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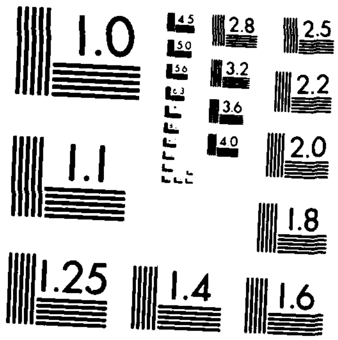

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IMPLEMENTATION PLAN FOR DATA COLLECTION, REDUCTION, AND ANALYSIS IN SUPPORT OF THE AUTOMATED TECHNICAL CONTROL (ATEC) JOINT OPERATIONAL TEST AND EVALUATION PROGRAM (JOT&E)

Prepared for
U.S. AIR FORCE COMMUNICATIONS SERVICE
Richards-Gebaur AFB, Missouri

Under
CONTRACT NO. F23613-74-C-0014 TASK 75-18
(SUBTASK D)

MAY 1976

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COMPUTER SCIENCES CORPORATION

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The purpose of this Implementation Plan is to provide for the collection, storage, and processing of data gathered by the ATEC Test Team. The Plan is a result of an analysis of the JOT&E Test Plan, Annex A, discussions with AFCS personnel, and observations made during a December 1975 visit to the Federal Republic of Germany.
The salient feature of this plan is that the software developed --

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Major Offices and Facilities Throughout the World

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SECTION 1 - INTRODUCTION

The purpose of this Implementation Plan is to provide for the collection, storage, and processing of data gathered by the ATEC Test Team. The Plan is a result of an analysis of the JOT&E Test Plan, Annex A, discussions with AFCS personnel, and observations made during a December 1975 visit to the Federal Republic of Germany.

Section 2 discusses input data collection. Included are types of data to be collected, collection method, and examples of the data.

Section 3 discusses output requirements. A list of identified outputs is presented and sample outputs are included.

Section 4 discusses implementation of data input collection and output generation. Included are methods of implementing data collection, data storage and transportation, security considerations, a discussion of available hardware and software, processing required, and data base structure and requirements.

Appendix A is a listing of representative AFTEC and DCEC forms, with recommended card input formats. This appendix has been developed with the assistance of the Test Team, AFCS, and AFTEC.

Appendix B is an extract from Honeywell BMD documentation showing sample data outputs.

The salient feature of this plan is that the software developed will be reusable on any Government WWMCCS computer system. The software involved can be divided into two basic functions: verification of input and processing.

The verification software will be written in a higher order language (HOL). The processing software will utilize the WWDMS data management software routines and the Honeywell version of the BMD statistical software routines. Both software packages are standard on any Government WWMCCS computer system.

The combination of HOL verification software and WWMCCS standard software routines make the implementation totally transportable.

SECTION 2 - INPUT DATA REQUIREMENTS

There are six main categories of data required for input to the data base. They are:

1. AFTEC JOT&E Data Forms
2. DCEC Modified JOT&E Forms
3. ATEC Parameter Data
4. Outage Reports
5. Maintenance Data
6. Circuit Directory Data.

The requirements for (1) are taken directly from the JOT&E Test Plan, while the requirements for (2) through (6) are derived from discussions with the test team analyst, DCEC Personnel, and from 1815 Test Squadron message 070545Z Oct 75. In this message, a preliminary attempt was made to formulate a data base structure using these inputs. This message and subsequent discussions identified the following breakout of the data base. The acronym SMART was coined by the test team to identify the data base elements, and is included to facilitate correlation with the referenced message. The data base elements were defined as:

1. Directory, by site, of links, trunks, and VF and DC circuits (SMART-0A)
2. Maintenance data from MDC files in Rhein Main computer system (SMART-0B)
3. Circuit outage tickets and other OPS data (SMART-0C)
4. Parameter data from ATEC equipment (SMART-0D).

These elements are required to satisfy OT&E objectives, DT&E requirements, and to provide management information. The management information is required to provide an overview of the system. It will indicate how the system is changing, if at all, and where best to perform certain types of tests. These reports have been grouped under the general category of "Measure of Effectiveness," and the report forms are discussed in Section 3.

This raw data is currently in one of three forms:

1. Paper - JOT&E test forms, OPS data, TCF files, Army MDC forms, and DCS circuit and trunk directories.

2. Punched paper tape - Parameter input data from ATEC equipments (I/OQCS, DDMS, MTS, etc.)

3. Magnetic tape - MDC files from 1945 Comm Squadron.

The following paragraphs specify a methodology for converting the raw data to formats for implementation into the data base.

2.1 AFTEC REPORTS AND FORMS

The individual objectives of the Joint Operational Test and Evaluation (JOT&E), Automated Technical Control Program (ATEC) Test Plan dated October 1975 have been reviewed with respect to their adaptability to Automatic Data Processing (ADP). To meet the desired objectives, the Test Plan called for use of over 100 forms for the collection of data. A major effort was undertaken to standardize input cards to minimize the number of different entry formats. As a result of this investigation, the required number of input data card formats has been reduced to eight. The reduction in the number required is the result of utilizing the same entry card for a number of forms with differences in the data field filled in or left blank by the key-punch operator.

Figures 2-1, 2-2, and 2-3 depict, respectively, a typical AFTEC data form; card format into which the data is placed for entry into the data base; and instructions as to how the data is to be implemented onto the card. Similar format and instruction forms have been generated for every AFTEC form suitable for ADP. These are assembled into Appendix A of this Plan for quick accessibility and reference.

PILOT MONITOR (PM) TEST*

LINK NO	MCHL LKF	TEST CHANNEL		PM				MANUAL			
		PJ	FREQ	PJ	FREQ	DTG START	DTG STOP	PJ	FREQ	DTG START	DTG STOP
MØØ69	MUL	2Ø	26ØØ	2Ø	26ØØ	5318Ø7ØØ	5318Ø71Ø				

Put remarks on back of form.
AFTEC Form 143 (AFTEC) Test
Oct 1975

Figure 2-1. AFTEC Form 143

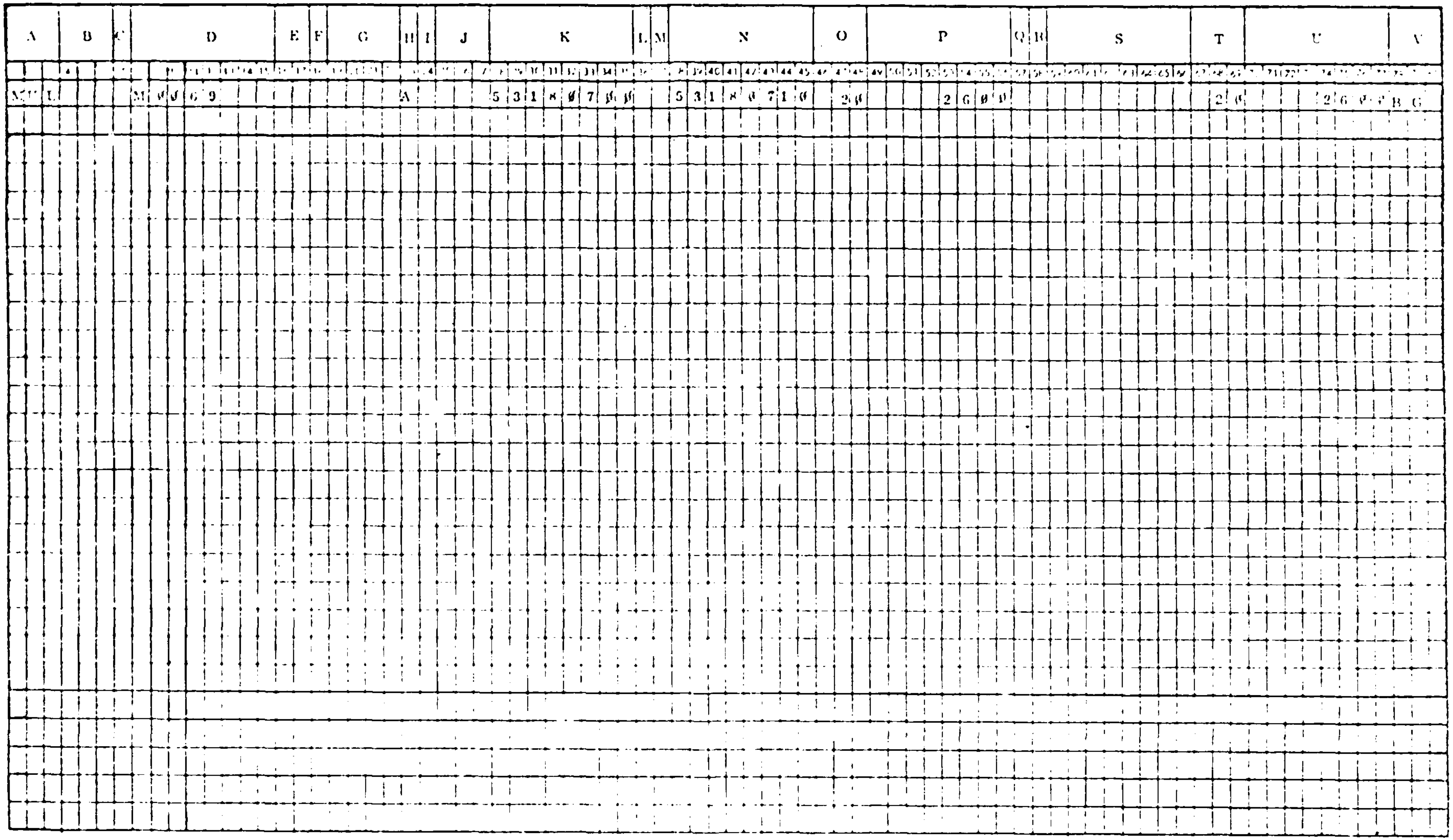


Figure 2-2. Data Transferral - AFTEC Form 143

AFTEC FORM NO. 143	CARD NO. B		
FORM ENTRY DESCRIPTION	**FIELD**	**DESCRIPTION**	**TRANSFER INSTRUCTIONS**
MUHL/LKF	A	Site	See Table A3 for Site Codes
	B	ATE Type	Code / Meaning Item 4 P MTS(PM) Item 5 Q I/OQCS Item 6 N NSS Control Note: If test mode is manual do not use the field
Link No.	D	Link Number	Direct Transfer
	H	Test Mode	Code / Meaning A Indicates times and measurements on this card are automatic M Indicates times and measurements on this card are manual
Manual (or PM) DTG Start	K	DTG Start	See Table A5 for Instructions
Manual (or PM) DTG Stop	N	DTG Stop	See Table A5 for Instructions
Test Channel PJ	O	Measurement Data	Direct Transfer
Test Channel FR	P	Measurement Data	Direct Transfer
PM or Manual PJ	T	Measurement Data	Direct Transfer
PM or Manual FR	U	Measurement Data	Direct Transfer
	V	Control	Code / Meaning Item 78 B Card ID Item 79 G Form ID Item 80 Not Used

Figure 2-3. Data Transferral - AFTEC Form 143

Test Plan objectives were analyzed utilizing a matrix in which the data collection forms were aligned against their ADP adaptability. The results are assembled in Tables 2-1, 2-2, and 2-3. In these tables, the FORM column always indicates an AFTEC form unless indicated otherwise.

The CARD NO. column cross-references or correlates to Appendix A where the entry card formats are found. The letter appearing in the column denotes the input data card format to be used with that particular data form. If the form is not adaptable to ADP, the REMARKS column explains or presents relevant information in clarifying this decision.

The following are analyses by annexes of the JOT&E Test Plan.

2.1.1 Annex A

Most of the data forms in Annex A are adaptable to ADP. There are a few questions on some of the forms as to the meaning of the information required and some forms should contain additional data to make them more complete.

Those forms classified as unsuitable for ADP are done so because the report can be generated automatically from the data base.

2.1.2 Annex B

Annex B consists of three appendices:

- Appendix 1 - Logistics Supportability Test Procedures
- Appendix 2 - Reliability/Maintainability Plan
- Appendix 3 - Reliability/Maintainability Data Reduction and Analysis Plan.

An analysis was performed on Appendices 1 and 3. Appendix 2 requires no data forms as it contains only duties and responsibilities for monitoring the JOT&E and for collecting the R/M data.

Table 2-1. Annex A Matrix

JOT&E PARA. NO.	JOT&E PAGE NO.	OBJECTIVE	FORM	ADP ADAPT-ABILITY	CARD NO.	REMARKS
2.4.1.1.1	A-54	Evaluate the ability of technical controllers to set required alarm thresholds in the ATEs (IQCS, I/OQCS, DDMS, MSMS).	None	--	--	
2.4.1.1.2	A-55	Verify that the in-service automatic scanning capability of the IQCS, I/OQCS, DDMS and MSMS enhances the ability of the technical controller to accomplish the performance monitoring tasks.	125	Yes	A	
2.4.1.1.3	A-58	Evaluate the capability of the IQCS and the I/OQCS to enhance the technical controller's ability to maintain level discipline.	126	No	--	Format and Report can be generated automatically from data contained in data base.
			127	No	--	Format and Report can be generated automatically from data contained in data base.
2.4.1.1.4	A-61	Evaluate the usefulness of the ATEs in accomplishing the DCA performance program.	178	Yes	B	
			173B	Yes	B	
			173C	Yes	B	
2.4.1.1.5	A-63	Evaluate the usefulness of the MSMS in enhancing the technical controller's capability to accomplish performance monitoring of VFCT systems.	128	Yes	A	
2.4.1.1.6	A-65	Evaluate the effectiveness of using the OQCS to accomplish parameter testing required for DCA S3 circuits as defined in DCAC 310-70-1. (If successful, this will ensure the ability of the I/OQCS to accomplish parameter testing of all lower grade circuits.)	129	Yes	B	
2.4.1.1.7	A-68	Evaluate the extent to which the BBSA aids the local technical controller and maintainer in accomplishing baseband sweeps.	130	Yes	B	Form should contain the site information.
			130A	Yes	B	
2.4.1.1.8	A-70	Evaluate the utility of the MTS alarm reporting system (MAD and ADU) relative to existing alarm systems at the local sites.	131	Yes	B	
			132	Yes	D	Site and date should be incorporated on form
			134	No	--	Format and Report can be generated automatically from data contained in data base.
--	--	Site Profile	139	Yes	F & G	

Table 2-1. Annex A Matrix (Continued)

JOT&E PARA. NO.	JOT&E PAGE NO.	OBJECTIVE	FORM	ADP ADAPT-ABILITY	CARD NO.	REMARKS
2.4.1.1.9	A-75	Evaluate the utility of the MTS as a piece of performance monitoring test equipment at the local site.	131	Yes	B	
			133	Yes	D	Site should be incorporated on form.
			134	No	--	Format and Report can be generated automatically from data contained in data base
2.4.1.1.10	A-82	Evaluate the relative speed and quality of doing baseband analysis using the BBSA controlled by the NSS as compared to manual accomplishment at the local site.	130	Yes	B	Site should be incorporated on form.
			135	Yes	D	Form should contain site and date information.
			134	No	--	Format and Report can be generated automatically from data contained in data base.
2.4.1.1.11	A-86	Evaluation of the capability of the NSS controlling the MTS options to accomplish TPA measurements of wideband systems.	140	Yes	B	Site should be on form.
			141	Yes	B	Site should be on form.
			142	Yes	B	Site should be on form.
			143	Yes	B	Site should be on form.
			144	Yes	B	Site should be on form.
			145	Yes	B	Site should be on form.
			146	Yes	B	Site should be on form.
2.4.1.1.12	A-99	Evaluate the capability of the NSS controlled MTS (MAC) to make VF, DC and RSL measurements.	136	No	--	Format and Report can be generated automatically from data contained in data base.
2.4.1.1.13	A-102	Evaluate whether the NSS console operator can ascertain the source of alarms transmitted to the NSS and can use the ARS through the NSS to determine the status of particular alarms.	132	Yes	D	Site and date should be incorporated on form.
			137	Yes	D	Site should be incorporated on form.
2.4.1.1.14	A-108	Evaluation of the ability to accomplish PMP testing using the time dependent test capability of the NSS.	147	Yes	D	Site should be incorporated on form.
2.4.1.1.15	A-113	Evaluate whether the ATE's alarm levels can be established such that they are site and transmission link independent.	139	Yes	C	Site and date should be incorporated on form.
2.4.1.2.1	A-114	Evaluation of the utility and completeness of displays generated by the ATEs and NSS.	148	Yes	D	Site should be incorporated on form.
			134	No	--	Format and Report can be generated automatically from data contained in data base.

Table 2-1. Annex A Matrix (Continued)

JOT&E PARA. NO.	JOT&E PAGE NO.	OBJECTIVE	FORM	ADP ADAPT-ABILITY	CARD NO.	REMARKS
2.4.1.2.2	A-119	The usefulness of the ATEC message mode feature as a method of coordinating between ATE operators, and between ATE operators and the NSS operator.	150	Yes	E	Site and ATE Type should be incorporated on form.
2.4.1.2.3	A-122	Evaluation of the usefulness of the ATEs in facilitating alternate routing decisions and restoral actions.	151	Yes	H	
2.4.1.2.4	A-125	Evaluation of the operational impact on the loss of power to an ATE and/or the NSS and the subsequent restoral of the respective equipment.	152	No	--	Narrative in Nature.
			153	No	--	No ADP necessary per test team representatives.
2.4.1.2.5	A-132	Evaluation of the ATEC system operations during degraded conditions of either the ATEC system, the telemetry links, or both.	154	No	--	The present form is narrative in nature.
2.4.1.2.6	A-134	Evaluation of the ability of an ATE(s) to fulfill the total testing requirements of the site at which it is installed and identify the manual test equipment necessary to supplement the ATEC capability.	155	No	--	No processing necessary
2.4.1.2.7	A-136	Evaluation of the manual backup necessary to sustain an acceptable technical control operation for 24 hours, one week, and one month in the event of the loss of use of the ATEC equipment at a site.	156	No	--	The present form is narrative in nature.
2.4.1.2.8	A-139	Evaluation of the time delay for task execution by the NSS console operator as affected by different loading on the NSS, from zero to all ATE(s) in operation and connected to the NSS.	157	Yes	B	Site should be incorporated on form.
2.4.1.2.9	A-142	Verification that the IQCS can correctly identify traffic types in the operational environment.	158	Yes	C	Site should be incorporated on form.
			159	No	--	Format and Report can be generated automatically from data contained in the data base.
2.4.1.2.10	A-145	Verification that the DDMS can correctly determine baud rate using the dynamic baud determination routine and the associated KW-26 routine in an operational environment.	138	Yes	C	Site should be incorporated on form.
			179	No	--	Format and Report can be generated automatically from data contained in the data base.

Table 2-1. Annex A Matrix (Continued)

JOT&E PARA. NO.	JOT&E PAGE NO.	OBJECTIVE	FORM	ADP ADAPT-ABILITY	CARD NO.	REMARKS
2.4.1.3.1	A-148	Evaluation of the capability of the technical controller to recognize a trend in the performance of a communications circuit/system using information provided by the ATE and/or NSS.	160	Yes	A	
			161	Yes	D	Site and date should be incorporated on form.
			134	No	--	Format and Report can be generated automatically from data contained in the data base.
2.4.1.4.1	A-157	To evaluate the enhancement (provided by the IQCS and the IQCS controlled by the NSS) of the technical controllers capability to accomplish fault isolation tasks.	168	Yes	B	ATEC type should be included on form.
2.4.1.4.2	A-161	To evaluate the enhancement (provided by the IQCS, BBSA, and MTS and options under local site and/or NSS control) of the technical controllers capability to accomplish fault isolation.	168	Yes	B	ATEC type should be included on form.
2.4.1.4.3	A-163	Evaluate the enhancement (provided by the MSMS and the DDMS site controlled or controlled by the NSS) of the technical controllers capability to accomplish fault isolation tasks.	168	Yes	B	ATEC type should be included on form.
2.4.1.4.4	A-165	To evaluate the usage made of the individual ATE(s) and NSS for fault isolation under normal operating conditions.	169	No	--	Format and Report can be generated automatically from data contained in the data base.
			170	No	--	Format and Report can be generated automatically from data contained in the data base.
2.4.1.4.5	A-170	Evaluate the effectiveness of using ATEC equipment to isolate problems on S3 circuits.	172	Yes	B	Site and circuit ID should be included on form.
2.4.1.4.6	A-176	Evaluate the utility of the NLG and SLG in fault isolation.	None	--	--	
2.4.1.4.7	A-178	Evaluate the utility of the ATEC equipment in aiding the technical controller in accomplishing more precise fault isolation than manual methods.	173	Yes	B	Circuit ID should be included on form.
			174	Yes	B	Circuit ID should be included on form.
			175	Yes	B	
			176	Yes	B	Circuit ID should be included on form.
			177	Yes	B	
2.4.1.5.1	A-191	Evaluation of the extent to which record keeping is enhanced through the use of ATE(s) and NSS outputs.	171	No	--	No processing necessary

Table 2-1. Annex A Matrix (Continued)

JOT&E PARA. NO.	JOT&E PAGE NO.	OBJECTIVE	FORM	ADP ADAPT-ABILITY	CARD NO.	REMARKS
2.4.1.5.2	A-194	Evaluation of the completeness of NSS generated reports relative to MILDEP and DCAC 310-55-1 status reporting requirements.	171	No	--	No processing necessary
			162	Yes	E	Form should contain ATE Type
			162A	Yes	E	
			163	Yes	E	
			164	Yes	D	Site should be included on form.
2.4.1.6.1	A-204	Evaluate the utility of the ATEs in facilitating management and control at level four as defined in the draft DCA concept of operation for ATEC. Management is defined as having adequate information (timely and accurate) about the status of a circuit/system for which a site is responsible and being capable of determining the appropriate action. Control is having the authority to implement and direct the necessary actions.	None	--	--	
2.4.1.6.2	A-205	Evaluate the utility of the ATEC in facilitating management and control at level three as defined in the draft DCA concept of operations for ATEC. Management is defined as having adequate information (timely and accurate) about the status of a circuit/system for which a site is responsible and being capable of determining the appropriate action. Control is having the authority to implement and direct the necessary actions.	None	--	--	
2.4.2.1	A-20[illegible]	Determine the reliability (mean time between failure, MTBF), maintainability (mean time to repair, MTTR), and availability (A) of the ATEC system.				See Table 2.3
2.4.2.1.1	A-20[illegible]	Determine the mean time to isolate ATEC malfunctions to hardware or software.				See Table 2.3
[illegible].2.1.2.[illegible]	A-[illegible]	Determine the mean time to isolate a fault once it has been determined that it is hardware related.				See Table 2.3
[illegible].2.1.2.[illegible]	A-210	Determine the mean time to effect the repair of a hardware fault once the suspect module/component is identified.				See Table 2.3
[illegible].2.1.2.[illegible]	A-21[illegible]	Determine the mean time to complete a minimum performance test to ascertain that system restoral action is complete.				See Table 2.3

Table 2-1. Annex A Matrix (Continued)

JOT&E PARA. NO.	JOT&E PAGE NO.	OBJECTIVE	FORM	ADP ADAPT-ABILITY	CARD NO.	REMARKS
2.4.2.1.3.1	A-212	Evaluate the ability of site personnel to accomplish data base updates, pre-processed program patches, and program restarts without support from the on-site computer software personnel.	104	No	--	Narrative in nature.
2.4.2.1.3.2	A-214	Evaluate the software program code to determine the visibility of the logic and structure and whether the structure will allow quick isolation of software problems.	97	Yes	D	Site should be included or form.
			103	Yes	D	Site should be included on form.
2.4.2.1.3.3	A-223	Evaluate the adequacy of the software debugging aids such as core dumps to provide information that is useful in error tracking. The usefulness of error messages and diagnostics that are provided when the system fails. The capability for debugging software on-site.	99	No	--	Narrative in nature.
2.4.2.1.3.4	A-226	Evaluate the mean time between software errors.	99	No	--	Narrative in nature.
2.4.2.1.3.5	A-227	Evaluate the mean time to isolate a software error once it has been detected.	99	No	--	Narrative in nature.
2.4.2.1.3.6	A-228	Evaluate the meantime to modify the code when depot corrective action is required.	105	No		Narrative in nature.
2.4.2.1.3.7	A-229	Evaluate the extent to which software modifications and checkout is dependent upon unique special purpose hardware and software systems.	105	No		Narrative in nature.
2.4.2.1.3.8	A-232	Evaluate the capability to modify the data base on-site to accommodate reconfiguration.	106	No		Narrative in nature.
2.4.2.1.3.9	A-235	Evaluate the Air Force capability to debug and provide software fixes at the depot level.	None	--	--	
2.4.2.1.3.10	A-236	Evaluate the flexibility of peripheral storage to include investigation of the disk management scheme and the ability for reallocation of storage space on the disk when files are added and deleted.	None	--	--	
2.4.2.1.3.11	A-238	The adequacy of space available both in core and on disk for program expansion and identification of the physical limitations on expansion of the computer subsystem for each of the ATEs and the NSS.	None	--	--	

Table 2-1. Annex A Matrix (Continued)

JOT&F PARA. NO.	JOT&F PAGE NO.	OBJECTIVE	FORM	ADP ADAPT-ABILITY	CARD NO.	REMARKS
2.4.2.2.1	A-239	Evaluation of the ATEC installation and checkout manning requirements.	149	No	--	Narrative in nature.
2.4.2.2.2	A-241	Evaluate post-ATEC operations manning requirements to include site limited manual backup capability and DCS evaluation teams.	165	Yes	B	
			124			There is a question as to what data is on form.
			173A	Yes	B	
			173D	Yes	B	
2.4.2.2.3	A-250	Evaluate the post-ATEC maintenance manning requirements to include site and wideband maintenance teams.	166	Yes	H	
			166A	Yes	H	
			166B	Yes	B	Type should be included on form.
2.4.2.2.4	A-253	Evaluate post-ATEC management manning requirements for levels three and four as defined in the DCA concept of operations for ATEC.	None	--	--	
2.4.2.3.1	A-254	Additional training due to AFCS/MOS/NEC skill-mix changes throughout the system.	101	No	--	Form requires subjective and narrative data.
			102	No	--	Form requires subjective and narrative data.
			167	No	--	Narrative questionnaire.
2.4.2.3.2	A-261	To access and/or extended skills required to use ATEC provided data for making meaningful and accurate assessment of system performance, and to operate, monitor, and maintain the ATEC subsystem to include the NSS.	167	No	--	Narrative questionnaire.
2.4.2.4	A-262	Logistics Supportability	--	--	--	See Table 2.2
2.4.2.5	A-263	Human Factors - Evaluate the complexity of the man-machine interface. Determine if the operator and maintainer can easily interact with the ATEC system in the operational [illegible] information is presented in a format that is [illegible] to operational personnel.	91	Yes	D	
2.4.2.6.1	A-[illegible]7	Physical [illegible]	None	--	--	
2.4.2.6.2	A-[illegible]	[illegible]	None	--	--	

Table 2-1. Annex A Matrix (Continued)

JOT&F PARA. NO.	JOT&F PAGE NO.	OBJECTIVE	FORM	ADP ADAPT-ABILITY	CARD NO.	REMARKS
2.4.2.6.3	A-269	Security compatibility	None	--	--	
2.4.2.6.4	A-270	Environmental compatibility	None	--	--	
2.4.2.6.5	A-271	Electromagnetic compatibility (EMC)	None	--	--	
2.4.2.6.6	A-272	Operational compatibility	None	--	--	
2.4.2.7	A-273	Cost of Ownership				Cost analyses are being performed by BDM

Table 2-2. Annex B Matrix, Appendix 1

JOT&E PARA. NO.	JOT&E PAGE NO.	OBJECTIVE	FORM	ADP ADAPT-ABILITY	CARD NO.	REMARKS
2.1.1	B-1-5	To evaluate spares repair parts support and consumption during the JOT&E	107	No	--	Form requires subjective and narrative data.
2.2.2	B-1-12	To access the adequacy, compatibility, usage and need of on-site SE/test equipment to support the ATEC JOT&E program.	108	No	--	Form requires subjective and narrative data.
			109	No	--	Form requires subjective and narrative data.
2.3.1	B-1-18	To assess the supply and maintenance (organization/intermediate and depot level) functions and facilities.	100	No	--	Forms require subjective and narrative data.
			110	No	--	
			102	No	--	
2.4.1	B-1-28	To assess the adequacy, completeness, effectiveness and useability of the contractor prepared technical manuals, handbooks and/or commercial manuals or prime equipment/SE to evaluate their compliance with the statement of work (SOW), contractor data requirements lists (CDRL), and technical order publications for ATEC.	111	No	--	Forms require subjective and narrative data.
			112	No	--	
			113	No	--	
			114	No	--	
			115	No	--	
			116	No	--	
			AFTO 158	No	--	
			AFLC 1057B	No	--	
2.5.1	B-1-57	To evaluate the Storage and Warehousing at the test facility.	117	No	--	Form requires subjective and narrative data.
2.6.1	B-1-62	To evaluate the transportation, packaging, packing, and materials handling utilized during the JOT&E.	118	No	--	Form requires subjective and narrative data.
2.7.1	B-1-69	To evaluate the system safety engineering as pertains to the ATEC system.	None	--	--	
2.8.1	B-1-71	To evaluate the Personnel Subsystem inherent in the ATEC system.	101	No	--	Form requires subjective and narrative data.
			98	No	--	
2.9.1	B-1-77	Evaluate corrosion control for the ATEC system and insure that the materials and processes used in equipment fabrication shall be such that corrosion does not occur.	None	--	--	

Table 2-2. Annex B Matrix, Appendix 1 (Continued)

JOT&E PARA. NO.	JOT&E PAGE NO.	OBJECTIVE	FORM	ADP ADAPT-ABILITY	CARD NO.	REMARKS
2.10.1	B-1-92	To evaluate the contractor prepared installed drawing records (as installed).	120	No	--	Form requires subjective and narrative data.
2.11.1	B-1-84	To assess the effectiveness of BITE to evaluate the overall performance, isolate faults to the LRU and detect faults without the need to perform off-the-air tests.	121	No	--	Forms require subjective and narrative data.
			122	No	--	
2.12.1	B-1-90	To assess the adequacy, accuracy, completeness, and effectiveness of contractor prepared data (drawings, specifications, technical orders, etc.) to permit AFLC to maintain the designed survivability of the ATEC equipment throughout its operational life cycle.	None	--	--	
2.13.1	B-1-91	To assess the transportability of items and equipment provided to support the test program and to evaluate the technical adequacy of the packaging design and the handling and mobility features incorporated to facilitate handling and movement.	None	--	--	
2.14	B-1-93	Reliability/Availability/Maintainability	--	--	--	See Table 2.3
2.15	B-1-94	Cost of Ownership	--	--	--	
2.16	B-1-95	Compatibility/Interoperability	--	--	--	See 2.4.2.6.1 through 2.4.2.6.6, Table 2.1
2.17	B-1-96	Assess the validity of the ORLA recommendations for throw-away versus recoverability and the level of repair of LRUs/SRUs. Assess the validity of the recommended maintenance specialties and skill levels.	None	--	--	
2.18	B-1-97/98	To ensure that materials and parts used in the ATEC equipment are of uniform quality and reproducibility, ensure that existing GFE parts and equipment are used to the maximum extent possible, and ensure that compatible items such as LRUs and SRUs used within the ATEC equipment are identified for maximum interchangeability.	None	--	--	

Table 2-3. Annex B Matrix, Appendix 3

JOT&E PARA. NO.	JOT&E PAGE NO.	OBJECTIVE	FORM	ADP ADAPT-ABILITY	CARD NO.	REMARKS
2.0	B-3-1	The function of the R/M evaluation is to provide further assurance that the R/M requirements including software will be met in operational use by the ATEC equipment designed and developed by the contractor. In addition, the evaluation will provide further information on which to base a production decision for the ATEs and NSS.	DD1753	No	--	All Narrative
			AFSC 258 & 258-4	Partially	I	
			95	No	--	If info in data base, Form could be generated automatically
			123	No	--	If info in data base, Form could be generated automatically
			119	No	--	If info in data base, Form could be generated automatically

2.1.2.1 Appendix 1 - Logistics Supportability Test Procedures

Appendix 1 contains many forms, most of which require subjective and narrative data for completion. The recommendation is made that this section not be utilized in ADP. Further, it is recommended that the normal logistics supportability procedures now used by the three services be continued along with any additional manual processing of data forms required by the test procedures.

2.1.2.2 Appendix 3 - Reliability/Maintainability Data Reduction and Analysis Plan

Appendix 3 contains two forms, AFSC 258 and AFSC 258-4, which are partially adaptable to ADP. The useful information on failed items, man hours, job control number, etc., will be used in correlation.

2.2 DCEC MODIFIED JOT&E FORMS

There are nine forms which DCEC has identified as containing data required as input. These forms are similar in content to the JOT&E test forms and are included in Table 2-1 under related test objectives. The forms are as follows:

Form	Title
130A	Baseband Sweeps: Man-Hour Allocations
162A	DCAC 310-55-1, MILDEP Reports & Other Reports
166A	Fault Detection/Isolation
166B	Assistance to Other Facilities and Other Non-Reportable Actions (As Applicable)
173A	Quality Control Testing: Man-Hour Allocations
173B	Performance Monitoring Program: Man-Hour Allocations
173C	Performance Monitoring Program: Man-Hour Allocation (Plotting and Analysis)
173D	Maintenance Man-Hour Allocations
199	Site Profile

All nine forms are adaptable to ADP and fit the associated data input format card identified in the matrix.

2.3 ATEC PAPER TAPE PREPROCESSING

A crucial problem is the paper tape data being collected. The paper tape being used to collect ATEC parameter data has an effective field life span of approximately 3 months. The oil impregnated nature of this tape causes serious problems in terms of deterioration and storage. Because of the oil, the tape cannot be stored in cardboard containers, or near any paper products. The leeching of the oil from the tape to its surrounding environment has the effect of contaminating and deteriorating the container in addition to giving off an unpleasant odor.

Due to either loss of oil, or to other environmental conditions, tapes become brittle after a short period of time which renders them unreadable. Thus, they break repeatedly when attempts are made to read them via high-speed paper tape readers which will be needed to transpose this large volume of paper tape data into magnetic tape or disk files. Additionally, the nature of paper tape makes its transportation difficult. Rolls of tape have a tendency to unwind or be mutilated when transported from place to place in briefcases or boxes.

The solution to these problems is the conversion of paper tape to another medium. Punched cards or magnetic tape, either reel or cassette, are viable alternatives. While there are valid reasons for considering punched cards and magnetic tape mediums equally, this Implementation Plan calls for the paper tape to be converted to magnetic tape.

Data is currently being collected and stored on paper tape at Langerkopf in Germany. At this site is the Nucleus processor, which possesses both magnetic tape and paper tape subsystems. The software programs required to read paper tape and write magnetic tape are currently available as part of the Nucleus software. These peripheral "driver" modules would be called by a simple software module that would govern the reading of the paper tape and the writing of the magnetic tape. In its simplest form, this program would do no more than request the paper tape driver module to read in a block of paper tape, and then request the magnetic tape driver to write the block out to a magnetic tape. To facilitate later processing of this data, the program should write an identification label on the magnetic tape, and include an identification block in front of each reel of paper tape. The identification label could include such data as the time span represented on the tape, sites involved, etc. The identification block written prior to each paper tape segment should include data identifying the site, type of device, shift or time span, and possible measurement commands. These identification blocks could be input from punched cards read prior to reading each paper tape segment.

As the current Nucleus software does not use either the paper tape reader or magnetic tape unit, this program could be run as a background job on-line or after the testing had ended for the day.

Because of the time critical nature of this conversion effort, a brief flowchart has been included as Figure 2-4.

2.4 OUTAGE REPORTS

Outage Report data will be obtained from DD Forms 1698 and 1433 by test team personnel conducting tests at the various sites. Figure 2-5 is a retyped version of JOT&E Procedure 3, dated 12 Nov 75, entitled "Outage Data Collection." Outage data will be keypunched using the formats and instructions. Sample Outage Data Information form is shown in Figure 2-6.

2.5 MAINTENANCE DATA

The format of maintenance data which is input to the data base is unknown at this time. However, it is assumed that it will be machine readable. Once this information is available, a program will be written to read the data into the data base.

At this time, no major problems are anticipated, since the data base has been structured to accommodate the MDC data.

2.6 CIRCUIT DIRECTORY DATA

The current directory data input format is in the same category as the Maintenance data. Its format is unknown but it is assumed to be machine readable. Once the

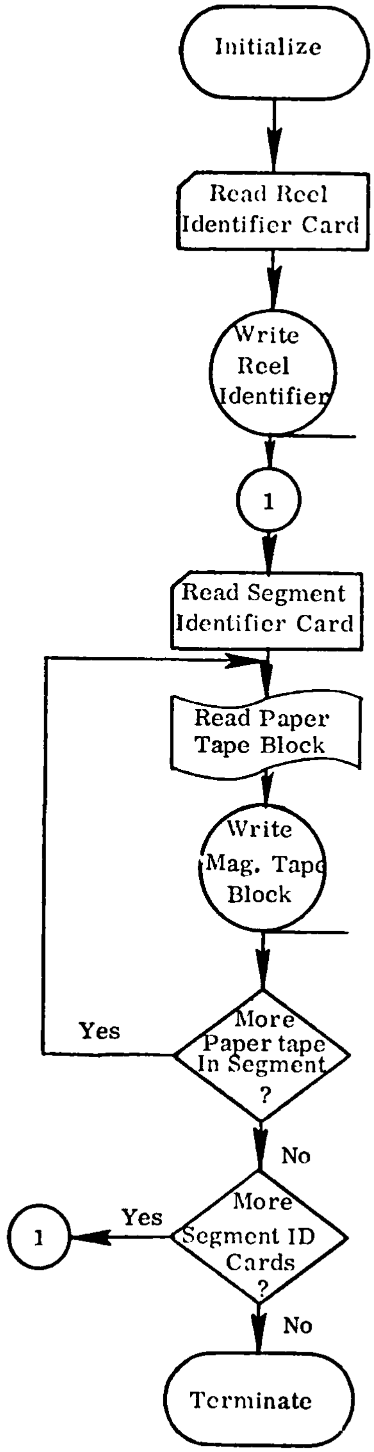


Figure 2-4. Paper Tape to Magnetic Tape Flow

OUTAGE DATA COLLECTION

PURPOSE: The purpose of this procedure is to ensure that Operations Baseline Data (file SMART-OC) are kept up-to-date.

OBJECTIVE NUMBER: 2.4.1.1.2; 2.4.1.1.5; 2.4.1.2.3; 2.4.1.6.1; 2.4.1.6.2; 3.1.2

METHOD: All circuit, trunk, or link outages will be recorded at all stations of concern. Data will be transcribed from station records as directed or during all idle periods while conducting tests at the given station(s). All Test Conductors are responsible for ensuring that this procedure is implemented. When a test is being conducted, Test Conductors on all shifts that have access to the site records will transcribe data from the site records onto the Data Collection Forms. Circuit outage data will be obtained from DD Form 1698 and DD Form 1443.

EQUIPMENT REQUIRED: None

REQUIRED DATA PRODUCTS: Completed Circuit Outage Data Collection Forms.

PROCEDURES:

1. Filed circuit outage forms (e.g., DD 1443 and DD 1698) will be withdrawn from the station files for transcription onto the Circuit Outage Collection Forms. If the circuit outage collection is done in conjunction with a test, the header line will be completed as follows:

   a. Blocks 1 through 3 will contain the DCS reporting designator for the station at which the test is being performed.

   b. Blocks 4 through 15 will contain the assigned test number.

   c. Blocks 16 through 25 will contain the last name of the Test Conductor.

Figure 2-5. Outage Data Collection (Page 1 of 4)

d. Blocks 26 through 33 will contain the DTG the test began. The DTG will be in the following format:

(1) Block 26 will contain the last numeral of the current year.

(2) Blocks 27 through 29 will contain the Julian day.

(3) Blocks 30 through 33 will contain the hour and minute the test commenced. An example of the format is provided below:

5	165	13	15
1975	165 Day	Hour	Minute

If the data collection is not performed in direct conjunction with a specific test, only items a, c, and d will apply.

2. Circuit outages will be transcribed as follows:

a. Blocks 1 through 3 will contain the DCS reporting designator of the station at which the data is being collected.

b. Blocks 4 through 11 will contain the full CCSD of the circuit. If the station's outage ticket contains only the last four elements of the CCSD, complete only blocks 8 through 11. No further research is required.

c. Blocks 18 through 25 will contain the DTG of the time of the outage (this will be in the same format as described in 1.d).

d. Blocks 26 through 33 will contain the DTG the circuit was returned to service.

e. Blocks 34 through 36 will contain the RFO code.

f. Block 37 will indicate whether or not the circuit was restored by using an alternate route. (Y-Yes; N-No).

Figure 2-5. Outage Data Collection (Page 2 of 4)

g. Blocks 38 through 40 will contain the DCS reporting designator of the station charged with the outages.

3. Trunk outages will be transcribed as described with the exception that blocks 4 through 9 will contain the DCS trunk identifier rather than a CCSD.

4. Link outages will be transcribed as described except that the DCS link identifier will be contained in blocks 4 through 8 vice the CCSD or trunk ID.

5. Only valid RFO codes and DCS reporting station designators will be allowed. Due to the use of ratio station call signs and locally devised station designators, a list of DCS reporting designators has been provided. It will be necessary to examine the station's outage ticket to ensure the proper code is used.

6. NOL (no outage logged) and "information only" tickets will not be recorded.

7. Data Log Cards will be used at each site to prevent unnecessary duplication of effort or losing data.

a. Each site record file will contain a Data Log Card containing the following information:

(1) Data transcriptions were made.

(2) DTG of first record transcribed.

(3) DTG of last record transcribed.

(4) Name of person making transcriptions.

b. The Data Log Card will be completed by the person making transcriptions each time a set of data is copied. The card will be placed in the file behind the last record copied.

8. Completed data collection forms will be keypunched for ADP.

Figure 2-5. Outage Data Collection (Page 3 of 4)

COORDINATION AND REVIEW: This procedure was coordinated with and reviewed by:

Major C. J. Fullilove
Captain D. C. Krukar
Captain R. H. Gattis
SMSgt J. G. Cerny
MSgt R. G. Soman

Figure 2-5. Outage Data Collection (Page 4 of 4)

SITE	TEST NR.	TEST CONDUCTOR	DATE	PAGE OF

	SITE			CCSD, TRUNK or LINK								OF STA			S/R			TIME OUT								TIME IN								RFO			ALT	STA CHARGED														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
A	L	K	F	D	T	X	X	6	E	Ø	8							5	2	6	2	1	2	Ø	5	5	2	6	2	1	3	3	Ø	J	E	W	N	F	E	L												
B	L	K	F	4	4	C	Z	B	1									5	2	6	2	1	3	3	4	5	2	6	2	1	3	4	5	D	B	E	N	S	C	H												
C	L	K	F	M	Ø	8	9	1										5	2	6	2	1	7	5	5	5	2	6	2	1	8	Ø	Ø	E	E	P	N	L	K	F												
D	L	K	F					W	1	5	7							5	2	6	2	2	Ø	Ø	5	5	2	6	2	2	1	1	Ø	A	N	R	N	O	F	F												

A. Example of circuit outage with full CCSD.

B. Example of trunk outage with trunk ID.

C. Example of link outage with link ID.

D. Example of circuit outage with only last four elements of the CCSD.

Figure 2-6. Sample Outage Data Information

information is available, a program will be written to read the information into the data base.

No problem is anticipated since connectivity has been built into the data base and the work now in progress on Task C has provided a workable methodology to utilize the data.

2.7 SUMMARY

Table 2-4 illustrates the conclusions reached concerning the conversion of the data types.

Table 2-4. Raw Data Conversion

Raw Data	Initial Medium	Processing Medium
JOT&E forms	Handwritten forms	Punched cards
1443, 1698, OPS, TCF files, Army MDC forms	Handwritten forms	Punched cards
Directory data on links, trunks, etc., from DCA circuit and trunk directories	Processor printouts	Punched cards
Parameter data from I/OQCS, DDMS, etc.	Paper tape	Magnetic tape
MDC data from 1945 Comm. Squadron	Magnetic tape	Magnetic tape

Some of this data, such as the MDC file from the 1945 Comm. Squadron at Rhein Main will be easy to gather and use since it has already been ordered, keyed, and used for processing. Some of the data, such as the parameter data from the ATEC equipment and the JOT&E test forms, will require processing from one medium to another. The rest of the data, particularly directory data, pose more severe difficulties because there is no common methodology for filling out the required forms, or the conversion of the data will require extraction from existing documentation.

Conversion of this data will be very time consuming. There is a massive amount of work to be done prior to manipulating the data to obtain the required reports. This work can be divided into two phases:

- Collection of the baseline data in machine readable formats
- Subsequent loading and modification of the baseline data base.

A vigorous attempt must be made to standardize the input coming from non-ATEC sites or sites using nonstandard forms. If this is not possible, a re-evaluation of the reports is indicated.

The collection of data for all but the Network Directory Data Element has already begun. Baseline data for this element should be extracted as soon as possible. While this element will be volatile in certain areas, i.e., circuit identifiers, the major portion is stable. Recommendations for this portion of the data base will be more fully explored in Section 4.

SECTION 3 - OUTPUT REQUIREMENTS

Thus far four categories of data output have been identified. These categories are:

1. AFTEC JOT&E Reports
2. DCEC Manpower Reports
3. Measure of Effectiveness Reports
4. Summary Reports.

The following paragraphs detail how the various outputs are to be generated from the data and assembled into the data base according to this Implementation Plan.

3.1 AFTEC JOT&E REPORTS

There are a number of reports and summaries which are required periodically during the course of the JOT&E testing. In referring to the matrices in Tables 2-1, 2-2, and 2-3, the REMARKS column indicates a class of JOT&E forms which are not adaptable to ADP since the data contained on the forms was already in the data base. Therefore, the information required by the reports or summaries could be generated directly from the data base.

It is envisioned that the information will be displayed in a format that imitates as much as possible the JOT&E forms. The following is a list of titles and form numbers of the reports and summaries which will be generated in this fashion.

Form	Title
95	R/M Daily Summary
119	Intermediate Level Maintenance Monthly Summary
123	On-Equipment Maintenance Monthly Summary
126	Level Discipline Evaluation
127	Alarm Status Record
134	Questionnaire Summary Form
136	Data Compilation Form

Form	Title
159	Traffic Recognition Evaluation Compilation Sheet
169	Fault Isolation Actions Record
170	Station Outage Record Compilation
179	DDMS Baud Determination Evaluation Compilation Sheet

For information purposes a sample of each form is included in this section as Figures 3-1 through 3-11.

3.2 DCEC MANPOWER REPORTS

DCEC representatives have expressed a requirement to perform statistical analyses in certain areas of manpower utilization, especially from "before" and "after" ATEC. A statistical package, called the BMD, Biomedical Computer Programs, will be utilized to fulfill other analyses described in Paragraph 3.3. This same package will satisfy the DCEC manpower analysis and concurrence for the implementation has been given by DCEC.

3.3 MEASURE-OF-EFFECTIVENESS REPORTS

Requirements for analysis reports other than those intended to directly satisfy OT&E objects have been identified by the ATEC Test Team Analyst. These analyses will satisfy DT&E requirements, some OT&E requirements, and provide management information.

The reports will be put into a standard format and will be published on a monthly, semi-annual, and annual basis. The monthly reports will summarize the previous calendar month's data. The semi-annual reports will summarize the preceeding 6 month's data. The annual reports will be a 12-month summary.

Table 3-1 lists those reports which have been identified. Table 3-2 is a further breakdown of the Measure-of-Effectiveness reports. The horizontal axis presents the type of tests which are to be performed and the vertical axis represents the partitioning of the data within the parameter under analysis. In addition, a Definition and Explanation directory of the various types of tests to be performed is included.

R/M Daily Summary as of ____________ for Element ____________ (1)
(Date) (Designation)

	Event (2)	Event time (3)	AFSC Form 258 Number (4)	Oper Time (5)	Non Op Time (6)	Rep Tm (7)	Reason, if nonrelevant (8)
	(15) Est lower MTBF:	(14) EST MTTR:	(13) Est Avail:	(12) Total:	(11) Total:	(10) Total	(9) Totals: Rel/ Non Rel Fails:

[illegible] 95 (ATEC) Test

Figure 3-1. R/M Daily Summary

R/M Intermediate Level Maintenance as of ________ (Month) for Element ________ (Designation) (a)

Date (b)	AFSC Form 258 Number (c)	Maintenance Man-hours (d)	SRUs Repl & Disp (e)		Piece Parts Replaced (f)	Adequacy T.O. (g)	Adequacy SE (h)	SRU Pack (i)	SE Hrs (k)

[illegible] Form 112 (AFTEC) Test

Figure 3-2. Intermediate Level Maintenance Monthly Summary

R/M On-Equipment Maintenance as of ____________ for Element ____________ (a)
(month) (Designation)

Date (b)	AFSC Form 256 Number (c)	Maintenance Man-hours (d)	LRUs Replaced (e)	Piece Parts Replaced (f)	Cause (g)	Adequacy Self Tst (h)	Adequacy T.O. (i)	TI or SE? (j)

Figure 3-3. R/M On-Equipment Maintenance

SITE ____________ TEST PERIOD ____________

ATE TYPE ____________ TEST TEAM MEMBER ____________

CCSD	SCANNER ADDRESS	NUMBER OF AV ALARMS PER DAY																														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

AFTEC Form 126 (ATEC) Test
OCT 1973

Figure 3-4. Level Discipline Evaluation

(1) Enter ATEC Alarm Level of Mnemonic

(2) "+" indicates improvement

"-" indicates degradation

"0" indicates no change

SITE: ____________

ATE TYPE: ____________

DTG: ____________

CCSD	SCANNER ADDRESS	ALARM STATUS			REMARKS
		(1) BEFORE	(1) AFTER	(2) IMPROVE-MENT	

AFTEC Form 127 (ATEC) Test
Oct 1975

Figure 3-5. Alarm Status Record

Date ________ Objective No. ________

Question Number	Total Number of Answers	Number of Each Type of Answer				
		Strongly Agree	Agree	Disagree	Strongly Disagree	No Opinion

AFTEC Form 134 ATEC Test
Oct 1975

Figure 3-6. Questionnaire Summary Form

OBJECTIVE NO: ________ MEASUREMENT TYPE: ________

DATE ________

DATE OF TEST	LAPSED TIME		TIME DIFF BTWN ATEC AND MAN	EQUIP ID OR CIRCUIT ID	SITE(S) INVOLVED	MEASUREMENTS OBTAINED			REMARKS
	MANUAL	ATEC				MANUAL	ATEC	DIFFERENCE	

AFTEC Form 136 (ATEC) Test
Oct 1975

Figure 3-7. Data Compilation Form

ASSIGNED DCS TFC TYPE	NOTE (1) TOTAL NO OF CKTS SAMPLED	NOTE (2) ATEC IDENTIFIED TFC TYPE										TOTAL NO OF SAMPLES	NOTE (3) ATEC VS MANUAL	NOTE (4) ATEC CORRECT	REMARKS
		V	WH	WL	NH	NL	S	TT	I	FA	N				

NOTE (1) Enter total number of different circuit of each traffic type sampled.

NOTE (2) Enter number of times identified as each traffic type.

NOTE (3) Enter number of times there is agreement between manual identification and ATEC.

NOTE (4) Enter number of times ATEC was correct relative to its own traffic recognition table.

AFTEC Form 159 (ATEC) Test
Oct 1975

Figure 3-8. IQCS Traffic Recognition Evaluation Compilation Sheet

FAULT ISOLATION ACTIONS RECORD

SITE: ____________________

DATE: ____________________

ATEC EQUIPMENT(S) ____________________

DTG	TYPE OF FAULT ISOLATION ACTION	TEST OR MEASUREMENTS MADE	SYSTEM OR CIRCUIT INVOLVED	ATEC EQUIPMENT USED	MANUAL EQUIPMENT USED	REMARKS

ATEC Form 169 (ATEC) Test
Oct 1975

Figure 3-9. Fault Isolation Actions Record

STATION OUTAGE RECORD COMPILATION

SITE: ______________________

DATE: ______________________

SYSTEM IDEN. OR CCSD	DTG		(1) NATURE OF OUTAGE	(2) WAS ATEC USED	WAS MANUAL EQUIP USED	(3) WAS THERE AN ATEC ALARM	REMARKS
	START	END					

*Notes are on back of form.

ATEC Form 170 (ATEC) Test

Figure 3-10. Station Outage Record Compilation (Sheet 1 of 2)

NOTES: (1) Brief comment describing outage, e.g., "level problem", "noise problem", "signal loss", etc.

(2) Answer "YES" or "NO" if ATEC was used to aid in fault isolation. If "YES" enter what type of ATEC equipment. If ATEC is not connected to the system or circuit, enter "NO."

(3) Enter if there was an ATEC alarm associated with the outage.

AFTEC Form 170 (Reverse)

Figure 3-10. Station Outage Record Compilation (Sheet 2 of 2)

DDMS BAUD DETERMINATION EVALUATION COMPILATION SHEET

ASSIGNED DCS BAUD RATE	TOTAL (1) OF CKTS SAMPLED	TOTAL NO. OF SAMPLES	ATEC (2) VS MANUAL	NO. OF UNKNOWN RESULTS	REMARKS

Note 1. Enter total number of different circuits of each baud rate/circuit type sampled.
Note 2. Enter number of times there is agreement between manual identification and ATEC.

ATEC Form 179 (ATEC) Test
Oct 1975

Figure 3-11. DDMS Baud Determination Evaluation Compilation Sheet

Table 3-1. Measure-of-Effectiveness Reports

TITLE	FREQUENCY
Outage Duration, Less than 30 Minutes	MARCR*
Outage Duration, All Durations Combined	MARCR*
Outage Duration, Greater than 30 Minutes	MARCR*
Bias Distortion (Levels Discipline)	Monthly, Semi-Annually
Peak Distortion (Levels Discipline)	Monthly, Semi-Annually
Envelope Delay, ED (Levels Discipline)	Monthly, Semi-Annually
Frequency Response, FR (Levels Discipline)	Monthly, Semi-Annually
Phase Jitter, PJ (Levels Discipline)	Monthly, Semi-Annually
3-kHz Weighted Noise Power, WF (Levels Discipline) OQCS	Monthly, Semi-Annually
Frequency Offset, FO (Levels Discipline)	Monthly, Semi-Annually
Net Loss, NL (Levels Discipline)	Monthly, Semi-Annually
C-Msg Weighted Noise Power, CN (Levels Discipline) OQCS	Monthly, Semi-Annually
Average Power, AV (Levels Discipline)	Monthly, Semi-Annually
Peak-To-Average Ratio, PA (Levels Discipline)	Monthly, Semi-Annually
Fax Low Level, FL (Levels Discipline)	Monthly, Semi-Annually
Frequency, FR (Levels Discipline)	Monthly, Semi-Annually
Half Peak Power, PI (Level Discipline)	Monthly, Semi-Annually
3- kHzWeighted Power Noise WF (Level Discipline) IQCS	Monthly, Semi-Annually
C-Msg Noise Power, WN (Level Discipline) IQCS	Monthly, Semi-Annually
Maintenance Manhour Expenditure	MARCR*
Maintenance Actions	MARCR*

*Monthly and As Required Cumulative Report

Table 3-1. Measure-of-Effectiveness Report (Cont'd)

DEFINITIONS AND EXPLANATIONS

The following is a list of the terms, with explanations, used in this table.

1. ANOVA - A one-way Analysis of Variance performed with a 95% F-Test. This test for a difference in means will detect changes with respect to time for all elements within each partition.

2. Count N - Total number of events, N, that occurred within report period.

3. Cum s - A cumulative (running) monthly standard deviation is to be computed.

4. Cum $\bar{x}$ - A cumulative (running) monthly mean is to be computed.

5. Data Source - Data files from which information is obtained to perform required computations.

6. Histo - A histogram of X is to be plotted with a listing of associated cell counts and cell percentages.

7. Measure-of-Effectiveness (MOE) - Provides a method of measuring the state of something quantitatively. A change in the value of a measure directly reflects a change in state of the item measured and provides a means for making judgements on the quality of the thing measured; or that which causes the change being measured. For our purposes, each MOE value will be referred to as X in all equations.

8. Partition - A sorting of the MOE according to some well-defined characteristic (e.g., if data is partitioned by site, partition elements will be each site from which data was obtained.)

9. % - Percentage of contribution of each element of a partition to the whole. Unless otherwise specified, this will be a percentage of number of measurements, not a percentage of sum of measurements.

Table 3-1. Measure-of-Effectiveness Report (Cont'd)

10.	Plot $\bar{x} - \bar{x}$ is to be plotted against time starting with estimate of μ and continuing with $\bar{x}$ for month one, then month two, etc.
11.	Report - Which reports MOE is to be contained in: monthly, semi-annual, annual.
12.	Trend $\bar{X}$ - A straight line regression of $\bar{X}$ versus time is to be performed. First variable, X_0, will be estimated from baseline data. X_1 will be $\bar{X}$ for first month, etc. A significant trend will be indicated when 95% confidence interval for estimate of slope does not contain 0.
13.	s - Sample standard deviation of the MOE.
14.	$s:\sigma$ - Hypothesis test to determine whether or not s (sample standard deviation) comes from the same population as the population standard deviation. An estimate of σ will be computed from the baseline data.
15.	X-Bar ($\bar{X}$) - Sample arithmetic mean of the MOE.
16.	$X:\mu$ - Hypothesis test to determine whether or not X (the sample mean) comes from same population as population mean, μ . An estimate of μ will be computed from baseline data. Nonparametric methods will be used if tests of the baseline data cannot determine distribution.
17.	$\bar{X}:\bar{X}$ - A hypothesis test between two means to determine whether or not there is a difference between the same categories measured at different sites, e.g., AV on 2400-baud circuits at Langerkopf and AV on 2400-baud circuits at Feldberg.

Table 3-2. Measure-of-Effectivenss Report Matrix

MEASURE OF EFFECTIVENESS: BIAS DISTORTION (LEVELS DISCIPLINE)

DATA SOURCE: DDMS, MSMS, CIRCUIT DIRECTORY

REPORT: MONTHLY, SEMI-ANNUAL

	COMPUTATION								
PARTITION	$\overline{X}$	s	$\overline{X}:\mu$	$s:\sigma$	Trend $\overline{X}$	Plot $\overline{X}$	Trend s	Plot s	$\overline{X}:\overline{X}$
Circuit Type, by ATE	X	X	X	X	X	X	X	X	
Link, by Circuit Type	X	X	X	X	X	X	X	X	X

Table 3-2. Measure-of-Effectiveness Report Matrix (Cont'd)

MEASURE OF EFFECTIVENESS: PEAK DISTORTION (LEVELS DISCIPLINE)

DATA SOURCE: DDMS, MSMS, CIRCUIT DIRECTORY

REPORT: MONTHLY, SEMI-ANNUAL

	COMPUTATION								
PARTITION	$\overline{X}$	s	$\overline{X}:\mu$	$s:\sigma$	Trend $\overline{X}$	Plot $\overline{X}$	Trend s	Plot s	$\overline{X}:\overline{X}$
Circuit Type, by ATE	X	X	X	X	X	X	X	X	
Link, by Circuit Type	X	X	X	X	X	X	X	X	X

Table 3-2. Measure-of-Effectiveness Report Matrix (Cont'd)

MEASURE OF EFFECTIVENESS: ENVELOPE DELAY, ED (LEVELS DISCIPLINE)

DATA SOURCE: OQCS, CIRCUIT DIRECTORY

REPORT: MONTHLY, SEMI-ANNUAL

	COMPUTATION								
PARTITION	$\overline{X}$	s	$\overline{X}:\mu$	$s:\sigma$	Trend $\overline{X}$	Plot $\overline{X}$	Trend s	Plot s	$\overline{X}:\overline{X}$
Circuit Type	X	X	X	X	X	X	X	X	
Link, by Circuit Type	X	X	X	X	X	X	X	X	X

Table 3-2. Measure-of-Effectiveness Report Matrix (Cont'd)

MEASURE OF EFFECTIVENESS: FREQUENCY RESPONSE, FR (LEVELS DISCIPLINE)

DATA SOURCE: OQCS, CIRCUIT DIRECTORY

REPORT: MONTHLY, SEMI-ANNUAL

	COMPUTATION								
PARTITION	$\overline{X}$	s	$\overline{X}:\mu$	$s:\sigma$	Trend $\overline{X}$	Plot $\overline{X}$	Trend s	Plot s	$\overline{X}:\overline{X}$
Circuit Type	X	X	X	X	X	X	X	X	
Link, by Circuit Type	X	X	X	X	X	X	X	X	X

Table 3-2. Measure-of-Effectiveness Report Matrix (Cont'd)

MEASURE OF EFFECTIVENESS: PHASE JITTER, PF (LEVELS DISCIPLINE)

DATA SOURCE: OQCS, CIRCUIT DIRECTORY

REPORT: MONTHLY, SEMI-ANNUAL

	COMPUTATION								
PARTITION	$\bar{X}$	s	$\bar{X}:\mu$	$s:\sigma$	Trend $\bar{X}$	Plot $\bar{X}$	Trend s	Plot s	$\bar{X}:\bar{X}$
Circuit Type	X	X	X	X	X	X	X	X	
Link, by Circuit Type	X	X	X	X	X	X	X	X	X

Table 3-2. Measure-of-Effectiveness Report Matrix (Cont'd)

MEASURE OF EFFECTIVENESS: 3-kHz WEIGHTED NOISE POWER, WF (LEVELS DISCIPLINE)

DATA SOURCE: OQCS, CIRCUIT DIRECTORY

REPORT: MONTHLY, SEMI-ANNUAL

	COMPUTATION								
PARTITION	$\overline{X}$	s	$\overline{X}$:	s:	Trend $\overline{X}$	Plot $\overline{X}$	Trend s	Plot s	$\overline{X}$:$\overline{X}$
Circuit Type	X	X	X	X	X	X	X	X	
Link, by Circuit Type	X	X	X	X	X	X	X	X	X

Table 3-2. Measure-of-Effectiveness Report Matrix (Cont'd)

MEASURE OF EFFECTIVENESS: FREQUENCY OFFSET, FO (LEVELS DISCIPLINE)

DATA SOURCE: OQCS, CIRCUIT DIRECTORY

REPORT: MONTHLY, SEMI-ANNUAL

	COMPUTATION								
PARTITION	$\overline{X}$	s	$\overline{X}:\mu$	$s:\sigma$	Trend $\overline{X}$	Plot $\overline{X}$	Trend s	Plot s	$\overline{X}:\overline{X}$
Circuit Type	X	X	X	X	X	X	X	X	
Link, by Circuit Type	X	X	X	X	X	X	X	X	X

Table 3-2. Measure-of-Effectiveness Report Matrix (Cont'd)

MEASURE OF EFFECTIVENESS: NET LOSS, NL (LEVELS DISCIPLINE)

DATA SOURCE: OQCS, CIRCUIT DIRECTORY

REPORT: MONTHLY, SEMI-ANNUAL

	COMPUTATION								
PARTITION	$\overline{X}$	s	$\overline{X}:\mu$	$s:\sigma$	Trend $\overline{X}$	Plot $\overline{X}$	Trend s	Plot s	$\overline{X}:\overline{X}$
Circuit Type	X	X	X	X	X	X	X	X	
Link, by Circuit Type	X	X	X	X	X	X	X	X	X

Table 3-2. Measure-of-Effectiveness Report Matrix (Cont'd)

MEASURE OF EFFECTIVENESS: C-MSG WEIGHTED NOISE POWER, CN (LEVELS DISCIPLINE)

DATA SOURCE: OQCS, CIRCUIT DIRECTORY

REPORT: MONTHLY, SEMI-ANNUAL

	COMPUTATION								
PARTITION	$\overline{X}$	s	$\overline{X}:\mu$	$s:\sigma$	Trend $\overline{X}$	Plot $\overline{X}$	Trend s	Plot s	$\overline{X}:\overline{X}$
Circuit Type	X	X	X	X	X	X	X	X	
Link, by Circuit Type	X	X	X	X	X	X	X	X	X

Table 3-2. Measure-of-Effectiveness Report Matrix (Continued)

MEASURE OF EFFECTIVENESS: AVERAGE POWER, AV (LEVELS DISCIPLINE)

DATA SOURCE: IQCS, CIRCUIT DIRECTORY

REPORT: MONTHLY, SEMI-ANNUAL

	COMPUTATION								
PARTITION	$\overline{X}$	s	$\overline{X}:\mu$	$s:\sigma$	Trend $\overline{X}$	Plot $\overline{X}$	Trend s	Plot s	$\overline{X}:\overline{X}$
Circuit Type	X	X	X	X	X	X	X	X	
Link, by Circuit Type	X	X	X	X	X	X	X	X	X

Table 3-2. Measure-of-Effectiveness Report Matrix (Cont'd)

MEASURE OF EFFECTIVENESS: PEAK-TO-AVERAGE POWER RATIO, PA (LEVELS DISCIPLINE)

DATA SOURCE: IQCS, CIRCUIT DIRECTORY

REPORT: MONTHLY, SEMI-ANNUAL

	COMPUTATION								
PARTITION	$\overline{X}$	s	$\overline{X}:\mu$	$s:\sigma$	Trend $\overline{X}$	Plot $\overline{X}$	Trend s	Plot s	$\overline{X}:\overline{X}$
Circuit Type	X	X	X	X	X	X	X	X	
Link, by Circuit Type	X	X	X	X	X	X	X	X	X

Table 3-2. Measure-of-Effectiveness Report Matrix (Cont'd)

MEASURE OF EFFECTIVENESS: FAX LOW LEVEL, FL (LEVELS DISCIPLINE)

DATA SOURCE: IQCS, CIRCUIT DIRECTORY

REPORT: MONTHLY, SEMI-ANNUAL

	COMPUTATION								
PARTITION	$\overline{X}$	s	$\overline{X}:\mu$	$s:\sigma$	Trend $\overline{X}$	Plot $\overline{X}$	Trend s	Plot s	$\overline{X}:\overline{X}$
Circuit Type	X	X	X	X	X	X	X	X	
Link, by Circuit Type	X	X	X	X	X	X	X	X	X

Table 3-2. Measure-of-Effectiveness Report Matrix (Cont'd)

MEASURE OF EFFECTIVENESS: FREQUENCY, FR (LEVELS DISCIPLINE)

DATA SOURCE: IQCS, CIRCUIT DIRECTORY

REPORT: MONTHLY, SEMI-ANNUAL

	COMPUTATION								
PARTITION	$\overline{X}$	s	$\overline{X}:\mu$	$s:\sigma$	Trend $\overline{X}$	Plot $\overline{X}$	Trend s	Plot s	$\overline{X}:\overline{X}$
Circuit Type	X	X	X	X	X	X	X	X	
Link, by Circuit Type	X	X	X	X	X	X	X	X	X

Table 3-2. Measure-of-Effectiveness Report Matrix (Cont'd)

MEASURE OF EFFECTIVENESS: HALF PEAK POWER, PI (LEVELS DISCIPLINE)

DATA SOURCE: IQCS, CIRCUIT DIRECTORY

REPORT: MONTHLY, SEMI-ANNUAL

	COMPUTATION								
PARTITION	$\overline{X}$	s	$\overline{X}:\mu$	$s:\sigma$	Trend $\overline{X}$	Plot $\overline{X}$	Trend s	Plot s	$\overline{X}:\overline{X}$
Circuit Type	X	X	X	X	X	X	X	X	
Link, by Circuit Type	X	X	X	X	X	X	X	X	X

Table 3-2. Measure-of-Effectiveness Report Matrix (Cont'd)

MEASURE OF EFFECTIVENESS: 3-kHz WEIGHTED NOISE POWER, WF (LEVELS DISCIPLINE)

DATA SOURCE: IQCS, CIRCUIT DIRECTORY

REPORT: MONTHLY, SEMI-ANNUAL

	COMPUTATION								
PARTITION	$\overline{X}$	s	$\overline{X}$:	s:	Trend $\overline{X}$	Plot $\overline{X}$	Trend s	Plot s	$\overline{X}$ Daily
Circuit Type	X	X	X	X	X	X	X	X	
Link, by Circuit Type	X	X	X	X	X	X	X	X	Monthly Report Only

Table 3-2. Measure-of-Effectiveness Report Matrix (Cont'd)

MEASURE OF EFFECTIVENESS: 3-kHz WEIGHTED NOISE POWER, WF (LEVELS DISCIPLINE) (Continued)

DATA SOURCE: IQCS, CIRCUIT DIRECTORY

REPORT: MONTHLY, SEMI-ANNUAL

COMPUTATION

PARTITION	Plot $\overline{X}$ Daily	$\overline{X}$:$\overline{X}$							
Circuit Type									
Link, by Circuit Type	Monthly Report Only	X							

Table 3-2. Measure-of-Effectiveness Report Matrix (Cont'd)

MEASURE OF EFFECTIVENESS: C-MESSAGE NOISE POWER, WN (LEVELS DISCIPLINE)

DATA SOURCE: IQCS, CIRCUIT DIRECTORY

REPORT: MONTHLY, SEMI-ANNUAL

COMPUTATION

PARTITION	$\overline{X}$	s	$\overline{X}:\mu$	$s:\sigma$	Trend $\overline{X}$	Plot $\overline{X}$	Trend s	Plot s	$\overline{X}:\overline{X}$
Circuit Type	X	X	X	X	X	X	X	X	
Link, by Circuit Type	X	X	X	X	X	X	X	X	X

Table 3-2. Measure-of-Effectiveness Report Matrix (Cont'd)

MEASURE OF EFFECTIVENESS: MAINTENANCE MANHOUR EXPENDITURE

DATA SOURCE: MDC

REPORT: ALL

COMPUTATION

PARTITION	$\overline{X}$	s	$\overline{X}:\mu$	$s:\sigma$	Trend $\overline{X}$	Plot $\overline{X}$	Histo	ANOVA	
Site	X	X	X	X	X	X	X	X	
Equipment Type	X	X	X	X	X	X	X	X	
Scheduled (For All Sites)	X	X	X	X	X	X	X	X	
Unscheduled (For All Sites)	X	X	X	X	X	X	X	X	
Scheduled, by Site	X	X	X	X	X	X	X	X	
Unscheduled, by Site	X	X	X	X	X	X	X	X	
Link	X	X	X	X	X	X	X	X	
ATEC Connected Equipment	X	X	X	X	X	X	X	X	
Non-ATEC Connected Equipment	X	X	X	X	X	X	X	X	

Table 3-2. Measure-of-Effectiveness Report Matrix (Cont'd)

MEASURE OF EFFECTIVENESS: Maintenance Manhour Expenditures

DATA SOURCE: MDC

REPORT: ALL

	COMPUTATION								
PARTITION	TOTAL	$\overline{X}$	s	$\overline{X} : \mu$	Trend $\overline{X}$	Plot $\overline{X}$	Histo	ANOVA	
Site	X	X	X	X	X	X			
Scheduled, by Site	X	X	X	X	X	X	X		
Unscheduled, by Site	X	X	X	X	X	X	X		
ATEC Discovered, by Site	X	X	X	X	X	X		X	
Non-ATEC Discovered by Site	X	X	X	X	X	X		X	
Total	X	X	X	X	X	X			
"How Mal", ATEC Discovered	X	X	X	X	X	X	X	X	
"How Mal" Non-ATEC Discovered	X	X	X	X	X	X	X	X	

Table 3-2. Measure-of-Effectiveness Report Matrix (Cont'd)

MEASURE OF EFFECTIVENESS: Maintenance Actions (Units Complete)

DATA SOURCE: MDC

REPORT: ALL

PARTITION	COMPUTATION								
	Count N			Trend N	Plot N		%		
Site	X			X	X		X		
Scheduled	X			X	X		X		
Unscheduled	X			X	X		X		
Equipment Category (WUC)	X			X	X		X		
ATEC-Discovered, by Site	X			X	X		X		
Non-ATEC-Discovered, by Site	X			X	X		X		
"How Mal", ATEC Discovered	X			X	X		X		
"How Mal" Non-ATEC Discovered	X			X	X		X		

Table 3-2. Measure-of-Effectiveness Report Matrix (Cont'd)

MEASURE OF EFFECTIVENESS: Parts Consumption

DATA SOURCE: MDC

REPORT: Monthly

COMPUTATION

PARTITION	Count N								
Part Number, ATEC Sites	X								
Part Number, Control Sites	X								

Table 3-2. Measure-of-Effectiveness Report Matrix (Cont'd)

MEASURE OF EFFECTIVENESS: OUTAGE DURATION, ALL DURATIONS COMBINED

DATA SOURCE: DATA BASE CIRCUIT DIRECTORY, CIRCUIT OUTAGE AND OPS DATA

REPORT: MARCR

	COMPUTATION								
PARTITION	$\overline{X}$	s	$\overline{X}:\mu$	$s:\sigma$	Trend $\overline{X}$	Plot $\overline{X}$	Histo	ANOVA	%
ATEC Circuits	X	X	X	X	X	X	X	X	X
Non-ATEC Circuits	X	X	X	X	X	X	X	X	X
Scheduled, by Site (RFO-BG, -BH	X	X	X	X	X	X	X	X	X
Unscheduled, by Site	X	X	X	X	X	X	X	X	X

Table 3-2. Measure-of-Effectiveness Report Matrix (Cont'd)

MEASURE OF EFFECTIVENESS: OUTAGE DURATION, GREATER THAN 30 MINUTES

DATA SOURCE: DATA BASE CIRCUIT DIRECTORY, CIRCUIT OUTAGE DATA, AND OTHER OPS DATA

REPORT: MARCR

	COMPUTATION								
PARTITION	$\overline{X}$	s	$\overline{X}:\mu$	$s:\sigma$	Trend $\overline{X}$	Plot $\overline{X}$	Histo	ANOVA	%
Site	X	X	X	X		X			X
Circuit Type	X	X	X	X		X			X
Link	X	X	X	X		X			X
ATEC Circuits	X	X	X	X	X	X	X	X	X
Non-ATEC Circuits	X	X	X	X	X	X	X	X	X
Scheduled, by Site (RFO-BG, -BH)	X	X	X	X	X	X	X	X	X
Unscheduled, by Site	X	X	X	X	X	X	X	X	X

The requirements will be met by utilizing a standard Biomedical Computer Program which will complement the software on the WWMCCS machine at Ramstein AFB. The BMD package was developed at the Health Sciences Computing facility, UCLA, under the sponsorship of HIH Special Research Resources Grant RR-3.

Two versions of the Biomedical Computer Program (BMD) package are now existant -- BMD and a later updated version, BMDP. At present WWMCCS software only supports BMD, although BMDP is being adapted for eventual use.

Table 3-3 lists the analysis requirement against the associated program(s) of the BMD package. Listed in the table are the BMD programs and the Time Share Applications Library programs which will be available at Ramstein. Also listed are the BMDP programs that could be used when the software becomes available.

3.4 SUMMARY REPORT

A requirement for a summary report of CCSD circuit performance on an as-required basis has been identified by the ATEC Test Team Analyst. The report is to contain:

- Total number of alarms
- Total number of items scanned
- Percent of time alarmed
- Correlation with outage tickets
- DTG of alarm
- DTG when alarm cleared
- Elapsed time of outage
- Reason for outage.

The report format will have a two-line display. The first line will contain the CCSD number, number of alarms, number of times circuit was scanned, and percent of time circuit was alarmed. The second line will display the DTG of alarm, status of alarm, alarm mnemonic, DTG when alarm cleared, total time of outage in minutes, and reason for the outage.

The following is a typical example:

	CCSD	No. of Alarms	Scans	Percent
1st Line	W157	30	60	50
	DTG/ALARM		DTG/time/RFO	
2nd Line	53311730/RHAV		53311930/120/EMH	

Table 3-3. Requirement vs Honeywell Program Measure-of-Effectiveness Reports

Requirement	BMDP Program*	BMD Program**	Time Share Applications Library
$\overline{X}$	1D, 2D, 5D	1D, 2D, 1V, 13D	UNISTA, MANDSD
σ	1D, 2D, 5D	1D, 2D, 1V, 13D	UNISTA, MANDSD
Hypothesis Test, $\overline{X}$	3D	13D	STATØ2, CONDIF
Hypothesis Test, σ	3D	13D	STATØ2
Regression $\overline{Xi}$	2R, 6D	1R	POLFIT, MULFIT, COLINR
Plot $\overline{Xi}$	2R, 5D	5D	
ANOVA	2V	1V	ANOVA
%	1D (as input to WWDMS)	WWDMS	
Histogram	2D, 5D	5D	
Cell Statistics	2D, 5D	1D	
Counts	1D, 5D, WWDMS	1D, 13D	
Median	2D	WWDMS	UNISTA
Mode	2D	WWDMS	UNISTA
Data Plot	2R, 6D	5D	
Range	1D	1D	
Correlation Matrix	2R	2D	STAT12
Nonparametric	3S	Not Available	TESTUD, STATØ6

* Prefix BMDP to Each Entry.
** Prefix BMD to Each Entry.

SECTION 4 - IMPLEMENTATION

4.1 DATA COLLECTION

This section outlines the recommended methods for collection, storage and transportation of the raw data and the methods of processing this data into the required report. Implicit in this discussion is the concept of a centralized authority controlling the data input. This authority would be responsible for directing the data gathering and processing effort, and for ensuring that input standards are maintained. Ideally, all raw data would flow to a focal point for preprocessing into standard formats for input to the required data base. This activity fulfills the role of a data base manager and is responsible for input to, and currency of, the data base.

Because some of the raw data will be on handwritten forms, the conversion of the data to machine readable media should take place as close as possible to the point of origin of the data. The rationale for this is twofold:

- It places the responsibility for the raw data at the source
- It assures minimal delay will be encountered from illegible input and its impossible correction by collocating the input source with this first stage of processing.

At many of the sites, this conversion will not be practical due to a lack of sufficient equipment, manpower, or both. Where this problem occurs, the raw data conversion should be accomplished at a central site which would act as a collection point for all data within its area, and would ensure a minimal amount of variation within the conversion process. These area sites would forward the preprocessed data to a central facility for storage and integration into the data base.

This structure becomes hierarchical in nature, with the individual sites reporting to an area collection point, which, in turn, reports to the data base management site. The data base management site will be responsible for collection of all data from all sites.

The personnel at this site must be highly motivated, competent professionals. They must be aware of the impact that their efforts will have on the success or failure of the entire program. Our conversations with the test team members in the Federal Republic of Germany left us with a high degree of confidence in the ability and dedication of these people.

4.2 TRANSPORTATION AND STORAGE REQUIREMENTS

The central site responsible for the maintenance of the data to be input to the data base should meet the following criteria:

- Location - this site should be centrally located to all test sites. The storage site should be easily accessible to the other sites in terms of distance and access to courier facilities.
- Storage facilities - the chosen site must have adequate facilities for storage of both the raw data and the processed raw data. The environmental requirements of both punched cards and magnetic tape more fully define the physical characteristics of the storage facility.
- Processing facilities - included in this are keypunch machines, paper tape to magnetic tape conversion facilities, and the manpower required to operate and maintain them.
- Management responsibility - the chosen site should be collocated with the group responsible for the data base management.

Unfortunately, there is no single site in the Federal Republic of Germany that can fulfill all of the preceding criteria. Previous sections have indicated the difficulties inherent in the processing of the paper tape input, and have recommended that the data be processed at the Langerkopf site. Current information indicates that this site is the only one able to support this required function. In addition, Langerkopf has both the manpower and the equipment to process the JOT&E forms into card input as specified in Appendix A.

However, Langerkopf has no adequate facility for storing either the raw data or the processed and archival data. Discussions with AFCS and test team representatives have resulted in the following recommendations:

- Processing of raw data (parameter input from ATEC measurement devices, JOT&E forms conversion, outage ticket forms conversion, and generation of the DCA directory data) should be accomplished at the Langerkopf site. This site will act as the central collection facility for the raw data from the field sites. Currently, the test team members at Langerkopf are converting the outage ticket data using a standardized format established there. As part of this conversion effort, the test team members have evolved a set of procedures for accomplishing the conversion from written forms to punched card format to punched cards. As a result of this ongoing effort, the personnel are aware of the requirements and difficulties involved in such an effort. This preliminary work makes them ideally suited for the future conversion of forms from the test effort.

  The collection methodology recommended in Section 3 will still have Langerkopf as its focus, with all other sites not able to process their data transporting the input to Langerkopf for conversion.

- Storage of preprocessed raw data, processed, and archival data will be at Pirmasens. This site was chosen after consultation with AFCS and the test team. Pirmasens has adequate room in the building occupied by the Test Team Director. The building is a permanent concrete structure, and control of temperature and humidity should pose little problem. The presence of the Test Director at this site will ensure that adequate accounting procedures are enforced to protect the data from loss or confusion. Use of this site will require that an area near the Test Director's office be partitioned off and supplied with card cabinets and racks for magnetic tape storage. The Test Director's office currently is in a vault-like area, separated from a large, mostly empty room by a concrete wall and steel door. This office space is currently used by the Test Director, his Deputy, and an enlisted man. The size of this area would allow a portion of it to be partitioned off and used for the proposed storage. This would obviate the requirement for extensive partitioning of the large adjacent room. Alternately, the entire office area could be converted into a storage area, and the Test Director, his Deputy, and any clerical help could be relocated to either a section of the large adjacent room or to separate office facilities. It is stressed that the location of these offices should be physically close to the data storage area to provide adequate control over the data.

This split solution is, admittedly, not ideal. However, given the realities of the situation in the field, it is the only solution that can adequately fulfill the four criteria mentioned previously. The preprocessed data will be transported from Langerkopf on a daily basis to Pirmasens, there to be stored until the test team can take it to Ramstein for processing. After being processed, both the raw data and any product will be returned to Pirmasens.

All of the data, both raw and processed, will be maintained on magnetic tape for long term storage. Use of a common storage medium will greatly facilitate management of the archives to be maintained. Long term card storage is not recommended for three reasons. First, not all of the data will be available in card format. Second, punched cards are a bulky storage medium when compared to magnetic tape. In a worst-case situation, inefficiently using magnetic tape, it is possible to store in excess of 20,000 card images on a single reel of tape. Lastly, if at any time in the future further processing is required, magnetic tape offers a much more rapid input transfer rate than is available with punched cards.

Figure 4-1 shows the flow of data from point of origin (1) to Langerkopf (2) for preprocessing of paper tape to magnetic tape and conversion of JOT&E forms, OPS data,

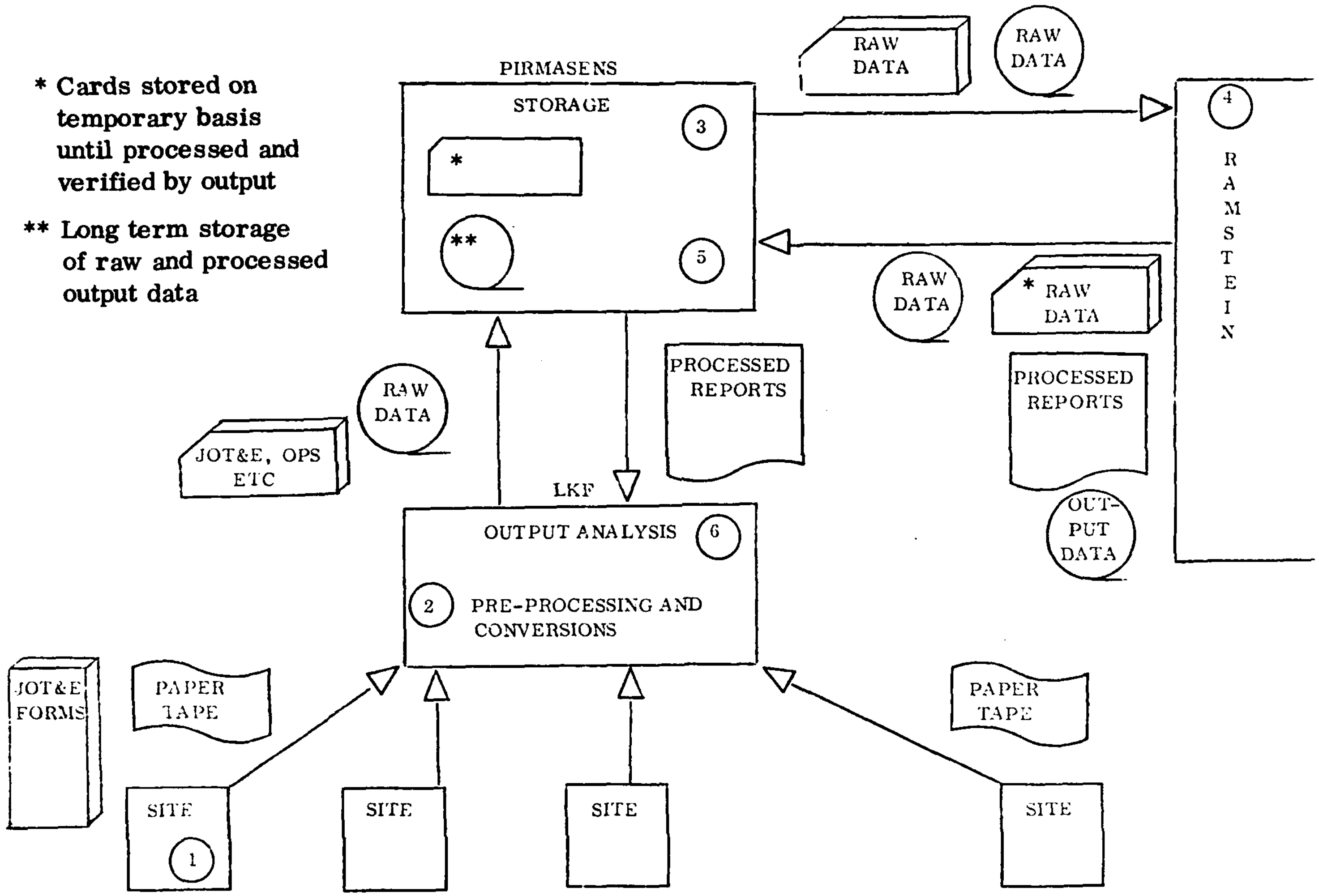


Figure 4-1. Data Flow

etc. to punched cards. The data is then transported to Pirmasens for temporary storage (3) before it is taken to Ramstein for processing (4). After is has been processed, all data, both input and output, will be returned to Pirmasens for long term storage (5). The input data on punched cards will be maintained at Pirmasens until verification and preliminary analysis indicates that the data was entered correctly. The report output will be sent to Langerkopf for analysis (6).

In summary, after the data has been collected and converted at Langerkopf, it is transferred to Pirmasens for storage. From there it is taken to Ramstein for processing (Figure 4-2). The raw and processed data is returned to Pirmasens for storage, and the output reports are returned to Langerkopf for analysis.

4.3 SECURITY

It is not within the scope of this document to recommend a security classification for the data, therefore, security will be concerned only with the physical protection of the data from loss or inadvertent destruction.

The previous paragraphs outlined a plan for utilizing a tree or hierarchical structure for collection and pre-processing of the data. Additionally, a central site has been recommended for storage of the raw and preprocessed data. This plan provides for the physical security of the data from the point of origin to the storage facility at Pirmasens (Figure 4-1). Within this plan, adequate provision can be made for instituting an audit and trace procedure to protect the data. Once the data has been pre-processed, the security emphasis shifts to the data base management group that will incorporate this data into the data base. This group will have the responsibility for all actions performed on the data base; specifically, for:

- Update - all updating of the data base will be done only by this group or under their direct supervision.
- Definition - any new item keys will be defined by this group, and a list of current item names will be maintained by them. This will prevent problems associated with doubly defining data elements.
- Assignment of "privacy locks" - the authority to use information and the method of access will be controlled by this group.

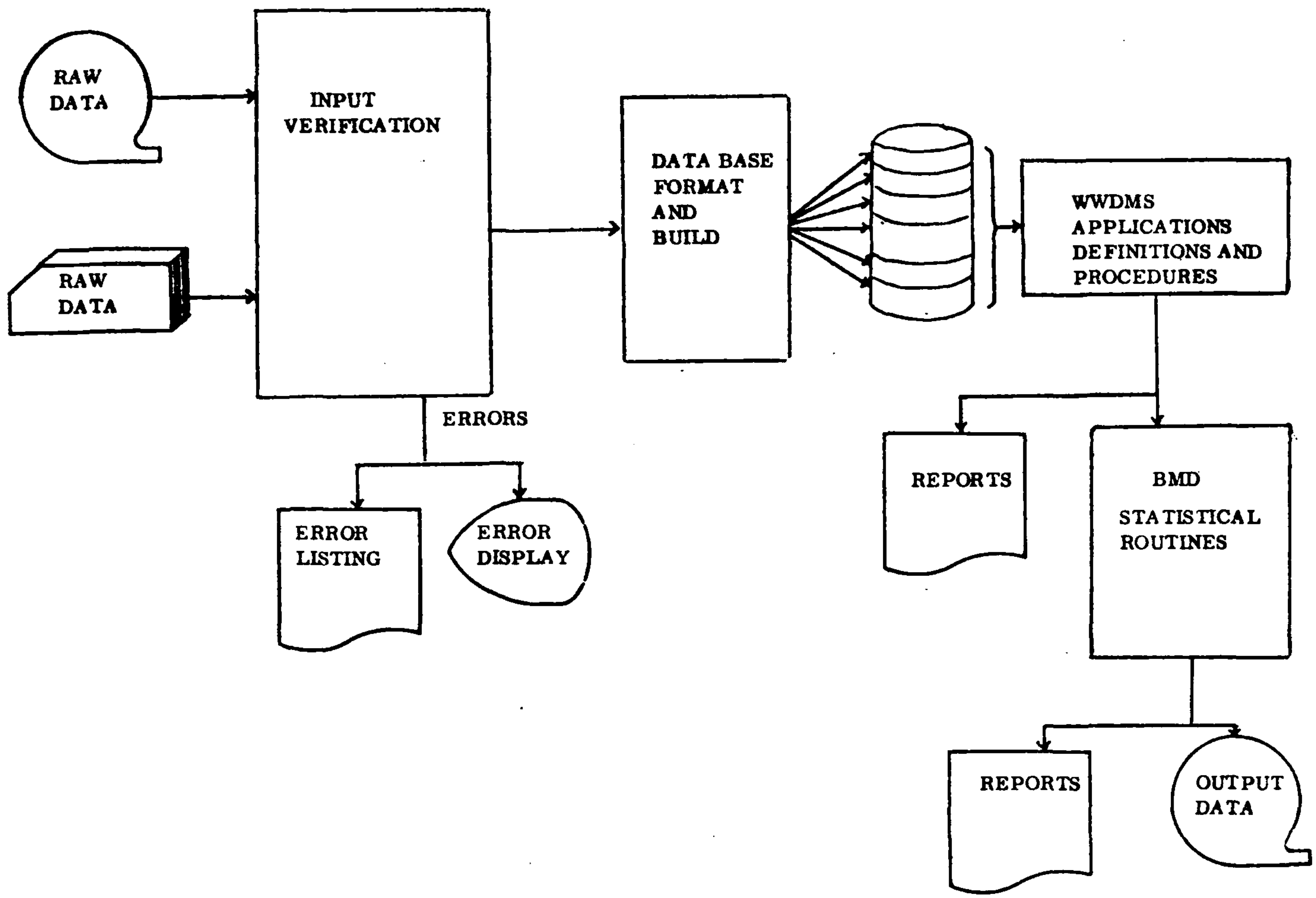


Figure 4-2. Data Flow Through the System

- In those cases where new schema are required for future reports, this group would assign names, select and structure the proper subset of the data base, and provide for alteration to the privacy locks on the data base.

- Monitor the data base - this group would use the system or data base management facilities to monitor use of the data base. They would use the various logging facilities and sampling techniques of the operating techniques of the operating system to gather data on usage, privacy breach, and potential reorganization of the data base. This input would be used by the manager of this effort to determine if the requirements of the system were being adequately met by the current data base.

4.4 HARDWARE/SOFTWARE

By direction of AFCS, the computer system that will be used to process the test data will be a Honeywell 6060 WWMCCS System at Ramstein. This system is configured as follows:

- Hardware. Honeywell 6060, 256K, Central Processing System with following components:

  (2) CRZ201 Card Reader
  (1) CPZ201 Card Punch
  (2) PRT201 Printers
  (4) DSU181 Disk Units (DSS 180 Subsystem)
  (5) DSU190A Disk Units (DSS 190 Subsystem)
  (4) DSU190B Disk Units (DSS 190 Subsystem)
  (6) MTH405 9TRK Tape Handlers
  (2) MTH301 7TRK Tape Handlers
  (1) CO8030 Operator Console
  (1) DN355 Datanet 355 Front-End Processor
  (23) KSR33 Teletype Consoles
  (8) VIP786W CRT Terminals
  (4) RLP300 Remote Line Printers

- Software System: The computer system software is basically the Honeywell 6000 commercial software package, release G, modified by the Government to support the WWMCCS community. The Command and Control Technical Center (formerly the Joint Technical Support Activity), Reston, Virginia, has primary responsibility for software maintenance. The software includes a slightly modified version of the GCOS III Operating System; GMAP assembly language; the usual higher order languages - COBOL, FORTRAN IV, JOVIAL, ALGOL, and SIMSCRIPT II.5; the WWMCCS Data Management System (WWDMS); the Honeywell Integrated Data Store capability; and a Time-Sharing subsystem. The Honeywell BMD software is also available. Access to the system requires a Top Secret clearance. User written programs are limited to 36K words. This is a powerful large-scale computer system, and should prove more than adequate for the processing the requirements outlined in Section 3.

It is recommended that a DSU190 disc pack be obtained for use by the test team. This recommendation is based on the Raw Data Quantity Estimate (Table 4-1) and the Parameter Data Estimation Technique (Table 4-2) supplied by AFCS. Additionally, the problems of physical security, accountability, and inadvertent destruction of data will be greatly alleviated if the test team has possession of the data base when it is not actually being used for processing.

4.5 PROCESSING THE DATA

The processing of the data can be divided into four broad categories:

- Input Verification
- Report Generation
- Data Base Structure and Load
- Post Report Processing.

Table 4-1. Raw Data Quantity Estimates

NAME	SOURCES	PHASE ONE QUANTITIES	PHASE TWO QUANTITIES
Parameter	Mag Tape	min: 1.2×10^6 char/mo	10×10^6 char/mo
		max: 46×10^6 char/mo	134×10^6 char/mo
Data Base	Card/Key	2000 Cards	20800
Operations	Card	2000 Cards	3000
Maintenance	Card/Tape(?)	500 Cards/mo	2000/mo
AFTEC Forms	Card/Key	250 Cards/mo	2500/mo
Special	Card/Key	2000 Cards	2000
Directory	?	3000 Records Record size probably	6500 Records 2 to 10 Cards

Estimated file size for on-line storage of data:

	PHASE ONE	PHASE TWO
Minimum	2M char ≅ 85 links	30.5M char ≅ 1324 links
Maximum	11M char ≅ 477 links	55M char ≅ 2387 links

This estimate based on storage of 20 percent of parameter data and five card images per directory record.

181 disc holds 1150 links.

191 disc holds 4800 links.

Table 4-2. Parameter Data Estimation Technique

Parameter Data per 30 day period:

Parameter data quantity will be in units of characters per month since storage of data on disc will be by month. This will be an estimated maximum. The factors affecting data quantities are:

1. Rate of scan of device in units of records/minute
2. Size of record in units of characters/record
3. Time of run in minutes/run
4. Number of runs in runs/mo

Let R_i = scan rate of device i

S_i = record size of report from device i

T_i = run time for device i

N_i = number of runs on device i

Q_i = quantity of data from device i

I_i = number of devices of type i

Then $Q_i = R_i S_i T_i N_i I_i$ $\qquad Q_{total} = \sum^{i} Q_i$

The following list is the estimated values of each term in the equation of Q.

DEVICE	i	R_i	S_i	T_i	N_i	Q_i/I_i	I_i
IQCS	1	4	365	480	25	17,520,000	3
OQCS	2	0.2	800	480	25	1,920,000	2
DDMS	3	5	100	480	25	600,000	1
MSMS	4	0.2	1330	480	25	3,192,000	2

The value of I_i changes with time as more devices become available.

4.5.1 Input Verification

Input verification programs perform two functions. First, they assure that the data entered is accurate. For each data type, a routine will be written to verify the data contained in the input. This means that there will be routines for each JOT&E form, OPS data, IQCS data, BBSA data, etc. By themselves, these routines are fairly small, therefore they will be designed to run as subroutines of a general input check program. The operator will specify parameters to the program to identify the type of data being input. Because of the structure of the JOT&E input data (See Appendix A), the JOT&E form is identified upon input. The routines that process these inputs will be able to key on the form identification field in the cards and by doing so will be able to ascertain the correct format.

- Missing Data Check - will identify data fields that should contain data in this input type but do not.

- Alphanumeric Check - will identify fields that contain the wrong type of data. Specifically, it will check for numbers in alphabetic fields, alphabetics in number fields, wrong length fields, and special characters in alphanumeric fields (i.e., $, ¢, *, etc. Normally, these are keypunch errors).

- Range Checking - will correlate the input values against known constants. This involves both the alphabetic and numeric values of the fields. For the alphabetic fields, the range check ensures that the letter entered is one of the valid set for that field (i.e., the first character in a link identifier). For the numeric fields, the range check verifies that the data entered does not exceed a preset maximum and minimum value set for the type (i.e., the channel number is not greater than 12).

- Value Correlation - will correlate one input value against other input values. On the input that specifies two or more interrelated values, this procedure will assure that the data values input in one field are within the range indicated by another field on the same input set (i.e., stop time greater than start time unless date has changed, verification that if X is in the range Ni to Nj then Y is in the range Ni' to Nj').

The second function these routines perform is the generation of an error listing and the recording of the input data to master files on magnetic tape for archival storage. The error listing may be output to either a printer or to one of the CRT units. In the latter case, the text editor features of the operating system could be used to correct the error fields.

4.5.2 Report Generation

Section 3 discussed in detail the report output formats, and indicated the proposed methodology. The reports will be generated by either the Honeywell BMD routines or directly from WWDMS procedures. Examples of BMD output and the required input parameters are included in Section 3.

Report processing can be divided into three broad categories:

- Scheduled reports requiring minimal arithmetic processing
- Scheduled reports requiring highly sophisticated statistical processing
- Unscheduled reports.

The majority of JOT&E and DCEC reports fall into the first category, while the majority of the Measure-of-Effectiveness reports and some DCEC reports are in the second category. Both report types fall into the third category.

For reports requiring minimal arithmetic processing, WWDMS will provide sufficient sophistication to perform the processing and format the output. For reports requiring highly sophisticated statistical processing, the BMD statistical routines will provide adequate analytical depth. WWDMS will be used for two functions:

- Simple report calculation and output
- Data base "filtering" for BMD input.

The discussion in Section 3 illustrated the requirement for utilization of the Honeywell BMD statistical routines. However, before the BMD routines can produce the desired reports, the input data must be extracted, or "filtered", from the mass of data in the system. This data must be correlated and collected in slightly different ways for each pass through the statistical routines. This extraction and correlation of the various data elements will be accomplished by the WWDMS procedures.

WWDMS is the acronym for World Wide Data Management System. It operates as a subsystem of the Series 6000 General Comprehensive Operating Supervisor (GCOS) in both time sharing and batch environment. Its capabilities include:

- Retrieval of data by Boolean criteria
- Retrieval or update based on the results of a prior retrieval
- Sorting of retrieved data on multiple fields in ascending, descending, or mixed order
- Multifile retrieval from up to 15 different files
- Performing computations on retrieved data
- Data base maintenance and update
- Restructuring of the data base
- Report generation
- Providing file security.

Because the WWDMS manuals contain copyrighted, restricted distribution information proprietary to Honeywell Information Systems, the interested reader is directed to WWMCCS documentation on WWDMS. Of particular interest are the "Data Management System Administrator's Guide", April 1974, DB98, latest revision, and "Data Management System Users' Guide", April 1974, DB97, current revision.

4.5.3 Structure of the Data Base

The elements identified by the test team that will comprise the data base are:

1. JOT&E data
2. DCEC manpower data
3. A directory, by site, of links, trunks, and VF and DC circuits
4. Maintenance and OPS data
5. Parameter data gathered by the ATEC equipment.

The key to this data base structure appears to be the directory element that identifies the links, trunks, and circuits. Discussions and memos supplied by AFCS personnel indicated that the desired objective of this format was to orient the data base on a site basis. While this is efficient for the Measure-of-Effectiveness reports, it is too restrictive for the majority of reports.

A great deal of work has been done by CSC to define the interrelationship of the directory items. This effort was integral to the development of the data base associated with the software under development for Task C. In this effort, the relationship between the following was defined:

- Links
- Routes
- Supergroups and groups
- DCS trunks
- Channels
- Subchannels
- VFCT
- CCSD.

These elements were defined in a schema so that given a group, links, channels, subchannels, etc., associated with that group could be identified. This schema enabled the software to determine all groups on a route, all channels on a route, all routes on a link, and so forth. The actual data base for Task C was developed under the constraint imposed by the Data Base Management System (DBMS) used. This DBMS, as do all others, has certain unique restrictions in its design, and would not be directly reusable on any other machine. Because many of the elements within this data base structure were defined for the unique requirements of the Task C algorithms, the complete data base is not recommended for this effort. However, the basic concepts of the interrelationships and the data base layout established while developing this data base should significantly contribute to a reduction in the amount of time required to specify this portion of the data base design.

The design of the data base has been identified as the most critical aspect of the task. An inefficient design can easily result in an unacceptable increase in processing time, storage space requirements, and complexity of applications programs. The crucial points to be resolved are:

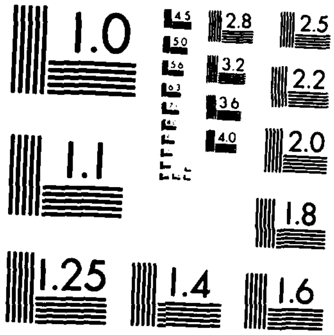
- Definition of data files necessary for data base
- File type (sequential, indexed, sequential, integrated) best suited for each file
- Interrelationship of data files in data base
- Organization of records in each file.

Further, as data base design is an iterative process, time will be included at the halfway or two thirds point for reevaluation and probable partial redesign of the data base in light of new requirements and problems encountered.

Concurrent with the design of the data base, as the relationships between the data files, entry names, and "virtual records" required by the WWDMS procedures become clear, the WWDMS Application Definitions will be written. These Application Definitions define the structure of the data to be processed by the WWDMS procedures. In effect, they redefine the relationship between the elements in the data base. As mentioned earlier, it is felt that the file interrelation specified by the test team is insufficient for all applications. The recommendation at this time on the data base structure is that the individual items be

AD-A128 791 IMPLEMENTATION PLAN FOR DATA COLLECTION REDUCTION AND ANALYSIS IN SUPPORT..(U) COMPUTER SCIENCES CORP FALLS CHURCH VA MAY 76 F23613-74-C-0014 2/4

UNCLASSIFIED F/G 9/2 NL



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

entered in the data base with key field identifiers and no fixed relational connectivity for any items other than the DCA directory data. The result of this recommendation would be a multiple number of files, each with its own internal relationships, that would be processed by WWDMS to create a "virtual file" containing "virtual records" for input to either BMD or the computation and report portions of WWDMS. The concept of "virtual records" is more fully explained in the WWDMS documentation referenced earlier. The net effect to the user is that the data records appear to be interrelated in exactly the required way. To effect this without WWDMS, the data base storage requirements would be two to three orders of magnitude larger than envisioned. This would result from the duplication many times over of the input data to satisfy the connectivity requirements. With WWDMS Applications Definitions, the data need be defined only once on the data base, and the connectivity of the various elements is external and independent to the way they are stored. This independence of the connectivity makes modification of the connectivity a trivial task when compared to the alternative of redefining an entire data base.

4.5.4 Post Report Processing

Once the processing of the data by both WWDMS and BMD has completed, post-processing routines will provide for data preservation which takes two forms. First, they will generate the printed reports as specified in the input descriptions supplied to the programs. Additionally, they will generate magnetic tape output files for archival purposes. These magnetic tape files will contain the same data as the printed reports. By using this medium, two objectives are fulfilled. First, the amount of archival storage is reduced. Magnetic tape storage of reports is much more efficient than retention of printed reports. Second, and equally important, the magnetic tape retention of the printed output allows the future printing of the same reports. This ability to produce multiple copies of a report at some time in the future will negate the necessity of producing multiple copies during the production run.

WWDMS provides for a further post-processing output for the data base managers. This output is an "audit trail". An audit trail is a trace through the data base of the activity which has taken place. It provides input to the data base managers concerning utilization of the data, attempted security violations, and a trace of what was updated, added, or deleted. This information can be used by the data base managers to determine the efficiency of the data base file structure, the activity on a file or on the data base, etc.

The audit trail features of WWDMS provide for a way of backtracking in the event of a catastrophic hardware failure. With the audit trail, it is possible to determine which records had already been updated, deleted, etc. at the time of the failure. This knowledge will prevent the problems of dual updating, duplicate records appearing in the data base, etc.

APPENDIX A - TASK D DATA GATHERING AND PREPARATION FORMATS

APPENDIX A - TASK D DATA GATHERING AND PREPARATION FORMATS

A. 1 INTRODUCTION

This Appendix contains a listing of those AFTEC forms which have been deemed convertible to automated data processing and includes instructions for their transferral onto the selected card formats. Each form has a typical line of data entered on it so that an example of a completed format card could be provided. These sample cards follow both the AFTEC Form and the Transfer Instructions for that form. Table A-1 lists the form number, its card format, and the page on which it can be found.

There are 50 AFTEC forms to be converted to ADP and six card formats, one of which will fit a given form. For card assignments, see Table A-2.

A-2 GENERAL INSTRUCTIONS

This paragraph contains some general rules which should be followed in completing all cards.

> The last three items of each card are reserved as control elements. Item 78 (a letter from A to H) will identify the card format that is being used. Item 79 (a letter designator from A to Z) will identify the particular AFTEC form whose entries will appear on the card. Item 80 (either the number "1" or "2") will be used for those forms which require multiple cards to completely enter all of its data.
>
> All numeric measurement data should be right-justified unless otherwise specified. For example, if the measurements -23.5 and 2600 are to be entered into two eight-character fields, they should appear as follows:

			-	2	3	.	5

and

				2	6	Ø	Ø

The first three places are reserved for the exponent should the number happen to be in scientific notation. The exponent should also be right-justified. A number such as -1.6×10^{-9}, for example, would be entered as follows:

	-	9		-	1	.	6

(Exponent)(Mantissa)

In practically all cases, however, the exponent will be zero.

c. **All alphabetic or alphanumeric entries should be left-justified.**

d. Instructions for entering date time groups are contained in Table A-5

Table A-1. Card/Form Cross-Reference

AFTEC Form Number	Card Format	Page
94	D	A-69
97	D	A-69
103	D	A-69
125	A	A- 9
128	A	A-12
129	B	A-15
130	B	A-18
130A	B	A-21
131	B	A-24
132	D	A-69
133	D	A-69
135	D	A-69
137	D	A-69
138	C	A-27
139	C	A-30
140	B	A-33
141	B	A-36
142	B	A-39
143	B	A-42
144	B	A-45
145	B	A-48
146	B	A-51
147	D	A-69
148	D	A-69
150	E	A-54
151	H	A-57
157	B	A-60
158	C	A-63
160	A	A-66
161	D	A-69
162	E	A-75
162A	E	A-78
163	E	A-81
164	D	A-69
165	B	A-84
166	H	A-87
166A	H	A-91
166B	B	A-95
168	B	A-98
172	B	A-101
173	B	A-104
173A	B	A-107
173B	B	A-111

Table A-1. Card/Form Cross-Reference (Continued)

AFTEC Form Number	Card Format	Page
173C	B	A-114
173D	B	A-117
174	B	A-120
175	B	A-123
176	B	A-126
177	B	A-129
178	B	A-132

Table A-2. Card Format Assignments

	CARD FORMAT							
	A	B	C	D	E	F	G	H
AFTEC FORMS ↓	125 128 160	129 130 130A 131 140 141 142 143 144 145 146 157 165 166B 168 172 173 173A 173B 173C 173D 174 175 176 177 178	138 139 158	94 97 103 132 133 135 137 147 148 161 164	150 162 162A 163	Not Used	Not Used	151 166 166A

Table A-3. Site Codes

The following is an abbreviated list of sites and codes within the JOT&E test configuration.

Site	DCS Code
Bann	BAN
Croughton	CRO
Coltano	CLO
Donnersberg	DON
Feldberg	FEL
Heidelberg	HDG
Hillingdon	HIN
Hohenstadt	HST
Langerkopf	LKF
Lindsey	LSY
Muhl	MUL
Mt. Limbara	MBA
Mt. Vergine	MRE
Pirmasens	PMS
Rhein Main	RMN
Schoenfeld	SCH
Stuttgart	SGT
Zugspitze	ZUG

Table A-4. ATE Codes

ATEC Equipment	Code
BBSA	B
DDMS	D
IQCS	I
I/OQCS	Q
MSMS	M
MTS (ARS) both (MAC) and (MAD)	A
MTS (ADU)	U
MTS (BM)	E
MTS (ILSC)	L
MTS (MAC)	C
MTS (MAD)	J
MTS (NLG)	G
MTS (NSF)	F
MTS (PM)	P
MTS (RPS)	R
MTS (SLG)	S
MTS (TSS)	T
NSS	N
OQCS	O

Special Instructions

For all "ATE Type" fields apply the following rules:

1. The first item indicates the ATEC equipment used in a given test (e.g., an IQCS)

2. The second item indicates whether a second piece of ATEC equipment was used in the same test (e.g., an MTS (TSS) used in conjunction with an OQCS)

3. The third item indicates whether a third piece of ATEC equipment was used in the same test (e.g., an NSS on control of two ATES)

4. If the data on the form is manual, do not use this field.

Table A-5. Conversion from Calendar Day to Raday

Month	Monthly Addition Factor	
	Normal Years	Leap Years
January	0	0
February	31	31
March	59	60
April	89	90
May	120	121
June	150	51
July	181	[illegible]
August	212	213
September	242	243
October	273	274
November	304	305
December	334	335

Special Instructions

On any form that contains time information, the following rules should apply:

1. Assume, unless otherwise specified, that the time given is in Zulu time. If not, it must be converted.
2. If only the time is given for some form entry, use the applicable date listed on the form to derive the first four digits of the date time group. The first digit will indicate the year (i.e., 1976 - enter a 6; 1975 - enter a 5). The next three digits are the radio day. The table indicates how many days should be added to the given date to get the radio day.
3. All "TOTAL TIME" entries should be converted to minutes.

STATION LKF
DTG 52170500

TEST TEAM MEMBER A.K.
ATE TYPE IOQCS

CCSD	ATEC SYSTEM						MANUAL SYSTEM			REMARKS
	SCANNER ADDRESS	SCANNING LEVEL	NO. OF ATE ALARMS BY COLOR	ATE PARAMETER ALARMED	DATA BASE CONF #	TIME OF FIRST ALARM	TIME DETECTED	DATA SOURCE	ACTION TAKEN	
DUUC9AAN	0051	1	5 Red; 8 Amber	AV	10	52170516	52170600	Customer Complaint	Coordination	

Figure A-1. Data Transferral - AFTEC Form 125 Sheet 1 of 3

AFTEC FORM NO. 125	CARD NO. A		
FORM ENTRY DESCRIPTION	**FIELD**	**DESCRIPTION**	**TRANSFER INSTRUCTIONS**
Station	A	Site	See Table A3 for Site Codes
ATE Type	B	ATE Type	See Table A4 for Abbreviations
CCSD	C	CCSD Number	Use Last Four Digits
Scanner Address	D	Scanner Address	Direct Transfer
Scanning Level	E	Scanning Level	Direct Transfer
ATE Parameter Alarmed	F	ATE Parameter Alarmed	Direct Transfer
No. of ATE Alarms by Color	I	No. of Amber Alarms	Direct Transfer
No. of ATE Alarms by Color	L	No. of Red Alarms	Direct Transfer
Data Base Conf. No.	M	Data Base Conf. No.	Direct Transfer
Time of First Alarm	N	DTG of First Alarm	See Table A5 for Instructions
Data Source	Q	Source of Manual Data	Code — Meaning C — Customer Complaint E — Equipment Alarm Q — Quality Control Test T — Trending A — Adjacent TCF K — Outage Ticket O — Other
Action Taken	R	Manual Actions Taken	Code — Meaning 1 — Coordination 2 — Patching (restoral or rerouting) 3 — Testing (measurement made due to extraordinary condition) 4 — Monitoring 5 — Reporting 6 — Other Note: these numbers should be right-justified; there is room for three action taken codes in this field should multiple actions be listed.
Time Detected	S	DTG of Manual Detection	See Table A5 for instructions
Remarks	T	Problems Addressed	Code — Meaning S — System problem Indicated C — Circuit Problem Indicated
	Y	Control	Code — Meaning Item 78 — A — Card ID Item 79 — A — Form ID Item 80 — Not Used

Figure A-1. Data Transferral - AFTEC Form 125 Sheet 2 of 3

Field	A			B			C				D				E		F		G	
Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Entry	L	K	F	Q			9	A	A	N	ø	ø	5	1	ø	1	A	V		

Field	G		H		I		J					K		L		M				N
Column	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Entry					ø	8								ø	5	ø	ø	1	ø	5

Field	N							O	P	Q	R			S						
Column	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Entry	2	1	7	ø	5	1	6			C			1	5	2	1	7	ø	6	ø

Field	S	T	U			V			W			X						Y		
Column	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Entry	ø																	A	A	

Figure A-1. Data Transferral - AFTEC Form 125 Sheet 3 of 3

SITE DON

ATE TYPE MSMS

TEST PERIOD Aug 4, 1975

TEST TEAM MEMBER A.K.

VFCT CCSD	SCANNER ADDRESS	SUBCHAN NUMBER	ALARM COLOR	PARAM ALARMED	TIME DETECTED	TYPE OF PROBLEM INDICATED *	COORDINATION	
							TRANSMITTER TERMINAL	RECEIVER TERMINAL
DTXX6FØ2	Ø1Ø3	12	Red	EM	5217Ø516	4,6	DON /No	PMS /ATEC/No

* Use Codes: (1) Input at TX End (2) TX Keyer (3) RX Converter
(4) Transmission Path (5) Not Confirmed (6) Confirmed

Figure A-2. Data Transferral - AFTEC Form 128 Sheet 1 of 3

AFTEC FORM NO. 128	CARD NO. A		
FORM ENTRY DESCRIPTION	FIELD	DESCRIPTION	TRANSFER INSTRUCTIONS
Site	A	Site	See Table A3 for Site Codes
ATE Type	B	ATE Type	See Table A4 for Abbreviations
VFCT CCSD	C	CCSD Number	Use Last Four Digits
Scanner Address	D	Scanner Address	Direct Transfer
Subchannel Number	E	Subchannel Number	Direct Transfer
Param Alarmed	F	Parameter Alarmed	Direct Transfer
Alarm Color	H	Alarm Color	Code / Meaning A Amber AH Amber High AL Amber Low AT Amber Trending R Red RH Red High RL Red Low RT Red Trending
Time Detected	N	DTG Detected	See Table A5 for Instructions
Type of Problem Indicated	O, P	Problem Indicated	Direct Transfer (Codes on bottom of Form 128)
Coordination	U	Coordination	Item 63 Use "Y" for yes, "N" for no and "U" for unknown to indicate if operator at the transmit site was aware of the problem. Item 64 Use "Y" for yes, "N" for no and "U" for unknown to indicate if ATEC operator at the receive site was aware of the problem. Item 65 Use "Y" for yes, "N" for no and "U" for unknown to indicate if Manual operator at the receive site was aware of the problem.
Transmitter Terminal	V	Transmitter Terminal	See Table A3 for Site Codes
Receiver Terminal	W	Receiver Terminal	See Table A3 for Site Codes
	Y	Control	Code / Meaning Item 78 A Card ID Item 79 B Form ID Item 80 Not Used

Figure A-2. Data Transferral - AFTEC Form 128 Sheet 2 of 3

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
DON	M	6FØ2	Ø1Ø3	12	EM		R						5217Ø516	4	6					NNU	DON	PMS		AB

Figure A-2. Data Transferral - AFTEC Form 128 Sheet 3 of 3

SITE FEL

DATE November 13, 1975

TESTER A.K.

CCSD	FROM STATION	TO STATION	ATEC METHOD			MANUAL METHOD		REMARKS
			TEST MODE	START TIME	STOP TIME	START TIME	STOP TIME	
9AWN	SCH	DON	Automatic	5318ø51ø	5318ø52ø			

Figure A-3. Data Transferral - AFTEC Form 129 Sheet 1 of 3

AFTEC FORM NO. 129	CARD NO. B		
ITEM ENTRY DESCRIPTION	FIELD	DESCRIPTION	TRANSFER INSTRUCTIONS
Site	A	Site	See Table A3 for Site Codes
	B	ATE Type	(If test mode indicates an automatic mode, Item 4 should be O and Item 5 T. If test mode is semi-automatic, Item 4 should be O. If test mode is manual do not use this field).
CCSD	G	CCSD Number	Use Last Four Digits
Test Mode	H	Test Mode	Code / Meaning A — Times on this card are automatic S — Times on this card are semi-automatic M — Times on this card are manual
Manual (or ATEC) Start Time	K	DTG Start	See Table A5 for Instructions
Manual (or ATEC) Stop Time	N	DTG Stop	See Table A5 for Instructions
From Station	O	TX Station	See Table A3 for Site Codes
To Station	T	RX Station	See Table A3 for Site Codes
	V	Control	Code / Meaning Item 78 — B — Card ID Item 79 — A — Form ID Item 80 — Not Used

Figure A-3. Data Transferral - AFTEC Form 129 Sheet 2 of 3

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1 2 3	4 5 6	7	8 9 10 11 12 13 14 15	16 17	18	19 20 21 22	23	24	25 26 27	28 29 30 31 32 33 34 35	36	37	38 39 40 41 42 43 44 45	46 47 48	49 50 51 52 53 54 55 56	57	58	59 60 61 62 63 64 65 66	67 68 69	70 71 72 73 74 75 76 77	78 79 80
H E L	O T					9 A W N	A			5 3 1 8 ∅ 5 1 ∅			5 3 1 8 ∅ 5 2 ∅	S C H					D O N		B A

Figure A-3. *Data Transferral* - AFTEC Form 129 Sheet 3 of 3

FM STA: LKF TO STA: DON LINK #: MØ671

DATA: November 13, 1975 START TIME: 53180800 STOP TIME:

BBL STANDARD -16.0 BBSA: 53180820

BBL MEASURED WITH BBSA -16.3 MANUAL 53180855

BBL MEASURED MANUALLY -16.4 TESTER:

SG/GP	PILOT LEVEL			PROBLEMS DETECTED		REMARKS
	STD	BBSA	MANUAL	BBSA	MANUAL	
01/3	-36.0	-36.1	-36.1			
01/4	-36.0	-35.9	-35.9			

Figure A-4. Data Transferral - AFTEC Form 130 Sheet 1 of 3

AFTEC FORM NO. 130	CARD NO. B		
FORM ENTRY DESCRIPTION	FIELD	DESCRIPTION	TRANSFER INSTRUCTIONS
Site	A	Site	See Table A: for Site Codes
	B	ATE Type	Code / Meaning Item 4 — B — Indicates BBSA Test Item 5 — N — Indicates NSS Control Note: If test mode is manual, do not use the field
Link No.	D	Link Number	Direct Transfer
SG/GP	E	Super Group Number	Direct Transfer
	F	Group Number	Direct Transfer Note: Two cards will have to be filled out, one for link data and one for group data. Fields A, B, D, H & K will be identical on both. For group data set Item 80=2 and enter the SG/GP numbers in fields E and F; otherwise leave fields E and F blank and set Item 80=1.
	H	Test Mode	Code / Meaning A — Indicates times and measurements on this card are automatic M — Indicates times and measurements on this card are manual
Start Time	K	DTG Start	See Table A5 for Instructions
Manual (or BBSA) Stop Time	N	DTG Stop	See Table A5 for Instructions
FROM Station	O	TX Station	See Table A3 for Site Codes.
BBL Measured Manually or with BBSA or Group Pilot Level	P	Measurement Data	Direct Transfer Note: For Item 80 = 2 enter group pilot level. (For first card (Item 80=1) Enter BBL Measurement).
BBL Standard or Group Pilot Level Standard	S	Measurement Data	Direct Transfer Note: For Item 80 = 2 enter group pilot level standard (For first card (Item 80=1) Enter BBL Standard).
TO Station	T	RX Station	See Table A3 for site codes
	V	Control	Code / Meaning Item 78 — B — Card ID Item 79 — B — Form ID Item 80 — 1 — Specifies measurements on fields P and S as BBL and BBL Standard respectively 2 — Specifies measurements on fields P and S as pilot level and pilot level standard.

Figure A-4. Data Transferral - AFTEC Form 130 Sheet 2 of 3

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
LKF	BN		MØ671				A			5318Ø8ØØ			5318Ø82Ø	LKF	-16.3			-16.Ø	DON		BB1
MANU	AL		DATA																		
LKF			MØ671				M			5318Ø8ØØ			5318Ø855	LKF	-16.4			-16.Ø	DON		BB1
GROU	P	D	ATA																		
LKF	BN		MØ671	Ø1	3		A			531848ØØ					-36.1			-36.Ø			BB2
LKF	BN		MØ671	Ø1	4		A			5318Ø8ØØ					-35.9			-36.Ø			BB3
MANU	AL		DATA																		
LKF			MØ671	Ø1	3		M			531848ØØ					-36.1			-36.Ø			BB2
LKF			MØ671	Ø1	4		M			5318Ø8ØØ					-35.9			-36.Ø			BB2

Figure A-4. Data Transferral - AFTEC Form 130 Sheet 3 of 3

BASEBAND SWEEPS: MAN-HOUR ALLOCATIONS

SITE Feldberg MONTH November

DATE	TOTAL NUMBER OF LINKS *	XMIT (✓)	REC (✓)	(MANUAL MODE) TOTAL TIME IN MINUTES	(AUTOMATED MODE) TOTAL TIME IN MINUTES	REMARKS
16 Nov	1	X		5		
" "	2		X	7		

* ONE LINK = XMIT & REC BASEBANDS. TOTAL NUMBER OF LINKS TESTED TO BE PLACED IN THIS COLUMN.

Figure A-5. Data Transferral - AFTEC Form 130A Sheet 1 of 3

AFTEC FORM NO. 130A	CARD NO. B		
FORM ENTRY DESCRIPTION	FIELD	DESCRIPTION	TRANSFER INSTRUCTIONS
Site	A	Site	See Table A3 for Site Codes
XMIT or REC	C	Transmit or Receive	Code / Meaning T — Transmit was checked R — Receive was checked B — Both checked
Link Number	D	Link Number	Direct Transfer (if applicable)
	H	Test Mode	Code / Meaning A — Indicates times on this card are automatic M — Indicates times on this card are manual
Total Number of Links	J	Total Number of Links Tested	Direct Transfer
Manual (or ATEC) DTG Start	K	DTG Start	See Table A5 for Instructions
Manual (or ATEC) DTG Stop	N	DTG Stop	See Table A5 for Instructions
Manual (or ATEC) Total Time	O	Total Time	Direct Transfer
Date	P	DTG of Test	Note: For the version of Form 130A with only manual and automated total times enter the date of form in this field. See Table A5 for Instructions. (left justified)
	V	Control	Code / Meaning Item 78 — B — Card ID Item 79 — C — Form ID Item 80 — Not used

Figure A-5. Data Transferral - AFTEC Form 130A Sheet 2 of 3

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
FEL		T					M		ØØ1					ØØ5	5319						BC
FEL		R					M		ØØ2					ØØ7	5319						BC

Figure A-5. Data Transferral - AFTEC Form 130 A Sheet 3 of 3

SITE: FEL

ALARM TYPE:

INJECTED X NON-INJECTED ___

TYPE OF ALARM	DTG OF ALARM	ARS CONNECTED	EXISTING STATION ALARM CONNECTED	MAJOR OR MINOR ALARM	ALARMS SYSTEM USED TO IDENTIFY ALARM (1)	ALARM INITIALLY IDENTIFIED (2)	DTG WHEN ALARM WAS CORRECTLY IDENTIFIED	REMARKS (3)
TX Failure	5318Ø92Ø	X		Major	ARS	TX Failure	5318Ø95Ø	

NOTES: (1) Enter ARS, Existing, or Both.
(2) Enter controller's initial assessment of alarm condition.
(3) During trial alarm phase controller's initials will be included in remarks.

Figure A-6. Data Transferral - AFTEC Form 131 Sheet 1 of 3

AFTEC FORM NO. 131	CARD NO. B		
FORM ENTRY DESCRIPTION	**FIELD**	**DESCRIPTION**	**TRANSFER INSTRUCTIONS**
Site	A	Site	See Table A3 for Site Codes
	B	ATE Type	Item 4; Use A to indicate MTS (ARS) Note: If test mode is manual, do not use this field.
ARS, Existing Station Alarm Connected	H	Test Mode	Code Meaning A ARS M Existing System B Both
Type of Alarm, Injected or Non-Injected, Major or Minor Alarm	J	Alarm Type	Code Meaning Item 25 C Circuit Failure E Equipment Failure G Group (Group Pilot) Failure H Channel Failure L Link Failure O Other Failure R Receiver Failure S Supergroup Failure T Transmitter Failure Item 26 I Injected N Non-Injected Item 27 A Major I Minor
DTG Of Alarm	P	DTG Of Alarm	See Table A5 for Instruction
Alarm Initially Identified	Q	Initial Assessment	See Alarm Type Codes Above
Alarm System Used to Identify Alarm	R	Alarm Detection Method	Code Meaning A ARS M Existing System B Both
DTG When Alarm was Correctly Identified	S	DTG Identification	See Table A5 for Instructions
	V	Control	Code Meaning Item 78 B Card ID Item 79 M Form ID Item 80 Not Used

Figure A-6. Data Transferral - AFTEC Form 131 Sheet 2 of 3

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
FFL	A						A		TIA						5318Ø92Ø	T	A	5318Ø95Ø			BM

Figure A-6. Data Transferral - AFTEC Form 131 Sheet 3 of 3

DDMS BAUD DETERMINATION EVALUATION

SCAN ADD		DTG WHEN MONITORED	ASSIGN DCS BAUD RATE	MAN RECOG BAUD RATE	ATEC RECOG BAUD RATE	ATEC BAUD RATE RECOGNITION VALUES				KW-26 CKT	REMARKS
						BE	RD	ST (1)	WAS ATEC CORRECT		
0057		52170510	10,000	10,000	10,000	00%	00%	00%	YES		

(1) Spurious Transitions

Figure A-7. Data Transferral - AFTEC Form 138 Sheet 1 of 3

AFTEC FORM NO. 138	CARD NO. C		
FORM ENTRY DESCRIPTION	FIELD	DESCRIPTION	TRANSFER INSTRUCTIONS
Site	A	Site	See Table A3 for Site Codes
	B	ATE Type	Item 4 - Use D to indicate DDMS
KW-26 CKT	C	CCSD Number	If provided, use last four digits
Scan Add	D	Scanner Address	Direct Transfer
Assigned Baud Rate	E	Assigned Baud Rate	Direct Transfer
MAN Recognized Baud Rate	F	Manually Recognized Baud Rate	Direct Transfer
ATEC Recognized Baud Rate	G	ATEC Recognized Baud Rate	Direct Transfer
DTG When Monitored	K	DTG When Monitored	See Table A5 for Instructions
ATEC Correct?	L	ATEC Correct?	Use "Y" for yes and "N" for no
BE Recognition Value	O	Measurement Data	Direct Transfer
RD Recognition Value	P	Measurement Data	Direct Transfer
ST Recognition Value	Q	Measurement Data	Direct Transfer
	U	Control	Code / Meaning Item 78 — C — Card ID Item 79 — A — Form ID Item 80 — Not Used

Figure A-7. Data Transferral - AFTEC Form 138 Sheet 2 of 3

A			B			C				D				E					F					G		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
P	M	S	D							ø	ø	5	7	1	ø	ø	ø	ø	1	ø	ø	ø	ø	1	ø	ø

		H		I		J		K								L	M	N′		O					P	
28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
ø	ø							5	2	1	7	ø	5	1	ø	Y							ø	ø		

			Q					R					S					T					U		
55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
	ø	ø				ø	ø																C	A	

Figure A-7. Data Transferral - AFTEC Form 138 Sheet 3 of 3

TYPE TRANSMISSION LINK SM

ATEC EQUIPMENT IQCS

TRAFFIC TYPE	ATE PARAMETER	ALARM THRESHOLDS					LINK QUALITY		
		CG	AH	RH	AL	RL	GOOD	MARGINAL	BAD
VON IST	AV	22.0	24.0	26.0	20.0	18.0	X		

Figure A-8. Data Transferral - AFTEC Form 139 Sheet 1 of 3

AFTEC FORM NO. 139 | CARD NO. C

FORM ENTRY DESCRIPTION	FIELD	DESCRIPTION	TRANSFER INSTRUCTIONS
Site	A	Site	See Table A3 for Site Codes
ATEC Equipment	B	ATE Type	See Table A4 for Codes
Traffic Type	K	Traffic Type	Code — Meaning VU — Von User VO — Voice SP — Spare VI — Von IST VX — Vox (Silk Purse, Vox O/W, Vox Net) DT — Data SE — SEVOCOM DI — Din IST VT — VFCT DU — Din User FX — Facsimile DC — DC OT — Other
Type Transmission Link	L	Link Type	Code — Meaning 1 — Short Tropo 2 — Long Tropo 3 — Short Microwave 4 — Long Microwave 5 — Cable
Link Quality	M	Link Quality	Code — Meaning G — Good M — Marginal B — Bad
ATE Parameter	N	ATE Parameter	Direct Transfer
CG Threshold	O	Measurement Data	Direct Transfer (Center Green Value)
AH Threshold	P	Measurement Data	Direct Transfer (Amber High Value)
RH Threshold	Q	Measurement Data	Direct Transfer (Red High Value)
AL Threshold	R	Measurement Data	Direct Transfer (Amber Low Value)
RL Threshold	S	Measurement Data	Direct Transfer (Red Low Value)
	U	Control	Code — Meaning Item 78 — C — Card ID Item 79 — B — Form ID Item 80 — Not Used

Figure A-8. Data Transferral - AFTEC Form 139 Sheet 2 of 3

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
TEL	I						VI				3	G	AV	22.Ø	24.Ø	26.Ø	2Ø.Ø	15.Ø		CB

Figure A-8. Data Transferral - AFTEC Form 139 Sheet 3 of 3

SITE SCH ILSC TEST

OBJECTIVE NO: 2.4.1.11.
DATE: November 13, 1975

LINK NO.	CCSD	ILSC MEASUREMENTS		NON-ILSC MEASUREMENTS		REMARKS
		LEVEL (DPMØ)	3KC NOISE (DBMØ)	LEVEL (DBMØ)	3KC NOISE (DBMØ)	
MØØ67	9AWN	2.0	2.6			

LINK NO.	ILSC		NON-ILSC		AVERAGED LINK ICN		
	START TIME	FINISH TIME	START TIME	FINISH TIME	ILSC	NON-ILSC	MAN. PMP
MØØ67	5318Ø8ØØ	5318Ø82Ø			-68.2		

COMMENTS:

Figure A-9. Data Transferral - AFTEC Form 140 Sheet 1 of 3

AFTEC FORM NO. 140	CARD NO. B		
FORM ENTRY DESCRIPTION	**FIELD**	**DESCRIPTION**	**TRANSFER INSTRUCTIONS**
Site	A	Site	See Table A3 for Site Codes
	B	ATE Type	Code / Meaning L — MTS(ILSC) N — NSS Control Note: If test mode is Non-ILSC, do not use this field.
Link No.	D	Link Number	Direct Transfer
CCSD	G	CCSD Number	Use last four digits. Note: Two cards will have to be filled out, one for link data and one for circuit data. Fields A, B, D, H & K should be identical on both. For circuit data, enter the CCSD in field G and set Item 80=2, otherwise, set Item 80=1 and leave field G blank.
	H	Test Mode	Code / Meaning A — Indicates times and measurements on this card are automatic M — Indicates times and measurements on this card are non-ILSC
Non-ILSC (or ILSC) Start Time	K	DTG Start	See Table A5 for Instructions
Non-ILSC (or ILSC) Stop Time	N	DTG Stop	See Table A5 for Instructions
Non-ILSC (or ILSC) Averaged LINK ICN or Level	P	Measurement Data	Direct Transfer Note: For Item 80 = 2, enter ILSC or Non-ILSC circuit level, otherwise enter avg. ICN
Non-ILSC (or ILSC) 3 KC Noise	S	Measurement Data	Direct Transfer Note: This field is only used for Item 80 = 2, otherwise do not use this field.
Manual PMP ICN	U	Measurement Data	Direct Transfer Note: Use only for item 80=1 and Manual Test Mode, otherwise do not use this field.
	V	Control	Code Item 78 — B — Card ID Item 79 — D — Form ID Item 80 — 1 — Specifies field P as AVG LINK ICN 2 — Specifies fields P and S as level and 3KC noise measurements respectively.

Figure A-9. Data Transferral - AFTEC Form 140 Sheet 2 of 3

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
SCH	LN		MØØ67				A			5318Ø8ØØ			5318Ø82Ø		-68.2						BD1
CIR	CUI	T	DATA																		
SCH	LN		MØØ67			9AWN	A			5318Ø8ØØ					2.Ø			2.6			BD2

Figure A-9. Data Transferral - AFTEC Form 140 Sheet 3 of 3

SITE SCH

LINK M0067

RPS TEST

RPS START	RPS FINISH	RPS MEASURED FORWARD	REFLECTED	RATIO	MANUAL START	FINISH	VSWR	REMARKS
					5217Ø6ØØ	5217Ø61Ø	1.0	

Figure A-10. Data Transferral - AFTEC Form 141 Sheet 1 of 3

AFTEC FORM NO. 141 CARD NO. B

FORM ENTRY DESCRIPTION	FIELD	DESCRIPTION	TRANSFER INSTRUCTIONS
Site	A	Site	See Table A3 for Site Codes
	B	ATE Type	Code / Meaning Item 4 R MTS(RPS) Item 5 N NSS Control Note: If test mode is manual, do not use this field.
Link Number	D	Link Number	Direct Transfer
	H	Test Mode	Code / Meaning A Indicates times and measurements on this card are automatic M Indicates times and measurements on this card are manual
Manual (or RPS) Start Time	K	DTG Start	See Table A5 for Instructions
Manual (or RPS) Stop Time	N	DTG Stop	See Table A5 for Instructions
Forward RPS Measured	P	Measurement Data	Direct Transfer. Leave Blank if Test Mode is Manual.
Reflect RPS Measured	S	Measurement Data	Direct Transfer. Leave Blank if Test Mode is Manual.
RPS Ratio (or Manual VSWR)	U	Measurement Data	Direct Transfer
	V	Control	Code / Meaning Item 78 B Card ID Item 79 E Form ID Item 80 Not Used

Figure A-10. Data Transferral - AFTEC Form 141 Sheet 2 of 3

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1–3	4–6	7	8–15	16–17	18	19–22	23	24	25–27	28–35	36	37	38–45	46–48	49–56	57	58	59–66	67–69	70–77	78–80
S C H	R N		M Ø Ø 6 7				M			5 2 1 7 Ø 6 Ø Ø			5 2 1 7 Ø 6 1 Ø							1 . Ø	B E

Figure A-10. Data Transferral - AFTEC Form 141 Sheet 3 of 3

SITE MUL

MTS (MAC) TRANSMIT POWER AND RSL TEST*

LINK NO	MANUAL PMP RSL	MTS (MAC)				MANUAL			
		TX PWR	RSL	DTG START	DTG STOP	TX PWR	RSL	DTG START	DTG STOP
MØØ69	-15.9	+7.0	-16.0	52170600	52170610				

* Put re[illegible]ks on back of form.

Figure A-11. Data Transferral - AFTEC Form 142 Sheet 1 of 3

AFTEC FORM NO. 142	CARD NO. B		
FORM ENTRY DESCRIPTION	**FIELD**	**DESCRIPTION**	**TRANSFER INSTRUCTIONS**
Site	A	Site	See Table A3 for Site Codes
	B	ATE Type	Code / Meaning Item 4 C MTS (MAC) Item 5 N NSS Control Note: If test mode is manual, do not use this field.
Link No.	D	Link Number	Direct Transfer
	H	Test Mode	Code / Meaning A Indicates times and measurements on this card are automatic M Indicates times and measurements on this card are manual
Manual (or MTS (MAC)) DTG Start	K	DTG Start	See Table A5 for instructions
Manual (or MTS (MAC)) DTG Stop	N	DTG Stop	See Table A5 for instructions
Manual (or MTS (MAC)) TX PWR	P	Measurement Data	Direct Transfer
Manual (or MTS(MAC)) RSL	S	Measurement Data	Direct Transfer
Manual PMP RSL	U	Measurement Data	Direct Transfer Note: Use this field for Manual Test Mode only, otherwise do not use.
	V	Control	Code / Meaning Item 78 B Card ID Item 79 F Form ID Item 80 Not Used

Figure A-11. Data Transferral - AFTEC Form 142 Sheet 2 of 3

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
N U L	C N		M Ø Ø 6 9				A			5 2 1 7 Ø 6 Ø 0			5 2 1 7 Ø 6 1 Ø		7 . Ø			- 1 6 . Ø			B F

Figure A-11. Data Transferral - AFTEC Form 142 Sheet 3 of 3

PILOT MONITOR (PM) TEST*

LINK NO	MUHL LKF	TEST CHANNEL		PM				MANUAL			
		PJ	FREQ	PJ	FREQ	DTG START	DTG STOP	PJ	FREQ	DTG START	DTG STOP
MØØ69	MUL	2Ø	26ØØ	2Ø	26ØØ	53180700	53180710				

Put remarks on back of form.

Figure A-12. Data Transferral - AFTEC Form 143 Sheet 1 of 3

AFTEC FORM NO. 143	CARD NO. B		
FORM ENTRY DESCRIPTION	FIELD	DESCRIPTION	TRANSFER INSTRUCTIONS
MUHL/LKF	A	Site	See Table A3 for Site Codes
	B	ATE Type	Code / Meaning Item 4 P MTS(PM) Item 5 Q I/OQCS Item 6 N NSS Control Note: If test mode is manual do not use the field
Link No.	D	Link Number	Direct Transfer
	H	Test Mode	Code / Meaning A Indicates times and measurements on this card are automatic M Indicates times and measurements on this card are manual
Manual (or PM) DTG Start	K	DTG Start	See Table A5 for Instructions
Manual (or PM) DTG Stop	N	DTG Stop	See Table A5 for Instructions
Test Channel PJ	O	Measurement Data	Direct Transfer
Test Channel FR	P	Measurement Data	Direct Transfer
PM or Manual PJ	T	Measurement Data	Direct Transfer
PM or Manual FR	U	Measurement Data	Direct Transfer
	V	Control	Code / Meaning Item 78 B Card ID Item 79 G Form ID Item 80 Not Used

Figure A-12. Data Transferral - AFTEC Form 143 Sheet 2 of 3

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
MUL			MØØ69				A			5318Ø7ØØ			5318Ø71Ø	2Ø	26ØØ				2Ø	26ØØ	BG

Figure A-12. Data Transferral - AFTEC Form 143 Sheet 3 of 3

SITE MUL

LINK M0067

BASEBAND MONITOR SLOTTED NOISE TEST

BM NOISE MEASUREMENTS			BM TIME		MANUAL MEAS		MANUAL TIME		REMARKS
36KHz	2.4MHz	4.7MHz	DTG START	DTG STOP	NPR	AVGICN	DTG START	DTG STOP	
					3.0	-64.2	5318Ø2ØØ	5318Ø21Ø	

Figure A-13. Data Transferral - AFTEC Form 144 Sheet 1 of 3

AFTEC FORM NO. 144 — CARD NO. B

FORM ENTRY DESCRIPTION	FIELD	DESCRIPTION	TRANSFER INSTRUCTIONS
Site	A	Site	See Table A3 for Site Codes
	B	ATE Type	Code / Meaning Item 4 — E — MTS (BM) Item 5 — N — NSS Control Note: If test mode is manual, do not use this field.
	C	TX or RX	Code — Meaning R — Receive
Link Number	D	Link Number	Direct Transfer
	H	Test Mode	Code — Meaning A — Indicates times on this card are automatic M — Indicates times on this card are manual
Manual Time (or BM) DTG Start	K	DTG Start	See Table A5 for Instructions
Manual Time (or BM) DTG Stop	N	DTG Stop	See Table A5 for Instructions
BM36KHz or Manual NPR	P	Measurement Data	Direct Transfer
BM 2.4MHz or Manual AVG ICN	S	Measurement Data	Direct Transfer
BM 4.7 MHz	U	Measurement Data	Direct Transfer
	V	Control	Code / Meaning Item 78 — B — Card ID Item 79 — H — Form ID Item 80 — Not Used

Figure A-13. Data Transferral -- AFTEC Form 144 Sheet 2 of 3

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1–3	4–6	7	8–15	16–17	18	19–22	23	24	25–27	28–35	36	37	38–45	46–48	49–56	57	58	59–66	67–69	70–77	78–80
MUL		R	MØØ67				M			5318Ø2ØØ			5318Ø21Ø		3.Ø			-64.2			BH

Figure A-13. Data Transferral - AFTEC Form 144 Sheet 3 of 3

SITE MUL

BASEBAND MONITOR BBL TEST

LINK NUMBER	TX OR RX	BM			MANUAL			MAN PMP BBL	REMARKS
		BBL MEAS.	START DTG	FINISH DTG	BBL MEAS	START DTG	FINISH DTG		
MØØ69	TX	52.3	53180900	53180910					

Figure A-14. Data Transferral - AFTEC Form 145 Sheet 1 of 3

AFTEC FORM NO. 145 CARD NO. B

FORM ENTRY DESCRIPTION	FIELD	DESCRIPTION	TRANSFER INSTRUCTIONS
Site	A	Site	See Table A3 for Site Codes
	B	ATE Type	Code / Meaning Item 4 E MTS (BM) Item 5 N NSS Control Note: If test mode is manual, do not use this field.
TX or RX	C	TX or RX	Code / Meaning T TX R RX
Link Number	D	Link Number	Direct Transfer
	H	Test Mode	Code / Meaning A Indicates times on this card are automatic M Indicates times on this card are manual
BM or Manual Start Time	K	DTG Start	See Table A5 for Instructions
BM or Manual Stop Time	N	DTG Stop	See Table A5 for Instructions
BM or Manual BBL Meas	P	Measurement Data	Direct Transfer
Manual PMP BBL	S	Measurement Data	Direct Transfer. Use this field only for cards with Manual Test Modes.
	V	Control	Code / Meaning Item 78 B Card ID Item 79 I Form ID Item 80 Not Used

Figure A-14. Data Transferral - AFTEC Form 145 Sheet 2 of 3

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
MUL	EN	T	MØØ69				A			5318Ø9ØØ			5318Ø91Ø		52.3						B

Figure A-14. Data Transferral - AFTEC Form 145 Sheet 3 of 3

NLG/BBSA IN-BAND NOISE TEST										
BBSA				MANUAL				MAN PMP		
SLOT #1	SLOT #2	START DTG	FINISH DTG	SLOT #1	SLOT #2	START DTG	FINISH DTG	AVG ICN	RSL	REMARKS
-67.8	-65.5	5318Ø9ØØ	5318Ø91Ø							

Figure A-15. Data Transferral - AFTEC Form 146 Sheet 1 of 3

AFTEC FORM NO. 146 CARD NO. B

FORM ENTRY DESCRIPTION	FIELD	DESCRIPTION	TRANSFER INSTRUCTIONS
Site	A	Site	See Table A3 for Site Codes .
	B	ATE Type	Code / Meaning Item 4 G MTS (NLG) Item 5 B BBSA Item 6 N NSS Control Note: If test mode is manual do not use this field.
	H	Test Mode	Code / Meaning A Indicates times and measurements on the card are automatic M Indicates times and measurements on the card are manual
Manual (or BBSA) DTG Start	K	DTG Start	See Table A5 for Instructions
Manual (or BBSA) DTG Finish	N	DTG Stop	See Table A5 for Instructions
BBSA or Manual SLOT#1 or MAN PMP AVG ICN	P	Measurement Data	Direct Transfer Note: For the Manual PMP AVG ICN and RSL measurements a separate card will have to be made out with manual test mode and Item 80 = 2. Enter AVG ICN into field P and RSL into field S. Fields A through K should be identical on both cards.
BBSA or Manual SLOT#2 or MAN PMP RSL	S	Measurement Data	Direct Transfer D X
	V	Control	Code / Meaning Item 78 B Card ID Item 79 J Form ID Item 80 1 Specifies fields P and S as slot noise measurements 2 Specifies fields P and S as Manual ICN and RSL measurements respectively

Figure A-15. Data Transferral - AFTEC Form 146 Sheet 2 of 3

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
LKF	CBN						A			5318ø9øø			5318ø91ø		-67.8			-65.5			BJ1

Figure A-15. Data Transferral - AFTEC Form 146 Sheet 3 of 3

Date August 4, 1975 OBJECTIVE NO: 2.4.1.2.2

TEST NUMBER	TIME INITIATED	TIME RESPONSE RECEIVED	TIME LAPSED	NUMBER OF REPEATED REQUESTS	MESSAGE FROM/TO	REMARKS
1	52170500	52170510	10 min	2	LKF/DON	

Figure A-16. Data Transferral - AFTEC Form 150 Sheet 1 of 3

AFTEC FORM NO. 150 CARD NO. E

FORM ENTRY DESCRIPTION	FIELD	DESCRIPTION	TRANSFER INSTRUCTIONS
Message From/To	A	Site (TX)	Use Site Where Message Originated From. See Table A3 for Site Codes.
Message From/To	C	Site (RX)	Use Site Where Message Transmitted To. See Table A3 for Site Codes.
Test Number	H	Test Number	Direct Transfer
Time Initiated	L	DTG Message Initiated	See Table A5 for Instructions
Time Response Received	O	DTG of Response	See Table A5 for Instructions
Lapsed	P	Total Time	See Table A5 for Instructions
Number of Repeated Requests	Q	Number of Repeated Requests	Direct Transfer
Objective Number	U	Objective Number	Direct Transfer (24122)
	Z	Control	Code / Meaning Item 78 — E — Card ID Item 79 — A — Form ID Item 80 — Not Used

Figure A-16. Data Transferral - AFTEC Form 150 Sheet 2 of 3

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1–3	4–6	7–9	10	11	12	13	14–15	16–19	20–27	28	29–36	37	38	39–46	47–50	51	52	53	54	55–59	60	61–62	63–70	71–77	78–80
LKF		DON					Ø1				5217Ø5ØØ			5217Ø51Ø	ØØ1Ø	2				24122					EA

Figure A-16. Data Transferral - AFTEC Form 150 Sheet 3 of 3

STATION LKF

ATEC OPERATOR NAME: AK   MANUAL OPERATOR NAME ____   TEST TEAM OBSERVER ____

DATE	*REAL OR PROBLEM	TIME	MANUAL	ATEC	CCSD	Estimate of Scope of Problem: Manual	Estimate of Scope of Problem: ATEC	ACTUAL SCOPE OF PROBLEM
Nov 13	Problem		5318 1000		9AWN	Channel		Group
						DTG-53181030		

WAS ALT ACTION TAKEN?	WHO MADE FIRST ALT DECISION?	WAS FIRST ALT GOOD?	WAS SECOND ALT GOOD?
No DTG ____			DTG Restoral: 53181Ø59

Comments: Provide a narrative of the problem and actions taken. Include any observation or information that you feel is pertinent to the analysis of this exercise.

*Indicate whether this is a real or injected problem.

Note: The Instructions Pertaining to Form 151 are to be used with an updated version to be provided at a later date.

Figure A-17. Data Transferral - AFTEC Form 151   Sheet 1 of 3

AFTEC FORM NO. 151 — CARD NO. H

FORM ENTRY DESCRIPTION	FIELD	DESCRIPTION	TRANSFER INSTRUCTIONS
Site Station	A	Site	See Table A3 for Site Codes
CCSD	B	CCSD Number	Use last four digits
Real or Injected	D	Problem Type	Code Meaning I Injected N Non-injected
Accomplished manually or with ATEC?	E	Test Mode	Code Meaning A Indicates times on this card are automatic M Indicates times on this card are manual
DTG Problem First Noticed	F	DTG of Problem	See Table A5 for Instructions
DTG Extent of Problem	G	DTG Determination of Scope of Problem	See Table A5 for Instructions
Estimate of Scope of Problem	H	Scope of Problem	Code Meaning L Link S Supergroup T Trunk G Group C Circuit H Channel O Other
Actual Scope of Problem	I	Actual Scope of Problem	See Codes in Field H above
DTG When ALT Route Selected	J	DTG ALT	See Table A5 for codes
Was ALT Action Taken?	K	ALT?	Use "Y" for yes and "N" for no
DTG Service Restored	L	DTG Restoral	See Table A5 for Codes
Who Made first ALT Decision?	N	Who Made ALT Decision?	Code Meaning T Tech controller (TCF) N Network controller M Maintenance A ATE Operator O Other
Was First ALT Good	O	ALT Good?	Use "Y" for yes and "N" for no
Was Second ALT Good	P	Second ALT Good?	Use "Y" for yes and "N" for no
ATEC Equipment	Q	ATE Type	See Table A4 for Abbreviations
	T	Control	Code Meaning Item 78 H Card ID Item 79 C Form ID Item 80 Not Used

Figure A-17. Data Transferral - AFTEC Form 151 Sheet 2 of 3

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1 2 3	4 5 6 7	8 9 10 11 12 13 14 15	16	17	18 19 20 21 22 23 24 25	26 27 28 29 30 31 32 33	34	35	36 37 38 39 40 41 42 43	44	45 46 47 48 49 50 51 52	53 54 55 56 57 58 59 60	61	62	63	64 65 66	67 68 69 70 71 72 73 74	75 76 77	78 79 80
L K F	9 A W N		I		5 3 1 8 1 Ø Ø Ø	5 3 1 8 1 Ø 3 Ø	H	G		N	5 3 1 8 1 Ø 5 9								H C

Figure A-17. Data Transferral - AFTEC Form 151 Sheet 3 of 3

NSS TASK EXECUTION EVALUATION

CONSOLE OPERATOR: A.K.

DATE: August 4, 1975

TASK NO	No ATE Scanning		Add LKF I/OQCS		Add FEL IQCS		Add SCH MTS (ARS)		Add DON I/OQCS		Add PMS DDMS		Add MUL MTS (ARS)	
	Start Time	Finish Time	Start Time	Finish Time	Start Time	Finish Time	Start Time	Finish Time	Start Time	Finish Time	Start Time	Finish Time	Start Time	Finish Time
1	5217 Ø5ØØ	5217 Ø51Ø	5217 Ø515	5217 Ø52Ø	5217 Ø525	5217 Ø53Ø	5217 Ø535	5217Ø54Ø	5217 Ø545	5217 Ø55Ø	5217 Ø555	5217 Ø6ØØ	5217 Ø61Ø	5217 Ø615

Figure A-18. Data Transferral - AFTEC Form 157 Sheet 1 of 3

FORM NO. 157	CARD NO. B		
FORM ENTRY DESCRIPTION	FIELD	DESCRIPTION	TRANSFER INSTRUCTIONS
	A	Site	Use LKF
	B	ATE Type	Use N to Indicate NSS Test
Task Number	E	Task Number	Direct Transfer
Add Site ATE	I	ATE Type Added to NSS Load	See Table A4 for Codes
	J	Site of added ATE Type	See Table A3 for Site Codes
			Note: If no ATE is scanning, leave I and J blank
Start Time	K	DTG Start	See Table A5 for Instructions
Stop Time	N	DTG Stop	See Table A5 for Instructions
	V	Control	Code / Meaning
			Item 78 — B — Card ID
			Item 79 — K — Form ID
			Item 80 — Not Used

Figure A-18. Data Transferral - AFTEC Form 157 Sheet 2 of 3

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
LKFN				Ø1						5217Ø5ØØ			5217Ø51Ø								BK
2ND	CARD																				
LKFN				Ø1					QLKF	5217Ø515			5217Ø520								BK
3RD	CARD																				
LKFN				Ø1					IFEL	5217Ø525			5217Ø53Ø								BK
4TH	CARD																				
LKFN				Ø1					ASCH	5217Ø535			5217Ø54Ø								BK
5TH	CARD																				
LKFN				Ø1					QDON	5217Ø545			5217Ø55Ø								BK
6TH	CARD																				
LKFN				Ø1					DPMS	5217Ø555			5217[illegible]								BK

Figure A-18. Data Transferral - AFTEC Form 157 Sheet 3 of 3

IQCS TRAFFIC RECOGNITION EVALUATION

STATION: LKF

ATE TYPE IQCS

SCANNER ADDRESS	CCSD	DTG WHEN MONITORED	ASSIGNED DCS TFC TYPE	MANUALLY RECOGNIZED TFC TYPE	ATEC RECOGNIZED TFC TYPE	ATEC TRAFFIC RECOGNITION VALUES					NOTE (1) WAS ATEC CORRECT?	REMARKS
						VU	PA	SW	FR	M5		
0057	9AA6	52170510	VFCT	VFCT	WL	-14.5	70.1	+0206	+1798	+08.3	YES	

NOTE (1): Evaluate if the ATEC recognized traffic type met the requirements of the traffic recognizition material.

Figure A-19. Data Transferral - AFTEC Form 158 Sheet 1 of 3

AFTEC FORM NO. 158	CARD NO. C		
FORM ENTRY DESCRIPTION	FIELD	DESCRIPTION	TRANSFER INSTRUCTIONS
Site	A	Site	See Table A3 for Site Codes
ATE Type	B	ATE Type	See Table A4 for Codes
CCSD	C	CCSD Number	Use last four digits
Scanner Address	D	Scanner Address	Direct Transfer
Assigned Traffic Type	H	Assigned Traffic Type	Code — Meaning VU — Von User VO — Voice SP — Spare VI — Von IST VX — Vox (Silk Purse, Vox O/W, Vox Net) DT — Data SE — SEVOCOM DI — Din IST VT — VFCT DU — Din User FX — Facsimile DC — DC OT — Other
Manually Recognized Traffic Type	I	Manually Recognized Traffic Type	See codes in field H above.
ATEC Recognized Traffic Type	J	ATEC Recognized Traffic Type	Direct Transfer
DTG When Monitored	K	DTG When Monitored	See Table A5 for Instructions
Was ATEC Correct?	L	ATEC Correct?	Use "Y" for yes and "N" for no
VU Value	O	Measurement Data	Direct Transfer (VU Measurement)
PA Value	P	Measurement Data	Direct Transfer (PA Measurement)
SW Value	Q	Measurement Data	Direct Transfer (SW Measurement)
FR Value	R	Measurement Data	Direct Transfer (FR Measurement)
M5 Value	S	Measurement Data	Direct Transfer (M5 Measurement)
	U	Control	Code — Meaning Item 78 — C — Card ID Item 79 — C — Form ID Item 80 — Not Used

Figure A-19. Data Transferral - AFTEC Form 158 Sheet 2 of 3

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1–3	4–6	7–10	11–14	15–19	20–24	25–29	30–31	32–33	34–35	36–43	44	45	46–47	48–52	53–57	58–62	63–67	68–72	73–77	78–80
IKF	1	9AA6	ØØ57				VT	VT	WL	5217Ø51Ø	Y			-14.5	70.1	Ø2Ø6	1798	8.3		CC

Figure A-19. Data Transferral - AFTEC Form 158 Sheet 3 of 3

NSS AND ATE TREND EVALUATION
(INJECTED TEST)

CCSD	DTG OF CHANGE	(1) PARAMETER VALUES		(2) WAS A TREND INDICATED AT				(3) WHAT WAS THE ALARM STATUS AT				(4) WAS TREND DETECTED AT				(5) HOW WAS THE TREND DETECTED				DTG WHEN TREND WAS DETECTED			
		FR	AV	LKF	DON	FEL	NSS	LKF	DON	FEL	NSS	LKF	DON	FEL	NSS	LKF	DON	FEL	NSS	LKF	DON	FEL	NS
044C9CJR	53180510	2580	22.5	Yes				AG				Yes				2				5318 0520			

*Notes are on the reverse of the form.

Figure A-20. Data Transferral - AFTEC Form 160 Sheet 1 of 3

AFTEC FORM NO. 160 CARD NO. A

FORM ENTRY DESCRIPTION	FIELD	DESCRIPTION	TRANSFER INSTRUCTIONS
	A	Site	Four cards will have to be filled out for each test; one for data pertaining to LKF, one for DON, one for FEL, and another for NSS. For the NSS data the site is LKF.
	B	ATE Type	Item 4 (If LKF use Q, if DON use Q, if FEL use I and if NSS use N)
CCSD	C	CCSD	Use Last Four Digits
FR Parameter Value	G	Measurement Data	Direct Transfer
FR Alarm Status	H	FR Alarm Status	Code — Meaning A — Amber AH — Amber High AL — Amber Low AT — Amber Trending R — Red RH — Red High RL — Red Low RT — Red Trending G — Green
AV Parameter Value	J	Measurement Data	Direct Transfer (AV Value)
AV Alarm Status	K	AV Alarm Status	Code — Meaning A — Amber AH — Amber High AL — Amber Low AT — Amber Trending R — Red RH — Red High RL — Red Low RT — Red Trending G — Green
DTG of Change	N	DTG of Change	See Table A5 for Instructions
Was Trend Indicated?	O	Trend Indicated?	Use "Y" for yes and "N" for no
Was Trend Detected?	P	Trend Detected?	Use "Y" for yes and "N" for no
How Was Trend Detected?	Q	How Detected?	Code — Meaning 1 — ATE Trend Report 2 — ATE Parameter Alarm Output 3 — Manual Methods
DTG When Trend Detected	S	DTG Of Detection	See Table A5 for Instructions
	Y	Control	Code — Meaning Item 78 — A — Card ID Item 79 — C — Form ID Item 80 — Not Used

Figure A-20. Data Transferral - AFTEC Form 160 Sheet 2 of 3

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
LKF	Q	9CJR				258Ø	A		22.5	G			5318Ø51Ø	Y	Y	2		5318Ø52Ø						AC

Figure A-20. Data Transferral - AFTEC Form 160 Sheet 3 of 3

ATEC TRENDING EVALUATION QUESTIONNAIRE

RANK/NAME P.R. E-5

SKILL(AFCS, MOS, SPECIALTY): ____________

Circle the response that best describes your opinion for each statement below. At the end of the questionnaire include any comments that would further amplify your opinion of the usefulness of the ATEC system in accomplishing trending. Several of the questions collectively address the NSS, IQCS and DDMS; circle the response under the applicable ATEC equipment.

1. I understand the trending capabilities of the:

NSS	IQCS	DDMS
a. Strongly agree	a. Strongly agree	a. Strongly agree
b. Agree	b. Agree	b. Agree
c. Disagree	c. Disagree	c. Disagree
d. Strongly disagree	d. Strongly disagree	d. Strongly disagree
e. No opinion	e. No opinion	e. No opinion

2. I have had adequate training in the use of trending for:

NSS	IQCS	DDMS
a. Strongly agree	a. Strongly agree	a. Strongly agree
b. Agree	b. Agree	b. Agree
c. Disagree	c. Disagree	c. Disagree
d. Strongly disagree	d. Strongly disagree	d. Strongly disagree
e. No opinion	e. No opinion	e. No opinion

3. The ATEC trending is an aid in detecting degrading conditions on a circuit:

NSS	IQCS	DDMS
a. Strongly agree	a. Strongly agree	a. Strongly agree
b. Agree	b. Agree	b. Agree
c. Disagree	c. Disagree	c. Disagree
d. Strongly disagree	d. Strongly disagree	d. Strongly disagree
e. No opinion	e. No opinion	e. No opinion

4. The ATEC trending is an aid in detecting degrading conditions on a system:

NSS	IQCS	DDMS
a. Strongly agree	a. Strongly agree	a. Strongly agree
b. Agree	b. Agree	b. Agree
c. Disagree	c. Disagree	c. Disagree
d. Strongly disagree	d. Strongly disagree	d. Strongly disagree
e. No opinion	e. No opinion	e. No opinion

Figure A-21. Data Transferral - AFTEC Form 161 Sheet 1 of 6

5. The ATEC outputs provide adequate indication of a degrading condition.

NSS	IQCS	DDMS
a. Strongly agree	a. Strongly agree	a. Strongly agree
b. Agree	b. Agree	b. Agree
c. Disagree	c. Disagree	c. Disagree
d. Strongly disagree	d. Strongly disagree	d. Strongly disagree
e. No opinion	e. No opinion	e. No opinion

6. The NSS Trend Summary display was easy to use.

NSS	IQCS	DDMS
a. Strongly agree	a. Strongly agree	a. Strongly agree
b. Agree	b. Agree	b. Agree
c. Disagree	c. Disagree	c. Disagree
d. Strongly disagree	d. Strongly disagree	d. Strongly disagree
e. No opinion	e. No opinion	e. No opinion

8. The NSS time dependent test feature is a good method for accomplishing trending.

NSS	IQCS	DDMS
a. Strongly agree	a. Strongly agree	a. Strongly agree
b. Agree	b. Agree	b. Agree
c. Disagree	c. Disagree	c. Disagree
d. Strongly disagree	d. Strongly disagree	d. Strongly disagree
e. No opinion	e. No opinion	e. No opinion

9. There should be some method of attracting the operators attention when the NSS is displaying trending information.

NSS	IQCS	DDMS
a. Strongly agree	a. Strongly agree	a. Strongly agree
b. Agree	b. Agree	b. Agree
c. Disagree	c. Disagree	c. Disagree
d. Strongly disagree	d. Strongly disagree	d. Strongly disagree
e. No opinion	e. No opinion	e. No opinion

10. A hard copy of NSS trending information should be automatically made at a specific time.

NSS	IQCS	DDMS
a. Strongly agree	a. Strongly agree	a. Strongly agree
b. Agree	b. Agree	b. Agree
c. Disagree	c. Disagree	c. Disagree
d. Strongly disagree	d. Strongly disagree	d. Strongly disagree
e. No opinion	e. No opinion	e. No opinion

Figure A-21. Data Transferral - AFTEC Form 161 Sheet 2 of 6

11. Trending can be accomplished better using manual methods rather than the NSS.

a. Strongly agree
b. Agree
c. Disagree
d. Strongly disagree
e. No opinion

12. The IQCS outputs immediately drew my attention to degrading conditions on a circuit.

a. Strongly agree
b. Agree
c. Disagree
d. Strongly disagree
e. No opinion

13. The DDMS printouts immediately drew my attention to degrading circuit conditions.

a. Strongly agree
b. Agree
c. Disagree
d. Strongly disagree
e. No opinion

14. It was easy to use the IQCS trending information.

a. Strongly agree
b. Agree
c. Disagree
d. Strongly disagree
e. No opinion

15. It was easy to use the DDMS trending information.

a. Strongly agree
b. Agree
c. Disagree
d. Strongly disagree
e. No opinion

16. I did not need to use internal sources to understand the significance of trending information output by the:

NSS	IQCS	DDMS
a. Strongly agree	a. Strongly agree	a. Strongly agree
b. Agree	b. Agree	b. Agree
c. Disagree	c. Disagree	c. Disagree
d. Strongly disagree	d. Strongly disagree	d. Strongly disagree
e. No opinion	e. No opinion	e No opinion

Figure A-21. Data Transferral - AFTEC Form 161 Sheet 3 of 6

17. I knew what to do when a degrading trend was indicated by:

NSS		IQCS		DDMS	
a.	Strongly agree	a.	Strongly agree	a.	Strongly agree
b.	Agree	b.	Agree	b.	Agree
c.	Disagree	c.	Disagree	c.	Disagree
d.	Strongly disagree	d.	Strongly disagree	d.	Strongly disagree
e.	No opinion	e.	No opinion	e	No opinion

18. The trending information presented by ATEC is helpful in preventing outages.

NSS		IQCS		DDMS	
a.	Strongly agree	a.	Strongly agree	a.	Strongly agree
b.	Agree	b.	Agree	b.	Agree
c.	Disagree	c.	Disagree	c.	Disagree
d.	Strongly disagree	d.	Strongly disagree	d.	Strongly disagree
e.	No opinion	e.	No opinion	e	No opinion

19. The trending information presented by ATEC is helpful in predicting failures.

NSS		IQCS		DDMS	
a.	Strongly agree	a.	Strongly agree	a.	Strongly agree
b.	Agree	b.	Agree	b.	Agree
c.	Disagree	c.	Disagree	c.	Disagree
d.	Strongly disagree	d.	Strongly disagree	d.	Strongly disagree
e.	No opinion	e.	No opinion	e	No opinion

20. A better display would improve the utility of ATEC trending information.

NSS		IQCS		DDMS	
a.	Strongly agree	a.	Strongly agree	a.	Strongly agree
b.	Agree	b.	Agree	b.	Agree
c.	Disagree	c.	Disagree	c.	Disagree
d.	Strongly disagree	d.	Strongly disagree	d.	Strongly disagree
e.	No opinion	e.	No opinion	e	No opinion

Figure A-21. Data Transferral - AFTEC Form 161 Sheet 4 of 6

AFTEC FORM NO. All Questionnaires CARD NO. D

FORM ENTRY DESCRIPTION	FIELD	DESCRIPTION	TRANSFER INSTRUCTIONS
Site	A	Site	See Table A3 for Site Codes
ATEC Equipment	B	ATE Type	See Table A4 for Codes
Operator	C	Name	Use initials
Rank	D	Rank	Direct Transfer
Skill Level	E	Skill Level	Direct Transfer
MOS/AFCS/NEC/SPECIALITY	F	MOS/AFCS/Speciality	Direct Transfer
Date	G	Date	Item 18 Year Item 19-21 Radio day (see Table A5 for Instructions)
Objective	H	Objective Number	Direct Transfer
	I	Answers	All questionnaire answers should be entered in this field. There are 50 items which is larger than the total number of questions on any onequestionnaire. Form 161, however, should be filled out on three cards; one for IQCS responses, one for NSS and another for DDMS.
	J	Control	Code / Meaning Item 78 D Card ID Item 79 Code Form ID A If Form 94 B If Form 97 C If Form 103 D If Form 132 E If Form 133 F If Form 135 G If Form 137 H If Form 147 I If Form 148 J If Form 161 K If Form 164 Item 80 Not used

Figure A-21. Data Transferral - AFTEC Form 161 Sheet 5 of 6

A	B	C	D	E	F	G	H	I	J
LKF	I	PR	E5			6ØØ9		CDEBACDEEDBAACDB	DJ
SEC	OND	CA	RD						
LKF	N	PR	E5			6ØØ9		CBEADCBADAABBBE	DJ
THI	RD	CA	RD						
LKF	D	PR	E5			6ØØ9		BBADDCCEAEBDEDBC	DJ

Figure A-21. Data Transferral - AFTEC Form 161 Sheet 6 of 6

ATEC DCAC 310-55-1 & MI''EP Reporting
(ATEC SITE SU EY)

SITE: MUHL

DATE: Jan 2, 1976

MILDEP OR DCA REPORT	(1) CATEGORY OF REPORT	(2) TYPE OF REPORT	(3) HOW TRANSMITTED	(4) TIME SUBMISSION REQUIRED	TIME SUBMITTED	(5) WAS IT ATEC DETECTABLE	LOCAL ATE ALARM	TIME ATE ALARMED	REMARKS
DCA	Equip Status	"K" Line Periodic	Message to Nucleus	5 min	52170510	Yes	FR	52170500	

*NOTES ARE ON REVERSE OF FORM

Figure A-22. Data Transferral - AFTEC Form 162

Sheet 1 of 3

AFTEC FORM NO. 162	CARD NO. E		
FORM ENTRY DESCRIPTION	FIELD	DESCRIPTION	TRANSFER INSTRUCTIONS
Site	A	Site	See Table A3 for Site Codes
MILDEP or DCA Report	D	MILDEP or DCA Report	Code / Meaning M MILDEP Report D DCA Report
Category of Report	E	Category of Report	Code / Meaning S System Outage C Circuit Outage E Equipment Status H Hazardous Condition L Link Outage T Trunk Outage O Other
Type of Report	F	Type of Report	Code / Meaning N Near Real Time or immediate P Periodic J JCN
	G	Format of Report	Code / Meaning K "K" Line C "C" Line W "W" Line A "A" Line Q "Q" Line
Time Submission Required	I	Time Submission Required	Convert measurement to minutes, i.e. 1 hour = 60 minutes.
Time Submitted	L	DTG Report Submitted	See Table A5 for Instructions
Time ATE Alarmed	O	DTG ATE Alarmed	See Table A5 for Instructions
How Transmitted	R	Method of Transmission	Code / Meaning V Voice Orderwire T Teletype Orderwire F Formal Message N Nucleus Message
Was it ATEC Detectable?	V	ATEC Detectable?	Use "Y" for yes and "N" for no
Local ATE Alarm	W	Local ATE Alarm	Direct Transfer
	Z	Control	Code / Meaning Item 78 E Card ID Item 79 C Form ID Item 80 Not Used

Figure A-22. Data Transferral - AFTEC Form 162 Sheet 2 of 3

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
MUL			D	E	P	K		ØØØ5			5217Ø51Ø			5217Ø5ØØ			N				Y	FR			EC

Figure A-23. Data Transferral - AFTEC Form 162 Sheet 3 of 3

DCAC 310-55-1, MILDEP REPORTS & OTHER REPORTS

SITE BANN DATE December 2, 1975

MILDEP (1) OR DCA REPORT	CATEGORY (2) OF REPORT	TYPE (3) OF REPORT	REPORT PREPARATION START TIME	TIME REPORT SUBMITTED	HOW (4) TRANSMITTED	OPERATOR'S INITIALS	REMARKS
DCA Report	CKT	Per,"K" Line	Ø621	Ø625	VOXO/W	CY	

NOTES:
1. ENTER WHETHER MILDEP OR DCA REPORT ON EACH REPORT GENERATED BY SITE (OTHER THAN REPORTS COVERED BY OUTAGE FORM).
2. ENTER WHETHER REPORT WAS EQUIPMENT STATUS, CIRCUIT OR SYSTEM OUTAGE, HAZARDOUS CONDITION, ETC.
3. ENTER TYPE OF DCA REPORT (NEAR-REAL-TIME OR PERIODIC) AND TYPE OF FORMAT (i.e. "K" LINE, "C" LINE, "W" LINE, "A" LINE, ETC.)
4. ENTER TELEPHONE, VOICE ORDERWIRE, TELETYPE ORDERWIRE, FORMAL MESSAGE, MESSAGE MADE TO ATEC NUCLEUS SUBSYSTEM, ETC.

Figure A-23. Data Transferral - AFTEC Form 162A Sheet 1 of 3

AFTEC FORM NO. 162A — CARD NO. E

FORM ENTRY DESCRIPTION	FIELD	DESCRIPTION	TRANSFER INSTRUCTIONS		
Site	A	Site	See Table A3 for Site Codes		
MILDEP or DCA Report	D	MILDEP or DCA Report	Code		Meaning
			M		MILDEP Report
			D		DCA Report
Category of Report	E	Category of Report	Code		Meaning
			S		System Outage
			C		Circuit Outage
			E		Equipment Status
			H		Hazardous Condition
			L		Link Outage
			T		Trunk Outage
			O		Other
Type of Report	F	Type of Report	Code		Meaning
			N		Near Real Time or Immediate
			P		Periodic
			J		JCN
	G	Format of Report	Code		Meaning
			K		"K" Line
			C		"C" Line
			W		"W" Line
			A		"A" Line
			Q		"Q" Line
Report Preparation Start Time	J	DTG Report Prep. Start Time	See Table A5 for Instructions		
Time Report Submitted	L	DTG Report Submitted	Direct Transfer		
How Transmitted	R	Method of Transmission	Code		Meaning
			V		Voice Orderwire
			T		Teletype Orderwire
			F		Formal Message
			N		Nucleus Message
	Z	Control		Code	Meaning
			Item 78	E	Card ID
			Item 79	B	Form ID
			Item 80		Not Used

Figure A-23. Data Transferral - AFTEC Form 162A Sheet 2 of 3

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
BAN			D	C	P	K			5337Ø621		5337Ø625						V								FB

Figure A-22. Data Transferral - AFTEC Form 162A Sheet 3 of 3

DCAC 310-55-1 & MILDEP Reporting Survey
(NSS SURVI

SITE: MUHL

DATE: Aug 4, 1975

MILDEP OR DCA REPORT	(1) CATEGORY OF REPORT	(2) TYPE OF REPORT	(3) REASON FOR REPORT	(4) TIME INFO RCVD	(5) ADEQUACY OF AM INFO	(6) FURTHER COORDINATION REQRD WITH AM	DTG NSS SUBMITTED REPORT	WERE TIME REQRD MET	(7) ATE SITE REPORT	REMARKS
Mildep	Circuit Outage	Near Real Time "K" Line	MM	52170500	Yes	No	52170510	Yes	Yes	

...S ARE ON REVERSE OF FORM

Figure A-24. Data Transferral - AFTEC Form 163

Sheet 1 of 3

AFTEC FORM NO. 163	CARD NO. E		
FORM ENTRY DESCRIPTION	FIELD	DESCRIPTION	TRANSFER INSTRUCTIONS
Site	A	Site	See Table A3 for Site Codes
MILDEP or DCA Report	D	MILDEP or DCA Report	Code Meaning M MILDEP Report D DCA Report
Category of Report	E	Category of Report	Code Meaning S System Outage C Circuit Outage E Equipment Status H Hazardous Condition L Link Outage T Trunk Outage O Other
Type of Report	F	Type of Report	Code Meaning N Near Real Time or Immediate P Periodic J JCN
	G	Format of Report	Code Meaning K "K" Line C "C" Line W "W" Line A "A" Line Q "Q" Line
Time Info Received	J	DTG Information Received	See Table A5 for Instructions
Reason for Report	K	Reason for Report	Code Meaning A Activity Message M Message Mode O Other
DTG NSS Submitted Report	L	DTG Report Submitted	See Table A5 for Instructions
Adequacy of AM Information	M	Information Adequate?	Use "Y" for yes and "N" for no
Further Coord Required with AM	N	Further Coordination Required?	Use "Y" for yes and "N" for no
Were Time Requirements Met?	S	In Time?	Use "Y" for yes and "N" for no
ATE Site Report	T	ATE Report"	Use "Y" for yes and "N" for no
	Z	Control	Code Meaning Item 78 E Card ID Item 79 D Form ID Item 80 Not Used

Figure A-24. Data Transferral - AFTEC Form 163 Sheet 2 of 3

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1-3	4-6	7-9	10	11	12	13	14-15	16-19	20-27	28	29-36	37	38	39-46	47-50	51	52	53	54	55-59	60	61-62	63-70	71-77	78-80
MUL		LKF	M	C	N	K				M	5217Ø5ØØ	Y	N	5217Ø51Ø				Y	Y						ED

Figure A-24. Data Transferral - AFTEC Form 163 Sheet 3 of 3

MANHOURS EVALUATION (OPERATIONS)*

** FUNCTION: I/OQCS PM

CONTROLLER(S) ACCOMPLISHING TASK AK

TECH CONTROL TASK Coordination

SKILL LEVEL(S) 5

OBSERVER

SITE FEL

START PERIOD NOV 13, 1975

ATEC EQUIPMENT IQCS

STOP PERIOD NOV 14, 1975

NO.	TASK START TIME	TASK COMP TIME	ELAPSED TIME (COL 3-COL 2 WITH ADJ FOR TIME -OUTS	NO. OF PERSONS	(CHECK ONE) ATEC	MANUAL	COMBINATION	REMARKS
1	1030	1059	0029	3	X			
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								

* If data collected on other AFTEC Forms will completely fill out this form, there is no requirement to complete this form at the time of testing.

** The functional relationships to technical control operations are listed on the verse side.

Figure A-25. Data Transferral - AFTEC Form 165 Sheet 1 of 3

AFTEC FORM NO. 165 | CARD NO. B

FORM ENTRY DESCRIPTION	FIELD	DESCRIPTION	TRANSFER INSTRUCTIONS
Site	A	Site	See Table A3 for Site Codes
ATEC Equipment	B	ATE Type	See Table A4 for Codes
Function	D	Function	Enter the objective number as listed next to the functions on the reverse side of Form 165. (left justified)
Tech Control Task	F	Tech Control Task	Code — Meaning 1 — Coordination 2 — Patching (restoral or rerouting) 3 — Testing (measurement made due to extraordinary condition) 4 — Monitoring 5 — Reporting 6 — Other
Skill Levels	G	Skill Levels	Enter Skill Levels Here. Have room for four.
ATEC, Manual, Combination	H	Test Mode	Code — Meaning A — Indicates times on this card are automatic M — Indicates times on this card are manual S — Indicates times on this card are a combination
Number of Persons	J	Number of Persons	Direct Transfer
Task Start Time	K	DTG Start	See Table A5 for Instructions
Task Stop Time	N	DTG Stop	See Table A5 for Instructions
Elapse Time	O	Total Time	Convert total time into minutes
	V	Control	Code — Meaning Item 78 — B — Card ID Item 79 — Z — Form ID Item 80 — Not Used

Figure A-25. Data Transferral - AFTEC Form 165 Sheet 2 of 3

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
FEL	I		24112		1	5	A		∅∅3	53181∅3∅			53181∅59	∅29							BZ

Figure A-25. Data Transferral - AFTEC Form 165 Sheet 3 of 3

FAULT DETECTION/ISOLATION

MANUAL MODE
ATEC EQUIP IQCS

Site MUL Tech Controller

Distant Terminal SCH

1. DTG Fault Detected: 5318Ø6ØØ

2. Method of Detection (Check one below):

Customer Complaint: X

Equipment Alarm

Quality Control Test

Trending

3. DTG Start Coordination: 5318Ø61Ø

4. DTG Fault Isolated: 5318Ø62Ø

5. Type of Fault (Check below):

Outage:

Noise/Fading: X

Improper Level:

6. Level of Fault (Check below):

*Customer Equip

Channel:

VF X

DC/Data

Multiplex

Wideband

7. Priority (of highest priority circuit affected)

8. Restoration Start Time if Applicable: 5318Ø625 (DTG)

Controller Action ( )

Maintenance Action (TCF) (X) Work Order #

Maintenance Action (Wideband) ( )

9. Altroute Start Time if Applicable: 5318Ø63Ø DTG

User Preemption necessary: Yes X No

10. Time Fault Cleared: 5318Ø635

11. Remarks:

13. For Test Team: Fault Injected: Yes No X

Figure A-26. Data Transferral - AFTEC Form 166 Sheet 1 of 4

AFTEC FORM NO. 166 — CARD NO. H

FORM ENTRY DESCRIPTION	FIELD	DESCRIPTION	TRANSFER INSTRUCTIONS
Site	A	Site	See Table A3 for Site Codes
Distant Terminal	B	Site	See Table A3 for Site Codes
DTG Fault Detected	C	DTG Fault Detected	See Table A5 for Instructions
Method of Detection	D	Method of Detection	Code — Meaning C — Customer Complaint E — Equipment Status Q — Quality Control Test T — Trending
Manual or ATEC Mode	E	Test Mode	If manual enter X and if ATEC enter the proper ATE code found in Table A4
DTG Start Coordination	F	DTG Start Fault Isolation	See Table A5 for Instructions
DTG Fault Isolated	G	DTG End Fault Isolation	See Table A5 for Instructions
Type of Fault	H	Type of Fault	Code — Meaning O — Outage N — Noise/Fading L — Improper Level
Level of Fault	I	Origin of Fault	Code — Meaning E — Customer Equipment V — VF Channel D — DC/DATA M — Multiplex W — Wideband
Restoration Start Time	J	DTG Start Correction	See Table A5 for Instructions
ALT Route Start Time	L	DTG Of Alt Begin	See Table A5 for Instructions
Priority	M	Priority	Direct Transfer (left justified)
User Preemption Necessary?	O	Preemption?	Use "Y" for yes and "N" for no
Fault Injected	P	Injected or Non-Injected	Code — Meaning I — Injected N — Non-Injected
Controller, Maintenance (TCF, Wideband) Action	Q	Action Taken	Item 64 — Enter a "1" if controller action was checked. Item 65 — Enter a "1" if maintenance (TCF) action was checked. Item 66 — Enter a "1" if maintenance (wideband) action was checked.
Time Fault Cleared	R	DTG Fault Cleared	See Table A5 for Instructions
Tech Controller	S	Rank, Skill Level	If given, enter the controller's rank and skill level. Item 75 & 76, for rank, and Item 77 for skill level.

Figure A-26. Data Transferral - AFTEC Form 166 Sheet 2 of 4

AFTEC FORM NO. 166	CARD NO. H (Continued)		
DATA ENTRY DESCRIPTION	FIELD	DESCRIPTION	TRANSFER INSTRUCTIONS
	T	Control	Note: The work order number, if provided, will be entered on a second card. Fields A through E will be identical on this card and the work order number will be entered in Field F. Leave Fields G through S blank and fill in Field T as usual only with Item 80 = 2.

	Code	Meaning
Item 78	H	Card ID
Item 79	B	Form ID
Item 80	1	Specifies Field F as a DTG Start Fault Isolation
	2	Specifies Field F as a work order number

Figure A-26. Data Transferral - AFTEC Form 166 Sheet 3 of 4

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1-3	4-7	8-15	16	17	18-25	26-33	34	35	36-43	44	45-52	53-60	61	62	63	64-66	67-74	75-77	78-80
MUL	SCH	5318Ø6ØØ	C	I	5318Ø61Ø	5318Ø62Ø	N	V	5318Ø625		5318Ø63Ø			N	N	1	5318Ø635		HB1

Figure A-26. Data Transferral - AFTEC Form 166 Sheet 4 of 4

FAULT DETECTION/ISOLATION

SITE: CROUGHTON

DETECTION

1. DTG Detected 53180655. CCSD (Last Four) DULF96XD.
2. How Detected:
   a. Complaint (X)*
   b. Equip Alarm ( )
   c. QC Test ( )
   d. Trending ( )
   3. Adjacent TCF ( )
3. Traffic type DATA (VF, DC, DATA).

FAULT ISOLATION

4. DTG Start Coordination 53180700.
5. DTG Fault Isolated 53180730.
6. Type of Fault:
   a. Outage ( )
   b. Noise/Fading (X)
   c. Improper Level ( )
   d. Other ( )
7. Where:
   a. Customer Equip ( )
   b. Channel ( )
   c. Mux ( )
   d. RF/Path (X)

CORRECTION

8. DTG Correction Started 53180730.
9. Alt Route Req'd: Yes (X) No ( ).
   If yes, begin time to establish Alt Route 53180755.
   End time to establish Alt Route 53180756.
10. For AF TCF's: Work order number (as applicable) ______.
    For Army TCF's: Problem turned over to Maintenance: Yes ( ) No (✓).
11. DTG Fault Cleared 53180806.

REPORTING

12 Time expended Completing Log, Forms, Reports 8 Minutes.

*( ) Place in check (✓)

Figure A-27. Data Transferral - AFTEC Form 166A Sheet 1 of 4

AFTEC FORM NO. 166A	CARD NO. H		
FORM ENTRY DESCRIPTION	**FIELD**	**DESCRIPTION**	**TRANSFER INSTRUCTIONS**
Site	A	Site	See Table A3 for Site Codes
CCSD	B	CCSD Number	Direct Transfer
DTG Detected	C	DTG Detected	See Table A5 for Instructions
How Detected	D	Method of Detection	Code Meaning
			Adjacent TCF
			Customer Complaint
			L DCA Requested Outage
			E Equipment Alarm
			Q Quality Control Test
			S Scheduled Outage
			T Trending
			O Other
Traffic Type	E	Traffic Type	Code Meaning
			H HF
			V VF
			D DC
			T Data
			O Other
DTG Start Coordination	F	DTG Start Fault Isolation	See Table A5 for Instructions
DTG Fault Isolated	G	DTG End Fault Isolation	See Table A5 for Instructions
Type of Fault	H	Type of Fault	Code Meaning
			O Outage
			N Noise/Fading
			L Improper Level
			X Other
Where	I	Origin of Fault	Code Meaning
			B Cable
			E Customer Equipment
			C Channel
			M MUX
			P RF/Path
			O Other
DTG Correction Started	J	DTG Start Correction	See Table A5 for Instructions
ALT Route Required?	K	ALT Necessary?	Use "Y" for yes and "N" for no
Begin Time to Establish ALT	L	DTG ALT Begin	See Table A5 for Instructions
End Time to Establish ALT	M	DTG ALT End	See Table A5 for Instructions
Maintenance	P	Maintenance?	Use "Y" for yes and "N" for no

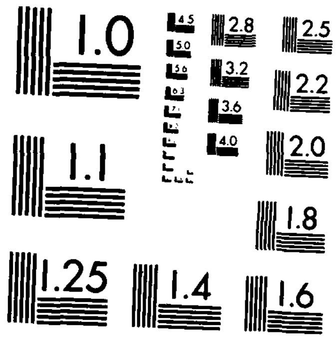
Figure A-27. Data Transferral - AFTEC Form 166A   Sheet 2 of 4

AFTEC FORM NO. 166A	CARD NO. H (Continued)		
FORM ENTRY DESCRIPTION	FIELD	DESCRIPTION	TRANSFER INSTRUCTIONS
DTG Fault Cleared	R	DTG Fault Cleared	See Table A5 for Instructions
Time Expended Completing Log, Forms, Report	S	Report Time	Direct Transfer Note: The work order number, if provided, will be entered on a second card. Fields A through E will be identical on this card and the work order number will be entered in Field F. Leave Fields G through S blank and fill in Field T as usual only with Item 80=2.
	T	Control	Code / Meaning Item 78 — H — Card ID Item 79 — A — Form ID Item 80 — 1 — Specifies Field F as a DTG Start Fault Isolation 2 — Specifies Field F as a work order number

Figure A-27. Data Transferral - AFTEC Form 166A Sheet 3 of 4

AD-A128 791 IMPLEMENTATION PLAN FOR DATA COLLECTION REDUCTION AND ANALYSIS IN SUPPORT..(U) COMPUTER SCIENCES CORP FALLS CHURCH VA MAY 76 F23613-74-C-0014 3/4

UNCLASSIFIED F/G 9/2 NL



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
CRO	96XD	5319Ø655	C	T	5318Ø7ØØ	5318Ø73Ø	N	P	5318Ø736	Y	5318Ø755	5318Ø756			N		531[illegible]Ø[illegible]Ø6	ØØ	[illegible]HMI

Figure A-27. Data Transferral - AFTEC Form 166A Sheet 4 of 4

ASSISTANCE TO OTHER FACILITIES AND OTHER NON-REPORTABLE ACTIONS (AS APPLICABLE)

SITE: LKF   OPERATOR: ML

DATE: 16 DEC 75   SHIFT: 3

ACTION (CHECK APPLICABLE COLUMNS)			CCSD,* TRUNK OR FACILITY	CHECK IF** ACTION TAKEN AS RESULT OF ATEC INDICATION	TIME ***			REMARKS ****
MEASURMENT	COORDINATION	OTHER			START	STOP	TOTAL (MIN)	
X	X		9CPL		0059	0105	6	

* WRITE IN LAST 4 OF CCSD

** USE ONLY DURING AFTER "ATEC" PERIOD

*** USE TOTAL MINUTES COLUMN WHERE POSSIBLE.

**** USE TO PROVIDE AMPLIFYING INFORMATION

Figure A-28. Data Transferral - AFTEC Form 166B   Sheet 1 of 3

AFTEC FORM NO. 166B	CARD NO. B		
FORM ENTRY DESCRIPTION	FIELD	DESCRIPTION	TRANSFER INSTRUCTIONS
Site	A	Site	See Table A3 for Site Codes
CCSD, Trunk or Facility	D	Trunk	Direct Transfer (If a trunk was tested, the number will have six items.)
CCSD, Trunk or Facility	G	CCSD Number	Use last four digits (If a circuit was tested, the number should have four items.)
Result of ATEC Indication	H	Test Mode	Code / Meaning A — Action taken was a result of ATEC indication M — Action taken was not a result of ATEC indication
Measurement, Coordination, Other	J	Actions Taken	Item 25 - Enter a "1" if measurement is checked Item 26 - Enter a "1" if coordination is checked Item 27 - Enter a "1" if other action is checked
Start Time	K	DTG Start	See Table A5 for Instructions
Stop Time	N	DTG Stop	See Table A5 for instructions
Total Time	O	Total Time	Direct Transfer
Date	P	DTG of Test	Note: For those entries which only indicate a total time in minutes and no start/stop times, put the date in this field. See Table A5 for Instructions. (left justified)
	V	Control	Code / Meaning Item 78 — B — Card ID Item 79 — L — Form ID Item 80 — Not Used

Figure A-28. Data Transferral - AFTEC Form 166B Sheet 2 of 3

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	P	S	T	U	V
LKF						9CPL			11	5337ØØ59			5337Ø1Ø5	ØØ6							BL

Figure A-28. Data Transferral - AFTEC Form 166B Sheet 3 of 3

FAULT ISOLATION EVALUATION

SITE: FEL ____________ TEST TEAM OBSERVER ____________

OPERATOR(S) ____________ ____________ ____________ DATE: ____________

LINK OR CCSD	DTG OF INJECTED PROBLEM	NATURE OF INJECTED PROBLEM	(1) DTG OF DETECTION		DTG WHEN ISOLATED			(2) WAS THERE AN ATEC ALARM		(3) WAS PROBLEM CORRECTLY IDENTIFIED		
			MANUAL	ATEC	MANUAL	ATE	NSS	ATE	NSS	MANUAL	ATE	NSS
M0063	53180600	AV	53180610		53180620					YES		

*Notes are on the back of form.

Figure A-29. Data Transferral - AFTEC Form 168 Sheet 1 of 3

AFTEC FORM NO. 168	CARD NO. B		
DATA ENTRY DESCRIPTION	FIELD	DESCRIPTION	TRANSFER INSTRUCTIONS
Site	A	Site	See Table A3 for Site Codes
Link or CCSD	D	Link Number	Direct Transfer (If test was made on a link, the number will be five characters long)
	G	CCSD Number	Use last four digits (If test was made on a circuit, the number will be eight or four characters long)
	H	Test Mode	Code / Meaning A — Indicates times on this card are automatic M — Indicates times on this card are manual N — Indicates times on this card are NSS
Nature of Injected Problem	J	Problem Type	Code / Meaning Item 25, 26 — AV — Level Problem FR — Frequency Problem Item 27 — I — Injected N — Non-Injected
DTG of Detection	K	DTG Start Fault Isolation	See Table A5 for Instructions
	L	Notified?	Use "Y" for yes and "N" for no. (This information can be obtained by observing whether an "N" was put alongside the DTG of detection. If so, the answer is yes; otherwise, it is no.
Was Problem Correctly Identified?	M	Success?	Use "Y" for yes and "N" for no
DTG When Isolated	N	DTG Stop Fault Isolation	See Table A5 for Instructions
DTG of Injected Problem	P	DTG of Problem	See Table A5 for Instructions
Was There an ATEC Alarm	Q	Alarm?	Use "Y" for yes and "N" for no. Use this field only if test mode is A or N.
	S	DTG of Alarm	See Table A5 for Instructions. Use this field only if test mode is A or N.
	V	Control	Code / Meaning Item 78 — B — Card ID Item 79 — N — Form ID Item 80 — Not Used

Figure A-29. Data Transferral - AFTEC Form 168 Sheet 2 of 3

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1–3	4–6	7	8–15	16–17	18	19–22	23	24	25–27	28–35	36	37	38–45	46–48	49–56	57	58	59–66	67–69	70–77	78–80
FEL			Møø63				M		AVI	S318ø61ø	N	Y	5318ø62ø		5319ø6øø						BN

Figure A-29. Data Transferral - AFTEC Form 168 Sheet 3 of 3

S3 CIRCUIT FAULT ISOLATION TEST

TEST TYPE (TABLE 2-3)	BER PRIOR TO PROBLEM INJECTION	BER AFTER PROBLEM INJECTED	DATE-TIME GROUP WHEN:						METHOD OF FAULT ISOLATION**
			PROBLEM INJECTED	NOTIFIED OF PROBLEM	PROBLEM TYPE IDENTIFIED*	PROBLEM IDENTIFIED	PROBLEM RESOLVED	CKT WAS RE-CERTIFIED	
9	0.5×10^{-5}	0.1×10^{-4}	53180510	53180520	53180530	53180540	53180550	53180600	FEL/IQCS

Enter Remarks on Back of Form.
*When multiple problem have been injected, use a separate line for each specific fault.
**Enter Manual, Site/ATE, or NSS.

Figure A-30. Data Transferral - AFTEC Form 172 Sheet 1 of 3

AFTEC FORM NO. 172	CARD NO. B		
DATA ENTRY DESCRIPTION	FIELD	DESCRIPTION	TRANSFER INSTRUCTIONS
Method of Fault Isolation	A	Site	See Table A3 for Site Codes (Use LKF if test mode is NSS)
	B	ATE TYPE	See Table A4 for Codes. Note: If test mode is manual do not use this field
Test CCSD	G	Test CCSD	Direct Transfer
	H	Test Mode	Code — Meaning A — Indicates the times and measurements on this card are automatic M — Indicates the times and measurements on this card are manual N — Indicates the times and measurements on this card are NSS
Test Type	J	Test Type	Direct Transfer
DTG Problem Injected	K	DTG of Injection	See Table A5 for Instructions Note: Two cards will have to be filled out for this form. They will be identical from fields A to K. The second card will use fields N, P and S differently. Card 1 will have Item 80 set to 1 and for card 2 Item 80 = 2.
DTG Notified of Problem or DTG Circuit Recertified	N	DTG Notification or DTG Recertification	See Table A5 for Instructions
DTG Problem Type Identified or BE before Injection	P	DTG Type Identification or BE before Injection	See Table A5 for Instructions. For second card directly transfer the BE measurement.
DTG Problem Identified or BE after Injection	S	DTG Final Identification or BE After Injection	See Table A5 for Instructions. For second card directly transfer the BE measurement.
DTG Problem Resolved	U	DTG Problem Resolved	See Table A5 for Instructions. For second card leave this field blank.
	V	Control	Code — Meaning Item 78 — B — Card ID Item 79 — O — Form ID Item 80 — 1 — Specifies fields N, P and S as DTG notification, type identification and final identification respectively 2 — Specifies fields N, P and S as DTG recertification, BE before and BE after injection respectively

Figure A-30. Data Transferral - AFTEC Form 172 Sheet 2 of 3

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
TELI							A		ØØ9	5318Ø51Ø			5318Ø52Ø		5318Ø53Ø			5318Ø54Ø		531[illegible]55[illegible]	[illegible]1
2ND	CAR	D																			
TELI							A		ØØ9	5318Ø51Ø			5318Ø6ØØ		-5 0.5			-4 0.1			B[illegible]

Figure A-30. Data Transferral - AFTEC Form 172 Sheet 3 of 3

FAULT ISOLATION (F.I.) (LEVEL PROBLEMS)

SITE FEL

DTG LEVEL PROBLEM DETECTED	DTG F.I. F.I. STARTED	F.I. (1) METHOD USED	INITIAL (2) EVALUATION	INITIAL (3) EVALUATION OF SOURCE	FINAL (4) SOURCE IDENTIFIED	(5) ASSISTANCE	ATEC (6) EQUIPMENT USED	REMARKS
53180610	53180620	ATEC	L-53180625	In station 53180630	53180650 RFO	L2	IQCS	

Notes are on back of form.

Figure A-31. Data Transferral - AFTEC Form 173 Sheet 1 of 3

AFTEC FORM NO. 173	CARD NO. B		
FORM ENTRY DESCRIPTION	**FIELD**	**DESCRIPTION**	**TRANSFER INSTRUCTIONS**
Site	A	Site	See Table A3 for Site Codes
ATEC Equipment Used	B	ATE Type	See Table A4 for Abbreviations Note: *If test mode is manual, do not use this field.*
FI Method Used	H	Test Mode	Code — Meaning A — Indicates times and measurements on this card are automatic M — Indicates times and measurements on this card are manual N — Indicates times and measurements on this card are NSS
DTG Level Problem	K	DTG of Problem	See Table A5 for Instructions
Assistance	L, M	Assistance	Enter the number of "L's" in Field L and the number of "O's" in Field M.
DTG FI Started	N	DTG Start Fault Isolation	See Table A5 for Instructions
Initial Evaluation	P	DTG of Initial Evaluation	See Table A5 for Instructions
	Q	Initial Evaluation	Code — Meaning L — Link R — Route G — Group C — Circuit S — Supergroup H — Channel O — Other
Initial Evaluation of Source	R	Evaluation of Source	Code — Meaning I — In-Station O — Out-of-Station
	S	DTG of Initial Evaluation of Source	See Table A5 for Instructions
Final Source Identified	T	RFO	Alongside DTG of Final Source Identified will be an RFO code; enter it in Field T.
	U	DTG End Fault Isolation	See Table A5 for Instructions
	V	Control	Code — Meaning Item 78 — B — Card ID Item 79 — P — Form ID Item 80 — Not Used

Figure A-31. Data Transferral - AFTEC Form 173 Sheet 2 of 3

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
DEL	I						A			5318Ø61Ø	2	Ø	5318Ø62Ø		5318Ø625	L	1	5318Ø63Ø	RFO	5315Ø65	ØED

Figure A-31. Data Transferral - AFTEC Form 173 Sheet 3 of 3

QUALITY CONTROL TESTING: MAN-HOUR ALLOCATIONS

SITE FELDBERG

DATE * NOV 16, 1975

** TYPE TEST ***	(MANUAL MODE) TOTAL TIME IN MINUTES	NUMBER OF CIRCUITS	(AUTOMATED MODE) TOTAL TIME IN MINUTES	REMARKS
Out of Service S3 semiannual	250	27		

* USE ONE FORM PER DAY; NORMALLY TWO ENTRIES PER DAY (ONE FOR IN-SERVICE QC & ONE FOR OUT-OF-SERVICE QC; BUT SEE ** BELOW).

** CIRCUIT PARAMETER TESTS CALLED FOR IN DCS TECHNICAL SCHEDULE [OUT-OF-SERVICE (S1, S3, V1); IN-SERVICE (XMSSN LEVEL)] & SPECIFIC QC TEST WHICH ARE UNIQUE TO TCF (i.e., ECHO SUPPRESSOR QC).

*** IF TEST IS OUT-OF-SERVICE ANNUAL, PLACE AN "A" BESIDE TYPE OF PARAMETER TEST (i.e., S3 A)

Figure A-32. Data Transferral - AFTEC Form 173A Sheet 1 of 4

AFTEC FORM NO. 173A	CARD NO. B			
FORM ENTRY DESCRIPTION	FIELD	DESCRIPTION	TRANSFER INSTRUCTIONS	
Site	**A**	**Site**	**See Table A3 for site codes.**	
	H	**Test Mode**	Code	Meaning
			A	**Indicates times on this card are automatic**
			M	**Indicates times on this card are manual**
Type Test	**J**	**Type Test**	Code	Meaning
			ASQ	ASAP Testing (Quarterly)
			CRQ	Crypto Test (Quarterly)
			DEO	Out of Service Test of Delay Equalizers
			DHO	Out of Service Test of Data Hubs
			D1	Out of Service Test of D1 Parameter
			D2	Out of Service Test of D2 Parameter
			ES	Echo Suppressor Test
			FTA	Out of Service Test (FTA-28)
			FWQ	Four Wire Test (Quarterly)
			FWW	Four Wire Test (Weekly)
			IHA	In House Alignment
			LOS	Out of Service Test of LIN Complex
			LT	Link Test
			MD7	Out of Service Test of MD700 Modems
			MPO	Out of Service Test of Monitor Printers
			MTC	Out of Service Test of Monitor Teletype Cabs
			N1	Out of Service Test of N1 Parameter
			N2	Out of Service Test of N2 Parameter
			N3	Out of Service Test of N3 Parameter
			OS	Out of Service Test (No Parameters Given)
			PC	Peg Count
			PG2	Out of Service Test of Pg-21
			PT	PABX Tests
			QAT	Quality Assurance Testing
			QAW	Quality Assurance Testing (Weekly)
			ROS	Out of Service Test of 608D Regenerators
			RT	Regenerator Test
			SA	System Alignment Test
			SDQ	Spare DC Channel or Landline Test (Quarterly)
			SLT	SF Leakage Test
			STQ	Station Test Tone (Quarterly)
			SVQ	Spare Voice Channel Testing (Quarterly)
			SYO	Out of Service Test of Station Yakker
			S1	Out of Service Test of S1 Parameter
			S2	Out of Service Test of S2 Parameter
			S3	Out of Service Test of S3 Parameter

Figure A-32. Data Transferral - AFTEC Form 173A Sheet 2 of 4

AFTEC FORM NO. 173A | CARD NO. B (Continued)

FORM ENTRY DESCRIPTION	FIELD	DESCRIPTION	TRANSFER INSTRUCTIONS
			Code / Meaning TAQ Out of Service Test of IA-182 (Quarterly) TOS Out of Service Test of Teletype VTQ Out of Service Test of VFCT (Quarterly) V1 Out of Service Test of V1 Parameter V2 Out of Service Test of V2 Parameter WC WINK/KP Check XL In Service Test XLA In Service VF or Audio Test XLD In Service DC Test IC IST Check (European) ICC IST Check (CONUS) (Use rightmost item (Item 27) to indicate whether the out of service tests are annual (A), quarterly (Q), or semi-annually (S).
	K	DTG Start	If provided, see Table A5 for instructions
	N	DTG Stop	If provided, see Table A5 for instructions
Number of Circuits	O	Number of Links or Circuits Tested	Direct Transfer
Date	P	DTG of Test	If no start/stop times given, enter the date in this field. The date should be left justified. See Table A5 for instructions.
Manual or Automated Total Time	T	Total Time	See Table A5 for instructions
	V	Control	Code / Meaning Item 78 B Card ID Item 79 Q Form ID Item 80 Not Used

Figure A-32. Data Transferral - AFTEC Form 173A Sheet 3 of 4

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
HEL							M		S3S					Ø27	5321				259		DØ

Figure A-32. Data Transferral - AFTEC Form 173A Sheet 4 of 4

PERFORMANCE MONITORING PROGRAM: MAN-HOUR ALLOCATIONS

SITE FEL   PERIOD COVERED BY THIS FORM 15 DEC 75

DATE	* DCS ROUTE NUMBER ***	MANUAL MODE			NUMBER OF CHANNELS TESTED	AUTOMATED MODE			REMARKS
		START TIME	STOP TIME	TOTAL TIME IN MIN'S **		START TIME	STOP TIME	TOTAL TIME IN MIN'S	
15 DEC 75	44CM10	1210	1230	20	02				

* ICN, RSL, BBL (SOMETIMES IPN) MEASUREMENTS PERFORMED ON DESIGNATED CHANNELS PER ROUTE PER DAY.

** TOTAL TIME TO PERFORM ALL MEASUREMENTS ON ALL DESIGNATED CHANNELS PER ROUTE. START TIME TO BEGIN AT TIME OF EQUIPMENT SETUP

*** TIME DATA FOR ALL ROUTES CAN BE COLLECTED ON THIS FORM. USE ONE LINE PER ROUTE. FORM CAN ACCOMODATE ENTRIES FOR MORE THAN ONE DAY.

Figure A-33. Data Transferral - AFTEC Form 175B   Sheet 1 of 3

AFTEC FORM NO. 173B | CARD NO. B

FORM ENTRY DESCRIPTION	FIELD	DESCRIPTION	TRANSFER INSTRUCTIONS
Site	A	Site	See Table A3 for Site Codes
DCS Route Number	D	Route ID	Direct Transfer
Remarks	G	Type Test (If provided)	Code / Meaning BB — Baseband loading (left justified) RL — Wideband RSL (left justified) BB RL — Both baseband loading and wideband RSL
	H	Test Mode	Code / Meaning A — Indicates times on this card are automatic M — Indicates times on this card are manual
Number of Channels Tested	J	Total Number of Links, Circuits, Channels Tested	Direct Transfer
Manual (or ATEC) Start Time	K	DTG Start	See Table A5 for Instructions
Manual (or ATEC) Stop Time	N	DTG Stop	See Table A5 for Instructions
Manual (or ATEC) Total Time	O	Total Time	Direct Transfer
Date	P	DTG OF Test	Note: For those entries which only indicate a total time in minutes and no start/stop times, put the date in this field. See Table A5 for instructions. (left justified)
	V	Control	Code / Meaning Item 78 — B — Card ID Item 79 — R — Form ID Item 80 — Not Used

Figure A-33. Data Transferral - AFTEC Form 173 B Sheet 2 of 3

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
TEL			14CM1Ø11				M		ØØ2	5351121Ø			5351123Ø	Ø2Ø							HR

Figure A-33. Data Transferral - AFTEC Form 173B Sheet 3 of 3

PERFORMANCE MONITORING PROGRAM: MAN-HOUR ALLOCATIONS
(PLOTTING & ANALYSIS)

SITE FELDBERG

PERIOD COVERED BY THIS FORM 01 DEC 75

DATE	PLOTTING *			ANALYSIS OF RESULTS			REMARKS
	START TIME	STOP TIME	TOTAL TIME IN MINUTES	START TIME	STOP TIME	TOTAL TIME IN MINUTES	
01 DEC 75	0730	1330	360	1331	1600	149	

* PLOTTING TIME TO INCLUDE TIME FOR COMPUTATIONS BY PLOTTER

Figure A-34. Data Transferral - AFTEC Form 173C Sheet 1 of 3

FORM NO. 173C	CARD NO. B		
FORM ENTRY DESCRIPTION	FIELD	DESCRIPTION	TRANSFER INSTRUCTIONS
Site	A	Site	See Table A3 for Site Codes
	H	Test Mode	Use M to indicate times are manual
Plotting Start Time	K	DTG Start	See Table A5 for Instructions
Plotting End Time	N	DTG Stop	See Table A5 for Instructions
Plotting Total Time	O	Total Time	Direct Transfer
Analysis Start Time	P	DTG Start	See Table A5 for Instructions
Remarks	Q	No. of persons plotting	If noted in the remarks, enter the number of persons performing the plotting.
	R	No. of persons for analysis	If noted in the remarks, enter the number of persons performing the analysis.
Analysis Stop Time	S	DTG Stop	See Table A5 for Instructions
Analysis Total Time	T	Total Time	Direct Transfer
	V	Control	Code / Meaning Item 78 B Card ID Item 79 S Form ID Item 80 Not Used

Figure A-34. Data Transferral - AFTEC Form 173C Sheet 2 of 3

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1 2 3	4 5 6	7	8 9 10 11 12 13 14 15	16 17	18	19 20 21 22	23	24	25 26 27	28 29 30 31 32 33 34 35	36	37	38 39 40 41 42 43 44 45	46 47 48	49 50 51 52 53 54 55 56	57	58	59 60 61 62 63 64 65 66	67 68 69	70 71 72 73 74 75 76 77	78 79 80
R E L							M			5 3 3 6 Ø 7 3 Ø			5 3 3 6 1 3 3 Ø	3 6 Ø	5 3 3 6 1 3 3 1			5 3 3 6 1 6 Ø Ø	1 4 9		B S

Figure A-34. Data Transferral - AFTEC Form 173C Sheet 3 of 3

MAINTENANCE MAN-HOUR ALLOCATIONS

DATE OF FORM DEC 1, 75

SITE LKF
MAINTENANCE MAN P. R.

PROBLEM ADDRESSED (CHECK AS APPROPRIATE)								TIME				
CUST EQUIP	COND EQUIP	CHANNEL	MUX	BASE-BAND	RF	PATH	OTHER	DTG START	DTG FINISH	TOTAL TIME	CHECK IF ATEC USED	CCSD *
				X				0740	0745	5		

* WRITE IN LAST FOUR OF CCSD AS APPLICABLE

Figure A-35. Data Transferral - AFTEC Form 173D Sheet 1 of 3

AFTEC FORM NO. 173D	CARD NO. B		
FORM ENTRY DESCRIPTION	FIELD	DESCRIPTION	TRANSFER INSTRUCTIONS
Site	A	Site	See Table A3 for Site Codes
CCSD	G	CCSD Number	Use Last Four Digits of Number
Check if ATEC Used	H	Test Mode	Code / Meaning M / If ATEC was not used A / If ATEC was used
DTG Start	K	DTG Start	See Table A5 for Instructions
DTG Stop	N	DTG Stop	See Table A5 for Instructions
Total Time	O	Total Time	See Table A5 for Instructions
	S	DTG of Test	Note: For those entries which only indicate total times and do not use start/stop times enter the date in this field. See Table A5 for Instructions
Cust. equip., cond. equip., channel, MUX, Baseband, RF, Path, Other	U	Problems Addressed	Item 70 - Enter a "1" is customer equipment is checked Item 71 - Enter a "1" if condition equipment is checked Item 72 - Enter a "1" if channel is checked Item 73 - Enter a "1" if Mux is checked *Item 74 - Enter a "1" if Baseband is checked* Item 75 - Enter a "1" if RF is checked Item 76 - Enter a "1" if Path is checked Item 77 - Enter a "1" if Other is checked
	V	Control	Code / Meaning Item 78 / B / Card ID Item 79 / T / Form ID Item 80 / / Not Used

Figure A-35. Data Transferral - AFTEC Form 173D Sheet 2 of 3

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
LKF							M			5336Ø74Ø			5336[illegible]715	365						1	[illegible]1

Figure A-35. Data Transferral - AFTEC Form 173D Sheet 3 of 3

FAULT ISOLATION (F.I.) (FACSIMILE)

SITE: FEL

DATE	TIME F.I. STARTED	F.I. MODE (1)	TIME F.I. COMPLETED (2)	PARAMETER MEASURED (3)			CKT QUALITY SATISFACTORY (4)	ATEC EQUIPMENT USED (5)	REMARKS
				BLACK LEVEL	WHITE LEVEL	CARRIER FREQ.			
Nov 13	1000	ATEC	1030	23.2	24.3	2600	YES	IQCS	

Notes are on back of form.

Figure A-36. Data Transferral - AFTEC Form 174 Sheet 1 of 3

[illegible] FORM NO. 174	CARD NO. B		
[illegible] DESCRIPTION	FIELD	DESCRIPTION	TRANSFER INSTRUCTIONS
Site	A	Site	See Table A3 for Site Codes
AFTEC Equipment Used	B	ATE Type	See Table A4 for Codes. Note: If test mode is manual, do not use this field.
CCSD	G	CCSD	Use last four digits
FI Mode	H	Test Mode	Code — Meaning A — Indicates the times on this card are automatic M — Indicates the times on this card are manual N — Indicates the times on this card are NSS
Time FI Started	K	DTG Start	See Table A5 for Instructions
CKT Quality Satisfactory	L	CKT Quality	Code — Meaning Y — Yes N — No U — Unknown
Time FI Completed	N	DTG Stop	See Table A5 for Instructions
Black Level	P	Measurement Data	Direct Transfer
White Level	S	Measurement Data	Direct Transfer
Carrier Frequency	U	Measurement Data	Direct Transfer
	V	Control	Code — Meaning Item 78 — B — Card ID Item 79 — U — Form ID Item 80 — Not Used

Figure A-36. Data Transferral - AFTEC Form 174 Sheet 2 of 3

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1 2 3	4 5 6	7	8 9 10 11 12 13 14 15	16 17	18	19 20 21 22	23	24	25 26 27	28 29 30 31 32 33 34 35	36	37	38 39 40 41 42 43 44 45	46 47 48	49 50 51 52 53 54 55 56	57	58	59 60 61 62 63 64 65 66	67 68 69	70 71 72 73 74 75 76 77	78 79 80
F F I	I						A			5 3 1 8 1 Ø Ø Ø	Y		5 3 1 8 1 Ø 3 Ø		2 3 . 2			2 1 . 3		2 6 Ø Ø	B U

Figure A-36. Data Transferral - AFTEC Form 174 Sheet 3 of 3

FAULT ISOLATION (F.I.) (VFCT)

SITE: FEL

VFCT CCSD	SUB CHAN NUMBER	TIME F.I. STARTED	F.I. MODE (1)	TIME F.I. COMPLETED (2)	COMPOSITE VFTG LEVEL	FREQ OFFSET STABILITY (3)	(4) SUBCHANNEL FREQUENCY CORRECTNESS	(5) SUBCHANNEL LEVELS CORRECTNESS	(6) SUBCHANNEL DISTORTION SATISFACTORY	ATEC EQUIP USED
9AWN	08	5217 1000	ATEC	5217 1030	-33.5	YES 8Hz	No M-6	NoA -26	No A	IOCS

Notes on back of form.

Figure A-37. Data Transferral - AFTEC Form 175 Sheet 1 of 3

FORM NO. 175	CARD NO. B		
FORM ENTRY DESCRIPTION	FIELD	DESCRIPTION	TRANSFER INSTRUCTIONS
Site	A	Site	See Table A3 for Site Codes
ATEC Equipment Used	B	ATE Type	See Table A4 for Codes Note: If test mode is manual, do not use this field
Subchan Number	E	Subchannel Number	Direct Transfer
VFCT CCSD	G	CCSD	Use last four digits
FI Mode	H	Test Mode	Code — Meaning A — Indicates times and measurements on this card are automatic M — Indicates times and measurements on this card are manual N — Indicates times and measurements on this card are NSS
Time FI Started	K	DTG Start Fault Isolation	See Table A5 for Instructions
Time FI Completed	N	DTG End Fault Isolation	See Table A5 for Instructions Note: A second card will have to be used for this form. They will be identical from fields A to K. On Card 1 Item 80 will be set to 1 and on Card 2 Item 80 = 2. Also Field U will be used as subchannel frequency correctness on card 1 and subchannel level correctness on card 2.
Composite VFTG Level	P	Composite Level	Direct Transfer Note: For second card leave this field blank
Frequency Offset Stability	S	Frequency Offset Stability	Item 59 - Use "Y" for yes and "N" for no Items 60, 61, 62, 63 used to indicate frequency error (number should be right justified) Note: For second card leave this field blank
Subchannel Distortion Satisfactory	T	Subchannel Distortion Satisfactory	Item 67 - Use "Y" for yes and "N" for no Items 68, 69 - Use to indicate color Note: For first card leave this field blank
Subchannel Frequency Correctness or Level Correctness	U	Subchannel Frequency Correctness	Item 70 - Use "Y" for yes and "N" for no Item 71 - Use to indicate mark frequency (M) or space frequency (S) Items 72, 73, 74, 75 - Use to indicate frequency offset (number should be right justified) Note: For second card field U will be used for subchannel level correctness as follows: Item 70 - Use "Y" for yes and "N" for no Item 71, 72 - Use to indicate color Items 73, 74, 75, 76, 77- Use to indicate level (number should be right justified)
	V	Control	Code — Meaning Item 78 — B — Card ID Item 79 — V — Form ID Item 80 — 1 — Specifies field U as subchannel frequency correctness 2 — Specifies field U as subchannel level correctness

Figure A-37. Data Transferral - AFTEC Form 175 Sheet 2 of 3

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
EFI	1			ø8		9AWN	A			52171ØØØ			5217[illegible]ø3ø		-33.5			Yøøø8	NA	NMøøø6	EV1
END	CARD																				
EFI	1			ø8		9AWN	A			52171ØØØ										NA -2[illegible].ø[illegible]	V-

Figure A-37. Data Transferral - AFTEC Form 175 Sheet 3 of 3

FAULT ISOLATION (F.I.) (CHANNEL PACKED DATA)

SITE: FEL

DATE	TIME F.I. STARTED	FAULT ISOLATION MODE (1)	TIME F.I COMPLETED (2)	PARAMETERS MEASURED (3)				CKT QUALITY SATISFACTORY (4)	ATEC EQUIPMENT USED
				COMPOSITE LEVEL	9 HEE LEVEL	9 HDZ LEVEL	9 HDY LEVEL		
Nov. 13, 75	1000	ATEC	1030	-3.5	-21.6	-22.3	-18.6	YES	IQCS

Put Remarks on back of Form. Notes are on back of form.

Figure A-38. Data Transferral - AFTEC Form 176 Sheet 1 of 3

[illegible] FORM NO. 176	CARD NO. B		
[illegible] ENTRY DESCRIPTION	FIELD	DESCRIPTION	TRANSFER INSTRUCTIONS
Site	A	Site	See Table A3 for Site Codes
ATEC Equipment Used	B	ATE Type	See Table A4 for Codes. Note: If test mode is manual, do not use this field.
CCSD	G	CCSD	Use last four digits
FI Mode	H	Test Mode	Code / Meaning A — Indicates times and measurements on this card are automatic M — Indicates times and measurements on this card are manual N — Indicates times and measurements on this card are NSS
Time FI Started	K	DTG Start Fault Isolation	See Table A5 for Instructions
CKT Quality Satisfactory	L	CKT Quality	Use "Y" for yes and "N" for no
Time FI Completed	N	DTG End Fault Isolation	See Table A5 for Instructions. Note: Two cards will have to be filled out for this form. The first will have the 9HEE, 9HDZ and 9HDY levels in fields P, S and U respectively, while the second will have the composite level entered in field P. Item 80 of card 1 will be 1 and 2 for card 2. They will be identical from field A to K.
9HEE Level or Composite Level	P	Measurement Data	Direct Transfer Note: For Card 1 enter 9HEE level and for Card 2 enter composite level
9HDZ Level	S	Measurement Data	Direct Transfer Note: For Card 1 enter 9HDZ level and for Card 2 leave this field blank
9HDY Level	U	Measurement Data	Direct Transfer Note: For Card 1 enter 9HDY level and for Card 2 leave this field blank
	V	Control	Code / Meaning Item 78 — B — Card ID Item 79 — W — Form ID Item 80 — 1 — Specifies field P as 9HEE level 2 — Specifies field P as composite level

Figure A-38. Data Transferral - AFTEC Form 176 Sheet 2 of 3

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
FELI							A			531810ØØØ	Y		531810Ø3Ø		-21.6			-22.3		-18.6	BW1
2ND CARD																					
FELI							A			531810ØØØ					-3.5						BW2

Figure A-38. Data Transferral - AFTEC Form 176 Sheet 3 of 3

FAULT ISOLATION (F.I.) (WIDEBAND LINK)

SITE: FEL

LINK NO.	TX OR RX	Im-pulse Noise Count	TIME F.I. START	F.I. (1) METHOD USED	TIME (2) F.I. COMPLETE	EST LINK ICN (VF LEVEL)	EST LINK ICN (BB LEVEL)	LEVEL (3) STABILITY	FREQ. (4) STABILITY	PHASE (5) JITTER	BBL	(6) TX POWER	(7) RX RSL	ATE EQU USE
M0069	T	10	5318Ø73Ø	ATEC	5318Ø75Ø	-59.0	-56.3	H 1-3	L 3-7	10°	-23.5	16.7	-19.6	IQCS

Put remarks on back of form. Notes are on back of form.

Figure A-39. Data Transferral - AFTEC Form 177 Sheet 1 of 3

[illegible] FORM NO. 177	CARD NO. B		
[illegible] ENTRY DESCRIPTION	FIELD	DESCRIPTION	TRANSFER INSTRUCTIONS
Site	A	Site	See Table A3 for Site Codes
ATEC Equipment Used	B	ATE Type	See Table A4 for Codes Note: If test mode is manual, do not use this field
TX or RX	C	TX or RX	Code — Meaning T — TX R — RX
FI Mode	H	Test Mode	Code — Meaning A — Indicates the times and measurements on this card are automatic M — Indicates the times and measurements on this card are manual N — Indicates the times and measurements on this card are NSS
Time FI Started	K	DTG Start Fault Isolation	See Table A5 for Instructions
Time FI Completed or RX RSL	N	DTG End Fault Isolation	See Table A5 for Instructions Note: Two cards will have to be filled out for this form. They will be identical from fields A through K. Card one will have Item 80 set to 1 and Card two will have Item 80 set to 2. For the second card Field N will contain the RX RSL entry.
Impulse Noise Count	O	Impulse Noise Count	Direct Transfer Note: For Card 1 enter impulse noise count and for Card 2 leave this field blank
EST Link ICN (VF Level) or BBL	P	VF Level ICN or BBL	Direct Transfer Note: For Card 1 enter VF level ICN and for Card 2 enter the BBL measurement
EST Link ICN (BB Level) or TX power	S	BB Level ICN or TX Power	Direct Transfer Note: For Card 1 enter BB level ICN and for Card 2 enter the TX power measurement
Phase Jitter	T	Phase Jitter	Direct Transfer Note: For Card 1 enter the phase jitter measurement and for Card 2 leave this field blank
Level Stability or Frequency Stability	U	Level or Frequency Stability	Item 70 - Use "H" to indicate level or frequency is high and "L" to indicate level or frequency is low. Items 71, 72, 73 - Use to indicate low end of range (number should be right justified) Items 74, 75, 76 - Use to indicate high end of range (number should be right justified)
	V	Control	Code — Meaning Item 78 — B — Card ID Item 79 — X — Form ID Item 80 — 1 — Specifies fields N, P, S, U as DTG End FI, VF ICN, BB ICN, and level stability respectively 2 — Specifies fields N, P, S, U as RX RSL, BBL, TX Power and frequency stability respectively.

Figure A-39. Data Transferral - AFTEC Form 177 Sheet 2 of 3

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
FEL	1	T	MØØ69				A			5318Ø73Ø			5318Ø75Ø	Ø1Ø	-59.Ø			-56.3	Ø1Ø	HØØ1ØØ3	BX1
2ND	CA	R	D																		
FEL	I	T	MØØ69				A			5318Ø73Ø			-19.6		-23.5			16.7		LØØ3ØØ7	BX2

Figure A-39. Data Transferral - AFTEC Form 177 Sheet 3 of 3

SITE FEL

TEST TEAM MEMBER

DATE

PMP* MEASUREMENT	ATEC METHOD					MANUAL METHOD			***REMARKS
	ATE USED	START TIME	STOP TIME	VALUE	SUCCESS**	START TIME	STOP TIME	VALUE	
RSL	IQCS	53180710	53180720	-15.8	Yes				12 Channels

* TYPE OF MEASUREMENT: ICN (3KC WEIGHTED) NET LOSS, IMPULSE NOISE, BASE BAND LOADING (BBL), RSL, VF LEVEL, C-MSG, SLOTTED NOISE, AND VFCT TESTS

** ENTER "YES" IF ATEC WAS CAPABLE OF MAKING THE MEASUREMENT.
ENTER "NO" IF ATEC WAS NOT CAPABLE OF MAKING THE MEASUREMENT.

***ENTER NUMBER OF CHANNELS TESTED (AS APPLICABLE).

Figure A-40. Data Transferral - AFTEC Form 178 Sheet 1 of 3

AFTEC FORM NO. 178 | CARD NO. B

FORM ENTRY DESCRIPTION	FIELD	DESCRIPTION	TRANSFER INSTRUCTIONS
Site	**A**	**Site**	See Table A3 for Site Codes
ATE Used	**B**	**ATE Type**	See Table A4 for Codes Note: **If test mode is manual, do not use this field**
	H	**Test Mode**	Code — Meaning A — Indicates times and **measurements on this card are automatic** M — Indicates times and **measurements on this card are manual**
	J	**Measurement Type**	Code — Meaning WF — ICN (3 KC weighted) IN — Impulse Noise BBL — Base Band Loading RSL — Receive Level AV — VF Level WN — C-Msg SLN — Slotted Noise VT — VFCT Test IPN — Out of service Test OT — Other
Manual (or ATEC) Start Time	K	DTG Start	See Table A5 for Instructions
Manual (or ATEC) Stop Time	N	DTG Stop	See Table A5 for Instructions
Manual (or Automated) Value	P	Measurement Data	Direct Transfer
Success	Q	*Success*	*Use "Y" for yes and "N" for no*
Remarks	T	**Number of Channels Tested**	Direct Transfer
	U	PMP Route Number	Direct Transfer (left justified)
	V	Control	Code — Meaning Item 78 — B — Card ID Item 79 — Y — Form ID Item 80 — — Not Used

Figure A-40. Data Transferral - AFTEC Form 178 Sheet 2 of 3

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
							A		RSL	5318Ø71Ø			5318Ø72Ø		-15.8	Y			012		DY

Figure A-40. Data Transferral - AFTEC Form 178 Sheet 3 of 3

APPENDIX B - BMD SAMPLE DATA OUTPUT

BMD01D
SIMPLE DATA DESCRIPTION

1. GENERAL DESCRIPTION

a. This program computes simple averages and measures of dispersion of variables, omitting those values which the user specifies for exclusion from the computations.

Methods for specifying the exclusion of blanks and certain special values from the computations are given below.

Method Number	Method
0	Set all blanks equal to 0; these and all other numbers will enter computations.
1	Blanks are not counted; all numbers will enter computation.
2	Blanks and/or pre-specified special values not counted; all other numbers will enter computations.
3	Pre-specified special values not counted; blanks set equal to 0 and entered with all other numbers into computations.

b. Output for this program includes:

(1) Means
(2) Standard deviations
(3) Standard errors of means
(4) Maximum values
(5) Minimum values
(6) Ranges
(7) Sample sizes (see the four methods listed above).

c. Limitations per problem:

(1) p, number of variables ($p \leq 999$)

(2) n, number of cases ($n \leq 99,999$)

(3) k, number of Variable Format Cards ($1 \leq k \leq 10$)

(4) c, number of special values specified for methods 2 or 3 ($0 \leq c \leq 8$)

(5) t, number of Transgeneration Cards ($0 \leq t \leq 100$)

(6) q, number of variables added after transgeneration ($-998 \leq q \leq 999$), ($p+q \leq 1000$)

d. Estimation of running time and output pages per problem:

Number of seconds $= 2 + [(p+q)n/100]$ (for IBM 7094)
Number of pages $= 1 + [(p+q)/50]$

e. The program allows transgeneration of the input data. Codes 1-17, 20-24, and 40 of the transgeneration list may be used.

2. ORDER OF CARDS IN JOB DECK

Cards indicated by letters enclosed in parentheses are optional. All other cards must be included in the order shown.

a. System Cards [Introduction, IV]

b. Problem Card

(c.) Special Value Card

(d.) Standard Transgeneration Card(s) [Introduction, III-B]

e. F-type Variable Format Card(s) [Introduction, III-C]

f. DATA INPUT Cards [Introduction, II]
(Place data input deck here if data input is from cards.)

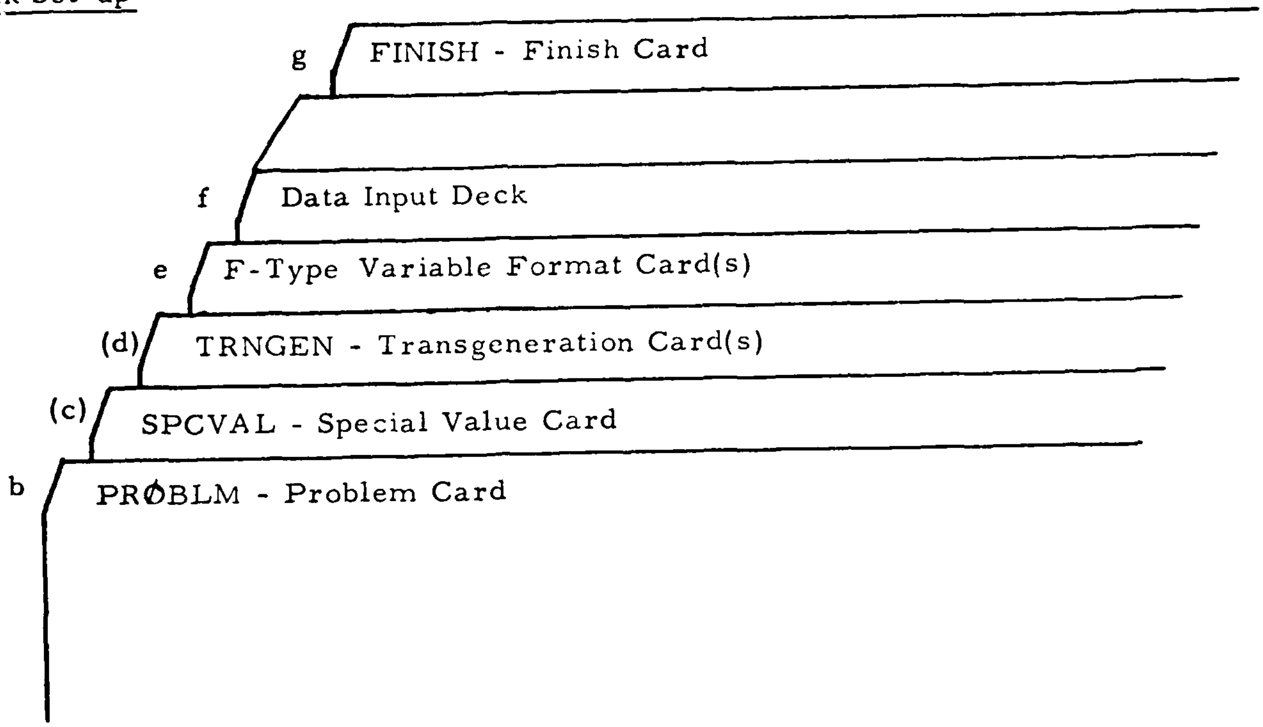
...

Repeat b. through f. as desired.

...

g. Finish Card [Introduction, III]

Deck Set-up



3. <u>CARD PREPARATION</u> (SPECIFIC FOR THIS PROGRAM)

Preparation of the cards listed below is specific for this program. All other cards listed in the preceding section are prepared according to instructions in the Introduction.

b. **Problem Card (One Problem Card for each problem)**

Col. 1-6	PRØBLM	(Mandatory)
Col. 7-12	Alphanumeric problem code	
Col. 13-17	Number of cases ($n \leq 99,999$)	
Col. 18-20	Number of variables ($p \leq 999$)	
Col. 21-24	Number of variables added after transgeneration ($-998 \leq q \leq 999$) ($p+q \leq 1000$)	
Col. 25	Method number (See Section 1-a.)	
Col. 26-28	Number of Transgeneration Cards ($0 \leq t \leq 100$)	

Col. 29 Number of special values ($0 \leq c \leq 8$)

Col. 30-68 Blank

Col. 69, 70 T If input data is from tape T ($T \leq 16$, $T \neq 5$, $T \neq 6$); otherwise leave blank.

Col. 71, 72 Number of Variable Format Cards ($1 \leq k \leq 10$)

(c.) Special Value Card

Col. 1-6 SPCVAL (Mandatory)

Col. 7-12 First special value*

Col. 13-18 Second special value*

...

Col. 49-54 Eighth special value*

4. COMPUTATIONAL PROCEDURE

Let X_{ij} be the j^{th} variable of the i^{th} case.

Step 1. If X_{ij} value satisfies the stated conditions for inclusion in the computation, X_{ij} is included in the computation of $\sum_i X_{ij}$, $\sum_i X_{ij}^2$, n_j, $\underset{i}{\text{Max}}\, X_j$, $\underset{i}{\text{Min}}\, X_j$; otherwise the value does not enter the computation.

Step 2. Mean $\frac{1}{n_j} \sum_i X_{ij}$

Variance $\frac{1}{(n_j-1)} \left[\sum_i X_{ij}^2 - \frac{\left(\sum_i X_{ij} \right)^2}{n_j} \right]$

Standard Deviation $\sqrt{\text{Variance}}$

Standard Error (of Mean) $(\text{Standard Deviation}) / \sqrt{n_j}$

Range $\text{Max}\, X_j - \text{Min}\, X_j$

*Keypunch the decimal. If the decimal is not punched, the values will be read with the decimal assumed to be at the right of the field.

```
PROBLMTEST 500006042 00930093
SPCVAL      99    188    170
TRNGEN0430800100010
TRNGEN0441000200003
TRNGEN0450900300010
TRNGEN0461102000021
TRNGEN0471201800019
TRNGEN0481302200022
TRNGEN0491500700060
TRNGEN0504000900001       4000069000065000063000058
TRNGEN05101010
(7X,21F3.0,/7X,21F3.0)
5314106188170155142143 99064063069090065 99110090085100085 99018033188
1111107018024023025020045025040025079077069057057041066067067053060040
1922113159156170133141144040045035056045074055075050070055170023028031
1922113044031035030035045135040055067059067061057051067063064049056050
2022108180169161142153135053062056071075077065075070095100100020020023
2022108036026041025025030050035050060053050047051046043051050054051061
2123102163162159154155165047046049069076103050050055090105115018021019
2123109029029032020025025040045035053060061050050044063061056057056053
2212508153159139147147141033035036069088091035040040100120105028031039
2212508031033032035055070040060035070061057056056046065061060050044040
2321413176172164159172155030034032043101078033 045940060125115010013023
2321413024031038015035045035050125100100080073039044098094079071051044
FINISH
```

Problem Test 5

6 cases, n
42 variables, p
9 variables added after transgeneration, q
Method 3 used; therefore specified special values will not enter the computations. Blanks will enter as zeros.
9 Transgeneration Cards
3 specified special values

Special Value Card

Special values are: 99, 188, 170.

Variable Format Card

The variable format statement directs the entry of Col. 8-70 in 3-digit fields on each of the two cards per case.

Transgeneration Cards

$X_1 + 10 \longrightarrow X_{43}$

$(X_2)^3 \longrightarrow X_{44}$

$(X_3)\,10 \longrightarrow X_{45}$

$(X_{20}) + (X_{21}) \longrightarrow X_{46}$

$(X_{18}) - (X_{19}) \longrightarrow X_{47}$

$(X_{22})(X_{22}) \longrightarrow X_{48}$

$$\begin{cases} \text{if } X_7 \geq 60, & X_{49} = 1 \\ \text{if } X_7 < 60, & X_{49} = 0 \end{cases}$$

$$\begin{cases} \text{if } X_9 = 69, 65, 63 \text{ or } 58; & X_{50} = 1 \\ \text{otherwise,} & X_{50} = X_{50} \end{cases}$$

$\sqrt{X_{10}} \longrightarrow X_{51}$

BMD01D - SIMPLE DATA DESCRIPTION - REVISED JANUARY 5, 1971
HEALTH SCIENCES COMPUTING FACILITY, UCLA

PROBLEM CARD

PROBLEM NUMBER	TEST 'S	METHOD NUMBER	3
NUMBER OF CASES	6	NUMBER OF SPECIAL VALUES	3
NUMBER OF VARIABLES	42	NUMBER OF TRANSGENERATIONS	9
NUMBER OF VARIABLES ADDED	9	INPUT TAPE NUMBER	5

NUMBER OF VARIABLE FORMAT CARDS 1

SPECIAL VALUES CARD
99.00000 168.00000 170.00000

VARIABLE FORMAT CARD(S)
(7X,21F3.0,/7X,21F3.0)

TRANS GENERATOR CARD(S)

CARD NO.	NEW VARIABLE	TRANS CODE	ORIG. VAR(A)	ORIG. VAR(B) OR CONSTANT	TYPE-40 CONSTANTS			
1	43	8	1	10.00000				
2	44	10	2	3.00000				
3	45	9	3	10.00000				
4	46	11	20	21.00000				
5	47	12	18	19.00000				
6	48	13	22	22.00000				
7	49	15	7	60.00000				
8	50	40	9	1.00000	59.00000	65.00000	63.00000	58.00000
9	51	1	10	-0.0				

VAR NO	MEAN	S.D.	S.E. OF MEAN	SAMPLE	MAXIMUM	MINIMUM	RANGE
1	166.2000	11.4324	5.1127	5	180.0000	153.0000	27.0000
2	165.6000	5.2249	2.3367	5	172.0000	159.0000	13.0000
3	155.6000	9.8387	4.4000	5	164.0000	139.0000	25.0000
4	146.1667	9.3256	3.8072	6	159.0000	133.0000	26.0000
5	151.8333	11.2857	4.6074	6	172.0000	141.0000	31.0000
6	148.0000	11.9583	5.3479	5	165.0000	135.0000	30.0000
7	44.5000	12.8179	5.2329	6	64.0000	30.0000	34.0000
8	47.5000	12.6293	5.1559	6	63.0000	34.0000	29.0000
9	46.1666	14.5247	5.9297	6	69.0000	32.0000	37.0000
10	66.2333	15.7945	6.4481	6	90.0000	43.0000	47.0000
11	75.0000	19.2146	7.8443	6	101.0000	45.0000	56.0000
12	84.6000	12.1778	5.4461	5	103.0000	74.0000	29.0000
13	57.5000	28.7663	11.7438	6	110.0000	30.0000	80.0000
14	62.5000	20.1866	8.2412	6	90.0000	40.0000	50.0000
15	56.6666	17.7951	7.2648	6	85.0000	40.0000	45.0000
16	85.8333	16.8572	6.8819	6	100.0000	60.0000	40.0000
17	98.3333	25.6255	10.4616	6	125.0000	55.0000	70.0000
18	108.7500	7.5000	3.7500	4	115.0000	100.0000	15.0000
19	19.5000	5.5517	2.4461	5	28.0000	10.0000	18.0000
20	24.3333	7.6333	3.1163	6	33.0000	13.0000	20.0000
21	27.0000	8.0000	3.5777	5	39.0000	19.0000	20.0000
22	30.3333	9.0921	3.7118	6	44.0000	18.0000	26.0000
23	29.0000	3.4059	1.3904	6	33.0000	24.0000	9.0000
24	33.5000	6.2209	2.5397	6	41.0000	23.0000	18.0000
25	25.0000	7.0711	2.8867	6	35.0000	15.0000	20.0000
26	32.5000	12.5499	5.1235	6	55.0000	20.0000	35.0000
27	43.3333	15.7056	6.4118	6	70.0000	25.0000	45.0000
28	54.1667	40.4249	16.5034	6	135.0000	25.0000	110.0000
29	45.0000	8.9443	3.6515	6	60.0000	35.0000	25.0000
30	54.1666	36.3891	14.8558	6	125.0000	25.0000	100.0000
31	71.5000	16.5257	6.7466	6	100.0000	53.0000	47.0000
32	68.3333	17.4547	7.1258	6	100.0000	53.0000	47.0000
33	65.5000	13.4127	5.4757	6	89.0000	50.0000	39.0000
34	57.3333	9.1757	3.7476	6	73.0000	47.0000	26.0000
35	51.6667	6.5186	2.6245	6	57.0000	39.0000	18.0000
36	45.3333	3.3267	1.3581	6	51.0000	41.0000	10.0000
37	67.0000	17.6522	7.2065	6	98.0000	43.0000	55.0000
38	66.1666	14.6208	5.9689	6	94.0000	51.0000	43.0000
39	62.6666	9.9533	4.0758	6	79.0000	50.0000	29.0000
40	55.6667	8.0416	3.2830	6	71.0000	49.0000	22.0000
41	53.0000	5.5857	2.2803	6	60.0000	44.0000	16.0000
42	48.0000	8.2704	3.3764	6	61.0000	40.0000	21.0000
43	176.2000	11.4324	5.1127	5	190.0000	163.0000	27.0000
44	4552154.0000	429372.2500	192021.1250	5	5038446.0000	4019676.0000	1064770.0000
45	1555.5998	59.3865	44.0000	5	1640.0000	1390.0000	250.0000
46	49.6000	14.3671	6.4234	5	70.0000	36.0000	34.0000
47	94.7500	13.4505	6.7253	4	105.0000	77.0000	28.0000
48	948.5995	570.3572	232.8474	6	1936.0000	324.0000	1612.0000
49	0.1667	0.4082	0.1667	6	1.0000	0.0	1.0000
50	0.1667	0.4082	0.1667	6	1.0000	0.0	1.0000
51	8.0945	0.9874	0.4031	6	9.4868	6.5574	2.9294

BMD02D
CORRELATION WITH TRANSGENERATION
(Boolean Selection of Cases)

1. GENERAL DESCRIPTION

a. This program computes simple correlation coefficients, averages and measures of dispersion on entering variables and/or transgenerated variables from selected cases whose values for specified variables have a precise logical relationship in agreement with a specified Boolean expression.

b. Output from this program includes:

(1) Sums
(2) Means
(3) Cross-product deviations
(4) Standard deviations
(5) Variance - covariance matrix
(6) Correlation matrix

Optional output includes:

(7) One-page cross-tabulation plots of any two variables, automatically scaled to 50 (vertical) by 100 (horizontal) character spaces or units.

c. Limitations per problem:

(1) p, number of original variables ($2 \le p \le 135$)
(2) n, number of original cases ($2 \le n \le 99{,}999$)
(3) j, number of Plot Selection Cards ($0 \le j \le 99$)
(4) q, number of variables added to the original set after transgeneration ($-133 \le q \le 133$), ($2 \le p + q \le 135$)
(5) b, number of Case Selection Cards ($0 \le b \le 9$)
(6) m, number of Transgeneration Cards ($0 \le m \le 150$)
(7) k, number of Variable Format Cards ($1 \le k \le 10$)

d. Estimation of running time and output pages per problem:

Number of seconds = 2 + [(p+q)n/100] + 30 j (for IBM 7094)
Number of pages = 4 + [(p+q)/4] + 1 page per plot

e. The program allows transgeneration of the input data. Codes 01, 02, . . . , 16 and 41 of the transgeneration list may be used.

f. A special feature of this program is the selection of cases from the input data by specifying a Boolean expression. A case is accepted if it is in agreement with the expression; otherwise the case is skipped. The expression consists of variables and constants involving relationships of equality or inequality written in a logical form using the operations AND and OR.

2. ORDER OF CARDS IN JOB DECK

Cards indicated by letters enclosed in parentheses are optional. All other cards must be included in the order shown.

a.	System Cards	[Introduction, IV]
b.	Problem Card	
(c.)	Standard Transgeneration Card(s)	[Introduction, III-B]
(d.)	Case Selection Card(s)	
e.	F-type Variable Format Card(s)	[Introduction, III-C]
f.	DATA INPUT Cards (Place data input deck here if data input is from cards.)	[Introduction, II]
(g.)	Plot Selection Card(s)	

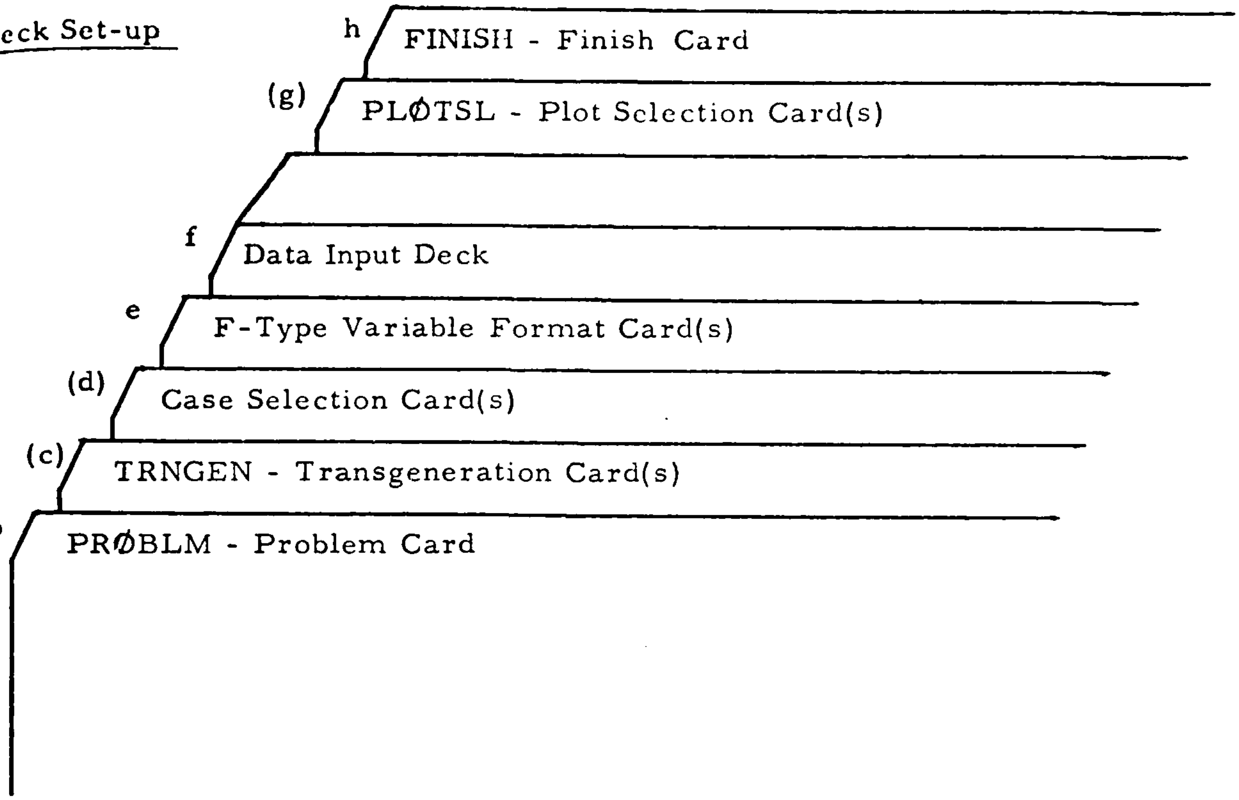
. . .

Repeat b. through (g.) as desired.

. . .

h.	Finish Card	[Introduction, III]

Deck Set-up



3. CARD PREPARATION (SPECIFIC FOR THIS PROGRAM)

Preparation of the cards listed below is specific for this program. All other cards listed in the preceding section are prepared according to instructions in the Introduction.

b. Problem Card (One Problem Card for each problem)

Col. 1-6	PRØBLM	(Mandatory)
Col. 7-12	Alphanumeric problem code	
Col. 13-15	Number of original variables ($2 \leq p \leq 135$)	
Col. 16-20	Number of original cases ($2 \leq n \leq 99,999$)	
Col. 21, 22	Number of Plot Selection Cards; if none, leave blank. ($0 \leq j \leq 99$)	
Col. 23-26	0000	No variables added to, or subtracted from, the original set after transgeneration
	+q	q variables added to the original set after transgeneration ($2 \leq p+q \leq 135$)
	-q	q variables subtracted from the original set after transgeneration

Col. 27, 28	00	No Case Selection Cards
	+b	b cards used for Boolean expression; case selection occurs after transgeneration ($b \leq 9$)
	-b	b cards used for Boolean expression; case selection occurs prior to transgeneration ($\lvert b \rvert \leq 9$)
Col. 29, 30	NO	if matrix of cross products is not desired
Col. 31, 32	NO	if covariance matrix is not desired
Col. 33, 34	NO	if alternate input tape is not to be rewound
Col. 35-65	Blank	
Col. 66-68	000	No transgeneration
	m	m Transgeneration Cards ($m \leq 150$)
Col. 69-70	00	Data input from cards
	T	Data input from logical tape T ($T \neq 5, 6, 1$)
Col. 71, 72	Number of Variable Format Cards ($1 \leq k \leq 10$)	

(d.) Case Selection Card(s)

It is often useful to select cases if the value of a particular variable is less than some constant, greater than some constant, equal to some constant, etc. Symbolically,

V(I)<C
V(I)>C
V(I)=C

where I is the index of some variable. To select only those cases where the values of a variable are between two constants involves the operation AND.

V(I)>C AND V(I)<B

To select only those cases where either of two variables must satisfy a relationship involves the operation OR.

V(I)>C OR V(J)<B

Perhaps a more complicated expression is desirable, e.g.,

(V(I)>A) OR (V(J)<B) AND (V(K)=C), . . .

According to rule, the entire Boolean expression is either true or false for the case being tested. It is examined from left to right. If an OR is encountered, and the expression preceding the OR is true, the entire expression is considered to be true for this case, and the case is selected for inclusion.

Since parentheses cannot be used for compound AND/OR expressions, AND is assumed to precede OR. The statement

W OR X AND Y OR Z

will operate as

W OR (X AND Y) OR Z.

A Case Selection Card is written as a sequence of *conditions* separated by an *operation*. A *condition* is a *variable* and a *constant* separated by a *relationship*.

Variables: A variable is specified by the alphabetic V and the variable index, e.g., V(100), V(010), V(149), V(008). The three-digit index is necessary; it is enclosed by parentheses.

Constants: Constants are specified by their literal value, e.g., -22.43, .99090, 1.0000, .00009. Five numeric characters with a decimal point are allowed. If the sign (+, -) is used, then only four numeric characters are allowed.

Relationships: Relationships are specified by using the following two-character codes: GT (greater than), LT (less than), GE (greater than or equal to), LE (less than or equal to), EQ (equal to), NE (not equal to).

Operations: Operations are specified by using the following two-character codes: AN (and), OR (or), ** (end of expression).

Note:	(not greater than)	$\longleftrightarrow$	LE
	(not less than)	$\longleftrightarrow$	GE
	(not greater than or equal to)	$\longleftrightarrow$	LT
	(not less than or equal to)	$\longleftrightarrow$	GT

Examples:

(i) (V(002)NEV(100))**

The case is accepted if variable 2 is not equal to variable 100.

(ii) (V(010)GE100.00)AN(V(010)LT200.00)**

The case is accepted if variable 10 is greater than or equal to 100.00 and variable 10 is less than 200.00.

The preparation of the Case Selection Card is as follows:

Col. 1-3	(V(	
Col. 4-6	Three-digit variable index	
Col. 7	)	
Col. 8,9	Two-character relationship	
Col. 10,11	V(	
Col. 12-14	Three-digit variable index	or
Col. 15	)	
Col. 10-15	Constant (Keypunch decimal)	
Col. 16	)	
Col. 17,18	Two-character operation	

This format is repeated four times per card ending in Column 72. The maximum number of cards is nine. The last operation of the expression must be **. Therefore, the user may specify from one to 36 conditions, each condition followed by an operation, the last operation being **.

(g.) Plot Selection Card(s)

Col. 1-6	PLØTSL	(Mandatory)
Col. 7-9	Index of the base variable (X-axis)	
Col. 10, 11	Number of variables to be cross-plotted with this base variable (≤ 20)	
Col. 12-14	Index of the 1st variable to be cross-plotted with this base variable	
Col. 15-17	Index of the 2nd variable to be cross-plotted with this base variable	
...		
Col. 69-71	Index of the 20th variable to be cross-plotted with this base variable.	

Each Plot Selection Card is independent. The same or different base variables may be specified on additional cards. The maximum number of Plot Selection Cards is 99.

The following table shows the symbol representations used in plotting frequencies.

1	1	21	L
2	2	22	M
3	3	23	N
4	4	24	O
5	5	25	P
6	6	26	Q
7	7	27	R
8	8	28	S
9	9	29	T
10	A	30	U
11	B	31	V
12	C	32	W
13	D	33	X
14	E	34	Y
15	F	35	Z
16	G	36-41	–
17	H	42-47	+ (&)
18	I	48-54	*
19	J	55-62	$
20	K	63+	/

4. COMPUTATIONAL PROCEDURE

Let X_{ij} be the j^{th} variable of the i^{th} case, where $i=1,2,\ldots,n$; $j=1,2,\ldots,p+q$.

For each X_{ij} value which is accepted for inclusion in the computations, the following steps are performed.

Step 1. Sums.

$$\sum_i X_{ij}$$

Step 2. Means.

$$\frac{1}{n} \sum_i X_{ij}$$

Step 3. Cross-product deviations.

$$\sum_i (X_{ij} - X_{.j})(X_{ik} - X_{.k})$$

Step 4. Standard deviations.

$$\sqrt{\sum_i (X_{ij} - X_{.j})^2 / n-1}$$

Step 5. Variance - covariance matrix.

$$\frac{\sum_i (X_{ij} - X_{.j})(X_{ik} - X_{.k})}{n-1}$$

Step 6. Correlation matrix.

$$\frac{\sum_i (X_{ij} - X_{.j})(X_{ik} - X_{.k})}{\sqrt{\sum_i (X_{ij} - X_{.j})^2 \sum (X_{ik} - X_{.k})^2}}$$

```
PROBLMTEST010040011302600461                                00430 1
TRNGEN00511001000002
TRNGEN00611003000004
TRNGEN00711001000003
TRNGEN00811002000004
(V(001)NE50.000)AN(V(002)NE50.000)**
(12X,4(3X,F2.0))
111001          00350102500465102050
111023          01050072501074908150
111096          10250075500595003850
112011          05150050500705001251
111034          04650052490665004149
112092          09951101500325104650
112036          10351040500515206150
111090          01851038500255206350
112099          04552034500125307850
112019          10852100500035310551
111038          01152033500835209851
111027          02452053500065304250
111029          09853001500165305051
111046          01650073510965201851
112002          00250029510745011050
111053          00950003510865003752
111009          07849076500274808750
111087          05848037500534702948
112062          10746060500614604050
111021          07159111571066009758
111095          00759108570335904759
111083          07458002571095909658
111081          04056104570205806458
112056          00559094560676007658
112035          09858079560895702456
112038          07058067560935900458
112048          07958058560875903459
112106          02556009550365603057
111028          03254016560485908253
112042          02959018550455804857
112004          03857035550755804456
111056          01956004550195807054
112008          10556081550795804557
112070          03656093551135900657
112072          06156087550435703555
112074          00156113550445806755
111013          06255022550345508656
111068          03955062550095903257
111036          01454103550145701656
112012          03154059550715601356
112096          03354031550695802259
111004          06553041550985410253
112058          00657065541035607554
112052          10656057540905809156
112075          00856068540295505852
111025          01254092540765505553
111052          07654055540855401554
111085          01354107541085405755
111010          04853036541015310153
111055          09253086540565400355
111077          08453030540635409054
111086          03452028540285310653
111089          09452066540585309951
112091          05454084531055500154
111014          10053021530925207850
111057          04453006530085406552
112007          03753026530135408853
112013          02353083530775301755
111032          04152051530215402655
111062          09652025530555211350
112006          09652019530305608452
112023          06051109531115202755
111018          00456035520915701954
111078          02656105521025400953
111079          07756044520265600553
112014          07356095520785506654
111064          07255024520025902153
112082          06454054520625511253
112093          02054074521045401153
111042          08053080520955307353
111033          06653043520655309252
```

The four variables are in Cols. 16, 17; Cols. 21, 22; Cols. 26, 27; Cols. 31, 32.

The first 19 cases will be excluded from computation since $X_1 \neq 50$ and $X_2 \neq 50$.

Problem Card

Test 01
4 original variables
113 cases
2 Plot Selection Cards
4 variables, q, added after transgeneration
1 card for Boolean expression, case selection to occur after transgeneration
4 Transgeneration Cards
Data input from cards
1 Variable Format Card

Transgeneration Cards

Variable 1 + variable 2 = variable 5
Variable 3 + variable 4 = variable 6
Variable 1 + variable 3 = variable 7
Variable 2 + variable 4 = variable 8

Case Selection Card

Variable 1 not equal to 50 and variable 2 not equal to 50

Plot Selection Cards

Cross-plot variable 5 (X-axis) with variable 6
Cross-plot variable 7 (X-axis) with variable 8

```
112028          02153005520005400352
112049          05953085520045408052
111075          08352091520175307752
112043          11252110520315204950
112100          06752089520055307952
112022          07554064511105702551
111084          04753098510015302352
112061          08553042510395200850
111045          06852007510985208151
111069          02152012510995205452
111074          04952090511005305352
112047          11352086510235203651
112065          09552027510245206051
112077          03552045510725411152
112088          02852014510415206251
111008          05051008510475010350
111076          09351017510575105950
112016          04351048510805205651
112050          06351069510425006852
111039          04245047470104507449
112032          02746071450814601445
112027          11146070460494603047
111019          05646106480184509547
111073          05347112460384710745
112053          08247049471124710448
111024          05747063480354704348
112060          10149010460684708948
111048          08748023470924810847
112029          05548077480224710048
112039          10948013490044803149
111047          06949020460114800246
112084          08949032470974807247
111058          09149046480404806948
112095          03049061480374810948
111012          09749096490644903357
111035          11049056450524900750
111045          10449011490844808549
112086          05249078490734907150
112017          01553099470605205247
111030          01751015460075109345
111037          09051095480155209447
111061          02251082480544901049
PLOTSL00501006
PLOTSL00701008
FINISH
```

```
BMD02R CORRELATION WITH TRANSGENERATION - REVISED JANUARY 29, 1970
HEALTH SCIENCES COMPUTING FACILITY,UCLA

PROBLEM CODE TEST01
NUMBER OF VARIABLES    4
NUMBER OF CASES    113
```

TRANS GENERATOR CARD(S)

CARD NO.	NEW VARIABLE	TRANS CODE	ORIG. VAR(A)	ORIG. VAR(B) OR CONSTANT
1	5	11	1	2.0000
2	6	11	3	4.0000
3	7	11	1	3.0000
4	8	11	2	4.0000

CASE SELECTION CARDS

```
A CASE IS ACCEPTED IF
(VAR(  1) NE 50.000) AN
(VAR(  2) NE 50.000) **
VARIABLE FORMAT CARD(S)
(12X,4(3X,F2.0))
```

REMAINING SAMPLE SIZE=   94

SUMS

4960.0000	4883.0000	5006.0000	4924.0000	9843.0000	9930.0000	9966.0000	9807.0000

MEANS

52.7659	51.9468	53.2553	52.3830	104.7128	105.6383	106.0213	104.3298

CROSS PRODUCT DEVIATIONS

ROW	COL. 1	COL. 2	COL. 3	COL. 4	COL. 5	COL. 6	COL. 7	COL. 8
1	1004.8430	817.8230	1123.6082	889.4177	1822.6677	2013.0293	2128.4536	1707.2446
2	817.8230	890.7278	997.2690	918.9075	1798.5527	1916.1794	1815.0947	1809.6379
3	1123.6082	997.2690	1401.8623	1075.7985	2120.8904	2477.6663	2525.4749	2073.0715
4	889.4177	918.9075	1075.7986	1166.2019	1808.3269	2242.0059	1965.2197	2085.1125
5	1822.6677	1708.5527	2120.8804	1808.3269	3531.2275	3929.2170	3943.5571	3516.8879
6	2013.0293	1916.1794	2477.6663	2242.0059	3929.2170	4719.6680	4490.6836	4158.1914
7	2128.4536	1815.0947	2525.4749	1965.2197	3943.5571	4490.6836	4653.9297	3780.3237
8	1707.2446	1809.6379	2073.0715	2085.1125	3516.8879	4158.1914	3780.3237	3894.7610

STANDARD DEVIATIONS

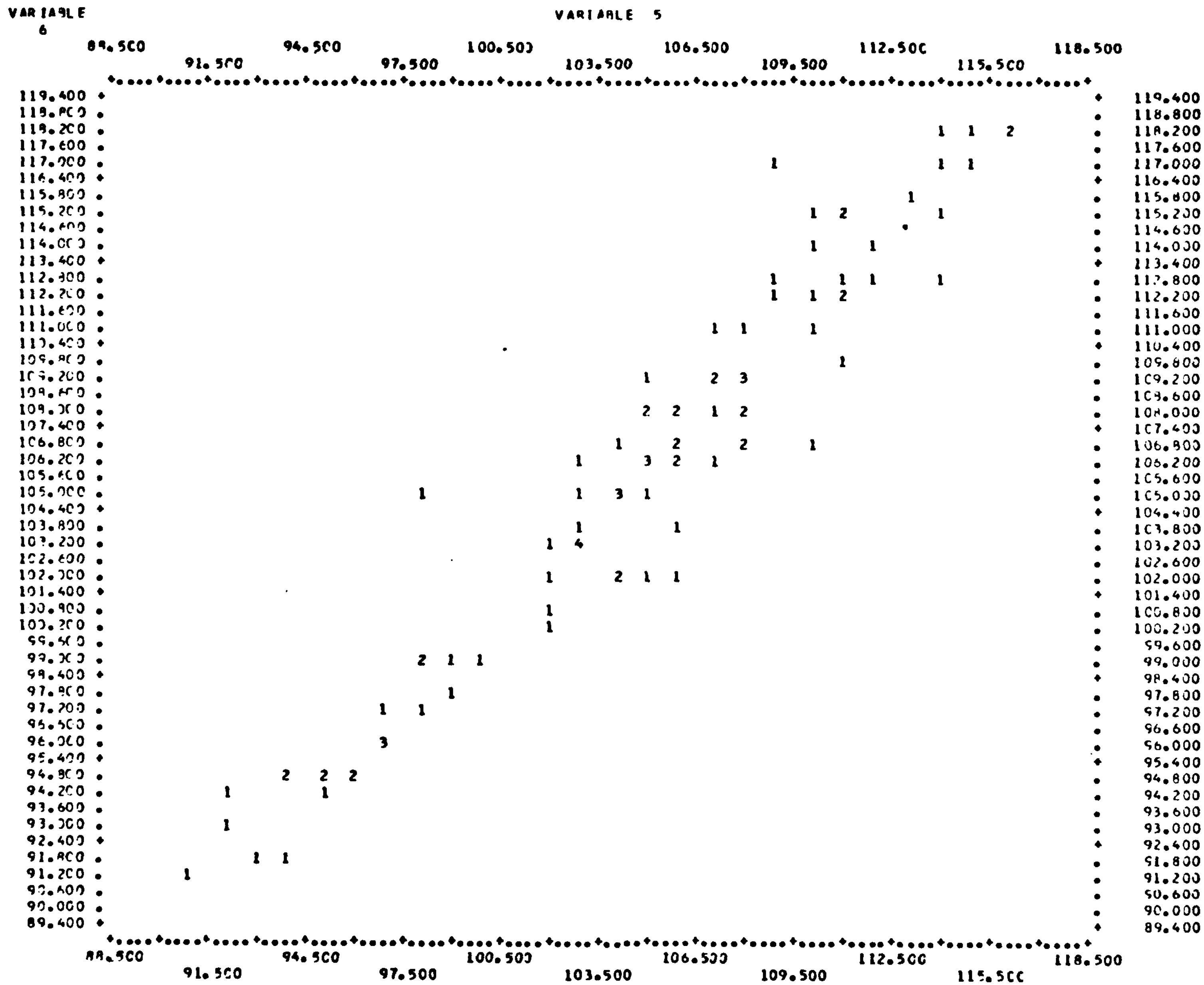
3.2871	3.0948	3.8825	3.5412	6.1620	7.1238	7.0741	6.4714

VARIANCE-COVARIANCE MATRIX

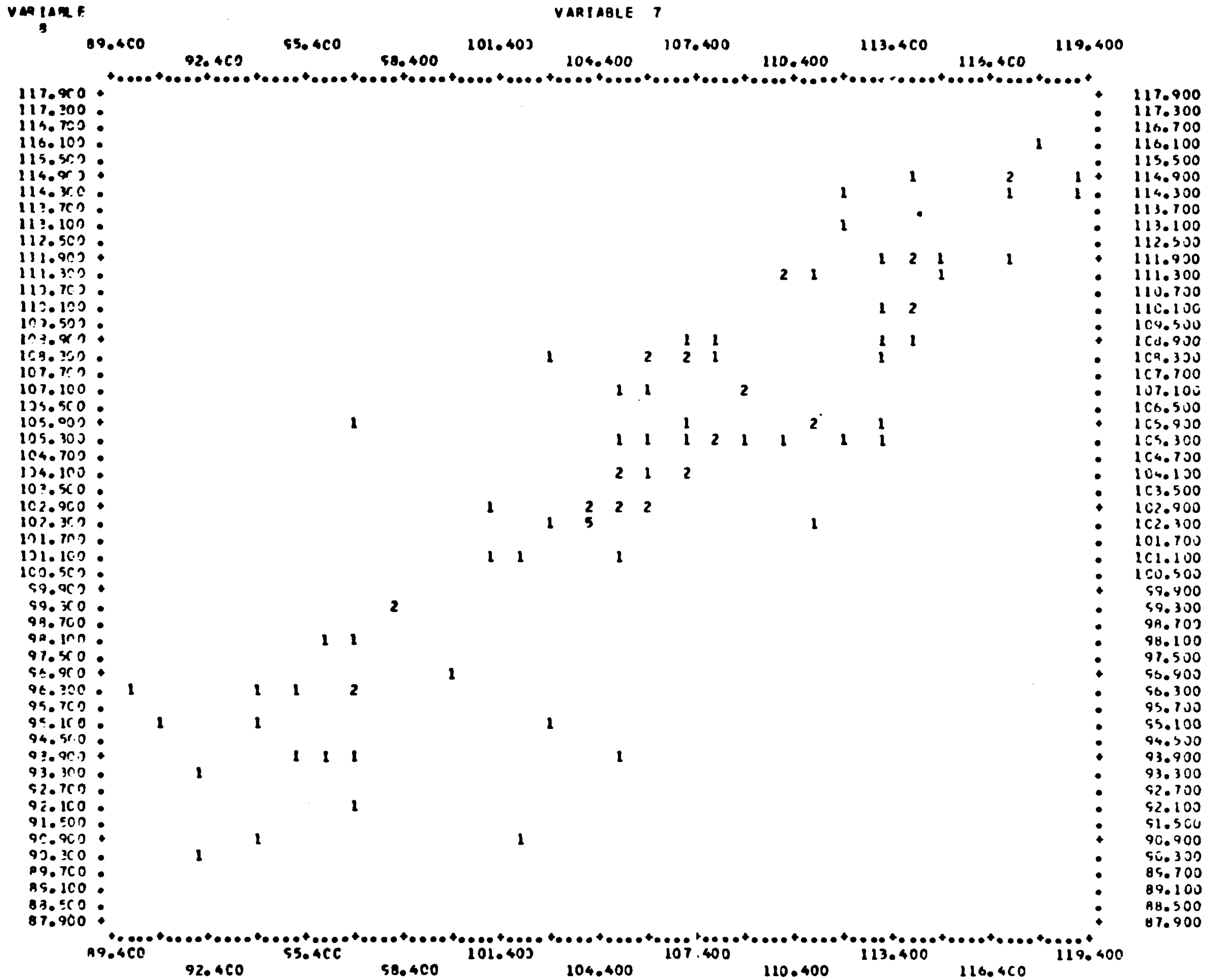
ROW	COL. 1	COL. 2	COL. 3	COL. 4	COL. 5	COL. 6	COL. 7	COL. 8
1	10.8048	8.7938	12.0818	9.5635	19.5986	21.6455	22.8866	18.3575
2	8.7938	9.5777	10.7233	9.8807	18.3715	20.6041	19.5171	19.4585
3	12.0818	10.7233	15.0738	11.5677	22.8052	26.6416	27.1556	22.2911
4	9.5636	9.8807	11.5677	12.5398	19.4444	24.1076	21.1314	22.4206
5	19.5986	18.3715	22.8052	19.4444	37.9702	42.2496	42.4038	37.8160
6	21.6455	20.6041	26.6416	24.1075	42.2496	50.7491	48.2869	44.7117
7	22.8866	19.5171	27.1556	21.1314	42.4038	48.2869	50.0423	40.6486
8	18.3575	19.4585	22.2911	22.4206	37.8160	44.7117	40.6486	41.8792

CORRELATION MATRIX

ROW	COL. 1	COL. 2	COL. 3	COL. 4	COL. 5	COL. 6	COL. 7	COL. 8
1	1.0000	0.8644	0.9467	0.8216	0.9676	0.9244	0.9842	0.8630
2	0.8644	1.0000	0.8925	0.9016	0.9636	0.9346	0.8515	0.9716
3	0.9467	0.8925	1.0000	0.8414	0.9532	0.9632	0.9887	0.8872
4	0.8216	0.9016	0.8414	1.0000	0.8911	0.9556	0.8436	0.9784
5	0.9676	0.9636	0.9532	0.8911	1.0000	0.9625	0.9728	0.9483
6	0.9244	0.9346	0.9632	0.9556	0.9625	1.0000	0.9582	0.9699
7	0.9842	0.8915	0.9887	0.8435	0.9728	0.9582	1.0000	0.8879
8	0.8630	0.9716	0.8872	0.9784	0.9483	0.9699	0.8879	1.0000



VARIABLE 6
VARIABLE 5
88.500 91.500 94.500 97.500 100.500 103.500 106.500 109.500 112.500 115.500 118.500
119.400 118.800 118.200 117.600 117.000 116.400 115.800 115.200 114.600 114.000 113.400 112.800 112.200 111.600 111.000 110.400 109.800 109.200 108.600 108.000 107.400 106.800 106.200 105.600 105.000 104.400 103.800 103.200 102.600 102.000 101.400 100.800 100.200 99.600 99.000 98.400 97.800 97.200 96.600 96.000 95.400 94.800 94.200 93.600 93.000 92.400 91.800 91.200 90.600 90.000 89.400


VARIABLE 8
VARIABLE 7
89.400
92.400
95.400
98.400
101.400
104.400
107.400
110.400
113.400
116.400
119.400
117.900
117.300
116.700
116.100
115.500
114.900
114.300
113.700
113.100
112.500
111.900
111.300
110.700
110.100
109.500
108.900
108.300
107.700
107.100
106.500
105.900
105.300
104.700
104.100
103.500
102.900
102.300
101.700
101.100
100.500
99.900
99.300
98.700
98.100
97.500
96.900
96.300
95.700
95.100
94.500
93.900
93.300
92.700
92.100
91.500
90.900
90.300
89.700
89.100
88.500
87.900

BMD05D
GENERAL PLOT INCLUDING HISTOGRAM

1. GENERAL DESCRIPTION

a. This program provides a method by which graphs and histograms can be produced.

b. Output for this program includes:

(1) GRAPHS. Two methods of plotting are available:

(a) The first method gives a one-page graph which has 50 units vertically and 100 units horizontally. The points are automatically scaled to conform to these dimensions, and a scale is printed both horizontally and vertically. The points (data cards) need be in no special order.

(b) The second method gives a multiple-page graph with as many units vertically as there are values of the base variable. The values of the base variable (data cards) must be ordered and consecutive. The base variable is not scaled. The cross variables are scaled by the computer to conform to a horizontal dimension of 100 units.

(2) HISTOGRAMS

A one-page histogram can be produced, with a maximum of 34 intervals. The width of the interval may be specified; however, if the interval is not specified or if the specified width would result in more than 34 intervals, the program will print comments to this effect and will compute a new width which will give exactly 34 intervals. Scales are printed on the vertical and horizontal axes.

c. Limitations per problem:

(1) p, number of original variables ($1 \leq p \leq 500$)
(2) n, number of cases ($2 \leq n \leq 20000$)
(3) q, number of variables added to the original set after transgeneration ($-499 \leq q \leq 499$)

(4) p+q, total number of variables $(1 \leq p+q \leq 500)$
(5) (p+q)n, total number of data $(2 \leq (p+q)n \leq 20000)$
(6) m, number of Transgeneration Cards $(0 \leq m \leq 999)$
(7) k, number of Variable Format Cards $(1 \leq k \leq 10)$

d. Estimation of running time and output pages per problem:

Number of seconds = 20 + 10 per 60 graphs or histograms (for IBM 7094)

Number of pages (page plot) = 5 + 1 per graph or histogram

Number of pages (multiple-page graphs) = 5 + 1 per 60 points per graph

e. This program allows transgeneration. Codes 01, 02, ..., 14 of the transgeneration list may be used.

2. ORDER OF CARDS IN JOB DECK

Cards indicated by letters enclosed in parentheses are optional. All other cards must be included in the order shown.

a. System Cards [Introduction, IV]

b. Problem Card

c. F-type Variable Format Card(s) [Introduction, III-C]

d. DATA INPUT Cards [Introduction, II]
(Place data input deck here if data input is from cards.)

(e.) Standard Transgeneration Card(s) [Introduction, III-B]

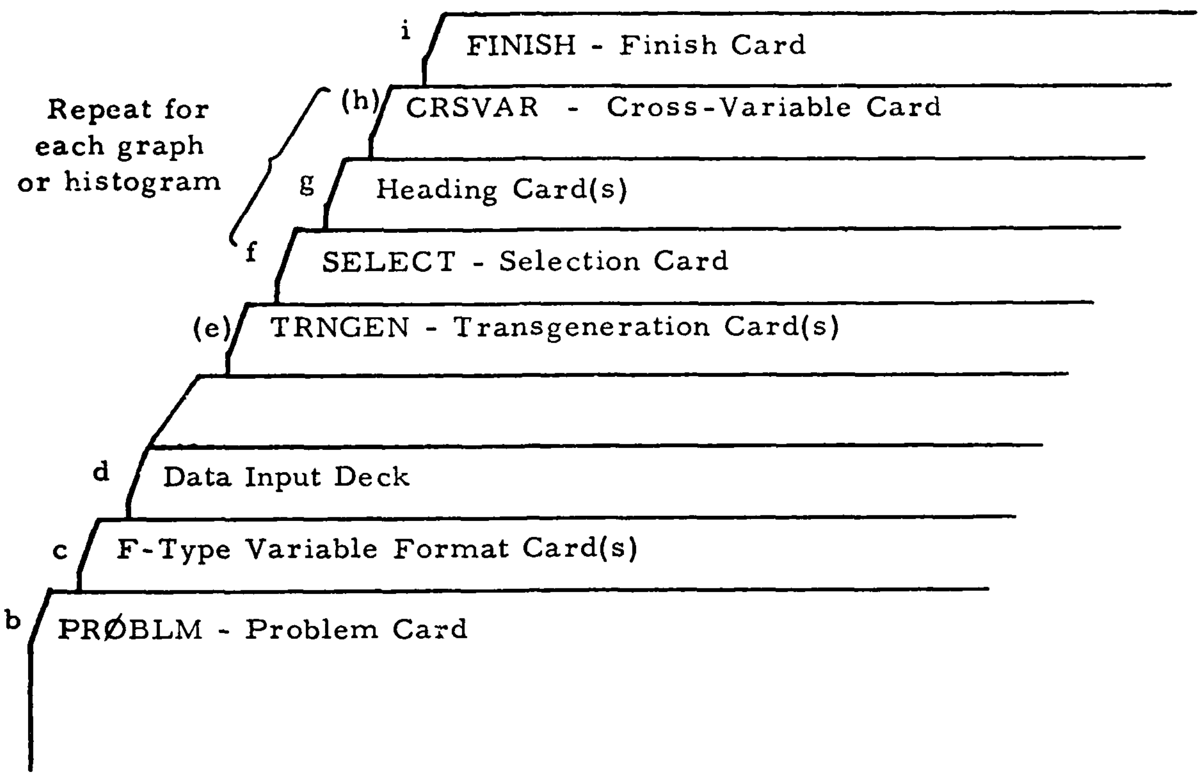
f. Selection Card
g. Heading Card(s)
(h.) Cross-Variable Card

Repeat for each graph or histogram (f. through (h.))

...
Repeat b. through (h.) as desired
...

i. Finish Card [Introduction, III]

Deck Set-up:



3. CARD PREPARATION (SPECIFIC FOR THIS PROGRAM)

Preparation of the cards listed below is specific for this program. All other cards listed in the preceding section are prepared according to instructions in the Introduction.

b. Problem Card (One Problem Card for each problem)

Col. 1-6	PRØBLM	(Mandatory)
Col. 7-12	Alphanumeric job code	
Col. 13-15	Number of original variables ($1 \leq p \leq 500$)	
Col. 16-20	Number of cases ($2 \leq n \leq 20000$)	
Col. 21-23	Number of Selection Cards	
Col. 24-27	Number of variables added to original set after transgeneration ($-499 \leq q \leq 499$) Note: ($2 \leq (p+q)n \leq 20000$)	
Col. 28-63	Blank	

Col. 64,65	NO	If input tape is not to be rewound
Col. 66-68	Number of Transgeneration Cards ($0 \leq m \leq 999$)	
Col. 69,70	T	If data input is from logical tape T ($T \neq 6$)
Col. 71,72	Number of Variable Format Cards ($1 \leq k \leq 10$)	

f. Selection Card

A Selection Card has seven purposes:

(1) To indicate whether a list of the data input is desired.
(2) To indicate whether a graph or a histogram is to be produced.
(3) To indicate the base variable of the graph or histogram.
(4) To indicate the number of lines of heading desired for each graph or histogram.
(5) To indicate for graphs how many variables are to be plotted against the base variable. (≤ 14)
(6) To indicate for graphs the choice of the type of graph.
(7) To indicate for histograms the width of an interval.

If the Selection Card specifies that a graph is to be printed, the Heading Card is followed by a Cross-Variable Card which indicates the cross variables to be plotted against the base variable and the symbols used for each cross variable.

Col. 1-6 SELECT (Mandatory)

Col. 7 Number of lines in a heading. Each Heading Card specifies one line of printed output. The maximum number of lines allowed in the heading is two. (See card g.)

Col. 8 Listing of the input data.

0 If the listing of input data is not desired.
1 If the listing of input data is desired.

Col. 9,10 Number of cross variables to appear on this graph (maximum is 14).

00 If a histogram is desired.

Col. 11-13 Index of the base variable. On graphs, the base variable will appear on the vertical axis. On histograms, the base variable will appear on the horizontal axis.

Col. 14-24 Form of the graph or width of interval if a histogram.

Col. 14, 15 01 If a one-page graph is desired.
-1 If a multiple-page graph is desired, or

Col. 14-24 Width of the interval for a histogram (punch the decimal point). If too small, but > 0 (Range)/34 will be used.

Col. 25-72 Blank

g. Heading Card(s)

Col. 1-72 Punch the desired heading. Each card is a line of the heading. There must be at least one Heading Card, but no more than two, per graph or histogram.

(h.) Cross-Variable Card

The Cross-Variable Card is punched as follows (for graphs only, not histograms). The cross variables specified to be crossed with one base variable will appear on one graph; the cross variables will appear on the horizontal axis.

Col. 1-6 CRSVAR (Mandatory)

Col. 7-9 Index of the 1st cross variable

Col. 10 Symbol for the 1st cross variable (see below)

Col. 11-15 Ignored

Col. 16-18 Index of the 2nd cross variable

Col. 19 Symbol for the 2nd cross variable

Col. 20-24 Ignored

...

Col. 61-63 Index of the 7th cross variable

Col. 64 Symbol for the 7th cross variable

Col. 65-69 Ignored

The symbols to be used for each cross variable must be specified. Allowable symbols are:

1 . , - J K L M N O P Q R S T U V W X Y Z *) (= $ ' +

The following symbols may not be used because they have been used to represent ties (more than one point occurring at the same coordinates):

Symbol	No. of Points	Symbol	No. of Points	Symbol	No. of Points
2	2	8	8	E	14
3	3	9	9	F	15
4	4	A	10	G	16
5	5	B	11	H	17
6	6	C	12	I	18
7	7	D	13	/	more than 18

If there are more than seven cross variables, continue punching a second card in the same manner.

Col. 1-6	CRSVAR	(Mandatory)
Col. 7-9	Index for the 8th cross variable	
Col. 10	Symbol for the 8th cross variable	
Col. 11-15	Ignored	
...	...	
Col. 61-63	Index for the 14th cross variable	
Col. 64	Symbol for the 14th cross variable	
Col. 65-69	Ignored	

The maximum number of cross variables for a specified base variable is fourteen.

REFERENCE

Dixon, W. J., and Massey, F., Introduction to Statistical Analysis, Third Edition, McGraw Hill, 1969, p. 6.

```
PROBLMTEST01001004C4001
(F4.0)
10.5
10.5
10.5
10.5
7.5
15.5
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13.5
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27.5
27.5
26.5
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.5
SELECT11C0C01        1.0
         TEST FOR BMD05D          ONE PAGE HISTOGRAM
```

1

Problem Card

Problem Test 01
1 original variable, p
404 cases, n
1 Selection Card
1 Variable Format Card

Selection Card

1 heading line will be specified.
Listing of data desired.
Histogram desired for variable 1 with interval width of 1.0

Heading Card

"Test for BMD05D One Page Histogram" will appear as the heading for the histogram.

```
PROBLMTEST020030028001
(F4.0, 1X, F5.0,1X,F5.0)
  17 2.125 5.375
  32 2.375 5.125
  60 2.625 4.875
 119 2.875 4.625
 190 3.125 4.375
 299 3.375 4.125
 448 3.625 3.875
 637 3.875 3.625
 852 4.125 3.375
1086 4.375 3.125
1316 4.625 2.875
1520 4.875 2.625
1668 5.125 2.375
1749 5.375 2.125
1749 5.625 8.875
1668 5.875 8.625
1520 6.125 8.375
1316 6.375 8.125
1086 6.625 7.875
 852 6.875 7.625
 637 7.125 7.375
 448 7.375 7.125
 299 7.625 6.875
 190 7.875 6.625
 119 8.125 6.375
  60 8.375 6.125
  32 8.625 5.875
  17 8.875 5.625
SELECT110200101
TEST FOR BMD05D      ONE PAGE GRAPH
CRSVAR002*00000003Q00000
FINISH
```

Problem Card

Problem Test 02
3 original variables, p
28 cases, n
1 Selection Card
1 Variable Format Card (1 in col. 72 is not shown)

Selection Card

1 heading line will be specified.
Listing of data desired.
2 cross variables to appear on the graph.
Variable 1 is the base variable and it will appear on the vertical axis.
One-page graph desired.

Heading Card

"Test for BMD05D One Page Graph" will appear as the heading for the graph.

Cross-Variable Card

Variable 2 (symbol *) and variable 3 (symbol Q) will be the cross variables.

BMD05D GENERAL PLOT - INCLUDING HISTOGRAM - REVISED JANUARY 30, 1970
HEALTH SCIENCES COMPUTING FACILITY, UCLA

PROBLEM CODE . . . TESTC1
NO. OF VARIABLES . . . 1
NO. OF CASES 404
NO. OF SELECTION CARDS 1
NO.OF VARIABLES ADDED . 0
NO. OF TRNGEN CARDS .. 0
NO. OF FORMAT CARDS .. 1
REWIND INPUT TAPE .... YES

VARIABLE FORMAT CARD(S)
(F4.0)

BMD05D GENERAL PLOT - INCLUDING HISTOGRAM - REVISED JANUARY 30, 1970
HEALTH SCIENCES COMPUTING FACILITY, UCLA

HISTOGRAM OF VARIABLE 1

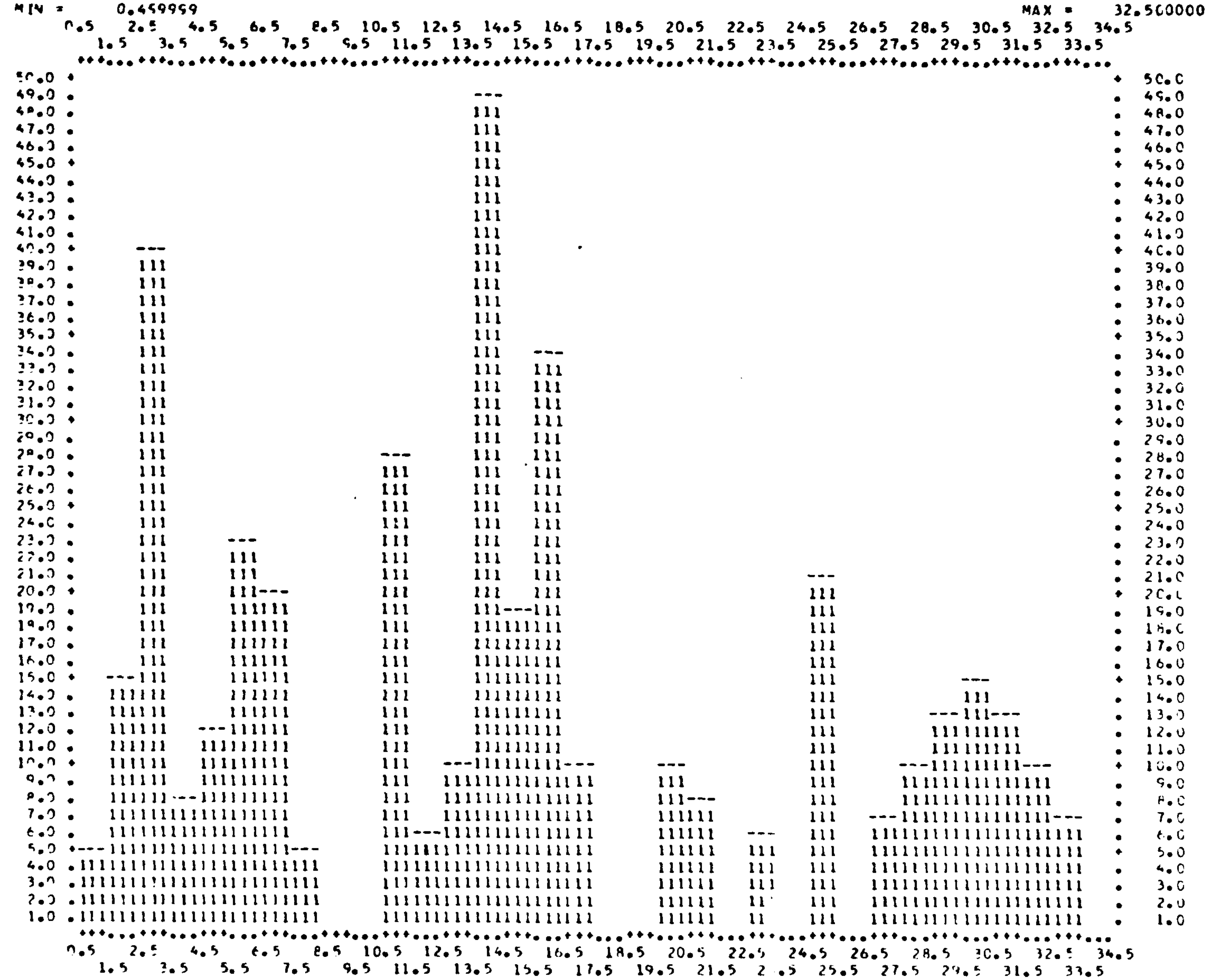
10.5000	10.5000	10.5000	10.5000	7.5000	15.5000	15.5000	15.5000	15.5000	15.5000
15.5000	15.5000	15.5000	15.5000	15.5000	15.5000	15.5000	15.5000	15.5000	15.5000
15.5000	15.5000	15.5000	15.5000	15.5000	15.5000	15.5000	15.5000	15.5000	15.5000
15.5000	15.5000	15.5000	15.5000	15.5000	15.5000	5.5000	5.5000	5.5000	5.5000
5.5000	5.5000	5.5000	5.5000	5.5000	5.5000	5.5000	5.5000	5.5000	5.5000
5.5000	5.5000	5.5000	5.5000	5.5000	5.5000	5.5000	5.5000	5.5000	19.5000
19.5000	19.5000	19.5000	19.5000	19.5000	19.5000	19.5000	19.5000	19.5000	14.5000
14.5000	14.5000	14.5000	14.5000	14.5000	14.5000	14.5000	14.5000	14.5000	14.5000
14.5000	14.5000	14.5000	14.5000	14.5000	14.5000	14.5000	14.5000	4.5000	4.5000
4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000	4.5000
16.5000	15.5000	16.5000	16.5000	16.5000	16.5000	16.5000	16.5000	16.5000	16.5000
6.5000	6.5000	6.5000	6.5000	6.5000	6.5000	6.5000	6.5000	6.5000	6.5000
6.5000	6.5000	6.5000	6.5000	6.5000	6.5000	6.5000	6.5000	6.5000	6.5000
12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000	12.5000
2.5000	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
2.5000	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
2.5000	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000	2.5000
2.5000	2.5000	2.5000	2.5000	2.5000	2.5000	13.5000	13.5000	13.5000	13.5000
13.5000	13.5000	13.5000	13.5000	13.5000	13.5000	13.5000	13.5000	13.5000	13.5000
13.5000	13.5000	13.5000	13.5000	13.5000	13.5000	13.5000	13.5000	13.5000	13.5000
13.5000	13.5000	13.5000	13.5000	13.5000	13.5000	13.5000	13.5000	13.5000	13.5000
13.5000	13.5000	13.5000	13.5000	13.5000	13.5000	13.5000	13.5000	13.5000	13.5000
13.5000	13.5000	13.5000	3.5000	3.5000	3.5000	3.5000	3.5000	3.5000	3.5000
3.5000	11.5000	11.5000	11.5000	11.5000	11.5000	11.5000	30.5000	30.5000	30.5000
30.5000	30.5000	30.5000	30.5000	30.5000	30.5000	30.5000	30.5000	30.5000	30.5000
31.5000	31.5000	31.5000	31.5000	31.5000	31.5000	31.5000	31.5000	31.5000	31.5000
32.5000	22.5000	32.5000	32.5000	32.5000	32.5000	32.5000	20.5000	20.5000	20.5000
20.5000	20.5000	20.5000	20.5000	20.5000	22.5000	22.5000	22.5000	22.5000	22.5000
22.5000	24.5000	24.5000	24.5000	24.5000	24.5000	24.5000	24.5000	24.5000	24.5000
24.5000	24.5000	24.5000	24.5000	24.5000	24.5000	24.5000	24.5000	24.5000	24.5000
24.5000	24.5000	26.5000	26.5000	27.5000	27.5000	27.5000	27.5000	27.5000	27.5000
27.5000	27.5000	28.5000	28.5000	28.5000	28.5000	28.5000	28.5000	28.5000	28.5000
28.5000	28.5000	28.5000	28.5000	28.5000	29.5000	29.5000	29.5000	29.5000	29.5000
29.5000	29.5000	29.5000	29.5000	29.5000	29.5000	29.5000	29.5000	29.5000	29.5000
1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000	1.5000
1.5000	1.5000	1.5000	1.5000	1.5000	10.5000	10.5000	10.5000	10.5000	10.5000
10.5000	10.5000	10.5000	10.5000	10.5000	10.5000	10.5000	10.5000	10.5000	10.5000
10.5000	10.5000	10.5000	10.5000	10.5000	10.5000	10.5000	10.5000	10.5000	15.5000
7.5000	7.5000	7.5000	7.5000	15.5000	15.5000	2.5000	2.5000	2.5000	2.5000
13.5000	13.5000	27.5000	27.5000	26.5000	26.5000	26.5000	26.5000	26.5000	0.5000
0.5000	0.5000	0.5000	0.5000						

BMD05D GENERAL PLOT - INCLUDING HISTOGRAM - REVISED JANUARY 30, 1970
HEALTH SCIENCES COMPUTING FACILITY, UCLA

TEST FOR BMD05D ONE PAGE HISTOGRAM

HISTOGRAM OF VARIABLE 1

MIN = 0.459999 MAX = 32.500000



```
BMD05D GENERAL PLOT - INCLUDING HISTOGRAM - REVISED JANUARY 30, 1970
HEALTH SCIENCES COMPUTING FACILITY, UCLA

PROBLEM CODE . . .  TESTC2
NO. OF VARIABLES . . .    3
NO. OF CASES . . . .     28
NO. OF SELECTION CARDS    1
NO.OF VARIABLES ADDED .   0
NO. OF TRNGEN CARDS ..    0
NO. OF FORMAT CARDS ..    1
REWIND INPUT TAPE .... YES

 VARIABLE FORMAT CARD(S)
(F4.0, 1X, F5.0,1X,F5.0)
```

```
BMD05D GENERAL PLOT - INCLUDING HISTOGRAM - REVISED JANUARY 30, 1970
HEALTH SCIENCES COMPUTING FACILITY, UCLA
```

BASE VARIABLE 1	2	3	CROSS VARIABLES
17.0000	2.1250	5.3750	
32.0000	2.3750	5.1250	
60.0000	2.6250	4.8750	
119.0000	2.8750	4.6250	
190.0000	3.1250	4.3750	
259.0000	3.3750	4.1250	
448.0000	3.6250	3.8750	
637.0000	3.8750	3.6250	
852.0000	4.1250	3.3750	
1086.0000	4.3750	3.1250	
1316.0000	4.6250	2.8750	
1520.0000	4.8750	2.6250	
1668.0000	5.1250	2.3750	
1749.0000	5.3750	2.1250	
1749.0000	5.6250	8.8750	
1668.0000	5.8750	8.6250	
1520.0000	6.1250	8.3750	
1316.0000	6.3750	8.1250	
1086.0000	6.6250	7.8750	
852.0000	6.8750	7.6250	
637.0000	7.1250	7.3750	
448.0000	7.3750	7.1250	
259.0000	7.6250	6.8750	
190.0000	7.8750	6.6250	
119.0000	8.1250	6.3750	
60.0000	8.3750	6.1250	
32.0000	8.6250	5.8750	
17.0000	8.8750	5.6250	

BMD13D
t PROGRAM

1. GENERAL DESCRIPTION

a. This program computes t-statistics and associated probability levels for the equality of the means of two groups based on pooled and separate variance estimates. An F-statistic and associated probability level for the equality of group variances is also computed. Groups are defined by means of a cut point for a category variable. Several dependent variables may be analyzed concurrently. Each problem may contain from one to twenty subproblems. Each subproblem is defined through Boolean selection of cases. Transgenerations are available and data specified as "missing" will be deleted for that variable. Paired comparison t-ratios may be obtained through transgeneration.

b. Output from this program includes:

(1) F-ratio of variance
(2) t-value (based on pooled variance estimate)
(3) t-value (based on separate variance estimate)
(4) Two-tailed probability levels for each t and for the F
(5) Means
(6) Standard deviations
(7) Standard error of the means
(8) Number of observations included in computation of 5-7 above
(9) Optional output of data input

c. Limitations per problem

(1) p, number of original variables ($1 \leq p \leq 199$)
(Note: only variables 1-100 can be analyzed; the remaining variables are available for transgeneration.)
(2) n, number of cases ($1 \leq n \leq 32000$)
(3) q, number of variables added to the original set after transgeneration ($-198 \leq q \leq 99$)
(4) p+q, total number of variables output ($1 \leq p+q \leq 100$)
(5) m, number of Transgeneration Cards ($0 \leq m \leq 100$)
(6) D, number of Missing Value Cards ($0 \leq D \leq 100$)
(7) S, number of subproblems ($1 \leq S \leq 20$)
(8) b, number of Case Selection Cards per subproblem ($1 \leq b \leq 2$)
(9) K, number of Variable Format Cards ($1 \leq K \leq 10$)
(10) t, alternate input tape cannot be equal to 1

d. Estimation of running time and output pages per problem:

Number of seconds = $2 + \frac{1}{10}(p+q)S$ (for IBM 7094)

(Add $(\frac{1}{6}(p+q)S)$ if YES in Col. 39-41 of Problem Card)

Number of pages = $4 + \frac{1}{8}(p+q)S$

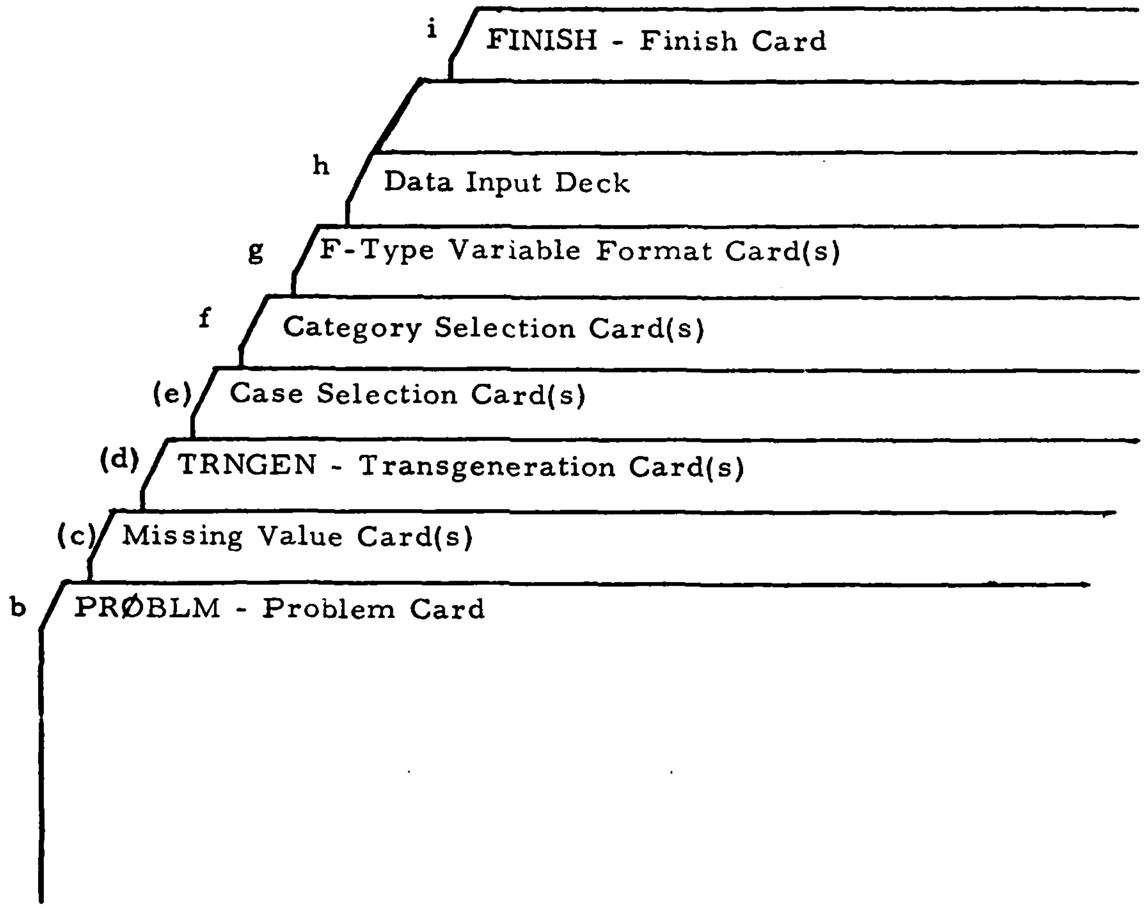
e. The program allows standard transgeneration. Codes 1-5, 7-17, 20-24, 40, and 41 of the transgeneration list may be used. Variabl transgenerated from variables with missing values will be consider missing.

2. ORDER OF CARDS IN DECK

Cards indicated by letters enclosed in parentheses are optional. All other cards must be included in the order shown.

a.	System Cards	[Introduction, IV]
b.	Problem Card	
(c.)	Missing Value Card(s)	
(d.)	Standard Transgeneration Card(s)	[Introduction, III-B]
(e.)	Case Selection Card(s)	
f.	Category Selection Card(s)	
g.	Variable Format Card(s)	[Introduction, II-C]
h.	DATA INPUT Cards if data are on cards (Place data input deck here if data input is from cards)	[Introduction, II]
	. . .	
	Repeat b. through h. as desired	
	. . .	
i.	Finish Card	[Introduction, III]

Deck Set-up:



3. CARD PREPARATION

Preparation of the cards listed below is specific for this program. All other cards listed in the preceding section are prepared according to instructions in the Introduction

b. Problem Card

Col.	1-6	PRØBLM
	7-12	Alphanumeric problem code
	13-17	Number of cases ($1 \leq n \leq 32000$)
	18-20	Number of original variables ($1 \leq p \leq 199$) (Note: only variables 1-100 can be analyzed; the remaining variables are available for transgeneration.
	21-23	Number of Transgeneration Cards ($0 \leq m \leq 100$)
	24-27	Number of variables added to or subtracted from the original set by transgeneration ($-198 \leq q \leq 99$)
	28-30	Number of Missing Value Cards ($0 \leq D \leq 100$)
	31-33	Number of subproblems ($1 \leq S \leq 20$) (This option must be used if the data are to be divided into one or more subsamples. If these columns are left blank, the program will assume that there is only one subproblem and that all of the cases are to be included in that subproblem.)
	34-36	Tape for data output (must not be 5 or 6)
	37, 38	Number of cards per case (If a tape number (Col. 34-36) and the number of card per case (Col. 37, 38) are specified, the program will copy the input data on the specified logical tape. Since the data is copied as card images, successive problems may read the data from this tape with different variable formats.)
	39-41	YES if probabilities are to be computed
	69, 70	00 data input from cards
		T data input from logical tape T ($T \neq 1, 6$)
	71, 72	Number of Variable Format Cards ($1 \leq K \leq 10$)

(c.) Missing Value Card(s)

Col.	1-4	Variable index (codes apply only to this variable)
		00 if same codes apply to all variables. In this case, only one Missing Value Card is prepared.
	5-8	Number of missing value codes ($1 \leq C \leq 10$)
	9-14	First missing value code
	15-20	Second missing value code
	⋮	
	63-68	Tenth missing value code

(c.) Case Selection Card(s)

Each subproblem is defined by a Boolean selection rule for selecting cases to be analyzed. This rule may be simple (one relationship), e.g., if variable 2 is not equal to variable 100 then accept the case) or may be complex (two through eight relationships, e.g., accept the case for analysis if variable 10 is greater than or equal to 100 and if variable 10 is less than 200). If the rule has more than four relationships, two cards are needed and the first card must contain the first four relationships. The first relationship for each subproblem must begin on a new card and the last operation must be ** to indicate the end of the selection rule for that subproblem.

According to the rule, the entire Boolean expression is either true or false for the case being tested. It is examined from left to right. If an OR is encountered and the expression preceding the OR is true, the case will be included in the subproblem. If the expression preceding the OR is false, the scan begins again with the expression following the OR.

Example: If the Problem Card had specified two subproblems, the two Case Selection Cards could be:

```
(V(002)NEV(100))**
(V(010)GE100.00)AN(V(010)LT200.00)**
```

The first subproblem would perform t-tests using cases which had the value of variable 2 not equal to the value of variable 100. The second subproblem would perform t-tests using cases for which the tenth variable was 100 or greater but less than 200.

One set of Case Selection Cards must be included for each subproblem specified in Col. 31-33 of the Problem Card. If these columns were left blank, do not include any Case Selection Cards.

Col.	1-3	(V(	
	4-6	Variable index for the first relationship	
	7	)	
	8, 9	Relationship	
		GT	(greater than)
		LT	(less than)
		GE	(greater than or equal to)
		LE	(less than or equal to)
		EQ	(equal to)
		NE	(not equal to)

10, 11	V(
12, 14	Variable index of variable to be related to the preceding variable
15	)
or	
10-15	Constant to be related to the preceding variable
16	)
17, 18	Operation

AN (and) The following relationship must also be true in order for the case to be included in this subproblem.

OR The case will be included if either the preceding or a following relationship is true.

** This terminates the set of Boolean relationships for this subproblem.

f. Category Selection Card(s)

Col.	1-3	Variable index of category variable for first subproblem
	4-9	Cut point for first subproblem
	10-12	Variable index of category variable for second subproblem
	13-18	Cut point for second subproblem
	⋮	
	64-66	Variable index of category variable for eighth subproblem
	67-72	Cut point for eighth subproblem

... continue, using three cards if necessary.

The observations for a case not specified as missing are included in the X category if the value of the variable specified on the Category Selection Cards is greater than or equal to the specified value; if the value is less, the case will be included in the Y category. If the category variable is missing, the case will be excluded from subproblems using that categorization.

4. COMPUTATIONAL PROCEDURE

P variables for the first case are read, missing values are replaced by -0 and transgenerations are performed. In transgeneration, if X_i or $X_j = -0$, then $X_k = -0$. If a case meets the specifications for a subproblem, its observations will be included in the calculations for that subproblem. A case may be included in more than one subproblem. Each subproblem is divided into two groups: an X and a Y category.

For each subproblem, the number of non-missing observations, the mean, standard deviation, and standard error are computed for each variable of each category. The t-values, F-value, and corresponding probability level for between category comparison are computed for each variable.

Step 1. $X_{ijk\ell}$, $i = 1, 2, \ldots, n;\ n \leq 32000$
$j = 1, 2, \ldots, (p+q);\ (p+q) \leq 100$
$k = 1, 2;\ 1 = X$ category, $2 = Y$ category
$\ell = 1, 2, \ldots, S;\ S \leq 20$

Step 2. Mean $\bar{X}_{jk\ell} = \frac{1}{n_{jk\ell}} \sum_i X_{ijk\ell}$

$$\text{Variance } s^2_{jk\ell} = \frac{1}{n_{jk\ell} - 1}\left(\sum_i X^2_{ijk\ell} - \frac{(\sum_i X_{ijk\ell})^2}{n_{jk\ell}}\right)$$

$$\text{Standard deviation } s_{jk\ell} = \sqrt{s^2_{jk\ell}}$$

$$\text{Standard error (of mean) } SE_{jk\ell} = \frac{s_{jk\ell}}{\sqrt{n_{jk\ell}}}$$

$$F_{j\ell} = \frac{s^2_{j1\ell}}{s^2_{j2\ell}} \quad \text{if} \quad (s^2_{j1\ell} \geq s^2_{j2\ell})$$

or

$$= \frac{s^2_{j2\ell}}{s^2_{j1\ell}} \quad \text{if} \quad (s^2_{j1\ell} < s^2_{j2\ell})$$

Degrees of freedom based on pooled variance estimate:

$$D_p = \max(n_{j1\ell} - 1, 0) + \max(n_{j2\ell} - 1, 0).$$

t based on pooled variance estimate:

$$t_p = \frac{\bar{X}_{j1\ell} - \bar{X}_{j2\ell}}{\sqrt{\left(\frac{1}{n_{j1\ell}} + \frac{1}{n_{j2\ell}}\right)\left[s^2_{j1\ell}(n_{j1\ell} - 1) + s^2_{j2\ell}(n_{j2\ell} - 1)\right] / D_p}}$$

t based on separate variance estimate:

$$t_s = \frac{\bar{X}_{j1\ell} - \bar{X}_{j2\ell}}{\sqrt{\frac{s^2_{j1\ell}}{n_{j1\ell}} + \frac{s^2_{j2\ell}}{n_{j2\ell}}}}$$

Degrees of freedom based on separate variance estimate:

$$D_s = \frac{1}{\frac{1}{n_{j1\ell} - 1}\left(\frac{(SE_{j1\ell})^2}{(SE_{j1\ell})^2 + (SE_{j2\ell})^2}\right)^2 + \frac{1}{n_{j2\ell} - 1}\left(\frac{(SE_{j2\ell})^2}{(SE_{j1\ell})^2 + (SE_{j2\ell})^2}\right)^2}$$

5. REFERENCE

Bennett, Carl A. and Franklin, Norman L., Statistical Analysis in Chemistry and the Chemical Industry, Wiley, 1954.

This program was written by Daniel Frumkes, a member of the staff of the Health Sciences Computing Facility, UCLA.

```
PROBLM   TEST     8 10 24  24  2  1      YES                    1
   4   3      9     10     11
  10  .2      4      9
TRNGEN 11 1   1
TRNGEN 12 2   1
TRNGEN 13 3   3
TRNGEN 14 4   4
TRNGEN 15 5   5
TRNGEN 16 5   6
TRNGEN 17 7   2
TRNGEN 18 8   2      1
TRNGEN 19 9   2      2
TRNGEN 2010   2      2
TRNGEN 2111   1      2
TRNGEN 2212   1      2
TRNGEN 2313   1      2
TRNGEN 2414   6      5
TRNGEN 2515   2    1.5
TRNGEN 2616   1      4
TRNGEN 2717   6
TRNGEN 2820   7
TRNGEN 2921   7
TRNGEN 3022   8
TRNGEN 3123   1      2
TRNGEN 3224   9      2
TRNGEN 3340   1      2     3     1     4     16
TRNGEN 3441  10      2
(V(002)EQ1.0000)OR(V(002)EQ2.0000)**
  2   1.5  1    5
(10F2.0)
 1 1 5 9 1 1 1 1 1 1
60 2 610 2 2 2 2 2 2 2
30 2 711 3 3 3 3 3 3
10 4 812 4 4 4 4 4 4
20 1 913 5 5 5 5 5 5
40 11014 6 6 6 6 6 6
15 11115 7 7 7 7 7 7
30 21216 8 8 8 8 8 8
FINISH
```

Problem Card

Title: "TEST"

8 cases
10 variables input
24 Transgeneration Cards
24 variables added by transgeneration
2 Missing Value Cards
1 subproblem
data input from cards
probabilities to be computed
1 Variable Format Card

Missing Value Cards

Variable 4, missing values are 9-11.
Variable 10, missing values are 4, 9.

Transgeneration Cards

Transgeneration codes available 1-17, 20-24, 40-41.

Subproblem Card

If Var. 2 = 1 or = 2, include the the case; omit otherwise.

Category Selection Card

Category X contains all cases such that Var. 2 $\geq$ 1.5.
Category Y contains all other cases.

Variable Format Card

F-type format, specifies each of 10 variables read in 2-column fields.

```
BMD13D - T PROGRAM - REVISED OCTOBER 1, 1972
HEALTH SCIENCES COMPUTING FACILITY,UCLA

PROBLEM    TEST
NUMBER OF CASES..........       8   NO. OF SUB-PROBLEMS. 1
NUMBER OF PUNCHED VARIABLES. 10   TAPE TO WRITE....... 0
NUMBER OF TRANSGENERATIONS.. 24   INPUT TAPE NUMBER... 0
NUMBER OF VARIABLES ADDED... 24   NUMBER OF VARIABLE
NUMBER OF MISVAL CARDS......  2   FORMAT CARDS...... .. 1

 MISSING  NUMBER OF
VARIABLE   VALUES    VALUE 1  VALUE 2  VALUE 3  VALUE 4  VALUE 5  VALUE 6  VALUE 7  VALUE 8  VALUE 9  VALUE 10

    4          3        9.00    10.00    11.00

   10          2        4.00     9.00

 NEW          OLD     B VAR.    NUMBER OF
 VAR.  CODE   VAR.  OR CONST.   CONSTANTS        TYPE 40 CONSTANTS
  11     1      1     -0.0
  12     2      1     -0.0
  13     3      3     -0.0
  14     4      4     -0.0
  15     5      5     -0.0
  16     5      6     -0.0
  17     7      2     -0.0
  18     8      2      1.00
  19     9      2      2.00
  20    10      2      2.00
  21    11      1      2.00
  22    12      1      2.00
  23    13      1      2.00
  24    14      6      5.00
  25    15      2      1.50
  26    16      1      4.00
  27    17      6     -0.0
  28    20      7     -0.0
  29    21      7     -0.0
  30    22      8     -0.0
  31    23      1      2.00
  32    24      9      2.00
  33    40      1      2.00       3            1.00     4.00    16.00
  34    41     10      2.00

CASE WILL BE INCLUDED IN SUB-PROBLEM  1 IFV(  2) EQ 1.0000 OR V(  2) EQ 2.0000 ** V(

   VARIABLE FORMAT
(10F2.0)
```

SUB-PROBLEM NUMBER 1 CONTAINS 7 CASES

VARIABLE INDEX		NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR	F VALUE	P VALUE	POOLED VARIANCE ESTIMATE T VALUE	DEGREES OF FREEDOM	P VALUE	SEPARATE VARIANCE ESTIMATE T VALUE	DEGREES OF FREEDOM	P VALUE
1	X	3	40.0000	17.320	10.000	1.15	0.851	1.65	5	0.159	1.63	4.25	0.178
	Y	4	19.0000	16.145	8.073								
2	X	3	2.0000	0.0	0.0	0.0	1.000	0.0	5	1.000	0.0	0.0	1.000
	Y	4	1.0000	0.0	0.0								
3	X	3	8.3333	3.215	1.856	1.49	0.709	-0.19	5	0.857	-0.18	3.86	0.866
	Y	4	8.7500	2.630	1.315								
4	X	1	16.0000	0.0	0.0	0.0	1.000	1.73	2	0.225	3.46	2.00	0.074
	Y	3	14.0000	1.000	0.577								

SUB-PROBLEM NUMBER 1 CONTAINS 7 CASES

VARIABLE INDEX		NUMBER OF CASES	MEAN	STANDARD DEVIATION	STANDARD ERROR	F VALUE	P VALUE	POOLED VARIANCE ESTIMATE T VALUE	DEGREES OF FREEDOM	P VALUE	SEPARATE VARIANCE ESTIMATE T VALUE	DEGREES OF FREEDOM	P VALUE
33	X	3	0.0	0.0	0.0	0.0	1.000	-0.85	5	0.437	-1.00	3.00	0.391
	Y	4	0.5000	1.000	0.500								
34	X	3	0.0	0.0	0.0	0.0	1.000	0.0	5	1.000	0.0	0.0	1.000
	Y	4	0.0	0.0	0.0								

NUMBER OF CASES NOT INCLUDED IN DESIGNATED SUB-PROBLEMS= 1
NUMBER OF INSTANCES IN WHICH TRANSGENERATION RESTRICTIONS WERE VIOLATED = 0

BMD01R
SIMPLE LINEAR REGRESSION
(ONE-WAY ANALYSIS OF COVARIANCE)

1. GENERAL DESCRIPTION

a. This program performs simple linear regression analysis on single or combined treatment groups with unequal sample sizes. (The words "treatment groups" are used here to describe categories.) The "within" cross-products sums and coefficients are computed; thus, analysis-of-covariance information is also provided in the output.

b. Output from this program includes:

(1) Sum of squares and products for treatment means, within, and total with degrees of freedom
(2) Deviations about regression for within, total, and adjusted means with degrees of freedom
(3) Regression coefficients for treatment means, within, and total
(4) F ratios for treatment means, adjusted means, and within coefficients with degrees of freedom
(5) Bioassay information (optional)

c. Limitations per problem:

(1) t, number of treatment groups $(1 \leq t \leq 999)$
(2) n_i, number of cases in the i^{th} treatment group $(1 \leq n_i \leq 999)$
(3) s, number of subset specifications $(0 \leq s \leq 500)$
(4) c, number of combinations of subsets $(0 \leq c \leq 99)$
(5) k, number of Variable Format Cards $(1 \leq k \leq 10)$

d. Estimation of running time and output pages per problem:

Number of seconds = 25 + s + c (for IBM 7094)
Number of pages = 10 s + c

e. This program allows transgeneration of either the dependent variable or independent variable or of both. Codes 1-10 from the transgeneration list may be used. (See Introduction, Section III-B, for Special Transgeneration Cards.)

f. Subsets and combinations of subsets can be selected from the input data as illustrated in the following example:

X = Pre-treatment measurement (or independent variable)
Y = Post-treatment measurement (or dependent variable)

Group A	Group B	Group C	Group D	etc.
Y_1X_1	Y_1X_1	Y_1X_1	Y_1X_1	.
. .	. .	. .	. .	.
. .	. .	. .	. .	.
. .	. .	. .	. .	.
Y_aX_a	Y_bX_b	Y_cX_c	Y_dX_d	.

Subset Specification

Subset Number	Group(s)
1	A
2	B, C, D
3	E, F, G
4	G
.	.
.	.
.	.

An analysis-of-variance table can be computed for each subset or one table for the combined subsets. If any additional tables are desired for combinations of these subsets, they are specified as follows:

Combination of Subsets

Combination Number	Subsets Included
1	1, 2, 3
2	1, 4
.	.
.	.
.	.
.	.

2. ORDER OF CARDS IN JOB DECK

Cards indicated by letters enclosed in parentheses are optional. All other cards must be included in the order shown.

a.	System Cards	[Introduction, IV]
b.	Problem Card	
c.	Sample Size Card(s)	
d.	F-type Variable Format Card(s)	[Introduction, III-C]
(e.)	Special Transgeneration Card (for independent variable)	[Introduction, III-B]
(f.)	Special Transgeneration Card (for dependent variable)	[Introduction, III-B]
g.	DATA INPUT Cards (Place data input deck here if data input is from cards.)	[Introduction, II]
(h.)	Subset Card(s)	
(i.)	Combination Selection Card(s)	
	...	
	Repeat b. through (i.) as desired.	
	...	
j.	Finish Card	[Introduction, III]

Deck Set-up:

j FINISH - Finish Card

(i) CØMSEL - Combination Selection Card(s)

(h) SUBSET - Subset Card(s)

g Data Input Deck

(f) SPECTG - Special Transgeneration Card (Y Variable)

(e) SPECTG - Special Transgeneration Card (X Variable)

d F-Type Variable Format Card(s)

c SAMSIZ - Sample Size Card(s)

b PRØBLM - Problem Card

3. CARD PREPARATION (SPECIFIC FOR THIS PROGRAM)

Preparation of the cards listed below is specific for this program. All other cards listed in the preceding section are prepared according to instructions in the Introduction.

a. Problem Card (One Problem Card for each problem)

Col. 1-6	PRØBLM (Mandatory)	
Col. 7-12	Alphanumeric job code	
Col. 13-15	Number of treatment groups ($1 \le t \le 999$)	
Col. 16	0	No transgeneration
	1	Transgeneration of independent variable only
	2	Transgeneration of dependent variable only
	3	Transgeneration of both independent and dependent variables
	Note: When transgeneration is specified, it applies to all treatment groups.	
Col. 17-19	Number of subsets specified ($0 \le s \le 500$)	
Col. 20, 21	Number of combination selections ($0 \le c \le 99$)	
Col. 22	0	If a single table based on all subsets combined is desired. This table will be of no value if subsets have groups in common, since some groups will be included more than once.
	1	If one table is desired for each subset separately, in addition to the above table.
Col. 23-28	Value of Student's t if bioassay information is desired; otherwise leave blank. (Keypunch decimal point.)	
Col. 29-68	Blank	
Col. 69, 70	B	If data input is from logical BCD tape B ($B \neq 6$).
Col. 71, 72	Number of Variable Format Card(s) ($1 \le k \le 10$)	

b. Sample Size Card(s)

Col. 1-6 SAMSIZ (Mandatory)

Col. 7-9 n_1, number of cases for treatment group 1

Col. 10-12 n_2, number of cases for treatment group 2

...

Col. 70-72 n_{22}, number of cases for treatment group 22

If there are more than 22 treatment groups, continue keypunching a second, a third card, etc. in the same manner.

Col. 1-6 SAMSIZ (Mandatory)

Col. 7-9 n_{23}, number of cases for treatment group 23

Col. 10-12 n_{24}, number of cases for treatment group 24

...

g. DATA INPUT Cards (See Introduction, Section II)

The form of the data input is illustrated in the following example:

Treatment Group	
1	$Y_{11}, X_{11}; Y_{12}, X_{12}; \ldots; Y_{1n_1}, X_{1n_1}$
2	$Y_{21}, X_{21}; Y_{22}, X_{22}; \ldots; Y_{2n_2}, X_{2n_2}$
...	...; ...; ...; ...
t	$Y_{t1}, X_{t1}; Y_{t2}, X_{t2}; \ldots; Y_{tn_t}, X_{tn_t}$

Begin a new card with each treatment group.

(h.) Subset Card(s)

Specifications for groups to be included in various subsets are indicated in the following example.

Col. 1-6	SUBSET	(Mandatory)
Col. 7-9 Col. 10-12	002 005	Subset 1 includes groups 2, 3, 4, 5
Col. 13-15 Col. 16-18	010 012	Subset 2 includes groups 10, 11, 12
Col. 19-21 Col. 22-24	006 006	Subset 3 includes group 6

The punched card would be SUBSET002005010012006006

If there are more than 11 subset specifications, continue keypunching a second, a third card, etc. in the same manner. The first six columns must be keypunched SUBSET.

(i.) Combination Selection Card(s)

This card allows the user to combine the subsets previously specified.

Col. 1-6	CØMSEL	(Mandatory)
Col. 7, 8	Number of subsets in the combination (≤ 21)	
Col. 9-11	Number of the 1st subset	
Col. 12-14	Number of the 2nd subset	
...	...	
Col. 69-71	Number of the 21st subset	

The maximum number of subsets in a combination is 21. The subset numbers must be keypunched in ascending order. The number of subsets in any combination must be less than or equal to the total number of subsets specified. Each Combination Selection Card is independent, so the same or different subset numbers may be keypunched from card to card depending on the user's interests.

4. COMPUTATIONAL PROCEDURE

Model: $Y_{ij} = \mu + \tau_i + \beta(X_{ij} - \bar{X}) + \epsilon_{ij}$

where $i = 1, 2, \ldots, t$ (treatment groups)
and $j = 1, 2, \ldots, n_i$ (cases for group i)

The following computations are performed for each analysis-of-covariance table. A table is computed for all treatment groups or each subset or each combination of subsets, depending on the user's specifications on the Problem Card.

Step 1. Sum of squares and products for total

XX_t = total sum of squares for X

$$= \sum_{i=1}^{t} \sum_{j=1}^{n_i} X_{ij}^2 - \frac{\left(\sum_{i=1}^{t} \sum_{j=1}^{n_i} X_{ij} \right)^2}{\sum_{i=1}^{t} n_i}$$

XY_t = total sum of products for X and Y

$$= \sum_i \sum_j X_{ij} Y_{ij} - \frac{\left(\sum_i \sum_j X_{ij} \right) \left(\sum_i \sum_j Y_{ij} \right)}{\sum_i n_i}$$

YY_t = total sum of squares for Y

$$= \sum_i \sum_j Y_{ij}^2 - \frac{\left(\sum_i \sum_j Y_{ij} \right)^2}{\sum_i n_i}$$

<u>Step 2.</u> Sum of squares and products for (treatment) means

XX_m = treatment sum of squares for X

$$= \sum_i \frac{\left(\sum_j X_{ij}\right)^2}{n_i} - \frac{\left(\sum_i \sum_j X_{ij}\right)^2}{\sum_i n_i}$$

XY_m = treatment sum of products for X and Y

$$= \sum_i \frac{\left(\sum_j X_{ij}\right)\left(\sum_j Y_{ij}\right)}{n_i} - \frac{\left(\sum_i \sum_j X_{ij}\right)\left(\sum_i \sum_j Y_{ij}\right)}{\sum_i n_i}$$

YY_m = treatment sum of squares for Y

$$= \sum_i \frac{\left(\sum_j Y_{ij}\right)^2}{n_i} - \frac{\left(\sum_i \sum_j Y_{ij}\right)^2}{\sum_i n_i}$$

<u>Step 3.</u> Sum of squares and products for within

XX_w = within sum of squares for X

$= XX_t - XX_m$

XY_w = within sum of products for X and Y

$= XY_t - XY_m$

YY_w = within sum of squares for Y

$= YY_t - YY_m$

Step 4. Deviations about regression

Within $= YY_w - (XY_w)^2/XX_w = SS_w$

Total $= YY_t - (XY_t)^2/XX_t = SS_t$

Difference* $= YY_m - (XY_m)^2/XX_m + (XY_w)^2/XX_w = SS_d$

Step 5. Regression coefficients

Means $= XY_m/XX_m = b_m$

Within $= XY_w/XX_w = b_w$

Total $= XY_t/XX_t = b_t$

Step 6. F ratios

Let $N = \sum_{i=1}^{t} n_i$

H_0: No difference among treatment means for X

$F = XX_m/(t-1) \div XX_w/(N-t)$

H_0: No difference among treatment means for Y

$F = YY_m/(t-1) \div YY_w/(N-t)$

H_0: No difference among treatment means for Y after adjusting by the regression on X

$F = SS_d/(t-1) \div SS_w/(N-t-1)$

H_0: Within regression coefficient = 0

$F = (XY_w)^2/XX_w \div SS_w/(N-t-1)$

---

*For testing among means

Step 7. Bioassay information

The following computations are printed if the user specifies a t-value in Columns 23-28 of the Problem Card.

Lambda

$$\lambda = \frac{\sqrt{SS_t/(N-2)}}{b_t}$$

Standard Error of λ

$$SE(\lambda) = \lambda \left\{ 1/(2N-3) + 1/\left[\frac{(XY_t)^2\ (N-2)}{(XX_t)\ \ (SS_t)} - (\text{Student's t})^2\right]\right\}^{1/2}$$

Note: Student's t is usually taken at .95 level (d.f. = N-2). For N large, $t \cong 2$.

Standard Error of log ratio of potencies

$$SE(p) = 2\lambda / \sqrt{N}$$

Estimate of required sample size for assay

$$E(N) = 4\,[\lambda + t\ SE(\lambda)\,]^2 / SE(p)^2$$

5. REFERENCES

Dixon, Wilfrid J., and Massey, Frank J., Introduction to Statistical Analysis, McGraw-Hill, 1969; Chapter 12. Third Edition.

Finney, D. J., Experimental Design and Its Statistical Basis, The University of Chicago Press, 1955.

Ostle, Bernard, Statistics in Research, The Iowa State College Press, 1954; Chapter 13.

```
PROBLMTEST01 150   5 212.0000
SAMSIZ00600600600601200400400400600600600400200500 9
(12F6.0)
   165     30    170     27    130     20    156     21    167     33    151   [illegible]
   180     24    169     31    171     20    161     26    180     20    170   [illegible]
   156     34    189     32    138     35    190     35    160     30    172   [illegible]
   201     41    173     32    200     30    193     35    142     28    189   [illegible]
   110     60    135     60    120     60    120     52    140     62    130   [illegible]
   135     62    150     64    145     64    170     70    185     70    160   [illegible]
    10      3      8      2      8      1     11      2
    12      4     12      3     10      3     13      5
     6      1      5      2      8      3      7      1
   136    149    154    164    111     64     96     90     76    218     85   19?
   138    297    174    393    131    299    207    279     66    389     85   36?
   231    781    280    766    219    675    261    659    263    919    272   97?
    45     00     46     00     49     00     44     00
    35     00     33     00
    34     00     34     00     35     00     34     00     33     00
    41     00     41     00     44     00     43     00     41     00     42     00
    44     00     41     00     41     00
SUBSET001004005005006008009011012015
COMSEL 2  1  2
COMSEL 4  2  3  4  5
FINISH
```

Problem Card

Problem Test 01

15 groups, t
no transgeneration
5 subsets
2 combination selections
One table is desired for each subset separately.
Student's t value of 2.0000 specified for bioassay information.

Sample Size Card

n_1	6	n_7	4
n_2	6	n_8	4
n_3	6	n_9	6
n_4	6	n_{10}	6
n_5	12	n_{11}	6
n_6	4	n_{12}	4
		n_{13}	2
		n_{14}	5
		n_{15}	9

Subset Card

Subset 0 (automatic) includes all groups.
Subset 1 includes groups 1, 2, 3, 4.
Subset 2 includes only group 5.
Subset 3 includes groups 6, 7, 8.
Subset 4 includes groups 9, 10, 11.
Subset 5 includes groups 12, 13, 14, 15.

Combination Selection Cards

Combination of subsets 1, 2 includes groups 1-5.
Combination of subsets 2, 3, 4, 5 includes groups 5-15.

```
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PROBLEM CODE TEST01
NC. OF GROUPS     15
TRANSGENERATION  0
NO. OF VAR. FMT. CARD(S)  1
THE VARIABLE FORMAT IS  (12F6.0)
```


```
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```


ANALYSIS OF COVARIANCE TABLE

SOURCE OF VARIATION	DEGREES FREEDOM	SUMS OF SQUARES AND PRODUCTS XX	XY	YY	*	DEVIATION ABOUT REGRESSION Y*Y*	DF	MEAN SQ Y*Y*
MEANS	14	37C4521.C000	778368.1875	448057.0000	*			
WITHIN	71	114052.0C00	-148.0000	32704.0000	*	32703.8047	70	467.1970
TOTAL	85	3818573.0000	778220.1875	480761.0000	*	322160.8125	84	
DIFFERENCE FOR TESTING AMONG ADJUSTED MEANS................*						289457.0000	14	20675.5000

REGRESSION COEFFICIENTS

MEANS	0.2101
WITHIN	-0.C013
TOTAL	0.2038

F RATIOS FOR		DF
X MEANS	164.7250	(14, 71)
Y MEANS	69.48C5	(14, 71)
Y* MEANS	44.2543	(14, 7C)
B WITHIN	0.00C4	(1, 7C)

BIOASSAY INFORMATION

LAMBDA=   303.8752

CONFIDENCE LIMIT FOR LAMBDA=   54.9553

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SUBSET SPECIFICATION

NO	START	END
1	1	4

ANALYSIS OF COVARIANCE TABLE

SOURCE OF VARIATION	DEGREES FREEDOM	SUMS OF SQUARES AND PRODUCTS			*	DEVIATION ABOUT REGRESSION		
		XX	XY	YY	*	Y*Y*	DF	MEAN SQ Y*Y*
MEANS	3	365.4531	451.1875	2163.1250	*			
WITHIN	20	361.5078	496.8750	5937.8750	*	5254.9414	19	276.5757
TOTAL	23	726.9609	948.0625	8101.0000	*	6864.5859	22	
DIFFERENCE FOR TESTING AMONG ADJUSTED MEANS................*						1609.6445	3	536.5481

REGRESSION COEFFICIENTS

MEANS	1.2346
WITHIN	1.3745
TOTAL	1.3041

F RATIOS FOR		DF
X MEANS	6.7354	(3, 20)
Y MEANS	2.4266	(3, 20)
Y* MEANS	1.9400	(3, 19)
B WITHIN	2.4692	(1, 19)

BIOASSAY INFORMATION

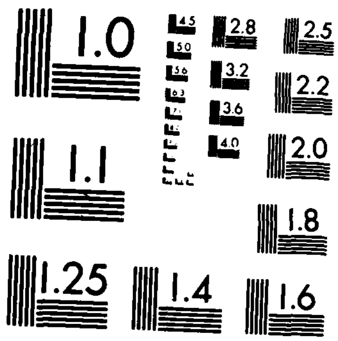
LAMBDA= 13.5447

THE APPROXIMATION USED IN THIS PROGRAM IS INAPPROPRIATE FOR THIS PROBLEM.

THE CONFIDENCE LEVEL FOR LAMBDA IS NOT COMPUTED.

AD-A128 791 IMPLEMENTATION PLAN FOR DATA COLLECTION REDUCTION AND ANALYSIS IN SUPPORT..(U) COMPUTER SCIENCES CORP FALLS CHURCH VA MAY 76 F23613-74-C-0014 4/4

UNCLASSIFIED F/G 9/2 NL



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

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SUBSET SPECIFICATION

NO	START	END
2	5	5

ANALYSIS OF COVARIANCE TABLE

SOURCE OF VARIATION	DEGREES FREEDOM	SUMS OF SQUARES AND PRODUCTS XX	XY	YY	*	DEVIATION ABOUT REGRESSION Y*Y*	DF	MEAN SQ Y*Y*
MEANS	0	C.C	0.0	0.0	*			
WITHIN	11	171.6680	863.3750	5266.6875	*	924.4922	10	92.4492
TOTAL	11	171.6680	863.3750	5266.6875	*	924.4922	10	
DIFFERENCE FOR TESTING AMONG ADJUSTED MEANS................*						0.0	0	0.0

REGRESSION COEFFICIENTS

MEANS	0.0
WITHIN	5.C293
TOTAL	5.C293

F RATIOS FOR		DF
X MEANS	0.0	(0, 11)
Y MEANS	0.0	(C, 11)
Y* MEANS	0.0	(C, 10)
B WITHIN	46.9684	(1, 10)

BIOASSAY INFORMATION

LAMBDA= 1.9118

CONFIDENCE LIMIT FOR LAMBDA= C.5132

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SUBSET SPECIFICATION

NO	START	END
3	6	8

ANALYSIS OF COVARIANCE TABLE

SOURCE OF VARIATION	DEGREES FREEDOM	SUMS OF SQUARES AND PRODUCTS XX	XY	YY	*	DEVIATION ABOUT REGRESSION Y*Y*	DF	MEAN SQ Y*Y*
MEANS	2	9.5000	20.7500	55.1667	*			
WITHIN	9	7.5000	6.2500	16.5000	*	11.2917	8	1.4115
TOTAL	11	17.0000	27.0000	71.6667	*	28.7844	10	
DIFFERENCE FOR TESTING AMONG ADJUSTED MEANS.................*						17.4927	2	8.7464

REGRESSION COEFFICIENTS

MEANS	2.1842
WITHIN	0.8333
TOTAL	1.5882

F RATIOS FOR

		DF
X MEANS	5.7000	(2, 9)
Y MEANS	15.0455	(2, 9)
Y* MEANS	6.1967	(2, 8)
B WITHIN	3.6500	(1, 8)

BIOASSAY INFORMATION

LAMBDA= 1.0682

CONFIDENCE LIMIT FOR LAMBDA= 0.4005

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SUBSET SPECIFICATION

NO	START	END
4	9	11

ANALYSIS OF COVARIANCE TABLE

SOURCE OF VARIATION	DEGREES FREEDOM	SUMS OF SQUARES AND PRODUCTS XX	XY	YY	*	DEVIATION ABOUT REGRESSION Y*Y*	DF	MEAN SQ Y*Y*
MEANS	2	1341315.0000	308411.0000	72194.2500	*			
WITHIN	15	113512.0000	-1514.0000	21450.2500	*	21430.0547	14	1530.7180
TOTAL	17	1454831.0000	306897.0000	93644.5000	*	28904.5312	16	
DIFFERENCE FOR TESTING AMONG ADJUSTED MEANS................*						7474.4766	2	3737.2383

REGRESSION COEFFICIENTS

MEANS	0.2299
WITHIN	-0.0133
TOTAL	0.2110

F RATIOS FOR		DF
X MEANS	88.6241	(2, 15)
Y MEANS	25.2424	(2, 15)
Y* MEANS	2.4415	(2, 14)
B WITHIN	0.0132	(1, 14)

BIOASSAY INFORMATION

LAMBDA= 201.4851

CONFIDENCE LIMIT FOR LAMBDA= 50.2420

```
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SUBSET SPECIFICATION

 NO  START  END

  5    12    15

                                  ANALYSIS OF COVARIANCE TABLE

SOURCE OF    DEGREES              SUMS OF SQUARES AND PRODUCTS       *        DEVIATION ABOUT REGRESSION
VARIATION    FREEDOM                                                 *
                           XX              XY              YY        *      Y*Y*      DF       MEAN SQ Y*Y*

  MEANS          3         0.0             0.0         432.0000      *

  WITHIN        16         0.0             0.0          32.0000      *     32.0000    15            2.1333

  TOTAL         19         0.C             0.0         464.0000      *    464.0000    18

       DIFFERENCE FOR TESTING AMONG ADJUSTED  MEANS.................*    432.0000     3          144.0000

 REGRESSION COEFFICIENTS                                         F RATIOS FOR                  DF

    MEANS        0.0                                             X MEANS          0.0    (  3,   16)
   WITHIN        0.C                                             Y MEANS      72.0CC0   (  3,   16)
    TOTAL        0.0                                             Y* MEANS     67.50C0   (  3,   15)
                                                                 B WITHIN         0.0    (  1,   15)
BIOASSAY INFORMATION

LAMBDA=      0.0

THE APPROXIMATION USED IN THIS PROGRAM IS INAPPROPRIATE FOR THIS PROBLEM.

THE CONFIDENCE LEVEL FOR LAMBDA IS NCT CCMPUTED.

SUBSET SPECIFICATION

 NO  START  END

  1     1     4
  2     5     5
  3     6     8
  4     9    11
  5    12    15
```

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COMBINATION NO 1

SUBSETS INCLUDED
1 2

ANALYSIS OF COVARIANCE TABLE

SOURCE OF VARIATION	DEGREES FREEDOM	SUMS OF SQUARES AND PRODUCTS			*	DEVIATION ABOUT REGRESSION		
		XX	XY	YY	*	Y*Y*	DF	MEAN SQ Y*Y*
MEANS	1	9544.9531	-7748.8750	6290.8750	*			
WITHIN	34	858.6875	1811.4375	13367.6875	*	9716.4648	33	294.4382
TOTAL	35	10443.6406	-5937.4375	19658.5625	*	16283.0000	34	
DIFFERENCE FOR TESTING AMONG ADJUSTED MEANS................*						6566.5352	1	6566.5352

REGRESSION COEFFICIENTS

MEANS	-0.8118
WITHIN	2.0156
TOTAL	-0.5685

F RATIOS FOR DF

X MEANS	361.1138	(1, 34)
Y MEANS	16.0005	(1, 34)
Y* MEANS	22.3019	(1, 33)
B WITHIN	12.4006	(1, 33)

BIOASSAY INFORMATION

LAMBDA= -38.4929

CONFIDENCE LIMIT FOR LAMBDA= -22.5320

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COMBINATION NO 2

SUBSETS INCLUDED
2 3 4 5

ANALYSIS OF COVARIANCE TABLE

SOURCE OF VARIATION	DEGREES FREEDOM	SUMS OF SQUARES AND PRODUCTS XX	XY	YY	*	DEVIATION ABOUT REGRESSION Y*Y*	DF	MEAN SQ Y*Y*
MEANS	3	2163541.0000	617045.8750	263950.6875	*			
WITHIN	58	1455020.0000	307788.0000	99446.8750	*	34338.9062	57	602.4368
TOTAL	61	3618561.0000	924833.8750	363397.5625	*	127028.0625	60	
DIFFERENCE FOR TESTING AMONG ADJUSTED MEANS................*						92689.1250	3	30896.3750

REGRESSION COEFFICIENTS

MEANS	0.2852
WITHIN	0.2115
TOTAL	0.2556

F RATIOS FOR		DF
X MEANS	28.7477	(3, 58)
Y MEANS	51.3143	(3, 58)
Y* MEANS	51.2857	(3, 57)
B WITHIN	108.0744	(1, 57)

BIOASSAY INFORMATION

LAMBDA= 180.0306

CONFIDENCE LIMIT FOR LAMBDA= 23.8759

BMD01V

ANALYSIS OF VARIANCE FOR ONE-WAY DESIGN

1. GENERAL DESCRIPTION

a. This program computes an analysis-of-variance table for one variable of classification, with unequal group sample sizes. Optionally data may be read in from an alternate input tape, either in BCD or in binary mode. Rewinding of the tape before read-in is also optional.

b. Output for this program includes:

(1) Optional listing of the group or treatment means and standard deviations

(2) An analysis-of-variance table including:

(a) Within Groups, Between Groups, and Total Sums of Squares

(b) Within Groups, Between Groups, and Total Degrees of Freedom

(c) Within Groups and Between Groups Mean Squares

(d) F Ratio (for H_0: $\mu_1 = \mu_2 \ldots = \mu_k$).

c. Limitations per problem:

(1) k, the number of different groups or categories ($2 \leq k \leq 5000$)

(2) n_i, the number of observations or cases (sample size) for the i^{th} treatment group or category ($1 \leq n_i \leq 20000$)

(3) N, the total number of observations in all groups or categories combined,

$$N = \sum_{i=1}^{k} n_i, \quad (N \leq 100,000,000)$$

(4) m, the number of Special Transgeneration Cards ($0 \leq m \leq 9$)

d. Estimation of running time and output pages per problem:

Number of seconds = 10 + k/30 (for IBM 7094)

Number of pages = 2 (add k/60 if treatment means are to be listed)

e. This program allows transgeneration. Codes 01-10 of the transgeneration list may be used.

2. ORDER OF CARDS IN JOB DECK

a. System Cards [Introduction, IV]

b. Problem Card

c. Sample Size Card(s)

(d.) Special Transgeneration Cards [Introduction, III-B]

e. (1) F-type Variable Format Card(s) [Introduction, III-C]
If data are on cards or on tape in BCD mode

(2) Record-length Card
If data are to be read from tape in binary mode

f. DATA INPUT Cards [Introduction, II]
(Place data input deck here if data input is from cards.)

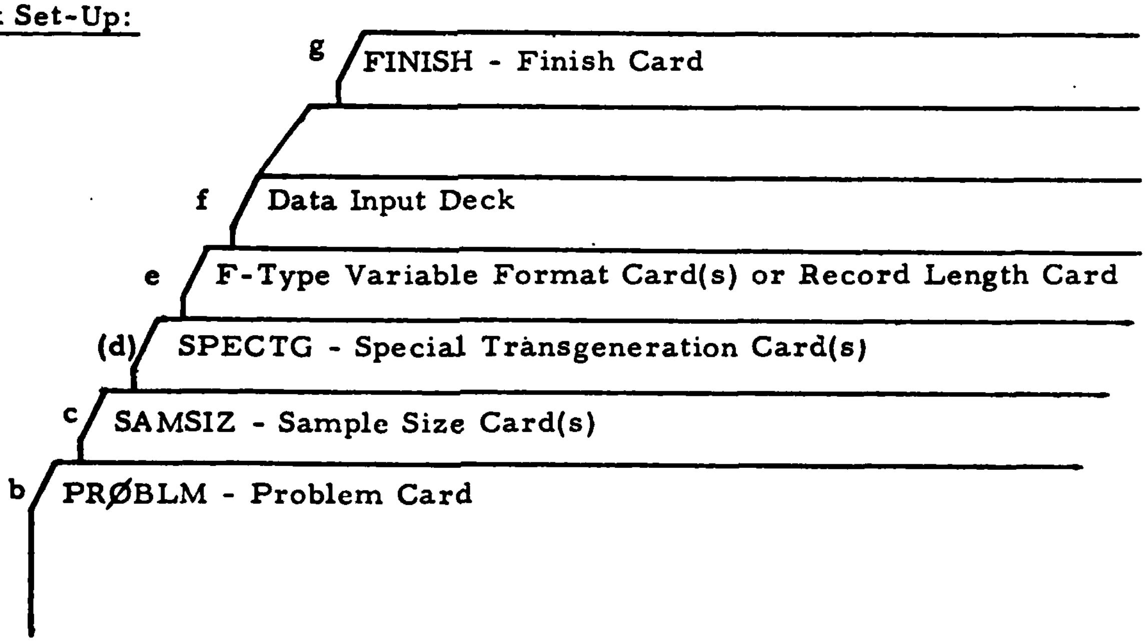
...

Repeat b. through f. as desired.

...

g. Finish Card [Introduction, III]

Deck Set-Up:



3. CARD PREPARATION (SPECIFIC FOR THIS PROGRAM)

Preparation of the cards listed below is specific for this program. All other cards listed in the preceding section are prepared according to instructions in the Introduction.

b. Problem Card

Col. 1-6	PRØBLM	(Mandatory)
Col. 7-12	Alphanumeric job code	
Col. 13-16	k Number of treatment groups ($2 \leq k \leq 5000$)	
Col. 17-19	YES If listing of treatment group means and standard deviations is desired; otherwise, leave blank.	
Col. 20	m Number of Special Transgeneration Cards ($0 \leq m \leq 9$)	
Col. 21-63	Blank	
Col. 64-66	YES If data are to be read in binary mode from tape; otherwise, leave blank.	
Col. 67, 68	NØ If alternate input tape is not to be rewound before data are read in. If blank, the alternate input tape will be rewound before it is read.	
Col. 69, 70	T If data are to be read from alternate input tape T ($T \neq 5, 6$). Leave blank if data are to be read from cards; in this case, Columns 64-66 and 67, 68 must also be blank.	
Col. 71, 72	Number of F-type Variable Format Cards if data are to be read from cards or from an alternate BCD input tape ($1 \leq f \leq 10$). If data are to be read in binary mode, leave blank.	

c. Record-length Card

If the data are to be read in binary mode (that is, if Columns 64-66 of the Problem Card contain YES), one Record-length Card must appear and no F-type Variable Format Cards.

Col. 1-3 Length of the logical records on binary tape

d. Sample Size Card(s)

Col. 1-6	SAMSIZ		(Mandatory)
Col. 7	Blank		
Col. 8-12	n_1	Number of observations in the 1st group ($1 \leq n_1 \leq 20000$)	
Col. 13-17	n_2	Number of observations in the 2nd group ($1 \leq n_2 \leq 20000$)	
...			
Col. 67-72	n_{13}	Number of observations in the 13th group ($1 \leq n_{13} \leq 20000$)	

If $k > 13$, additional Sample Size Cards are punched in the same manner; the second Sample Size Card would include n_{14} through n_{26}; the third, n_{27} through n_{39}; etc.

e. DATA INPUT Cards

Data must appear on cards or on alternate input tape "group-wise"; that is, all n_1 values in the first group or treatment must appear first; then, starting on a new card (or logical record, if input is from alternate BCD or binary tape), all n_2 values in the second group, etc., so that the last n_k values on the cards or tape will be the n_k values in the k^{th} or last group. The format for all treatment groups is identical and is specified on the Variable Format Card.

4. COMPUTATIONAL PROCEDURE

Let x_{ij} be the data value for the j^{th} case in the i^{th} treatment group. The means and sums of squares

$$\bar{x}_i = \frac{1}{n_i} \sum_{j=1}^{n_i} X_{ij} \qquad i = 1, \ldots, k$$

$$S_i = \sum_{j=1}^{n_i} (X_{ij} - \bar{X}_i)^2 \qquad i = 1, \ldots, k$$

are computed. If requested on the Problem Card the standard deviations

$$s_i = \sqrt{S_i/(n_i - 1)} \qquad i = 1, \ldots, k$$

are computed and printed together with the means. The following are computed and printed:

Within Sum of Squares $= S_w = \sum_{i=1}^{k} S_i$

Within Degrees of Freedom $= \sum_{i=1}^{k} (n_i - 1) = N - k$

Within Mean Square $= M_w = S_w/(N$

Between Sum of Squares $= S_b = \sum_{i=2}^{k} n_i (\quad _1)^2$

$$- N \left(\frac{1}{N} \sum_{i=1}^{k} \sum_{j=1}^{n_i} X_{ij} - \bar{X}_1\right)^2$$

Between Degrees of Freedom $= k-1$

Between Mean Square $= M_b = S_b/(k-1)$

Total Sum of Squares $= S_w + S_b$

Total Degrees of Freedom $= (N-k) + (k-1) = N-1$

F Ratio $= M_b/M_w$

The computing formula for the Between Sum of Squares given above is mathematically equivalent to

$$S_b = \sum_{i=1}^{k} n_i (\bar{X}_i - \bar{X})^2$$

where $$\bar{X} = \frac{1}{N} \sum_{i=1}^{k} \sum_{j=1}^{n_i} X_{ij}$$

5. REFERENCE

Dixon, Wilfrid J., and Massey, Frank J., Introduction to Statistical Analysis, Third Edition, McGraw-Hill 1969. Chapter 10.

```
PROBLMVAR=12   12YES                                                          1
SAMSIZ     38     3    17    32    11    19    24    61    30     3    48    60
(12F6.1)
   464   060  1486  1022  1394   906  1179 -1501 -0690  1372 -0482 -1376
 -1010 -0005  1393 -1787 -0105 -1339  1041  0279 -1805 -1186  0658 -0439
 -1399  0199  0159  2273  0041 -1132  0768  0375 -0513  0292  1026 -1334
 -0287  0161
 -0853  0235  0862
 -0957  0525 -1865 -0035  0371 -0702 -0432 -0465  0120 -0238 -0869 -0273
 -1016  0417  0056  0561 -0237
 -0271  0932 -1029  0479  2709 -0057 -0300 -0594 -1047 -1347  0996 -1023
  0551  0418  0074  0524  0479  0326  1114  1058  0772  0226 -0298  1064
  0162 -0129 -1204  1097 -0916  1222 -1153  1298
  0274 -0976  0957 -0686  0097  0269  0447 -0859 -0780 -1132 -1256
 -1329  1284  0619  0699  0101 -1381 -0574  0096  1389  1249  0756 -0860
 -0860 -0778  0037  2619 -0420  1048  1000  0170
  2252  0554 -1203 -1210  0794  1001  0217 -3111  0354  0639  0317  0771
  1303 -1326 -0676  0592 -0395 -0825  2362  1050  0298 -0726 -1433 -0224
 -1752 -0291 -0933 -0450  0512 -0702  0284 -0509 -1776 -0044  0263  0986
 -0441 -0866 -1215 -0475  1200 -0498 -0743  0779 -0206 -0092 -1222  0068
  0183 -0811 -1010  1453  0759  0287 -0669  0392 -0337  0369 -1694  0985
 -1063  0033  0597 -1601 -0266  0901 -1433  1327 -0248 -0401  0344  0441
  0824  1385 -0329  0085  0130 -0244 -0882  0472  0039  1420 -1033  1807
 -0578
 -1210  0131 -1202  0894 -0780 -0195 -0927 -1582  0075  1600 -2904  1149
  1210 -0838  0278  0035  0106  0199 -1990  0710  0340 -0594 -1527  0362
 -0570 -1309  1531 -1008  0763  0798
 -0679 -0324 -0372
 -1084  0318  0367 -0992  0529  0278  1392  0409  0061 -0964  0507 -1414
 -0947 -1191  0165 -0090 -0866 -1116 -0156 -1387 -0046 -0454  0575 -0266
  1246  0557  0004 -1114 -0586  0882  0679 -0032  0091  0838 -0304  1082
 -2716  0823 -1248  0346 -0537 -0402  1214 -1264  1353  1511 -0184 -0264
 -0182 -0165 -0717  1407 -1060 -0192  0154  1278  2455  0524 -0445  0795
 -1638 -0880 -0281 -1187 -0417 -1611 -0933  0490 -1117  0652 -0200  1751
  0539 -1546 -0520 -0218  1169 -1543 -0930  1341 -1208 -1430  0449 -1225
  0604 -0446  1353 -0024  0394 -0218 -0513 -0 93  0474  2847  2315 -1212
 -0049  0027 -0856 -0276  0039  1468 -1805  2285 -0602  0229  1382  0978
```

<u>Problem Card</u>

Problem VAR = 12

12 treatment groups, k

Treatment group means and standard deviations are desired.

1 F-type Variable Format Card

<u>Sample Size Card</u>

The sample sizes of the groups are:

$n_1 = 38$	$n_7 = 24$
$n_2 = 3$	$n_8 = 61$
$n_3 = 17$	$n_9 = 30$
$n_4 = 32$	$n_{10} = 3$
$n_5 = 11$	$n_{11} = 48$
$n_6 = 19$	$n_{12} = 60$

```
PROBLMDEC=13   13YES                                                     2
SAMSIZ     38     3    17    32    11    19    24    61    30     3    48    60    32
( F6.2,  F6.2,  F6.2,  F6.2,  F6.2,  F6.2,  F6.2,  F6.2,  F6.2,  F6.2,
 F6.2,  F6.2 )
   464   060  1486  1022  1394   906  1179 -1501 -0690  1372 -0482 -1376
 -1010 -0005  1393 -1787 -0105 -1339  1041  0279 -1805 -1186  0658 -0439
 -1399  0199  0159  2273  0041 -1132  0768  0375 -0513  0292  1026 -1334
 -0287  0161
 -0853  0235  0862
 -0957  0525 -1865 -0035  0371 -0702 -0432 -0455  0120 -0238 -0869 -0273
 -1016  0417  0056  0561 -0237
 -0271  0932 -1029  0479  2709 -0057 -0300 -0594 -1047 -1347  0996 -1023
  0551  0418  0074  0524  0479  0326  1114  1068  0772  0226 -0298  1064
  0162 -0129 -1204  1097 -0916  1222 -1153  1298
  0274 -0976  0957 -0686  0097  0269  0447 -0859 -0780 -1132 -1256
 -1329  1284  0619  0699  0101 -1381 -0574  0076  1389  1249  0756 -0860
 -0860 -0778  0037  2619 -0420  1048  1000  0170
  2252  0554 -1203 -1210  0794  1001  0217 -3111  0354  0639  0317  0771
  1303 -1326 -0676  0592 -0395 -0825  2362  1050  0298 -0726 -1483 -0224
 -1752 -0291 -0933 -0450  0512 -0702  0234 -0509 -1776 -0044  0263  0986
 -0441 -0866 -1215 -0475  1200 -0498 -0743  0779 -0206 -0092 -1222  0068
  0183 -0811 -1010  1453  0759  0287 -0669  0392 -0337  0369 -1694  0985
 -1063  0033  0597 -1601 -0266  0901 -1433  1327 -0248 -0401  0344  0441
  0824  1385 -0329  0085  0130 -0244 -0832  0472  0039  1420 -1033  1807
 -0570
 -1210  0131 -1202  0894 -0780 -0195 -0927 -1582  0075  1600 -2904  1149
  1210 -0838  0278  0035  0106  0199 -1990  0710  0340 -0594 -1527  0362
 -0570 -1309  1531 -1008  0763  0788
 -0679 -0324 -0372
 -1084  0318  0367 -0992  0529  0278  1392  0409  0061 -0964  0507 -1414
 -0847 -1191  0185 -0090 -0866 -1116 -0155 -1387 -0046 -0454  0575 -0266
  1246  0557  0004 -1114 -0586  0882  0679 -0032  0091  0838 -0304  1082
 -2716  0823 -1248  0346 -0537 -0402  1214 -1254  1353  1511 -0184 -0264
 -0182 -0165 -0717  1407 -1060 -0192  0154  1278  2455  0524 -0445  0795
 -1638 -0880 -0281 -1187 -0417 -1611 -0983  0490 -1117  0652 -0200  1751
  0539 -1545 -0520 -0218  1169 -1543 -0930  1341 -1208 -1430  0449 -1225
  0604 -0446  1353 -0024  0394 -0218 -0513 -0393  0474  2847  2315 -1212
 -0049  0027 -0856 -0276  0039  1468 -1905  2295 -0602  0229  1382  0978
 -0678 -0366 -1074 -0600  0918 -0791  0598  0567  0963  0489 -1627 -1096
 -2532  0024  0192 -1324 -0726 -1618  1695  0790  1792  0771 -1438 -0294
 -1966 -0999  0581  0370  0834 -0376 -1621  0163
FINISH
```

Problem Card

Problem DEC = 13

13 treatment groups, k

Treatment group means and standard deviations are desired.

2 F-type Variable Format Cards

Sample Size Card

The sample sizes of the first 12 groups are the same as in the previous problem; $n_{13} = 32$.

BMD01V - ANALYSIS OF VARIANCE FOR ONE-WAY DESIGN - REVISED JANUARY 5, 1972
HEALTH SCIENCES COMPUTING FACILITY, UCLA

PROBLEM CODE VAR=12
NUMBER OF TREATMENT GROUPS 12
NUMBER OF VARIABLE FORMAT CARDS 1
DATA INPUT TAPE 5

THE VARIABLE FORMAT
(12F6.1)

TREATMENT GROUP	1	2	3	4	5	6	7	8	9	10	11	12
SAMPLE SIZE	38	3	17	32	11	19	24	61	30	3	48	60
MEAN	0.4158	8.1333	-29.6411	19.1958	-33.1363	24.7105	5.5525	-10.6376	-21.5499	-45.8333	-8.9103	2.1834
STANDARD DEVIATION	105.6037	86.7765	64.6698	93.6208	75.4526	107.1424	124.1842	86.4095	109.7837	19.2604	90.5390	111.7597

ANALYSIS OF VARIANCE

	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO
BETWEEN GROUPS	77396.0625	11	7036.0033	0.7110
WITHIN GROUPS	3305029.0000	334	9895.2933	
TOTAL	3382425.0000	345		

BMD01V - ANALYSIS OF VARIANCE FOR ONE-WAY DESIGN - REVISED JANUARY 5, 1972
HEALTH SCIENCES COMPUTING FACILITY, UCLA

PROBLEM CODE CFC=13
NUMBER OF TREATMENT GROUPS 13
NUMBER OF VARIABLE FORMAT CARDS 2
DATA INPUT TAPE 5

THE VARIABLE FORMAT
(F6.2, F6.2, F6.2, F6.2, F6.2, F6.2, F6.2, F6.2, F6.2, F6.2,
F6.2, F6.2)

TREATMENT	SAMPLE SIZE	MEAN	STANDARD DEVIATION
1	38	0.04158	10.56037
2	3	0.81333	8.67765
3	17	-2.96411	6.46697
4	32	1.91968	9.36209
5	11	-3.31363	7.54525
6	19	2.47105	10.71424
7	24	0.55625	12.41843
8	61	-1.06376	8.64095
9	30	-2.15499	10.97838
10	3	-4.58333	1.92634
11	48	-0.89104	9.05391
12	60	0.21834	11.17594
13	32	-2.61843	10.88173

ANALYSIS OF VARIANCE

	SUM OF SQUARES	DF	MEAN SQUARE	F RATIO
BETWEEN GROUPS	919.7546	12	76.6462	0.7618
WITHIN GROUPS	36721.0625	365	100.6055	
TOTAL	37640.8164	377		

END

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