark data, detector type 3, anomaly type 1

9

0. 9

0. 806. 6.

10. 614. 5.

20. 515. 5.

30. 453. 5.

40. 413. 3.

50. 377. 3.

70. 351. 3.

80. 337. 4.

100. 324. 3.

1. 9

0. 786. 5.

10. 603. 5.

20. 526. 5.

30. 470. 4.

40. 434. 5.

50. 409. 4.

70. 374. 4.

80. 360. 3.

100. 344. 3.

2. 9

0. 748. 5.

10. 584. 5.

20. 511. 4.

30. 467. 4.

40. 434. 4.

50. 418. 4.

70. 379. 4.

80. 367. 3.

100. 346. 3.

4. 7

0. 652. 5.

10. 536. 6.

20. 476. 6.

30. 441. 5.

50. 405. 4.

70. 360. 4.

100. 336. 4.

8. 5

0. 494. 5.

10. 416. 3.

20. 370. 3.

30. 349. 3.

50. 317. 4.

11. 5

0. 405. 3.

10. 353. 4.

20. 317. 3.

30. 300. 4.

50. 264. 3.

15. 5

0. 300. 3.

10. 277. 2.

20. 247. 2.

30. 234. 2.

50. 215. 3.

20. 7

0. 206. 2.

5. 214. 3.

10. 207. 3.

15. 200. 3.

20. 189. 2.

30. 176. 2.

50. 165. 2.

25. 5

0. 160. 2.

10. 160. 2.

20. 150. 2.

30. 141. 2.

50. 132. 2.

B.1.4 File tmadtest.d1a2.bm

tmad test benchmark data, detector type 1, anomaly type 2
 2
 0. 3
 0.0 0. 10.
 0.1 50. 10.
 0.2 75. 10.
 0.1 3
 0.0 0. 10.
 0.1 5. 10.
 0.2 10. 10.

B.1.5 File tmadtest.d2a2.bm

tmad test benchmark data, detector type 2, anomaly type 2
 2
 0. 3
 0.0 0. 10.
 0.1 50. 10.
 0.2 75. 10.
 0.1 3
 0.0 0. 10.
 0.1 5. 10.
 0.2 10. 10.

B.1.6 File tmadtest.d3a2.bm

tmad test benchmark data, detector type 3, anomaly type 2
 2
 0. 3
 0.0 0. 10.
 0.1 50. 10.
 0.2 75. 10.
 0.1 3
 0.0 0. 10.
 0.1 5. 10.
 0.2 10. 10.

B.2 SCAN DATA

B.1.1 File tmadtest.d1.scan

tmad test tank scan, detector type 1
 9 25 94
 6
 14.09666 6879
 13.01462 5797
 12.00878 1162
 11.00294 1589
 10.01234 230
 9.00650 15

B.1.2 File tmadtest.d2.scan

tmad test tank scan, detector type 2
 9 25 94
 6
 14.00548 965
 13.01488 911
 12.00904 800
 11.0032 898
 10.0126 193
 9.00676 9

B.1.3 File tmadtest.d3.scan

tmad test tank scan, detector type 3
 9 25 94
 6
 14.01058 521
 13.00474 513
 12.01414 325

11.00830	427
10.00246	94
9.011860	24

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APPENDIX D
OUTPUT FILES

This appendix contains the output files from each of the tests

C.1 File tmadtest1.out

LIBMAKR v1.0 9/9/95

enter name of library file

Library file not found

0) Abort

1) Enter new name

2) Create library

Select option to continue:

Enter title line for new library file

Enter effective date of source model (month day year e.g., 12 31 1994)

Tmad Library Options:

0) Done

1) Add data to library

2) Delete data from library

3) Modify weights

4) List data in library

5) Modify anomaly limits

Enter Selection

Enter name of ascii data file

performing curve fits

1	4.500000	8.697145	
curve coeffs	1973.671	142.7267	-0.7446465
chisqr	17.39429	goodness of fit	4.9927421E-02
2	4.500000	8.975016	
curve coeffs	1722.245	127.2971	-0.6479363
chisqr	17.95003	goodness of fit	4.0536571E-02
3	4.500000	12.24054	
curve coeffs	1502.529	111.4106	-0.5546799
chisqr	24.48108	goodness of fit	3.1152735E-03
4	2.500000	1.927215	
curve coeffs	1100.458	91.05537	-0.5245006
chisqr	3.854429	goodness of fit	0.3598059
5	2.500000	4.935699	
curve coeffs	705.9474	57.63894	-0.3701296
chisqr	9.871397	goodness of fit	1.7451176E-02
6	2.500000	2.123147	
curve coeffs	522.4927	41.23520	-0.2651765
chisqr	4.246294	goodness of fit	0.3229825
7	2.500000	26.16350	
curve coeffs	268.3979	36.96603	-0.3460282
chisqr	52.32700	goodness of fit	2.2607747E-11
8	2.500000	8.636863	
curve coeffs	204.2708	22.72767	-0.1817234
chisqr	17.27373	goodness of fit	5.5015925E-04
9	2.500000	3.390196	
curve coeffs	143.9996	17.18316	-0.1759546
chisqr	6.780392	goodness of fit	7.0221767E-02

Library file title:

TMAD test library

New data file title:

tmad test benchmark data, detector type 1, anomaly type 1

Enter name of new detector type

Enter source decay constant (in 1/days) for
the probe associated with this detector

Enter name of new anomaly type

Enter minimum possible size for this anomaly type

Enter maximum possible size for this anomaly type

Tmad Library Options:

0) Done

1) Add data to library

2) Delete data from library

3) Modify weights

4) List data in library

5) Modify anomaly limits
Enter Selection

Enter name of ascii data file
performing curve fits

1	5.500000	9.669903	
curve coeffs	743.6662	0.8491058	1.2771249E-02
chisqr	19.33981	goodness of fit	0.2611756
2	4.500000	10.27325	
curve coeffs	728.4354	5.559273	-1.3604581E-02
chisqr	20.54650	goodness of fit	1.4963926E-02
3	4.500000	16.41563	
curve coeffs	713.8271	10.71754	-3.9502859E-02
chisqr	32.83126	goodness of fit	9.4592440E-05
4	2.500000	2.197590	
curve coeffs	630.0006	22.78980	-0.1852847
chisqr	4.395179	goodness of fit	0.3103673
5	2.500000	15.41223	
curve coeffs	449.0601	25.51102	-0.1992582
chisqr	30.82447	goodness of fit	8.2024661E-07
6	2.500000	18.20164	
curve coeffs	373.2483	22.10475	-0.1686773
chisqr	36.40327	goodness of fit	5.4532819E-08
7	2.500000	13.84481	
curve coeffs	269.3567	18.61469	-0.1527423
chisqr	27.68963	goodness of fit	3.7396326E-06
8	2.500000	6.387063	
curve coeffs	170.2681	16.01680	-0.1400906
chisqr	12.77413	goodness of fit	4.5653321E-03
9	2.500000	7.128988	
curve coeffs	120.0488	12.74599	-0.1193123
chisqr	14.25798	goodness of fit	2.2813494E-03

Library file title:
TMAD test library
New data file title:
tmad test benchmark data, detector type 2, anomaly type 1

Select appropriate detector type for this file

- 1) detector type 1
- 2) New

Enter name of new detector type
Enter source decay constant (in 1/days) for
the probe associated with this detector

Select appropriate anomaly type for this file

- 1) anomaly type 1
- 2) New

Tmad Library Options:

- 0) Done
 - 1) Add data to library
 - 2) Delete data from library
 - 3) Modify weights
 - 4) List data in library
 - 5) Modify anomaly limits
- Enter Selection

Enter name of ascii data file
performing curve fits

1	4.500000	200.1590	
curve coeffs	728.3990	-10.15358	6.2747478E-02
chisqr	400.3179	goodness of fit	0.0000000E+00
2	4.500000	197.4861	
curve coeffs	723.3379	-9.288458	5.6607395E-02
chisqr	394.9721	goodness of fit	0.0000000E+00
3	4.500000	190.6980	
curve coeffs	685.0629	-8.019943	4.7901988E-02
chisqr	381.3959	goodness of fit	0.0000000E+00
4	3.500000	59.90266	
curve coeffs	621.6940	-6.464973	3.6785752E-02
chisqr	119.8053	goodness of fit	4.5878040E-24
5	2.500000	8.283772	

```

curve coeffs  483.6917      -6.962048      7.3905110E-02
chisqr  16.56754      goodness of fit  7.6857838E-04
        6  2.500000      3.045160
curve coeffs  403.2483      -5.102901      4.6771467E-02
chisqr  6.090320      goodness of fit  9.5090106E-02
        7  2.500000      3.388238
curve coeffs  302.5447      -3.179256      2.8565913E-02
chisqr  6.776477      goodness of fit  7.0343331E-02
        8  3.500000      14.05707
curve coeffs  211.0497      -1.125870      3.5385787E-03
chisqr  28.11414      goodness of fit  4.5962704E-05
        9  2.500000      3.530562
curve coeffs  162.1263      -0.6054459      -2.6395917E-04
chisqr  7.061124      goodness of fit  6.2013604E-02

```

Library file title:
 TMAD test library
 New data file title:
 tmad test benchmark data, detector type 3, anomaly type 1

Select appropriate detector type for this file

- 1) detector type 1
- 2) detector type 2
- 3) New

Enter name of new detector type
 Enter source decay constant (in 1/days) for
 the probe associated with this detector

Select appropriate anomaly type for this file

- 1) anomaly type 1
- 2) New

Tmad Library Options:

- 0) Done
 - 1) Add data to library
 - 2) Delete data from library
 - 3) Modify weights
 - 4) List data in library
 - 5) Modify anomaly limits
- Enter Selection

Enter name of ascii data file
 performing curve fits

```

        1  1.500000      3.8664896E-12
curve coeffs  1.3828278E-05  624.9998      -1250.000
chisqr  7.7329792E-12 goodness of fit  1.000000
        2  1.500000      4.6496836E-15
curve coeffs  8.3819032E-07  49.99999      2.4795532E-05
chisqr  9.2993672E-15 goodness of fit  1.000000

```

Library file title:
 TMAD test library
 New data file title:
 tmad test benchmark data, detector type 1, anomaly type 2

Select appropriate detector type for this file

- 1) detector type 1
- 2) detector type 2
- 3) detector type 3
- 4) New

Select appropriate anomaly type for this file

- 1) anomaly type 1
- 2) New

Enter name of new anomaly type
 Enter minimum possible size for this anomaly type
 Enter maximum possible size for this anomaly type

Tmad Library Options:

- 0) Done
- 1) Add data to library
- 2) Delete data from library

3) Modify weights
 4) List data in library
 5) Modify anomaly limits
 Enter Selection

Enter name of ascii data file
 performing curve fits

	1	1.500000	3.8664896E-12	
curve coeffs		1.3828278E-05	624.9998	-1250.000
chisqr		7.7329792E-12	goodness of fit	1.000000
	2	1.500000	4.6496836E-15	
curve coeffs		8.3819032E-07	49.99999	2.4795532E-05
chisqr		9.2993672E-15	goodness of fit	1.000000

Library file title:
 TMAD test library
 New data file title:
 tmad test benchmark data, detector type 2, anomaly type 2

Select appropriate detector type for this file

- 1) detector type 1
- 2) detector type 2
- 3) detector type 3
- 4) New

Select appropriate anomaly type for this file

- 1) anomaly type 1
- 2) anomaly type 2
- 3) New

Tmad Library Options:

- 0) Done
- 1) Add data to library
- 2) Delete data from library
- 3) Modify weights
- 4) List data in library
- 5) Modify anomaly limits

Enter Selection

Enter name of ascii data file
 performing curve fits

	1	1.500000	3.8664896E-12	
curve coeffs		1.3828278E-05	624.9998	-1250.000
chisqr		7.7329792E-12	goodness of fit	1.000000
	2	1.500000	4.6496836E-15	
curve coeffs		8.3819032E-07	49.99999	2.4795532E-05
chisqr		9.2993672E-15	goodness of fit	1.000000

Library file title:
 TMAD test library
 New data file title:
 tmad test benchmark data, detector type 3, anomaly type 2

Select appropriate detector type for this file

- 1) detector type 1
- 2) detector type 2
- 3) detector type 3
- 4) New

Select appropriate anomaly type for this file

- 1) anomaly type 1
- 2) anomaly type 2
- 3) New

Tmad Library Options:

- 0) Done
- 1) Add data to library
- 2) Delete data from library
- 3) Modify weights
- 4) List data in library
- 5) Modify anomaly limits

Enter Selection

C.2 File tmadtest2.out

LIBMAKR v1.0 9/9/95

enter name of library file

library file title:

TMAD test library

effective source date 1 1 1995

Tmad Library Options:

- 0) Done
 - 1) Add data to library
 - 2) Delete data from library
 - 3) Modify weights
 - 4) List data in library
 - 5) Modify anomaly limits
- Enter Selection

Select anomaly/detector combination to delete

Possible Detector Types:

- 0) All
 - 1) detector type 1
 - 2) detector type 2
 - 3) detector type 3
- Enter Selection:

Possible Anomaly Types:

- 0) All
 - 1) anomaly type 1
 - 2) anomaly type 2
- Enter Selection:

Tmad Library Options:

- 0) Done
 - 1) Add data to library
 - 2) Delete data from library
 - 3) Modify weights
 - 4) List data in library
 - 5) Modify anomaly limits
- Enter Selection

C.3 File tmadtest3.out

LIBMAKR v1.0 9/9/95

enter name of library file

library file title:

TMAD test library

effective source date 1 1 1995

Tmad Library Options:

- 0) Done
 - 1) Add data to library
 - 2) Delete data from library
 - 3) Modify weights
 - 4) List data in library
 - 5) Modify anomaly limits
- Enter Selection

Enter name of ascii data file

performing curve fits

1	5.500000	9.669903	
curve coeffs	743.6662	0.8491058	1.2771249E-02
chisqr	19.33981	goodness of fit	0.2611756
2	4.500000	10.27325	
curve coeffs	728.4354	5.559273	-1.3604581E-02
chisqr	20.54650	goodness of fit	1.4963926E-02
3	4.500000	16.41563	
curve coeffs	713.8271	10.71754	-3.9502859E-02
chisqr	32.83126	goodness of fit	9.4592440E-05
4	2.500000	2.197590	
curve coeffs	630.0006	22.78980	-0.1852847
chisqr	4.395179	goodness of fit	0.3103673
5	2.500000	15.41223	
curve coeffs	449.0601	25.51102	-0.1992582
chisqr	30.82447	goodness of fit	8.2024661E-07
6	2.500000	18.20164	
curve coeffs	373.2483	22.10475	-0.1686773

```

chisqr    36.40327    goodness of fit    5.4532819E-08
           7    2.500000    13.84481
curve coeffs    269.3567    18.61469    -0.1527423
chisqr    27.68963    goodness of fit    3.7396326E-06
           8    2.500000    6.387063
curve coeffs    170.2681    16.01680    -0.1400906
chisqr    12.77413    goodness of fit    4.5653321E-03
           9    2.500000    7.128988
curve coeffs    120.0488    12.74599    -0.1193123
chisqr    14.25798    goodness of fit    2.2813494E-03

```

Library file title:

TMAD test library

New data file title:

tmad test benchmark data, detector type 2, anomaly type 1

Select appropriate detector type for this file

- 1) detector type 1
- 2) detector type 2
- 3) detector type 3
- 4) New

Select appropriate anomaly type for this file

- 1) anomaly type 1
- 2) anomaly type 2
- 3) New

Tmad Library Options:

- 0) Done
 - 1) Add data to library
 - 2) Delete data from library
 - 3) Modify weights
 - 4) List data in library
 - 5) Modify anomaly limits
- Enter Selection

C.4 File tmadtest4.out

LIBMAKR v1.0 9/9/95

enter name of library file

library file title:

TMAD test library

effective source date 1 1 1995

Tmad Library Options:

- 0) Done
 - 1) Add data to library
 - 2) Delete data from library
 - 3) Modify weights
 - 4) List data in library
 - 5) Modify anomaly limits
- Enter Selection

Select anomaly type to apply new limit to

Possible Anomaly Types:

- 1) anomaly type 1
- 2) anomaly type 2

Enter Selection:

current minimum size: 0.0000000E+00

enter new minimum size:

current maximum size: 50.00000

enter new maximum size:

Tmad Library Options:

- 0) Done
 - 1) Add data to library
 - 2) Delete data from library
 - 3) Modify weights
 - 4) List data in library
 - 5) Modify anomaly limits
- Enter Selection

C.5 File tmadtest5.out

LIBMAKR v1.0 9/9/95

enter name of library file

library file title:

TMAD test library

effective source date 1 1 1995

Tmad Library Options:

0) Done

1) Add data to library

2) Delete data from library

3) Modify weights

4) List data in library

5) Modify anomaly limits

Enter Selection

enter new weight value

Select anomaly/detector combination to apply new weight to

Possible Detector Types:

0) All

1) detector type 1

2) detector type 2

3) detector type 3

Enter Selection:

Possible Anomaly Types:

0) All

1) anomaly type 1

2) anomaly type 2

Enter Selection:

TMAD test library

applying new weights to the following:

tmad test benchmark data, detector type 2, anomaly type 1

Tmad Library Options:

0) Done

1) Add data to library

2) Delete data from library

3) Modify weights

4) List data in library

5) Modify anomaly limits

Enter Selection

C.6 File tmadtest6.out

LIBMAKR v1.0 9/9/95

enter name of library file

library file title:

TMAD test library

effective source date 1 1 1995

Tmad Library Options:

0) Done

1) Add data to library

2) Delete data from library

3) Modify weights

4) List data in library

5) Modify anomaly limits

Enter Selection

Select anomaly/detector combination to list

Possible Detector Types:

0) All

1) detector type 1

2) detector type 2

3) detector type 3

Enter Selection:

Possible Anomaly Types:

0) All

1) anomaly type 1

2) anomaly type 2

Enter Selection:

Library title: TMAD test library

data title: tmad test benchmark data, detector type 1, anomaly type 1

detector type: detector type 1

anomaly type: anomaly type 1

weight = 1.0000

decay constant = 0.0007

anomaly size = 0.0000

(min size= 0.0000E+00 max size= 50.00)

curve fit coeffs: 1973.670 142.7270 -0.7446470

chisqr: 17.39430 goodness of fit 4.9927399E-02

moisture	counts	sigma
0.00	1947.	20.
10.00	3363.	25.
20.00	4571.	33.
30.00	5596.	50.
40.00	6474.	49.
50.00	7241.	64.
70.00	8143.	77.
80.00	8473.	80.
100.00	8907.	61.

anomaly size = 1.0000

(min size= 0.0000E+00 max size= 50.00)

curve fit coeffs: 1722.250 127.2970 -0.6479360

chisqr: 17.95000 goodness of fit 4.0536601E-02

moisture	counts	sigma
0.00	1701.	18.
10.00	2981.	28.
20.00	4050.	30.
30.00	4944.	36.
40.00	5683.	51.
50.00	6526.	54.
70.00	7362.	74.
80.00	7632.	77.
100.00	8076.	69.

anomaly size = 2.0000

(min size= 0.0000E+00 max size= 50.00)

curve fit coeffs: 1502.530 111.4110 -0.5546800

chisqr: 24.48110 goodness of fit 3.1152701E-03

moisture	counts	sigma
0.00	1478.	16.
10.00	2602.	20.
20.00	3532.	33.
30.00	4359.	41.
40.00	5066.	38.
50.00	5701.	44.
70.00	6492.	53.
80.00	6711.	54.
100.00	7230.	54.

anomaly size = 4.0000

(min size= 0.0000E+00 max size= 50.00)

curve fit coeffs: 1100.460 91.05540 -0.5245010

chisqr: 3.854430 goodness of fit 0.3598060

moisture	counts	sigma
0.00	1095.	14.
10.00	1973.	19.
20.00	2729.	23.
30.00	3320.	26.
50.00	4355.	30.

anomaly size = 8.0000

(min size= 0.0000E+00 max size= 50.00)

curve fit coeffs: 705.9470 57.63890 -0.3701300

chisqr: 9.871400 goodness of fit 1.7451201E-02

moisture	counts	sigma
0.00	695.	12.
10.00	1286.	16.
20.00	1695.	19.
30.00	2077.	20.

```

50.00    2677.    25.
anomaly size = 11.0000
(min size= 0.0000E+00 max size= 50.00 )
curve fit coeffs: 522.4930    41.23520    -0.2651770
chisqr: 4.246290    goodness of fit 0.3229830
moisture    counts    sigma
0.00    521.    7.
10.00    921.    17.
20.00    1260.    23.
30.00    1477.    26.
50.00    1929.    22.
anomaly size = 15.0000
(min size= 0.0000E+00 max size= 50.00 )
curve fit coeffs: 268.3980    36.96600    -0.3460280
chisqr: 52.32700    goodness of fit 2.2607700E-11
moisture    counts    sigma
0.00    261.    5.
10.00    655.    9.
20.00    843.    11.
30.00    1031.    13.
50.00    1304.    25.
anomaly size = 20.0000
(min size= 0.0000E+00 max size= 50.00 )
curve fit coeffs: 204.2710    22.72770    -0.1817230
chisqr: 17.27370    goodness of fit 5.5015902E-04
moisture    counts    sigma
0.00    200.    5.
10.00    443.    9.
20.00    574.    10.
30.00    695.    15.
50.00    904.    19.
anomaly size = 25.0000
(min size= 0.0000E+00 max size= 50.00 )
curve fit coeffs: 144.0000    17.18320    -0.1759550
chisqr: 6.780390    goodness of fit 7.0221797E-02
moisture    counts    sigma
0.00    141.    5.
10.00    309.    7.
20.00    419.    11.
30.00    478.    12.
50.00    570.    12.

```

data title: tmad test benchmark data, detector type 1, anomaly type 2

detector type: detector type 1

anomaly type: anomaly type 2

weight = 1.0000

decay constant = 0.0007

anomaly size = 0.0000

(min size= 0.0000E+00 max size= 100.0)

curve fit coeffs: 1.3828300E-05 625.0000 -1250.000

chisqr: 7.7329801E-12 goodness of fit 1.000000

```

moisture    counts    sigma
0.00    0.    10.
0.10    50.    10.
0.20    75.    10.

```

anomaly size = 0.1000

(min size= 0.0000E+00 max size= 100.0)

curve fit coeffs: 8.3818998E-07 50.00000 2.4795499E-05

chisqr: 9.2993697E-15 goodness of fit 1.000000

```

moisture    counts    sigma
0.00    0.    10.
0.10    5.    10.
0.20    10.    10.

```

data title: tmad test benchmark data, detector type 2, anomaly type 1

detector type: detector type 2

anomaly type: anomaly type 1

weight = 1.0000

decay constant = 0.0007

anomaly size = 0.0000

(min size= 0.0000E+00 max size= 50.00)

```

curve fit coefs: 743.6660 0.8491060 1.2771200E-02
chisqr: 19.33980 goodness of fit 0.2611760
moisture counts sigma
0.00 730. 8.
10.00 769. 10.
20.00 803. 12.
30.00 766. 15.
40.00 782. 15.
50.00 797. 18.
60.00 833. 20.
70.00 861. 21.
80.00 889. 18.
90.00 927. 28.
100.00 973. 21.
anomaly size = 1.0000
(min size= 0.0000E+00 max size= 50.00 )
curve fit coefs: 728.4350 5.559270 -1.3604600E-02
chisqr: 20.54650 goodness of fit 1.4963900E-02
moisture counts sigma
0.00 716. 8.
10.00 803. 12.
20.00 868. 14.
30.00 895. 13.
40.00 898. 18.
50.00 940. 16.
70.00 1060. 20.
80.00 1074. 19.
100.00 1169. 22.
anomaly size = 2.0000
(min size= 0.0000E+00 max size= 50.00 )
curve fit coefs: 713.8270 10.71750 -3.9502900E-02
chisqr: 32.83130 goodness of fit 9.4592397E-05
moisture counts sigma
0.00 693. 9.
10.00 836. 10.
20.00 959. 16.
30.00 1017. 15.
40.00 1080. 19.
50.00 1106. 16.
70.00 1244. 23.
80.00 1286. 25.
100.00 1428. 21.
anomaly size = 4.0000
(min size= 0.0000E+00 max size= 50.00 )
curve fit coefs: 630.0010 22.78980 -0.1852850
chisqr: 4.395180 goodness of fit 0.3103670
moisture counts sigma
0.00 624. 10.
10.00 863. 14.
20.00 1008. 13.
30.00 1130. 17.
50.00 1312. 17.
anomaly size = 8.0000
(min size= 0.0000E+00 max size= 50.00 )
curve fit coefs: 449.0600 25.51100 -0.1992580
chisqr: 30.82450 goodness of fit 8.2024701E-07
moisture counts sigma
0.00 439. 6.
10.00 713. 7.
20.00 866. 9.
30.00 1008. 11.
50.00 1260. 20.
anomaly size = 11.0000
(min size= 0.0000E+00 max size= 50.00 )
curve fit coefs: 373.2480 22.10480 -0.1686770
chisqr: 36.40330 goodness of fit 5.4532801E-08
moisture counts sigma
0.00 365. 5.
10.00 608. 7.
20.00 747. 8.
30.00 852. 9.
50.00 1069. 10.
anomaly size = 15.0000

```

```
(min size= 0.0000E+00 max size= 50.00 )
curve fit coeffs: 269.3570 18.61470 -0.1527420
chisqr: 27.68960 goodness of fit 3.7396301E-06
moisture counts sigma
0.00 261. 5.
10.00 466. 6.
20.00 572. 6.
30.00 675. 8.
50.00 826. 9.
anomaly size = 20.0000
(min size= 0.0000E+00 max size= 50.00 )
curve fit coeffs: 170.2680 16.01680 -0.1400910
chisqr: 12.77410 goodness of fit 4.5653302E-03
moisture counts sigma
0.00 167. 4.
10.00 329. 6.
20.00 439. 7.
30.00 504. 8.
50.00 628. 9.
anomaly size = 25.0000
(min size= 0.0000E+00 max size= 50.00 )
curve fit coeffs: 120.0490 12.74600 -0.1193120
chisqr: 14.25800 goodness of fit 2.2813501E-03
moisture counts sigma
0.00 117. 3.
10.00 247. 4.
20.00 322. 5.
30.00 382. 7.
50.00 464. 7.
```

```
data title: tmad test benchmark data, detector type 2, anomaly type 2
detector type: detector type 2
anomaly type: anomaly type 2
weight = 1.0000
decay constant = 0.0007
anomaly size = 0.0000
(min size= 0.0000E+00 max size= 100.0 )
curve fit coeffs: 1.3828300E-05 625.0000 -1250.000
chisqr: 7.7329801E-12 goodness of fit 1.000000
moisture counts sigma
0.00 0. 10.
0.10 50. 10.
0.20 75. 10.
anomaly size = 0.1000
(min size= 0.0000E+00 max size= 100.0 )
curve fit coeffs: 8.3818998E-07 50.00000 2.4795499E-05
chisqr: 9.2993697E-15 goodness of fit 1.000000
moisture counts sigma
0.00 0. 10.
0.10 5. 10.
0.20 10. 10.
```

```
data title: tmad test benchmark data, detector type 3, anomaly type 1
detector type: detector type 3
anomaly type: anomaly type 1
weight = 1.0000
decay constant = 0.0007
anomaly size = 0.0000
(min size= 0.0000E+00 max size= 50.00 )
curve fit coeffs: 728.3990 -10.15360 6.2747501E-02
chisqr: 400.3180 goodness of fit 0.0000000E+00
moisture counts sigma
0.00 806. 6.
10.00 614. 5.
20.00 515. 5.
30.00 453. 5.
40.00 413. 3.
50.00 377. 3.
70.00 351. 3.
80.00 337. 4.
100.00 324. 3.
```

```

anomaly size = 1.0000
(min size= 0.0000E+00 max size= 50.00 )
curve fit coeffs: 723.3380 -9.288460 5.6607399E-02
chisqr: 394.9720 goodness of fit 0.0000000E+00
moisture counts sigma
0.00 786. 5.
10.00 603. 5.
20.00 526. 5.
30.00 470. 4.
40.00 434. 5.
50.00 409. 4.
70.00 374. 4.
80.00 360. 3.
100.00 344. 3.

anomaly size = 2.0000
(min size= 0.0000E+00 max size= 50.00 )
curve fit coeffs: 685.0630 -8.019940 4.7901999E-02
chisqr: 381.3960 goodness of fit 0.0000000E+00
moisture counts sigma
0.00 748. 5.
10.00 584. 5.
20.00 511. 4.
30.00 467. 4.
40.00 434. 4.
50.00 418. 4.
70.00 379. 4.
80.00 367. 3.
100.00 346. 3.

anomaly size = 4.0000
(min size= 0.0000E+00 max size= 50.00 )
curve fit coeffs: 621.6940 -6.464970 3.6785800E-02
chisqr: 119.8050 goodness of fit 4.5878001E-24
moisture counts sigma
0.00 652. 5.
10.00 536. 6.
20.00 476. 6.
30.00 441. 5.
50.00 405. 4.
70.00 360. 4.
100.00 336. 4.

anomaly size = 8.0000
(min size= 0.0000E+00 max size= 50.00 )
curve fit coeffs: 483.6920 -6.962050 7.3905103E-02
chisqr: 16.56750 goodness of fit 7.6857797E-04
moisture counts sigma
0.00 494. 5.
10.00 416. 3.
20.00 370. 3.
30.00 349. 3.
50.00 317. 4.

anomaly size = 11.0000
(min size= 0.0000E+00 max size= 50.00 )
curve fit coeffs: 403.2480 -5.102900 4.6771500E-02
chisqr: 6.090320 goodness of fit 9.5090099E-02
moisture counts sigma
0.00 405. 3.
10.00 353. 4.
20.00 317. 3.
30.00 300. 4.
50.00 264. 3.

anomaly size = 15.0000
(min size= 0.0000E+00 max size= 50.00 )
curve fit coeffs: 302.5450 -3.179260 2.8565900E-02
chisqr: 6.776480 goodness of fit 7.0343301E-02
moisture counts sigma
0.00 300. 3.
10.00 277. 2.
20.00 247. 2.
30.00 234. 2.
50.00 215. 3.

anomaly size = 20.0000
(min size= 0.0000E+00 max size= 50.00 )
curve fit coeffs: 211.0500 -1.125870 3.5385799E-03

```



```

chisqr: 28.11410      goodness of fit 4.5962701E-05
moisture counts sigma
  0.00    206.    2.
  5.00    214.    3.
 10.00    207.    3.
 15.00    200.    3.
 20.00    189.    2.
 30.00    176.    2.
 50.00    165.    2.
anomaly size = 25.0000
(min size= 0.0000E+00 max size= 50.00 )
curve fit coefs: 162.1260 -0.6054460 -2.6395899E-04
chisqr: 7.061120      goodness of fit 6.2013600E-02
moisture counts sigma
  0.00    160.    2.
 10.00    160.    2.
 20.00    150.    2.
 30.00    141.    2.
 50.00    132.    2.

```

```

data title: tmad test benchmark data, detector type 3, anomaly type 2
detector type: detector type 3
anomaly type: anomaly type 2
weight = 1.0000
decay constant = 0.0007
anomaly size = 0.0000
(min size= 0.0000E+00 max size= 100.0 )
curve fit coefs: 1.3828300E-05 625.0000 -1250.000
chisqr: 7.7329801E-12 goodness of fit 1.000000
moisture counts sigma
  0.00    0.    10.
  0.10    50.    10.
  0.20    75.    10.
anomaly size = 0.1000
(min size= 0.0000E+00 max size= 100.0 )
curve fit coefs: 8.3818998E-07 50.00000 2.4795499E-05
chisqr: 9.2993697E-15 goodness of fit 1.000000
moisture counts sigma
  0.00    0.    10.
  0.10    5.    10.
  0.20   10.    10.

```

Tmad Library Options:

```

0) Done
1) Add data to library
2) Delete data from library
3) Modify weights
4) List data in library
5) Modify anomaly limits
Enter Selection

```

C.7 File tmadtest7.out

TMAD v1.0 9/9/95

```

enter name of library file
library file title:
TMAD test library
effective source date      1      1      1995

```

Tmad Options:

```

0) Done
1) Select scan data to analyze
2) Analyse scan data
Enter Selection

```

Tmad Scan Data Options:

```

0) Return to previous menu
1) Select a scan
2) Un-select a scan
3) Change scan detector type

```

4) List selected scan data
Enter Selection

No scans currently selected

Enter name of ascii file containing scan data
scan title:
tmd test tank scan, detector type 1

Possible Detector Types:
1) detector type 1
2) detector type 2
3) detector type 3
Enter Selection:

Tmd Scan Data Options:
0) Return to previous menu
1) Select a scan
2) Un-select a scan
3) Change scan detector type
4) List selected scan data
Enter Selection

Currently selected scans:

1) tmdtest.d1.scan set to type= detector type 1
tmd test tank scan, detector type 1

Enter name of ascii file containing scan data
scan title:
tmd test tank scan, detector type 2

Possible Detector Types:
1) detector type 1
2) detector type 2
3) detector type 3
Enter Selection:

Tmd Scan Data Options:
0) Return to previous menu
1) Select a scan
2) Un-select a scan
3) Change scan detector type
4) List selected scan data
Enter Selection

Currently selected scans:

1) tmdtest.d1.scan set to type= detector type 1
tmd test tank scan, detector type 1
2) tmdtest.d2.scan set to type= detector type 2
tmd test tank scan, detector type 2

Enter name of ascii file containing scan data
scan title:
tmd test tank scan, detector type 3

Possible Detector Types:
1) detector type 1
2) detector type 2
3) detector type 3
Enter Selection:

Tmd Scan Data Options:
0) Return to previous menu
1) Select a scan
2) Un-select a scan
3) Change scan detector type
4) List selected scan data
Enter Selection

Currently selected scans:

- 1) tmadtest.d1.scan set to type= detector type 1
tmad test tank scan, detector type 1
- 2) tmadtest.d2.scan set to type= detector type 2
tmad test tank scan, detector type 2
- 3) tmadtest.d3.scan set to type= detector type 3
tmad test tank scan, detector type 3

Enter number of scan to list (or 0 to return to previous menu):

tmad test tank scan, detector type 1
read from file: tmadtest.d1.scan
detector type: detector type 1

depth	detector response
9.01	1.500000E+01
10.01	2.300000E+02
11.00	1.589000E+03
12.01	1.162000E+03
13.01	5.797000E+03
14.10	6.879000E+03

Tmad Scan Data Options:

- 0) Return to previous menu
 - 1) Select a scan
 - 2) Un-select a scan
 - 3) Change scan detector type
 - 4) List selected scan data
- Enter Selection

Currently selected scans:

- 1) tmadtest.d1.scan set to type= detector type 1
tmad test tank scan, detector type 1
- 2) tmadtest.d2.scan set to type= detector type 2
tmad test tank scan, detector type 2
- 3) tmadtest.d3.scan set to type= detector type 3
tmad test tank scan, detector type 3

Enter number of scan to list (or 0 to return to previous menu):

tmad test tank scan, detector type 2
read from file: tmadtest.d2.scan
detector type: detector type 2

depth	detector response
9.01	9.000000E+00
10.01	1.930000E+02
11.00	8.980000E+02
12.01	8.000000E+02
13.01	9.110000E+02
14.01	9.650000E+02

Tmad Scan Data Options:

- 0) Return to previous menu
 - 1) Select a scan
 - 2) Un-select a scan
 - 3) Change scan detector type
 - 4) List selected scan data
- Enter Selection

Currently selected scans:

- 1) tmadtest.d1.scan set to type= detector type 1
tmad test tank scan, detector type 1
- 2) tmadtest.d2.scan set to type= detector type 2
tmad test tank scan, detector type 2
- 3) tmadtest.d3.scan set to type= detector type 3
tmad test tank scan, detector type 3

Enter number of scan to list (or 0 to return to previous menu):

tmd test tank scan, detector type 3
 read from file: tmdtest.d3.scan
 detector type: detector type 3

depth	detector response
9.01	2.400000E+01
10.00	9.400000E+01
11.01	4.270000E+02
12.01	3.250000E+02
13.00	5.130000E+02
14.01	5.210000E+02

Tmd Scan Data Options:
 0) Return to previous menu
 1) Select a scan
 2) Un-select a scan
 3) Change scan detector type
 4) List selected scan data
 Enter Selection

Tmd Options:
 0) Done
 1) Select scan data to analyze
 2) Analyse scan data
 Enter Selection

C.8 File tmdtest8.out

TMAD v1.0 9/9/95

enter name of library file
 library file title:
 TMAD test library
 effective source date 1 1 1995

Tmd Options:
 0) Done
 1) Select scan data to analyze
 2) Analyse scan data
 Enter Selection

Tmd Scan Data Options:
 0) Return to previous menu
 1) Select a scan
 2) Un-select a scan
 3) Change scan detector type
 4) List selected scan data
 Enter Selection

No scans currently selected

Enter name of ascii file containing scan data
 scan title:
 tmd test tank scan, detector type 1

Possible Detector Types:
 1) detector type 1
 2) detector type 2
 3) detector type 3
 Enter Selection:

Tmd Scan Data Options:
 0) Return to previous menu
 1) Select a scan
 2) Un-select a scan
 3) Change scan detector type
 4) List selected scan data
 Enter Selection

Currently selected scans:

1) tmdtest.d1.scan set to type= detector type 1

tmad test tank scan, detector type 1

Enter name of ascii file containing scan data
scan title:

tmad test tank scan, detector type 2

Possible Detector Types:

- 1) detector type 1
- 2) detector type 2
- 3) detector type 3

Enter Selection:

Tmad Scan Data Options:

- 0) Return to previous menu
- 1) Select a scan
- 2) Un-select a scan
- 3) Change scan detector type
- 4) List selected scan data

Enter Selection

Currently selected scans:

- 1) tmadtest.d1.scan set to type= detector type 1
 tmad test tank scan, detector type 1
- 2) tmadtest.d2.scan set to type= detector type 2
 tmad test tank scan, detector type 2

Enter name of ascii file containing scan data
scan title:

tmad test tank scan, detector type 3

Possible Detector Types:

- 1) detector type 1
- 2) detector type 2
- 3) detector type 3

Enter Selection:

Tmad Scan Data Options:

- 0) Return to previous menu
- 1) Select a scan
- 2) Un-select a scan
- 3) Change scan detector type
- 4) List selected scan data

Enter Selection

Currently selected scans:

- 1) tmdtest.d1.scan set to type= detector type 1
tmd test tank scan, detector type 1
- 2) tmdtest.d2.scan set to type= detector type 2
tmd test tank scan, detector type 2
- 3) tmdtest.d3.scan set to type= detector type 3
tmd test tank scan, detector type 3

Enter number of scan to un-select (or 0 for no change):

Scan 2 un-selected

Tmd Scan Data Options:

- 0) Return to previous menu
 - 1) Select a scan
 - 2) Un-select a scan
 - 3) Change scan detector type
 - 4) List selected scan data
- Enter Selection

Currently selected scans:

- 1) tmdtest.d1.scan set to type= detector type 1
tmd test tank scan, detector type 1
- 2) tmdtest.d3.scan set to type= detector type 3
tmd test tank scan, detector type 3

Enter number of scan to list (or 0 to return to previous menu):

tmd test tank scan, detector type 1

read from file: tmdtest.d1.scan

detector type: detector type 1

depth	detector response
9.01	1.500000E+01
10.01	2.300000E+02
11.00	1.589000E+03
12.01	1.162000E+03
13.01	5.797000E+03
14.10	6.879000E+03

Tmd Scan Data Options:

- 0) Return to previous menu
 - 1) Select a scan
 - 2) Un-select a scan
 - 3) Change scan detector type
 - 4) List selected scan data
- Enter Selection

Currently selected scans:

- 1) tmdtest.d1.scan set to type= detector type 1
tmd test tank scan, detector type 1
- 2) tmdtest.d3.scan set to type= detector type 3
tmd test tank scan, detector type 3

Enter number of scan to list (or 0 to return to previous menu):

tmd test tank scan, detector type 3

read from file: tmdtest.d3.scan

detector type: detector type 3

depth	detector response
9.01	2.400000E+01
10.00	9.400000E+01
11.01	4.270000E+02
12.01	3.250000E+02
13.00	5.130000E+02
14.01	5.210000E+02

Tmd Scan Data Options:

- 0) Return to previous menu
- 1) Select a scan
- 2) Un-select a scan

3) Change scan detector type
 4) List selected scan data
 Enter Selection

Tmad Options:
 0) Done
 1) Select scan data to analyze
 2) Analyse scan data
 Enter Selection

C.9 File tmadtest9.out

TMAD v1.0 9/9/95

enter name of library file
 library file title:
 TMAD test library
 effective source date 1 1 1995

Tmad Options:
 0) Done
 1) Select scan data to analyze
 2) Analyse scan data
 Enter Selection

Tmad Scan Data Options:
 0) Return to previous menu
 1) Select a scan
 2) Un-select a scan
 3) Change scan detector type
 4) List selected scan data
 Enter Selection

No scans currently selected

Enter name of ascii file containing scan data
 scan title:
 tmad test tank scan, detector type 1

Possible Detector Types:
 1) detector type 1
 2) detector type 2
 3) detector type 3
 Enter Selection:

Tmad Scan Data Options:
 0) Return to previous menu
 1) Select a scan
 2) Un-select a scan
 3) Change scan detector type
 4) List selected scan data
 Enter Selection

Currently selected scans:

1) tmadtest.d1.scan set to type= detector type 1
 tmad test tank scan, detector type 1

Enter name of ascii file containing scan data
 scan title:
 tmad test tank scan, detector type 2

Possible Detector Types:
 1) detector type 1
 2) detector type 2
 3) detector type 3
 Enter Selection:

Tmad Scan Data Options:
 0) Return to previous menu
 1) Select a scan

2) Un-select a scan
 3) Change scan detector type
 4) List selected scan data
 Enter Selection

Currently selected scans:

1) tmadtest.d1.scan set to type= detector type 1
 tmad test tank scan, detector type 1
 2) tmadtest.d2.scan set to type= detector type 3
 tmad test tank scan, detector type 2

Enter number of scan to change detector type (or 0 for no change):

Current detector type set to: detector type 3

Enter number of desired detector type (or 0 for no change):

Possible Detector Types:

1) detector type 1
 2) detector type 2
 3) detector type 3

Enter Selection:

Scan 2 changed to detector type 2

Tmad Scan Data Options:

0) Return to previous menu
 1) Select a scan
 2) Un-select a scan
 3) Change scan detector type
 4) List selected scan data
 Enter Selection

Currently selected scans:

1) tmadtest.d1.scan set to type= detector type 1
 tmad test tank scan, detector type 1
 2) tmadtest.d2.scan set to type= detector type 2
 tmad test tank scan, detector type 2

Enter name of ascii file containing scan data
 scan title:

tmad test tank scan, detector type 3

Possible Detector Types:

1) detector type 1
 2) detector type 2
 3) detector type 3

Enter Selection:

Tmad Scan Data Options:

0) Return to previous menu
 1) Select a scan
 2) Un-select a scan
 3) Change scan detector type
 4) List selected scan data
 Enter Selection

Currently selected scans:

1) tmadtest.d1.scan set to type= detector type 1
 tmad test tank scan, detector type 1
 2) tmadtest.d2.scan set to type= detector type 2
 tmad test tank scan, detector type 2
 3) tmadtest.d3.scan set to type= detector type 3
 tmad test tank scan, detector type 3

Enter number of scan to list (or 0 to return to previous menu):

tmad test tank scan, detector type 1
 read from file: tmadtest.d1.scan
 detector type: detector type 1

depth	detector response
9.01	1.500000E+01
10.01	2.300000E+02
11.00	1.589000E+03
12.01	1.162000E+03
13.01	5.797000E+03
14.10	6.879000E+03

Tmad Scan Data Options:

- 0) Return to previous menu
 - 1) Select a scan
 - 2) Un-select a scan
 - 3) Change scan detector type
 - 4) List selected scan data
- Enter Selection

Currently selected scans:

- 1) tmadtest.d1.scan set to type= detector type 1
tmad test tank scan, detector type 1
- 2) tmadtest.d2.scan set to type= detector type 2
tmad test tank scan, detector type 2
- 3) tmadtest.d3.scan set to type= detector type 3
tmad test tank scan, detector type 3

Enter number of scan to list (or 0 to return to previous menu):

tmad test tank scan, detector type 2

read from file: tmadtest.d2.scan

detector type: detector type 2

depth	detector response
9.01	9.000000E+00
10.01	1.930000E+02
11.00	8.980000E+02
12.01	8.000000E+02
13.01	9.110000E+02
14.01	9.650000E+02

Tmad Scan Data Options:

- 0) Return to previous menu
 - 1) Select a scan
 - 2) Un-select a scan
 - 3) Change scan detector type
 - 4) List selected scan data
- Enter Selection

Currently selected scans:

- 1) tmadtest.d1.scan set to type= detector type 1
tmad test tank scan, detector type 1
- 2) tmadtest.d2.scan set to type= detector type 2
tmad test tank scan, detector type 2
- 3) tmadtest.d3.scan set to type= detector type 3
tmad test tank scan, detector type 3

Enter number of scan to list (or 0 to return to previous menu):

tmad test tank scan, detector type 3

read from file: tmadtest.d3.scan

detector type: detector type 3

depth	detector response
9.01	2.400000E+01
10.00	9.400000E+01
11.01	4.270000E+02
12.01	3.250000E+02
13.00	5.130000E+02
14.01	5.210000E+02

Tmad Scan Data Options:
 0) Return to previous menu
 1) Select a scan
 2) Un-select a scan
 3) Change scan detector type
 4) List selected scan data
 Enter Selection

Tmad Options:
 0) Done
 1) Select scan data to analyze
 2) Analyse scan data
 Enter Selection

C.10 File tmadtest10.out

TMAD v1.0 9/9/95

enter name of library file
 library file title:
 TMAD test library
 effective source date 1 1 1995

Tmad Options:
 0) Done
 1) Select scan data to analyze
 2) Analyse scan data
 Enter Selection

Tmad Scan Data Options:
 0) Return to previous menu
 1) Select a scan
 2) Un-select a scan
 3) Change scan detector type
 4) List selected scan data
 Enter Selection

No scans currently selected

Enter name of ascii file containing scan data
 scan title:
 tmad test tank scan, detector type 1

Possible Detector Types:
 1) detector type 1
 2) detector type 2
 3) detector type 3
 Enter Selection:

Tmad Scan Data Options:
 0) Return to previous menu
 1) Select a scan
 2) Un-select a scan
 3) Change scan detector type
 4) List selected scan data
 Enter Selection

Currently selected scans:

1) tmadtest.d1.scan set to type= detector type 1
 tmad test tank scan, detector type 1

Enter name of ascii file containing scan data
 scan title:
 tmad test tank scan, detector type 2

Possible Detector Types:
 1) detector type 1
 2) detector type 2

3) detector type 3
Enter Selection:

Tmad Scan Data Options:
0) Return to previous menu
1) Select a scan
2) Un-select a scan
3) Change scan detector type
4) List selected scan data
Enter Selection

Currently selected scans:

1) tmadtest.d1.scan set to type= detector type 1
 tmad test tank scan, detector type 1
2) tmadtest.d2.scan set to type= detector type 2
 tmad test tank scan, detector type 2

Enter name of ascii file containing scan data
scan title:
tmad test tank scan, detector type 3

Possible Detector Types:
1) detector type 1
2) detector type 2
3) detector type 3
Enter Selection:

Tmad Scan Data Options:
0) Return to previous menu
1) Select a scan
2) Un-select a scan
3) Change scan detector type
4) List selected scan data
Enter Selection

Tmad Options:
0) Done
1) Select scan data to analyze
2) Analyse scan data
Enter Selection

WORKING

Tmad Options:
0) Done
1) Select scan data to analyze
2) Analyse scan data
Enter Selection

APPENDIX E

DATA LIBRARIES

Part of the output of the TMAD system is a data library. In several of the tests, evaluation of the results involved direct comparison of libraries. Those libraries are listed in this appendix.

D.1 File tmadtest1.lib

TMAD test library

1 1 1995

3 2

detector type 1

detector type 2

detector type 3

anomaly type 1

anomaly type 2

0.718838E-03

0.718838E-03

0.718838E-03

0.000000E+00 0.500000E+02

0.000000E+00 0.100000E+03

3

1

1

tmad test benchmark data, detector type 1, anomaly type 1

9

0.100000E+01

0.000000E+00

0.197367E+04 0.142727E+03 -0.744647E+00

0.173943E+02 0.499274E-01

0.000000E+00 0.194700E+04 0.200000E+02

0.100000E+02 0.336300E+04 0.250000E+02

0.200000E+02 0.457100E+04 0.330000E+02

0.300000E+02 0.559600E+04 0.500000E+02

0.400000E+02 0.647400E+04 0.490000E+02

0.500000E+02 0.724100E+04 0.640000E+02

0.700000E+02 0.814300E+04 0.770000E+02

0.800000E+02 0.847300E+04 0.800000E+02

0.100000E+03 0.890700E+04 0.610000E+02

0.100000E+01

0.172225E+04

0.127297E+03 -0.647936E+00

0.179500E+02 0.405366E-01

0.000000E+00 0.170100E+04 0.180000E+02

0.100000E+02 0.298100E+04 0.280000E+02

0.200000E+02 0.405000E+04 0.300000E+02

0.300000E+02 0.494400E+04 0.360000E+02

0.400000E+02 0.568300E+04 0.510000E+02

0.500000E+02 0.652600E+04 0.540000E+02

0.700000E+02 0.736200E+04 0.740000E+02

0.800000E+02 0.763200E+04 0.770000E+02

0.100000E+03 0.807600E+04 0.690000E+02

0.200000E+01

0.150253E+04

0.111411E+03 -0.554680E+00

0.244811E+02 0.311527E-02

0.000000E+00 0.147800E+04 0.160000E+02

0.100000E+02 0.260200E+04 0.200000E+02

0.200000E+02 0.353200E+04 0.330000E+02

0.300000E+02 0.435900E+04 0.410000E+02

0.400000E+02 0.506600E+04 0.380000E+02

0.500000E+02 0.570100E+04 0.440000E+02

0.700000E+02 0.649200E+04 0.530000E+02

0.800000E+02 0.671100E+04 0.540000E+02

0.100000E+03 0.723000E+04 0.540000E+02

0.400000E+01

0.110046E+04

0.910554E+02 -0.524501E+00

0.385443E+01 0.359806E+00

0.000000E+00 0.109500E+04 0.140000E+02

0.100000E+02 0.197300E+04 0.190000E+02

0.200000E+02 0.272900E+04 0.230000E+02

0.300000E+02 0.332000E+04 0.260000E+02

0.500000E+02 0.435500E+04 0.300000E+02

0.800000E+01

0.705947E+03

0.576389E+02 -0.370130E+00

0.987140E+01 0.174512E-01

0.000000E+00	0.695000E+03	0.120000E+02
0.100000E+02	0.128600E+04	0.160000E+02
0.200000E+02	0.169500E+04	0.190000E+02
0.300000E+02	0.207700E+04	0.200000E+02
0.500000E+02	0.267700E+04	0.250000E+02
0.110000E+02	5	
0.522493E+03	0.412352E+02	-0.265177E+00
0.424629E+01	0.322983E+00	
0.000000E+00	0.521000E+03	0.700000E+01
0.100000E+02	0.921000E+03	0.170000E+02
0.200000E+02	0.126000E+04	0.230000E+02
0.300000E+02	0.147700E+04	0.260000E+02
0.500000E+02	0.192900E+04	0.220000E+02
0.150000E+02	5	
0.268398E+03	0.369660E+02	-0.346028E+00
0.523270E+02	0.226077E-10	
0.000000E+00	0.261000E+03	0.500000E+01
0.100000E+02	0.655000E+03	0.900000E+01
0.200000E+02	0.843000E+03	0.110000E+02
0.300000E+02	0.103100E+04	0.130000E+02
0.500000E+02	0.130400E+04	0.250000E+02
0.200000E+02	5	
0.204271E+03	0.227277E+02	-0.181723E+00
0.172737E+02	0.550159E-03	
0.000000E+00	0.200000E+03	0.500000E+01
0.100000E+02	0.443000E+03	0.900000E+01
0.200000E+02	0.574000E+03	0.100000E+02
0.300000E+02	0.695000E+03	0.150000E+02
0.500000E+02	0.904000E+03	0.190000E+02
0.250000E+02	5	
0.144000E+03	0.171832E+02	-0.175955E+00
0.678039E+01	0.702218E-01	
0.000000E+00	0.141000E+03	0.500000E+01
0.100000E+02	0.309000E+03	0.700000E+01
0.200000E+02	0.419000E+03	0.110000E+02
0.300000E+02	0.478000E+03	0.120000E+02
0.500000E+02	0.570000E+03	0.120000E+02
2		
tmad test benchmark data, detector type 1, anomaly type 2		
2		
0.100000E+01		
0.000000E+00	3	
0.138283E-04	0.625000E+03	-0.125000E+04
0.773298E-11	0.100000E+01	
0.000000E+00	0.000000E+00	0.100000E+02
0.100000E+00	0.500000E+02	0.100000E+02
0.200000E+00	0.750000E+02	0.100000E+02
0.100000E+00	3	
0.838190E-06	0.500000E+02	0.247955E-04
0.929937E-14	0.100000E+01	
0.000000E+00	0.000000E+00	0.100000E+02
0.100000E+00	0.500000E+01	0.100000E+02
0.200000E+00	0.100000E+02	0.100000E+02
2	2	
1		
tmad test benchmark data, detector type 2, anomaly type 1		
9		
0.100000E+01		
0.000000E+00	11	
0.743666E+03	0.849106E+00	0.127712E-01
0.193398E+02	0.261176E+00	
0.000000E+00	0.730000E+03	0.800000E+01
0.100000E+02	0.769000E+03	0.100000E+02
0.200000E+02	0.803000E+03	0.120000E+02
0.300000E+02	0.766000E+03	0.150000E+02
0.400000E+02	0.782000E+03	0.150000E+02
0.500000E+02	0.797000E+03	0.180000E+02
0.600000E+02	0.833000E+03	0.200000E+02
0.700000E+02	0.861000E+03	0.210000E+02
0.800000E+02	0.889000E+03	0.180000E+02
0.900000E+02	0.927000E+03	0.280000E+02
0.100000E+03	0.973000E+03	0.210000E+02
0.100000E+01	9	

0.728435E+03	0.555927E+01	-0.136046E-01
0.205465E+02	0.149639E-01	
0.000000E+00	0.716000E+03	0.800000E+01
0.100000E+02	0.803000E+03	0.120000E+02
0.200000E+02	0.868000E+03	0.140000E+02
0.300000E+02	0.895000E+03	0.130000E+02
0.400000E+02	0.898000E+03	0.180000E+02
0.500000E+02	0.940000E+03	0.160000E+02
0.700000E+02	0.106000E+04	0.200000E+02
0.800000E+02	0.107400E+04	0.190000E+02
0.100000E+03	0.116900E+04	0.220000E+02
0.200000E+01	9	
0.713827E+03	0.107175E+02	-0.395029E-01
0.328313E+02	0.945924E-04	
0.000000E+00	0.693000E+03	0.900000E+01
0.100000E+02	0.836000E+03	0.100000E+02
0.200000E+02	0.959000E+03	0.160000E+02
0.300000E+02	0.101700E+04	0.150000E+02
0.400000E+02	0.108000E+04	0.190000E+02
0.500000E+02	0.110600E+04	0.160000E+02
0.700000E+02	0.124400E+04	0.230000E+02
0.800000E+02	0.128600E+04	0.250000E+02
0.100000E+03	0.142800E+04	0.210000E+02
0.400000E+01	5	
0.630001E+03	0.227898E+02	-0.185285E+00
0.439518E+01	0.310367E+00	
0.000000E+00	0.624000E+03	0.100000E+02
0.100000E+02	0.863000E+03	0.140000E+02
0.200000E+02	0.100800E+04	0.130000E+02
0.300000E+02	0.113000E+04	0.170000E+02
0.500000E+02	0.131200E+04	0.170000E+02
0.800000E+01	5	
0.449060E+03	0.255110E+02	-0.199258E+00
0.308245E+02	0.820247E-06	
0.000000E+00	0.439000E+03	0.600000E+01
0.100000E+02	0.713000E+03	0.700000E+01
0.200000E+02	0.866000E+03	0.900000E+01
0.300000E+02	0.100800E+04	0.110000E+02
0.500000E+02	0.126000E+04	0.200000E+02
0.110000E+02	5	
0.373248E+03	0.221048E+02	-0.168677E+00
0.364033E+02	0.545328E-07	
0.000000E+00	0.365000E+03	0.500000E+01
0.100000E+02	0.608000E+03	0.700000E+01
0.200000E+02	0.747000E+03	0.800000E+01
0.300000E+02	0.852000E+03	0.900000E+01
0.500000E+02	0.106900E+04	0.100000E+02
0.150000E+02	5	
0.269357E+03	0.186147E+02	-0.152742E+00
0.276896E+02	0.373963E-05	
0.000000E+00	0.261000E+03	0.500000E+01
0.100000E+02	0.466000E+03	0.600000E+01
0.200000E+02	0.572000E+03	0.600000E+01
0.300000E+02	0.675000E+03	0.800000E+01
0.500000E+02	0.826000E+03	0.900000E+01
0.200000E+02	5	
0.170268E+03	0.160168E+02	-0.140091E+00
0.127741E+02	0.456533E-02	
0.000000E+00	0.167000E+03	0.400000E+01
0.100000E+02	0.329000E+03	0.600000E+01
0.200000E+02	0.439000E+03	0.700000E+01
0.300000E+02	0.504000E+03	0.800000E+01
0.500000E+02	0.628000E+03	0.900000E+01
0.250000E+02	5	
0.120049E+03	0.127460E+02	-0.119312E+00
0.142580E+02	0.228135E-02	
0.000000E+00	0.117000E+03	0.300000E+01
0.100000E+02	0.247000E+03	0.400000E+01
0.200000E+02	0.322000E+03	0.500000E+01
0.300000E+02	0.382000E+03	0.700000E+01
0.500000E+02	0.464000E+03	0.700000E+01

2

tmd test benchmark data, detector type 2, anomaly type 2

```

2
0.100000E+01
0.000000E+00 3
0.138283E-04 0.625000E+03 -0.125000E+04
0.773298E-11 0.100000E+01
0.000000E+00 0.000000E+00 0.100000E+02
0.100000E+00 0.500000E+02 0.100000E+02
0.200000E+00 0.750000E+02 0.100000E+02
0.100000E+00 3
0.838190E-06 0.500000E+02 0.247955E-04
0.929937E-14 0.100000E+01
0.000000E+00 0.000000E+00 0.100000E+02
0.100000E+00 0.500000E+01 0.100000E+02
0.200000E+00 0.100000E+02 0.100000E+02
3 2
1
tmad test benchmark data, detector type 3, anomaly type 1
9
0.100000E+01
0.000000E+00 9
0.728399E+03 -0.101536E+02 0.627475E-01
0.400318E+03 0.000000E+00
0.000000E+00 0.806000E+03 0.600000E+01
0.100000E+02 0.614000E+03 0.500000E+01
0.200000E+02 0.515000E+03 0.500000E+01
0.300000E+02 0.453000E+03 0.500000E+01
0.400000E+02 0.413000E+03 0.300000E+01
0.500000E+02 0.377000E+03 0.300000E+01
0.700000E+02 0.351000E+03 0.300000E+01
0.800000E+02 0.337000E+03 0.400000E+01
0.100000E+03 0.324000E+03 0.300000E+01
0.100000E+01 9
0.723338E+03 -0.928846E+01 0.566074E-01
0.394972E+03 0.000000E+00
0.000000E+00 0.786000E+03 0.500000E+01
0.100000E+02 0.603000E+03 0.500000E+01
0.200000E+02 0.526000E+03 0.500000E+01
0.300000E+02 0.470000E+03 0.400000E+01
0.400000E+02 0.434000E+03 0.500000E+01
0.500000E+02 0.409000E+03 0.400000E+01
0.700000E+02 0.374000E+03 0.400000E+01
0.800000E+02 0.360000E+03 0.300000E+01
0.100000E+03 0.344000E+03 0.300000E+01
0.200000E+01 9
0.685063E+03 -0.801994E+01 0.479020E-01
0.381396E+03 0.000000E+00
0.000000E+00 0.748000E+03 0.500000E+01
0.100000E+02 0.584000E+03 0.500000E+01
0.200000E+02 0.511000E+03 0.400000E+01
0.300000E+02 0.467000E+03 0.400000E+01
0.400000E+02 0.434000E+03 0.400000E+01
0.500000E+02 0.418000E+03 0.400000E+01
0.700000E+02 0.379000E+03 0.400000E+01
0.800000E+02 0.367000E+03 0.300000E+01
0.100000E+03 0.346000E+03 0.300000E+01
0.400000E+01 7
0.621694E+03 -0.646497E+01 0.367858E-01
0.119805E+03 0.458780E-23
0.000000E+00 0.652000E+03 0.500000E+01
0.100000E+02 0.536000E+03 0.600000E+01
0.200000E+02 0.476000E+03 0.600000E+01
0.300000E+02 0.441000E+03 0.500000E+01
0.500000E+02 0.405000E+03 0.400000E+01
0.700000E+02 0.360000E+03 0.400000E+01
0.100000E+03 0.336000E+03 0.400000E+01
0.800000E+01 5
0.483692E+03 -0.696205E+01 0.739051E-01
0.165675E+02 0.768578E-03
0.000000E+00 0.494000E+03 0.500000E+01
0.100000E+02 0.416000E+03 0.300000E+01
0.200000E+02 0.370000E+03 0.300000E+01
0.300000E+02 0.349000E+03 0.300000E+01
0.500000E+02 0.317000E+03 0.400000E+01

```

0.110000E+02	5	
0.403248E+03	-0.510290E+01	0.467715E-01
0.609032E+01	0.950901E-01	
0.000000E+00	0.405000E+03	0.300000E+01
0.100000E+02	0.353000E+03	0.400000E+01
0.200000E+02	0.317000E+03	0.300000E+01
0.300000E+02	0.300000E+03	0.400000E+01
0.500000E+02	0.264000E+03	0.300000E+01
0.150000E+02	5	
0.302545E+03	-0.317926E+01	0.285659E-01
0.677648E+01	0.703433E-01	
0.000000E+00	0.300000E+03	0.300000E+01
0.100000E+02	0.277000E+03	0.200000E+01
0.200000E+02	0.247000E+03	0.200000E+01
0.300000E+02	0.234000E+03	0.200000E+01
0.500000E+02	0.215000E+03	0.300000E+01
0.200000E+02	7	
0.211050E+03	-0.112587E+01	0.353858E-02
0.281141E+02	0.459627E-04	
0.000000E+00	0.206000E+03	0.200000E+01
0.500000E+01	0.214000E+03	0.300000E+01
0.100000E+02	0.207000E+03	0.300000E+01
0.150000E+02	0.200000E+03	0.300000E+01
0.200000E+02	0.189000E+03	0.200000E+01
0.300000E+02	0.176000E+03	0.200000E+01
0.500000E+02	0.165000E+03	0.200000E+01
0.250000E+02	5	
0.162126E+03	-0.605446E+00	-0.263959E-03
0.706112E+01	0.620136E-01	
0.000000E+00	0.160000E+03	0.200000E+01
0.100000E+02	0.160000E+03	0.200000E+01
0.200000E+02	0.150000E+03	0.200000E+01
0.300000E+02	0.141000E+03	0.200000E+01
0.500000E+02	0.132000E+03	0.200000E+01
2		
tmad test benchmark data, detector type 3, anomaly type 2		
2		
0.100000E+01		
0.000000E+00	3	
0.138283E-04	0.625000E+03	-0.125000E+04
0.773298E-11	0.100000E+01	
0.000000E+00	0.000000E+00	0.100000E+02
0.100000E+00	0.500000E+02	0.100000E+02
0.200000E+00	0.750000E+02	0.100000E+02
0.100000E+00	3	
0.838190E-06	0.500000E+02	0.247955E-04
0.929937E-14	0.100000E+01	
0.000000E+00	0.000000E+00	0.100000E+02
0.100000E+00	0.500000E+01	0.100000E+02
0.200000E+00	0.100000E+02	0.100000E+02

D.2 File tmadtest2.lib

TMAD test library

1	1	1995
3	2	
detector type 1		
detector type 2		
detector type 3		
anomaly type 1		
anomaly type 2		
0.718838E-03		
0.718838E-03		
0.718838E-03		
0.000000E+00	0.500000E+02	
0.000000E+00	0.100000E+03	
3		
1	2	
1		
tmad test benchmark data, detector type 1, anomaly type 1		
9		
0.100000E+01		

0.000000E+00	9	
0.197367E+04	0.142727E+03	-0.744647E+00
0.173943E+02	0.499274E-01	
0.000000E+00	0.194700E+04	0.200000E+02
0.100000E+02	0.336300E+04	0.250000E+02
0.200000E+02	0.457100E+04	0.330000E+02
0.300000E+02	0.559600E+04	0.500000E+02
0.400000E+02	0.647400E+04	0.490000E+02
0.500000E+02	0.724100E+04	0.640000E+02
0.700000E+02	0.814300E+04	0.770000E+02
0.800000E+02	0.847300E+04	0.800000E+02
0.100000E+03	0.890700E+04	0.610000E+02
0.100000E+01	9	
0.172225E+04	0.127297E+03	-0.647936E+00
0.179500E+02	0.405366E-01	
0.000000E+00	0.170100E+04	0.180000E+02
0.100000E+02	0.298100E+04	0.280000E+02
0.200000E+02	0.405000E+04	0.300000E+02
0.300000E+02	0.494400E+04	0.360000E+02
0.400000E+02	0.568300E+04	0.510000E+02
0.500000E+02	0.652600E+04	0.540000E+02
0.700000E+02	0.736200E+04	0.740000E+02
0.800000E+02	0.763200E+04	0.770000E+02
0.100000E+03	0.807600E+04	0.690000E+02
0.200000E+01	9	
0.150253E+04	0.111411E+03	-0.554680E+00
0.244811E+02	0.311527E-02	
0.000000E+00	0.147800E+04	0.160000E+02
0.100000E+02	0.260200E+04	0.200000E+02
0.200000E+02	0.353200E+04	0.330000E+02
0.300000E+02	0.435900E+04	0.410000E+02
0.400000E+02	0.506600E+04	0.380000E+02
0.500000E+02	0.570100E+04	0.440000E+02
0.700000E+02	0.649200E+04	0.530000E+02
0.800000E+02	0.671100E+04	0.540000E+02
0.100000E+03	0.723000E+04	0.540000E+02
0.400000E+01	5	
0.110046E+04	0.910554E+02	-0.524501E+00
0.385443E+01	0.359806E+00	
0.000000E+00	0.109500E+04	0.140000E+02
0.100000E+02	0.197300E+04	0.190000E+02
0.200000E+02	0.272900E+04	0.230000E+02
0.300000E+02	0.332000E+04	0.260000E+02
0.500000E+02	0.435500E+04	0.300000E+02
0.800000E+01	5	
0.705947E+03	0.576389E+02	-0.370130E+00
0.987140E+01	0.174512E-01	
0.000000E+00	0.695000E+03	0.120000E+02
0.100000E+02	0.128600E+04	0.160000E+02
0.200000E+02	0.169500E+04	0.190000E+02
0.300000E+02	0.207700E+04	0.200000E+02
0.500000E+02	0.267700E+04	0.250000E+02
0.110000E+02	5	
0.522493E+03	0.412352E+02	-0.265177E+00
0.424629E+01	0.322983E+00	
0.000000E+00	0.521000E+03	0.700000E+01
0.100000E+02	0.921000E+03	0.170000E+02
0.200000E+02	0.126000E+04	0.230000E+02
0.300000E+02	0.147700E+04	0.260000E+02
0.500000E+02	0.192900E+04	0.220000E+02
0.150000E+02	5	
0.268398E+03	0.369660E+02	-0.346028E+00
0.523270E+02	0.226077E-10	
0.000000E+00	0.261000E+03	0.500000E+01
0.100000E+02	0.655000E+03	0.900000E+01
0.200000E+02	0.843000E+03	0.110000E+02
0.300000E+02	0.103100E+04	0.130000E+02
0.500000E+02	0.130400E+04	0.250000E+02
0.200000E+02	5	
0.204271E+03	0.227277E+02	-0.181723E+00
0.172737E+02	0.550159E-03	
0.000000E+00	0.200000E+03	0.500000E+01
0.100000E+02	0.443000E+03	0.900000E+01

```

0.200000E+02 0.574000E+03 0.100000E+02
0.300000E+02 0.695000E+03 0.150000E+02
0.500000E+02 0.904000E+03 0.190000E+02
0.250000E+02 5
0.144000E+03 0.171832E+02 -0.175955E+00
0.678039E+01 0.702218E-01
0.000000E+00 0.141000E+03 0.500000E+01
0.100000E+02 0.309000E+03 0.700000E+01
0.200000E+02 0.419000E+03 0.110000E+02
0.300000E+02 0.478000E+03 0.120000E+02
0.500000E+02 0.570000E+03 0.120000E+02
2
tmad test benchmark data, detector type 1, anomaly type 2
2
0.100000E+01
0.000000E+00 3
0.138283E-04 0.625000E+03 -0.125000E+04
0.773298E-11 0.100000E+01
0.000000E+00 0.000000E+00 0.100000E+02
0.100000E+00 0.500000E+02 0.100000E+02
0.200000E+00 0.750000E+02 0.100000E+02
0.100000E+00 3
0.838190E-06 0.500000E+02 0.247955E-04
0.929937E-14 0.100000E+01
0.000000E+00 0.000000E+00 0.100000E+02
0.100000E+00 0.500000E+01 0.100000E+02
0.200000E+00 0.100000E+02 0.100000E+02
2 1
2
tmad test benchmark data, detector type 2, anomaly type 2
2
0.100000E+01
0.000000E+00 3
0.138283E-04 0.625000E+03 -0.125000E+04
0.773298E-11 0.100000E+01
0.000000E+00 0.000000E+00 0.100000E+02
0.100000E+00 0.500000E+02 0.100000E+02
0.200000E+00 0.750000E+02 0.100000E+02
0.100000E+00 3
0.838190E-06 0.500000E+02 0.247955E-04
0.929937E-14 0.100000E+01
0.000000E+00 0.000000E+00 0.100000E+02
0.100000E+00 0.500000E+01 0.100000E+02
0.200000E+00 0.100000E+02 0.100000E+02
3 2
1
tmad test benchmark data, detector type 3, anomaly type 1
9
0.100000E+01
0.000000E+00 9
0.728399E+03 -0.101536E+02 0.627475E-01
0.400318E+03 0.000000E+00
0.000000E+00 0.806000E+03 0.600000E+01
0.100000E+02 0.614000E+03 0.500000E+01
0.200000E+02 0.515000E+03 0.500000E+01
0.300000E+02 0.453000E+03 0.500000E+01
0.400000E+02 0.413000E+03 0.300000E+01
0.500000E+02 0.377000E+03 0.300000E+01
0.700000E+02 0.351000E+03 0.300000E+01
0.800000E+02 0.337000E+03 0.400000E+01
0.100000E+03 0.324000E+03 0.300000E+01
0.100000E+01 9
0.723338E+03 -0.928846E+01 0.566074E-01
0.394972E+03 0.000000E+00
0.000000E+00 0.786000E+03 0.500000E+01
0.100000E+02 0.603000E+03 0.500000E+01
0.200000E+02 0.526000E+03 0.500000E+01
0.300000E+02 0.470000E+03 0.400000E+01
0.400000E+02 0.434000E+03 0.500000E+01
0.500000E+02 0.409000E+03 0.400000E+01
0.700000E+02 0.374000E+03 0.400000E+01
0.800000E+02 0.360000E+03 0.300000E+01
0.100000E+03 0.344000E+03 0.300000E+01

```

0.200000E+01	9	
0.685063E+03	-0.801994E+01	0.479020E-01
0.381396E+03	0.000000E+00	
0.000000E+00	0.748000E+03	0.500000E+01
0.100000E+02	0.584000E+03	0.500000E+01
0.200000E+02	0.511000E+03	0.400000E+01
0.300000E+02	0.467000E+03	0.400000E+01
0.400000E+02	0.434000E+03	0.400000E+01
0.500000E+02	0.418000E+03	0.400000E+01
0.700000E+02	0.379000E+03	0.400000E+01
0.800000E+02	0.367000E+03	0.300000E+01
0.100000E+03	0.346000E+03	0.300000E+01
0.400000E+01	7	
0.621694E+03	-0.646497E+01	0.367858E-01
0.119805E+03	0.458780E-23	
0.000000E+00	0.652000E+03	0.500000E+01
0.100000E+02	0.536000E+03	0.600000E+01
0.200000E+02	0.476000E+03	0.600000E+01
0.300000E+02	0.441000E+03	0.500000E+01
0.500000E+02	0.405000E+03	0.400000E+01
0.700000E+02	0.360000E+03	0.400000E+01
0.100000E+03	0.336000E+03	0.400000E+01
0.800000E+01	5	
0.483692E+03	-0.696205E+01	0.739051E-01
0.165675E+02	0.768578E-03	
0.000000E+00	0.494000E+03	0.500000E+01
0.100000E+02	0.416000E+03	0.300000E+01
0.200000E+02	0.370000E+03	0.300000E+01
0.300000E+02	0.349000E+03	0.300000E+01
0.500000E+02	0.317000E+03	0.400000E+01
0.110000E+02	5	
0.403248E+03	-0.510290E+01	0.467715E-01
0.609032E+01	0.950901E-01	
0.000000E+00	0.405000E+03	0.300000E+01
0.100000E+02	0.353000E+03	0.400000E+01
0.200000E+02	0.317000E+03	0.300000E+01
0.300000E+02	0.300000E+03	0.400000E+01
0.500000E+02	0.264000E+03	0.300000E+01
0.150000E+02	5	
0.302545E+03	-0.317926E+01	0.285659E-01
0.677648E+01	0.703433E-01	
0.000000E+00	0.300000E+03	0.300000E+01
0.100000E+02	0.277000E+03	0.200000E+01
0.200000E+02	0.247000E+03	0.200000E+01
0.300000E+02	0.234000E+03	0.200000E+01
0.500000E+02	0.215000E+03	0.300000E+01
0.200000E+02	7	
0.211050E+03	-0.112587E+01	0.353858E-02
0.281141E+02	0.459627E-04	
0.000000E+00	0.206000E+03	0.200000E+01
0.500000E+01	0.214000E+03	0.300000E+01
0.100000E+02	0.207000E+03	0.300000E+01
0.150000E+02	0.200000E+03	0.300000E+01
0.200000E+02	0.189000E+03	0.200000E+01
0.300000E+02	0.176000E+03	0.200000E+01
0.500000E+02	0.165000E+03	0.200000E+01
0.250000E+02	5	
0.162126E+03	-0.605446E+00	-0.263959E-03
0.706112E+01	0.620136E-01	
0.000000E+00	0.160000E+03	0.200000E+01
0.100000E+02	0.160000E+03	0.200000E+01
0.200000E+02	0.150000E+03	0.200000E+01
0.300000E+02	0.141000E+03	0.200000E+01
0.500000E+02	0.132000E+03	0.200000E+01
2		
tmd test benchmark data, detector type 3, anomaly type 2		
2		
0.100000E+01		
0.000000E+00	3	
0.138283E-04	0.625000E+03	-0.125000E+04
0.773298E-11	0.100000E+01	
0.000000E+00	0.000000E+00	0.100000E+02
0.100000E+00	0.500000E+02	0.100000E+02

0.200000E+00	0.750000E+02	0.100000E+02
0.100000E+00	3	
0.838190E-06	0.500000E+02	0.247955E-04
0.929937E-14	0.100000E+01	
0.000000E+00	0.000000E+00	0.100000E+02
0.100000E+00	0.500000E+01	0.100000E+02
0.200000E+00	0.100000E+02	0.100000E+02

D.3 File tmdtest3.lib

TMAD test library

1 1 1995

3 2

detector type 1

detector type 2

detector type 3

anomaly type 1

anomaly type 2

0.718838E-03

0.718838E-03

0.718838E-03

0.000000E+00 0.500000E+02

0.000000E+00 0.100000E+03

3

1 2

1

tmd test benchmark data, detector type 1, anomaly type 1

9

0.100000E+01

0.000000E+00 9

0.197367E+04 0.142727E+03 -0.744647E+00

0.173943E+02 0.499274E-01

0.000000E+00 0.194700E+04 0.200000E+02

0.100000E+02 0.336300E+04 0.250000E+02

0.200000E+02 0.457100E+04 0.330000E+02

0.300000E+02 0.559600E+04 0.500000E+02

0.400000E+02 0.647400E+04 0.490000E+02

0.500000E+02 0.724100E+04 0.640000E+02

0.700000E+02 0.814300E+04 0.770000E+02

0.800000E+02 0.847300E+04 0.800000E+02

0.100000E+03 0.890700E+04 0.610000E+02

0.100000E+01 9

0.172225E+04 0.127297E+03 -0.647936E+00

0.179500E+02 0.405366E-01

0.000000E+00 0.170100E+04 0.180000E+02

0.100000E+02 0.298100E+04 0.280000E+02

0.200000E+02 0.405000E+04 0.300000E+02

0.300000E+02 0.494400E+04 0.360000E+02

0.400000E+02 0.568300E+04 0.510000E+02

0.500000E+02 0.652600E+04 0.540000E+02

0.700000E+02 0.736200E+04 0.740000E+02

0.800000E+02 0.763200E+04 0.770000E+02

0.100000E+03 0.807600E+04 0.690000E+02

0.200000E+01 9

0.150253E+04 0.111411E+03 -0.554680E+00

0.244811E+02 0.311527E-02

0.000000E+00 0.147800E+04 0.160000E+02

0.100000E+02 0.260200E+04 0.200000E+02

0.200000E+02 0.353200E+04 0.330000E+02

0.300000E+02 0.435900E+04 0.410000E+02

0.400000E+02 0.506600E+04 0.380000E+02

0.500000E+02 0.570100E+04 0.440000E+02

0.700000E+02 0.649200E+04 0.530000E+02

0.800000E+02 0.671100E+04 0.540000E+02

0.100000E+03 0.723000E+04 0.540000E+02

0.400000E+01 5

0.110046E+04 0.910554E+02 -0.524501E+00

0.385443E+01 0.359806E+00

0.000000E+00 0.109500E+04 0.140000E+02

0.100000E+02 0.197300E+04 0.190000E+02

0.200000E+02 0.272900E+04 0.230000E+02

0.300000E+02 0.332000E+04 0.260000E+02

0.500000E+02	0.435500E+04	0.300000E+02
0.800000E+01	5	
0.705947E+03	0.576389E+02	-0.370130E+00
0.987140E+01	0.174512E-01	
0.000000E+00	0.695000E+03	0.120000E+02
0.100000E+02	0.128600E+04	0.160000E+02
0.200000E+02	0.169500E+04	0.190000E+02
0.300000E+02	0.207700E+04	0.200000E+02
0.500000E+02	0.267700E+04	0.250000E+02
0.110000E+02	5	
0.522493E+03	0.412352E+02	-0.265177E+00
0.424629E+01	0.322983E+00	
0.000000E+00	0.521000E+03	0.700000E+01
0.100000E+02	0.921000E+03	0.170000E+02
0.200000E+02	0.126000E+04	0.230000E+02
0.300000E+02	0.147700E+04	0.260000E+02
0.500000E+02	0.192900E+04	0.220000E+02
0.150000E+02	5	
0.268398E+03	0.369660E+02	-0.346028E+00
0.523270E+02	0.226077E-10	
0.000000E+00	0.261000E+03	0.500000E+01
0.100000E+02	0.655000E+03	0.900000E+01
0.200000E+02	0.843000E+03	0.110000E+02
0.300000E+02	0.103100E+04	0.130000E+02
0.500000E+02	0.130400E+04	0.250000E+02
0.200000E+02	5	
0.204271E+03	0.227277E+02	-0.181723E+00
0.172737E+02	0.550159E-03	
0.000000E+00	0.200000E+03	0.500000E+01
0.100000E+02	0.443000E+03	0.900000E+01
0.200000E+02	0.574000E+03	0.100000E+02
0.300000E+02	0.695000E+03	0.150000E+02
0.500000E+02	0.904000E+03	0.190000E+02
0.250000E+02	5	
0.144000E+03	0.171832E+02	-0.175955E+00
0.678039E+01	0.702218E-01	
0.000000E+00	0.141000E+03	0.500000E+01
0.100000E+02	0.309000E+03	0.700000E+01
0.200000E+02	0.419000E+03	0.110000E+02
0.300000E+02	0.478000E+03	0.120000E+02
0.500000E+02	0.570000E+03	0.120000E+02
2		
tmad test benchmark data, detector type 1, anomaly type 2		
2		
0.100000E+01		
0.000000E+00	3	
0.138283E-04	0.625000E+03	-0.125000E+04
0.773298E-11	0.100000E+01	
0.000000E+00	0.000000E+00	0.100000E+02
0.100000E+00	0.500000E+02	0.100000E+02
0.200000E+00	0.750000E+02	0.100000E+02
0.100000E+00	3	
0.838190E-06	0.500000E+02	0.247955E-04
0.929937E-14	0.100000E+01	
0.000000E+00	0.000000E+00	0.100000E+02
0.100000E+00	0.500000E+01	0.100000E+02
0.200000E+00	0.100000E+02	0.100000E+02
2	2	
1		
tmad test benchmark data, detector type 2, anomaly type 1		
9		
0.100000E+01		
0.000000E+00	11	
0.743666E+03	0.849106E+00	0.127712E-01
0.193398E+02	0.261176E+00	
0.000000E+00	0.730000E+03	0.800000E+01
0.100000E+02	0.769000E+03	0.100000E+02
0.200000E+02	0.803000E+03	0.120000E+02
0.300000E+02	0.766000E+03	0.150000E+02
0.400000E+02	0.782000E+03	0.150000E+02
0.500000E+02	0.797000E+03	0.180000E+02
0.600000E+02	0.833000E+03	0.200000E+02
0.700000E+02	0.861000E+03	0.210000E+02

0.800000E+02	0.889000E+03	0.180000E+02
0.900000E+02	0.927000E+03	0.280000E+02
0.100000E+03	0.973000E+03	0.210000E+02
0.100000E+01	9	
0.728435E+03	0.555927E+01	-0.136046E-01
0.205465E+02	0.149639E-01	
0.000000E+00	0.716000E+03	0.800000E+01
0.100000E+02	0.803000E+03	0.120000E+02
0.200000E+02	0.868000E+03	0.140000E+02
0.300000E+02	0.895000E+03	0.130000E+02
0.400000E+02	0.898000E+03	0.180000E+02
0.500000E+02	0.940000E+03	0.160000E+02
0.700000E+02	0.106000E+04	0.200000E+02
0.800000E+02	0.107400E+04	0.190000E+02
0.100000E+03	0.116900E+04	0.220000E+02
0.200000E+01	9	
0.713827E+03	0.107175E+02	-0.395029E-01
0.328313E+02	0.945924E-04	
0.000000E+00	0.693000E+03	0.900000E+01
0.100000E+02	0.836000E+03	0.100000E+02
0.200000E+02	0.959000E+03	0.160000E+02
0.300000E+02	0.101700E+04	0.150000E+02
0.400000E+02	0.108000E+04	0.190000E+02
0.500000E+02	0.110600E+04	0.160000E+02
0.700000E+02	0.124400E+04	0.230000E+02
0.800000E+02	0.128600E+04	0.250000E+02
0.100000E+03	0.142800E+04	0.210000E+02
0.400000E+01	5	
0.630001E+03	0.227898E+02	-0.185285E+00
0.439518E+01	0.310367E+00	
0.000000E+00	0.624000E+03	0.100000E+02
0.100000E+02	0.863000E+03	0.140000E+02
0.200000E+02	0.100800E+04	0.130000E+02
0.300000E+02	0.113000E+04	0.170000E+02
0.500000E+02	0.131200E+04	0.170000E+02
0.800000E+01	5	
0.449060E+03	0.255110E+02	-0.199258E+00
0.308245E+02	0.820247E-06	
0.000000E+00	0.439000E+03	0.600000E+01
0.100000E+02	0.713000E+03	0.700000E+01
0.200000E+02	0.866000E+03	0.900000E+01
0.300000E+02	0.100800E+04	0.110000E+02
0.500000E+02	0.126000E+04	0.200000E+02
0.110000E+02	5	
0.373248E+03	0.221048E+02	-0.168677E+00
0.364033E+02	0.545328E-07	
0.000000E+00	0.365000E+03	0.500000E+01
0.100000E+02	0.608000E+03	0.700000E+01
0.200000E+02	0.747000E+03	0.800000E+01
0.300000E+02	0.852000E+03	0.900000E+01
0.500000E+02	0.106900E+04	0.100000E+02
0.150000E+02	5	
0.269357E+03	0.186147E+02	-0.152742E+00
0.276896E+02	0.373963E-05	
0.000000E+00	0.261000E+03	0.500000E+01
0.100000E+02	0.466000E+03	0.600000E+01
0.200000E+02	0.572000E+03	0.600000E+01
0.300000E+02	0.675000E+03	0.800000E+01
0.500000E+02	0.826000E+03	0.900000E+01
0.200000E+02	5	
0.170268E+03	0.160168E+02	-0.140091E+00
0.127741E+02	0.456533E-02	
0.000000E+00	0.167000E+03	0.400000E+01
0.100000E+02	0.329000E+03	0.600000E+01
0.200000E+02	0.439000E+03	0.700000E+01
0.300000E+02	0.504000E+03	0.800000E+01
0.500000E+02	0.628000E+03	0.900000E+01
0.250000E+02	5	
0.120049E+03	0.127460E+02	-0.119312E+00
0.142580E+02	0.228135E-02	
0.000000E+00	0.117000E+03	0.300000E+01
0.100000E+02	0.247000E+03	0.400000E+01
0.200000E+02	0.322000E+03	0.500000E+01

```

0.300000E+02 0.382000E+03 0.700000E+01
0.500000E+02 0.464000E+03 0.700000E+01
2
tmad test benchmark data, detector type 2, anomaly type 2
2
0.100000E+01
0.000000E+00 3
0.138283E-04 0.625000E+03 -0.125000E+04
0.773298E-11 0.100000E+01
0.000000E+00 0.000000E+00 0.100000E+02
0.100000E+00 0.500000E+02 0.100000E+02
0.200000E+00 0.750000E+02 0.100000E+02
0.100000E+00 3
0.838190E-06 0.500000E+02 0.247955E-04
0.929937E-14 0.100000E+01
0.000000E+00 0.000000E+00 0.100000E+02
0.100000E+00 0.500000E+01 0.100000E+02
0.200000E+00 0.100000E+02 0.100000E+02
3 2
1
tmad test benchmark data, detector type 3, anomaly type 1
9
0.100000E+01
0.000000E+00 9
0.728399E+03 -0.101536E+02 0.627475E-01
0.400318E+03 0.000000E+00
0.000000E+00 0.806000E+03 0.600000E+01
0.100000E+02 0.614000E+03 0.500000E+01
0.200000E+02 0.515000E+03 0.500000E+01
0.300000E+02 0.453000E+03 0.500000E+01
0.400000E+02 0.413000E+03 0.300000E+01
0.500000E+02 0.377000E+03 0.300000E+01
0.700000E+02 0.351000E+03 0.300000E+01
0.800000E+02 0.337000E+03 0.400000E+01
0.100000E+03 0.324000E+03 0.300000E+01
0.100000E+01 9
0.723338E+03 -0.928846E+01 0.566074E-01
0.394972E+03 0.000000E+00
0.000000E+00 0.786000E+03 0.500000E+01
0.100000E+02 0.603000E+03 0.500000E+01
0.200000E+02 0.526000E+03 0.500000E+01
0.300000E+02 0.470000E+03 0.400000E+01
0.400000E+02 0.434000E+03 0.500000E+01
0.500000E+02 0.409000E+03 0.400000E+01
0.700000E+02 0.374000E+03 0.400000E+01
0.800000E+02 0.360000E+03 0.300000E+01
0.100000E+03 0.344000E+03 0.300000E+01
0.200000E+01 9
0.685063E+03 -0.801994E+01 0.479020E-01
0.381396E+03 0.000000E+00
0.000000E+00 0.748000E+03 0.500000E+01
0.100000E+02 0.584000E+03 0.500000E+01
0.200000E+02 0.511000E+03 0.400000E+01
0.300000E+02 0.467000E+03 0.400000E+01
0.400000E+02 0.434000E+03 0.400000E+01
0.500000E+02 0.418000E+03 0.400000E+01
0.700000E+02 0.379000E+03 0.400000E+01
0.800000E+02 0.367000E+03 0.300000E+01
0.100000E+03 0.346000E+03 0.300000E+01
0.400000E+01 7
0.621694E+03 -0.646497E+01 0.367858E-01
0.119805E+03 0.458780E-23
0.000000E+00 0.652000E+03 0.500000E+01
0.100000E+02 0.536000E+03 0.600000E+01
0.200000E+02 0.476000E+03 0.600000E+01
0.300000E+02 0.441000E+03 0.500000E+01
0.500000E+02 0.405000E+03 0.400000E+01
0.700000E+02 0.360000E+03 0.400000E+01
0.100000E+03 0.336000E+03 0.400000E+01
0.800000E+01 5
0.483692E+03 -0.696205E+01 0.739051E-01
0.165675E+02 0.768578E-03
0.000000E+00 0.494000E+03 0.500000E+01

```

0.100000E+02	0.416000E+03	0.300000E+01
0.200000E+02	0.370000E+03	0.300000E+01
0.300000E+02	0.349000E+03	0.300000E+01
0.500000E+02	0.317000E+03	0.400000E+01
0.110000E+02	5	
0.403248E+03	-0.510290E+01	0.467715E-01
0.609032E+01	0.950901E-01	
0.000000E+00	0.405000E+03	0.300000E+01
0.100000E+02	0.353000E+03	0.400000E+01
0.200000E+02	0.317000E+03	0.300000E+01
0.300000E+02	0.300000E+03	0.400000E+01
0.500000E+02	0.264000E+03	0.300000E+01
0.150000E+02	5	
0.302545E+03	-0.317926E+01	0.285659E-01
0.677648E+01	0.703433E-01	
0.000000E+00	0.300000E+03	0.300000E+01
0.100000E+02	0.277000E+03	0.200000E+01
0.200000E+02	0.247000E+03	0.200000E+01
0.300000E+02	0.234000E+03	0.200000E+01
0.500000E+02	0.215000E+03	0.300000E+01
0.200000E+02	7	
0.211050E+03	-0.112587E+01	0.353858E-02
0.281141E+02	0.459627E-04	
0.000000E+00	0.206000E+03	0.200000E+01
0.500000E+01	0.214000E+03	0.300000E+01
0.100000E+02	0.207000E+03	0.300000E+01
0.150000E+02	0.200000E+03	0.300000E+01
0.200000E+02	0.189000E+03	0.200000E+01
0.300000E+02	0.176000E+03	0.200000E+01
0.500000E+02	0.165000E+03	0.200000E+01
0.250000E+02	5	
0.162126E+03	-0.605446E+00	-0.263959E-03
0.706112E+01	0.620136E-01	
0.000000E+00	0.160000E+03	0.200000E+01
0.100000E+02	0.160000E+03	0.200000E+01
0.200000E+02	0.150000E+03	0.200000E+01
0.300000E+02	0.141000E+03	0.200000E+01
0.500000E+02	0.132000E+03	0.200000E+01

2

tmad test benchmark data, detector type 3, anomaly type 2

2

0.100000E+01		
0.000000E+00	3	
0.138283E-04	0.625000E+03	-0.125000E+04
0.773298E-11	0.100000E+01	
0.000000E+00	0.000000E+00	0.100000E+02
0.100000E+00	0.500000E+02	0.100000E+02
0.200000E+00	0.750000E+02	0.100000E+02
0.100000E+00	3	
0.838190E-06	0.500000E+02	0.247955E-04
0.929937E-14	0.100000E+01	
0.000000E+00	0.000000E+00	0.100000E+02
0.100000E+00	0.500000E+01	0.100000E+02
0.200000E+00	0.100000E+02	0.100000E+02

D.4 File tmadtest4.lib

TMAD test library

1

1

1995

3 2

detector type 1

detector type 2

detector type 3

anomaly type 1

anomaly type 2

0.718838E-03

0.718838E-03

0.718838E-03

0.500000E+01 0.780000E+02

0.000000E+00 0.100000E+03

3

1 2

```

1
tmad test benchmark data, detector type 1, anomaly type 1
9
0.100000E+01
0.000000E+00 9
0.197367E+04 0.142727E+03 -0.744647E+00
0.173943E+02 0.499274E-01
0.000000E+00 0.194700E+04 0.200000E+02
0.100000E+02 0.336300E+04 0.250000E+02
0.200000E+02 0.457100E+04 0.330000E+02
0.300000E+02 0.559600E+04 0.500000E+02
0.400000E+02 0.647400E+04 0.490000E+02
0.500000E+02 0.724100E+04 0.640000E+02
0.700000E+02 0.814300E+04 0.770000E+02
0.800000E+02 0.847300E+04 0.800000E+02
0.100000E+03 0.890700E+04 0.610000E+02
0.100000E+01 9
0.172225E+04 0.127297E+03 -0.647936E+00
0.179500E+02 0.405366E-01
0.000000E+00 0.170100E+04 0.180000E+02
0.100000E+02 0.298100E+04 0.280000E+02
0.200000E+02 0.405000E+04 0.300000E+02
0.300000E+02 0.494400E+04 0.360000E+02
0.400000E+02 0.568300E+04 0.510000E+02
0.500000E+02 0.652600E+04 0.540000E+02
0.700000E+02 0.736200E+04 0.740000E+02
0.800000E+02 0.763200E+04 0.770000E+02
0.100000E+03 0.807600E+04 0.690000E+02
0.200000E+01 9
0.150253E+04 0.111411E+03 -0.554680E+00
0.244811E+02 0.311527E-02
0.000000E+00 0.147800E+04 0.160000E+02
0.100000E+02 0.260200E+04 0.200000E+02
0.200000E+02 0.353200E+04 0.330000E+02
0.300000E+02 0.435900E+04 0.410000E+02
0.400000E+02 0.506600E+04 0.380000E+02
0.500000E+02 0.570100E+04 0.440000E+02
0.700000E+02 0.649200E+04 0.530000E+02
0.800000E+02 0.671100E+04 0.540000E+02
0.100000E+03 0.723000E+04 0.540000E+02
0.400000E+01 5
0.110046E+04 0.910554E+02 -0.524501E+00
0.385443E+01 0.359806E+00
0.000000E+00 0.109500E+04 0.140000E+02
0.100000E+02 0.197300E+04 0.190000E+02
0.200000E+02 0.272900E+04 0.230000E+02
0.300000E+02 0.332000E+04 0.260000E+02
0.500000E+02 0.435500E+04 0.300000E+02
0.800000E+01 5
0.705947E+03 0.576389E+02 -0.370130E+00
0.987140E+01 0.174512E-01
0.000000E+00 0.695000E+03 0.120000E+02
0.100000E+02 0.128600E+04 0.160000E+02
0.200000E+02 0.169500E+04 0.190000E+02
0.300000E+02 0.207700E+04 0.200000E+02
0.500000E+02 0.267700E+04 0.250000E+02
0.110000E+02 5
0.522493E+03 0.412352E+02 -0.265177E+00
0.424629E+01 0.322983E+00
0.000000E+00 0.521000E+03 0.700000E+01
0.100000E+02 0.921000E+03 0.170000E+02
0.200000E+02 0.126000E+04 0.230000E+02
0.300000E+02 0.147700E+04 0.260000E+02
0.500000E+02 0.192900E+04 0.220000E+02
0.150000E+02 5
0.268398E+03 0.369660E+02 -0.346028E+00
0.523270E+02 0.226077E-10
0.000000E+00 0.261000E+03 0.500000E+01
0.100000E+02 0.655000E+03 0.900000E+01
0.200000E+02 0.843000E+03 0.110000E+02
0.300000E+02 0.103100E+04 0.130000E+02
0.500000E+02 0.130400E+04 0.250000E+02
0.200000E+02 5

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0.204271E+03 0.227277E+02 -0.181723E+00
0.172737E+02 0.550159E-03
0.000000E+00 0.200000E+03 0.500000E+01
0.100000E+02 0.443000E+03 0.900000E+01
0.200000E+02 0.574000E+03 0.100000E+02
0.300000E+02 0.695000E+03 0.150000E+02
0.500000E+02 0.904000E+03 0.190000E+02
0.250000E+02 5
0.144000E+03 0.171832E+02 -0.175955E+00
0.678039E+01 0.702218E-01
0.000000E+00 0.141000E+03 0.500000E+01
0.100000E+02 0.309000E+03 0.700000E+01
0.200000E+02 0.419000E+03 0.110000E+02
0.300000E+02 0.478000E+03 0.120000E+02
0.500000E+02 0.570000E+03 0.120000E+02
2
tmad test benchmark data, detector type 1, anomaly type 2
2
0.100000E+01
0.000000E+00 3
0.138283E-04 0.625000E+03 -0.125000E+04
0.773298E-11 0.100000E+01
0.000000E+00 0.000000E+00 0.100000E+02
0.100000E+00 0.500000E+02 0.100000E+02
0.200000E+00 0.750000E+02 0.100000E+02
0.100000E+00 3
0.838190E-06 0.500000E+02 0.247955E-04
0.929937E-14 0.100000E+01
0.000000E+00 0.000000E+00 0.100000E+02
0.100000E+00 0.500000E+01 0.100000E+02
0.200000E+00 0.100000E+02 0.100000E+02
2 2
1
tmad test benchmark data, detector type 2, anomaly type 1
9
0.100000E+01
0.000000E+00 11
0.743666E+03 0.849106E+00 0.127712E-01
0.193398E+02 0.261176E+00
0.000000E+00 0.730000E+03 0.800000E+01
0.100000E+02 0.769000E+03 0.100000E+02
0.200000E+02 0.803000E+03 0.120000E+02
0.300000E+02 0.766000E+03 0.150000E+02
0.400000E+02 0.782000E+03 0.150000E+02
0.500000E+02 0.797000E+03 0.180000E+02
0.600000E+02 0.833000E+03 0.200000E+02
0.700000E+02 0.861000E+03 0.210000E+02
0.800000E+02 0.889000E+03 0.180000E+02
0.900000E+02 0.927000E+03 0.280000E+02
0.100000E+03 0.973000E+03 0.210000E+02
0.100000E+01 9
0.728435E+03 0.555927E+01 -0.136046E-01
0.205465E+02 0.149639E-01
0.000000E+00 0.716000E+03 0.800000E+01
0.100000E+02 0.803000E+03 0.120000E+02
0.200000E+02 0.868000E+03 0.140000E+02
0.300000E+02 0.895000E+03 0.130000E+02
0.400000E+02 0.898000E+03 0.180000E+02
0.500000E+02 0.940000E+03 0.160000E+02
0.700000E+02 0.106000E+04 0.200000E+02
0.800000E+02 0.107400E+04 0.190000E+02
0.100000E+03 0.116900E+04 0.220000E+02
0.200000E+01 9
0.713827E+03 0.107175E+02 -0.395029E-01
0.328313E+02 0.945924E-04
0.000000E+00 0.693000E+03 0.900000E+01
0.100000E+02 0.836000E+03 0.100000E+02
0.200000E+02 0.959000E+03 0.160000E+02
0.300000E+02 0.101700E+04 0.150000E+02
0.400000E+02 0.108000E+04 0.190000E+02
0.500000E+02 0.110600E+04 0.160000E+02
0.700000E+02 0.124400E+04 0.230000E+02
0.800000E+02 0.128600E+04 0.250000E+02

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0.100000E+03	0.142800E+04	0.210000E+02
0.400000E+01	5	
0.630001E+03	0.227898E+02	-0.185285E+00
0.439518E+01	0.310367E+00	
0.000000E+00	0.624000E+03	0.100000E+02
0.100000E+02	0.863000E+03	0.140000E+02
0.200000E+02	0.100800E+04	0.130000E+02
0.300000E+02	0.113000E+04	0.170000E+02
0.500000E+02	0.131200E+04	0.170000E+02
0.800000E+01	5	
0.449060E+03	0.255110E+02	-0.199258E+00
0.308245E+02	0.820247E-06	
0.000000E+00	0.439000E+03	0.600000E+01
0.100000E+02	0.713000E+03	0.700000E+01
0.200000E+02	0.866000E+03	0.900000E+01
0.300000E+02	0.100800E+04	0.110000E+02
0.500000E+02	0.126000E+04	0.200000E+02
0.110000E+02	5	
0.373248E+03	0.221048E+02	-0.168677E+00
0.364033E+02	0.545328E-07	
0.000000E+00	0.365000E+03	0.500000E+01
0.100000E+02	0.608000E+03	0.700000E+01
0.200000E+02	0.747000E+03	0.800000E+01
0.300000E+02	0.852000E+03	0.900000E+01
0.500000E+02	0.106900E+04	0.100000E+02
0.150000E+02	5	
0.269357E+03	0.186147E+02	-0.152742E+00
0.276896E+02	0.373963E-05	
0.000000E+00	0.261000E+03	0.500000E+01
0.100000E+02	0.466000E+03	0.600000E+01
0.200000E+02	0.572000E+03	0.600000E+01
0.300000E+02	0.675000E+03	0.800000E+01
0.500000E+02	0.826000E+03	0.900000E+01
0.200000E+02	5	
0.170268E+03	0.160168E+02	-0.140091E+00
0.127741E+02	0.456533E-02	
0.000000E+00	0.167000E+03	0.400000E+01
0.100000E+02	0.329000E+03	0.600000E+01
0.200000E+02	0.439000E+03	0.700000E+01
0.300000E+02	0.504000E+03	0.800000E+01
0.500000E+02	0.628000E+03	0.900000E+01
0.250000E+02	5	
0.120049E+03	0.127460E+02	-0.119312E+00
0.142580E+02	0.228135E-02	
0.000000E+00	0.117000E+03	0.300000E+01
0.100000E+02	0.247000E+03	0.400000E+01
0.200000E+02	0.322000E+03	0.500000E+01
0.300000E+02	0.382000E+03	0.700000E+01
0.500000E+02	0.464000E+03	0.700000E+01
2		
tmad test benchmark data, detector type 2, anomaly type 2		
2		
0.100000E+01		
0.000000E+00	3	
0.138283E-04	0.625000E+03	-0.125000E+04
0.773298E-11	0.100000E+01	
0.000000E+00	0.000000E+00	0.100000E+02
0.100000E+00	0.500000E+02	0.100000E+02
0.200000E+00	0.750000E+02	0.100000E+02
0.100000E+00	3	
0.838190E-06	0.500000E+02	0.247955E-04
0.929937E-14	0.100000E+01	
0.000000E+00	0.000000E+00	0.100000E+02
0.100000E+00	0.500000E+01	0.100000E+02
0.200000E+00	0.100000E+02	0.100000E+02
3		
2		
1		
tmad test benchmark data, detector type 3, anomaly type 1		
9		
0.100000E+01		
0.000000E+00	9	
0.728399E+03	-0.101536E+02	0.627475E-01
0.400318E+03	0.000000E+00	

0.000000E+00	0.806000E+03	0.600000E+01
0.100000E+02	0.614000E+03	0.500000E+01
0.200000E+02	0.515000E+03	0.500000E+01
0.300000E+02	0.453000E+03	0.500000E+01
0.400000E+02	0.413000E+03	0.300000E+01
0.500000E+02	0.377000E+03	0.300000E+01
0.700000E+02	0.351000E+03	0.300000E+01
0.800000E+02	0.337000E+03	0.400000E+01
0.100000E+03	0.324000E+03	0.300000E+01
0.100000E+01	9	
0.723338E+03	-0.928846E+01	0.566074E-01
0.394972E+03	0.000000E+00	
0.000000E+00	0.786000E+03	0.500000E+01
0.100000E+02	0.603000E+03	0.500000E+01
0.200000E+02	0.526000E+03	0.500000E+01
0.300000E+02	0.470000E+03	0.400000E+01
0.400000E+02	0.434000E+03	0.500000E+01
0.500000E+02	0.409000E+03	0.400000E+01
0.700000E+02	0.374000E+03	0.400000E+01
0.800000E+02	0.360000E+03	0.300000E+01
0.100000E+03	0.344000E+03	0.300000E+01
0.200000E+01	9	
0.685063E+03	-0.801994E+01	0.479020E-01
0.381396E+03	0.000000E+00	
0.000000E+00	0.748000E+03	0.500000E+01
0.100000E+02	0.584000E+03	0.500000E+01
0.200000E+02	0.511000E+03	0.400000E+01
0.300000E+02	0.467000E+03	0.400000E+01
0.400000E+02	0.434000E+03	0.400000E+01
0.500000E+02	0.418000E+03	0.400000E+01
0.700000E+02	0.379000E+03	0.400000E+01
0.800000E+02	0.367000E+03	0.300000E+01
0.100000E+03	0.346000E+03	0.300000E+01
0.400000E+01	7	
0.621694E+03	-0.646497E+01	0.367858E-01
0.119805E+03	0.458780E-23	
0.000000E+00	0.652000E+03	0.500000E+01
0.100000E+02	0.536000E+03	0.600000E+01
0.200000E+02	0.476000E+03	0.600000E+01
0.300000E+02	0.441000E+03	0.500000E+01
0.500000E+02	0.405000E+03	0.400000E+01
0.700000E+02	0.360000E+03	0.400000E+01
0.100000E+03	0.336000E+03	0.400000E+01
0.800000E+01	5	
0.483692E+03	-0.696205E+01	0.739051E-01
0.165675E+02	0.768578E-03	
0.000000E+00	0.494000E+03	0.500000E+01
0.100000E+02	0.416000E+03	0.300000E+01
0.200000E+02	0.370000E+03	0.300000E+01
0.300000E+02	0.349000E+03	0.300000E+01
0.500000E+02	0.317000E+03	0.400000E+01
0.110000E+02	5	
0.403248E+03	-0.510290E+01	0.467715E-01
0.609032E+01	0.950901E-01	
0.000000E+00	0.405000E+03	0.300000E+01
0.100000E+02	0.353000E+03	0.400000E+01
0.200000E+02	0.317000E+03	0.300000E+01
0.300000E+02	0.300000E+03	0.400000E+01
0.500000E+02	0.264000E+03	0.300000E+01
0.150000E+02	5	
0.302545E+03	-0.317926E+01	0.285659E-01
0.677648E+01	0.703433E-01	
0.000000E+00	0.300000E+03	0.300000E+01
0.100000E+02	0.277000E+03	0.200000E+01
0.200000E+02	0.247000E+03	0.200000E+01
0.300000E+02	0.234000E+03	0.200000E+01
0.500000E+02	0.215000E+03	0.300000E+01
0.200000E+02	7	
0.211050E+03	-0.112587E+01	0.353858E-02
0.281141E+02	0.459627E-04	
0.000000E+00	0.206000E+03	0.200000E+01
0.500000E+01	0.214000E+03	0.300000E+01
0.100000E+02	0.207000E+03	0.300000E+01

0.150000E+02	0.200000E+03	0.300000E+01
0.200000E+02	0.189000E+03	0.200000E+01
0.300000E+02	0.176000E+03	0.200000E+01
0.500000E+02	0.165000E+03	0.200000E+01
0.250000E+02	5	
0.162126E+03	-0.605446E+00	-0.263959E-03
0.706112E+01	0.620136E-01	
0.000000E+00	0.160000E+03	0.200000E+01
0.100000E+02	0.160000E+03	0.200000E+01
0.200000E+02	0.150000E+03	0.200000E+01
0.300000E+02	0.141000E+03	0.200000E+01
0.500000E+02	0.132000E+03	0.200000E+01

2

tmad test benchmark data, detector type 3, anomaly type 2

2

0.100000E+01		
0.000000E+00	3	
0.138283E-04	0.625000E+03	-0.125000E+04
0.773298E-11	0.100000E+01	
0.000000E+00	0.000000E+00	0.100000E+02
0.100000E+00	0.500000E+02	0.100000E+02
0.200000E+00	0.750000E+02	0.100000E+02
0.100000E+00	3	
0.838190E-06	0.500000E+02	0.247955E-04
0.929937E-14	0.100000E+01	
0.000000E+00	0.000000E+00	0.100000E+02
0.100000E+00	0.500000E+01	0.100000E+02
0.200000E+00	0.100000E+02	0.100000E+02

D.5 File tmadtest5.lib

TMAD test library

1	1	1995
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3 2

detector type 1

detector type 2

detector type 3

anomaly type 1

anomaly type 2

0.718838E-03		
0.718838E-03		
0.718838E-03		
0.000000E+00	0.500000E+02	
0.000000E+00	0.100000E+03	

3

1 2

1

tmad test benchmark data, detector type 1, anomaly type 1

9

0.100000E+01		
0.000000E+00	9	
0.197367E+04	0.142727E+03	-0.744647E+00
0.173943E+02	0.499274E-01	
0.000000E+00	0.194700E+04	0.200000E+02
0.100000E+02	0.336300E+04	0.250000E+02
0.200000E+02	0.457100E+04	0.330000E+02
0.300000E+02	0.559600E+04	0.500000E+02
0.400000E+02	0.647400E+04	0.490000E+02
0.500000E+02	0.724100E+04	0.640000E+02
0.700000E+02	0.814300E+04	0.770000E+02
0.800000E+02	0.847300E+04	0.800000E+02
0.100000E+03	0.890700E+04	0.610000E+02
0.100000E+01	9	
0.172225E+04	0.127297E+03	-0.647936E+00
0.179500E+02	0.405366E-01	
0.000000E+00	0.170100E+04	0.180000E+02
0.100000E+02	0.298100E+04	0.280000E+02
0.200000E+02	0.405000E+04	0.300000E+02
0.300000E+02	0.494400E+04	0.360000E+02
0.400000E+02	0.568300E+04	0.510000E+02
0.500000E+02	0.652600E+04	0.540000E+02
0.700000E+02	0.736200E+04	0.740000E+02

0.800000E+02	0.763200E+04	0.770000E+02
0.100000E+03	0.807600E+04	0.690000E+02
0.200000E+01	9	
0.150253E+04	0.111411E+03	-0.554680E+00
0.244811E+02	0.311527E-02	
0.000000E+00	0.147800E+04	0.160000E+02
0.100000E+02	0.260200E+04	0.200000E+02
0.200000E+02	0.353200E+04	0.330000E+02
0.300000E+02	0.435900E+04	0.410000E+02
0.400000E+02	0.506600E+04	0.380000E+02
0.500000E+02	0.570100E+04	0.440000E+02
0.700000E+02	0.649200E+04	0.530000E+02
0.800000E+02	0.671100E+04	0.540000E+02
0.100000E+03	0.723000E+04	0.540000E+02
0.400000E+01	5	
0.110046E+04	0.910554E+02	-0.524501E+00
0.385443E+01	0.359806E+00	
0.000000E+00	0.109500E+04	0.140000E+02
0.100000E+02	0.197300E+04	0.190000E+02
0.200000E+02	0.272900E+04	0.230000E+02
0.300000E+02	0.332000E+04	0.260000E+02
0.500000E+02	0.435500E+04	0.300000E+02
0.800000E+01	5	
0.705947E+03	0.576389E+02	-0.370130E+00
0.987140E+01	0.174512E-01	
0.000000E+00	0.695000E+03	0.120000E+02
0.100000E+02	0.128600E+04	0.160000E+02
0.200000E+02	0.169500E+04	0.190000E+02
0.300000E+02	0.207700E+04	0.200000E+02
0.500000E+02	0.267700E+04	0.250000E+02
0.110000E+02	5	
0.522493E+03	0.412352E+02	-0.265177E+00
0.424629E+01	0.322983E+00	
0.000000E+00	0.521000E+03	0.700000E+01
0.100000E+02	0.921000E+03	0.170000E+02
0.200000E+02	0.126000E+04	0.230000E+02
0.300000E+02	0.147700E+04	0.260000E+02
0.500000E+02	0.192900E+04	0.220000E+02
0.150000E+02	5	
0.268398E+03	0.369660E+02	-0.346028E+00
0.523270E+02	0.226077E-10	
0.000000E+00	0.261000E+03	0.500000E+01
0.100000E+02	0.655000E+03	0.900000E+01
0.200000E+02	0.843000E+03	0.110000E+02
0.300000E+02	0.103100E+04	0.130000E+02
0.500000E+02	0.130400E+04	0.250000E+02
0.200000E+02	5	
0.204271E+03	0.227277E+02	-0.181723E+00
0.172737E+02	0.550159E-03	
0.000000E+00	0.200000E+03	0.500000E+01
0.100000E+02	0.443000E+03	0.900000E+01
0.200000E+02	0.574000E+03	0.100000E+02
0.300000E+02	0.695000E+03	0.150000E+02
0.500000E+02	0.904000E+03	0.190000E+02
0.250000E+02	5	
0.144000E+03	0.171832E+02	-0.175955E+00
0.678039E+01	0.702218E-01	
0.000000E+00	0.141000E+03	0.500000E+01
0.100000E+02	0.309000E+03	0.700000E+01
0.200000E+02	0.419000E+03	0.110000E+02
0.300000E+02	0.478000E+03	0.120000E+02
0.500000E+02	0.570000E+03	0.120000E+02
2		
tmd test benchmark data, detector type 1, anomaly type 2		
2		
0.100000E+01		
0.000000E+00	3	
0.138283E-04	0.625000E+03	-0.125000E+04
0.773298E-11	0.100000E+01	
0.000000E+00	0.000000E+00	0.100000E+02
0.100000E+00	0.500000E+02	0.100000E+02
0.200000E+00	0.750000E+02	0.100000E+02
0.100000E+00	3	

0.838190E-06	0.500000E+02	0.247955E-04
0.929937E-14	0.100000E+01	
0.000000E+00	0.000000E+00	0.100000E+02
0.100000E+00	0.500000E+01	0.100000E+02
0.200000E+00	0.100000E+02	0.100000E+02
2	2	
1		
tmd test benchmark data, detector type 2, anomaly type 1		
9		
0.200000E+01		
0.000000E+00	11	
0.743666E+03	0.849106E+00	0.127712E-01
0.193398E+02	0.261176E+00	
0.000000E+00	0.730000E+03	0.800000E+01
0.100000E+02	0.769000E+03	0.100000E+02
0.200000E+02	0.803000E+03	0.120000E+02
0.300000E+02	0.766000E+03	0.150000E+02
0.400000E+02	0.782000E+03	0.150000E+02
0.500000E+02	0.797000E+03	0.180000E+02
0.600000E+02	0.833000E+03	0.200000E+02
0.700000E+02	0.861000E+03	0.210000E+02
0.800000E+02	0.889000E+03	0.180000E+02
0.900000E+02	0.927000E+03	0.280000E+02
0.100000E+03	0.973000E+03	0.210000E+02
0.100000E+01	9	
0.728435E+03	0.555927E+01	-0.136046E-01
0.205465E+02	0.149639E-01	
0.000000E+00	0.716000E+03	0.800000E+01
0.100000E+02	0.803000E+03	0.120000E+02
0.200000E+02	0.868000E+03	0.140000E+02
0.300000E+02	0.895000E+03	0.130000E+02
0.400000E+02	0.898000E+03	0.180000E+02
0.500000E+02	0.940000E+03	0.160000E+02
0.700000E+02	0.106000E+04	0.200000E+02
0.800000E+02	0.107400E+04	0.190000E+02
0.100000E+03	0.116900E+04	0.220000E+02
0.200000E+01	9	
0.713827E+03	0.107175E+02	-0.395029E-01
0.328313E+02	0.945924E-04	
0.000000E+00	0.693000E+03	0.900000E+01
0.100000E+02	0.836000E+03	0.100000E+02
0.200000E+02	0.959000E+03	0.160000E+02
0.300000E+02	0.101700E+04	0.150000E+02
0.400000E+02	0.108000E+04	0.190000E+02
0.500000E+02	0.110600E+04	0.160000E+02
0.700000E+02	0.124400E+04	0.230000E+02
0.800000E+02	0.128600E+04	0.250000E+02
0.100000E+03	0.142800E+04	0.210000E+02
0.400000E+01	5	
0.630001E+03	0.227898E+02	-0.185285E+00
0.439518E+01	0.310367E+00	
0.000000E+00	0.624000E+03	0.100000E+02
0.100000E+02	0.863000E+03	0.140000E+02
0.200000E+02	0.100800E+04	0.130000E+02
0.300000E+02	0.113000E+04	0.170000E+02
0.500000E+02	0.131200E+04	0.170000E+02
0.800000E+01	5	
0.449060E+03	0.255110E+02	-0.199258E+00
0.308245E+02	0.820247E-06	
0.000000E+00	0.439000E+03	0.600000E+01
0.100000E+02	0.713000E+03	0.700000E+01
0.200000E+02	0.866000E+03	0.900000E+01
0.300000E+02	0.100800E+04	0.110000E+02
0.500000E+02	0.126000E+04	0.200000E+02
0.110000E+02	5	
0.373248E+03	0.221048E+02	-0.168677E+00
0.364033E+02	0.545328E-07	
0.000000E+00	0.365000E+03	0.500000E+01
0.100000E+02	0.608000E+03	0.700000E+01
0.200000E+02	0.747000E+03	0.800000E+01
0.300000E+02	0.852000E+03	0.900000E+01
0.500000E+02	0.106900E+04	0.100000E+02
0.150000E+02	5	

0.269357E+03	0.186147E+02	-0.152742E+00
0.276896E+02	0.373963E-05	
0.000000E+00	0.261000E+03	0.500000E+01
0.100000E+02	0.466000E+03	0.600000E+01
0.200000E+02	0.572000E+03	0.600000E+01
0.300000E+02	0.675000E+03	0.800000E+01
0.500000E+02	0.826000E+03	0.900000E+01
0.200000E+02	5	
0.170268E+03	0.160168E+02	-0.140091E+00
0.127741E+02	0.456533E-02	
0.000000E+00	0.167000E+03	0.400000E+01
0.100000E+02	0.329000E+03	0.600000E+01
0.200000E+02	0.439000E+03	0.700000E+01
0.300000E+02	0.504000E+03	0.800000E+01
0.500000E+02	0.628000E+03	0.900000E+01
0.250000E+02	5	
0.120049E+03	0.127460E+02	-0.119312E+00
0.142580E+02	0.228135E-02	
0.000000E+00	0.117000E+03	0.300000E+01
0.100000E+02	0.247000E+03	0.400000E+01
0.200000E+02	0.322000E+03	0.500000E+01
0.300000E+02	0.382000E+03	0.700000E+01
0.500000E+02	0.464000E+03	0.700000E+01
2		
tmad test benchmark data, detector type 2, anomaly type 2		
2		
0.100000E+01		
0.000000E+00	3	
0.138283E-04	0.625000E+03	-0.125000E+04
0.773298E-11	0.100000E+01	
0.000000E+00	0.000000E+00	0.100000E+02
0.100000E+00	0.500000E+02	0.100000E+02
0.200000E+00	0.750000E+02	0.100000E+02
0.100000E+00	3	
0.838190E-06	0.500000E+02	0.247955E-04
0.929937E-14	0.100000E+01	
0.000000E+00	0.000000E+00	0.100000E+02
0.100000E+00	0.500000E+01	0.100000E+02
0.200000E+00	0.100000E+02	0.100000E+02
3	2	
1		
tmad test benchmark data, detector type 3, anomaly type 1		
9		
0.100000E+01		
0.000000E+00	9	
0.728399E+03	-0.101536E+02	0.627475E-01
0.400318E+03	0.000000E+00	
0.000000E+00	0.806000E+03	0.600000E+01
0.100000E+02	0.614000E+03	0.500000E+01
0.200000E+02	0.515000E+03	0.500000E+01
0.300000E+02	0.453000E+03	0.500000E+01
0.400000E+02	0.413000E+03	0.300000E+01
0.500000E+02	0.377000E+03	0.300000E+01
0.700000E+02	0.351000E+03	0.300000E+01
0.800000E+02	0.337000E+03	0.400000E+01
0.100000E+03	0.324000E+03	0.300000E+01
0.100000E+01	9	
0.723338E+03	-0.928846E+01	0.566074E-01
0.394972E+03	0.000000E+00	
0.000000E+00	0.786000E+03	0.500000E+01
0.100000E+02	0.603000E+03	0.500000E+01
0.200000E+02	0.526000E+03	0.500000E+01
0.300000E+02	0.470000E+03	0.400000E+01
0.400000E+02	0.434000E+03	0.500000E+01
0.500000E+02	0.409000E+03	0.400000E+01
0.700000E+02	0.374000E+03	0.400000E+01
0.800000E+02	0.360000E+03	0.300000E+01
0.100000E+03	0.344000E+03	0.300000E+01
0.200000E+01	9	
0.685063E+03	-0.801994E+01	0.479020E-01
0.381396E+03	0.000000E+00	
0.000000E+00	0.748000E+03	0.500000E+01
0.100000E+02	0.584000E+03	0.500000E+01

0.200000E+02	0.511000E+03	0.400000E+01
0.300000E+02	0.467000E+03	0.400000E+01
0.400000E+02	0.434000E+03	0.400000E+01
0.500000E+02	0.418000E+03	0.400000E+01
0.700000E+02	0.379000E+03	0.400000E+01
0.800000E+02	0.367000E+03	0.300000E+01
0.100000E+03	0.346000E+03	0.300000E+01
0.400000E+01	7	
0.621694E+03	-0.646497E+01	0.367858E-01
0.119805E+03	0.458780E-23	
0.000000E+00	0.652000E+03	0.500000E+01
0.100000E+02	0.536000E+03	0.600000E+01
0.200000E+02	0.476000E+03	0.600000E+01
0.300000E+02	0.441000E+03	0.500000E+01
0.500000E+02	0.405000E+03	0.400000E+01
0.700000E+02	0.360000E+03	0.400000E+01
0.100000E+03	0.336000E+03	0.400000E+01
0.800000E+01	5	
0.483692E+03	-0.696205E+01	0.739051E-01
0.165675E+02	0.768578E-03	
0.000000E+00	0.494000E+03	0.500000E+01
0.100000E+02	0.416000E+03	0.300000E+01
0.200000E+02	0.370000E+03	0.300000E+01
0.300000E+02	0.349000E+03	0.300000E+01
0.500000E+02	0.317000E+03	0.400000E+01
0.110000E+02	5	
0.403248E+03	-0.510290E+01	0.467715E-01
0.609032E+01	0.950901E-01	
0.000000E+00	0.405000E+03	0.300000E+01
0.100000E+02	0.353000E+03	0.400000E+01
0.200000E+02	0.317000E+03	0.300000E+01
0.300000E+02	0.300000E+03	0.400000E+01
0.500000E+02	0.264000E+03	0.300000E+01
0.150000E+02	5	
0.302545E+03	-0.317926E+01	0.285659E-01
0.677648E+01	0.703433E-01	
0.000000E+00	0.300000E+03	0.300000E+01
0.100000E+02	0.277000E+03	0.200000E+01
0.200000E+02	0.247000E+03	0.200000E+01
0.300000E+02	0.234000E+03	0.200000E+01
0.500000E+02	0.215000E+03	0.300000E+01
0.200000E+02	7	
0.211050E+03	-0.112587E+01	0.353858E-02
0.281141E+02	0.459627E-04	
0.000000E+00	0.206000E+03	0.200000E+01
0.500000E+01	0.214000E+03	0.300000E+01
0.100000E+02	0.207000E+03	0.300000E+01
0.150000E+02	0.200000E+03	0.300000E+01
0.200000E+02	0.189000E+03	0.200000E+01
0.300000E+02	0.176000E+03	0.200000E+01
0.500000E+02	0.165000E+03	0.200000E+01
0.250000E+02	5	
0.162126E+03	-0.605446E+00	-0.263959E-03
0.706112E+01	0.620136E-01	
0.000000E+00	0.160000E+03	0.200000E+01
0.100000E+02	0.160000E+03	0.200000E+01
0.200000E+02	0.150000E+03	0.200000E+01
0.300000E+02	0.141000E+03	0.200000E+01
0.500000E+02	0.132000E+03	0.200000E+01
2		
tmd test benchmark data, detector type 3, anomaly type 2		
2		
0.100000E+01		
0.000000E+00	3	
0.138283E-04	0.625000E+03	-0.125000E+04
0.773298E-11	0.100000E+01	
0.000000E+00	0.000000E+00	0.100000E+02
0.100000E+00	0.500000E+02	0.100000E+02
0.200000E+00	0.750000E+02	0.100000E+02
0.100000E+00	3	
0.838190E-06	0.500000E+02	0.247955E-04
0.929937E-14	0.100000E+01	
0.000000E+00	0.000000E+00	0.100000E+02

0.100000E+00	0.500000E+01	0.100000E+02
0.200000E+00	0.100000E+02	0.100000E+02

D.6 File tmdtest6.lib

TMAD test library

1 1 1995

3 2

detector type 1

detector type 2

detector type 3

anomaly type 1

anomaly type 2

0.718838E-03

0.718838E-03

0.718838E-03

0.000000E+00 0.500000E+02

0.000000E+00 0.100000E+03

3

1 2

1

tmd test benchmark data, detector type 1, anomaly type 1

9

0.100000E+01

0.000000E+00

9

0.197367E+04 0.142727E+03 -0.744647E+00

0.173943E+02 0.499274E-01

0.000000E+00 0.194700E+04 0.200000E+02

0.100000E+02 0.336300E+04 0.250000E+02

0.200000E+02 0.457100E+04 0.330000E+02

0.300000E+02 0.559600E+04 0.500000E+02

0.400000E+02 0.647400E+04 0.490000E+02

0.500000E+02 0.724100E+04 0.640000E+02

0.700000E+02 0.814300E+04 0.770000E+02

0.800000E+02 0.847300E+04 0.800000E+02

0.100000E+03 0.890700E+04 0.610000E+02

0.100000E+01 9

0.172225E+04 0.127297E+03 -0.647936E+00

0.179500E+02 0.405366E-01

0.000000E+00 0.170100E+04 0.180000E+02

0.100000E+02 0.298100E+04 0.280000E+02

0.200000E+02 0.405000E+04 0.300000E+02

0.300000E+02 0.494400E+04 0.360000E+02

0.400000E+02 0.568300E+04 0.510000E+02

0.500000E+02 0.652600E+04 0.540000E+02

0.700000E+02 0.736200E+04 0.740000E+02

0.800000E+02 0.763200E+04 0.770000E+02

0.100000E+03 0.807600E+04 0.690000E+02

0.200000E+01 9

0.150253E+04 0.111411E+03 -0.554680E+00

0.244811E+02 0.311527E-02

0.000000E+00 0.147800E+04 0.160000E+02

0.100000E+02 0.260200E+04 0.200000E+02

0.200000E+02 0.353200E+04 0.330000E+02

0.300000E+02 0.435900E+04 0.410000E+02

0.400000E+02 0.506600E+04 0.380000E+02

0.500000E+02 0.570100E+04 0.440000E+02

0.700000E+02 0.649200E+04 0.530000E+02

0.800000E+02 0.671100E+04 0.540000E+02

0.100000E+03 0.723000E+04 0.540000E+02

0.400000E+01 5

0.110046E+04 0.910554E+02 -0.524501E+00

0.385443E+01 0.359806E+00

0.000000E+00 0.109500E+04 0.140000E+02

0.100000E+02 0.197300E+04 0.190000E+02

0.200000E+02 0.272900E+04 0.230000E+02

0.300000E+02 0.332000E+04 0.260000E+02

0.500000E+02 0.435500E+04 0.300000E+02

0.800000E+01 5

0.705947E+03 0.576389E+02 -0.370130E+00

0.987140E+01 0.174512E-01

0.000000E+00 0.695000E+03 0.120000E+02

0.100000E+02	0.128600E+04	0.160000E+02
0.200000E+02	0.169500E+04	0.190000E+02
0.300000E+02	0.207700E+04	0.200000E+02
0.500000E+02	0.267700E+04	0.250000E+02
0.110000E+02	5	
0.522493E+03	0.412352E+02	-0.265177E+00
0.424629E+01	0.322983E+00	
0.000000E+00	0.521000E+03	0.700000E+01
0.100000E+02	0.921000E+03	0.170000E+02
0.200000E+02	0.126000E+04	0.230000E+02
0.300000E+02	0.147700E+04	0.260000E+02
0.500000E+02	0.192900E+04	0.220000E+02
0.150000E+02	5	
0.268398E+03	0.369660E+02	-0.346028E+00
0.523270E+02	0.226077E-10	
0.000000E+00	0.261000E+03	0.500000E+01
0.100000E+02	0.655000E+03	0.900000E+01
0.200000E+02	0.843000E+03	0.110000E+02
0.300000E+02	0.103100E+04	0.130000E+02
0.500000E+02	0.130400E+04	0.250000E+02
0.200000E+02	5	
0.204271E+03	0.227277E+02	-0.181723E+00
0.172737E+02	0.550159E-03	
0.000000E+00	0.200000E+03	0.500000E+01
0.100000E+02	0.443000E+03	0.900000E+01
0.200000E+02	0.574000E+03	0.100000E+02
0.300000E+02	0.695000E+03	0.150000E+02
0.500000E+02	0.904000E+03	0.190000E+02
0.250000E+02	5	
0.144000E+03	0.171832E+02	-0.175955E+00
0.678039E+01	0.702218E-01	
0.000000E+00	0.141000E+03	0.500000E+01
0.100000E+02	0.309000E+03	0.700000E+01
0.200000E+02	0.419000E+03	0.110000E+02
0.300000E+02	0.478000E+03	0.120000E+02
0.500000E+02	0.570000E+03	0.120000E+02
2		
tmd test benchmark data, detector type 1, anomaly type 2		
2		
0.100000E+01		
0.000000E+00	3	
0.138283E-04	0.625000E+03	-0.125000E+04
0.773298E-11	0.100000E+01	
0.000000E+00	0.000000E+00	0.100000E+02
0.100000E+00	0.500000E+02	0.100000E+02
0.200000E+00	0.750000E+02	0.100000E+02
0.100000E+00	3	
0.838190E-06	0.500000E+02	0.247955E-04
0.929937E-14	0.100000E+01	
0.000000E+00	0.000000E+00	0.100000E+02
0.100000E+00	0.500000E+01	0.100000E+02
0.200000E+00	0.100000E+02	0.100000E+02
2		
2		
1		
tmd test benchmark data, detector type 2, anomaly type 1		
9		
0.100000E+01		
0.000000E+00	11	
0.743666E+03	0.849106E+00	0.127712E-01
0.193398E+02	0.261176E+00	
0.000000E+00	0.730000E+03	0.800000E+01
0.100000E+02	0.769000E+03	0.100000E+02
0.200000E+02	0.803000E+03	0.120000E+02
0.300000E+02	0.766000E+03	0.150000E+02
0.400000E+02	0.782000E+03	0.150000E+02
0.500000E+02	0.797000E+03	0.180000E+02
0.600000E+02	0.833000E+03	0.200000E+02
0.700000E+02	0.861000E+03	0.210000E+02
0.800000E+02	0.889000E+03	0.180000E+02
0.900000E+02	0.927000E+03	0.280000E+02
0.100000E+03	0.973000E+03	0.210000E+02
0.100000E+01	9	
0.728435E+03	0.555927E+01	-0.136046E-01

0.205465E+02	0.149639E-01	
0.000000E+00	0.716000E+03	0.800000E+01
0.100000E+02	0.803000E+03	0.120000E+02
0.200000E+02	0.868000E+03	0.140000E+02
0.300000E+02	0.895000E+03	0.130000E+02
0.400000E+02	0.898000E+03	0.180000E+02
0.500000E+02	0.940000E+03	0.160000E+02
0.700000E+02	0.106000E+04	0.200000E+02
0.800000E+02	0.107400E+04	0.190000E+02
0.100000E+03	0.116900E+04	0.220000E+02
0.200000E+01	9	
0.713827E+03	0.107175E+02	-0.395029E-01
0.328313E+02	0.945924E-04	
0.000000E+00	0.693000E+03	0.900000E+01
0.100000E+02	0.836000E+03	0.100000E+02
0.200000E+02	0.959000E+03	0.160000E+02
0.300000E+02	0.101700E+04	0.150000E+02
0.400000E+02	0.108000E+04	0.190000E+02
0.500000E+02	0.110600E+04	0.160000E+02
0.700000E+02	0.124400E+04	0.230000E+02
0.800000E+02	0.128600E+04	0.250000E+02
0.100000E+03	0.142800E+04	0.210000E+02
0.400000E+01	5	
0.630001E+03	0.227898E+02	-0.185285E+00
0.439518E+01	0.310367E+00	
0.000000E+00	0.624000E+03	0.100000E+02
0.100000E+02	0.863000E+03	0.140000E+02
0.200000E+02	0.100800E+04	0.130000E+02
0.300000E+02	0.113000E+04	0.170000E+02
0.500000E+02	0.131200E+04	0.170000E+02
0.800000E+01	5	
0.449060E+03	0.255110E+02	-0.199258E+00
0.308245E+02	0.820247E-06	
0.000000E+00	0.439000E+03	0.600000E+01
0.100000E+02	0.713000E+03	0.700000E+01
0.200000E+02	0.866000E+03	0.900000E+01
0.300000E+02	0.100800E+04	0.110000E+02
0.500000E+02	0.126000E+04	0.200000E+02
0.110000E+02	5	
0.373248E+03	0.221048E+02	-0.168677E+00
0.364033E+02	0.545328E-07	
0.000000E+00	0.365000E+03	0.500000E+01
0.100000E+02	0.608000E+03	0.700000E+01
0.200000E+02	0.747000E+03	0.800000E+01
0.300000E+02	0.852000E+03	0.900000E+01
0.500000E+02	0.106900E+04	0.100000E+02
0.150000E+02	5	
0.269357E+03	0.186147E+02	-0.152742E+00
0.276896E+02	0.373963E-05	
0.000000E+00	0.261000E+03	0.500000E+01
0.100000E+02	0.466000E+03	0.600000E+01
0.200000E+02	0.572000E+03	0.600000E+01
0.300000E+02	0.675000E+03	0.800000E+01
0.500000E+02	0.826000E+03	0.900000E+01
0.200000E+02	5	
0.170268E+03	0.160168E+02	-0.140091E+00
0.127741E+02	0.456533E-02	
0.000000E+00	0.167000E+03	0.400000E+01
0.100000E+02	0.329000E+03	0.600000E+01
0.200000E+02	0.439000E+03	0.700000E+01
0.300000E+02	0.504000E+03	0.800000E+01
0.500000E+02	0.628000E+03	0.900000E+01
0.250000E+02	5	
0.120049E+03	0.127460E+02	-0.119312E+00
0.142580E+02	0.228135E-02	
0.000000E+00	0.117000E+03	0.300000E+01
0.100000E+02	0.247000E+03	0.400000E+01
0.200000E+02	0.322000E+03	0.500000E+01
0.300000E+02	0.382000E+03	0.700000E+01
0.500000E+02	0.464000E+03	0.700000E+01

2

tmd test benchmark data, detector type 2, anomaly type 2

2

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0.100000E+01
0.000000E+00 3
0.138283E-04 0.625000E+03 -0.125000E+04
0.773298E-11 0.100000E+01
0.000000E+00 0.000000E+00 0.100000E+02
0.100000E+00 0.500000E+02 0.100000E+02
0.200000E+00 0.750000E+02 0.100000E+02
0.100000E+00 3
0.838190E-06 0.500000E+02 0.247955E-04
0.929937E-14 0.100000E+01
0.000000E+00 0.000000E+00 0.100000E+02
0.100000E+00 0.500000E+01 0.100000E+02
0.200000E+00 0.100000E+02 0.100000E+02
3 2
1
tmad test benchmark data, detector type 3, anomaly type 1
9
0.100000E+01
0.000000E+00 9
0.728399E+03 -0.101536E+02 0.627475E-01
0.400318E+03 0.000000E+00
0.000000E+00 0.806000E+03 0.600000E+01
0.100000E+02 0.614000E+03 0.500000E+01
0.200000E+02 0.515000E+03 0.500000E+01
0.300000E+02 0.453000E+03 0.500000E+01
0.400000E+02 0.413000E+03 0.300000E+01
0.500000E+02 0.377000E+03 0.300000E+01
0.700000E+02 0.351000E+03 0.300000E+01
0.800000E+02 0.337000E+03 0.400000E+01
0.100000E+03 0.324000E+03 0.300000E+01
0.100000E+01 9
0.723338E+03 -0.928846E+01 0.566074E-01
0.394972E+03 0.000000E+00
0.000000E+00 0.786000E+03 0.500000E+01
0.100000E+02 0.603000E+03 0.500000E+01
0.200000E+02 0.526000E+03 0.500000E+01
0.300000E+02 0.470000E+03 0.400000E+01
0.400000E+02 0.434000E+03 0.500000E+01
0.500000E+02 0.409000E+03 0.400000E+01
0.700000E+02 0.374000E+03 0.400000E+01
0.800000E+02 0.360000E+03 0.300000E+01
0.100000E+03 0.344000E+03 0.300000E+01
0.200000E+01 9
0.685063E+03 -0.801994E+01 0.479020E-01
0.381396E+03 0.000000E+00
0.000000E+00 0.748000E+03 0.500000E+01
0.100000E+02 0.584000E+03 0.500000E+01
0.200000E+02 0.511000E+03 0.400000E+01
0.300000E+02 0.467000E+03 0.400000E+01
0.400000E+02 0.434000E+03 0.400000E+01
0.500000E+02 0.418000E+03 0.400000E+01
0.700000E+02 0.379000E+03 0.400000E+01
0.800000E+02 0.367000E+03 0.300000E+01
0.100000E+03 0.346000E+03 0.300000E+01
0.400000E+01 7
0.621694E+03 -0.646497E+01 0.367858E-01
0.119805E+03 0.458780E-23
0.000000E+00 0.652000E+03 0.500000E+01
0.100000E+02 0.536000E+03 0.600000E+01
0.200000E+02 0.476000E+03 0.600000E+01
0.300000E+02 0.441000E+03 0.500000E+01
0.500000E+02 0.405000E+03 0.400000E+01
0.700000E+02 0.360000E+03 0.400000E+01
0.100000E+03 0.336000E+03 0.400000E+01
0.800000E+01 5
0.483692E+03 -0.696205E+01 0.739051E-01
0.165675E+02 0.768578E-03
0.000000E+00 0.494000E+03 0.500000E+01
0.100000E+02 0.416000E+03 0.300000E+01
0.200000E+02 0.370000E+03 0.300000E+01
0.300000E+02 0.349000E+03 0.300000E+01
0.500000E+02 0.317000E+03 0.400000E+01
0.110000E+02 5

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0.403248E+03	-0.510290E+01	0.467715E-01
0.609032E+01	0.950901E-01	
0.000000E+00	0.405000E+03	0.300000E+01
0.100000E+02	0.353000E+03	0.400000E+01
0.200000E+02	0.317000E+03	0.300000E+01
0.300000E+02	0.300000E+03	0.400000E+01
0.500000E+02	0.264000E+03	0.300000E+01
0.150000E+02	5	
0.302545E+03	-0.317926E+01	0.285659E-01
0.677648E+01	0.703433E-01	
0.000000E+00	0.300000E+03	0.300000E+01
0.100000E+02	0.277000E+03	0.200000E+01
0.200000E+02	0.247000E+03	0.200000E+01
0.300000E+02	0.234000E+03	0.200000E+01
0.500000E+02	0.215000E+03	0.300000E+01
0.200000E+02	7	
0.211050E+03	-0.112587E+01	0.353858E-02
0.281141E+02	0.459627E-04	
0.000000E+00	0.206000E+03	0.200000E+01
0.500000E+01	0.214000E+03	0.300000E+01
0.100000E+02	0.207000E+03	0.300000E+01
0.150000E+02	0.200000E+03	0.300000E+01
0.200000E+02	0.189000E+03	0.200000E+01
0.300000E+02	0.176000E+03	0.200000E+01
0.500000E+02	0.165000E+03	0.200000E+01
0.250000E+02	5	
0.162126E+03	-0.605446E+00	-0.263959E-03
0.706112E+01	0.620136E-01	
0.000000E+00	0.160000E+03	0.200000E+01
0.100000E+02	0.160000E+03	0.200000E+01
0.200000E+02	0.150000E+03	0.200000E+01
0.300000E+02	0.141000E+03	0.200000E+01
0.500000E+02	0.132000E+03	0.200000E+01
2		
tmd test benchmark data, detector type 3, anomaly type 2		
2		
0.100000E+01		
0.000000E+00	3	
0.138283E-04	0.625000E+03	-0.125000E+04
0.773298E-11	0.100000E+01	
0.000000E+00	0.000000E+00	0.100000E+02
0.100000E+00	0.500000E+02	0.100000E+02
0.200000E+00	0.750000E+02	0.100000E+02
0.100000E+00	3	
0.838190E-06	0.500000E+02	0.247955E-04
0.929937E-14	0.100000E+01	
0.000000E+00	0.000000E+00	0.100000E+02
0.100000E+00	0.500000E+01	0.100000E+02
0.200000E+00	0.100000E+02	0.100000E+02