

AMRL-TR-68-51

LEARNER-CENTERED INSTRUCTION (LCI):

**VOLUME II — JOB BEHAVIORAL DESCRIPTION
FOR AFSC 322X1R**

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Foreword

This report represents both the exploratory development and the advanced development programs of the Technical Training Branch, Behavioral Sciences Laboratory. The job behavioral description presented in this report is a portion of the Advanced Development Program on Learner-Centered Instruction, which is documented under Project No. 686F-(INNOVATE), Innovations in Training and Education. First Lieutenant Larry Sayre is responsible for the overall administration of Project INNOVATE. Mr. Horace H. Valverde is responsible for that portion of the project that pertains to Learner-Centered Instruction. The development of this job behavioral description is related to the exploratory development program of the Technical Training Branch and it was supported under Task 171004, "Techniques for Training, Aiding, and Evaluating the Performance of Technical Tasks" of Project 1710, "Human Factors in the Design of Training Systems." Dr. Gordon A. Eckstrand is the Project Scientist. Dr. Ross L. Morgan is the Task Scientist.

This report covers part of the research conducted under Contract AF 33(615) 5161 by Applied Science Associates, Inc. Dr. John D. Folley, Jr., was the principal investigator for Applied Science Associates, Inc.

The authors express their appreciation to MSgt M. Hagerman and MSgt L. Stansberry, of Cannon Air Force Base, New Mexico, and to MSgt P. May, TSgt J. Banks, and Mr. A. Hanson of Lowry Air Force Base, Colorado, for their assistance during the development of the Weapon Control Systems Mechanic/Technician job behavioral description.

This technical report has been reviewed and is approved.

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Abstract

This report describes the approach taken in the development of a job-behavioral description for the Learner-Centered Instruction (LCI), Weapon Control Systems Mechanic/Technician, Air Force Specialty Code (AFSC) 322X1R course to be conducted at Lowry AFB, Colorado. The behavioral description will serve as a basis for the preparation of Statements of Learning Objectives (SOLOS) and a performance criterion test in the development of the LCI course. The term LCI, as used in this advanced development program, refers to a course based upon a systems approach to training. The course is a job-oriented electronics course for training airmen to perform flight-line maintenance tasks on weapon control systems.

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Section I.

INTRODUCTION

BACKGROUND

This report is the second of a series describing the development of the Air Force F-111A Weapon Control Systems (Fire Power Control) Learner-Centered Instruction (LCI), Electronics Maintenance course. The introductory report in this series (Valverde, 1968) describes the overall purpose and proposed development of this LCI electronics maintenance course. Subsequent reports will present the results of the development of the job performance test, maintenance task environment simulator, plan of instruction, course development methodology, and the course evaluation as proposed in Figure 1. Report titles within solid-line blocks have been published. Dashed-line blocks indicate titles to be published later. The term "LCI," as used in this advanced development program, refers to a systems approach to training. The term "ABR" refers to Airman Basic Resident.

PURPOSE

The purpose of this report is to present a job behavioral description of the Air Force Specialty (AFS) Weapon Control Systems Mechanic/Technician, Air Force Specialty Code (AFSC) 322X1R for the F-111A weapon system. The behavioral description will serve as a basis for the preparation of Air Training Command Statements of Learning Objectives (SOLOs) and the job performance criterion test for the LCI program. In later developments, the SOLOs will be used to determine the training content of the LCI course. The procedures used in the development of the behavioral description should be generalizable to other technical training areas.

PROBLEM

A review of the literature on training research reveals that, except in isolated instances, relatively little effort has been expended in the development and field tryout of actual job performance measurements. Because of the complexity involved in any attempt to provide adequate measures of human performance, greater stress has been placed on paper-and-pencil evaluation of knowledge about jobs. However, such peripheral measurements do not provide adequate feedback concerning the trainee's demonstrated performance in the real job environment. Consequently, the job performance assessment of maintenance technicians is a continuing and difficult Air Force training problem.

DEVELOPMENTAL EFFORTS

The most apparent solution to the performance criterion problem is to measure the technician's ability to perform the tasks required on the job. To accomplish this objective, however, first it is necessary to obtain a systematic and complete list of tasks in terms of the behaviors which the technician must perform. Therefore, during Phase 1 of the two phases of behavioral description preparation, task data concerning the Weapon Control Systems Mechanic/Technician job specialty were collected during visits to General Dynamics, Fort Worth, Texas; Edwards Air Force Base, California; and Cannon Air Force Base, New Mexico.

The information obtained in the task analysis phase was used in Phase 2 to develop the behavioral description which identifies and describes the job behaviors required of airmen assigned to maintenance duties in AFSC 322X1R. Thus, the behavioral description (a product of task an-

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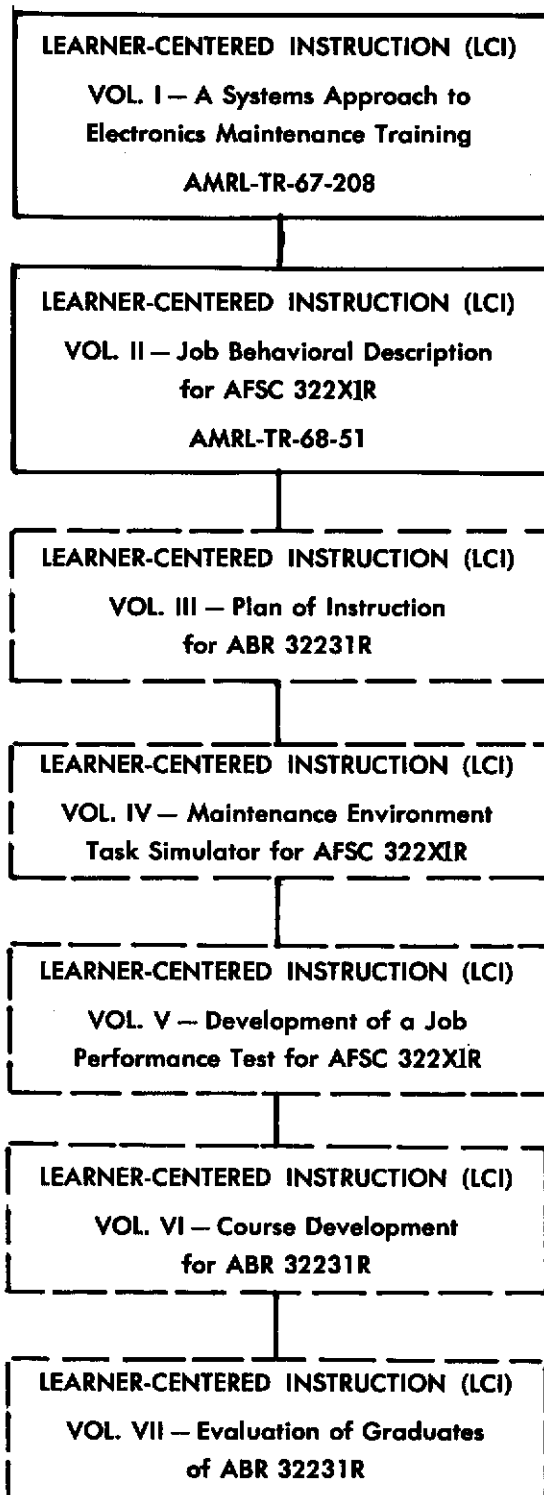


Figure 1. Learner-Centered Instruction Reports

alysis) represents a profile of behaviors which the technician should perform to maintain equipment at maximal operational capability. However, the behavioral description alone will not produce an effective training program. A great deal of skill and effort is required to translate the derived list of behavioral activities into training objectives, performance criteria, course content, and media requirements. Subsequent LCI developmental efforts will focus attention upon methods used to make training decisions based upon the behavioral description presented in Section III of this report.

MAINTENANCE EQUIPMENT AND PERFORMANCE AIDS

The technician's job behaviors are related to the prime equipment maintained, the test equipment and performance aids used, and the level of maintenance activity performed. The Weapon Control Systems Mechanic/Technician is responsible for the following F-111A prime equipment systems and their interconnecting wiring:

1. Attack Radar System (ARS)
2. Lead Computing Optical Sight System (LCOSS)
3. Sequential Dual Bombing Timer (SDBT)

The test equipment used by this technician* consists of the following:

1. All self-test provisions of the prime equipment.
2. A multimeter (PSM-6 or equivalent).
3. An oscilloscope (Tektronix 545A or equivalent).
4. The Subsystem Tie-In Test Set.
5. The Pressurization Test Set.
6. The Ultrasonic Leak Detector.

This technician's specified performance aids include the following technical orders (T.O.s):

- | | |
|--------------------------|---|
| 1. T.O. 1F-111A-2-5-1 | Weapon Control System (LCOSS and SDBT) |
| 2. T.O. 1F-111A-2-19 | Attack Radar and Terrain Following Radar Systems |
| 3. T.O. 1F-111A-4-22 | Illustrated Parts Breakdown, Attack Radar and Terrain Following Radar Systems |
| 4. T.O. 1F-111A-4-22 | Illustrated Parts Breakdown, Fire Power Control Systems (LCOSS and SDBT) |
| 5. T.O. 1F-111A-2-19CL-1 | Organizational Check List, Attack Radar System |
| 6. T.O. 1F-111A-2-22CL-2 | Organizational Check List, Attack Radar, and Integrated Systems |
| 7. T.O. 1F-111A-2-22CL-6 | Organizational Check List, Lead Computing Optical Sight, and Integrated Systems |

*The term "technician" used in this report also includes "mechanic."

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- | | |
|---------------------------|---|
| 8. T.O. 1F-111A-2-5-ICL-1 | Organizational Check List Firepower Control System (SDBT) |
| 9. T.O. 1F-111A-2-14 | Wiring Diagrams |
| 10. T.O. 33D7-3-59-1 | Subsystem Tie-In Test Set |
| 11. T.O. 1F-111A-2-16-1 | Air Data Computer System |
| 12. T.O. 1F-111A-2-22 | Systems Integration Information |

The maintenance responsibility of this technician is organizational flightline maintenance. He maintains the aircraft on the flight line to the level of the line replaceable units and wiring harness. Line-replaceable-units (LRU's) are not repaired by this technician; he finds the faulty one in the aircraft and replaces it. However, he is responsible for effecting wiring harness repairs.

Section II.

APPROACH

The behavioral task description was completed in the following two phases:

1. Data Collection
2. Behavioral Analysis

During the data collection phase, information on the technician's maintenance functions was obtained from the technical orders and from personnel concerned with the prime equipment, the training, and the performance aids of this technician. The functions on which information was obtained were: checking, adjusting, servicing, replacing, repairing, and troubleshooting. During phase 2, this maintenance function information was analyzed using a modification of the Task Analysis Method (Chenzoff and Folley, 1965). This analysis was performed to identify tasks, to determine task "activities," and to describe behavioral details.

DATA COLLECTION

Obtaining reliable information about technician functions for a system which is still in Category II testing is a task full of uncertainty. Studies done by Miller and Folley (1951, 1952) and by Miller, Folley, and Smith (1953) demonstrated, however, that electronic maintenance task analysis data obtained on prototype systems still under development had a high degree of applicability to later production models of the same system. Preparation of this behavioral analysis is another attempt to assess the validity of maintenance job requirements determined before a system has accumulated any substantial field experience. It is the beginning of a systems approach to training for a new system. The extent to which this development project succeeds should have implications for use of this technique for development of training for future systems.

In contrast to a system which has been in the field for some time, a test system is constantly being modified. Procedures and technician functions are constantly changing and representative task times are nonexistent. The information available is, in some cases, only an approximation of the finalized procedure or reading that will be used by the technicians in the field. However, neither official changes, such as altering a sequence of steps or changing a meter reading nor unofficial changes, such as replacing a Line Replaceable Unit (LRU) instead of using the subsystem Tie-In Test Set, are expected to be drastic for this system. Both types of changes should be easily incorporated into the performance test to be based upon this behavioral description, because they should not significantly alter the intellectual or behavioral requirements placed on the technician. In order to maximize the accuracy of the information finally used, every effort was made to verify information at each of the data collection sites.

The sources of information were technical orders, manufacturers' representatives, Air Force test personnel, and Air Force instructors. Data was collected at three sites:

1. General Dynamics, Fort Worth, Texas
2. Edwards Air Force Base, California
3. Cannon Air Force Base, Clovis, New Mexico

One visit, which lasted about a week, was made to each site. To maximize the amount of information obtained, we adopted and tried to adhere to a standard data collection procedure.

Just before each trip and before any trips were made, the technical orders were examined to determine the technician's maintenance functions for the overall system, for each of the subsystems and interconnecting wiring, and for each LRU. Procedures, decisions, equipment usage, etc. which were not covered in the technical orders, or about which we had any questions, were noted as topics to be discussed with personnel at the data collection site.

On site we explained to our informants the type of information we were trying to obtain, and then asked them to work through certain problematic portions of the technical orders. Whenever their explanations were not clear, they were asked specifically how a function was performed and, when possible, to demonstrate using the actual equipment involved. Every attempt was made to observe technicians actually performing the job, but because of the limited number of aircraft in existence and the ongoing test program, we were never able to do this. At the last site we visited (Cannon AFB) a training mockup of the systems was available to us. We were able to run most of the check procedures and to observe a demonstration of the use of the Subsystem Tie-In Test Set.

Source _____ Date _____

Observer _____ Location _____

5161 DATA COLLECTION

<i>Equipment</i>		<i>Critical Aspects</i>			
<i>Maintenance Functions</i>	<i>ASA code</i>	<i>Test Equipment</i>	<i>Tools</i>	<i>Performance Aids</i>	<i>Error Producing</i>

Figure 2. Data Collection Form

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The technical order information augmented by that obtained from the trips constituted the data collected. All pertinent information was recorded on the data collection form shown in Figure 2. Before any trips were made, the forms were completed using technical order information. Whenever verified information, either contradictory or supplementary, was obtained, it was substituted for, or added to, that already recorded on the form. The following information was recorded on the forms:

Source: The origin of the information was recorded to facilitate rechecking any inconsistencies between two sources. The sources included technical orders and people.

Observer: The initials of the task analyst obtaining the information from the source were entered here.

Location: The site name or geographical location of the source was listed as the location.

Equipment: In this space the name of the system or unit to which the maintenance functions applied was written. For example, the listed functions could pertain to the overall integrated system, one of the systems (ARS, LCOSS, or SDBT), or a line-replaceable-unit (e.g., the lead- and launch-computing amplifier).

Maintenance Functions: Actions performed by the technicians were recorded as the maintenance functions. Some examples are: (a) performs cross-hair kill test; (b) changes lead computing gyroscope; and (c) checks wiring harness.

Code: The following five codes were used, each representing one of five equipment related functions performed by the technician: C—checking, A—adjusting, S—servicing, Rpl—replacing, Rpr—repairing, or T—troubleshooting.

Critical Aspects: Those aspects of the test equipment, tools, or performance aids which have critical effects on required job behaviors were listed here. For example, successful job performance requires that the technician somehow know the equipment tolerances. Job behaviors different from those normally required are needed when tolerances are ambiguous or missing from the performance aids. Therefore, missing tolerances were listed as a critical aspect of performance aids.

Some critical aspects are especially likely to produce errors in job performance, and we felt these should be listed separately. One outstanding example was found in a troubleshooting procedure. In this case, two line-replaceable-units could be causing the trouble, but only one is listed in the performance aid. If the malfunction is not corrected by replacing the unit listed, the technician would have to conclude that the trouble was in the wiring harness. This conclusion could be wrong, because the unlisted LRU has not been replaced. Only if replacing both LRU's did not cure the malfunction would the wiring harness be causing the malfunction. This item was recorded as error-producing because the technician can be led to an incorrect alternative by following the performance aid.

Data collection was concluded when all known sources of information were exhausted and it was apparent that we were not going to be able to observe technicians performing the maintenance job. At this point, all information was pooled and a final set of maintenance function forms was prepared. These forms were then used as the starting point of the job behavioral description. The maintenance functions were analyzed to determine tasks, activities, and behavioral details of the Weapon Control Systems Mechanic/Technician job.

BEHAVIORAL JOB ANALYSIS

The analysis was performed in the following sequence of stages:

1. Identifying tasks
2. Determining task activities
3. Describing behavioral details

The following are some basic definitions used in Task Analysis Method (TAM):

1. A task is composed of one or more activities that are: (a) bounded by two events, (b) directed toward achieving a single objective or goal, and (c) describable so that the resulting description conveys enough information about the task to permit performance testing decisions to be made.
An event is a discrete, identifiable act or occurrence (e.g., (a) pilot debriefing completed, (b) LRU replaced).
2. Activities are classes of behaviors of which a task may be composed. The 5 classes used in TAM are defined below. The profile of activities in a task has relevance to job performance testing.
3. The behavioral details are the basic behaviors required in performing each activity. This information fills in the details to supplement the information already recorded in the previous stages. The information obtained in this stage will be used in determining aspects of the task to be measured by the job performance test.

The word "activities" has a special meaning in TAM. It refers to one of the following five types of behavior:

1. Procedure Following
2. Continuous Perceptual-Motor Activity (Tracking)
3. Monitoring
4. Communicating
5. Decision-Making and Problem-Solving

Brief descriptions and examples of the behaviors in each activity are given below.

1. Procedure Following

Performing a sequence of discrete steps, each of which has an identifiable beginning and ending point. The procedure may be either fixed or branched. A branched procedure is one in which the step to be performed at one or more points is governed by the result of a perception or discrimination in a previous step or steps.

Examples of steps:

- a. Setting a control
- b. Reading a display
- c. Observing a display reaction and operating a control to set the display to a certain point

Examples of procedure following:

- a. Performing an operational check of the Attack Radar antenna
- b. Removing and replacing a line replaceable unit

2. Continuous Perceptual-Motor Activity

Observing displays and operating controls continuously to maintain a specified relationship between an object under the operator's control and other objects.

An example of continuous perceptual-motor activity:

Keeping the radar azimuth and range crosshairs on a moving target for more than one sweep on the scope to accomplish radar lock-on

3. Monitoring

Observing a display, or a portion of the environment, either continuously or by scanning, in order to detect a specified kind of change. The concept of monitoring involves prolonged or periodic *watchfulness* to detect a specific class of cues or environmental change. The moment of occurrence of the change is often not predictable.

Examples of monitoring:

- a. Keeping watch for targets on a radar scope
- b. Watching an oscilloscope to determine when a trigger pulse occurs

4. Communicating

Receiving and/or sending information either in words or in other kinds of symbols.

Examples of communicating:

- a. Giving instructions to a technician
- b. Ordering spare parts
- c. Debriefing a pilot

5. Decision Making and Problem Solving

Decision making consists of choosing a course of action on the basis of facts, opinions, and other relevant information. Problem solving is a broad category of purposeful or goal-directed thinking which includes decision making. Generally, decision making involves evaluation of several alternative courses of action in order to choose the one which best serves the purpose of the decision maker. However, decision making also includes those cases in which only one course of action is considered, when the action is selected on the basis of past experience, or a rule-of-thumb, so long as doing something else or doing nothing could have been chosen. The above situation is not the same as following a branched procedure, in which case there is a rule specifying the next action to be taken based on the outcome of the present action.

Examples of decision making or problem solving:

- a. Troubleshooting (non-procedural)
- b. Figuring out how to repair something with available materials

Behavioral detail descriptions clarify the specific behaviors performed under each activity. There are two classes of behaviors, only one of which was of major interest and concern. Normal

Repertoire Behaviors (NRB) are those which require no special skills or knowledges to perform. A person who can read and follow directions can perform these behaviors. Therefore, they are of little concern in this analysis. This is not to say that NRBs do not have to be performed in order to do the job, but only that these behaviors do not discriminate between technicians and non-technicians. Special Behaviors (SB) are those which only the well-trained, proficient technician using his special skills and knowledges can perform. These behaviors are of major interest. The critical aspects of these behaviors (e.g., tricky discriminations, particularly rapid responses, knowledge of unfamiliar terms, and operation of special test equipment) peculiar to each task are recorded. No information is recorded concerning knowledge of special names, appearance of equipment, or locations of controls, displays, or other items of equipment. These must be known for every task, so there is no point in repeating them for each task individually.

JOB ANALYSIS PROCEDURES

Stage 1. Identifying tasks.

The first step in identifying the tasks was to examine the final list of maintenance functions to determine a logical breakdown of technician behaviors. The first set of tasks identified were those dealing with the operational checkout and self-test troubleshooting of the three major systems (LCOSS, ARS, and SDBT), troubleshooting with the Subsystem Tie-In Test Set, removal and replacement procedures, locating and correcting wiring harness malfunctions, and boresighting the optical display sight cradle. Re-examination of the behaviors in these categories showed that a further and more useful breakdown of tasks within each category was possible. Therefore, these first categories were designated task blocks, of which there were ten in number.

The second step in this initial stage of the analysis was to examine each block to identify events which terminated or initiated a group of actions aimed at accomplishing a single objective. An initiating event could be, for example, a communication that the optical display sight was not functioning properly. There would then be a group of actions performed to check out the optical display sight. The terminating event could be a communication that the sight was all right, or an indication of equipment malfunction causing the technician to stop the operational checkout. This same indication could serve as the initiating event for a different group of actions aimed at a new objective. The collection of behaviors occurring between these initiating and terminating events were designated as tasks.

The task blocks and tasks identified are listed in section III.

Stage 2. Determining task activities.

After all the tasks in each of the task blocks were identified, each task was examined to determine which class or classes of behavior were required in performing the task. The specific behaviors required of the technician were matched against the definition of each activity. The activities identified were then listed under the task.

Most tasks contained only one activity, others contained several. A few tasks contained behaviors which did not clearly fall into one of the five basic activities described earlier. In these cases, the activity listed was the basic activity containing behaviors most nearly like those performed.

The activities performed in each task are listed under the task in section III of this report.

Stage 3. Describing behavioral details.

After all task activities were determined, the form shown in Figure 3, which is taken directly from the TAM report cited earlier, was used as a guide for developing the behavioral details descriptions. The following is a brief description of the information used to describe the behavioral details for each activity:

1. Procedure Following: Two kinds of procedures were identified: fixed and branched. A fixed procedure always contained the same steps performed in the same sequence. A branched procedure, on the other hand, contained a different number of steps, different steps, or different step sequences each time it was performed. When dealing with a branched procedure the maximum possible number of steps in the procedure and steps which are SB were recorded. A step in this analysis involved the manipulation of a single control, or the observation of a single display, in contrast to some analyses which consider, for example, an entire radar turn-on procedure a step. The SB steps were described by a statement or short sentence.

2. Continuous Perceptual-Motor Activity: The information recorded for this activity, with only two exceptions, is self-explanatory. Lag and backlash are factors which introduce a delay between the instant the control is activated and the instant the display starts to react. Both could make the task difficult and where they were found their presence was noted.

3. Monitoring: No instances of this activity were found for AFSC 322X1R.

4. Communicating: The information recorded under this activity is self-explanatory.

5. Decision Making and Problem Solving: Three general classes of decision making or problem solving were considered. The first of these was one in which only one of several available courses of action are considered, such as when the decision-maker uses a rule of thumb, special knowledge or experience, or memory of what action proved successful in the past. The second was one in which criteria for an adequate solution are known and alternatives are evaluated until one is found which satisfies the criteria. The third was one in which most possible alternatives are known, and the one that it follows is the one which *best* fits the criteria. In this analysis, the type of decision to be made was determined first. Then a description of the decision process was written, stating the problem, the alternatives available or possible, and the information considered in reaching a decision.

Describing the behavioral details completed the analysis of each task. The section which follows contains the complete job behavioral description of AFSC 322X1R.

BEHAVIORAL DETAILS DESCRIPTION FORM Block No. _____ Task No. _____

Procedure Following

Number of steps in procedure: _____ Number of steps which are SB: _____

Kind of procedure: _____ Fixed _____ Branched Describe kinds of SB steps below:

Continuous Perceptual-Motor Activity

Type

____ Guiding a vehicle ____ Operating remote manipulators ____ Keeping cursor on target ____ Other _____

Displays

____ Direct or window view ____ Scope or instruments ____ Optical System ____ Other _____

Controls

____ Steering wheel ____ Tracking handle ____ Handwheels ____ Other _____

Control-Display Relationship

____ Position control ____ Velocity control ____ Acceleration control ____ Lag ____ Backlash ____ Other _____

Error tolerance or accuracy required: _____

Monitoring

Object or signal to be monitored: _____

Display

____ Scope ____ Window view ____ Instruments ____ Optical system ____ Sounds ____ Other _____

Relevant Attribute

____ Movement of object or signal ____ Appearance of object or signal ____ Change in object or signal

____ Other _____

Other Data

Estimated frequency of events: _____

Search area: _____

Are events easy to detect? _____

If "no," how should detection be made? _____

Communicating

____ Radio or telephone ____ Direct verbal ____ Direct observation ____ Written or printed English

Media

____ Video ____ Electro-mechanical displays ____ Other _____

Special Knowledge Requirements

____ Code ____ Format ____ Keyboard operation ____ Operation of special equipment (Specify)

Decision-Making and Problem-Solving

____ The chosen solution or alternative is one which has proven successful in the past or one dictated by standard procedure.

____ Reasonable alternatives are generated, considered, and rejected, until an acceptable one is found.

____ Most possible alternatives are known by the decision-maker or problem-solver, and all reasonable ones are evaluated.

Items or kinds of information used in reaching decision or solution (describe): _____

Figure 3. Behavioral Details Description

Section III.

JOB BEHAVIORAL DESCRIPTION

INTRODUCTION

A key concept in the job analysis method used to develop this description is that procedural tasks (which emphasize most maintenance tasks) can be usefully described on two relatively independent dimensions.

- a. The sequence of procedural steps.
- b. The characteristics of the individual steps.

The method of describing the characteristics of the individual steps in terms of NRB and SB has already been outlined.

The job analysis method excludes the recital of all the procedural steps involved in the job. Rather, it concentrates on the critical parts of the job in much the same manner as does Flannagan's Critical Incident Technique (1954).

This does not mean that the sequence of procedural steps is unimportant. This sequence is one of the critical aspects of the job. The total procedures, which appear in the technical orders, are thus included by reference so that the total sequence of procedural steps is known. In this way, much of the detail which adds little information to the description is excluded, but a means for determining the sequence of all steps, both NRB and SB is preserved.

TASK BLOCKS

- I Operational check of LCOSS
- II Operational check of ARS
- III Operational check of SDBT
- IV Troubleshooting the LCOSS
- V Troubleshooting the ARS
- VI Troubleshooting the SDBT
- VII Troubleshooting with the Subsystem Tie-In Test Set
- VIII Removal and Replacement Procedures
- IX Locating and Correcting Wiring Harness Malfunctions
- X Boresighting the Optical Display Sight Cradle

Block I Tasks (Operational check of LCOSS)

1. Establish Initial Setup
2. Check Reticle Brilliance
3. Perform Mechanical Cage Test
4. Perform Com Mode Self-Test
5. Perform GAR-8 Mode Self-Test
6. Perform Gun-AA Mode Self-Test
7. Perform Gun-AG Mode Self-Test
8. Perform RKT-AG Mode Self-Test
9. Perform DIV-BOMB Mode Self-Test
10. Perform LOF-BOMB Mode Self-Test

11. Perform LEV-BOMB Mode Self-Test
12. Perform HOM Mode Self-Test
13. Perform Manual Depression Test

Block II Tasks (Operational check of ARS)

1. Perform Pressurization Test
2. Establish Initial Conditions
3. Perform ANT. TILT Test
4. Check Range Marks
5. Check Range and Azimuth Cursor Slewing
6. Perform Lamp and Camera Magazine Test
7. Check Modulator-Receiver-Transmitter Parameters
8. Perform Stabilized Platform Unit and Terrain Following Radar Tie-In Tests
9. Check Target Presentation
10. Perform Navigational Computer Unit Initial Setup
11. Perform Navigational Computer Unit Tie-In Test
12. Perform Altitude Calibrate Test
13. Perform Crosshair Kill Test
14. Test GND VEL Mode Operation
15. Test Air Mode Operation
16. Perform Mechanical Check

Block III Tasks (Operational check of SDBT)

1. Perform Initial Setup
2. Check Timer Operation

Block IV Tasks (Troubleshooting the LCOSS)

1. Select Path in Troubleshooting Chart
2. Perform Self-Test Indicated
3. Test Using Subsystem Tie-In Test Set

Block V Tasks (Troubleshooting the ARS)

1. Select Path in Troubleshooting Chart
2. Perform Self-Test Indicated
3. Test Using Subsystem Tie-In Test Set

Block VI Tasks (Troubleshooting the SDBT)

1. Decide Where to Test
2. Perform Test Indicated

Block VII Tasks (Troubleshooting with the Subsystem Tie-In Test Set)

1. Perform Test Set Self-Test
2. Connect to Prime Equipment

Block VIII Tasks (Removal and Replacement Procedures)

1. Remove and Replace Optical Display Sight
2. Remove and Replace Lead and Launch Computing Amplifier

3. Remove and Replace Lead Computing Gyroscope
4. Remove and Replace Indicator Recorder
5. Remove and Replace Electrical Synchronizer
6. Remove and Replace Antenna-Indicator Control
7. Remove and Replace Radar Set Control
8. Remove and Replace Antenna Assembly
9. Remove and Replace Antenna Control Unit
10. Remove and Replace Modulator-Receiver-Transmitter
11. Remove and Replace Antenna Pedestal
12. Remove and Replace Sequential Dual Bombing Timer

Block IX Tasks (Locating and Correcting Wiring Harness Malfunctions)

1. Troubleshoot the Wiring Harness
2. Repair Faulty Wires

Block X Tasks (Boresighting the Optical Display Sight Cradle)

1. Prepare Aircraft
2. Install Forward and Aft Fuselage Fixtures
3. Remove Optical Display Sight
4. Align Reference Axis
5. Install Armament Datum Line Boresight Fixture
6. Adjust Optical Display Sight Cradle
7. Replace Optical Display Sight

TASK CUEING AND SEQUENCING

Operational checkout tasks are initiated by a write-up of system malfunction. Checkout tasks are stopped and troubleshooting tasks are started when a checkout self-test fails. Troubleshooting tests are performed, following the troubleshooting tests are performed, following the troubleshooting logic chart sequence, until the malfunction is isolated to an LRU or interconnecting wire. Following remove and replace or repair tasks, performed to effect the corrective action, the system operational checkout tasks are repeated to assure corrective system operation.

JOB BEHAVIORAL DESCRIPTION

Block I (Operational check of LCOSS)

Task: Establish Initial Setup

Activities: Procedure-Following

Behavioral Details: 16-step fixed procedure, no SB steps

Task: Check Reticle Brilliance

Activities: Procedure-Following

Behavioral Details: 7-step fixed procedure, no SB steps

Block I (Operational check of LCOSS)

Task: Perform Mechanical Cage Test

Activities: Procedure-Following

Behavioral Details: 16-step fixed procedure, 2 SB steps

The SB steps require the technician to perceive a 4 milliradian error in aiming reticle position. Perception must be made visually and no performance aids are provided. (Figure 4 Note)*.

Task: Perform Com Mode Self-Test

Activities: Procedure-Following

Behavioral Details: 17-step fixed procedure, 2 SB steps

The SB steps require the technician to perceive a position error of 7 milliradians for the aiming reticle and 3 milliradians for the command bars. (Figure 4: 11).

Task: Perform GAR-8 Mode Self-Test

Activities: Procedure-Following

Behavioral Details: 6-step fixed procedure, 1 SB step

The SB step requires the technician to perceive indicator position to the nearest 15 minute clock position; graduations are hour marks (Figure 4: 8).

Task: Perform Gun-AA Mode Self-Test

Activities: Procedure-Following

Behavioral Details: 11-step fixed procedure, no SB steps

Task: Perform Gun-AG Mode Self-Test

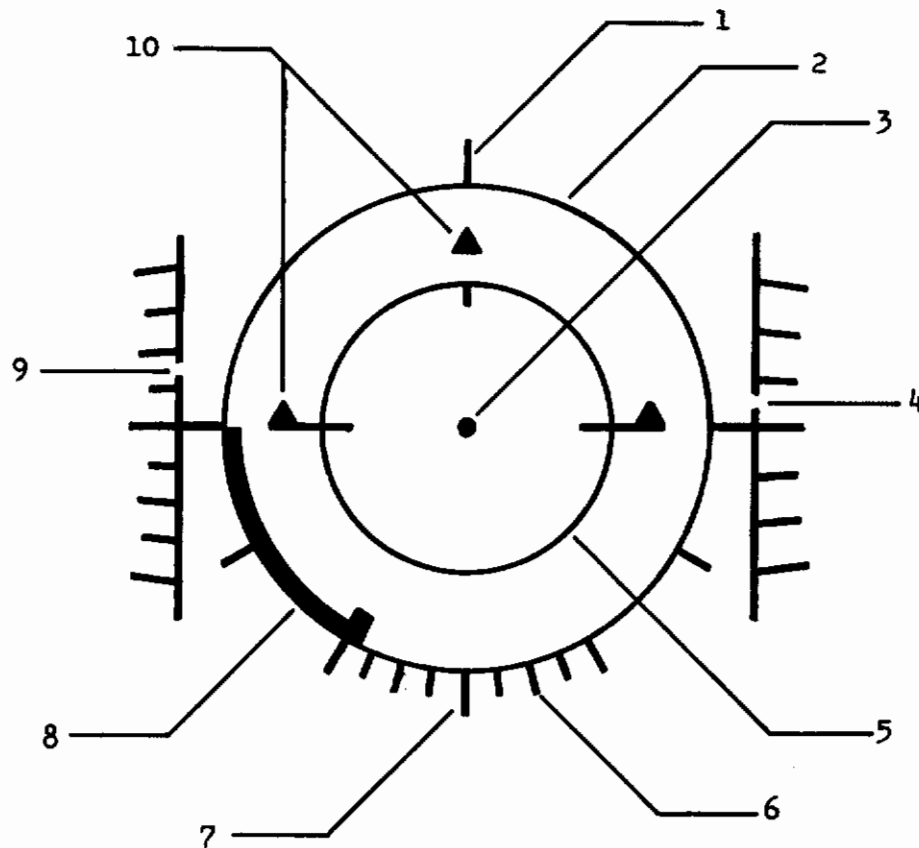
Activities: Procedure-Following

Behavioral Details: 17-step fixed procedure, 2 SB steps

The SB steps require the technician to perceive aiming reticle movements of 4 and 5 milliradians.

*The figure number and index notation (e.g., Figure 4: Note), refer to either figure 3 or figure 4, as indicated. The numbers indicate the display and attribute to which the technician is attending, when performing the SB step.

Contrails



- | | |
|------------------------------|-----------------------------|
| 1. Twelve O'Clock Index | 6. Range Marks |
| 2. 50 Milliradian Circle | 7. Six O'clock Index |
| 3. 2 Milliradian Pipper | 8. Analog Bar |
| 4. Right Deviation Indicator | 9. Left Deviation Indicator |
| 5. 30 Milliradian Circle | 10. Roll Tabs |

11. Command Bars (not shown) form a cross; normally the vertical bar extends from the 12 o'clock to six o'clock index, and the horizontal bar extends from the nine o'clock to three o'clock index. The intersection of the two bars, anywhere within the 50 milliradian circle, depends on mode of operation and target location.

Note: The deviation scales, range marks, circles, and pipper are always in the same relative position. The roll tabs always rotate between the 50 and 30 milliradian circles. Analog bar (range indicator) varies between the nine o'clock and three o'clock positions depending on target range.

Figure 4. Aiming Recticle Display

Block I (Operational check of LCOSS)

Task: Perform RKT-AG Mode Self-Test

Activities: Procedure-Following

Behavioral Details: 13-step fixed procedure, 2 SB steps

The SB steps require perception of a change in aiming reticle position of 3 and 4 milliradians.

Task: Perform DIV-BOMB Mode Self-Test

Activities: Procedure-Following

Behavioral Details: 9-step fixed procedure, 1 SB step

The SB step requires perception of a 3 milliradian movement of the aiming reticle.

Task: Perform LOF-BOMB Mode Self-Test

Activities: Procedure-Following

Behavioral Details: 10-step fixed procedure, 3 SB steps

Two of the SB steps require perception of 3 and 4 milliradian movements of the aiming reticle. The third requires perception of indicator position to the nearest 15 minute clock position; graduations are hour marks. (Figure 4: 8).

Task: Perform LEV-BOMB Mode Self-Test

Activities: Procedure-Following

Behavioral Details: 8-step fixed procedure, 1 SB step

The SB step requires perception of a 3 milliradian movement of the aiming reticle.

Task: Perform HOM Mode Self-Test

Activities: Procedure-Following

Behavioral Details: 10-step fixed procedure, 1 SB step

The SB step requires perception of a 3 milliradian movement of the aiming reticle.

Task: Perform Manual Depression Test

Activities: Procedure-Following

Behavioral Details: 10-step fixed procedure, no SB steps

Block II (Operational check of ARS)

Task: Perform Pressurization Test

Activities: Procedure-Following

Behavioral Details: 10-step fixed procedure, 3 SB steps

Two SB steps require the reading of two flow meters which look like thermometers. The scale divisions are very small and the mercury indicator is difficult to see on the white scale background. The third SB step requires the technician to remember that the test set requires 30 psi for accurate readings (the technical order specifies 28 psi).

Task: Establish Initial Conditions

Activities: Procedure-Following

Behavioral Details: 24-step fixed procedure, no SB steps

Task: Perform ANT. TILT Test

Activities: Procedure-Following

Behavioral Details: 10-step fixed procedure, 2 SB steps

Task: Check Range Marks

Activities: Procedure-Following

Behavioral Details: 17-step fixed procedure, 2 SB steps

The SB steps require the perception of three-tenths of an inch, the distance between the vertex of the sweep and the bottom of the scope and six-tenths of an inch, the distance between the farthest range mark and the top of the scope. (Figure 5: 3, 1).

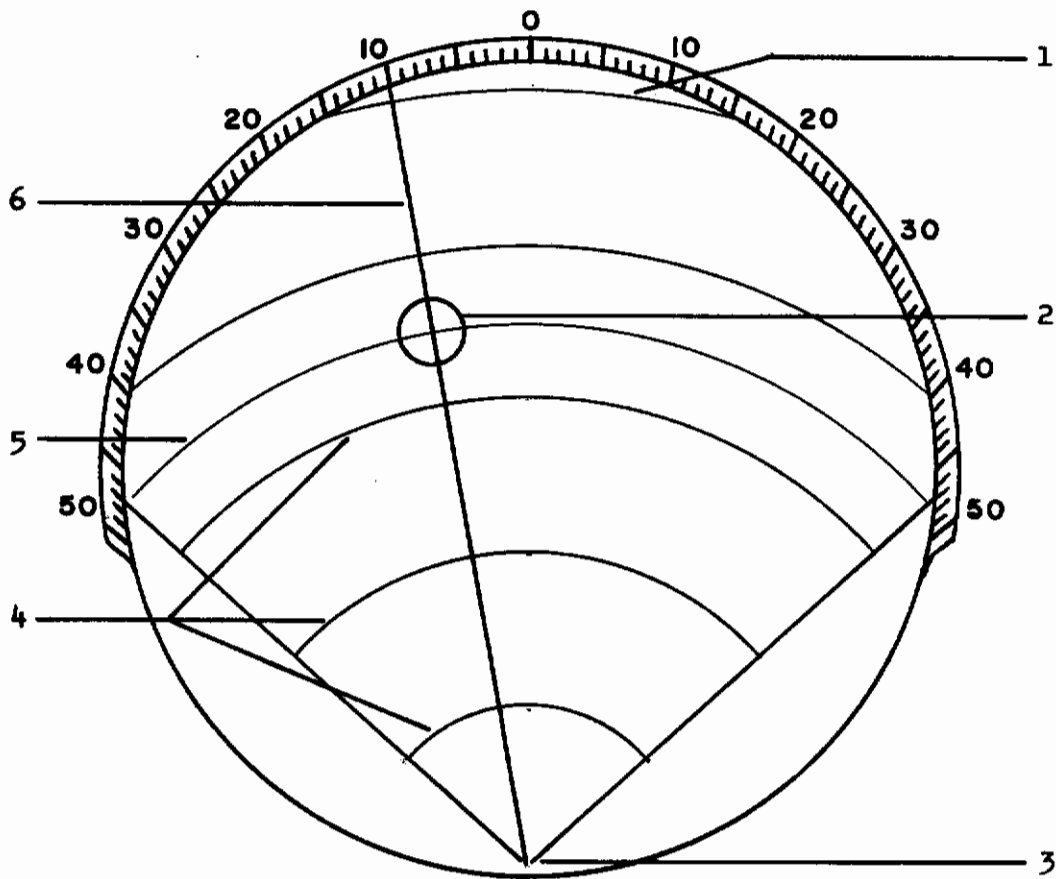
Task: Check Range and Azimuth Cursor Slewing

Activities: Procedure-Following

Behavioral Details: 33-step fixed procedure, 5 SB steps

One of the SB steps requires the perception of increasing rate of slew with increasing control handle displacement. A second SB step requires a judgment of the number of seconds required to slew the range cursor one diameter of the scope screen. The three remaining SB steps require judgments of three sweep rates, as follows: (a) 20 degrees per second, (b) 74 degrees per second, (c) 40 degrees per second. No performance aids, such as a stop-watch, are provided. (Figure 5: 6)

Contrails



- | | |
|--------------------------------|-------------------|
| 1. Top Range Mark | 4. Range Marks |
| 2. Azimuth and Range Crosshair | 5. Range Cursor |
| 3. Sweep Vertex | 6. Azimuth Cursor |

<i>Range (miles)</i>	<i>No. Marks</i>	<i>Marker Spacing</i>
5	5	1 mi.
10	5	2 mi.
30	6	5 mi.
80	4	20 mi.
160	4	40 mi.

Note: In Air Mode, Azimuth Cursor breaks open when radar lock-on occurs. The break extends above and below the Range Cursor.

Figure 5. Attack Radarscope Display

Block II (Operational check of ARS)

Task: Perform Lamp and Camera Magazine Test

Activities: Procedure-Following

Behavioral Details: Possible 23-step branched procedure, 1 SB step

The SB step requires that the technician remember to place the test switch in "lights" to check dimmer switch functioning.

Task: Check Modulator-Receiver-Transmitter Parameters

Activities: Procedure-Following

Behavioral Details: 26-step fixed procedure, no SB steps

Task: Perform Stabilized Platform Unit and Terrain Following Radar Tie-In Tests

Activities: Procedure-Following; Decision-Making and Problem-Solving

Behavioral Details: Procedure-Following – 41-step fixed procedure, 2 SB steps

One of the SB steps requires estimating 1-mile and 20-mile distances on the radarscope when the range shown is 30 miles. The second SB step requires the technician to remember the point in the procedure at which the ALT BYPASS switch is released.

Decision-Making and Problem-Solving – The problem is to determine which of the stabilized platform erection procedures to follow. The alternatives are rapid align and normal align. The information considered by the technician is the position of the controls on the navigational computer unit. The action performed is following the correct procedure in the FIRE POWER CONTROL SYSTEMS, Maintenance Manual. (Figure 5: 4)

Task: Check Target Presentation

Activities: Procedure-Following

Behavioral Details: 20-step fixed procedure, 1 SB step

The SB step requires recognition of "differentiated targets" on the Attack Radar scope.

Task: Perform Navigational Computer Unit Initial Setup

Activities: Procedure-Following

Behavioral Details: 34-step fixed procedure, no SB steps

Task: Perform Navigational Computer Unit Tie-In Test

Activities: Procedure-Following

Behavioral Details: 35-step fixed procedure, 3 SB steps

Two of the SB steps require time judgments, as follows: (a) the range cursor slews 25 miles in 5 seconds, and (b) the azimuth cursor slews 45 degrees in 4 seconds. The third SB

Block II (Operational check of ARS)

step requires that the technician remember the method used to set the navigational computer unit destination counters. (Figure 5: 5, 6)

Task: Perform Altitude Calibrate Test

Activities: Procedure-Following

Behavioral Details: 23-step fixed procedure, 1 SB step

The SB step requires the recognition of linear and non-linear range mark spacing (Figure 5: 4)

Task: Perform Crosshair Kill Test

Activities: Procedure-Following

Behavioral Details: 3-step fixed procedure, no SB steps

Task: Test GND VEL Mode Operation

Activities: Procedure-Following

Behavioral Details: 49-step fixed procedure, 3 SB steps

The first SB step requires the technician to determine that the intersection of the Range and Azimuth Cursors is in the middle of the radar scope. No tolerances are given. The second SB step requires the technician to determine that the sweep vertex is less than 1 radius offset from the center of the scope. However, no information is given as to the quadrant in which the vertex should be located. The third SB step requires the technician to perceive .25-inch movement of the range cursor. (Figure 5: 2)

Task: Test Air Mode Operation

Activities: Procedure-Following

Behavioral Details: 50-step fixed procedure, 8 SB steps

The first SB step requires perception of a 2-degree movement of the antenna tilt meter indicator; graduations are 5 degrees. The second and third SB steps require the technician to judge an angular tracking handle displacement of 30° and an antenna tilt position change of 20° per second. The fourth and fifth SB steps require a judgment that the angular displacement of the tracking handle is between 10° and 30° and a judgment that the antenna tilt meter steps 1.8° at each azimuth turnaround. The sixth and seventh SB steps require the technician to judge that the tracking handle displacement is less than 10° and that the rate of movement of the antenna scan pattern is no greater than 0.6° per second. The eighth SB step requires the technician to judge the maximum slew rate of the Azimuth Cursor (20° per second). No tolerances are specified for any of the above rates. (Figure 5: 6)

Block II (Operational check of ARS)

Task: Perform Mechanical Checks

Activities: Procedural-Following

Behavioral Details: 10-step fixed procedure, no SB steps

Block III (Operational check of SDBT)

Task: Perform Initial Setup

Activities: Procedure-Following

Behavioral Details: 13-step fixed procedure, no SB steps

Task: Check Timer Operation

Activities: Procedure-Following

Behavioral Details: 18-step fixed procedure, no SB steps

Block IV (Troubleshooting the LCOSS)

Task: Select Path in Troubleshooting Chart

Activities: Procedure-Following; Decision-Making and Problem-Solving

Behavioral Details:

Procedure-Following – Possible 145-step branched procedure, 15 SB steps. The technician follows the LCOSS check-out procedure, as described earlier, until a malfunction indication is encountered. After the malfunction indication appears, the steps followed are based on the outcome of the tests performed. The alternatives available for each step in the branched procedure are listed in the troubleshooting logic chart. The 145 possible steps do not include isolating the trouble to wiring malfunctions. All SB steps were described in Block I.

Decision-Making and Problem-Solving – The problem is to select the path to be followed in the troubleshooting logic chart. In most instances this is solved by a branched procedure; however, in some instances there are more than two alternative points at which the logic chart can be entered. The information considered is the tests performed and their outcomes. He selects the path, which according to some strategy, is most likely to lead him to the malfunctioning line replaceable unit or wiring harness.

Task: Perform Self-Test Indicated

Activities: Procedure-Following

Behavioral Details: The behavioral details for all self-tests performed in this system are listed under Block I.

Block IV (Troubleshooting the LCOSS)

Task: Test Using Subsystem Tie-In Test Set

Activities: Procedure-Following; Decision-Making and Problem-Solving

Behavioral Details:

Procedure-Following – Although this task obviously contains procedure following, the procedures are not specified in the technical order.

Decision-Making and Problem-Solving – The problem is to determine when and how to use the test set. The alternatives available are troubleshoot the wiring harness or test for a tie-in malfunction. The information considered is the following:

- a. A LRU was replaced, the malfunction persists
- b. The types of faulty signals
- c. The capability of the test set for testing these signals
- d. The most probable cause of the malfunction

The performance aid does not include instructions for connecting the Subsystem Tie-In Test Set. The technician must use his knowledge of how the test set can be used in choosing to troubleshoot either the harness or a suspected system tie-in malfunction.

Block V (Troubleshooting the ARS)

Task: Select Path in Troubleshooting Chart

Activities: Procedure-Following; Decision-Making and Problem-Solving

Behavioral Details:

Procedure-Following – Possible 40-step branched procedure, 24 SB steps. All SB steps are described in Block II.

Decision-Making and Problem-Solving – The comments about this task given in Block IV also apply here.

Task: Perform Self-Test Indicated

Activities: Procedure-Following

Behavioral Details: The behavioral details of all self-tests for this system are listed under Block II tasks.

Task: Test Using Subsystem Tie-In Test Set

Activities: Procedure-Following

Behavioral Details: Possible 70-step branched procedure, 2 SB steps

One of the SB steps requires test set connections which simultaneously provide the signal being tested to the Attack Radar System. No information on how these connections should

Block V (Troubleshooting the ARS)

be made is provided in the technical order. The second SB step requires the technician to remember, ARS mode of operation, switch settings because the system must be turned off before connecting the test set. Tables listing ARS switch positions for the various modes of operation are not provided in the technical order.

The description above applies only to connecting and using the Subsystem Tie-In Test Set. The description of the test set self-test procedure is given below; Block VII. The number of possible steps (70) for the branched procedure above, includes those required to perform the test set self-test. The self-test is performed, as a part of this procedure, prior to any measurements with the test set.

Block VI (Troubleshooting the SDBT)

Task: Deciding Where To Test

Activities: Decision-Making and Problem-Solving

Behavioral Details: The technician must decide where he is to make each check. The information considered is the results of the operational check and the system data flow shown in the test loop diagram. The technician must examine the data flow diagram, using the malfunction indications obtained, to determine the probable causes of malfunction. He enters his guess in a table, of probable causes and isolation procedures, to select his first test. If the test result does not confirm the suspected cause, he repeats the activity.

Task: Perform Test Indicated

Activities: Procedure-Following

Behavioral Details: Possible 8-step branched procedure, 2 SB steps

The SB steps require reading the ohms and voltage scales of a PSM-6 Multimeter.

Block VII (Troubleshooting with the Subsystem Tie-In Test Set)

Task: Perform Test Set Self-Test

Activities: Procedure-Following

Behavioral Details: 34-step fixed procedure, no SB steps

Although none of the steps in the procedure are SB, the control indicators and control names are all special and must be known before the test set can be operated.

Task: Connect to Prime Equipment

Activities: Procedure-Following

Behavioral Details: Possible 11-step branched procedure, no SB steps

A table indicating the cable to be used, the test set switch settings to be made, and the indicator to be read is provided in the attack radar system performance aid. A diagram, showing cable connections to the test set and to the prime equipment, is also provided.

Block VIII (Removal and Replacement Procedures)

Task: Remove and Replace Optical Display Sight

Activities: Procedure-Following

Behavioral Details: 17-step fixed procedure, 1 SB step

The SB step requires knowledge of how the thermal radiation protector seal around the sight is to be removed. The replacement steps and sequence are opposite those of removal.

Task: Remove and Replace Lead and Launch Computing Amplifier

Activities: Procedure-Following

Behavioral Details: 9-step fixed procedure, no SB steps

The replacement steps and sequence are opposite those of removal.

Task: Remove and Replace Lead Computing Gyroscope

Activities: Procedure-Following

Behavioral Details: 6-step fixed procedure, no SB steps

The replacement is the same with the exception that the steps are performed in reverse order.

Task: Remove and Replace Indicator Recorder

Activities: Procedure-Following

Behavioral Details: 6-step fixed procedure, 1 SB step

The SB step requires the use of a handling fixture for transporting the indicator recorder.

The replacement steps and sequence are opposite those of removal.

Task: Remove and Replace Electrical Synchronizer

Activities: Procedure-Following

Behavioral Details: 7-step fixed procedure, no SB steps

The replacement steps and sequence are opposite those of removal.

Task: Remove and Replace Antenna-Indicator Control

Activities: Procedure-Following

Behavioral Details: 5-step fixed procedure, no SB steps

The replacement steps and sequence are opposite those of removal.

Block VIII (Removal and Replacement Procedures)

Task: Remove and Replace Radar Set Control

Activities: Procedure-Following

Behavioral Details: 7-step fixed procedure, no SB steps

The replacement steps and sequence are opposite those of removal.

Task: Remove and Replace Antenna Assembly

Activities: Procedure-Following; Communicating

Behavioral Details:

Procedure-Following – 29-step fixed procedure, 4 SB steps.

The SB steps require the following special knowledges:

- a. Where the roll stow pin is to be inserted
- b. How to tell when the Azimuth gimbal is in its midposition
- c. How to position and secure the handling fixture
- d. How to position and secure the antenna assembly to the transporting fixture

Communicating – Direct verbal, for coordinating actions.

Several of the steps in this procedure require the cooperation of three men. Two to support the antenna assembly and one to perform the steps.

The replacement steps and sequence are opposite those of removal.

Task: Remove and Replace Antenna Control Unit

Activities: Procedure-Following

Behavioral Details: 15-step fixed procedure, 1 SB step

The SB step requires that the technician know how to disconnect the air hose attached to the antenna control unit.

The replacement steps and sequence are opposite those of removal.

Task: Remove and Replace Modulator-Receiver-Transmitter

Activities: Procedure-Following; Communicating

Behavioral Details:

Procedure-Following – 14-step fixed procedure, 1 SB step

The SB step requires skill in removing wave guides without damaging them.

Communicating – Direct verbal, for coordinating actions.

Several steps require the cooperation of two men when removing the MRT unit; it weighs 102 pounds.

The replacement steps and sequence are opposite those of removal.

Block VIII (Removal and Replacement Procedures)

Task: Remove and Replace Antenna Pedestal

Activities: Procedure-Following; Communicating

Behavioral Details:

Procedure-Following – 15-step fixed procedure, 1 SB step.

The SB step requires skill in removing wave guide flanges, without damaging them, and placing protective caps over them.

Before this procedure is performed the following three tasks must be completed:

1. Remove Antenna Assembly
2. Remove Antenna-Indicator Control Unit
3. Remove Terrain Following Radar Antenna Receivers

Communicating – Direct verbal, for coordinating actions during the Antenna Assembly Remove and Replace tasks.

The replacement steps and sequence are opposite those of removal.

Task: Remove and Replace Sequential Dual Bombing Timer

Activities: Procedure-Following

Behavioral Details: 2-step fixed procedure, no SB steps

The replacement steps and sequence are opposite those of removal.

Block IX (Locating and Correcting Wiring Harness Malfunctions)

Task: Troubleshoot the Wiring Harness

Activities: Procedure-Following; Communicating; Decision-Making and Problem-Solving

Behavioral Details:

Procedure-Following – Branched procedure, 2 SB steps. The possible number of steps depends on the number of wires and connectors involved in the problem.

The SB steps require skill in the following:

1. Locating connectors
2. Identifying pins
3. Locating wires
4. Tracing wires

Communicating – Direct verbal, for coordinating actions. Continuity checks of long wires, from cockpit to radome, requires a second technician to locate connector pins at opposite end of wire.

Decision-Making – The problem is to determine which inter-connecting wire is faulty. The alternatives are all wires connecting the LRUs between which the signal disappeared.

Block IX (Locating and Correcting Wiring Harness Malfunctions)

The information considered is that contained in the wiring diagrams, and that obtained from each voltage and continuity test.

The technician must examine the wiring diagrams to determine which wires carry the faulty signal. Next he decides which wire to check. If the first wire checked contained the fault he chooses the segment or connector to be checked next. This continues until the broken or shorted wire segment or connector pin is located.

Task: Repair Faulty Wires

Activities: Procedure-Following; Decision-Making and Problem-Solving

Behavioral Details:

Procedure-Following – Branched procedure, many SB steps. The exact possible number of steps is not known and depends on whether the wire is broken or shorted between connectors or at a connector.

The SB steps require the following information:

1. How and where to run wires in a cable
2. How to connect wires to plug and jack pins
3. How to repair or replace connector pins

Decision-Making and Problem-Solving – The problem is to decide how to effect the repair. The alternatives for wires are to connect an unused wire already in the cable to the correct pins, string new wire, or repair the break. The alternatives for pins are; move the wire to different pins, replace the bad pins, or repair the bad pins. The information considered is whether or not; (1) there are spare wires in the cable, (2) there are spare pins in the connector, (3) the pins in the connector are replaceable, and (4) the break in the wire can be repaired without stringing a new wire. The information is evaluated and the workable alternative chosen.

Block X (Boresighting the Optical Display Sight Cradle)

Task: Prepare Aircraft

Activities: Procedure-Following

Behavioral Details: 6-step fixed procedure, no SB steps. Two of the steps are performed by another AFSC.

Task: Install Forward and Aft Fuselage Fixtures

Activities: Procedure-Following

Behavioral Details: 12-step fixed procedure, 2 SB steps

One of the SB steps requires knowledge of the location of mounting holes in the bulkheads. The other SB step requires knowledge of the correct position of the alignment telescope in the fixture.

Block X (Boresighting the Optical Display Sight Cradle)

Task: Remove Optical Display Sight

Activities: Procedure-Following

Behavioral Details: This procedure is described above in Block VIII.

Task: Align Reference Axis

Activities: Procedure-Following

Behavioral Details: 14-step fixed procedure, 3 SB steps

The first SB step requires skill in detecting and eliminating parallax when viewing through the alignment telescope. The second SB step requires skill in accurately reading the inclinometer. The third step requires knowledge of the method of deriving the corrected roll reference angle.

Task: Install Armament Datum Line Boresight Fixture

Activities: Procedure-Following

Behavioral Details: 26-step fixed procedure, 2 SB steps

The first SB step requires skill in securing the boresight fixture to the bulkhead through the tooling hole. The second SB step requires knowledge of the direction and amount of movement provided by the roll, pitch, and azimuth adjustment screws, on the boresight fixture.

Task: Adjust Optical Display Sight

Activities: Procedure-Following

Behavioral Details: Possible 48-step branched procedure, 2 SB steps

The first SB step requires knowledge of the correct position of the alignment telescope in the cradle fixture. The second SB step requires skill in judging 30 seconds of cradle deviation in roll, pitch, and yaw.

Task: Replace Optical Display Sight

Activities: Procedure-Following

Behavioral Details: This procedure is described above in Block VIII.

Section IV.

DISCUSSION

The principle activities of the Weapons Control System Technician/Mechanic (AFSC 322XIR) are:

1. Procedure-Following
2. Communicating
3. Decision-Making and Problem-Solving

The most frequent activity is Procedure-Following. All the operational self-tests and most of the troubleshooting tests are proceduralized. The procedures require many special behavior steps varying from knowledge of the location of antenna assembly alignment holes to skill in perceiving small angular displacements of the aiming reticle.

A less frequent activity is communicating. However, this activity is probably more important and performed more often than indicated in the behavioral description. Communication for the purpose of coordinating actions will occur, on the job, whenever it is advantageous for one technician to work in the cockpit while another works on the ground. These situations are difficult to detect, from technical order information, without observing technicians on the job.

Decision-making and problem-solving is the activity performed least frequently by this technician. It is performed in only five of the sixty-two tasks. However, when performed, this activity must be done well because the cost of choosing an incorrect alternative will be high.

The information, about tasks, task activities, and behavioral details contained in this behavioral analysis, supplemented by the normal repertoire information in the technical orders, provides sufficient information for performance test development. The importance of each of the tasks, task activities, and behaviors will be considered in developing the test items.

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Security Classification

DOCUMENT CONTROL DATA - R & D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY (Corporate author) Applied Science Assoc., Inc. Aero. Med. Res. Labs. Box 158 & AMD, AFSC Valencia, PA 16059 WPAFB, OH 45433		2a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED
		2b. GROUP N/A

3. REPORT TITLE
**LEARNER-CENTERED INSTRUCTION (LCI):
VOLUME II - JOB BEHAVIORAL DESCRIPTION
FOR AFSC 322X1R**

4. DESCRIPTIVE NOTES (Type of report and inclusive dates)
Final Report

5. AUTHOR(S) (First name, middle initial, last name)
William J. Pieper
John D. Folley, Jr.
Horace H. Valverde

6. REPORT DATE August 1968	7a. TOTAL NO. OF PAGES 32	7b. NO. OF REFS 12
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8a. CONTRACT OR GRANT NO. AF 33(615)5161 b. PROJECT NO. 1710 c. Task No. 171004 d.	9a. ORIGINATOR'S REPORT NUMBER(S)
	9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report) AMRL-TR-68-51

10. DISTRIBUTION STATEMENT
This document has been approved for public release and sale; its distribution is unlimited.

11. SUPPLEMENTARY NOTES	12. SPONSORING MILITARY ACTIVITY Aerospace Medical Research Laboratories Aerospace Medical Division, Air Force Systems Command, Wright-Patterson AFB, OH
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13. ABSTRACT
This report describes the approach taken in the development of a job-behavioral description for the Learner-Centered Instruction (LCI), Weapon Control Systems Mechanic/Technician, Air Force Specialty Code (AFSC) 322X1R course to be conducted at Lowry AFB, Colorado. The behavioral description will serve as a basis for the preparation of Statements of Learning Objectives (SOLOS) and a performance criterion test in the development of the LCI course. The term LCI, as used in this advanced development program, refers to a course based upon a systems approach to training. The course is a job-oriented electronics course for training airmen to perform flight-line maintenance tasks on weapon control systems.

Contrails

Security Classification

14. KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
Task analysis Job analysis Air Force training Maintenance personnel Electronics Performance (human) Weapon Control Systems F-111A Aircraft						

Security Classification