

AN/UGC-144 COMMUNICATIONS TERMINAL (CT)
(Secure Communications Systems Maintenance Journeyman/Craftsman)

SECTION A: GENERAL

1. This Air Force Job Qualification Standard (AFJQS) and attached Air Force Qualification Training Package (AFQTP) standardize on-the-job training (OJT) tasks and constitute an approved training program for the AN/UGC-144 Communications Terminal. The AFJQS and AFQTP are used by unit training managers, supervisors, trainers, trainees, and other training functions to plan, conduct, and document OJT on this equipment.
2. Maintain the AFJQS IAW AFR 50-23 and AFI 36-2233. Routine changes will be accomplished via page changes and urgent changes will be disseminated via message. Enter additional local tasks in the blank areas on the AFJQS or add forms. Develop Task Training Guides for added tasks; they should be consistent in content and format with those in the AFQTP. Submit recommended AFJQS/AFQTP improvements/corrections to the 81 TRSS/TSQS, BLDG 2602, 601 D Street, Keesler AFB MS 39534-2229.
3. Review Air Force publishing bulletins and AFIND8 to identify available training materials. Use this AFJQS in conjunction with other applicable JQSs or the Specialty Training Standard (STS) and locally-assigned tasks to identify work center duty positions. Also, use this AFJQS along with other applicable JQSs and the STS to evaluate newly assigned personnel and identify individual training requirements.
4. Tasks listed on the AFJQS have been selected IAW the Instructional System Development (ISD) process. They are the minimum, mandatory AF training requirements for this equipment.
5. Trainees must accurately perform each assigned task unassisted IAW Technical References (TRs) prior to being certified. To qualify for skill-level upgrade, trainees must be certified on assigned tasks, satisfactorily complete career knowledge training, and meet mandatory specialty qualifications IAW AFRs 35-1 and 39-1. After upgrade, assign individuals to other work center duty positions and continue qualification training.

SECTION B: DOCUMENTATION

1. AFJQS tasks will be compiled in an automated training management system, such as the Core Automated Maintenance System (CAMS), if available. The system must contain each AFJQS title line with appropriate AFJQS numbers, titles, and dates. AFJQS and automated documentation requirements are listed below.

a. Load applicable tasks in the automated training system or identify training requirements by circling the task numbers on each individual's AFJQS.

b. If task statements contain more than one noun or action verb which precludes certification on the entire task, load/circle the noun or verb to indicate the individual is being trained only on that portion of the task.

c. When training is started on a task, enter the start date in the appropriate place. When training is complete, the supervisor and trainee accomplish certification by changing the automated code or by initialing the appropriate blocks and entering the date completed.

2. The identification blocks listed below are to be used when the trainer is other than the trainee's immediate supervisor.

TRAINEE'S NAME	INITIALS	SSN
TRAINER'S NAME, INITIALS, DATE:		
TRAINER'S NAME, INITIALS, DATE:		
TRAINER'S NAME, INITIALS, DATE:		
TRAINER'S NAME, INITIALS, DATE:		
TRAINER'S NAME, INITIALS, DATE:		

BY ORDER OF THE SECRETARY OF THE AIR FORCE

OFFICIAL

MERRILL A. McPEAK, General, USAF
Chief of Staff

EDWARD A. PARDINI, Colonel, USAF
Director of Information Management

- 4 Atch
1. AF Form 797
 2. Trainer's Guide
 3. Skill Training Material
 4. Knowledge Evaluation Pamphlet

JOB QUALIFICATION STANDARD CONTINUATION/COMMAND JQS

	TASKS, KNOWLEDGE AND TECHNICAL REFERENCES						
1	Prepare equipment for operation TR: 31W4-2UGC144-1, Chap 2 and 4						
2	Perform system self-test TR: 31W4-2UGC144-1, Chap 3						
3	Configure terminal software TR: 31W42UGC144-1, Chap 2						
4	Configure communications software TR: 31W4-2UGC144-1, Chap 2						
5	Set up UGC-144 to operate within common configurations TR: 31W4-2UGC144-1, Chap 2						
6	Format floppy diskettes TR 31W4-2UGC144-1, Chap 2						
7	PREVENTIVE MAINTENANCE INSPECTIONS (PMI) TR: 31W4-2UGC144-6WC-1						
a	Perform a 56-day PMI TR: Cards 1-001 thru 1-004						
b	Perform a 168-day PMI TR: Cards 1-005 and 1-006						
c	Perform a 336-day PMI TR: Cards 1-007 and 1-008						
						JQS NUMBER 2E3X1-208X	PAGE NO 1

JOB QUALIFICATION STANDARD CONTINUATION/COMMAND JQS

	TASKS, KNOWLEDGE AND TECHNICAL REFERENCES						
8	Remove and replace power supply subassemblies TR: 31W4-2UGC144-2, Chap 2, Sec III						
9	Remove and replace terminal subassemblies TR: 31W4-2UGC144-2, Chap 2, Sec III						
10	Remove and replace display compartment subassemblies TR: 31W4-2UGC144-2, Chap 2, Sec III						
11	Troubleshoot system TR: 31W4-2UGC144-2, Chap 2, Sec III						
						JQS NUMBER 2E3X1-208X	PAGE NO 2

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INTRODUCTION

This Air Force Qualification Training Package (AFQTP) was developed to enhance on-the-job training for the maintenance of the AN/UGC-144 Communications Terminal (CT). It provides you, the trainer, the tools you need to rapidly train your people to a high degree of proficiency. It can also aid evaluators in performing well-rounded personnel evaluations. You'll find this AFQTP is a valuable tool that gives you and the people you train long-term dividends.

The goal of the 81ST Training Support Squadron is to publish accurate training material beneficial to trainers and trainees. The value of your expertise in meeting this goal cannot be overstated. We ask you to assist us in meeting this goal. If you find discrepancies in this AFQTP or have suggestions for its improvement, we want to know about them. Use the Trainer Survey located at the back of this Trainer's Guide. Don't be shy in presenting your suggestions or telling us we made an error. In return, we pledge to provide you an answer and to devote our resources to providing you the best possible training material.

QUALIFICATION TRAINING FLIGHT
81ST TRAINING SUPPORT SQUADRON
601 D STREET
KEESLER AIR FORCE BASE MS 39534-2229

ABOUT THIS AFQTP

This AFQTP was developed using Instructional System Development (ISD) concepts by TSgt Michael L. Williams. Mr. Harold E. Smith and Mr. John R. Rhodes were the Training and Education Specialists. MSgt Dennis E. Salathe, 31 CCS/CYBR, also supported the development as the AN/UGC-144 Subject Matter Expert. It was field tested and validated at the 51 CCS/CYTR, 74 ACS/LS, and 255 ACS ANG.

OBJECTIVES. This AFQTP was developed with four objectives in mind.

1. To standardize on-the-job training.
2. To reduce training time while maintaining proficiency standards.
3. To provide trainers and trainees with a logically organized training plan which yields immediate and measurable feedback.
4. To provide a standard to measure task knowledge and performance during personnel evaluations.

APPLICATION. This AFQTP provides the trainee logical, step-by-step modules (lessons) covering task knowledge and the practical application of maintenance procedures. It permits the trainee to gain the required knowledge prior to demonstrating task proficiency. It also provides you a standardized training plan and a Knowledge Evaluation Pamphlet (KEP) for measuring the trainee's progress. Since the KEP provides excellent criteria for measuring task knowledge, it can also be used by task evaluators during personnel evaluations. This training material applies to personnel in upgrade and/or qualification training.

TRAINING PACKAGE CONTENTS

This training package consists of an Air Force Job Qualification Standard and an AFQTP which includes a Trainer's Guide, Skill Training Material, and Knowledge Evaluation Pamphlet. Carefully inventory the package to ensure all parts have been received. Please advise us immediately if portions of the package are missing. The purpose and content each part of the training package are explained below.

CAUTION

This package is NOT intended to replace the applicable technical references. It is to be used in conjunction with these for training purposes only.

AIR FORCE JOB QUALIFICATION STANDARD (AFJQS). The AFJQS is a listing of all tasks performed on the AN/UGC-144 Communications Terminal (CT) that require structured training and certification. Use and maintain the AFJQS IAW applicable Air Force directives.

TRAINER'S GUIDE (TG). The TG provides you, the trainer, the tools and information you need to effectively conduct on-the-job training using this AFQTP.

Task Training Guides (TTG). Attachment 2 contains a series of TTGs. Every task identified on the AFJQS is covered on a TTG. TTGs provide you a detailed sequence of actions which must be followed to conduct effective on-the-job training and meet minimum requirements for task certification. TTGs identify all the material required to train the task and any prerequisite training required before task training can begin. Each TTG also contains a Task Evaluation Checklist. These checklists aid you in measuring the trainee's ability to successfully perform the task. Task Evaluation Checklists reflect the major areas of a task which must be performed satisfactorily before certification.

SKILL TRAINING MATERIAL (STM). The STM contains instructions on what the trainee is responsible for during the course of completing this AFQTP. The STM also contains training modules, review questions, a review question confirmation key, and performance procedures.

AFQTP Module. Each AFQTP module provides information and guidance to the trainee concerning the task being trained. The module may present the required information or it may make specific reading assignments to the trainee. Each module contains review questions the trainee must answer.

Review Questions. Review questions measure the trainee's attainment of the knowledge associated with the training objective(s). Review questions are open-book.

Review Question Confirmation Key. A review question confirmation key is in the back of the STM. It is used by the trainee to verify the review question answers are correct. It provides immediate feedback to the trainee to reinforce learning.

Performance Procedures. Modules which contain criterion-based training objectives also include performance procedures the trainee must complete. These procedures specify, to the trainee, the conditions under which the task is performed, requirements of the procedure(s), and the standard of performance which must be met. They are performed in conjunction with the Task Evaluation Checklist.

KNOWLEDGE EVALUATION PAMPHLET (KEP). The KEP contains a test for each module. KEP questions are administered and checked by a trainer. Separate the KEP from the rest of the AFQTP and detach the KEP Key and Answer Sheet(s). Store the KEP and KEP Key in a secure place. Failure to do so compromises the KEP. The results of the KEP tests provide you immediate feedback as to how well the trainee understands the information.

DEVELOPING INDIVIDUAL TRAINING PLANS

For training to be effective, carefully plan what you want the trainee to do. Use the following steps to plan training.

1. Determine your work center's needs to assure 100% task coverage. Develop a work center Master Task List (MTL) IAW applicable directives. AFQTP 750X0-215G, ISD for OJT, provides you detailed guidance on MTL and work center training program development.

2. Review the trainee's training record and determine the trainee's previous training and certification. AF Form 623, On-the-Job Training Record, provides this information for each military member. You must question or evaluate the trainee to determine current proficiency levels.

3. Assign the trainee to a duty position. The duty position is a series of work center tasks the trainee is responsible to perform after training is completed. When making this assignment, you must first consider the work center's needs and then the needs of the trainee. After the trainee completes the training requirements of the initial duty position, assign additional duty positions and conduct the necessary training for

each. Keep in mind that the objective of training is to produce a 100% qualified technician.

4. Develop the trainee's training plan outlining which tasks are to be trained and when the training takes place. You can use a General Purpose form (such as the AF Form 3126) or create a computer generated Individual Training Plan for this purpose (see Attachment 1).

5. Interview the trainee. Discuss with the trainee the initial duty or expanded duty position and training program.

6. Should circumstances dictate a change in duty position, or in training schedule, discuss this with the trainee and annotate the trainee's training record, AF Form 623a. On the Individual Training Plan, annotate the remarks area.

CONDUCTING OJT USING THIS TRAINING PACKAGE

1. Explain the AFJQS/AFQTP to the trainee and how they are used to conduct training. If the trainee is enrolled in upgrade training (UGT), explain any CDC requirements which may apply and the trainee's UGT responsibilities.

NOTE

Trainees in UGT must use this AFJQS/AFQTP to satisfy the performance criteria for each task selected for training.

2. Using the trainee's Individual Training Plan, select the first task for training and review the applicable TTG. Ensure all training material and references are available. Assure that the trainee is qualified on all prerequisites for this task.

3. Discuss with the trainee the task objective(s) and training steps listed on the appropriate TTG. Assign the corresponding STM module for the trainee to complete.

4. Verify the trainee completed the review questions. Answer any questions the trainee may have. The trainee may use the AFQTP modules and technical references (TRs) to answer the review questions.

5. When you and the trainee are satisfied with the trainee's knowledge of the material, administer the module KEP Questions. The trainee may NOT refer to the AFQTP modules when answering the KEP questions.

NOTE

The KEP for Module 3 provides five figures for the trainee's use while answering the questions.

Normally, the trainee is not permitted to use TRs when taking a KEP test. If use of TRs is permitted, it will be stated in the STM and at the beginning of each KEP test. If TR use is permitted (open-book test), a score of 100% is required. If the use of TRs is not permitted, the trainee must score a minimum of 70% on the KEP tests. Check the trainee's KEP answers against the KEP Confirmation Key. Review missed KEP questions with the trainee to ensure understanding of the material. If the score is less than what is required, have the trainee restudy the module and retake the KEP.

6. Using the technical reference(s) and Task Evaluation Checklist as guidance, explain the task performance procedures to the trainee.

7. Demonstrate the task procedures to the trainee. Answer any questions the trainee has.

8. Have the trainee practice and explain the task procedures to you. Correct any errors the trainee may make.

9. Have the trainee perform the task procedures unassisted. Using the Task Evaluation Checklist, evaluate the trainee's performance. Should the trainee fail the evaluation, determine the cause of unsatisfactory performance. If the cause is a lack of knowledge, the trainee may have to retake the module. If the cause is a lack of trainee's skill, demonstrate the task again. Have the trainee practice the task under your supervision. When you and the trainee are satisfied that the task can be performed unassisted, reevaluate the trainee.

10. When the trainee performs the task at the desired level of proficiency without assistance, document training and task certification as outlined in the AFJQS cover letter.

11. Using the Individual Training Plan, assign additional tasks until the trainee completes the requirements for the duty position.

12. Expand the trainee's duty position, if possible, by adding more tasks to the Individual Training Plan. Training continues until the trainee is 100% work center task qualified or is reassigned.

NOTE

Should the trainee not complete the AFJQS/AFQTP before being reassigned to another location which has this equipment, we recommend you retrieve the training material from the trainee and forward it to the gaining work center.

13. Schedule periodic evaluations after the trainee is task certified. We recommend you use the performance procedures and Task Evaluation Checklists to conduct these evaluations. The KEP developed for this AFQTP may also be used to measure the trainee's knowledge of the tasks.

INDIVIDUAL TRAINING PLAN				
TRAINEE: Amn Smith		TRAINER: SSgt Jones		
AFJQS NUMBER/ TASK NUMBER	ESTIMATED TRAINING TIME	ESTIMATED START TIME	DATE TRAINING COMPLETED	REMARKS
XXXXX-XXXX /1	2 days	21 Jun 97	23 Jun 97	
	/2 4 hours	24 Jun 97	25 Jun 97	
<u>EXAMPLE</u>		<u>EXAMPLE</u>		
<p>This Individual Training Plan is an example only. It does not reflect accurate training times.</p>				

EQUIPMENT PREPARATION
TASK TRAINING GUIDE

TRAINEE'S NAME: _____

1. AFJQS TASK NUMBER: 1
2. ESTIMATED TASK TRAINING TIME: _____
3. TRAINING REFERENCES:
 - a. TO 31W4-2UGC144-1
 - b. TO 33-1-32
 - c. AFQTP Modules 1 and 2
4. REQUIREMENTS:
 - a. Test equipment to be used: Digital multimeter
 - b. Downtime/user release is/is not required.
5. TRAINING OBJECTIVE:

Given TO 31W4-2UGC144-1 and the necessary materials, prepare the equipment for operation IAW Chapters 2 and 4.

6. INITIAL TRAINING STEPS (Check when completed):
 - a. Discuss the objective for the task, including the work center speed and accuracy standards for performing the task. Also discuss the conditions under which it is normally performed.
 - b. Assign AFQTP Module 1.
 - c. Discuss Module 1 review questions and answers with the trainee.

- d. Administer Module 1 KEP.
- e. Check Module 1 KEP answers and review missed questions.
- f. Assign AFQTP Module 2.
- g. Discuss Module 2 review questions and answers with the trainee.
- h. Administer Module 2 KEP.
- i. Check Module 2 KEP answers and review missed questions.

7. OBJECTIVE TRAINING STEPS:

a. Using TO 31W4-2UGC144-1 and the checklist in para 8 as guidance, discuss the task steps for achieving the objective with your trainee.

— (1) Ensure all Notes, Cautions, and Warnings listed in the TO for each step are covered. Brief the trainee on all safety precautions and local procedures that apply.

— (2) Be sure your trainee has all materials on hand before starting the task. This practice will keep delays to a minimum.

- b. Demonstrate the correct task performance.
- c. Review each task step with your trainee and answer any questions.
- d. Have your trainee practice the task steps and assist as necessary.

8. TASK EVALUATION:

a. Have trainee perform task steps unassisted and evaluate performance IAW the following checklist. (Return to step 7a if evaluation is unsatisfactory.)

— (1) Gathered required materials.

- (2) Set printer DIP switches.
- (3) Installed the print head.
- (4) Installed terminal batteries.
- (5) Converted the system to use 115 VAC single-phase power.
- (6) Converted the system to use 230 VAC single-phase power.
- (7) Connected data cables.
- (8) Returned materials to proper storage locations and cleaned work area.
- b. Trainee is ready to be certified on AFJQS task 1. Follow local certification procedures.
- c. Assign the next task for training.

SOFTWARE PREPARATION
TASK TRAINING GUIDE

TRAINEE'S NAME: _____

1. AFJQS TASK NUMBERS: 2, 3, 4, 5, and 6
2. ESTIMATED TASK TRAINING TIME: _____
3. TRAINING REFERENCES:
 - a. TO 31W4-2UGC144-1
 - b. AFQTP Module 3
4. REQUIREMENTS:
 - a. Test equipment to be used: None
 - b. Downtime/user release is/is not required.
 - c. Ensure trainee has completed AFQTP Modules 1 and 2.
5. TRAINING OBJECTIVES:
 - a. Given TO 31W4-2UGC144-1 and two properly formatted 3½-inch floppy diskettes, perform a system self-test IAW Chapter 3.
 - b. Given TO 31W4-2UGC144-1, configure the terminal software parameters IAW Chapter 2.
 - c. Given TO 31W4-2UGC144-1, configure the communications software parameters IAW Chapter 2.
 - d. Given TO 31W4-2UGC144-1, two floppy diskettes, and a set of cables, configure a UGC-144 to operate within common circuits IAW Chapter 2.

e. Given TO 31W4-2UGC144-1 and three floppy diskettes, format the diskettes IAW Chapter 2.

6. INITIAL TRAINING STEPS (Check when completed):

- a. Discuss the objective for each task, including the work center speed and accuracy standards for performing the tasks. Also discuss the conditions under which each task is normally performed.
- b. Assign AFQTP Module 3.
- c. Discuss the review questions and answers with the trainee.
- d. Administer the KEP.
- e. Check the KEP answers and review missed questions.

7. OBJECTIVE 5a TRAINING STEPS:

- a. Using technical references and the checklist in para 8 as guidance, discuss the task steps for achieving objective 5a with trainee. Ensure all Notes, Cautions, and Warnings listed in the TO for each step are covered. Brief the trainee on all safety precautions and local procedures that apply.

NOTE

Provide properly formatted ASC and OTC floppy diskettes for your trainee. They will be used in the self-test. Diskette formatting is not evaluated until task 6.

- b. Demonstrate how to perform the self-test.
- c. Review task steps with trainee and answer any questions.
- d. Have trainee practice steps and assist as necessary.

8. TASK 2 EVALUATION:

a. Have trainee perform task steps unassisted and evaluate performance IAW the following checklist. (Return to step 7a if evaluation is unsatisfactory.)

— (1) Installed a floppy diskette into the ASC drive.

— (2) Performed a system self-test.

— (3) Powered the terminal off, then on.

— b. Trainee is ready to be certified on AFJQS task 2. Follow local certification procedures.

— c. Assign the next task for training.

9. OBJECTIVE 5b TRAINING STEPS:

— a. Using technical references and the checklist in para 10 as guidance, discuss the task steps for achieving objective 5b with trainee. Ensure all Notes, Cautions, and Warnings listed in the TO for each step are covered. Brief the trainee on all safety precautions and local procedures that apply.

— b. Demonstrate how to configure the terminal software parameters.

— c. Review task steps with trainee and answer any questions.

— d. Have trainee practice steps and assist as necessary.

10. TASK 3 EVALUATION:

a. Have trainee perform task steps unassisted and evaluate performance IAW the following checklist. (Return to step 9a if evaluation is unsatisfactory.)

— (1) Changed the DTU Menu settings.

— (2) Changed the Edit Menu settings.

- (3) Changed the Guarded Menu **Terminal** settings.
- (4) Changed the Access Menu settings.
- b. Trainee is ready to be certified on AFJQS task 3. Follow local certification procedures.

11. OBJECTIVE 5c TRAINING STEPS:

- a. Using technical references and the checklist in para 12 as guidance, discuss the task steps for achieving objective 5c with trainee. Ensure all Notes, Cautions, and Warnings listed in the TO for each step are covered. Brief the trainee on all safety precautions and local procedures that apply.
- b. Demonstrate how to configure the communications software parameters.
- c. Review task steps with trainee and answer any questions.
- d. Have trainee practice steps and assist as necessary.

12. TASK 4 EVALUATION:

a. Have trainee perform task steps unassisted and evaluate performance IAW the following checklist. (Return to step 11a if evaluation is unsatisfactory.)

- (1) Changed the System Menu parameters.
- (2) Changed the SSI Menu parameters.
- (3) Changed the RI/PLA Table settings.
- b. Trainee is ready to be certified on AFJQS task 4. Follow local certification procedures.

13. OBJECTIVE 5d TRAINING STEPS:

- a. Using technical references and the checklist in para 14 as guidance, discuss the task steps for achieving objective 5d with trainee. Ensure all Notes, Cautions,

and Warnings listed in the TO for each step are covered. Brief the trainee on all safety precautions and local procedures that apply.

- b. Demonstrate how to configure a UGC-144 to operate within common circuits.

NOTE

Choose a dial-up and dedicated circuit from the examples in the STM (Figures 3-6 thru 3-15). Your trainee will be required to set up the UGC-144 to operate within these two circuits.

- c. Review task steps with trainee and answer any questions.
- d. Have trainee practice steps and assist as necessary.

14. TASK 5 EVALUATION:

a. Have trainee perform task steps unassisted and evaluate performance IAW the following checklist. (Return to step 13a if evaluation is unsatisfactory.)

- (1) Configured the UGC-144 to operate in a specified dial-up circuit.
- (2) Configured the UGC-144 to operate in a specified dedicated circuit.
- b. Trainee is ready to be certified on AFJQS task 5. Follow local certification procedures.

15. OBJECTIVE 5e TRAINING STEPS:

- a. Using technical references and the checklist in para 16 as guidance, discuss the task steps for achieving objective 5e with trainee. Ensure all Notes, Cautions, and Warnings listed in the TO for each step are covered. Brief the trainee on all safety precautions and local procedures that apply.

NOTE

The three floppy diskettes supplied to the trainee do not have to be formatted to start this task.

- b. Demonstrate how to format floppy diskettes.

- c. Review task steps with trainee and answer any questions.
- d. Restore system to normal operating configuration.
- e. Have trainee practice steps and assist as necessary.

16. TASK 6 EVALUATION:

a. Have trainee perform task steps unassisted and evaluate performance IAW the following checklist. (Return to step 15a if evaluation is unsatisfactory.)

- (1) Formatted an ASC diskette.
- (2) Formatted an OTC Floppy diskette.
- (3) Formatted an OTC Message diskette.
- b. Trainee is ready to be certified on AFJQS task 6. Follow local certification procedures.
- c. Assign the next task for training.

PREVENTIVE MAINTENANCE INSPECTIONS (PMI)
TASK TRAINING GUIDE

TRAINEE'S NAME: _____

1. AFJQS TASK NUMBERS: 7a, 7b, and 7c
2. ESTIMATED TASK TRAINING TIME: _____
3. TRAINING REFERENCES:
 - a. TO 31W4-2UGC144-6WC-1
 - b. AFQTP Module 4
4. REQUIREMENTS:
 - a. Test equipment to be used: None
 - b. Downtime/user release is/is not required.
 - c. Ensure trainee has completed AFQTP Modules 1 thru 3.
5. TRAINING OBJECTIVES:
 - a. Given a #2 Phillips screwdriver and necessary cleaning supplies, perform a 56-day Preventive Maintenance Inspection IAW TO 31W4-2UGC144-6WC-1, Cards 1-001 thru 1-004.
 - b. Given a disk head cleaning kit, perform a 168-day Preventive Maintenance Inspection IAW TO 31W4-2UGC144-6WC-1, Cards 1-005 and 1-006.
 - c. Given a #2 Phillips screwdriver, and four "C" cell Nicad batteries, perform a 336-day Preventive Maintenance Inspection IAW TO 31W4-2UGC144-6WC-1, Cards 1-007 and 1-008.

6. INITIAL TRAINING STEPS (Check when completed):

- a. Discuss the objective for the task, including the work center speed and accuracy standards for performing the task. Also discuss the conditions under which it's normally performed.
- b. Assign AFQTP Module 4.
- c. Discuss the review questions and answers with the trainee.
- d. Administer the KEP.
- e. Check the KEP answers and review missed questions.

7. OBJECTIVE 5a TRAINING STEPS:

a. Using TO 31W4-2UGC144-6WC-1 and the checklist in para 8 as guidance, discuss the task steps for achieving objective 5a with your trainee.

- (1) Ensure all Notes, Cautions, and Warnings listed in the TO for each step are covered. Brief the trainee on all safety precautions and local procedures that apply.
- (2) Discuss the proper procedure for releasing and returning the system to the line. Also, instruct your trainee which agencies to notify and which maintenance documentation to complete.
- (3) Instruct your trainee to have all materials on hand before starting the task. This practice will keep delays to a minimum. Be sure your trainee knows to return the materials after task completion.
- b. Demonstrate the correct task performance.
- c. Review each task step with your trainee and answer any questions.
- d. Have your trainee practice the task steps and assist as necessary.

8. TASK 7a EVALUATION:

a. Have trainee perform task steps unassisted and evaluate performance IAW the following checklist. (Return to step 7a if evaluation is unsatisfactory.)

- (1) Gathered required materials.
- (2) Removed the system from the line.
- (3) Initiated any required maintenance documentation.
- (4) Performed a system self-test.
- (5) Performed a routine inspection.
- (6) Performed the cleaning requirements.
- (7) Performed a final self-test.
- (8) If necessary, returned the system to the line.
- (9) Returned materials to their proper storage places.
- (10) Cleaned the work area.
- (11) Completed all maintenance documentation.
- b. Trainee is ready to be certified on AFJQS task 7a. Follow local certification procedures.

9. OBJECTIVE 5b TRAINING STEPS:

a. Using TO 31W4-2UGC144-6WC-1 and the checklist in para 10 as guidance, discuss the task steps for achieving objective 5b with your trainee.

- (1) Ensure all Notes, Cautions, and Warnings listed in the TO for each step are covered.

Brief the trainee on all safety precautions and local procedures that apply.

- (2) Instruct your trainee to have all materials on hand before starting the task. This practice will keep delays to a minimum. Be sure your trainee knows to return the materials after task completion.
- b. Demonstrate the correct task performance.
- c. Review each task step with your trainee and answer any questions.
- d. Have your trainee practice the task steps and assist as necessary.

10. TASK 7b EVALUATION:

a. Have trainee perform task steps unassisted and evaluate performance IAW the following checklist. (Return to step 9a if evaluation is unsatisfactory.)

NOTE

If you train all PMIs in one session, your trainee need not repeat the PMI preparation and post procedures.

- (1) Gathered required materials.
- (2) Removed the system from the line.
- (3) Initiated any required maintenance documentation.
- (4) Performed a system self-test.
- (5) Performed a major inspection.
- (6) Cleaned the disk heads.
- (7) Performed a final self-test.
- (8) If necessary, returned system to the line.

— (9) Returned materials to their proper storage places.

— (10) Cleaned the work area.

— (11) Completed all maintenance documentation.

— b. Trainee is ready to be certified on AFJQS task 7b. Follow local certification procedures.

11. OBJECTIVE 5c TRAINING STEPS:

a. Using TO 31W4-2UGC144-6WC-1 and the checklist in para 12 as guidance, discuss the task steps for achieving objective 5c with your trainee.

— (1) Ensure all Notes, Cautions, and Warnings listed in the TO for each step are covered. Brief the trainee on all safety precautions and local procedures that apply.

— (2) Instruct your trainee to have all materials on hand before starting the task. This practice will keep delays to a minimum. Be sure your trainee knows to return the materials after task completion.

— b. Demonstrate the correct task performance.

— c. Review each task step with your trainee and answer any questions.

— d. Have your trainee practice the task steps and assist as necessary.

12. TASK 7c EVALUATION:

a. Have trainee perform task steps unassisted and evaluate performance IAW the following checklist. (Return to step 11a if evaluation is unsatisfactory.)

— (1) Gathered required materials.

— (2) Removed the system from the line.

— (3) Initiated any required maintenance documentation.

— (4) Performed a system self-test.

- (5) Replaced the batteries.
- (6) Performed a final self-test.

- (7) Returned the system to the line.

- (8) Returned materials to their proper storage places.

- (9) Cleaned the work area.

- (10) Completed all maintenance documentation.

- b. Trainee is ready to be certified on AFJQS task 7c. Follow local certification procedures.

- c. Assign the next task for training.

SUBASSEMBLY REMOVAL AND REPLACEMENT
AND SYSTEM TROUBLESHOOTING
TASK TRAINING GUIDE

TRAINEE'S NAME: _____

1. AFJQS TASK NUMBERS: 8, 9, 10, and 11
2. ESTIMATED TASK TRAINING TIME:
3. TRAINING REFERENCES:
 - a. TO 31W4-2UGC144-2
 - b. AFQTP Module 5
4. REQUIREMENTS:
 - a. Test equipment to be used: Digital Multimeter
 - b. Downtime/user release is/is not required.
 - c. Ensure trainee has completed AFQTP Modules 1 thru 4.
5. TRAINING OBJECTIVES:
 - a. Given TO 31W4-2UGC144-2, an electrostatic work station, and a standard tool kit, remove and replace Power Supply subassemblies IAW Chapter 2, Section III.
 - b. Given TO 31W4-2UGC144-2, an electrostatic work station, and a standard tool kit, remove and replace terminal subassemblies IAW Chapter 2, Section III.
 - c. Given TO 31W4-2UGC144-2, an electrostatic work station, and a standard tool kit, remove and replace the display compartment subassemblies IAW Chapter 2, Section III.

d. Given TO 31W4-2UGC144-2, a digital multimeter, an electrostatic work station, and a standard tool kit, troubleshoot the UGC-144 system IAW Chapter 2, Section III.

6. INITIAL TRAINING STEPS (Check when completed):

- a. Discuss the objective for each task, including the work center speed and accuracy standards for performing them. Also discuss the conditions under which they are normally performed.
- b. These tasks were written to be taught consecutively in one training session. If you decide to teach them separately, have the trainee perform the task preparation and post-task steps for each session. After completing a training session, it is important that the trainee perform a self-test to ensure the system functions properly.
- c. Assign AFQTP Module 5.
- d. Discuss the review questions and answers with the trainee.
- e. Administer the KEP.
- f. Check the KEP answers and review missed questions.

7. OBJECTIVE 5a TRAINING STEPS:

a. Using TO 31W4-2UGC144-2 and the checklist in para 8 as guidance, discuss the task steps for achieving objective 5a with the trainee.

- (1) Ensure all Notes, Cautions, and Warnings listed in the TO for each step are covered. Brief the trainee on all safety precautions and local procedures that apply.
- (2) Discuss completion of the proper maintenance documentation.
- (3) Instruct your trainee to have all materials on hand before starting the task. This practice will keep delays to a minimum. Be sure your trainee knows to return the materials after task completion.
- b. Demonstrate the correct task performance.

- __ c. Review each task step with your trainee and answer any questions.
- __ d. Have your trainee practice the task steps and assist as necessary.

8. TASK 8 EVALUATION:

a. Have trainee perform task steps unassisted and evaluate performance IAW the following checklist. (Return to step 7a if evaluation is unsatisfactory.)

- __ (1) Gathered all required materials.
- __ (2) Removed the AN/UGC-144 from service.
- __ (3) Initiated required maintenance documentation.
 - __ (4) Removed the PS Interface.
 - __ (5) Removed the PS CCAs.
 - __ (6) Removed the PS Motherboard.
 - __ (7) Replaced the PS Motherboard.
 - __ (8) Replaced the PS CCAs.
 - __ (9) Replaced the PS Interface.

- __ b. Trainee is ready to be certified on AFJQS task 8. Follow local certification procedures.

9. OBJECTIVE 5b TRAINING STEPS:

- __ a. Using TO 31W4-2UGC144-2 and the checklist in para 10 as guidance, discuss the task steps for achieving objective 5b with the trainee. Ensure all Notes, Cautions, and Warnings listed in the TO for each step are covered. Brief the trainee on all safety precautions and local procedures that apply.
- __ b. Demonstrate the correct task performance.

- c. Review each task step with your trainee and answer any questions.
- d. Have your trainee practice the task steps and assist as necessary.

10. TASK 9 EVALUATION:

a. Have trainee perform task steps unassisted and evaluate performance IAW the following checklist. (Return to step 9a if evaluation is unsatisfactory.)

- (1) Removed the Logic CCAs.
- (2) Removed the Disk Memory Unit Assembly.
- (3) Removed the Motherboard.
- (4) Replaced the Motherboard.
- (5) Replaced the Disk Memory Unit Assembly.
- (6) Replaced the Logic CCAs.

- b. Trainee is ready to be certified on AFJQS task 9. Follow local certification procedures.

11. OBJECTIVE 5c TRAINING STEPS:

- a. Using TO 31W4-2UGC144-2 and the checklist in para 12 as guidance, discuss the task steps for achieving objective 5c with the trainee. Ensure all Notes, Cautions, and Warnings listed in the TO for each step are covered. Brief the trainee on all safety precautions and local procedures that apply.
- b. Demonstrate the correct task performance.
- c. Review each task step with your trainee and answer any questions.
- d. Have your trainee practice the task steps and assist as necessary.

12. TASK 10 EVALUATION:

a. Have trainee perform task steps unassisted and evaluate performance IAW the following checklist. (Return to step 11a if evaluation is unsatisfactory.)

- (1) Removed the Keyboard assembly.
- (2) Removed the Control Panel assembly.
- (3) Replaced the Control Panel assembly.
- (4) Replaced the Keyboard assembly.
- (5) Removed the Display subassembly.
- (6) Replaced the Display subassembly.
- (7) Performed a final system self-test.
- (8) Placed the system on line, if necessary.
- (9) Returned all materials to their proper storage locations and cleaned the work area.
- (10) Completed all maintenance documentation.
- (11) Sent the faulty LRUs to the depot for repair.

— b. Trainee is ready to be certified on AFJQS task 10. Follow local certification procedures.

13. OBJECTIVE 5d TRAINING STEPS:

— a. Using TO 31W4-2UGC144-2 and the checklist in para 14 as guidance, discuss the task steps for achieving objective 5d with your trainee. Ensure all Notes, Cautions, and Warnings listed in the TO for each step are covered. Brief the trainee on all safety precautions and local procedures that apply.

— b. Demonstrate the correct task performance.

— c. Review each task step with your trainee and answer any questions.

— d. Have your trainee practice the task steps and assist as necessary.

14. TASK 11 EVALUATION:

a. Have trainee perform task steps unassisted and evaluate performance IAW the following checklist. (Return to step 13a if evaluation is unsatisfactory.)

- (1) Performed a preliminary analysis of a malfunction.
 - (2) Used the self-test to isolate a fault.
 - (3) Used the troubleshooting flow charts to isolate a fault.
 - (4) Performed a final system self-test.
 - (5) Placed the system on line, if necessary.
 - (6) Returned all materials to their proper storage locations and cleaned the work area.
 - (7) Completed all maintenance documentation.
 - (8) Sent the faulty LRUs to the depot for repair.
- b. Trainee is ready to be certified on AFJQS task 11. Follow local certification procedures.

TRAINER SURVEY

NAME _____ RANK _____ DSN _____

UNIT ADDRESS _____ MAJCOM _____ DATE _____

1. How long have you been a trainer on this equipment/ system/function?
 - a. Less than 1 year
 - b. 1 to 2 years
 - c. 3 to 6 years
 - d. 7 to 10 years
 - e. 11 years or more

2. Which statement best describes the experience level of most technicians arriving at your duty location?
 - a. No experience
 - b. Limited experience (technical school or previous training)
 - c. Experienced on related equipment/function
 - d. Experienced on this equipment/function

3. What is the average training time required to fully qualify a trainee on this equipment/function?
 - a. 30 days
 - b. 60 days
 - c. 90 days
 - d. 120 days
 - e. Other _____

4. The purpose of AFQTPs is to provide standardized training programs on specific equipment or functions. How well do you feel this AFQTP accomplished its purpose?
 - a. Outstanding
 - b. Excellent
 - c. Satisfactory
 - d. Marginal (Please explain; use extra paper if necessary)
 - e. Unsatisfactory (Please explain)

5. Have you completed this AFQTP?
 - a. Yes
 - b. No (Please explain)

6. Were the technical references listed on the AFJQS correct?
 - a. Yes
 - b. No (Please explain)

7. The Trainer's Guide helped me to conduct an effective training program while using this AFQTP.
 - a. Yes
 - b. No (Please explain)

8. Was the information presented in the Skill Training Material (STM) technically correct?
 - a. Yes
 - b. No (Please explain)

9. Did the module arrangement follow a logical training sequence (easy to difficult, simple to complex)?
 - a. Yes
 - b. No (Please explain)

10. Would additional figures, illustrations, or examples help the trainee understand the material presented in the AFQTP?
- a. Yes (Please explain)
 - b. No
11. Does the AFJQS contain all required tasks?
- a. Yes
 - b. No (List tasks)
12. Do the review and KEP questions measure the knowledge required by the trainee to perform the task(s)?
- a. Yes
 - b. No (Please explain)
13. While completing this package, the trainee
- a. had no major or unusual difficulties.
 - b. had some minor problems.
 - c. often required my assistance.
 - d. could not have completed this AFQTP without assistance from an experienced trainer.
14. Approximately how many people have you trained using this AFQTP? _____
15. What improvements would you make to this AFQTP to help meet your training needs?

TRAINING CERTIFICATION FOR
AFJQS 2E3X1-208X
AN/UGC-144 COMMUNICATIONS TERMINAL (CT)

I certify the individual listed below has completed all of the requirements for the above AFJQS/AFQTP. Date completed _____.

(Please Print) TRAINEE'S RANK, FIRST, MI, LAST NAME SSN

(Please Print) UNIT MAILING ADDRESS, INCLUDING ZIP CODE

SUPERVISOR'S RANK/NAME/DUTY TITLE/DSN

CONCUR/NONCONCUR

Commander or Designated Representative

Please attach the completed and graded KEP answer sheet(s) and Trainer/Trainee Surveys and mail to 81 TRSS/TSQS, 601 D STREET, KEESLER AFB MS 39534-2229. A certificate of training will be issued upon receipt of these documents.

NOTE

Do NOT submit trainees for training certificates more than once per AFJQS/AFQTP. Some AFJQSs/AFQTPs are used for recurring training, but only ONE certificate will be issued for a trainee per AFJQS/AFQTP.

PERSONAL DATA
PRIVACY ACT OF 1974
(5 U.S.C. 552a)

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PREFACE

This Air Force Qualification Training Package (AFQTP) was developed to standardize the OJT program for the AN/UGC-144 Communications Terminal (CT). It explains the functional operation, preventive maintenance, the equipment and software preparation, repair and troubleshooting of the AN/UGC-144.

Put this package to use. We hope you'll find it to be a valuable tool which aids you in becoming a competent Secure Communications Systems Maintenance Specialist/Technician in the shortest possible time.

This AFQTP was developed by TSgt Michael L. Williams, 81st Training Support Squadron, Keesler AFB, MS. The Training and Education Specialists were Mr. Harold E. Smith and Mr. John R. Rhodes. It was validated by 51 CCS/CYTR, 74 ACS/LS, and 255 ACS ANG. MSgt Dennis E. Salathe, 31 CCS/CYBR, was the Subject Matter Expert for the AN/UGC-144.

CAUTION

This package is NOT intended to replace the applicable technical references. It is to be used for training purposes only.

INSTRUCTIONS TO THE TRAINEE

1. Be sure your trainer explains the qualification training process (task assignment, proficiency attainment, task certification), your responsibilities, and how to use this AFQTP.
2. Review the Air Force Job Qualification Standard (AFJQS) and this Skill Training Material (STM) to get an idea of their content.
3. Your trainer uses the AFJQS to assign your initial tasks and the corresponding AFQTP modules. You and your trainer jointly plan your anticipated progress.
4. Make sure you understand the prerequisites before attempting each module (ask your trainer). If you are not familiar with the prerequisites, training is necessary.
5. Within normal workload constraints, set aside sufficient time to work on the package. Studies into effective training programs indicate that the best trainees reserve the same time each day to complete their study. Pace yourself; establish a schedule and stick to it. Give yourself top priority in becoming qualified.
6. After you read the information in the module, answer the review questions and immediately check your responses. You may use the AFQTP modules and technical references to answer the questions. Ask your trainer to explain the questions you don't understand or answer incorrectly. Refer to applicable technical references for more detailed information.
7. After you answer the review questions, your trainer will administer the Knowledge Evaluation Pamphlet (KEP). Answer all KEP questions and give the answer sheet to your trainer for grading. Your trainer will discuss any incorrect answers with you. You are normally NOT allowed to use the AFQTP modules to answer the KEP questions. If you are not permitted to use technical references, you must score 70% or more on each test. In some cases, technical references may be used to answer the KEP questions. This is identified at the beginning of the particular module test. If you are permitted to use the references (open-book test), you must score 100%.
8. You are required to demonstrate your task proficiency by completing the performance procedures identified at the end of each module. When both you and your trainer are satisfied that you have attained the required proficiency level, you may be certified on the AFJQS following local certification procedures. If you are not

completely satisfied that you have obtained the required proficiency level, further study and practice are needed before you initial the AFJQS.

CAUTION

You are not to perform on the equipment without your trainer being present.

9. Your trainer assigns additional tasks (modules) until you have completed the entire package and have become position qualified.

10. We need your help in revising this AFQTP and in developing future AFQTPs. Make note of any problem areas you find as you encounter them. If you have recommendations, suggestions, corrections, or comments, please jot them down on the Trainee Survey located at the back of this book. We pledge to devote all our resources to providing you with the best possible training materials.

MODULE 1

INTRODUCTION AND FAMILIARIZATION

OBJECTIVES

- a. Discuss the AN/UGC-144 system application.
- b. Describe the equipment features and operational characteristics.
- c. Describe the functions of the AN/UGC-144.
- d. Identify general support material.
- e. Explain the function of each terminal control and indicator.
- f. Explain the function of each printer control and indicator.
- g. Identify the function of each subassembly.

TRAINING REFERENCE

TO 31W4-2UGC144-1

INFORMATION

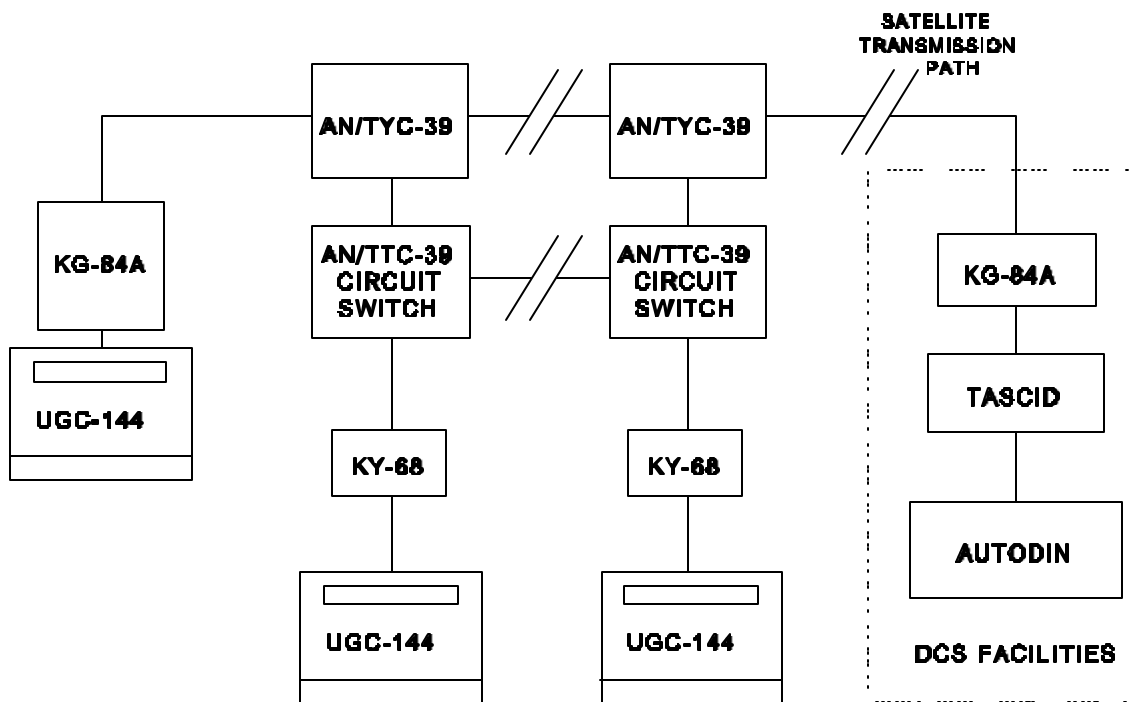
This Air Force Qualification Training Package (AFQTP) consists of five modules. This module provides an introduction to the AN/UGC-144 (referred to as the UGC-144). The other modules cover equipment operation, interconnection, and maintenance.

Before you can learn how to maintain and operate the UGC-144, you should have an idea of how it's employed in the field. This entails the system application, interface equipment, and functional operation. You should also have good understanding of the controls, indicators, and major subassemblies. If you're ready, we'll begin with a brief overview of the UGC-144 system application.

SYSTEM APPLICATION

The UGC-144 is a ruggedized communications terminal (CT) and printer which can store, edit, display, send, receive, and print record traffic. It operates in a mobile environment and interfaces with a variety of tactical equipment.

Equipment Interface. Figure 1-1 illustrates several possible UGC-144 interface



arrangements with other tactical equipment.

Security. For communication security, UGC-144 send and receive lines normally tie to a KG-84A or KY-68 encryption device. As shown in Figure 1-1, a UGC-144/KG-84A can communicate with a UGC-144/KY-68 only if the AN/TYC-39 and AN/TTC-39 are in the circuit.

Switches. The UGC-144, through an encryption device, typically connects to a circuit switch (like the AN/TTC-39) or an AN/TYC-39 message switch. There are many possible circuit switches and circuit arrangements.

Equipment Compatibility. The UGC-144 is very versatile. It is compatible with the following equipment, all of which have digital ports.

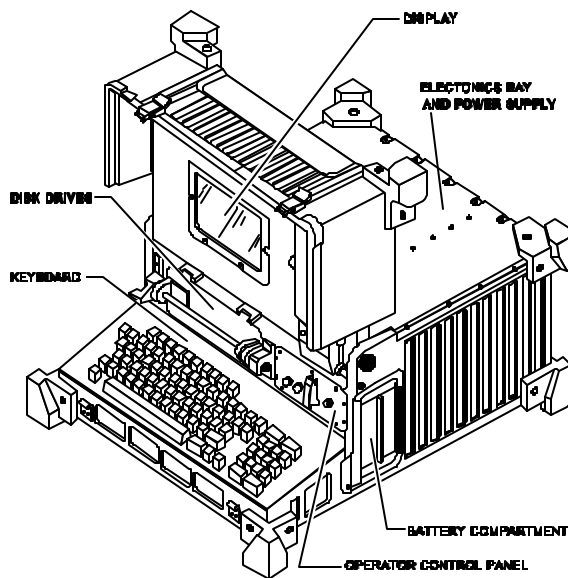
- KY-68 Digital Subscriber Voice Terminal (DSVT)
- KG-84 Dedicated Loop Encryption Device (DLED)
- CV-3591 Advanced Narrowband Digital Voice Terminal (ANDVT)
- TA-1042 Digital Non-secure Voice Terminal (DNVT)
- STU-III telephone

Now that you have an idea of the UGC-144 system application, let's discuss some of its features and operational characteristics.

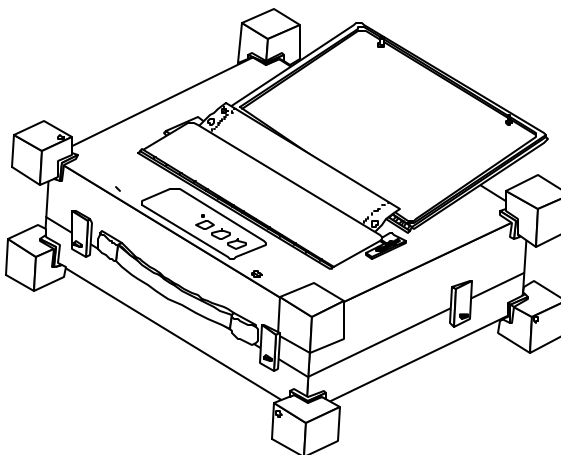
FEATURES AND OPERATIONAL CHARACTERISTICS

As shown in Figures 1-2 and 1-3, the UGC-144 consists of the communications terminal (CT) and printer.

Terminal. The terminal has a keyboard, control panel, display, 40M hard disk, two 3½-inch disk drives, power supply, battery compartment, and electronics bay. It can operate with 115 or 230 VAC single-phase power.



Printer. The AN/UGC-144 includes the Miltope Jet 150X ink jet printer (shown in Figure 1-3) which is a separate unit. As its name implies, it has an ink jet cartridge instead of a ribbon. It uses fanfold or single sheet paper. It can run on 115 VAC single-phase or 230 VAC dual-phase power. It can also operate on 230 VAC single-phase power with the use of a step-down transformer.



The UGC-144 contains many Line Replaceable Units (LRUs). You may remove and replace these LRUs, but not repair them. Faulty LRUs are sent to the depot for repair.

DACM. As mentioned earlier, the UGC-144 has a unique operating feature. It can operate in the Data Adapter Control Mode (DACM). The terminal contains the software for the DACM. This mode enables the terminal to operate with different types of data terminal equipment.

Before sending a message, the UGC-144 sends the receiver (or vice versa) a data adapter control block (DACB). This can only happen if both equipment items are operating in the DACM. These control blocks automatically set the terminal operating parameters; i.e., baud rate or message code. These control blocks ensure equipment compatibility.

Operating Speed. The UGC-144 can operate at loop rates of 75 through 32000 b/s. The terminal also has a variety of data rates, ranging from 45.5 to 16000 b/s. It can operate in ASCII (odd, even, or no parity), Baudot Figure S, or Figure J code formats.

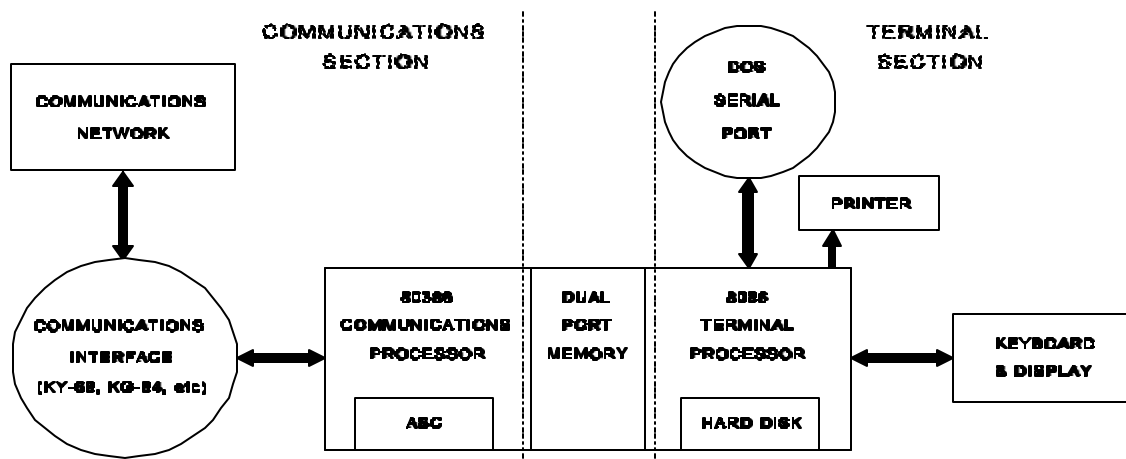
As you can see, the UGC-144 is very versatile and can be used in most communication configurations. Let's dig a little deeper into its functions.

FUNCTIONS

The terminal is a menu driven computer to build, edit, and process messages. It contains Single Subscriber Interface (SSI) and JINTACCS Automated Message Preparation System (JAMPS) software editors. The UGC-144 allows the operator to

- prepare messages.
- send or receive messages.
- edit messages.
- store messages.
- print message copies.

As shown in Figure 1-4, the terminal is divided into the communications and



terminal sections.

Communications Section. This section contains the

- circuitry to receive and send messages.
- data adapter mode control circuits.
- message validation circuits.
- message memory.
- Auxiliary Storage Cassette (ASC) floppy disk drive control.

Terminal Section. The terminal section circuitry allows the operator to interface with the system. It also controls the

- internal operation of the keyboard.
- display.
- Disk Memory Unit (DMU).
- printer.

You should now have a basic understanding of the UGC-144 terminal and printer

functions and features. In the next section, we will discuss some general support material you will need to maintain the UGC-144.

GENERAL SUPPORT MATERIAL

In this section, you will become familiar with the miscellaneous publications, Technical Orders, and Test, Measurement, and Diagnostic Equipment (TMDE). You will also learn about the UGC-144 tools, cables, loopback plugs, and miscellaneous supplies. You will need this information to operate, troubleshoot, and repair the equipment effectively.

Technical Publications. The Joint Chiefs of Staff (JCS) publish a set of manuals which provide technical data on a host of communications systems and networks. Here is a list of the publications you will use the most.

Joint Pub 6-05.3. This publication, Joint Record Data Communications, provides information to implement record data communications systems used in the joint communications network.

Lessons Learned Reports. These reports are provided by the JCS on a quarterly basis. They provide relevant and timely information to operators and maintenance technicians of tactical command, control, and communications equipment and systems.

Technical Orders. The U.S. Army has the overall management responsibility for the UGC-144. Therefore, the Technical Orders (TOs) are actually Army technical manuals with a TO number stamped on them. Unfortunately, they don't include one of the luxuries we enjoy: figure numbers. This makes it hard for us to refer you to a specific TO figure. Because of this, we have redrawn all pertinent figures into this AFQTP. Here is an overview of each UGC-144 TO.

TO 31W4-2UGC144-1. This TO, entitled Operator's and Unit Maintenance Manual, provides a description of the UGC-144. It gives instructions for operating and installing the terminal. It also provides a functional description of the major subassemblies. In addition, there are operator and maintenance instructions, including troubleshooting, repair and functional testing.

TO 31W4-2UGC144-2. This TO, Intermediate Direct Support Maintenance Manual, contains detailed maintenance instructions for Intermediate Direct Support

technicians. It includes step-by-step troubleshooting and maintenance procedures.

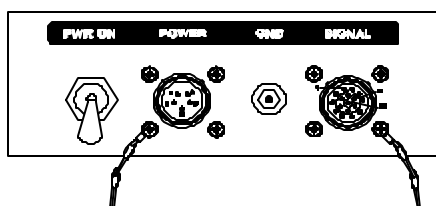
TO 31W4-2UGC144-4. TO 31W4-2UGC144-4, Unit and Direct Support Maintenance Repair Parts and Special Tools List, has an Illustrated Parts Breakdown (IPB) of all LRUs. Also included are the Source, Maintenance and Recoverability (SMR) Codes and their explanation.

TO 31W4-2UGC144-6WC-1. TO 31W4-2UGC144-6WC-1, Scheduled Periodic Inspection Workcard Set, is a pocket size TO. It provides step-by-step instructions for performing 56, 168, and 336-day Preventive Maintenance Inspections (PMI).

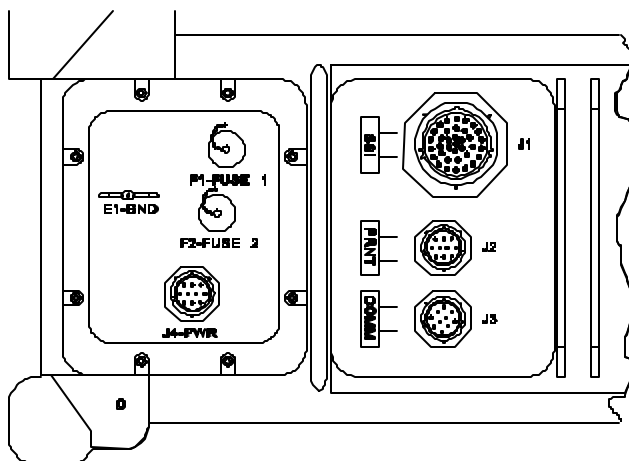
TMDE. TO 31W4-2UGC144-1, Appendix B, states the only required TMDE is a digital multimeter (Fluke 87 or equivalent). You will use this multimeter to troubleshoot the UGC-144.

Tools. There are three general support tool kits which are required to maintain the UGC-144. Their part numbers are: TK-100, TK-101, TK-105.

Cables. Appendix C of TO 31W4-2UGC144-1 lists all of the UGC-144 cables. The printer and terminal each have a rear connector panel for cable and ground connections as shown in Figures 1-5 and 1-6.

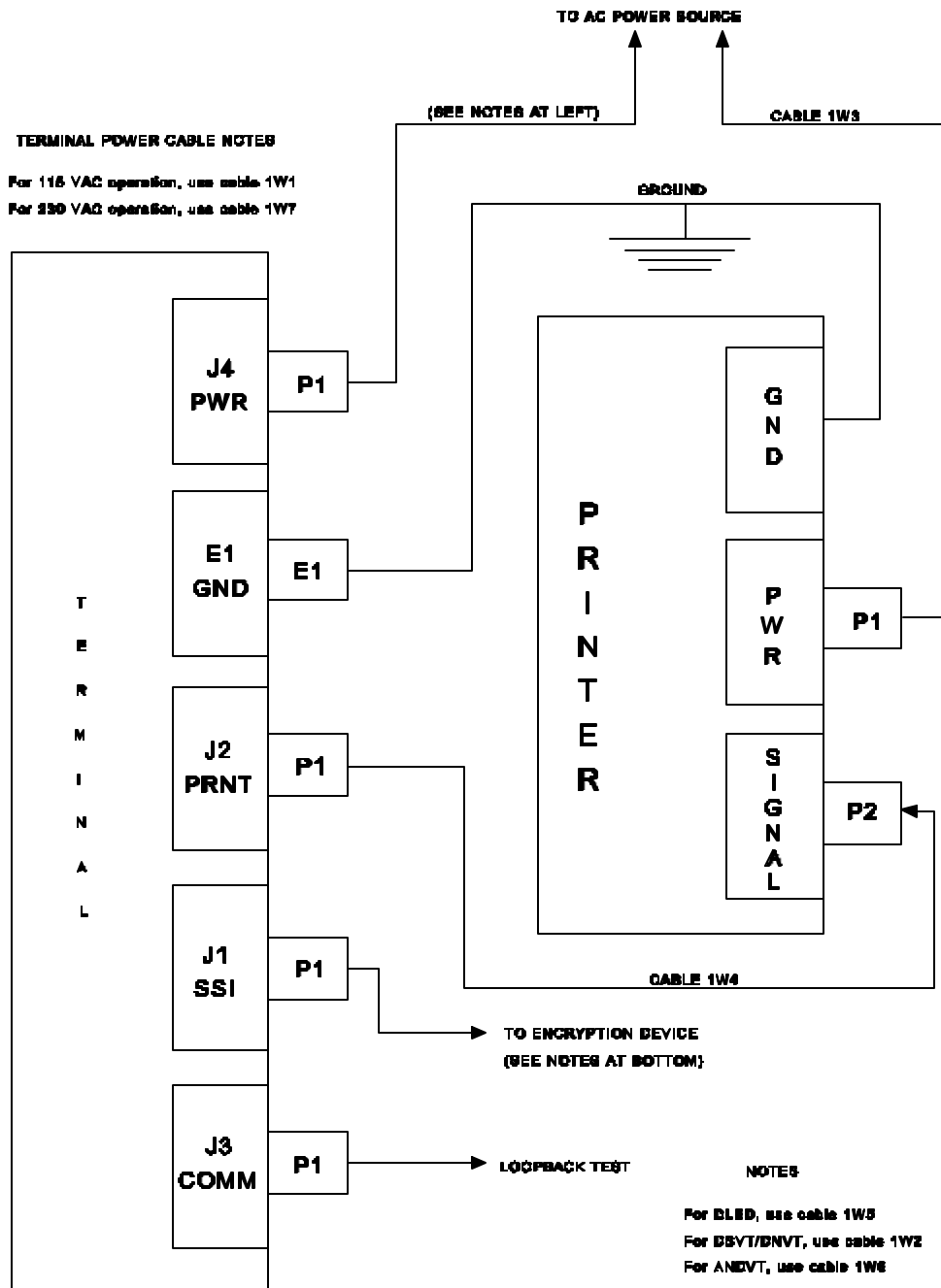


Some of the following cables connect your printer to the terminal. The rest connect the system to various configurations or applications as shown in Figure 1-7.



- 110V (1W1) and 230V (1W7) terminal power cables
- DSVT (or DNVT) data cable 1W2
- Printer power cable 1W3
- Printer data cable 1W4

- DLED data cable 1W5



- ANDVT data cable 1W6

NOTE

The Army and the Air Force don't use the UGC-144 in the ANDVT configuration. Therefore, the ANDVT cable (W6) is no longer required. The Army has dropped the cable from its inventory. The Air Force will probably

follow suit.

Loopback Plugs. You use the SSI, COMM, and Printer loopback plugs to troubleshoot the system. They connect to J1, J2, and J3 of the terminal rear connector panel.

Miscellaneous Supplies. TO 31W4-2UGC144-1, Appendix E, lists the following required supplies: 3½-inch floppy diskettes, printer ink cartridge, and printer paper. Also needed, but not listed, is a disk drive cleaning kit. You will need these supplies to operate and maintain the UGC-144.

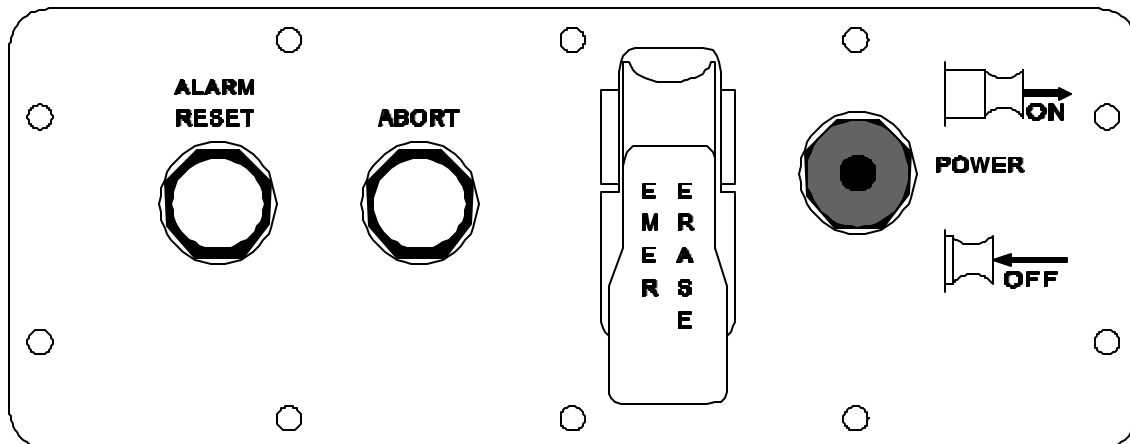
Okay. So much for support material. Let's move on to the next objective—terminal controls and indicators.

TERMINAL CONTROLS AND INDICATORS

There are three UGC-144 subassemblies with controls and indicators on them. These include the Control Panel, Display Subassembly, and the Keyboard. You must be familiar with these to set up, operate, and maintain the terminal.

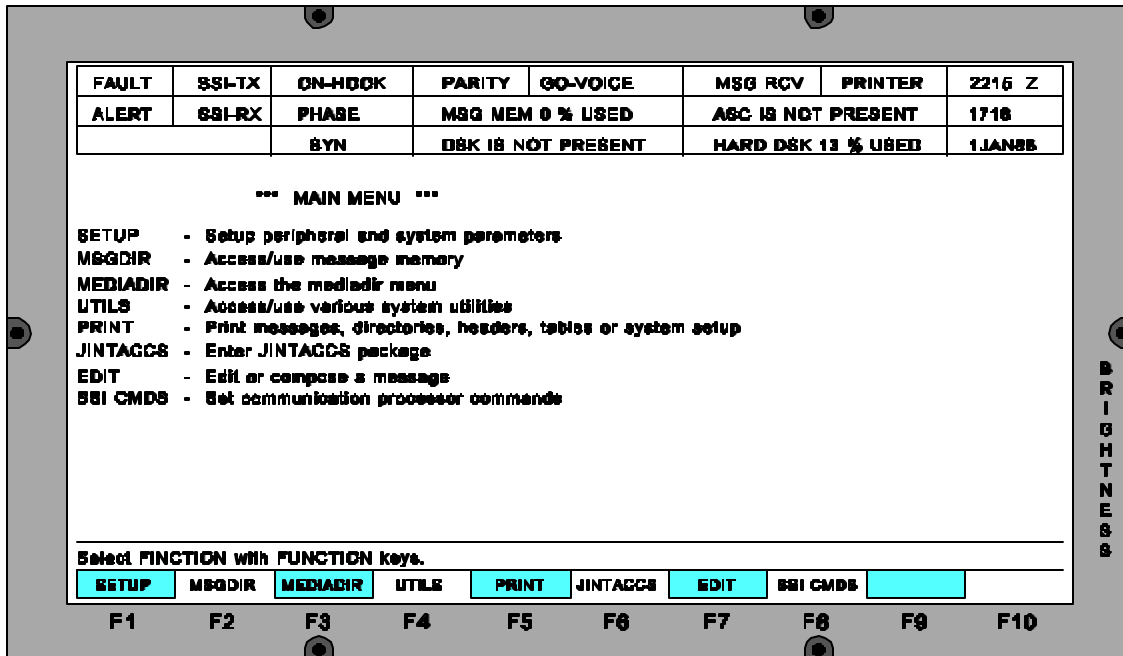
Control Panel. As you can see in Figure 1-8, the Control Panel has the following switches:

- Power
- Alarm reset
- Abort
- Emergency erase



The power switch applies and disables terminal AC power. The alarm reset switch disables the audible alarm, and the abort switch disables all printing and transmission functions. The emergency erase switch clears all message memory. This switch has a cover over it which prevents accidental activation.

Display Subassembly. When you apply power, the software shows the status indicators (Figure 1-9) on the top three lines of the display screen. They provide visual alerts. They also show terminal status and operating modes. Some indicators flash to demand



immediate attention from the operator. The Display Subassembly also has a brightness control knob. This allows the operator to alter the brightness of the display.

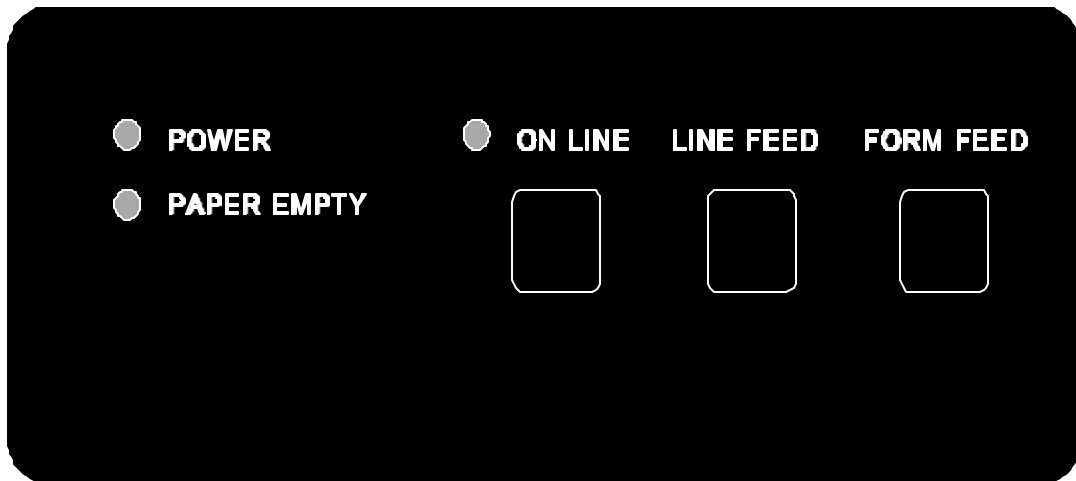
Keyboard Subassembly. As with most keyboards, this subassembly provides operator interface with the system. This non-standard keyboard has control keys to allow the operator to send control characters over the line. The Keyboard Subassembly consists of three functional areas: the function keys, main keyboard, and the key pad.

The function keys (F1 thru F10) initiate special functions controlled by the terminal. The main keyboard functional area consists of alpha-numeric keys for entering text and commands. The key pad consists of cursor positioning, arrow keys, and special purpose keys.

PRINTER CONTROLS AND INDICATORS

You will find all printer controls on the printer Control Panel. The POWER switch is on the rear connector panel.

Control Panel. This panel, shown in Figure 1-10, has three switches. These are the ON LINE, LINE FEED, and FORM FEED switches. The LINE FEED and FORM FEED switches function only when the printer is off line.



ON LINE Switch. This switch places the printer on line and takes it off line. You also use this switch to recover from error conditions. For instance, when you get a paper empty alarm, you renew the paper supply and press the ON LINE switch to reset the alarm circuits.

LINE FEED Switch. The LINE FEED switch advances the paper one line at a time. This switch, if held down, advances paper until released.

FORM FEED Switch. This switch advances paper to the top of the next sheet.

When you simultaneously press the LINE FEED and FORM FEED switches, the paper reverses one line. When you simultaneously hold these switches, the paper reverses until you release them.

The control panel also has three indicators: Power, Paper Empty, and On Line.

Rear Connector Panel. As shown in Figure 1-6, you will find the printer power switch

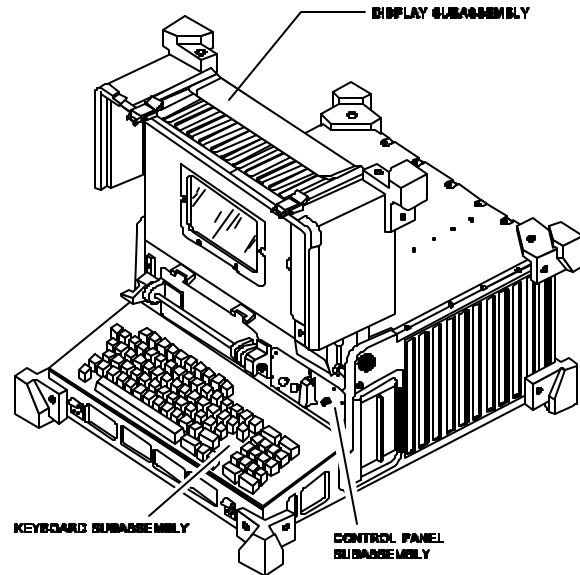
on this panel. The power switch applies 110 or 230 VAC to the printer.

Now that you're familiar with printer controls and indicators, it's time to move on and learn about the functions of the UGC-144 subassemblies.

SUBASSEMBLY FUNCTION

The UGC-144 has many subassemblies. We'll briefly discuss the function of each.

Display Subassembly (1A1A2A1). This subassembly, shown in Figure 1-11, receives video information from the Dual I/O Control Circuit Card Assembly (CCA). It converts the video data to a format required to drive the electro-luminescent display panel. The display subassembly high voltage power supply and controller CCA operate the display. A potentiometer on the display panel controls the brightness of the display.



Keyboard (1A1A6). The keyboard (Figure 1-11) has 88 keys which allow operator input to the terminal. The keyboard micro-controller scans each switch state and generates a scan code when it detects an activated switch. The micro-controller also produces a keyboard data clock. The terminal Central Processor Unit (CPU) CCA uses this clock to synchronize the data (scan codes) received from the keyboard.

Control Panel (1A1A1A3). As discussed earlier, the Control Panel (Figure 1-11) has four switches. Three switches control the alarm reset, emergency erase, and abort functions. The fourth applies power to the terminal. The Control Panel sends switch control signals to the Communications Control CCA.

NOTE

Figure 1-12 shows the rest of the UGC-144 subassemblies.

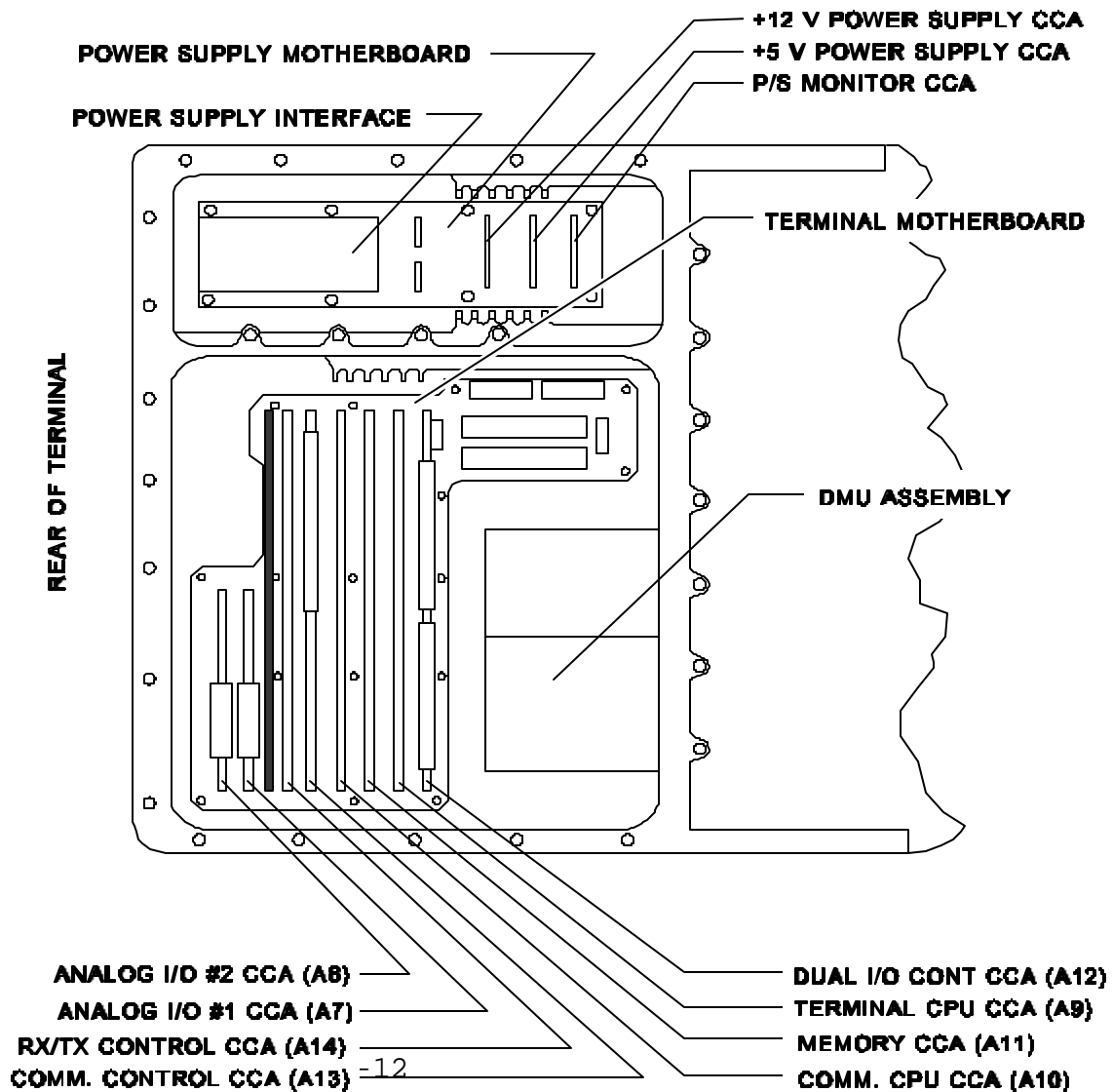
Analog I/O #1 CCA (1A1A1A7). This CCA has

- a telephone tone decoder to detect a busy signal and a dial tone.

- three buffers which interface the terminal with the autodial, printer, and communications ports.
- a switching regulator which converts +12VDC to +8.6VDC. It also has another switching regulator which converts +12VDC to -8.6VDC for use in the constant current regulators.
- five constant current regulators which provide stable output voltages for use in various circuits.

Analog I/O #2 CCA (1A1A1A8). This CCA consists of level translators, multiplexers, and logic circuits which allow functioning of the terminal communication and Single Subscriber Interface (SSI) ports.

PowerSupply Interface (1A1A3). This subassembly converts 115 (or 230) VAC line voltage into +300VDC. Two DC-DC converters use the +300 VDC to supply +5 and +12 VDC to the terminal electronics.



PowerSupply Monitor CCA (1A1A15). This CCA monitors the output of the +5VDC-DC converter to determine when the terminal should go into the battery backup mode. This CCA directs battery backup power to the Memory CCA when it senses the +5VDC-DC converter output voltage is out of tolerance ($+5\text{VDC} \pm 5\%$).

+5V PowerSupply CCA (1A1A17). This CCA takes +300VDC from the Power Supply Interface and converts it to a regulated +5VDC. The terminal uses this +5VDC in many areas. The +5VDC Power Supply CCA also contains over-voltage and over-current protection circuits.

+12V PowerSupply CCA (1A1A16). This CCA takes +300VDC from the Power Supply Interface and converts it to a regulated +12VDC.

Dual I/O Control CCA (1A1A12). This CCA contains circuitry for

- a display controller which generates screen characters information for the Display Subassembly.
- a Small Computer System Interface (SCSI) bus controller for the Disk Memory Unit (DMU).
- Input/Output (I/O) interface for the printer.
- I/O interface for the communications port.
- I/O interface for the floppy drive.
- I/O circuit control.

Memory CCA (1A1A11). This CCA contains the

- audio alarm volume control circuit.
- dual port 192KB Random Access Memory (RAM). The Terminal and Communication CPUs use 120KB of RAM for message memory, and the remaining 72KB for program memory.
- battery switch-over circuit. This circuit supplies +5VDC to the dual port RAM during power failures.

Terminal CPU CCA (1A1A9). This CCA controls all data transfers across the Terminal CPU bus. The bus interfaces with and transfers all data between the Terminal CPU and the

- Display controller section of the Dual I/O CCA.
- Printer port.
- Communications port.
- Disk Memory Unit (DMU) controller.
- Floppy drive.
- Dual port RAM.
- Keyboard.

Communications Control CCA (1A1A13). The Communications CPU CCA drives this CCA. The Communications Control CCA provides interface and control for the

- ASC drive (control, read, and write functions).
- Rx/Tx Control CCA (relieves the Communications CPU of some Mode I protocol to speed up the CPU response time).
- Autodial circuit phone keyboard simulator (automatically allows the Communications CPU to dial a pre-programmed number through the SSI interface).
- Watchdog (resets the Communications CPU should you lose system control).
- Interface with the Control Panel switches: Emer Erase, ASC Door Open, Alarm Reset, and Abort.

Communications CPU CCA (1A1A10). This CPU CCA controls all data transfers across the communications processor bus. This bus interfaces with and transfers all data between the Communications CPU and the

- SSI port (through the Analog I/O #2 CCA).
- Dual port memory (RAM) (through the Memory CCA).
- Direct Memory Access (DMA) (to allow Rx/Tx Control CCA to transfer data without tying up the Communications CPU).
- Interrupt controllers.
- local memory (2MB).
- ASC drive control.

Rx/Tx Control CCA (1A1A14). The Rx/Tx Control CCA handles DACB and protocol for the various SSI interfaces. It also provides interface between the following subassemblies through the communications processor bus:

- Communications Control CCA

- Analog I/O #2 CCA
- Memory CCA

PowerSupply Motherboard (1A1A1A1). The motherboard provides all required voltages to the terminal LRUs. It also distributes primary power from the Power Supply Interface.

Disk Memory Unit Assembly (1A1A4). The DMU stores program data and JAMPS messages. It's controlled by the Dual I/O Control CCAs SCSI bus controller. The ASC connects to the Communications Control CCA for message storage and retrieval. The floppy drive connects to the Dual I/O Control CCA for data transfers to and from the floppy disk. The DMU assembly consists of the

- 40MB hard disk,
- ASC drive interface subassembly, and the
- 3.5 inch floppy disk drive.

Printer Assembly. The printer provides hard copy of incoming and outgoing messages, depending on how you set it up. It receives print commands from the terminal processor through the Printer data cable (1W4). Its buffer can store up to a half page of text before printing. This allows the terminal to perform other functions during printing operations. It has the following features:

- Internal paper supply
- Quick change, disposable ink jet cartridge
- Self-test print pattern
- Status indicator lights
- 115 VAC single-phase or 230 VAC dual-phase operating capability (It can operate with 230 VAC single-phase power only if you connect it to a step-down transformer.)

You should now have a basic understanding of the UGC-144 system. The next module will teach you how to prepare the system for operation.

SUMMARY

It's most important for you to have a good understanding of the UGC-144 and its

switches and indicators. Without this knowledge, equipment maintenance would be futile. You must also become familiar with some general support information; i.e., TOs, TMDE, cables, and loopback plugs. You will use this knowledge frequently when working with the UGC-144.

At last—you're through. This module covered a lot of information. With all the switches, indicators, TOs and subassemblies swimming around inside your head, it's a wonder you can think at all! But you're on the road to becoming an ace UGC-144 maintenance craftsman!

ADDITIONAL READING

There are some publications available which will help you better understand the UGC-144 and how it operates within various communications systems. They also provide crypto switch settings and ancillary equipment patches. You may want to increase your UGC-144 system knowledge by reading the following publications.

- Joint Pub 6-05.3
- AN/UGC-144 Communications Terminal Planner's Guide

REVIEW QUESTIONS

Answer the following review questions. Compare your responses with the confirmation key in the back of this book. You may refer to this module and Technical Order 31W4-2UGC144-1 to answer the questions. Your responses do not have to match word-for-word, but should convey the same basic meaning. Review the applicable portions of this module for all missed questions.

1. The UGC-144 send and receive lines normally tie to a ___ or ___ encryption device.
2. What would you call a block of information sent before an actual message?

3. List the major terminal components.
4. Which feature enables the terminal to operate with different terminal equipment without resetting terminal parameters?
5. List the editing software used in the UGC-144.
6. List the five functions of the UGC-144.
7. What are the two main sections of the UGC-144?
8. List the four UGC-144 technical orders.
9. Which TO contains an Illustrated Parts Breakdown?
10. Which TMDE do you require to maintain the UGC-144?
11. List the seven UGC-144 cables.
12. Which plugs do you need to troubleshoot the UGC-144?
13. List the three subassemblies which have controls or indicators.
14. Which terminal control panel switch clears message memory?
15. The top three lines of the display screen are called the ____.

16. List the three functional areas of the keyboard assembly.
17. What is the name of the UGC-144 printer?
18. Which printer control is NOT on the control panel?
19. The control panel switches send control signals to the ____.
20. The ____ converts 115 VAC line voltage into +300 VDC.
21. The ____ directs battery backup power to the memory.
22. Which CCA contains over-voltage and over-current protection circuits?
23. The ____ contains a display controller which generates screen characters information for the Display subassembly.
24. The UGC-144 contains ____ KB of RAM.
25. List the three subassemblies which make up the DMU assembly.

ADDITIONAL INSTRUCTIONS

When finished, ask your trainer for help with any problem area you may have. Once you are ready, your trainer will administer the KEP questions for this module. You may refer to the technical order and you must score 100%. Your trainer will check your answers and review any you may have missed. When you achieve the KEP standard,

your trainer will assign Module 2.

MODULE 2

EQUIPMENT PREPARATION

OBJECTIVES

Given TO 31W4-2UGC144-1 and the necessary materials, prepare the equipment for operation

IAW Chapters 2 and 4.

- a. Explain how to set printer dual in-line package (DIP) switches.
- b. Explain how to install the printhead.
- c. Explain how to install terminal batteries.
- d. Explain how to set up the system for 115 VAC single-phase power.
- e. Explain how to set up the system for 230 VAC single-phase power.
- f. Explain how to connect the data cables.

PREREQUISITE

You must have completed AFQTP Module 1.

TRAINING REFERENCES

- a. TO 31W4-2UGC144-1
- b. TO 33-1-32

INFORMATION

In Module 1, you became familiar with the UGC-144, its subassemblies and support material. In this module, you will learn how to prepare the UGC-144 for initial power application. You will do this by setting the printer's dual in-line package (DIP) switches, installing the print head and batteries, and adapting the system to operate with either 115 or 230VAC single-phase power. You will also learn how to connect the system's data connections. First, you need to know which materials you will require to perform this task.

NOTE

It will be beneficial if you can observe the actual equipment as you read this module.

To decrease delays, be sure you have all materials on hand before you start the task. you will need the following **materials**:

7-level screwdriver

Paper clip

Lint-free cloth

Prince Reed #2 screwdriver

Four Nickel-Cadmium (Nicad) batteries (P/N BB-416/U)

Flat-tip screwdriver

#1 Phillips screwdriver

Digital multimeter

Ground wire

Now that you have all your materials on hand, let's discuss the printer DIP switches.

DIP SWITCHES

Since power is not yet applied, this would be a good time to ensure the printer DIP switches are properly set. The TO doesn't explain the purpose of the DIP switches; however, we know they set the following printer operating parameters:

- Baud rate
- Data bits
- Stop bits
- Parity

All UGC-144 printers should have identical DIP switch settings. If you receive a new printer, check the switches to ensure they match the settings shown in Figure 2-1. If necessary, use a 7-level screwdriver to change the settings. Be sure the switch #6 on the 10-switch bank and switch #5 on the 8-switch bank are set to "1" (ON). All others switches should be set to "0" (OFF).

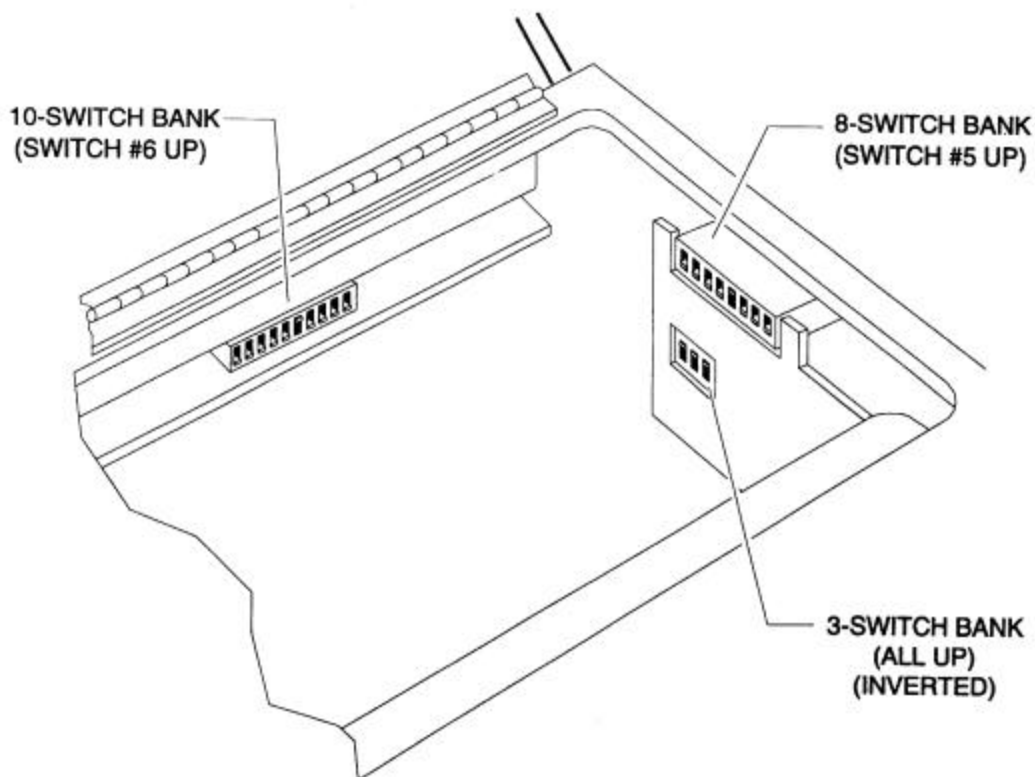


Figure 2-1. Printer DIP Switch Settings

NOTE

The 3-switch bank is installed upside down when compared to the others. Its ON position is down. set all of its switches to the OFF position (UP).

Now that your printer is set correctly, you will learn how to install the print head.

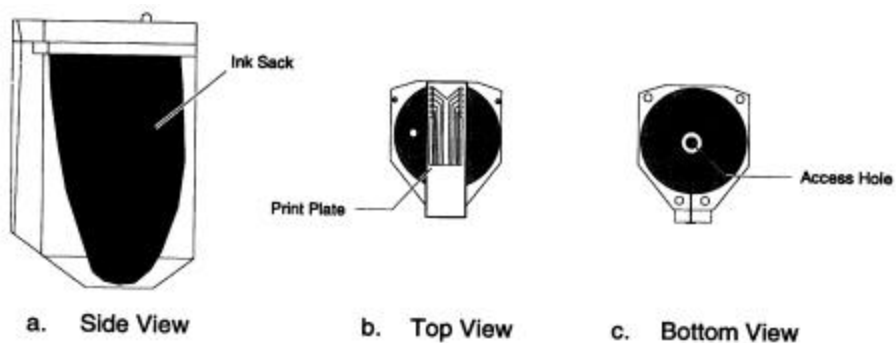


Figure 2-2. UGC-144 Print Head

CAUTION

In the next procedure, do NOT touch or scratch the print head metal surfaces. Something as simple as finger prints will affect the ink distribution.

PRINT HEAD INSTALLATION

During equipment setup or maintenance, you will have to install the print head (Figure 2-2a). This is a simple procedure. Underneath the printer top cover is a decal explaining how to install the print head. Follow these instructions and you shouldn't have any problem.

Before you install a new print head, you must first activate it to allow the ink to flow. To do this, hold the print head cartridge so the shiny print plate faces up as shown in Figure 2-2b. Straighten out a section of a paper clip. Insert it into the access hole (Figure 2-2c) at the bottom of the print head cartridge. The hole provides access to the ink bladder.

CAUTION

Do NOT allow the paper clip to puncture the ink bladder inside the print head.

Gently push the paper clip into the ink bladder until a bead of ink appears on the print plate. Remove the paper clip. Clean the ink from the print plate (Figure 2-2b) with a lint-free cloth. Install the activated print head IAW the decal underneath the printer's top cover.

NOTE

Be sure to install a new white absorber into the clip holder. The absorber's fiber side must face the print head (front of printer).

Now that you know how to install the print head, let's discuss battery installation.

BATTERY INSTALLATION

UGC-144 terminals are usually transported with no batteries installed. You will probably have to install them at your deployment site. These batteries will maintain the UGC-144 message memory in case of a power failure. Here are the steps you should take to install the batteries.

Step 1. Using a Prince Reed #2 screwdriver (a special cross-tip screwdriver which fits shallow screws), remove the three screws which secure the battery compartment access cover. If any batteries are inside the compartment, remove them.

Step 2. Inspect the battery compartment for cleanliness and corrosion. If necessary, clean the compartment.

Step 3. Install four new batteries IAW the battery installation template. Be sure they are 1.2VDC Nickel-Cadmium (Nicad) batteries (P/N BB-416/U). The template is printed on the compartment wall. Be sure the batteries fully seat against the electrical contact springs.

Step 4. Install the battery access cover. Replace the cover by inserting the tab on the cover under the terminal frame. Replace the three screws to secure the cover.

You should now have a good concept of how to set up your terminal. Now it's time to learn how to configure your equipment to operate with 115 VAC or 230 VAC single-phase power.

NOTE

230 VAC dual-phase power (the US Standard) consists of two 115 VAC legs and a common wire. Standard household (outlet) power consists of one of these 115 VAC legs and a common. To simplify equipment setup and avoid dangerous procedures, the UGC-144 printer will always operate on 115 VAC power. If only 230 VAC power is available, use a step-down transformer to change the 230 VAC to 115 VAC. No matter the operating

PART NUMBER	DESCRIPTION	CABLE NUMBER
A3096904	Terminal power (115 VAC) cable	1W1
A3096905	Terminal power (230 VAC) cable	1W7
A3096906	DLED (KG-84/KG-84A) cable	1W5
A3096907	DSVT (KY-68) or DNVT (TA-1042) cable	1W2
A3096909	ANDVT (CV-3591) cable	1W6
A3096911	Printer Interface cable	1W4
A3096912	Printer power cable	1W3

location, the printer should always be setup to operate on 115 VAC.

TABLE 2-1. UGC-144 Cable List

You need to have the proper cables to perform this task. Each UGC-144 comes with a package of power and data cables. Table 2-1 gives a complete list of the cables and their part numbers.

Step 1. The first step you should take is to verify the available site power. Be sure the terminal and printer POWER switches are in the OFF position. The site power must be between 105 and 127 VAC, measured between the hot and return leads of the power outlet. If your input power is 230 VAC you must also complete the 230 VAC

configuration.

WARNING

Do NOT plug the power cables into the power source until instructed to do so. Failure to adhere to this warning will cause equipment damage and possibly bodily harm.

Step 2. Install the terminal power cable (IW1) on the terminal rear connector panel J4.

Step 3. Connect one end of the ground wire to the terminal's ground stud (E1). This stud is on the rear connector panel. Terminate the other end of the ground wire to **a common site ground**.

CAUTION

Do NOT interconnect the terminal ground to the printer ground lug. At the common site ground, the printer and terminal ground wires must be terminated using separate connectors.

Step 4. Remove the printer paper if any is installed. This will allow you to access the fuses and Input Power Selection switch. To remove the paper:

- Open the printer top cover (Figure 2-4). It **has two** captive twist lock screws which secure it to the printer upper enclosure. Turn the screws Saturn counterclockwise.

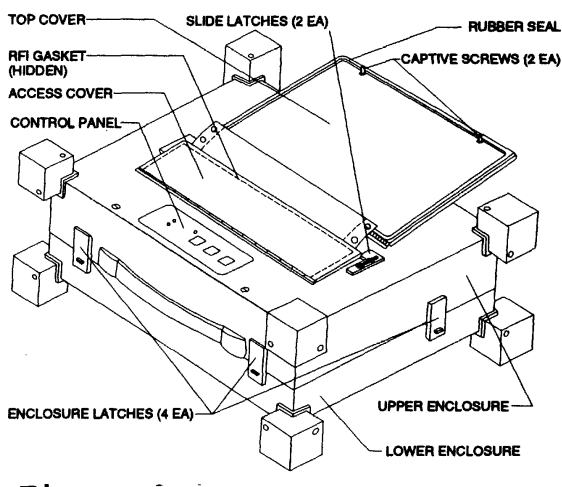


Figure 2-4. UGC-144 Printer

- Open the printer carriage access cover, shown in Figure 2-4. Also shown are the two cover slide latches. Slide these latches back to release the access cover.

- Pull the bail arm away (back) from the platen roller. The bail arm is the long chrome bar extending across the carriage. The platen roller is the long black plastic roller extending across the carriage.

Figure 2-4. UGC-144 Printer

The bail arm should lock into the open position.

- Open the upper enclosure. The upper enclosure is the top half of the printer. The upper enclosure has four black plastic latches, two on the front, and one on each side. These latches secure the upper enclosure to the lower enclosure. Each latch has a small gray plastic tab which secures the latch. To open the latches, you must push these tabs down with gentle pressure and raise the black plastic latches.

- Once all four latches are open, raise the upper enclosure. You will notice a chrome brace on the right side of the inner compartment (Figure 2-5). This brace will hold the upper enclosure open when you pull it into the locked position. From inside the enclosure, pull the paper out. Remove the paper plastic latches, two on the stack from the paper storage area.

Step 5. Ensure the Input Power Selector switch is in the proper position. To do this, remove two Phillips screws and the panel which covers the switch. Use a 7-level screwdriver to place the switch in the 115 VAC position. Replace the panel and its screws. Figure 2-5 shows the location of all the power conversion parts.

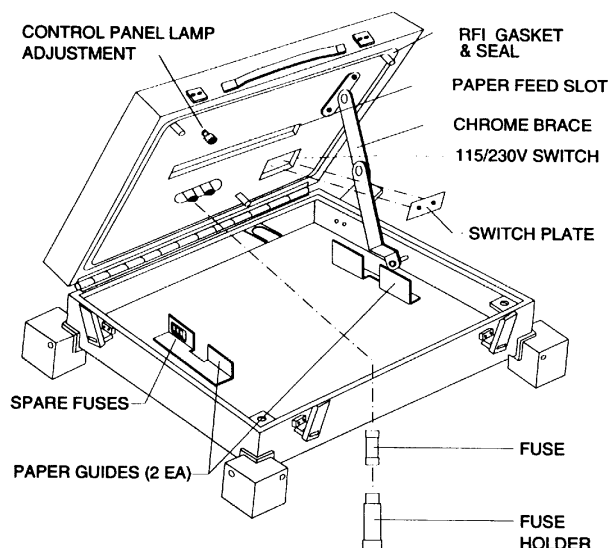


Figure 2-5. Printer (Opened)

WARNING

Do **NOT** replace fuses with power applied. High voltages could cause bodily harm or equipment damage. Replacement fuses must be of the same type.

Step 6. Ensure the printer has M-amp fuses installed. To do this, you will need a 7-level flat blade screwdriver to remove the fuse holders (Figure 2-5).

Step 7. Before this task is complete, you must reload the printer paper. Underneath the printer's top cover is a decal explaining how to install it. Follow the decal's instructions

and you should have no problem.

WARNING

Do **NOT** plug the power cables into the power source until instructed to do so. Failure to adhere to this warning will cause equipment damage and possibly bodily harm.

Step 8. Ensure the proper AC plug is installed on the printer power cable (1W3) IAW TO 31W4-2UGC144-1, Chapter 4. Install the 115 VAC power cable (1W3) on the printer.

Step 9. Connect one end of a ground wire to the printer ground lug. The ground stud is on the rear connector panel. Terminate the other end of the ground wire to a common site ground.

CAUTION

Do **NOT** interconnect the printer ground to the terminal ground lug. At the common site ground, the printer and terminal ground wires must be terminated using separate connectors.

Now your system is configured to accept 115 VAC power. However, you shouldn't apply power until the Printer Interface and SSI cables are installed. We'll discuss the installation of these cables later. Next, you will learn how to configure the system for 230 VAC power.

230 VAC SINGLE-PHASE SETUP

TO 31W4-2UGC144-1 covers single-phase, 230 VAC terminal setup. However, the TO procedure is incomplete as it doesn't address single- and dual-phase differences.

WARNING

In TO 31W4-2UGC144-1, the 230 VAC power cable and its wiring diagram show incorrect color codes for standard U.S. or European power (see TO 33-1-32, para

ld}. The UGC-144 TO procedure will likely cause confusion, resulting in bodily injury and equipment damage.

CAUTION

Figure 2-6, Printer Caution Label, shows a decal which is supposed to be in place on the back of your printer. Some printers do NOT have this decal affixed.

Because of the limitation shown in Figure 2-6, you must install a 230 to 115 VAC step-down transformer for standard European 230 VAC single-phase power. This power transformer will provide the correct voltage for your printer. We highly recommend you also use this transformer to power your terminal. This would eliminate the need for a 230 VAC terminal power cable. It would also simplify installation procedures and preclude possible injury and equipment damage.

Step 1. Perform all steps to configure the system for 115 VAC single-phase operation as mentioned earlier.

Step 2. Measure the line voltage that the transformer will use. The transformer requires between 207 and 253 VAC, measured between the hot and return leads of the outlet.

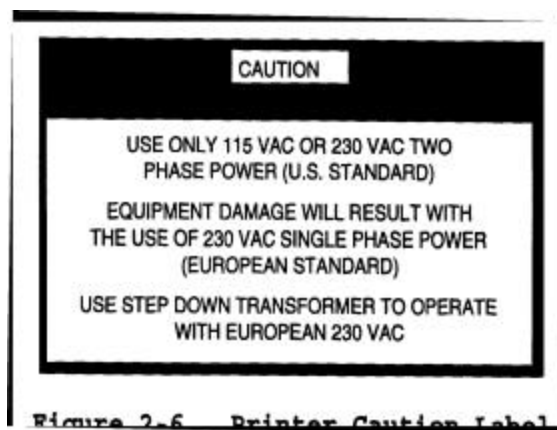


Figure 2-6. Printer Caution Label

CAUTION

Before continuing, ensure nothing is plugged into the power outlets of the transformer.

Step 3. Plug the transformer into the wall outlet.

Step 4. Measure the output voltage of the transformer. It must be between 105 and 127

VAC, measured between the hot and return leads of the transformer outlet.

CAUTION

If the transformer output voltage is incorrect, there is something wrong with it. Do **NOT** use it! Incorrect input voltage to the UGC-144 terminal and printer will result in damage.

This completes this task. Before connecting the transformer to your terminal, you must first connect the data cables.

DATA CABLE CONNECTION

The UGC-144 has three data cable connectors on the rear terminal. One is labeled PRINT for the Printer Interface cable (1W4). Another is the COMM port connector. This port can connect to other printers or other RS-423 devices (a new industry standard plug; however, seldom used in UGC-144 applications). The COMM port cannot be used with standard UGC-144 software. The third connector (SSI) is for various data cables which connect the UGC-144 terminal to ancillary equipment.

Here is a list of the various SSI data cables:

- DSVT (KY-68) or DNVT (TA-1042) cable 1W2
- DLED (RG-84) cable 1W5 (See Note)
- ANDVT (CV-3591) cable 1W6
- UGC-144/STU-III interface cable

Your shop will have to fabricate the UGC-144/STU-III interface cable. Table 2-2 shows the cable connector pin out.

NOTE

The DLED cable issued with the UGC-144 must be modified. It works fine with the KG-84A strapped to emulate a KG-84. However, if you have a KG-84A, you must connect a strap between pins 29 (+6V) and 38 (PTTR) of the KG-84A connector. (Ref. Lessons Learned Report,

C3A-JITC-001-91, dated March 91.)

TABLE 2-2. Cable Connector Pin Out

AN/UGC-144 (CONNECTOR MS3476W22-55P)			STU-III (DB25 DTE CONNECTOR)
RD	B	3	RD
TD	M	2	TD
GND	C	7	GND
TX CLOCK	K	15	TX CLOCK
RX CLOCK	H	17	RX CLOCK
FRAME GND	HH	1	FRAME GND
TX READY (tied to ring data)	a	20	DTR
RING DATA	x	4	RTS (tied to DSR)
		6	DSR

Step 1. Attach one end of the Printer Interface cable (1W4) to the SIGNAL connector on the printer rear connector panel. Connect the other end to the terminal PRINT connector.

Step 2. Connect the SSI data cable. To do this, attach the appropriate cable to the SSI port connector on the terminal. Attach the other end of the cable to the appropriate ancillary equipment input connector.

Now that you have all the data cables connected, you can safely connect power to the equipment. Do this by attaching the terminal and printer power cables to the power source (in case of 230 VAC application, the transformer). Ensure all cables are secure. Your UGC-144 is now ready for power application.

When you finish connecting all the cables, it's time to start cleaning up. you should return all materials to their proper storage locations and clean up your work area.

SUMMARY

Your equipment is now ready to receive power. The printer DIP switches are set, the print head, batteries, and proper cables are installed. Remember to use the transformer for the printer AND the terminal if your system requires 230 VAC single-phase power.

REVIEW QUESTIONS

Answer the following review questions. Compare your responses with the confirmation key in the back of **this** book. You may refer to this module and TO 31W4-2UGC144-1 to answer the questions. Your responses do not have to match word-for-word, but should convey the same basic meaning. Review the applicable portions of this module for all missed questions.

1. When would be a good time to check **the DIP switch** settings?
2. List the printer parameters set with the DIP switches.
3. Why shouldn't you touch or scratch the print head metal surfaces?
4. Where can you find a decal with instructions on print head?
installation?
5. What must you do to a new print head before installing it?
6. What is the purpose of the UGC-144 batteries?

7. Which type of batteries should you install in the UGC-144?

8. Where can you find a battery installation template?

9. What is your first step when configuring your system to use 115 VAC power?

10. What is the UGC-144 115 VAC power requirement?

11. At the common site ground, the printer and terminal ground wires must be terminated using separate .

12. For 115 VAC single-phase operation, the UGC-144 printer must have amp fuses installed.

13. What is the printer 115VAC power cable number?

14. For European UGC-144 printer operation, you must install a transformer.

15. What is the 230 VAC step-down transformer input power requirement for the UGC-144?

16. For use with the UGC-144, the 230 VAC step-down transformer output voltage should be between and ____ VAC.

17. Name the three data cable connectors on the back of the terminal.

18. Which data cable must be fabricated by your shop?

19. How do you modify the DLED cable for KG-84A interface?

20. One end of the SSI data cable attaches to the terminal's SSI port connector and the other end to the appropriate _____ input connector.

ADDITIONAL INSTRUCTIONS

When ready, ask your trainer to administer the KEP questions for this module. You may use TO 31W4-2UGC144-1 and you must score 100%. Your trainer will check your answers and review any incorrectly answered questions with you. When you have achieved the KEP standard, proceed to the performance procedures.

PERFORMANCE PROCEDURES

Your trainer will demonstrate this task to you. Then you will be provided with all the required materials. Using TO 31W4-2UGC144-1 and these materials, practice the following procedures in the presence of your trainer. This will instill confidence in your ability to perform the task. Practice until you and your trainer feel you are ready. You will then perform the evaluation procedures below without help. Your trainer will also evaluate you on any applicable local procedures. Follow the steps below to prepare the UGC-144 for use.

1. Gather all required materials.
2. Set printer DIP switches.
3. Install the print head.
4. Install UGC-144 batteries.
5. Set up the system for 115 VAC input power.
6. Set up the system for 230 VAC input power.
7. Connect data cables.
8. Return materials to storage and clean area.

After you complete these procedures, your trainer will review your work. When you are proficient in performing the procedures, you may be certified on the AFJQS. Your trainer will assign the next task.

MODULE 3

SOFTWARE PREPARATION

OBJECTIVES

1. Given TO 31W4-2UGC144-1 and two properly formatted 3½-inch floppy diskettes, perform a system self-test IAW Chapter 3.
 - a. Explain how to install floppy diskettes.
 - b. Explain when to perform the system self-test.
 - c. Explain how to perform a system self-test.
2. Given TO 31W4-2UGC144-1, configure the terminal software parameters IAW Chapter 2.
 - a. Explain how to edit the Date/Time Update Menu settings.
 - b. Explain how to change the terminal volume.
 - c. Explain how to change the Edit Menu settings.
 - d. Explain how to change the terminal settings of the Guarded Menu.
 - e. Explain how to change the Access Menu settings.
3. Given TO 31W4-2UGC144-1, configure the communications software parameters IAW Chapter 2.
 - a. Explain how to edit the System Menu parameters.
 - b. Explain how to edit the SSI Menu parameters.
 - c. Explain how to edit the RI/PLA Table parameters.
4. Given TO 31W4-2UGC144-1, two floppy diskettes, and a set of cables, configure a

UGC-144 to operate within common circuits IAW Chapter 2.

- a. Identify common dial up circuits.
 - b. Identify common dedicated circuits.
5. Given TO 31W4-2UGC144-1 and three floppy diskettes, format the diskettes IAW Chapter 2.
- a. Explain how to format an ASC diskette.
 - b. Explain how to format an OTC Floppy diskette.
 - c. Explain how to format an OTC Message diskette.

PREREQUISITES

You must have completed AFQTP Modules 1 and 2.

TRAINING REFERENCE

TO 31W4-2UGC144-1

INFORMATION

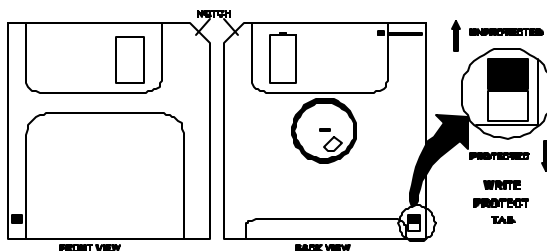
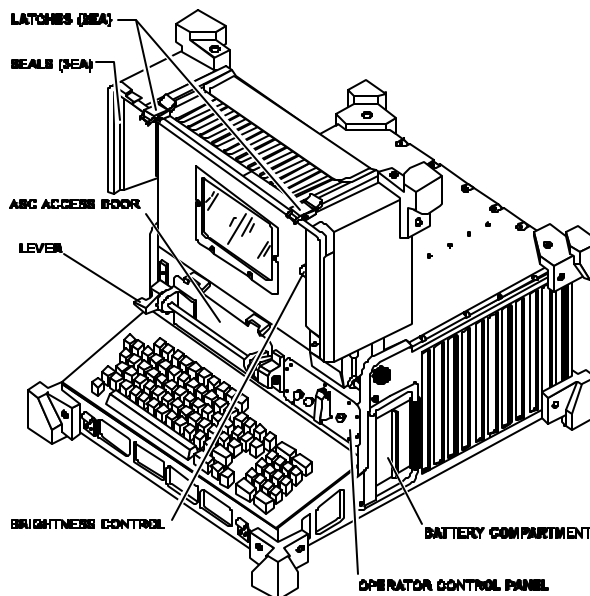
This module contains all the information you need to perform a system self-test and configure the UGC-144 for on-line use. Let's start with preparing the UGC-144 for on-line operation.

SYSTEM SELF-TEST

This test will check the operation of the terminal and printer. Part of this test is the ASC and OTC floppy disk drive tests. To do this you will need to know how to load a diskette. Your trainer will provide you two diskettes; one formatted as an ASC diskette, the other as an OTC floppy diskette.

Floppy Disk Installation. The UGC-144 has two disk drives: the ASC and OTC floppy drives. Please note that they are both floppy disk drives. They have different functions, hence their different names. The diskette installation procedure is the same for either drive.

Step 1. Lift the ASC access door latch and open the door (Figure 3-1).



Step 2. Hold the disk with its label side up and notch to the right. The write-protect tab must be in the unprotected position as shown in Figure 3-2. Push the diskette into the appropriate drive until it locks in place.

NOTE

TIP: If you see a square hole through the diskette cover by the tab, the diskette is protected.

Step 3. Close and lock the ASC access door. To lock the door, press down the lever on the left side of the door. The lever should click into the locked position.

Now that you know how to insert a diskette into the drive, you are ready to learn the self-test. To do this test, your printer should have the power cable, interface cable, print head, and paper installed. Let's get started.

NOTE

The purpose of this section is to familiarize you with the self-test. In this module, we will not cover fault messages. If you receive a fault message, leave the terminal as it is

and consult your trainer.

System Self-Test. You should perform the self-test as part of:

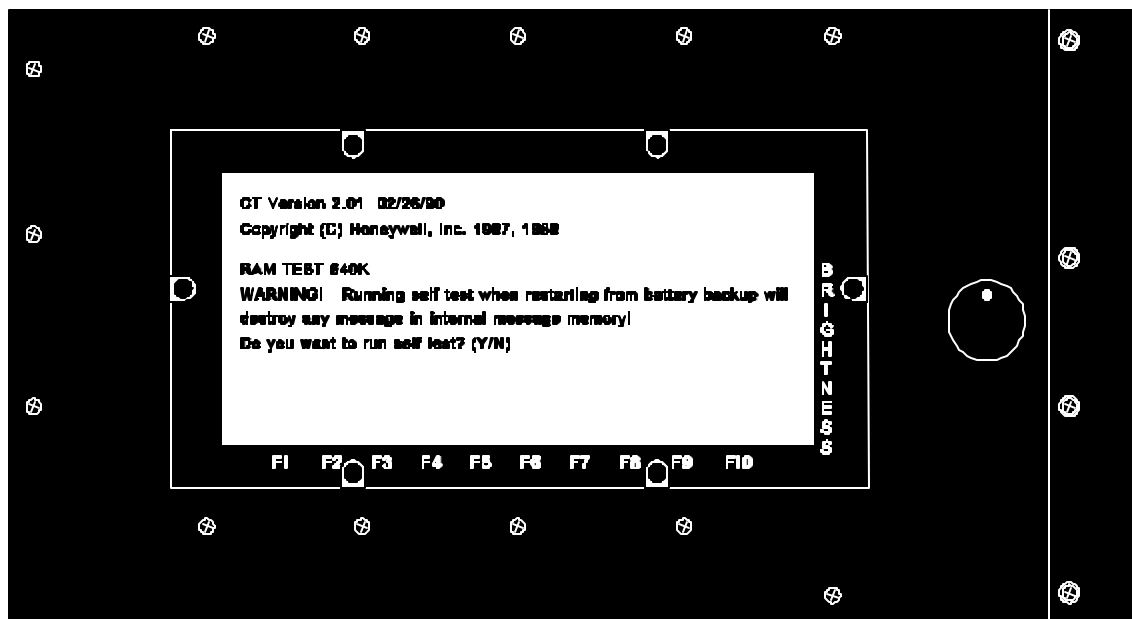
- acceptance inspection.
- pre- and post-deployment inspections.
- equipment installation.
- 56-day PMI.
- unscheduled maintenance.

You should also perform this test before configuring the system software—not afterward. This is necessary because the self-test will erase some of your configuration data.

NOTE

The printer has a built-in print test available by holding the FORM FEED switch while applying power to the printer. This print test consists of five font patterns printed on one page.

Step 1. Apply power to the equipment and turn on the POWER switches. Once they're on, the terminal automatically performs a 640k Random Access Memory (RAM) Test. When the terminal successfully



completes the RAM test, you will hear a short beep. A screen message will appear as shown in Figure 3-3.

If you don't press a key in about 37 seconds, the terminal assumes your response is N (No) and bypasses the self-test. It then proceeds to the main menu.

Step 2. Press Y (Yes) to enter the self-test mode. The speaker will emit a series of electronic chimes. The next message will read:

**IF THIS MESSAGE APPEARS ON THE SCREEN,
PRESS THE "Y" KEY.**

NOTE

You can also initiate the terminal self-test from the utilities menu by pressing F7.

Step 3. Press Y and another message will appear.

**IF SPEAKER WAS HEARD AND VOLUME WAS VARYING,
PRESS Y. IF SPEAKER NOT HEARD PRESS N.**

Step 4. If you press Y, a new message appears.

**IS THE CURSOR BLINKING? ENTER "Y" FOR YES,
"N" FOR NO.**

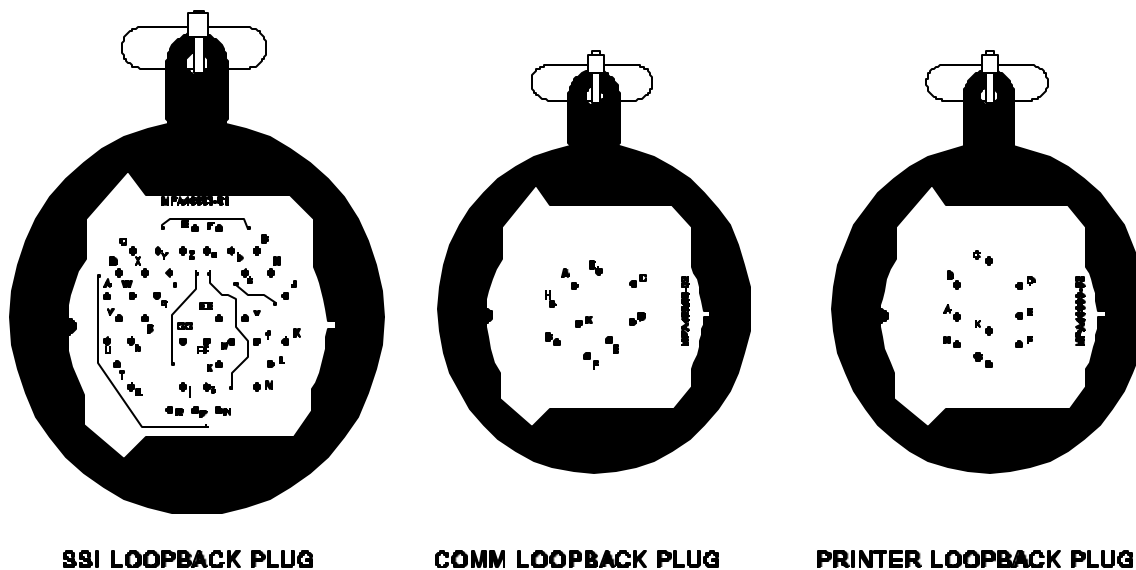
Step 5. Press Y and the following message appears:

**INSTALL THE LOOPBACK PLUGS. ENTER ANY KEY WHEN
READY TO CONTINUE...**

Step 6. Remove cables J1 and J3 from the terminal rear connector panel. Install the SSI and Comm loopback plugs (Figure 3-4). These plugs are keyed to prevent accidental cross-connection.

CAUTION

The loopback plugs are very fragile. Be careful when aligning the plugs with the connectors.



Step 7. Press any key to start this portion of the self-test. This test should check the communications circuits and SSI, Comm, and Printer ports. The following message appears on the screen:

MEMORY TEST IN PROGRESS

Step 8. After about 37 seconds, a message appears as shown in Figure 3-5. While watching the screen, press each key on the keyboard. Ensure each key highlights its corresponding screen character. Note which keys fail, if any.

When finished, simultaneously press **ALT** and **R**. The following message will appear:

**IF ALL KEYS DEPRESSED HIGHLIGHTED THE
CORRESPONDING KEY ON THE SCREEN, PRESS Y.
IF ANY KEY FAILED TO HIGHLIGHT THE CORRESPOND-
ING KEY ON THE SCREEN, PRESS ANY OTHER KEY**

Step 9. If all keys properly highlight, press **Y**. The following screen message appears:

```
!"#$%&'<>v@-=[]{};+:*~,<,>
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
```

**IF THE CHARACTERS DISPLAYED ABOVE ARE FULLY
FORMED, PRESS Y. IF THE CHARACTERS DISPLAYED
ABOVE ARE MISSING DOTS OR ARE NOT FORMED**

CORRECTLY, PRESS ANY OTHER KEY

Step 10. If all the displayed characters correctly form, press **Y**. The following will appear:

**PRESSING A KEY WILL CAUSE THE SCREEN TO FILL
WITH KEY. PRESS ALT R TO END TEST**

ATTRIBUTES ARE SET WITH THE FOLLOWING KEYS:

F1 - NORMAL VIDEO

F2 - REVERSE

F3 - UNDERSCORE

F4 - BLINK

F5 - BLINK + REVERSE

Pressing function keys **F1** through **F5** will change the various screen attributes.

Step 11. Press **F5** (BLINK + REVERSE). The screen background should turn bright orange and the menu text appears as flashing black characters.

Step 12. Press **F4** (BLINK). The screen background should turn black and the menu text appears as flashing orange characters.

Step 13. Press **F3** (UNDERSCORE). The screen background should appear black with orange horizontal lines. The menu text appears as steady orange characters.

Step 14. Press **F2** (REVERSE). The screen background should appear orange and the menu text appears as steady black characters.

Step 15. Press **F1** (NORMAL). The screen background should appear black and the menu text appears as steady orange characters.

The attribute part of this test is complete. Refer back to the screen message after Step 10.

Step 16. As you sequentially depress each key, the screen should fill with that key's corresponding character. Press the following keys: 1, 2, 3, 4, 5, 6, 7, 8, 9, 0, -, [,], q, w, e, r, t, y, u, i, o, p, @, \, _, DEL, a, s, d, f, g, h, j, k, l, ;, :, ^, z, x, c, v, b, n, m, ,, ., /, SPACE. After pressing the SPACE key, the screen appears blank.

NOTE

Don't be concerned with upper/lowercase letters. Just be sure to check all of the keys listed above.

Step 17. Press **ALT R**. You should observe the following message:

**IF ATTRIBUTES OR CHARACTER DISPLAYS WERE
CORRECT, PRESS Y. IF ATTRIBUTES OR
CHARACTER DISPLAYS WERE INCORRECT, PRESS
ANY OTHER KEY**

Step 18. Pressing **Y** will end this part of the self-test and the Printer Test message will appear. Be sure the printer Interface Cable is installed and the ONLINE indicator is lit.

**IS A PRINTER PRESENT? PRESS 'Y' IF YES
(PRINTER TEST PERFORMED) OR ANY OTHER KEY
FOR LOOPBACK TEST.**

Step 19. Press **Y** to enter the printer test. The printer should begin printing a 36-line "barber pole pattern" of printable ASCII characters.

NOTE

The printer test will be bypassed if you press a key other than **Y**.

**CHECK OUTPUT OF PRINTER FOR CORRECT PRINT DATA
IF PRINTER DATA IS CORRECT, PRESS 'Y', IF PRINT
IS INCORRECT, PRESS ANY OTHER KEY**

Step 20. Pressing **Y** after the printer test causes the following message to appear:

TERMINAL MEMORY TEST: TERMINAL SIDE

The memory test for the terminal side takes about ten seconds. If successful, the message for the Comm side appears:

TERMINAL MEMORY TEST: COMM SIDE

After another ten seconds you should hear a tone from the speaker followed by a new message:

WAS POWER APPLIED WITH THE FRONT PANEL POWER SWITCH? (Y/N)

Step 21. Press **Y**. You will hear a tone and the following message will appear:

WAS A TONE HEARD FROM THE SPEAKER?

Step 22. Press **Y** if you heard the tone. Press any other key if you did **NOT** hear the tone. If **Y** was pressed, another message will appear:

TOGGLE THE EMER ERASE SWITCH

NOTE

In self-test Steps 23 thru 26, you must respond to each request within 25 seconds or the terminal will assume a malfunction. Hence, an error message will be displayed.

Step 23. Lift the red cover of the EMER ERASE switch. Momentarily hold the EMER ERASE switch in the up position and then release it. If all is well, the next screen will appear:

PRESS THE ALARM RESET SWITCH

Step 24. Press the ALARM RESET switch. If all is well, the following screen message will appear:

PRESS THE ABORT SWITCH

Step 25. Press the ABORT switch and this screen appears:

OPEN AND CLOSE THE ASC DOOR

Step 26. Lift up on the ASC door latch. Raise and lower the door. Secure the latch. The next screen message should appear.

RX/TX CONTROL TEST IN PROGRESS

The terminal then performs the RX/TX Control Test. After this test, a chime sounds and the following message appears on the screen:

**ATTENTION! IF THE ASC TEST IS PERFORMED,
ALL DATA ON THE ASC WILL BE DESTROYED!!
DO YOU WISH TO PERFORM THE ASC TEST? (Y/N)**

Step 27. Press **Y** and the following message will appear:

**REMOVE THE ASC CARTRIDGE AND CLOSE
THE ASC DOOR. ENTER "Y" KEY WHEN READY.**

Step 28. Ensure an ASC floppy diskette (also referred to as an ASC cartridge) is NOT in the ASC drive. Close the door and then press **Y**. The following message will appear:

TESTING ASC DRIVE MEMORY BUFFERS ...

Within a short time, the following message will appear:

**MOVE THE ASC WRITE-PROTECT SWITCH TO "PROTECT"
INSERT THE ASC CARTRIDGE INTO THE ASC SLOT AND CLOSE THE
ASC DOOR. ENTER "Y" WHEN READY.**

Step 29. Write protect your ASC floppy diskette. Open the ASC drive door and insert the diskette into the ASC drive (on the left side). Close the ASC door and then press **Y**. The following message will appear:

**REMOVE THE ASC. MOVE THE WRITE-PROTECT SWITCH TO "WRITE".
INSERT THE ASC CARTRIDGE INTO THE ASC SLOT AND CLOSE THE
ASC DOOR. ENTER "Y" WHEN READY.**

Step 30. Remove the diskette from the ASC drive. Move the write-protect tab to the "UNPROTECTED" position. Insert the diskette back into the ASC drive. Close the ASC door and then press **Y**. The self-test program will test the ASC drive by writing test data to the diskette and then reading it. A screen message will tell you when the program is writing and reading. After five write/read cycles, the following message will appear:

**IF THE FLOPPY DISK DRIVE IS PRESENT AND YOU WISH TO RUN
THE FLOPPY DRIVE SELFTEST, TYPE "Y", OTHERWISE TYPE "N".
!ATTENTION! THIS TEST WILL DESTROY THE CONTENTS OF THE
FLOPPY DISKETTE.**

Step 31. Type **Y** and the following message will appear:

**OPEN ASC DOOR, INSERT A WRITE PROTECTED FLOPPY DISKETTE
INTO THE DRIVE, AND CLOSE THE ASC DOOR. PRESS "Y" WHEN
READY TO PROCEED.**

Step 32. Write protect the second (OTC Floppy) diskette. Open the ASC drive door and insert the diskette into the floppy drive (on the right side). Close the ASC door and then press **Y**. The following message will appear:

**OPEN THE ASC DOOR, REMOVE THE FLOPPY DISKETTE, UNWRITE
PROTECT THE DISKETTE, REINSERT INTO THE DRIVE, AND CLOSE
THE ASC DOOR. ENTER "Y" WHEN READY TO PROCEED.**

Step 33. Remove the diskette from the floppy drive (on the right side). Move the write-protect tab to the "UNPROTECTED" position. Insert the diskette back into the floppy drive (on the right side). Close the ASC door and then press **Y**. The self-test program will test the floppy drive by writing test data to the diskette and then reading it. A screen message will tell the test is under way. Within two minutes, the following message appears:

**SELF TEST COMPLETE WITH NO ERRORS DETECTED.
CYCLE POWER TO RESTART**

As the screen message indicates, your self-test is complete--hopefully with no errors detected. At this point, you will have to turn the power off, wait 30 seconds, then turn the power back on. This is the only way to exit the self-test software program. You cannot set the terminal software parameters while in the self-test mode.

TERMINAL SOFTWARE PARAMETERS

In this task, you will learn how to adjust the date, time, and volume settings. You will also learn how to set certain parameters within the Edit, Guarded, and Access Menus. These are all functions within the terminal section of the UGC-144. Other areas of these same menus will be covered later in this module. From the Main menu, press **F1** to access the Setup Menu. Now press **F1** again to access the Date/Time Update (DTU) Menu.

DTU Menu. This menu allows you to set the terminal's date and time. This data is automatically placed in all message headers. Press the UP or DOWN arrow key to access the CURRENT DAY function.

- **CURRENT DAY** - Press the **BS** (backspace) key to erase the current setting. Enter the current day (of the month). Then press the DOWN arrow key.
- **CURRENT MONTH** - Press the RIGHT or LEFT arrow key until the current month is displayed. Then press the DOWN arrow key.
- **CURRENT YEAR** - Press the **BS** (backspace) key to erase the current setting. Enter the current year. Then press the DOWN arrow key.
- **LOCAL TIME** - Press the **BS** (backspace) key to erase the current setting. Enter the current local time. Then press the DOWN arrow key.
- **ZULU TIME** - Press the **BS** (backspace) key to erase the current setting. Enter the current Zulu time. Then press the DOWN arrow key.

Terminal Volume. Press **F2** to enter the volume setting screen. This function changes the speaker volume. Use the UP arrow key to increase the speaker volume. Use the DOWN arrow key to decrease the speaker volume. The press the **MENU** key to exit to the Setup Menu.

Set Edit. This function allows you to set:

- Caps Lock - This setting determines if the terminal powers up with the Caps Lock key set to ON or OFF. Use the LEFT or RIGHT arrow key to set the Caps Lock feature ON.
- Line Length - Press **BS** (backspace) to erase the current line length; then enter your requirement using the number keys. The line length must be set for **69** for AUTODIN JANAP 128 format.
- Tab - Press **BS** to erase the current tab setting; then enter your requirement using the number keys. Enter an * to erase all tab positions.

You are now finished with the Edit Menu. Press the **MENU** key to exit to the Setup Menu.

Guarded Menu. Press **F5** to enter the Guarded Menu. You can only enter the Guarded Menu if you enter the correct password. The default password is **abcdef**. Within the Guarded Menu, press the **F1** key to access the System Menu.

System Menu Terminal Parameters. At this time, you will only be concerned with the following System Menu parameters:

- Terminal Community - Use the LEFT or RIGHT arrow keys to change between **R** and **Y**. **R** is used for the Genser community. **Y** is used for the Defense Special Security Communications System (DSSCS) community.
- Terminal Classification - Use the LEFT or RIGHT arrow keys to select one of the following:

The following Terminal Classification settings are valid only for the Genser community:

U	Unclassified
E	Unclassified, Encrypted for Transmission Only (EFTO). (Version 2.2 or higher)
R	Restricted
C	Confidential
S	Secret
T	Top Secret

NOTE

M is the only valid Terminal Classification setting for the DSSCS community.

Press the **MENU** key to return to the Guarded Menu. Press **F3** to access the Printer Menu.

Printer Menu. This function has five parameters which are accessed through the Printer Menu (F3 on the Guarded Menu). With these, you can set the printer's parameters and allow it to operate in any circuit configuration. Press the UP or DOWN arrow key to access the Baud Rate function.

- **Baud Rate**. Use the LEFT or RIGHT arrow key to change the baud rate (bit/sec). The options are: 300, 600, 1200, 2400, 4800, and 9600b/s. If you use the UGC-144 printer (Miltope Jet 150), set the baud rate to 9600 b/s. Select 2400 b/s if you use the *UGC-129* as your printer. All other printers should use 9600 b/s. Press the UP or DOWN arrow key to access the Data Bits function.

- **Data Bits**. Use the LEFT or RIGHT arrow key to change the setting. This parameter has two options, 7 and 8. Choose option 7 if you use the Miltope Jet 150 or AN/UGC-129 printer.

- **Stop Bits**. This parameter also has two options, 1 and 2. Choose option 1 if you use the Miltope Jet 150 or option 2 to use the AN/UGC-129 printer. Use the LEFT or RIGHT arrow key to change the setting.

- **Parity**. This parameter's options are **OFF**, **ODD**, and **EVEN**. All printers should be set to ODD parity. Use the LEFT or RIGHT arrow key to change the setting.

- **Auto-Opt**. The auto-option parameter determines which messages will automatically print. Its options include: OFF, TRANSMIT, RECEIVE, and TRANSMIT/RECEIVE. Use the LEFT or RIGHT arrow key to change the setting. The normal setting is RECEIVE. If you select OFF, no incoming or outgoing messages will automatically print.

That is all for the Printer Menu, press the **MENU** key to return to the Guarded Menu. Press the **F5** key to access the Autosave Menu.

Autosave Menu. The Autosave Menu has three parameters which can be selected by pressing the UP or DOWN arrow key. Here is a brief explanation of each parameter. Select the Autosave parameter.

- **Autosave** - The Autosave options are: TRANSMIT, RECEIVE, TRANSMIT/RECEIVE, and OFF. The setting determines which messages will be automatically saved. The normal setting is

TRANSMIT/RECEIVE. Use the LEFT or RIGHT arrow key to change the setting.

- Autosave Device - This parameter has three options: ASC, FLOPPY DISKETTE, and HARD DRIVE. When the UGC-144 is operational, only one of these storage devices can be active for automatic message storage. The floppy diskette can only operate with message type media. In Modes I and VI, the ASC is always used as the storage device (if the floppy diskette or hard drive is selected, the message will be stored twice). In Mode II, the internal memory is used as the storage device. Use the LEFT or RIGHT arrow key to change the setting.

- Delete Safestored Message - The choices are ON and OFF. This parameter eliminates the message storage duplication caused by selecting the floppy diskette or hard drive in Modes I and VI. When set to ON, the ASC message is automatically deleted ONLY after the message is safely stored on the floppy diskette or hard drive. Use the LEFT or RIGHT arrow key to change the setting.

Press the **MENU** key to exit the Autosave Menu. Next is passwords; press the **F6** key to access the Password Menu.

Passwords Menu. The Password Menu is divided into two sub-menus: Access and System Passwords. To change the Access passwords, press **a** (or **A**). Once in this sub-menu, you will see a list like the one below. Each selection represents possible levels of the operator's security clearance (DOI103 is a DSSCS security level). If a new password has replaced the default password, your trainer will have to advise you of the new one. Use the function keys to change the default passwords (ABCDEF).

ACCESS PASSWORDS

F1	(RSTRD)
F2	(CONF)
F3	(SEC)
F4	(TOP SEC)
F5	(DOI103)
F6	(XMT REL)

NOTE

Software Version 2.2 has added another password for EFTO.

To change the system passwords, press **s** (or **S**). Once in this sub-menu, you will have many options. If a

new password has replaced the default password, your trainer will have to advise you of the new one. Use the function keys to change the default passwords (ABCDEF).

SYSTEM PASSWORDS

F1(GUARDED)

F2(RI/PLA)

F3(PDSS)

F4(UPLOAD)

F5(DNLOAD)

NOTE

F3 (PDSS) is a restricted password. You won't normally have access to it.

A password has between one and six characters. To change a password, press a function key to select the password you wish to change. Type in the current password and press the **RETURN** key. Type in the new password and press the **RETURN** key. Type in the new password again and press the **RETURN** key again.

That's all for the passwords. Press the **MENU** key three times to return to the Guarded Menu. Next is the Access Menu.

Access Menu. Press the **F4** key to display the Access Menu. This menu enables (or disables) operator classification levels and transmission capability (password required). The terminal will show you the current (default) settings. If you previously set your terminal to act in the Genser community, you will see a display that looks something like this:

UNCLASSIFIED	ENABLED
RESTRICTED	DISABLED
CONFIDENTIAL	DISABLED
SECRET	DISABLED
TOP SECRET	DISABLED
TRANSMIT	DISABLED

If you previously set your terminal to act in the DSSCS community, you will see a display that looks something like this:

DOI-103	ENABLED
TRANSMIT	DISABLED

To change the options, press the UP or DOWN arrow keys to select the function to be changed. Pressing the F1 key would enable the selected function. Pressing the F2 key would disable the selected function. Pressing the F3 key would disable all functions except UNCLASSIFIED and DOI-103. Press the MENU once to exit to the Guarded Menu.

NOTE

If you interrupt power to your terminal, all of these Access Menu parameters will revert to the default settings. Disabling a classification will automatically disable all higher classifications.

You now know how to set up your terminal parameters, let's learn how to set up your communications parameters.

COMMUNICATIONS SOFTWARE CONFIGURATION

In this task, you will learn how to set up your equipment to operate in AUTODIN. In the Guarded Menu, use the UP or DOWN arrow key to highlight the parameter you wish to change. Use the LEFT or RIGHT arrow key to select a parameter option. To change a typed setting, use the BS key to erase the current setting; then type in the new setting.

System Menu. At the Guarded Menu, press the F1 key. You will see a system parameter screen. The following is an example of this screen showing an actual system setup.

Terminal Community	R
Content/Comm Indicator	ZYUW
Originator/Destination LMF	AA
Terminal Routing Indicator	RHIRFAA
Terminal Plain Lang. Addr.	31CCS TINKER AFB OK
Terminal Classification	T-TOP SECRET
Terminal Phone Number	98231706
Channel ID	FAA
EOL Sequence	<CR><CR><LF>

XMIT Start Envelope	
XMIT Stop Envelope (1 - 8)	<LF><LF><LF><LF><LF><LF><LF>N
XMIT Stop Envelope (9 - 16)	NNN
RCV Start Envelope	
RCV Stop Envelope (1 - 8)	<LF><LF><LF><LF><LF><LF><LF>N
RCV Stop Envelope (9 - 16)	NNN

CAUTION

The Terminal Community and Terminal Classification settings were covered earlier. Do NOT change these settings!

Content/Comm Indicator. This input consists of four characters; the first three are letters, the fourth can be a letter or number. JANAP 128 describes these inputs in detail. The normal setting is ZYUW.

Originator/Destination LMF. The Originator/Destination LMF (Language Media Format) input consists of two letters. The first letter position identifies your terminal's (originator) media format. The second letter position identifies the distant end (or destination) terminal media format. The only two letters the UGC-144 can accept are the letters **A** and **T**. The **A** format describes a paper tape (teletype) with 8-level ASCII code. The **T** format describes 5-level Baudot (ITA-2) code. The letters **AA** are normally used in a TRI-TAC network.

Terminal Routing Indicator. All entries to the Routing Indicator (RI) must be between four and seven letters. The first letter of the RI is either an **R** (Genser) or a **Y** (DSSCS). This parameter setting must match the Terminal Community setting you made earlier. The RI is normally assigned by the ASC or the AN/TYC-39.

Terminal Plain Language Address. The plain language address (PLA) will be 0 - 50 characters in length. Your RI corresponds to this entry.

Terminal Phone Number. This number is assigned by the AN/TTC-39 or other circuit switch. If you use a KG-84A, this entry should remain blank; it is only used in dial-up circuits.

Channel ID. This entry cannot be changed. The terminal software uses the last three characters of the RI as a Channel ID.

EOL Sequence. This input can be left blank, or it can be one to eight characters in length. This allows the operator to define the End of Line (EOL) sequence. Each message line is limited to 69 characters including the EOL sequence.

XMIT Start/Stop Envelopes. These settings (one to eight characters) are only used in Mode II operation. In Modes I and VI, the parameter is not used and must be left blank. The normal Mode II setting is VZCZC (if you wish to read more on this subject, refer to JANAP 128).

XMIT/RCV Stop Envelopes. Several informational sources have released UGC-144 configuration parameter data which makes the UGC-144 incompatible with AUTODIN Switching Centers (ASC) and Message Distribution Terminals (MDT). The parameters in question are the XMIT STOP ENVELOPE and RCV STOP ENVELOPE. For all ASCII messages, the EOM validation sequences are required to be <CR><CR><LF><LF><LF><LF><LF><LF><LF><LF><LF>NNNN. This requirement is satisfied by combining the EOL sequence and the XMIT STOP ENVELOPE parameter. In other words:

- <CR><CR><LF> = EOL
- <LF><LF><LF><LF><LF><LF><LF>NNNN = STOP ENVELOPE
- <CR><CR><LF> + <LF><LF><LF><LF><LF><LF><LF>NNNN = EOM

Press the **MENU** key to exit to the Guarded Menu. Next is the SSI Menu.

SSI Menu. This menu reflects the current SSI communications settings which will allow you to match your UGC-144 to a circuit. Use the arrow keys to change the settings. Press the **F2** key, the SSI Menu appears. Here is an example of an actual menu:

Master/Slave	• Slave
DACB Protocol	• On
Channel Control	• Mode I Continuous
Message Code/Parity	• ASCII/Odd Parity
Loop Rate	• 32000
Data Rate	• 2400
Error Control	• Multi-sampling
SSI Interface	• DSVT
Auto Resync	• Off
Clock Source	• Internal
Ext. Clock Polarity	• Positive
Transmit Signal Sense	• Mark Positive
Receive Signal Sense	• Mark Positive
Serial Data Code	• NRZ
Number of Stop Bits	• 1
Data Mode Control	• On
Mode VI Storage Blocks	• None

Mode I Answer Timer • 5

The following is a brief explanation of each SSI parameter.

Master/Slave. In most cases, this option should be set to Slave. Since both terminals cannot initiate a resync, the Master will "be the boss." The only instance when Master is chosen is in a UGC-144 → KG-84 → KG-84 → UGC-144 dedicated circuit with no digital switch.

Data Adapter Control Mode (DACM) Protocol. DACM is a communications interface protocol consisting of a set of functions and capabilities which allow for enhanced communications. Currently, the Data Adapter (DA) protocol is used with the AN/TYC-39(V) and the AN/UGC-144. DA is also used with the Tactical AUTODIN Satellite Compensation Interface Device (TASCID). It's installed in some (but not all) AUTODIN ASCs. We will discuss some of the DA capabilities and functions.

- DA is a high speed digital interface which allows the information (data) rate to be less than the transmission (loop) rate. This feature allows flexibility when connecting various systems to each other. The varying data rate will allow equipment to send data at its own speed, rather than having to adapt to the receiver. Table 3-1 shows the relationship of loop and data transmission rates.

- Two DA error control techniques are used: Golay Forward Error Correction (FEC), and automatic repeat-request (ARQ) techniques. The FEC technique used on DA lines are functions of the loop and data transmission rates.

NOTE

The implementation of the DACM in the AN/TYC-39 requires DACM protocol to be used. Whenever the UGC-144 dials the message switch, the protocol must be enabled.

Channel Control. This parameter allows you to select the operating mode: Mode I, Mode II, or Mode VI. Here is a basic description of each of the three modes.

- Mode I Operation. This mode will be the normal operating mode. Mode I is an automatic repeat-request (ARQ) channel arrangement that provides for synchronous, simultaneous, duplex data transfer. It's designed for land links. All messages are structured into blocks which are transmitted to the receiver. The receiver acknowledges error-free blocks (ACK) and blocks with errors (NAK). Blocks acknowledged with a NAK are automatically retransmitted. The UGC-144 has been DCA certified to operate with AUTODIN at data rates of 2400b/s and below.

LOOP TRANSMISSION RATES (kb)	INFORMATION (DATA) RATES (kb)	SAMPLING RATES
2400	300 600 1200 2400	8 4 2 1
4800	300 600 1200 2400 4800	16 8 4 2 1
9600	300 600 1200 2400 4800 9600	32 16 8 4.0 4 2 1
19200	300 600 1200 2400 4800 9600 19200	64 1/8 32 2/8 16 1/8 8 2/8 4 1/8 STUFFED TO 19200 2 4 2 1
38400	300 600 1200 2400 4800 9600 19200 38400	128 2/8 64 1/8 32 2/8 16 1/8 8 2/8 4 1/8 16 8 4 2

- Mode II Operation. Mode II is used when neither UGC-144 can operate in Mode I or Mode VI. It's a non-ARQ channel coordination which provides asynchronous, simultaneous, independent, duplex data transfer. No block acknowledgement is used. The UGC-144 operates as a half-duplex terminal.

- Mode VI Operation. Mode VI is a synchronous, full duplex channel coordination procedure. It's designed to improve the transfer of data over transmission paths which naturally have long delays, such as satellites, and/or high bit error environments.

There are some major differences between Mode I and Mode VI block transmission. Mode I transmits one block at a time with positive acknowledgement (ACK) that the block was received before the sending the next. If a block is incorrectly received, a negative acknowledgement (NAK) is sent back and the bad block is retransmitted.

Mode VI, on the other hand, transmits a series of blocks before requiring acknowledgement. A series of blocks is called a group and can consist of 16, 32, 64, or 96 blocks, depending on the equipment involved. After one Mode VI group is sent, an ACK is required to send the next group. A NAK will identify bad blocks for retransmission. For example, the AN/TYC-39 requires 16 or 32 groups (84 characters per block). The TASCID can only use a group size of 32 blocks. Mode VI doesn't require an ACK to transmit the next block.

Message Parity. This option selects the communications interface code. The possible selections are:

- ASCII Odd
- ASCII Even
- ASCII No Parity
- Baudot Fig S
- Baudot Fig J

Fig S and J are the Baudot codes which allow the activation of the audible alarm when they are received. To interface with older teletype equipment or some Allied equipment, Baudot code is used. You will normally use ASCII Odd parity.

SSI Loop Rate. This is the message transmission rate. The data rate is proportional to the loop rate. It's either equal to the loop rate or multi-sampled, Golay coded or "bit stuffed" to the loop rate. The options are: OFF, 75, 150, 300, 600, 1200, 2400, 4800, 9600, 16000, 32000.

The OFF option sets the loop rate the same as the data rate. The loop rate must always be equal to or greater than the data rate. In Mode II operation, the SSI Loop Rate must be set to OFF.

SSI Data Rate. The SSI data rates (in b/s) are: 45.5, 50, 75, 150, 300, 600, 1200, 2400, 4000, 4800, 8000, 9600, and 16000.

In Mode II operation, the data rate can only be 75, 50, or 45.5b/s. ASCII codes limit the data rate from 75 to 16000b/s. Whenever DACB is enabled, the data rate must be at least 2400b/s.

Error Rate. This function has two choices, Golay or Multi-sampling. Golay refers to a forward error correction technique. Bit errors during data transmission is one of the most common message switch problems. The Golay channel encoded/decoder is used in the TRI-TAC message switching network to control these errors.

Multi-sampling (and in some cases, bit stuffing) allows the data rate to be sampled at different rates to achieve a specific loop or transmission rate.

Most UGC-144 applications will use multi-sampling. For example, if you have a data rate of 2000b/s, the data must be multi-sampled eight or sixteen times to achieve the 16000 or 32000b/s rate needed by the DSVT.

LOOP TRANSMISSION RATES (b/s)	BIT SYNCHRONOUS INFORMATION (DATA) RATES (b/s)	SAMPLING RATES
2400	300 600 1200	Quadruple codeword (1/8 rate) Double codeword (1/4 rate) Half codeword (1/2 rate)
4800	800 1200 2400	1/8 rate 1/4 rate 1/2 rate
9600	1200 2400 4800	1/8 rate 1/4 rate 1/2 rate
16000	1200 2400 4800 2000 4000 8000	1/8 rate, stuffed to 16000 1/4 rate, stuffed to 16000 1/2 rate, stuffed to 16000 1/8 rate 1/4 rate 1/2 rate
32000	2400 4800 9600 4000 8000 16000	1/8 rate, stuffed to 32000 1/4 rate, stuffed to 32000 1/2 rate, stuffed to 32000 1/8 rate 1/4 rate 1/2 rate

These relationships are shown in Table 3-2.

SSI Interface. The available options are: DSVT, DLED, DNVT, and ANDVT. These interfaces were explained in Module 1 of this AFQTP.

AutoResync. The options are ON and OFF. This function only applies when the UGC-144 data base is set for DLED. When it's ON, the UGC-144 monitors the incoming data stream for synchronization.

Clock Source. The options are INTERNAL and EXTERNAL. Whenever a modem or cryptographic equipment is used, this should be set to external. Also, set this to external if the UGC-144 is using a conditioned diphas output and interfacing directly with TRI-TAC multiplex equipment.

External Clock Parity. The options are POSITIVE and NEGATIVE clock. Use the positive clock for most applications.

Transmit Signal Sense. The options are MARK POSITIVE and MARK NEGATIVE. Most applications require MARK POSITIVE.

Receive Signal Sense. This option must be the same as the transmit signal sense.

Serial Data Code. The options are NON-RETURN TO ZERO (NRZ) and CONDITIONED DIPHASE.

NOTE

With the current version of software, you cannot select CONDITIONED DIPHASE. Choose the NRZ setting.

Number of Stop Bits. The options are ONE or TWO stop bits. This function is only used for Mode II operation. Most Mode II applications should use one stop bit.

Data Mode Control (DMC). The options are ON and OFF. This only applies to the DSVT setup. DMC is a cryptographic feature which must be set to ON when used with the DSVT application and OFF for all others.

Mode VI Storage Blocks. This feature has the following options: NONE, 16, 32, 64, and 96. This parameter is injected into position 14 of the DACB for every Mode VI message. It identifies the block group size in terms of line blocks. The AN/TYC-39 can only accept 16 or 32 block sizes. Normal Mode VI operation calls for the 32 setting. For Modes I and II, choose the None setting.

Mode I Answer Timer. The options for this parameter (in seconds) are: DEFAULT, 0.5, 1, 2, 3, 4, and 5. This parameter is ignored in Modes II and VI. This Mode I time setting determines how long the processor will wait for an ACK or NAK signal. After the time elapses, the UGC-144 will send the same block three more times. If it still fails to receive an acknowledgement it sends an error message to the operator. The default setting establishes a timer rate based on the data rate; use this for land based circuits. For satellite circuits, choose the five second option.

That is all for the SSI Menu. To return to the Guarded Menu, press the MENU key. The terminal has a factory default setting for these parameters. TO 31W4-2UGC144-1 shows all factory setup defaults.

RI/PLA Table. This table is listed on the Guarded Menu. It's like an address or phone directory. You can enter numerous Routing Indicators (RIs) with their Plain Language Addresses (PLAs) and phone numbers. TO 31W4-2UGC144-1, Chapter 2, Section V, contains instructions for using this table. When you exit the Guarded Menu, you will have the opportunity to save any changes made to the RI/PLA Table.

Now you should be familiar with the various UGC-144 software menus and parameters. Let's see how these apply in some common circuit scenarios.

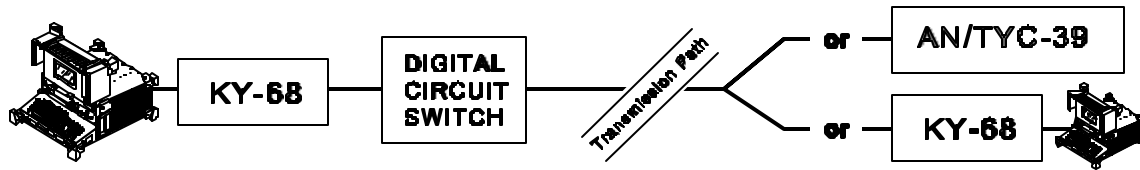
COMMON CIRCUITS

This section covers several standard UGC-144 circuits. They are not all inclusive as they don't show all possible variations. They are a wide selection that will help familiarize you with various circuit parameters. Use the following charts (Figures 3-6 through 3-15) to configure your UGC-144.

NOTE

This configuration data is the result of field experience and several written sources. These written sources are: Lessons Learned reports, AN/TTC-39A(V)4 Software Users Guide, AN/TYC-39(V)1 Software Users Guide, JANAP 128, and the AN/UGC-144 Planners Guide. If you wish to read more about circuit configurations, refer to these publications.

The sample circuits show the UGC-144 used in conjunction with a KY-68 or STU-III in dial-up modes. Also shown are possible scenarios involving the UGC-144 in dedicated Frequency Shift Keying (FSK) or Conditioned Diphase Interface (CDI) circuits.



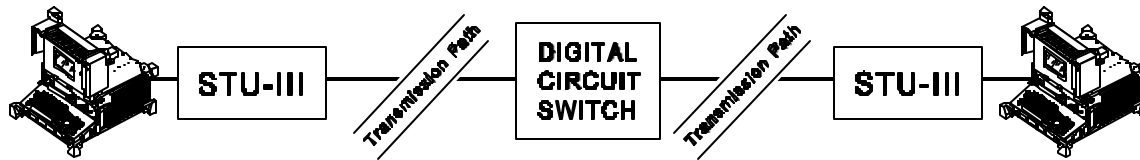
SYSTEM SETUP

Terminal Community	• R (or as requested)
Content/Comm Indicator	• ZYUW (or as requested)
Originator/Destination LMF	• AA
Terminal Routing Indicator	• (as requested)
Terminal Plain Lang. Addr.	• (as requested)
Terminal Classification	• (as required)
Terminal Phone Number	• (Supplied by circuit switch)
Channel ID	• (Program automatically sets)
EOL Sequence	• <CR><CR><LF>
XMIT Start Envelope	• No entry
XMIT Stop Envelope (1 - 8)	• <LF><LF><LF><LF><LF><LF><LF><LF>N
XMIT Stop Envelope (9 - 16)	• NNN
RCV Start Envelope	• No entry
RCV Stop Envelope (1 - 8)	• <LF><LF><LF><LF><LF><LF><LF><LF>N
RCV Stop Envelope (9 - 16)	• NNN

SSI SETUP

Master/Slave	• Slave
DACB Protocol	• On
Channel Control	• Mode I Continuous
Message Code/Parity	• ASCII/Odd Parity
Loop Rate	• 16000 or 32000 (as required)
Data Rate	• 2400 (or higher)
Error Control	• Multi-sampling
SSI Interface	• DSVT
Auto Resync	• Off
Clock Source	• Internal
Ext. Clock Polarity	• Positive
Transmit Signal Sense	• Mark Positive
Receive Signal Sense	• Mark Positive
Serial Data Code	• NRZ
Number of Stop Bits	• 1
Data Mode Control	• On
Mode VI Storage Blocks	• None
Mode I Answer Timer	• 5

Figure 3-6. Dial-up (Mode I) KY-68 Circuit



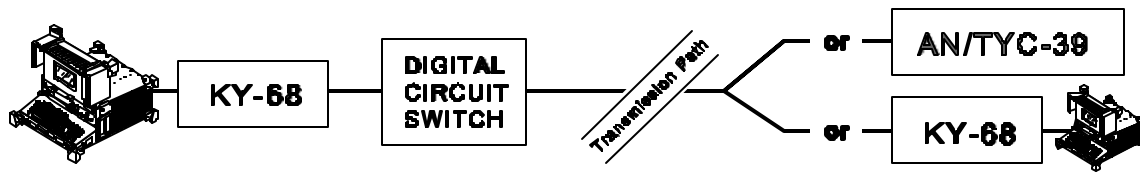
SYSTEM SETUP

Terminal Community	• R (or as requested)
Content/Comm Indicator	• ZYUW (or as requested)
Originator/Destination LMF	• AA
Terminal Routing Indicator	• (as requested)
Terminal Plain Lang. Addr.	• (as requested)
Terminal Classification	• (as required)
Terminal Phone Number	• (Assigned by circuit switch)
Channel ID	• (Program automatically sets)
EOL Sequence	• <CR><CR><LF>
XMIT Start Envelope	• No entry
XMIT Stop Envelope (1 - 8)	• <LF><LF><LF><LF><LF><LF><LF>N
XMIT Stop Envelope (9 - 16)	• NNN
RCV Start Envelope	• No entry
RCV Stop Envelope (1 - 8)	• <LF><LF><LF><LF><LF><LF><LF>N
RCV Stop Envelope (9 - 16)	• NNN

SSI SETUP

Master/Slave	• Slave
DACB Protocol	• Off
Channel Control	• Mode I Continuous
Message Code/Parity	• ASCII/Odd Parity
Loop Rate	• 2400
Data Rate	• 2400
Error Control	• Multi-sampling
SSI Interface	• DLED
Auto Resync	• Off
Clock Source	• Internal
Ext. Clock Polarity	• Positive
Transmit Signal Sense	• Mark Positive
Receive Signal Sense	• Mark Positive
Serial Data Code	• NRZ
Number of Stop Bits	• 1
Data Mode Control	• Off
Mode VI Storage Blocks	• None
Mode I Answer Timer	• 5

Figure 3-7. Dial-up (Mode I) STU-III Circuit



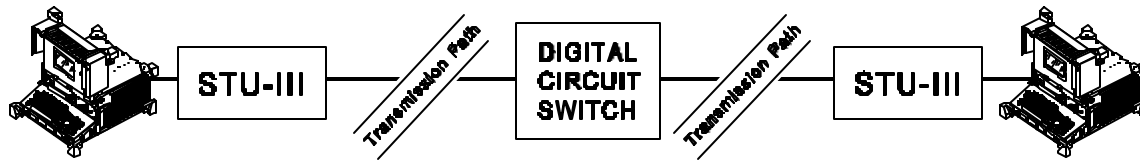
SYSTEM SETUP

Terminal Community	• R (or as requested)
Content/Comm Indicator	• ZYUW (or as requested)
Originator/Destination LMF	• AA
Terminal Routing Indicator	• (as requested)
Terminal Plain Lang. Addr.	• (as requested)
Terminal Classification	• (as required)
Terminal Phone Number	• (Supplied by circuit switch)
Channel ID	• (Program automatically sets)
EOL Sequence	• <CR><CR><LF>
XMIT Start Envelope	• No entry
XMIT Stop Envelope (1 - 8)	• <LF><LF><LF><LF><LF><LF><LF>N
XMIT Stop Envelope (9 - 16)	• NNN
RCV Start Envelope	• No entry
RCV Stop Envelope (1 - 8)	• <LF><LF><LF><LF><LF><LF><LF>N
RCV Stop Envelope (9 - 16)	• NNN

SSI SETUP

Master/Slave	• Slave
DACB Protocol	• On
Channel Control	• Mode VI
Message Code/Parity	• ASCII/Odd Parity
Loop Rate	• 16000 or 32000 (as required)
Data Rate	• 2400 (or higher)
Error Control	• Multi-sampling
SSI Interface	• DSVT
Auto Resync	• Off
Clock Source	• Internal
Ext. Clock Polarity	• Positive
Transmit Signal Sense	• Mark Positive
Receive Signal Sense	• Mark Positive
Serial Data Code	• NRZ
Number of Stop Bits	• 1
Data Mode Control	• On
Mode VI Storage Blocks	• 16 or 32 (as required)
Mode I Answer Timer	• Default

Figure 3-8. Dial-up (Mode VI) KY-68 Circuit



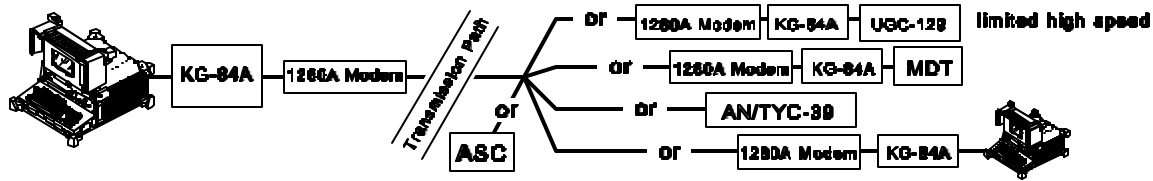
SYSTEM SETUP

Terminal Community	• R (or as requested)
Content/Comm Indicator	• ZYUW (or as requested)
Originator/Destination LMF	• AA
Terminal Routing Indicator	• (as requested)
Terminal Plain Lang. Addr.	• (as requested)
Terminal Classification	• (as required)
Terminal Phone Number	• (Supplied by circuit switch)
Channel ID	• (Program automatically sets)
EOL Sequence	• <CR><CR><LF>
XMIT Start Envelope	• No entry
XMIT Stop Envelope (1 - 8)	• <LF><LF><LF><LF><LF><LF><LF><LF>N
XMIT Stop Envelope (9 - 16)	• NNN
RCV Start Envelope	• No entry
RCV Stop Envelope (1 - 8)	• <LF><LF><LF><LF><LF><LF><LF><LF>N
RCV Stop Envelope (9 - 16)	• NNN

SSI SETUP

Master/Slave	• Slave
DACB Protocol	• On
Channel Control	• Mode VI
Message Code/Parity	• ASCII/Odd Parity
Loop Rate	• 2400
Data Rate	• 2400
Error Control	• Multi-sampling
SSI Interface	• DLED
Auto Resync	• Off
Clock Source	• Internal
Ext. Clock Polarity	• Positive
Transmit Signal Sense	• Mark Positive
Receive Signal Sense	• Mark Positive
Serial Data Code	• NRZ
Number of Stop Bits	• 1
Data Mode Control	• Off
Mode VI Storage Blocks	• 32
Mode I Answer Timer	• Default

Figure 3-9. Dial-up (Mode VI) STU-III Circuit



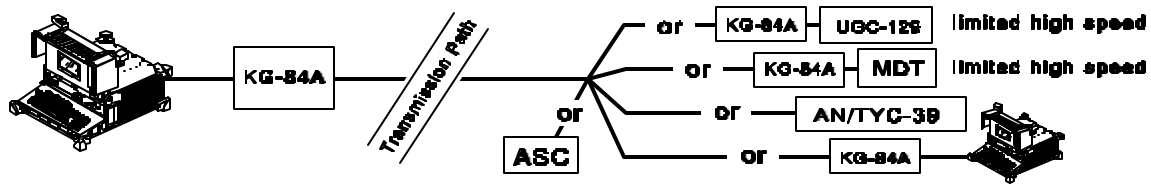
SYSTEM SETUP

Terminal Community	• R (or as requested)
Content/Comm Indicator	• ZYUW (or as requested)
Originator/Destination LMF	• AA
Terminal Routing Indicator	• (as requested)
Terminal Plain Lang. Addr.	• (as requested)
Terminal Classification	• (as required)
Terminal Phone Number	• No entry
Channel ID	• (Program automatically sets)
EOL Sequence	• <CR><CR><LF>
XMIT Start Envelope	• No entry
XMIT Stop Envelope (1 - 8)	• <LF><LF><LF><LF><LF><LF><LF><LF>N
XMIT Stop Envelope (9 - 16)	• NNN
RCV Start Envelope	• No entry
RCV Stop Envelope (1 - 8)	• <LF><LF><LF><LF><LF><LF><LF><LF>N
RCV Stop Envelope (9 - 16)	• NNN

SSI SETUP

Master/Slave	• Slave
DACB Protocol	• Off
Channel Control	• Mode I Continuous
Message Code/Parity	• ASCII/Odd Parity
Loop Rate	• Off
Data Rate	• 75 - 1200 (as required)
Error Control	• Multi-sampling
SSI Interface	• DLED
Auto Resync	• Off
Clock Source	• Internal
Ext. Clock Polarity	• Positive
Transmit Signal Sense	• Mark Positive
Receive Signal Sense	• Mark Positive
Serial Data Code	• NRZ
Number of Stop Bits	• 1
Data Mode Control	• Off
Mode VI Storage Blocks	• None
Mode I Answer Timer	• 5

Figure 3-10. Dedicated (Mode I) FSK Circuit



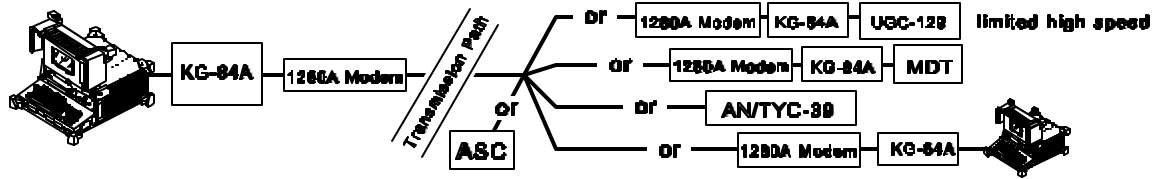
SYSTEM SETUP

Terminal Community	• R (or as requested)
Content/Comm Indicator	• ZYUW (or as requested)
Originator/Destination LMF	• AA
Terminal Routing Indicator	• (as requested)
Terminal Plain Lang. Addr.	• (as requested)
Terminal Classification	• (as required)
Terminal Phone Number	• No entry
Channel ID	• (Program automatically sets)
EOL Sequence	• <CR><CR><LF>
XMIT Start Envelope	• No entry
XMIT Stop Envelope (1 - 8)	• <LF><LF><LF><LF><LF><LF><LF>N
XMIT Stop Envelope (9 - 16)	• NNN
RCV Start Envelope	• No entry
RCV Stop Envelope (1 - 8)	• <LF><LF><LF><LF><LF><LF><LF>N
RCV Stop Envelope (9 - 16)	• NNN

SSI SETUP

Master/Slave	• Slave
DACB Protocol	• Off
Channel Control	• Mode I Continuous
Message Code/Parity	• ASCII/Odd Parity
Loop Rate	• 1200 - 16000 (as required)
Data Rate	• 1200 - 16000 (as required)
Error Control	• Multi-sampling
SSI Interface	• DLED
Auto Resync	• Off
Clock Source	• Internal
Ext. Clock Polarity	• Positive
Transmit Signal Sense	• Mark Positive
Receive Signal Sense	• Mark Positive
Serial Data Code	• NRZ
Number of Stop Bits	• 1
Data Mode Control	• Off
Mode VI Storage Blocks	• None
Mode I Answer Timer	• 5

Figure 3-11. Dedicated (Mode I) Wireline CDI Circuit



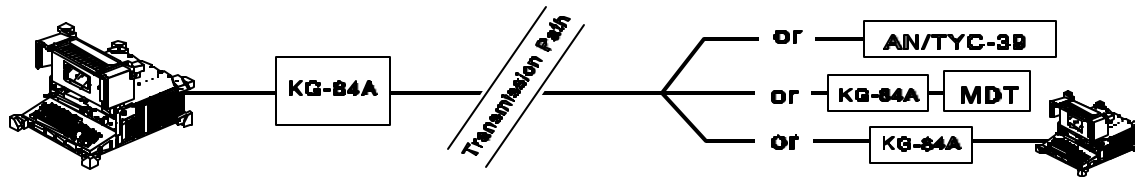
SYSTEM SETUP

- | | |
|-----------------------------|---------------------------------|
| Terminal Community | • R (or as requested) |
| Content/Comm Indicator | • ZYUW (or as requested) |
| Originator/Destination LMF | • AA |
| Terminal Routing Indicator | • (as requested) |
| Terminal Plain Lang. Addr. | • (as requested) |
| Terminal Classification | • (as required) |
| Terminal Phone Number | • No entry |
| Channel ID | • (Program automatically sets) |
| EOL Sequence | • <CR><CR><LF> |
| XMIT Start Envelope | • VZCZC |
| XMIT Stop Envelope (1 - 8) | • <LF><LF><LF><LF><LF><LF><LF>N |
| XMIT Stop Envelope (9 - 16) | • NNN |
| RCV Start Envelope | • VZCZC |
| RCV Stop Envelope (1 - 8) | • <LF><LF><LF><LF><LF><LF><LF>N |
| RCV Stop Envelope (9 - 16) | • NNN |

SSI SETUP

- | | |
|------------------------|---------------------------|
| Master/Slave | • Slave |
| DACB Protocol | • Off |
| Channel Control | • Mode II Full Duplex |
| Message Code/Parity | • ASCII/Odd Parity |
| Loop Rate | • Off |
| Data Rate | • 75 - 1200 (as required) |
| Error Control | • Multi-sampling |
| SSI Interface | • DLED |
| Auto Resync | • Off |
| Clock Source | • Internal |
| Ext. Clock Polarity | • Positive |
| Transmit Signal Sense | • Mark Positive |
| Receive Signal Sense | • Mark Positive |
| Serial Data Code | • NRZ |
| Number of Stop Bits | • 1 or 2 (as required) |
| Data Mode Control | • Off |
| Mode VI Storage Blocks | • None |
| Mode I Answer Timer | • Default |

Figure 3-12. Dedicated (Mode II) FSK Circuit



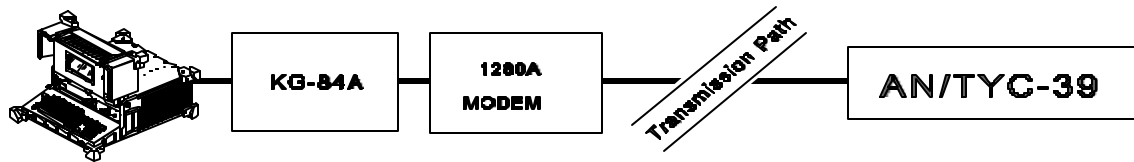
SYSTEM SETUP

Terminal Community	• R (or as requested)
Content/Comm Indicator	• ZYUW (or as requested)
Originator/Destination LMF	• AA
Terminal Routing Indicator	• (as requested)
Terminal Plain Lang. Addr.	• (as requested)
Terminal Classification	• (as required)
Terminal Phone Number	• No entry
Channel ID	• (Program automatically sets)
EOL Sequence	• <CR><CR><LF>
XMIT Start Envelope	• VZCZC
XMIT Stop Envelope (1 - 8)	• <LF><LF><LF><LF><LF><LF><LF>N
XMIT Stop Envelope (9 - 16)	• NNN
RCV Start Envelope	• VZCZC
RCV Stop Envelope (1 - 8)	• <LF><LF><LF><LF><LF><LF><LF>N
RCV Stop Envelope (9 - 16)	• NNN

SSI SETUP

Master/Slave	• Slave
DACB Protocol	• Off
Channel Control	• Mode II Full Duplex
Message Code/Parity	• ASCII/Odd Parity
Loop Rate	• Off
Data Rate	• 1200 - 4800 (as required)
Error Control	• Multi-sampling
SSI Interface	• DLED
Auto Resync	• Off
Clock Source	• Internal
Ext. Clock Polarity	• Positive
Transmit Signal Sense	• Mark Positive
Receive Signal Sense	• Mark Positive
Serial Data Code	• NRZ
Number of Stop Bits	• 1 or 2 (as required)
Data Mode Control	• Off
Mode VI Storage Blocks	• None
Mode I Answer Timer	• Default

Figure 3-13. Dedicated (Mode II) Wireline CDI Circuit



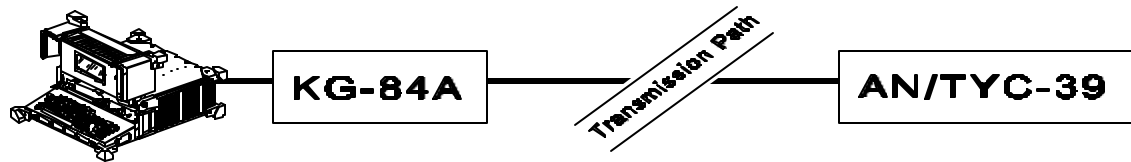
SYSTEM SETUP

Terminal Community	• R (or as requested)
Content/Comm Indicator	• ZYUW (or as requested)
Originator/Destination LMF	• AA
Terminal Routing Indicator	• (as requested)
Terminal Plain Lang. Addr.	• (as requested)
Terminal Classification	• (as required)
Terminal Phone Number	• No entry
Channel ID	• (Program automatically sets)
EOL Sequence	• <CR><CR><LF>
XMIT Start Envelope	• No entry
XMIT Stop Envelope (1 - 8)	• <LF><LF><LF><LF><LF><LF><LF>N
XMIT Stop Envelope (9 - 16)	• NNN
RCV Start Envelope	• No entry
RCV Stop Envelope (1 - 8)	• <LF><LF><LF><LF><LF><LF><LF>N
RCV Stop Envelope (9 - 16)	• NNN

SSI SETUP

Master/Slave	• Slave
DACB Protocol	• Off
Channel Control	• Mode VI
Message Code/Parity	• ASCII/Odd Parity
Loop Rate	• Off
Data Rate	• 75 - 1200 (as required)
Error Control	• Multi-sampling
SSI Interface	• DLED
Auto Resync	• Off
Clock Source	• Internal
Ext. Clock Polarity	• Positive
Transmit Signal Sense	• Mark Positive
Receive Signal Sense	• Mark Positive
Serial Data Code	• NRZ
Number of Stop Bits	• 1
Data Mode Control	• Off
Mode VI Storage Blocks	• 16 or 32 (as required)
Mode I Answer Timer	• Default

Figure 3-14. Dedicated (Mode VI) FSK Circuit



SYSTEM SETUP

Terminal Community	• R (or as requested)
Content/Comm Indicator	• ZYUW (or as requested)
Originator/Destination LMF	• AA
Terminal Routing Indicator	• (as requested)
Terminal Plain Lang. Addr.	• (as requested)
Terminal Classification	• (as required)
Terminal Phone Number	• No entry
Channel ID	• (Program automatically sets)
EOL Sequence	• <CR><CR><LF>
XMIT Start Envelope	• No entry
XMIT Stop Envelope (1 - 8)	• <LF><LF><LF><LF><LF><LF><LF>N
XMIT Stop Envelope (9 - 16)	• NNN
RCV Start Envelope	• No entry
RCV Stop Envelope (1 - 8)	• <LF><LF><LF><LF><LF><LF><LF>N
RCV Stop Envelope (9 - 16)	• NNN

SSI SETUP

Master/Slave	• Slave
DACB Protocol	• On
Channel Control	• Mode VI
Message Code/Parity	• ASCII/Odd Parity
Loop Rate	• 2400 - 32000 (as required)
Data Rate	• 1200 - 16000 (as required)
Error Control	• Multi-sampling
SSI Interface	• DLED
Auto Resync	• Off
Clock Source	• Internal
Ext. Clock Polarity	• Positive
Transmit Signal Sense	• Mark Positive
Receive Signal Sense	• Mark Positive
Serial Data Code	• NRZ
Number of Stop Bits	• 1
Data Mode Control	• Off
Mode VI Storage Blocks	• 16 or 32 (as required)
Mode I Answer Timer	• Default

Figure 3-15. Dedicated (Mode VI) Wireline CDI Circuit

You should now have a basic understanding of how to set up your UGC-144 for most scenarios. There's still one more task in this module—learning how to format diskettes.

FLOPPY DISKETTE FORMATTING

You have to prepare a diskette before the terminal can use it. This preparation procedure is called formatting. New diskettes are unformatted which means the terminal cannot use them yet. That means you will have to format them before you can use them. You will use three types of diskettes: the ASC, OTC Floppy, and OTC Message. Each diskette has its own format program.

ASC Diskette Format. ASC diskettes are used as backup disks for both disk drives and the hard drive.

NOTE

If a diskette is write-protected, it cannot be formatted. Be sure the diskette is NOT write-protected.

Step 1. Insert a new (or used) diskette into the **ASC** drive. Close and latch the door.

Step 2. From the Main Menu, press the **F3** key (MEDIADIR MENU).

Step 3. Next, press the **F2** key (ASCDIR).

Step 4. If you inserted a new diskette, a screen message will appear:

The ASC is unformatted or wrong format. Do you want to format? (Y/N):

If you inserted an already formatted diskette, this message will appear:

The ASC cartridge contains NO MESSAGES. Do you want to format it? (Y/N)

In either case, press the **Y** key to start the format process. The display status ASC indicator shows the status of the format process. The process takes a few minutes to complete.

OTC Floppy Diskette Format. This diskette stores MS-DOS format ASCII text messages. Format a diskette for use as an OTC Floppy diskette. To do this, insert a new (or used) diskette into the **OTC** drive. Close and

latch the door. Press the **F3** key (FLOPDIR). Follow the same procedures as with the ASC diskette.

OTC Message Diskette Format. This diskette stores standard messages. Format a diskette for use as an OTC Message diskette. To do this, insert a new (or used) diskette into the **OTC** drive. Close and latch the door. Press the **F4** key (OTCDIR). Follow the same procedures as with the ASC diskette. When finished, press the **MENU** key to revert to the Main Menu.

SUMMARY

From this module, you learned how to perform a self-test on the UGC-144. You have become acquainted with the UGC-144 software and its operating menus. You also know of the various terminal and communications parameters. You learned there is a lot of work in setting up your terminal to operate in a dial-up or dedicated circuit. The last thing you learned was how to format the floppy disks.

You covered a lot of ground in this module. Much of the information you learned is in an area new to the 2E3X1 world—software configuring. Some of this information may seem impractical; however, a time will come when you will be glad you learned it.

REVIEW QUESTIONS

Answer the following review questions. Compare your responses with the confirmation key in the back of this book. You may refer to this module and the technical references to answer the questions. Your responses do not have to match word-for-word, but should convey the same basic meaning. Review the applicable portions of this module for all missed questions.

1. Insert a diskette with its label side ____ and its ____ to the right.
2. A diskette's write-protect tab is in the protected position if you see a ____.
3. When should you perform a system self-test?
4. Why should you perform a self-test before configuring the system software and not afterward?
5. During the video portion of the self-test, what should happen if you press function key F5 (BLINK + REVERSE)?

6. How many write/read cycles are there during the floppy drive part of the self-test?
7. How do you access the DTU Menu?
8. List the functions of the DTU Menu.
9. How do you access the terminal volume screen?
10. Use the ____ key to increase the speaker volume and the ____ key to decrease the speaker volume.
11. Which features can be set using the Set Edit screen?
12. The Set Edit line length must be set at ____ for AUTODIN JANAP 128 format.
13. What is the Guarded Menu default password?
14. Which Terminal Community parameter must you choose for DSSCS operation?
15. Which Terminal Classification settings are only valid for the Genser community?
16. You must select ____ b/s if you use a UGC-129 printer.
17. List the Autosave Menu parameters.

18. In Modes ____ and ____, the ASC is always used as the storage device.
19. A password has between ____ and ____ characters.
20. Which menu enables (or disables) operator classification levels and transmission capability?
21. Disabling a classification will automatically ____ all higher classifications.
22. When must you configure the UGC-144 communications software?
23. Which System Menu parameter identifies your terminal's media format?
24. What are the EOM validation sequences for all ASCII messages?
25. Which digital communications interface allows equipment to send data at its own speed, rather than having to adapt to its receiver?
26. List the three terminal operation modes.
27. An automatic repeat-request (ARQ) channel arrangement that provides for synchronous, simultaneous, duplex data transfer is Mode ____ operation.
28. No block acknowledgement is used with Mode ____ operation.
29. Which operational mode transmits a series of blocks before requiring acknowledgement?
30. In Mode VI operation, a series of blocks is called a group and can consist of ____, ____, ____, or

blocks.

31. Where in the UGC-144 software would you enter addresses and phone numbers?
32. At which point are you afforded the opportunity to save the RI/PLA settings?
33. If you wish to read more about UGC-144 configuration data, which publications should you consult?
34. In a Dial-up Mode I KY-68 circuit, what should the setting be for the SSI Interface?
35. In a Dial-up Mode VI KY-68 circuit, you should set the loop rate to ____.
36. In a Dedicated Mode II Wireline CDI circuit, set the DACB protocol to ____ and the data rate to ____.
37. In a Dedicated Mode VI Wireline CDI circuit, set the DACB protocol to ____ and the channel control to ____.
38. List the three diskette format types.
39. Which diskette is used as a backup disk for both disk drives and the hard drive?

ADDITIONAL INSTRUCTIONS

When finished, ask your trainer for help with any problems you may have. Once you are ready, your trainer will administer the KEP questions for this module. You may refer to the technical reference and the KEP figures. You must score 100%. Your trainer will check your answers and review any you may have missed. When you have achieved the KEP standard, proceed to the performance procedures.

PERFORMANCE PROCEDURES

Your trainer will demonstrate this task to you. Then you will be provided with all the required materials. Using the technical references and these materials, practice the following procedures in the presence of your trainer. This will instill confidence in your ability to perform the task. Practice until you and your trainer feel you are ready. You will then perform the evaluation procedures below without help. Your trainer will also evaluate you on any applicable local procedures. Follow the steps below to prepare the software for use.

1. Gather all required materials.
2. Install a floppy diskette into the ASC drive. (Remove the diskette when finished.)
3. Perform a system self-test.
4. Configure the UGC-144 terminal and communications software to operate in a dial-up circuit of your trainer's choosing.
5. Configure the UGC-144 terminal and communications software to operate in a dedicated circuit of your trainer's choosing.
6. Format an ASC diskette.
7. Format an OTC Floppy diskette.
8. Format an OTC Message diskette.
9. Return all materials to storage and clean your work area.

After you complete these procedures, your trainer will review your work. When you are proficient in performing the procedures, you may be certified on the AFJQS. Your trainer will assign the next task.

MODULE 4

PREVENTIVE MAINTENANCE INSPECTIONS (PMI)

OBJECTIVES

1. Given a #2 Phillips screwdriver and the necessary cleaning supplies, perform a 56-day Preventive Maintenance Inspection IAW TO 31W4-2UGC144-6WC-1, Cards 1-001 thru 1-004.
 - a. Explain the task preparation procedure.
 - b. Explain how to perform a AN/UGC-144 self-test.
 - c. Explain how to perform a routine inspection.
 - d. Explain how to perform the cleaning requirements.

2. Given a disk head cleaning kit, perform a 168-day Preventive Maintenance Inspection IAW TO 31W4-2UGC144-6WC-1, Cards 1-005 and 1-006.
 - a. Explain how to perform a major inspection.
 - b. Explain how to clean the disk heads.

3. Given a #2 Phillips screwdriver and four "C" cell Nicad batteries, perform a 336-day Preventive Maintenance Inspection IAW TO 31W4-2UGC144-6WC-1, Cards 1-007 and 1-008.
 - a. Explain how to replace the batteries.
 - b. Explain the post-task procedures.

PREREQUISITES

You must have completed AFQTP Modules 1 thru 3.

TRAINING REFERENCE

TO 31W4-2UGC144-6WC-1

INFORMATION

Preventive maintenance on the AN/UGC-144 Communications Terminal consists of 56-, 168-, and 336-day Preventive Maintenance Inspections (PMI). Some parts of the task preparation objectives are the same for each PMI interval and we won't duplicate them. You must accomplish all task preparation and post-task procedures for each PMI when you perform them separately. We will explain the post-task procedure after the 336-day PMI to avoid duplicity. First on the list is the 56-day PMI.

NOTE

The AN/UGC-144 has been modified to include the floppy disk drive. However, TO 31W4-2UGC144-6WC-1 has not been updated to reflect this modification.

56-DAY PMI

The 56-day PMI consists of task preparation, AN/UGC-144 self-test, a routine inspection, and cleaning. You will learn how to perform the 168- and 356-day PMIs later.

Task Preparation. Before you can start the PMI, you must first accomplish three steps which we call the task preparation procedures.

- Gather all of your materials.
- Coordinate system downtime.
- Initiate any required maintenance documentation.

Gather Materials. You will require the following items to perform this PMI.

- TO 31W4-2UGC144-6WC-1
- #2 Phillips screwdriver
- Lint-free cloth
- Isopropyl alcohol

Coordinate System Downtime. Once you have all your materials in one place, you should coordinate system downtime. Be sure the Operations shift supervisor and Job Control know what you plan to do. Your trainer will show you how to accomplish any special requirements. When you talk to Job Control, get a Job Control Number (JCN). You will need a JCN when completing your documentation.

Initiate Documentation. You must document all maintenance actions. Some organizations use the AFTO Form 349 to document their work. Others use an automated system. Your trainer will provide any help you may need. Once you finish the preparation work, you can get started on the 56-day PMI.

System Self-Test. Before you begin any maintenance, you should know the condition of the equipment. To do this, perform a system self-test. If you remember, you learned how to do this task in a previous module. You may notice the PMI workcards don't show this step. We include it because it's important to know the operating condition of the equipment before performing any maintenance. You should perform the self-test before and after all maintenance, including PMIs.

Routine Inspection. Once you have completed a successful self-test, you will perform a routine inspection as discussed in the following steps.

NOTE

This step doesn't require the AN/UGC-144 to have power applied.

Keyboard and Switches. The PMI workcards tell you to inspect the keyboard and switches for proper operation. You thoroughly tested the keyboard and switch operation when you performed the self-test. Check all keys and switches for legible markings. You must replace any that you cannot read.

Brightness Control. Inspect the brightness control for proper operation. The brightness control is to the right of the screen. Turn it completely to the left and right. The brightness of the screen characters will vary.

Cables. Inspect all data and power cables for cuts, frays, and insulation wear. These are the cables external to the terminal and printer. They all connect on the rear connector panels of the terminal and printer. Inspect all connectors of the external cables for bent pins, corrosion, and damaged keyways.

Hardware. Inspect the terminal and printer for loose or missing nuts, bolts, and other connecting hardware.

Cleaning Requirements. The AN/UGC-144 cleaning requirements are simple. There are no lubrication

requirements for the terminal or the printer.

WARNING

Remove power when cleaning around any area of possible electrical hazard.

CAUTION

Do NOT use cleaning chemicals on or around the printing surface of the print head.

Exterior. Using a lint-free cloth dampened with isopropyl alcohol, clean the exterior of the equipment to remove dirt, mildew, etc. The next step is to inspect the terminal interior for cleanliness.

NOTE

TO 31W4-2UGC144-6WC-1 has steps (Card 1-002, steps 1B, 1C, 1D and 1E) for mildew (and fungus) inspection and removal. After conferring with the equipment specialist it was decided these steps and the NOTE are unnecessary. An AFTO Form 22 has been submitted to delete these steps.

Replace the terminal top cover by reversing the removal procedures. Once you have closed the display assembly, you have finished the 56-day PMI. Next is the 168-day PMI.

168-DAY PMI

The 168-day PMI consists of task preparation, a 56-day PMI, a major inspection, and disk head cleaning. The 56-day PMI is also a step in this PMI. Since you just learned the 56-day PMI, we won't go over it again.

Task Preparation. The materials required to perform the 168-day PMI differ from the 56-day PMI. The only material required is a disk head cleaning kit. If the system is on-line, you must coordinate downtime. The documentation requirement is the same as the 56-day PMI.

Major Inspection. As the name implies, this part of the PMI is more in-depth than the routine inspection. The first step is to inspect the rubber seals and gaskets.

Step 1. Inspect the rubber seals and gaskets for cracks and fit. Here is a list of the seals and gaskets with their locations:

Terminal

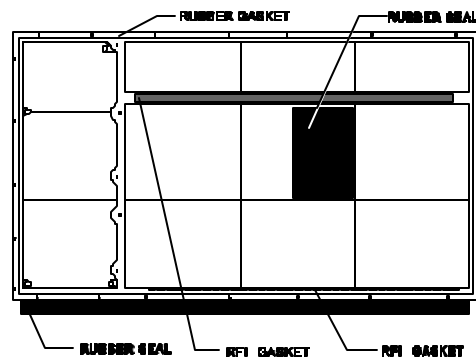
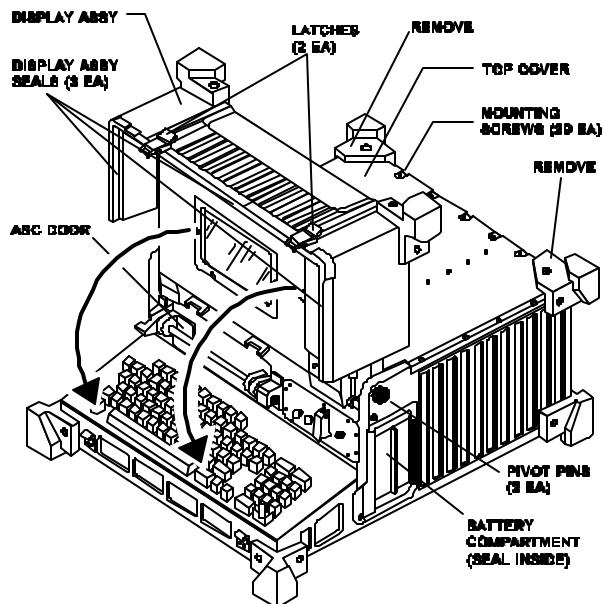
- Display assembly seals (Figure 4-1)
- Door gasket (behind ASC door) (Figure 4-1)
- Battery compartment seal (See NOTE)
- Top cover seals and gaskets (Figure 4-2)

NOTE

The battery compartment seal is accessible by removing the three Phillips screws securing the battery compartment panel (Figure 4-1). The seal is behind the panel.

Printer (Figure 4-3)

- Upper enclosure gasket
- Top cover seals and gaskets
- Carriage access cover gasket

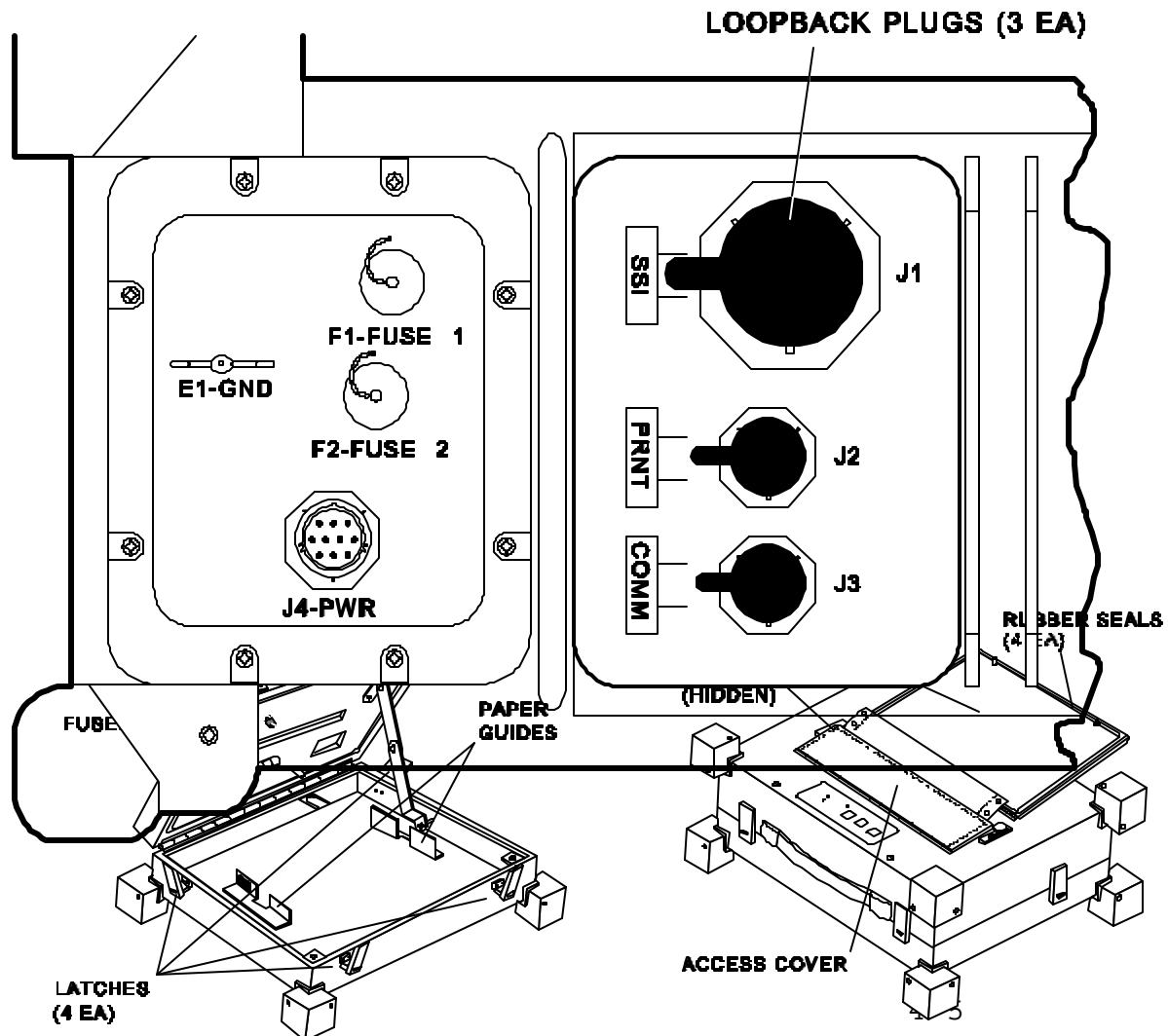


Step 2. Inspect the rubber boots under each keytop for cracks. To do this, you must remove the keytops. With pressure applied on two opposite sides of the key, firmly pull straight up. Once you inspect the rubber boot, replace the keytop.

NOTE

A pending AFTO Form 22 recommends dropping this step. (However, this step is still required until the AFTO Form 22 is approved and the TO changed.) To avoid replacing the 88 keytops in the wrong position, **ONLY** remove one keytop at a time. Removing the keytops would probably deteriorate the molding to the point where the key would no longer secure to the keyboard.

Step 3. Inspect the fuses, connector caps, and chains for signs of wear. (Figure 4-3 shows the printer fuses. Figure 4-4 shows the terminal fuses, caps, and chains.) Be sure the connector dust caps and loopback plugs connect to their chains. With the data and power cables connected, the cable connector dust caps should be hanging on a chain.



Step 4. According to the TO, this step would have you inspect the loopback plugs (Figure 4-4) and dust caps to ensure they are attached to their chains. Since they have no chains attached, it would be impossible to accomplish this step. To prevent losing or damaging the plugs, you could attach chains to them.

Step 5. Inspect the latches (cover fasteners) for signs of wear. Figures 4-1 and 4-3, respectively, show the terminal and printer latches.

Step 6. Inspect the printer rollers and tractor feed sprockets for proper alignment. There are no alignment procedures for the rollers or sprockets.

NOTE

A pending AFTO Form 22 recommends dropping this step. If the rollers and sprockets were out of alignment, the equipment operator would identify the problem long before this PMI became due. However, until the AFTO Form 22 is approved and the TO changed, this is still a required step.

Step 7. Inspect the cowling hinges for smooth operation. The cowling hinges are the big pivot pins on which the Display Assembly swings. There are two: one on the left and the other on the right. Figure 4-1 shows these hinges.

NOTE

The workcards calls these the "cowling hinges". The author could find no other reference to a cowling hinge, so it was difficult to understand which assembly to check. A pending AFTO Form 22 suggests changing the term cowling hinges to "display assembly pivot pins".

Step 8. Inspect the paper guides to be sure they are secure. Figure 4-3 shows the location of the guides. Two hex nuts with washers secure each guide. If the guides are loose, make sure the washers are present and tighten the nuts.

This concludes the major inspection. The next step of the 168-day PMI is cleaning the diskette read/write heads.

Disk Head Cleaning. You will perform this task with a standard "off the shelf" disk cleaning kit. These kits are available at most Base Service Stores. They are all basically the same.

Step 1. Apply power to the terminal. After the RAM test, press N to tell the computer you **DON'T** want to run a self-test. After the program loads, the MAIN menu should appear on the display.

NOTE

It takes a little over a minute for the computer to load the program. There is no sign that the computer is doing anything. Be patient. If after a couple of minutes nothing happens, recycle the power and try again.

Step 2. Follow the instructions included with the cleaning kit. Insert the cleaning disk into the OTC floppy drive (the one on the right) to clean the floppy disk head. Be sure you close the ASC door. Press function key **F3** to activate the MEDIADIR Menu. Next, press function key **F4** to select the OTC floppy drive.

NOTE

Pressing the **MENU** key will return the display to the previous menu.

After the cleaning disk has turned for several seconds, a message will appear at the bottom of the display telling you:

The current disk is unformatted or wrong format. Do you want to FORMAT? (Y/N):

Press **N**, and after the drive stops, remove the cleaning disk.

Step 3. Repeat the procedure for the ASC disk head (the one on the left). When you get to the MEDIADIR Menu, press function key **F2** to select the ASC drive.

This concludes the disk head cleaning procedure and the 168-day PMI. Next is the 336-day PMI.

336-DAY PMI

The 336-day PMI consists of task preparation, 56- and 168-day PMIs, battery replacement, and the post-task procedures. You have already learned the 56- and 168-day PMIs. You have also learned portions of the task preparation procedures. The only difference is the required materials.

Task Preparation. This task requires some extra materials. Here is a list of these materials.

- TO 31W4-2UGC144-6WC-1
- #2 Phillips screwdriver

- Four "C" cell Nicad batteries

If the system is on-line, you must coordinate downtime. The documentation requirement is the same as the other PMIs. Now it's time for you to learn battery replacement.

Battery Replacement. When primary power fails, the battery backup system maintains any messages in the message memory. This is true **ONLY** if the POWER switch stays in the ON position. The messages will stay in memory only for about one hour. The backup will also save the system setup parameters for one hour. Now that you know the importance of the backup system, it's time for you to learn how to replace the batteries.

Step 1. Remove the battery compartment access cover. Figures 4-1 and 4-5 show this compartment. Three Phillips screws secure it to the chassis.

Step 2. Remove the old batteries (if any).

Step 3. Inspect the battery compartment for cleanliness and corrosion. You should treat all maintenance problems identified during a PMI as separate maintenance actions. If corrosion exists, your trainer will show you how to open a separate Job Control Number. Your trainer should also show you how to remove the corrosion.

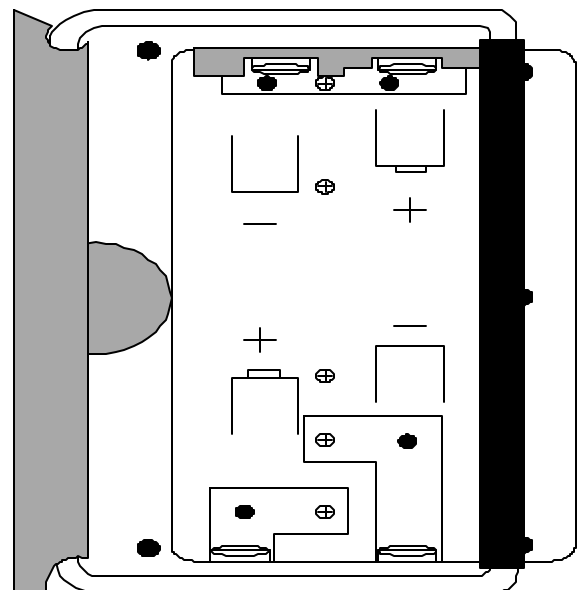
Step 4. Install four new batteries IAW the battery installation template. This template is molded into the back wall of the compartment. It shows the proper battery polarity. Only use "C" cell Nicad batteries. Be sure the batteries fully seat against the electrical contact springs.

Step 5. Install the battery compartment access cover. The cover has a tab which slides into a slot under the carrying handle. Be sure the three screws are tight. This will ensure the batteries make good contact.

Post-task Procedures. You should accomplish these procedures after completing any (or all) of the PMIs. For example, if you only perform a 56-day PMI, this step should be your last.

Step 1. Perform a final system self-test to be sure the terminal and printer are properly working.

Step 2. Return the system to the line. Your trainer will



show you how to accomplish any special requirements. When you contact Job Control, close the Job Control Number (JCN).

Step 3. Return all materials to their proper storage places.

Step 4. Clean your work area.

Step 5. Complete all maintenance documentation.

SUMMARY

Preventive maintenance is the key to effective equipment operation. If you slack off on PMIs, your system will be prone to failures. The self-test lets you be sure your system is properly working before you start tinkering with it. Remember to perform the self-test before and after all maintenance.

This concludes the 336-day PMI and this module on preventive maintenance. You have learned how to perform the 56-, 168- and 336-day PMIs. These procedures are the basics of AN/UGC-144 maintenance. If you perform them faithfully, your AN/UGC-144 should require very little unscheduled maintenance. A system with minimal unscheduled maintenance actions reflects highly on its craftsmen.

If you have any questions on the material you just read, now is the time to ask your trainer. If not, you should be ready to answer the following review questions.

NOTE

The author has submitted several AFTO Forms 22 which are pending. Keep these areas in mind, but remember--the TO is the boss--you must follow it unless you obtain a wavier from the proper authority.

REVIEW QUESTIONS

Answer the following review questions. Compare your responses with the confirmation key in the back of this book. You may refer to this module and technical order 31W4-2UGC144-6WC-1 to answer the questions. Your responses do not have to match word-for-word, but should convey the same basic meaning. Review the applicable portions of this module for all missed questions.

1. List the steps which make up a 56-day PMI.
2. The scheduled PMI intervals for the AN/UGC-144 are the 56-day, ____, and the ____ PMI.
3. Why should you perform a self-test before starting a 56-day PMI?
4. Which parts do you inspect in a routine inspection?
5. What should you look for when inspecting the external cable connectors?
6. Clean the exterior of the equipment with a lint-free cloth dampened with ____ ____.
7. List the steps performed in a 168-day PMI.
8. List the areas checked in a major inspection.
9. Which terminal rubber seals and gaskets do you check during a major inspection?
10. Which printer rubber seals and gaskets do you check during a major inspection?
11. How do you avoid replacing keytops in the wrong position?
12. How do you align the tractor feed sprockets?
13. Which screen menus do you access during floppy disk drive head cleaning?

14. When cleaning the disk heads, press function key ____ to select the OTC floppy drive.
15. Which message appears on the screen after the cleaning disk has turned for several seconds?
16. The 336-day PMI consists of task preparation, 56- and 168-day PMIs, ____, and the post-task procedures.
17. Explain the importance of the battery backup system.
18. The battery backup system uses four ____ batteries.
19. When installing new batteries, which reference do you use to ensure proper battery polarity?
20. Why is it important to be sure the battery compartment cover screws are tight?
21. List the post-task steps for all PMIs.
22. Why should you perform another self-test after completing a PMI?

ADDITIONAL INSTRUCTIONS

When ready, ask your trainer to administer the KEP questions for this module. You may refer to the technical order and you must score 100%. Your trainer will check your answers and review any you may have missed. When you achieve the KEP standard, proceed to the performance procedures.

PERFORMANCE PROCEDURES

Your trainer will provide you with an AN/UGC-144 and all required materials. You may use TO

31W4-2UGC144-6WC-1. Use these materials to practice the following procedures before you actually perform the performance exercise. Practice until you and your trainer feel you are ready. You will then perform the evaluation procedures below without help. Your trainer will also evaluate you on any local procedures which may apply. Follow the steps below to perform preventive maintenance on the AN/UGC-144.

1. Perform a 56-day PMI.
 - a. Gather required materials.
 - b. Remove the system from the line.
 - c. Initiate any required maintenance documentation.
 - d. Perform a system self-test.
 - e. Perform a routine inspection.
 - f. Perform the cleaning requirements.
2. Perform a 168-day PMI.
 - a. Perform a major inspection.
 - b. Clean the disk heads.
3. Perform a 336-day PMI.
 - a. Replace the batteries.
 - b. Perform a final self-test.
 - c. Return the system to the line.
 - d. Return materials to their proper storage places.
 - e. Clean work area.
 - f. Complete all maintenance documentation.

After you complete these procedures, your trainer will review your work. When you are proficient in performing the procedures, you may be certified on the AFJQS. Your trainer will assign the next task.

MODULE 5
SUBASSEMBLY REMOVAL AND REPLACEMENT
AND SYSTEM TROUBLESHOOTING

OBJECTIVES

1. Given TO 31W4-2UGC144-2, an electrostatic work station, and a standard tool kit, remove and replace Power Supply subassemblies IAW Chapter 2, Section III.
 - a. Explain the task preparation procedures.
 - b. Explain how to remove the Power Supply (PS) Interface.
 - c. Explain how to remove the PS circuit cards.
 - d. Explain how to remove the PS Motherboard.
 - e. Explain how to replace the PS Motherboard.
 - f. Explain how to replace the PS circuit cards.
 - g. Explain how to replace the PS Interface.

2. Given TO 31W4-2UGC144-2, an electrostatic work station, and a standard tool kit, remove and replace terminal subassemblies IAW Chapter 2, Section III.
 - a. Explain how to remove the logic circuit cards.
 - b. Explain how to remove the Disk Memory Unit.
 - c. Explain how to remove the terminal Motherboard.
 - d. Explain how to replace the terminal Motherboard.
 - e. Explain how to replace the Disk Memory Unit.
 - f. Explain how to replace the logic circuit cards.

3. Given TO 31W4-2UGC144-2, an electrostatic work station, and a standard tool kit, remove and replace the display compartment subassemblies IAW Chapter 2, Section III.
 - a. Explain how to remove the Keyboard.
 - b. Explain how to remove the Control Panel.
 - c. Explain how to replace the Control Panel.
 - d. Explain how to replace the Keyboard.
 - e. Explain how to remove the Display subassembly.
 - f. Explain how to replace the Display subassembly.

4. Given TO 31W4-2UGC144-2, a digital multimeter, an electrostatic work station, and a standard tool kit, troubleshoot the UGC-144 system IAW Chapter 2, Section 3.
 - a. Explain how to perform a preliminary analysis of the malfunction.
 - b. Explain how to use the self-test to isolate faults.
 - c. Explain how to use the troubleshooting flow charts to isolate faults.
 - d. Explain how to perform the post-task procedures.

PREREQUISITES

You must have completed AFQTP Modules 1 thru 4.

TRAINING REFERENCE

TO 31W4-2UGC144-2

INTRODUCTION

In the last module you learned how to perform UGC-144 preventive maintenance. Now it's time for you to learn how to repair the equipment. There are no UGC-144 adjustments or alignments, thus, equipment repair is limited to component replacement. After you have learned all the replacement tasks, you will learn how to troubleshoot the equipment.

INFORMATION

The remove and replace tasks are divided into three categories: power supply, terminal, and display sub-assemblies. They are written to be taught all in one session.

REMOVE AND REPLACE POWER SUPPLY (PS) SUBASSEMBLIES

In this task, you will learn how to disassemble the Power Supply and then put it back together. When you finish, you should be proficient at replacing all Power Supply line replacement units (LRUs). First, you need to get prepared to perform the task.

Preparation. Before you begin, there are certain steps you must take to get prepared. These steps include: gaining system downtime, initiating maintenance documentation, and gathering your materials.

System Downtime. If necessary, remove the system from the line. Your trainer will show you how to accomplish any special requirements. Notify

- Job Control—obtain a Job Control Number (JCN).
- Operations.
- Systems (Tech) Control.

Maintenance Documentation. Initiate any required maintenance documentation. All maintenance actions must be documented. Most organizations use an automated system to document their work. Some organizations still use the AFTO Form 349.

Materials. Gather all required materials. You will need the following materials to perform this task.

- TO 31W4-2UGC144-2
- Electrostatic work station (P/N 8501)
- 8-inch (or longer) #1 Phillips screwdriver
- Allen wrench set

The electrostatic workstation is required to protect the delicate electronics in the UGC-144.

WARNING

All UGC-144 subassemblies are sensitive to electrostatic discharge (ESD) and are marked with the ESD symbol (Figure 5-1).

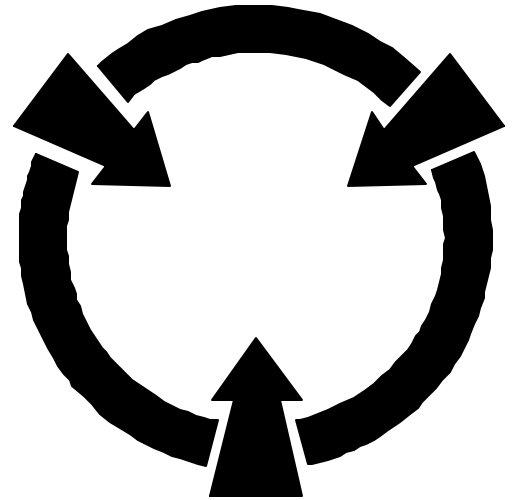
STOP

Read TO 31W4-2UGC144-2, pages a thru d, and return to this module.

You should now be familiar with all ESD hazards and the procedures necessary to preclude component damage.

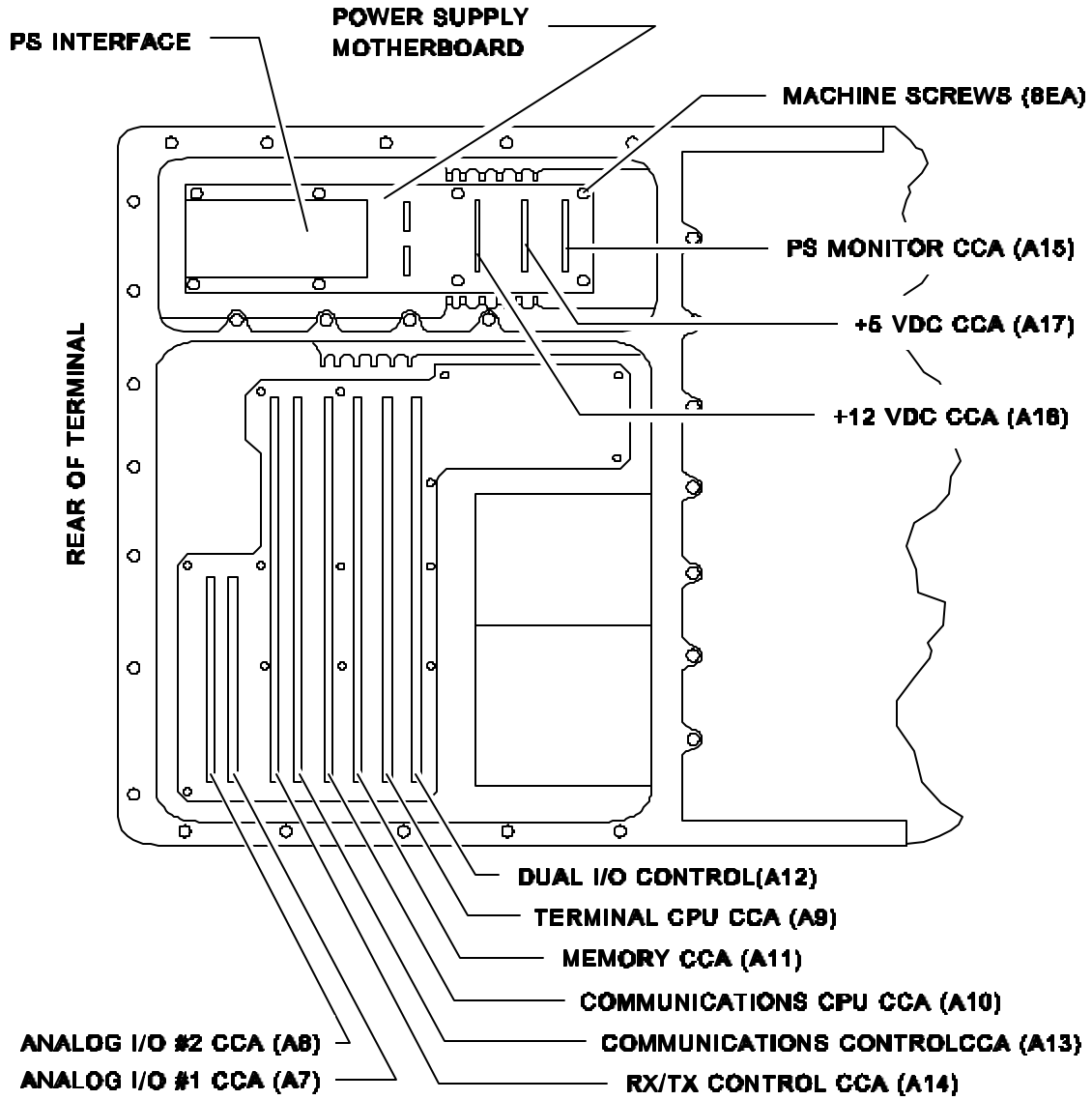
Now you know how to get prepared—you initiate paperwork, obtain equipment downtime, and gather your materials. In the following procedures, you will learn how to disassemble and reassemble the AN/UGC-144 Power Supply (PS). This includes removing (and replacing) the PS Interface, PS circuit cards, and the PS Motherboard.

Remove PS Interface. The first disassembly step is removing the PS Interface. Figure 5-2 shows the location of the Power Supply assemblies.



Step 1. Ensure the POWER switch is OFF. Disconnect the power cable (1W1) from the power source. Disconnect the terminal ground strap. The ground lug is on the rear connector panel and is secured by a wing nut. The rear connector panel is actually part of the interface.

Step 2. Remove the top cover. First, ensure the display assembly is closed. Remove the three screws attaching each of the rear upper bumpers (two each). Loosen the 29 captive screws and remove the cover.

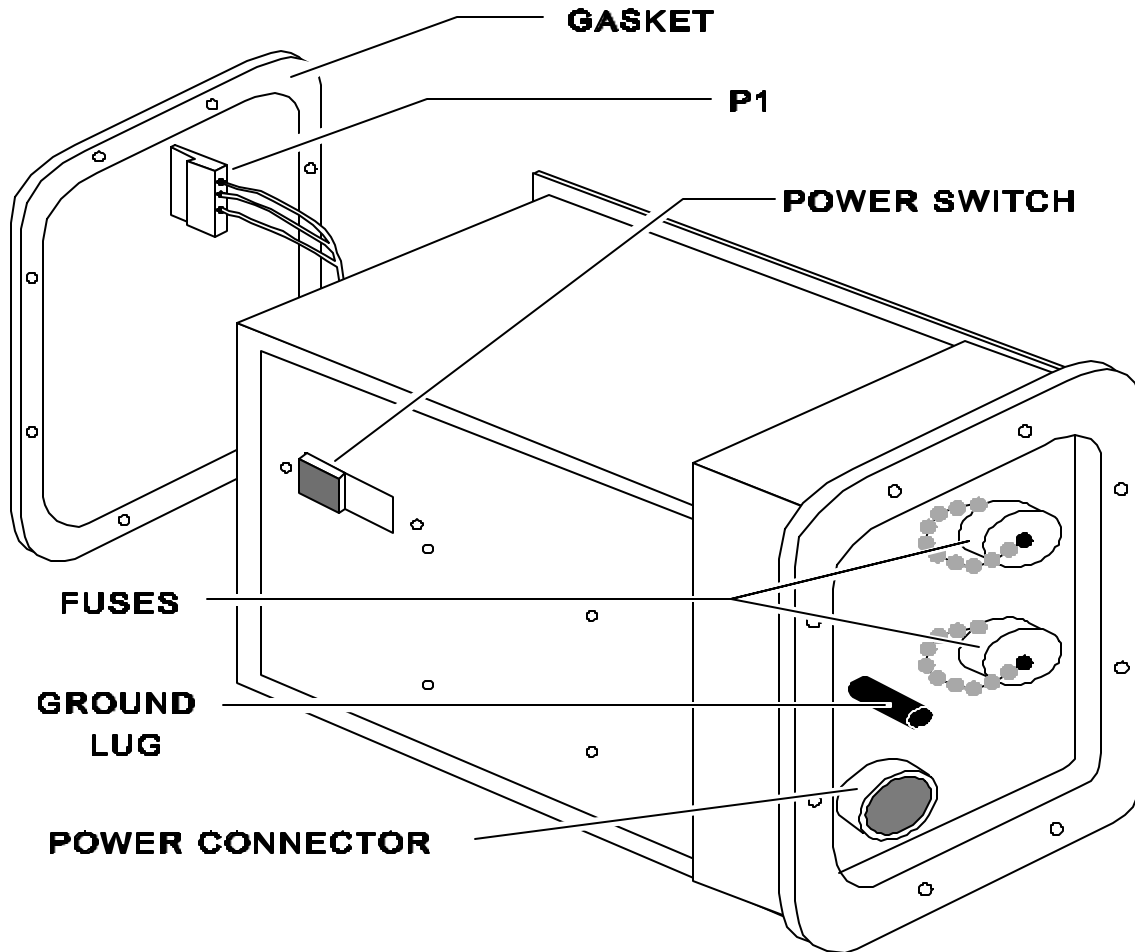


CAUTION

Be careful! Some of the captive screws may become separated from the cover. Missing screws will destroy the TEMPEST integrity of the system.

CAUTION

In the next step, ensure the power switch linkage (left side of interface) is disengaged from the interface power switch (shown in Figure 5-3).



Step 3. Remove the eight interface mounting screws, locking and flat washers. Slide the interface half way out of its enclosure.

Step 4. Gently disconnect (pull up) the interface cable connector (PS plug P1). It doesn't have a catch. Make note of P1's polarity.

Step 5. Slide the interface with its rubber gasket the rest of the way out of its enclosure.

NOTE

Although this task doesn't call for it, this would be an good opportunity to inspect the gasket for damage.

Remove Power Supply CCAs. The Power Supply (PS) CCAs are in the compartment in front of the PS Interface, as shown in Figure 5-2. The removal procedure is the same for each CCA. It includes the:

- PS Monitor CCA (A15)
- +12 Volt PS CCA (A16)
- +5 Volt PS CCA (A17)

Each CCA is secured by two wedge locks (Figure 5-4). Turn each wedge lock Allen screw approximately three turns counter-clockwise and then firmly press down on the Allen wrench. You may hear a click as the wedge lock breaks loose.

CAUTION

DON'T loosen wedge lock screws more than three (3) turns. This will keep the wedge locks from coming loose and falling into the electronics. If a wedge lock does fall off, IMMEDIATELY retrieve it.

Lift up on the CCA extractors and remove the card. Each CCA has a pair of extractors which release the CCA from its slot. If you cannot easily remove the CCA, firmly push down on the CCA extractors. This should free the jammed wedge locks and enable you to remove the card.

Remove Power Supply Motherboard. With the PS Interface and all the PS CCAs removed, you can easily remove the PS Motherboard.

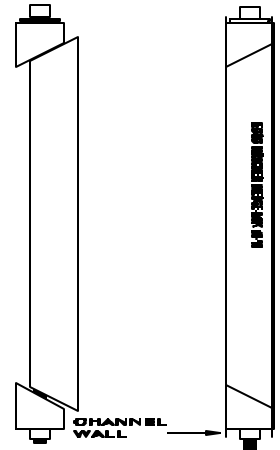
Step 1. Disconnect the plug (P2) from the Motherboard.

Step 2. Remove eight machine screws (and washers) which secure the PS Motherboard to the chassis.

Step 3. Carefully remove the Motherboard through the interface opening.

CAUTION

Be sure PS plug P2 cable wires are not pinched or stressed



during this procedure.

Replace Power Supply Motherboard. Now it's time to put it all back together. To do this, you will reverse the steps, starting with the PS Motherboard.

Step 1. Carefully slide the PS Motherboard through the interface opening. Position it so its capacitors face up and toward the rear of the chassis.

Step 2. Line up the Motherboard with the screw holes and replace the eight screws with locking and flat washers.

Step 3. Connect PS plug P2 to the Motherboard J2.

NOTE

You removed PS plug P1 when you disconnected the PS Interface. Neither P1 nor P2 are keyed. Be sure you reinstall them in the correct PS Mother-board jack. P1 connects to the jack toward the outside of the chassis, P2 toward the middle. The PS Motherboard jacks are labeled.

Replace Power Supply CCAs. Place the CCAs back into their slots and press down firmly on the extractors. Tighten the wedge lock screws. The wedge locks may not easily slide into the channel. You may have to use a small screwdriver to line them up with the channel wall. A CCA slot label on the chassis wall tells you in which slots to install the CCAs.

Replace PS Interface. The next step is to install the PS Interface.

Step 1. Slide the interface (with its rubber gasket in place) about ¼ of the way into its enclosure.

CAUTION

Be sure the rubber gasket is installed properly and not twisted.

Step 2. While noting the polarity of the connector, carefully plug the interface cable connector (P1) into PS Motherboard connector J1.

Step 3. Pull the POWER switch linkage out toward the rear of the terminal. This will allow the interface POWER switch to easily engage the linkage.

Step 4. Slide the interface all the way into its enclosure.

NOTE

Be sure the POWER switch linkage catches and stays engaged to the switch.

Step 5. Secure the interface mounting hardware.

This concludes the removal and replacement of the Power Supply assemblies. Next, you will learn how to remove and replace the terminal subassemblies.

REMOVE AND REPLACE TERMINAL SUBASSEMBLIES

Before you begin this task, gather your materials. You will need the following materials for this task.

- TO 31W4-2UGC144-2
- 8-inch (or longer) #1 Phillips screwdriver
- Allen wrench set
- ¼-inch nut driver set (with 6-inch extension)
- Electrostatic work station (P/N 8501)

NOTE

All AN/UGC-144 subassemblies are ESD sensitive and are marked with the ESD symbol.

Remove Logic CCAs. Before removing the CCAs, ensure the UGC-144 is disconnected from the power source. The CCA wedge locks and extractors are the same as for the power supply CCAs. The logic CCAs are in the large compartment, as shown in Figure 5-2. They are as follows:

- Terminal CPU CCA (A9)
- Memory CCA (A11)
- Communications CPU CCA (A10)
- Communications Control CCA (A13)
- Rx/Tx Control CCA (A14)

- Dual I/O Control CCA (A12)

The Dual I/O Control (A12) and Communications Control (A13) CCAs have ribbon cables which must be disconnected. Each connector has an extraction device. Spread the tabs and the connectors will loosen. When reconnecting, push the connectors into the socket and the extractors will snap into the locked position.

NOTE

The TO doesn't label these plugs. To minimize the confusion, we have labeled the plugs with reference to the assembly to which they connect. The ribbon cable connectors are replaced with the red stripe to the left.

Step 1. Remove the Terminal CPU CCA (A9).

Step 2. Remove the Memory CCA (A11).

Step 3. Remove the Communications CPU CCA (A10).

Step 4. Remove the Communications Control CCA (A13).

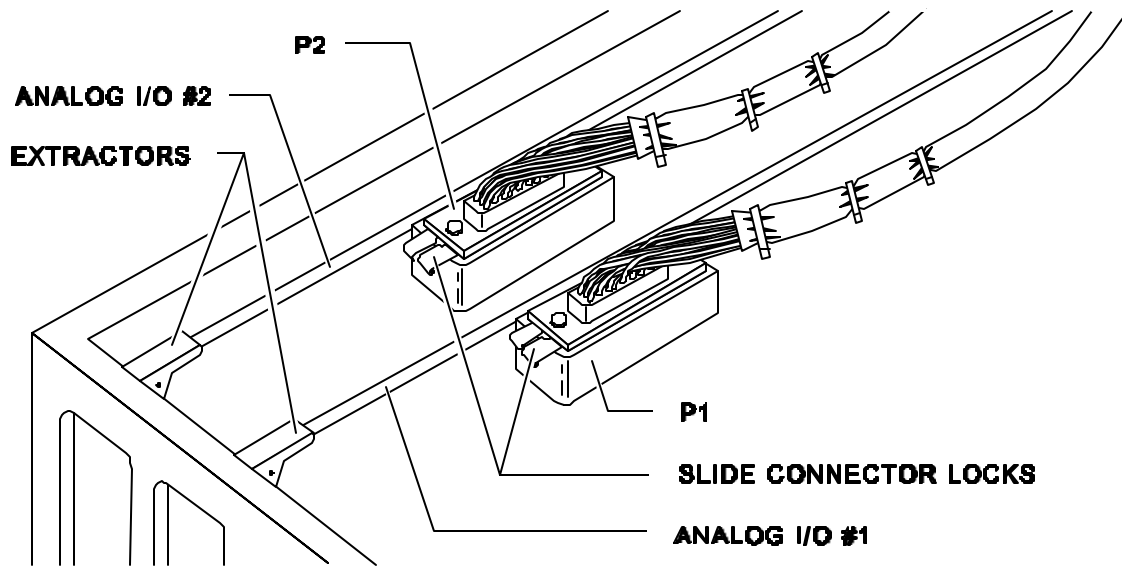
Step 5. Remove the Rx/Tx Control CCA (A14).

Step 6. The Dual I/O Control CCA (A12) is in the first card slot, in front of the others. Here's how to remove it.

- Disconnect CCA A12's two ribbon cables.
- Disconnect plug P1.
- Release the wedge-locks (no more than 3 turns).
- Lift up on the CCA extractors and carefully pull the CCA out of the card slot.

There are two other logic cards besides those already mentioned. These are the Analog I/O #1 (A7) and #2 (A8) CCAs. They have different removal procedures.

Step 7. Using the shank of the #1 Phillips screwdriver, you must slide the connector locks to the left (Figure 5-5).

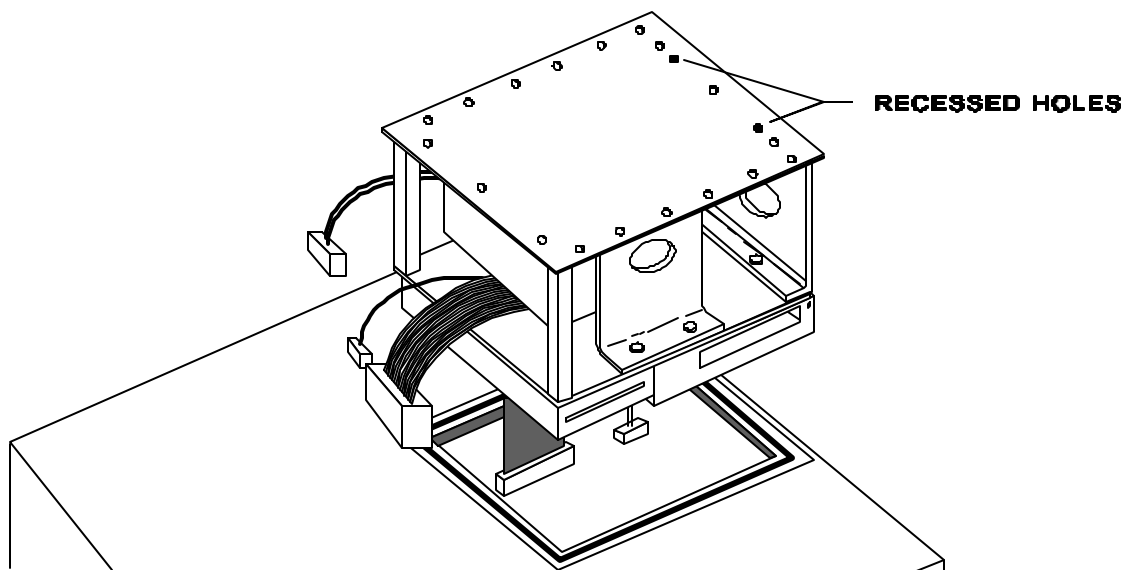


Step 8. Disconnect both CCA connectors (A8P1 and A7P2) (Figure 5-5). P1 is a male connector and P2 is female; they cannot be cross-connected.

Step 9. Unscrew the wedge-locks.

Step 10. Lift up on the extractors to remove the CCAs.

Remove Disk Memory Unit. To remove the DMU, you will have to disconnect some plugs. Figure 5-6 shows the DMU and all its associated plugs.



CAUTION

Be sure the cables are not in a position where they can be damaged.

Step 1. Ensure the Display Subassembly is closed and latched.

Step 2. Set the terminal on its left side.

Step 3. While supporting the DMU, remove its eighteen black screws (with locking and flat washers).

CAUTION

Do NOT remove the two screws in the recessed holes.

Step 4. Carefully remove the DMU and set it down on the static mat beside the chassis.

NOTE

Before removing J6 and J7, ensure the connector slide lock mechanisms are open.

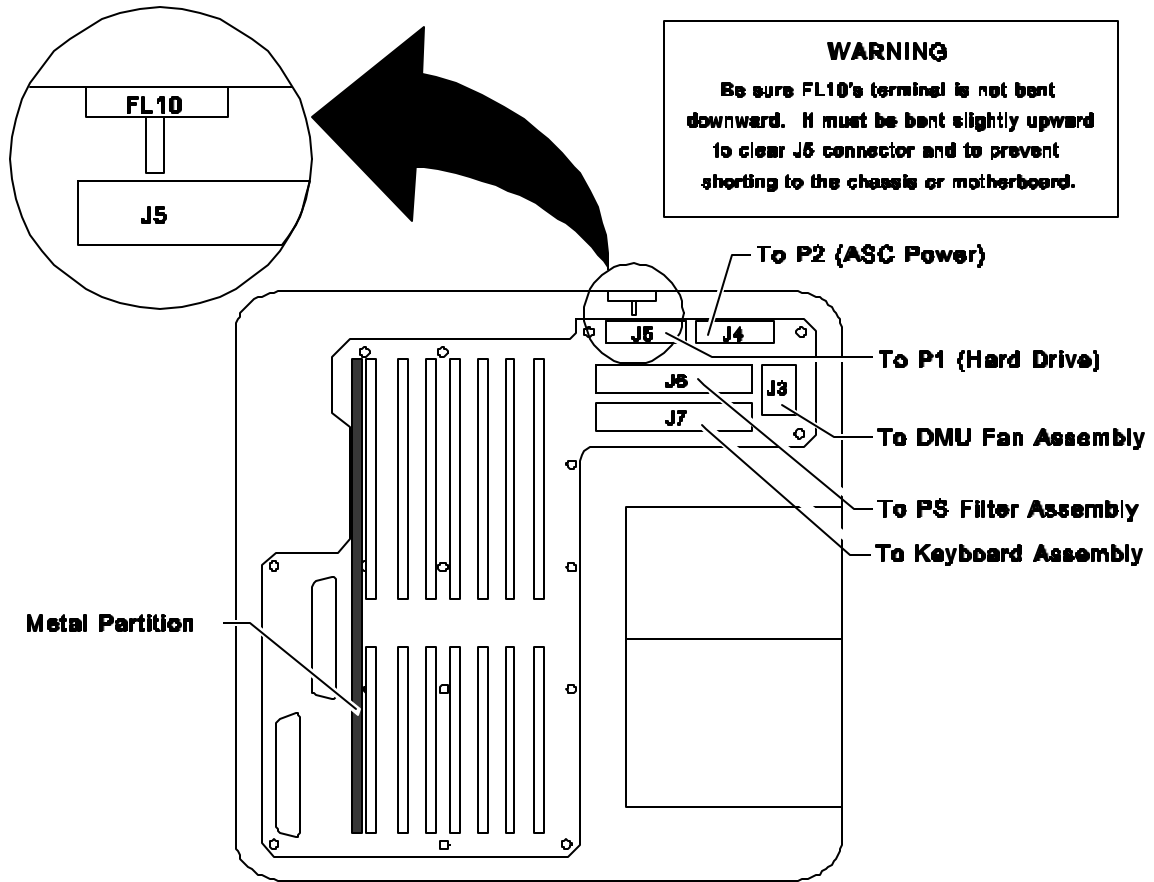
Step 5. From the left side of the terminal opening, disconnect the cables from the following Motherboard connectors:

- J3 (DMU Fan Assembly connector)
- J4 (ASC power connector)
- J5 (hard drive power connector)
- J6 (PS Filter Assembly connector)
- J7 (Keyboard Assembly cable connector)

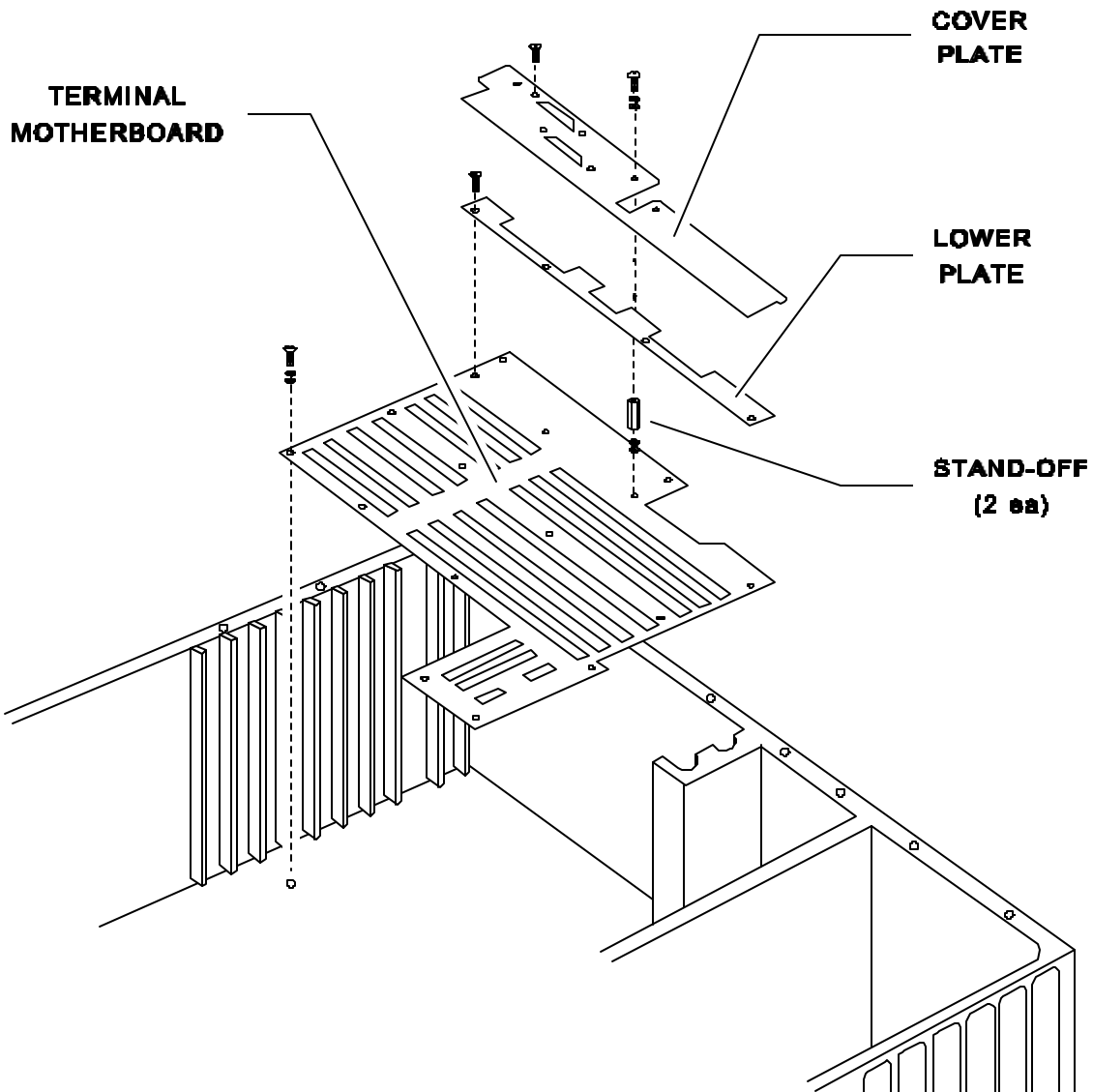
Step 6. Feed the DMU cables through the chassis opening and remove the DMU Assembly.

Remove Terminal Motherboard.

Step 1. Unscrew the wedge locks and remove the metal partition with its gasket. The partition is between the A7 and A14 CCAs as shown in Figure 5-7.



Step 2. Remove the four screws securing the lower plate (Figure 5-8).



Step 3. Remove the lower plate.

Step 4. Remove the analog connector cover plate retaining brackets (right and left). Note exactly how they fit.

Step 5. Remove the three Phillips screws (with locking and flat washers) from the connector cover plate.

Step 6. Remove the four flat head screws from the connector cover plate.

Step 7. Remove the connector cover plate by **slightly** flexing the plate and moving it forward.

Step 8. Using a ¼-inch nut driver (with extension), remove the two stand-offs (Figure 5-8), with locking and flat washers, from the back of the Motherboard.

Step 9. Unscrew the eleven Motherboard mounting screws (with locking and flat washers).

WARNING

As shown in Figure 5-7, the right side of the Terminal Motherboard sits up against the PS Filter Assembly. FL10's lead is bent slightly **UPWARD** to clear the motherboard's J5 connector. Be sure FL10 is **NOT** bent **DOWNWARD**, as the filter will short to the Motherboard or chassis. Failure to heed this warning will cause equipment damage.

Step 10. Pull the Motherboard out to the left. This will prevent the motherboard from contacting the FL10 terminal (see Figure 5-7).

Replace Terminal Motherboard.

Step 1. Position the Motherboard into the chassis.

Step 2. Temporarily insert A14 CCA into its card slot. This will allow you to properly align the motherboard.

Step 3. Install and tighten the eleven mounting screws, washers, and lock washers.

Step 4. Remove the A14 CCA.

Step 5. Using a ¼-inch nut driver (with extension), carefully attach the two stand-offs (with washers) to the rear of the Motherboard. Take care to not cross-thread them.

Step 6. Position the analog connector cover plate over the rear of the motherboard and the analog connectors. You will need to slightly flex the plate to clear these connectors.

Step 7. Install the four flat-head analog connector cover plate screws. These secure the analog connectors.

Step 8. Install the three cover plate mounting screws and washers.

Step 9. Position the right and left cover plate retaining brackets.

Step 10. Position the lower plate and install the four flat-head lower plate mounting screws.

HELPFUL TIP

Before sliding the metal partition into its slot, place a thin sheet of **non-conductive** material in front of the SSI, PRINTER, and COMM plug wiring harnesses. This will prevent damage to the wiring harnesses.

Step 11. Install the metal partition into its slot with the wedge locks to the rear. Tighten the wedge locks.

Replace Disk Memory Unit.

Step 1. Ensure the Display Subassembly is closed and latched.

CAUTION

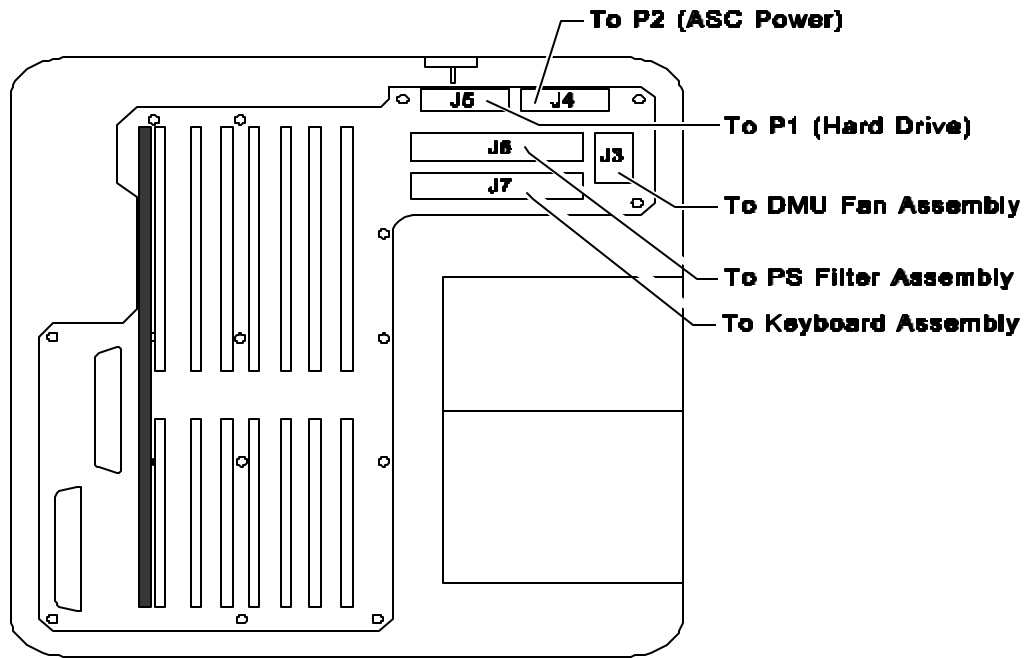
Ensure cables are not in a position where they can be damaged.

Step 2. Set the terminal on its left side.

Step 3. Position the DMU Assembly to the right of the terminal, beside the chassis opening.

Step 4. From the left side of the terminal, reach through the chassis opening and connect the cables (Figure 5-9) in the following order:

1. ASC power cable (P2) to J4
2. Hard Drive Power cable (P1) to J5
3. DMU Fan Assembly cable to J3



NOTE

Before accomplishing the next two steps, ensure the connector locking mechanisms are open.

Step 5. Connect the PS Filter Assembly cable connector (P6) to J6 of the Motherboard. Secure the locking mechanism.

Step 6. Connect the Keyboard Assembly cable (J1) to J7 of the Motherboard. Secure the locking mechanism.

Step 7. While keeping the ribbon cables to the rear of the terminal, insert the DMU Assembly into the chassis. While holding the DMU Assembly, secure the eighteen black screws (with locking and flat washers).

Step 8. Return the terminal to its upright position.

NOTE

The ribbon cables have a red stripe on the side. Install the cables so the red stripe is to the left.

Replace Logic CCAs. The Analog CCAs are replaced first.

Step 1. Insert the Analog #1 and #2 CCAs into the correct slots (see the CCA label on the chassis wall) so the wedge locks are to the front of the terminal.

Step 2. Tighten the wedge locks.

Step 3. Connect A8P1 and A7P2 and slide each connector lock to the right.

CAUTION

When replacing the A12 CCA, slide a thin sheet of non-static material between the A12 CCA slot and the ribbon cables. This will protect the cables from damage while inserting the A12 CCA.

Now that the Analog CCAs are in place, you can insert the remaining logic CCAs.

Step 4. Starting with the A12 CCA, slide the cards into the correct slots (see the CCA label on the chassis wall) so the wedge locks are to the front.

Step 5. Tighten, but don't over-tighten, the wedge lock screws.

Step 6. Reconnect the cable connectors. When reconnecting, push the connectors into the socket and the extractors will snap into the locked position. The ribbon cable connectors are placed so that the red stripe of the cable is to the left.

REMOVE AND REPLACE DISPLAY COMPARTMENT SUBASSEMBLIES

In this task, you will learn how to remove and replace all (except the DMU) major subassemblies in the display compartment. These include the Keyboard and the Control Panel. Since you must remove the Keyboard to gain access to the Control Panel wiring harness, the Keyboard removal will be taught first. The last part of this task is the Display subassembly removal and replacement.

First is a list of the required materials. The following tools and materials are required to remove (and replace) the Keyboard, Control Panel, and Display subassemblies. Make sure you have these materials on hand before attempting the task.

- TO 31W4-2UGC144-2
- #1 Phillips screwdriver
- Offset Phillips screwdriver
- 7-level screwdriver
- wire cutters
- cable tie

Let's start with the Keyboard Assembly removal.

Keyboard Removal.

Step 1. Open the display compartment.

Step 2. Open the ASC door. Using #1 and offset Phillips screwdrivers, remove the twenty screws which secure the Keyboard assembly to the chassis.

NOTE

The ASC door must be open to access the four Keyboard screws. The door hinders the screws removal, so they must be removed using an offset Phillips screwdriver. Using a straight shank screwdriver will strip the screw heads.

CAUTION

Only extend the Keyboard enough to clear the ASC door and the Control Panel. Otherwise, you may damage the cable hidden beneath the Keyboard.

Step 3. Lift the Keyboard (front edge first) and pull it toward you about two inches. Swing the left side of the Keyboard up so that the Keyboard rests vertically on the chassis. This will give you access to its wiring harness. The wiring harness is beneath the Keyboard's right hand side. You may have to use a 7-level screwdriver to separate the Keyboard from the chassis assembly.

Step 4. Disconnect the Keyboard wiring harness connector (J3).

Step 5. Lift the Keyboard from the chassis.

Remove Control Panel.

Step 1. Using wire cutters, cut the cable tie which binds the Control Panel wiring harness connector P1. The Control Panel wiring harness connector is directly below the POWER switch.

Step 2. Disconnect the Control Panel wiring harness P1 connector.

Step 3. Using a #1 Phillips screwdriver, remove the ten screws (with flat and locking washers) which secure the Control Panel.

Step 4. Pull the Control Panel assembly away from the chassis.

NOTE

The POWER switch plunger may bind, but a gentle twisting motion should free it.

CAUTION

Keep the wiring harness away from obstructions while removing the Control Panel assembly.

Replace Control Panel.

Step 1. Feed the Control Panel wiring harness through the hole in the chassis where the Control Panel will go.

Step 2. Align the Control Panel with the POWER switch plunger and push the panel into place.

Step 3. Connect the Control Panel wiring harness connector (P1).

Step 4. Place a new cable tie around the connectors.

NOTE

There is a cable securing device glued to the base of the chassis. This device has a channel through which the cable tie should be secured.

Step 5. Position the Control Panel onto the chassis and secure it with the ten Phillips screws (with flat and locking washers).

NOTE

The POWER switch plunger may not readily engage the linkage, but a gentle twisting motion will help it engage.

CAUTION

Keep the wiring harness away from obstructions while replacing the Control Panel assembly.

Replace Keyboard.

Step 1. Position the Keyboard (on top of the chassis) so that it rests vertically on its right side.

Step 2. Connect the Keyboard's wiring harness connector (J3) and lay the Keyboard on the chassis in its natural position.

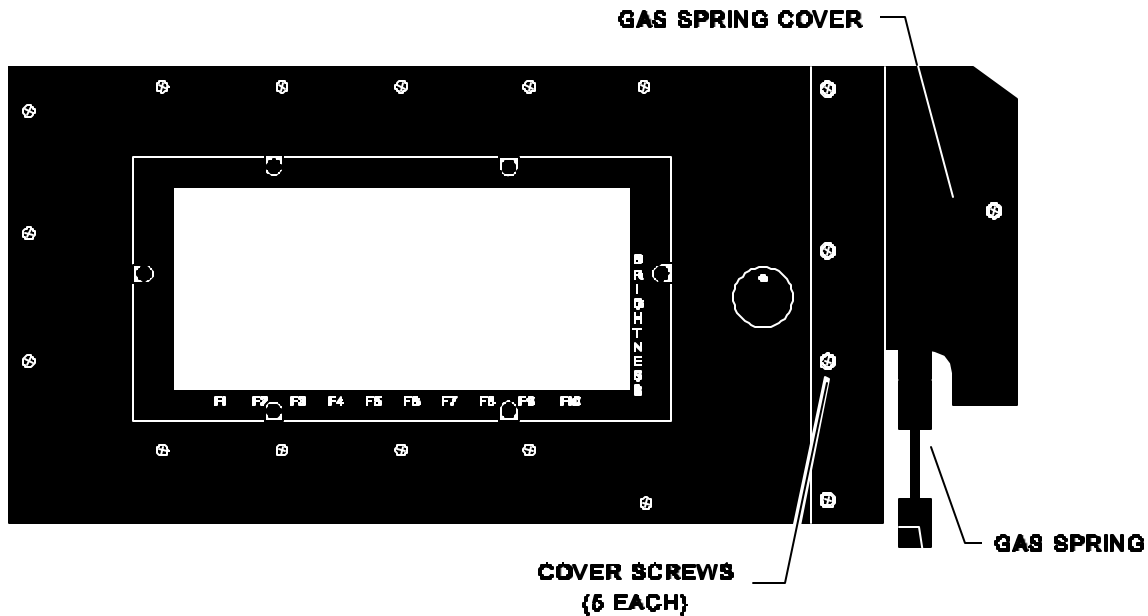
NOTE

The cable connectors may prevent the Keyboard from laying flush on the chassis. Raise the Keyboard to reposition the connectors.

Step 3. With the ASC door open, secure the Keyboard assembly to the chassis with the twenty screws.

Remove Display Subassembly.

Step 1. Remove the five Phillips screws (with flat and locking washers) securing the gas spring cover to the display (Figure 5-10). Set the cover and screws aside.



Step 2. While holding the display window in place, remove the thirteen beveled Phillips screws securing the window panel to the chassis.

CAUTION

The Display CCA is ESD sensitive. Use care when handling and storing the display subassembly. The delicate circuitry and glass are easily damaged.

Step 3. Pull the window panel out far enough to disconnect the brightness control connector. This connector is directly behind the brightness control.

Step 4. Lay the window panel aside with the rubber gaskets facing up. Be sure you protect the glass and gaskets from damage.

CAUTION

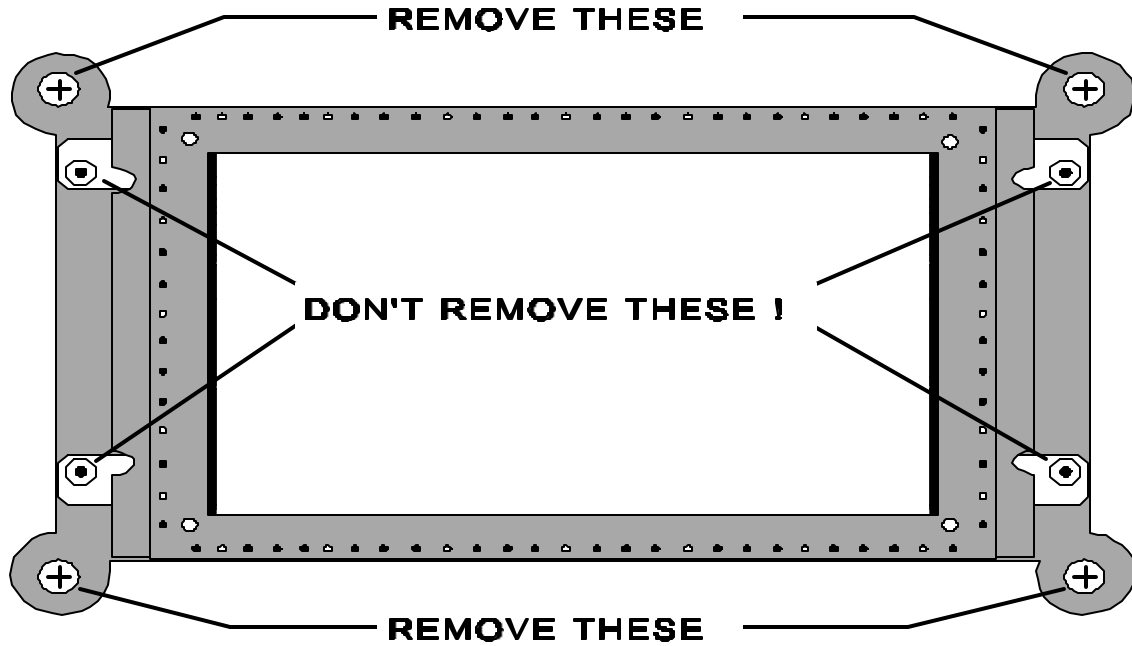
Do NOT remove the four hex nuts around the display subassembly.

NOTE

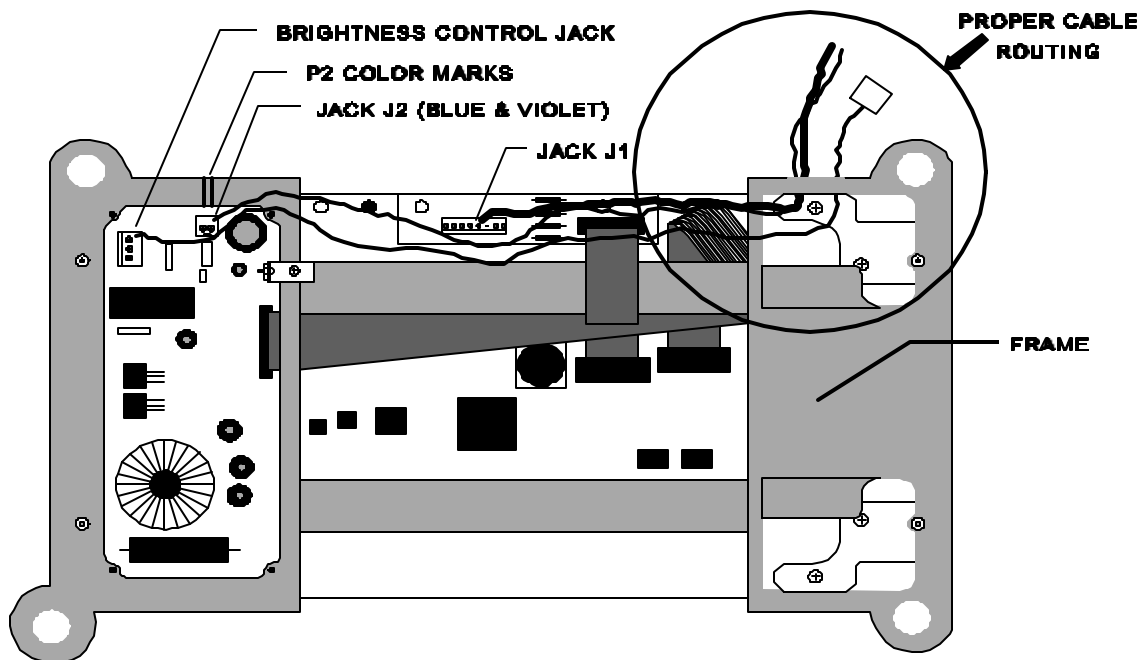
Keep the glass clean and unscratched. Do NOT touch the surface of the display subassembly.

Step 5. While holding the Display subassembly in place, remove the four Phillips screws (with flat and

locking washers) at each corner of the display subassembly. These screws are shown in Figure 5-11.



Step 6. Tilt the top of the Display subassembly down. This will allow easy access to the back of the subassembly (Figure 5-12).



Step 7. Note the path the cables take through the opening in the frame. Only disconnect the wire cables

J1 and J2 as shown in Figure 5-12. Do NOT disconnect the ribbon cables. Separate cables J1 and J2 from the display subassembly frame.

Step 8. Remove the display subassembly and lay it aside. Ensure the subassembly is protected.

Replace Display Subassembly.

Step 1. Hold the display subassembly so the CCA components are on the left side facing you.

Step 2. Feed the two cables (P1 and P2) through the chassis and connect them to the jacks as shown in Figure 5-12.

NOTE

Jack J2 has a red and black mark drawn on the chassis next to it. These colors correspond to the colors of the heat shrink on the connector wires. Figure 5-12 shows the location of the marks.

Step 3. Tilt the display subassembly up and position it over its four mounting holes. Install the four mounting screws.

Step 4. Hold the display window panel close enough to connect the brightness control connector.

Step 5. Secure the window panel to the chassis with the thirteen beveled Phillips screws. Don't place any screws in the four holes on the far right—these secure the gas spring cover.

Step 6. Replace the gas spring cover.

Step 7. Reconnect the power source.

Now you are familiar with all UGC-144 subassembly replacements. Essentially, these tasks are the only repair procedures offered. Now let's get ready to learn UGC-144 troubleshooting.

TROUBLESHOOTING

Troubleshooting the UGC-144 involves three processes or steps. These are preliminary analysis, self-test, and fault isolation. Before you learn these steps, you must first gather all of the materials you will be using. You will need the following materials to perform this task.

- TO 31W4-2UGC144-2
- Digital multimeter (Fluke 87 or equivalent)
- Electrostatic work station (P/N 8501)
- 8-inch (or longer) #1 Phillips screwdriver
- Allen wrench set
- 1/4-inch nut driver set (with 6-inch extension)

Preliminary Analysis. The purpose of this step is to examine the symptoms. You should realize that, depending on the malfunction, you may not be able to perform all of the steps.

Step 1. Interview the equipment operator to identify malfunction symptoms.

NOTE

The next two steps will preserve key software settings which could be lost during the self-test and its power on/off procedures.

Step 2. If possible, use the print screen feature to get a record copy of the screen's error or alarm message. To do this, press SHIFT + PRT SC.

Step 3. If possible, print all menu settings. From the Main Menu, press **F5** to access the Print Menu; then press **F3** to print all setup parameters.

Step 4. Perform an external visual inspection. Check the cables and connectors. Also, ensure a properly formatted diskette in the ASC drive.

Short of running a self-test, you have all the available operational information on the malfunction on the printouts. Now it's time for you to perform a self-test. You learned this procedure in an earlier module.

Self-test. The purpose of the self-test is to identify a terminal or printer malfunction. Once the display messages lead you away from the normal self-test path, start printing each screen (press SHIFT + PRT SC). Also, print any error or alarm messages. These printouts will be valuable troubleshooting aids.

CAUTION

When you turn off the UGC-144, wait at least 30 seconds before applying power. This allows the hard drive to come

to a **complete** stop before starting again; thus, protecting the drive motor.

If you have an equipment malfunction, but the self-test runs error-free, proceed to the Symptom Index in Table 5-1. If the self-test detects an error, it will identify some possible suspect subassemblies. Replace these items in the order suggested by the self-test. If the problem persists, proceed to the Symptom Index. This index will either give you some more suggestions or refer you to a specific flow chart.

Fault Isolation. In this step, you will heavily rely on three basic flow charts. Figure 5-12 (Flow Chart Symbols) explains all of the symbols used in these flow charts. The three flow charts are: the Power Fault Flow Chart (Figure 5-13), Voltage Check Flow Chart (Figure 5-14), and the No Display Flow Chart (Figure 5-15).

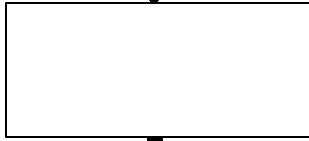
If your terminal screen doesn't display text within 10 seconds of power on, refer to the No Display Flow Chart.

Upon power on, the terminal should initiate a RAM Test which ends with a beep and a **640K** screen message. If the RAM Test is faulty, refer to the Symptom Index.

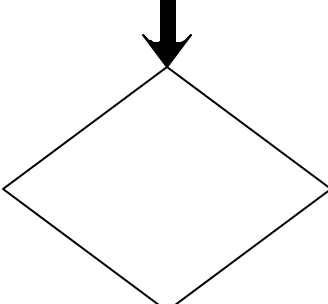
FLOW CHART SYMBOLS AND EXPLANATIONS



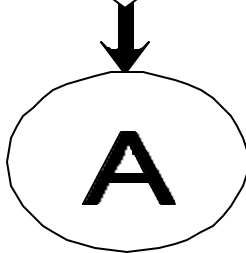
Starts or finishes a flow chart.



This is a task symbol: What to do and where to measure.



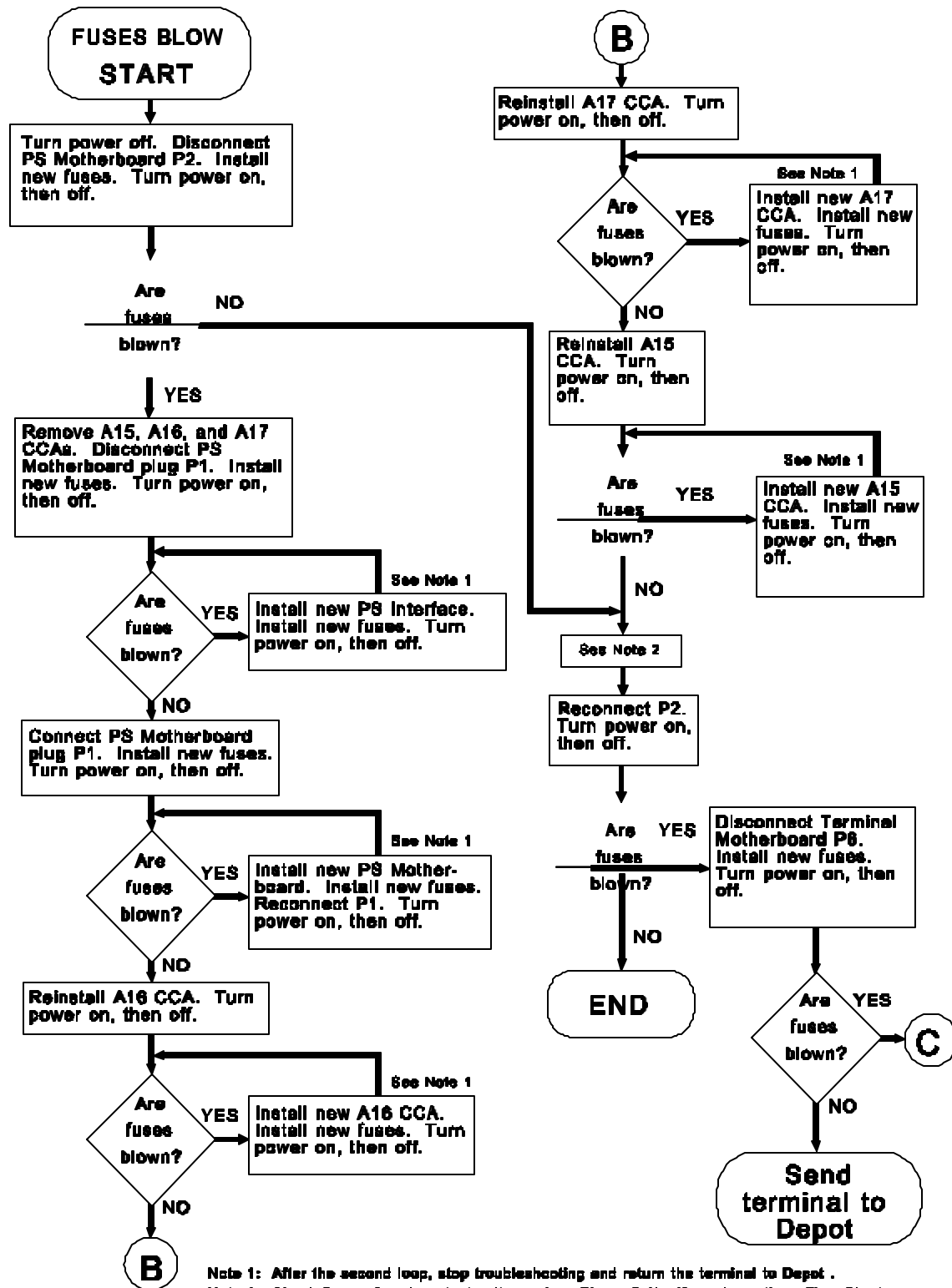
This is a YES or NO decision symbol. It depends on a measured result.

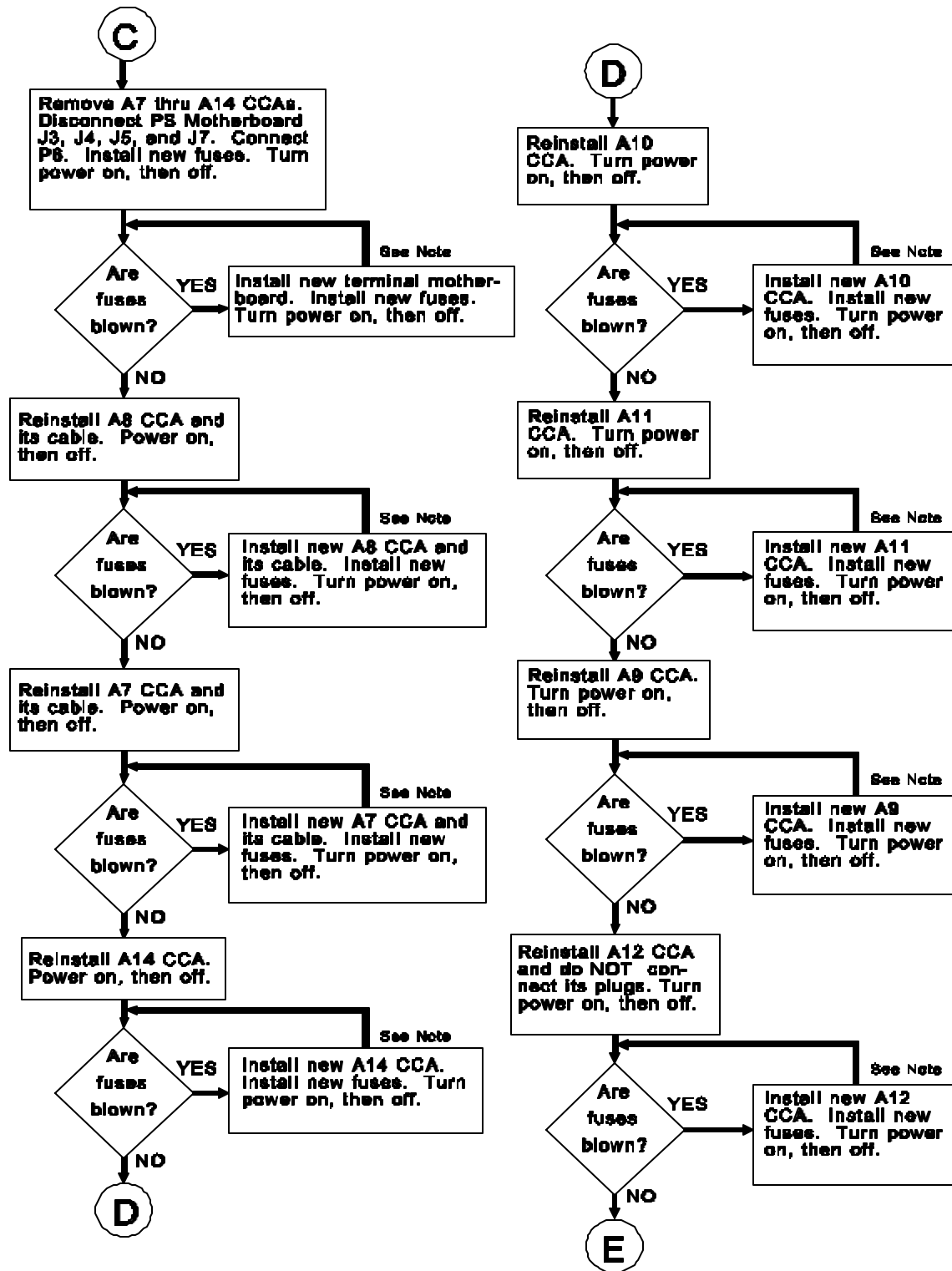


This indicates a link to or from another location on the same sheet or another sheet within the same flow chart.

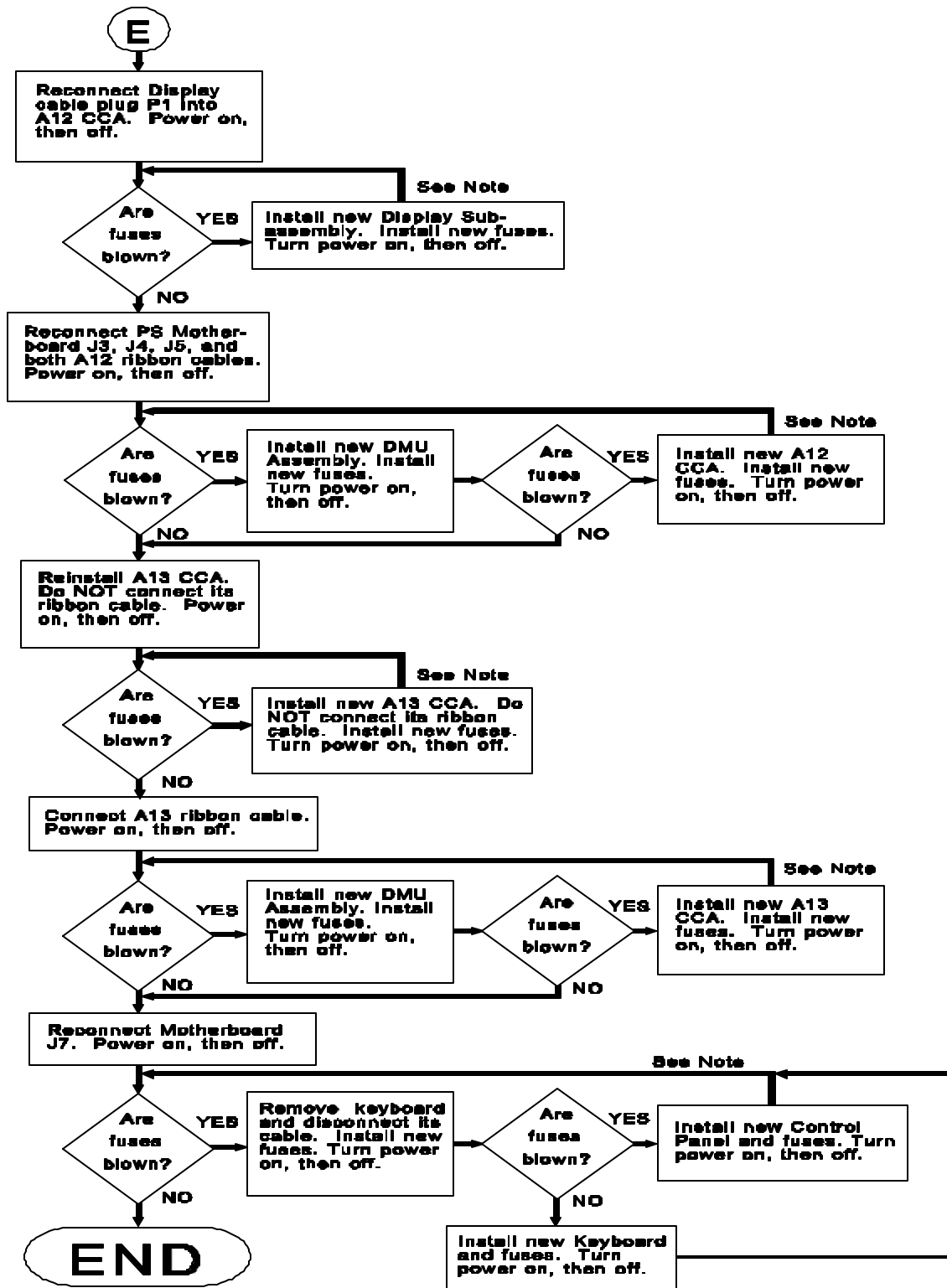
FUSES CONTINUALLY BLOW AT POWER ON.	REFER TO POWER FAULT FI
NO DISPLAY	REFER TO NO DISPLAY FLO
ABNORMAL OR UNREADABLE SCREEN	♥ DUAL I/O CONTROL (A12) ♥ TERMINAL CPU CCA (A9) ♥ DISPLAY SUBASSEMBLY
AUDIO ALARM SOUNDS CONTINUOUSLY	♥ COMMUNICATIONS CPU ♥ MEMORY CCA (A11)
PRINTER FAILS TO GO ONLINE	♥ PRINTER:EXECUTE SELF PRINTER LOOPBACK PLUG '
RAM TEST STOPS AT 128K OR DOESN'T END AT 640K	♥ TERMINAL CPU CCA (A9)
MAIN MENU SCREEN FAILS TO APPEAR	♥ DISK MEMORY UNIT
SCREEN MESSAGE: UNABLE TO BOOT FROM ANY DEVICE	♥ DISK MEMORY UNIT
STATUS BLOCK "MSG MEM % USED" HAS GARBLED CHARACTERS IN IT	♥ MEMORY CCA (A11) ♥ COMMUNICATIONS CPU ♥ PS MONITOR CCA (A15)
SELF-TEST STOPS: ♥ AT KEYBOARD TEST AND THE SCREEN BLANKS AFTER PRESSING "ALT R"	♥ MEMORY CCA (A11) ♥ TERMINAL CPU CCA (A9)
♥ AT PRINTER TEST	♥ PRINTER: RUN SELF-TEST LOOPBACK PLUG; IF TEST F PRINTER.
♥ AND DOESN'T START AT TERMINAL MEMORY TEST -SCREEN BLANKS.	♥ TERMINAL CPU CCA (A9) ♥ MEMORY CCA (A11)
♥ AT TERMINAL MEMORY TEST - TERMINAL SECTION	♥ MEMORY CCA (A11)
♥ AT TERMINAL MEMORY TEST - COMMUNICATIONS SECTION	♥ COMMUNICATIONS CPU ♥ COMMUNICATIONS CON ♥ MEMORY CCA (A11)
♥ AT RX/TX TEST.	♥ COMMUNICATION CONT ♥ COMMUNICATIONS CPU ♥ RX/TX CCA (A14)
♥ AT ASC BUFFER TEST.	♥ COMMUNICATIONS CON ♥ COMMUNICATIONS CPU

Table 5-1. Symptom Index

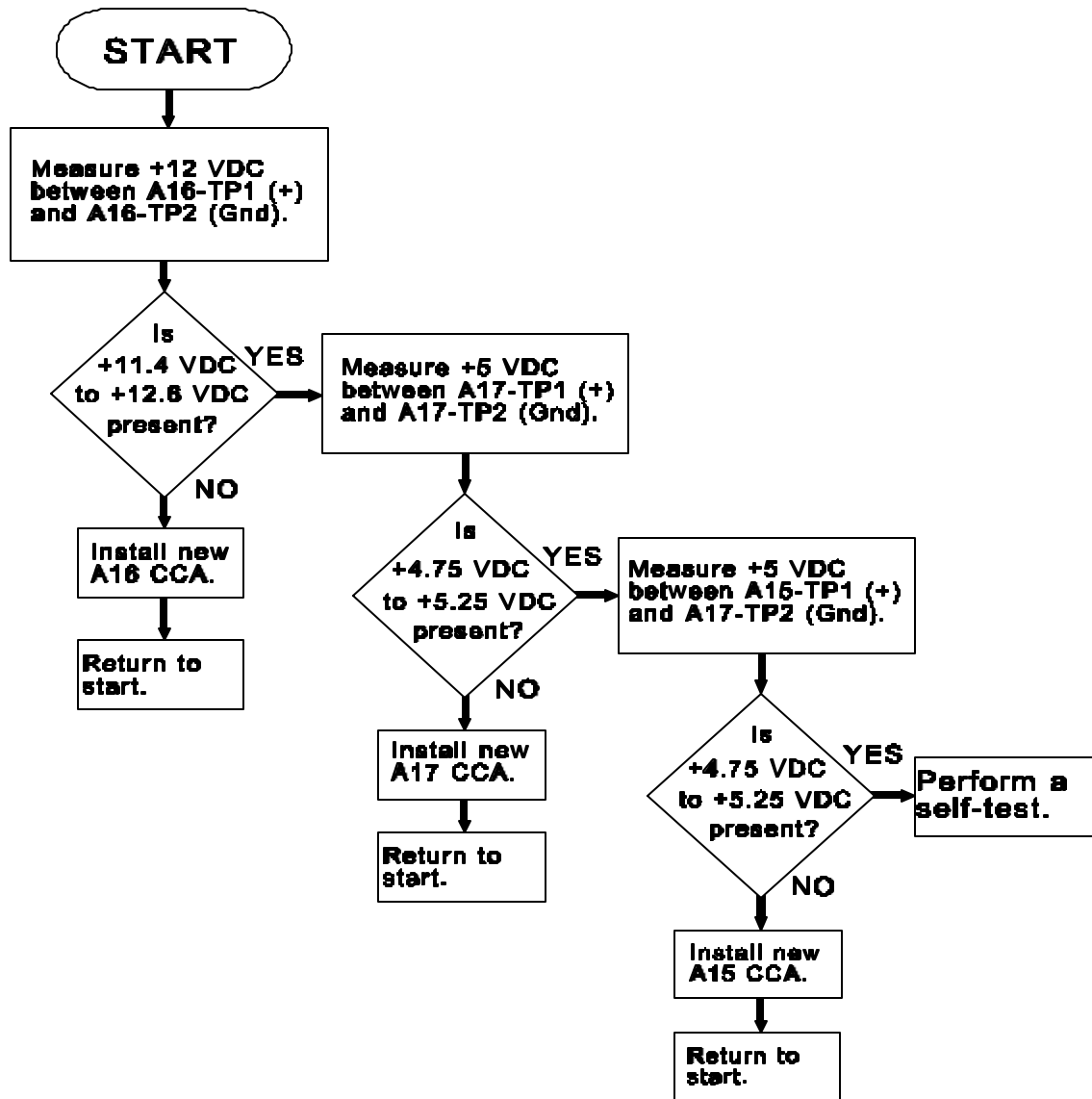


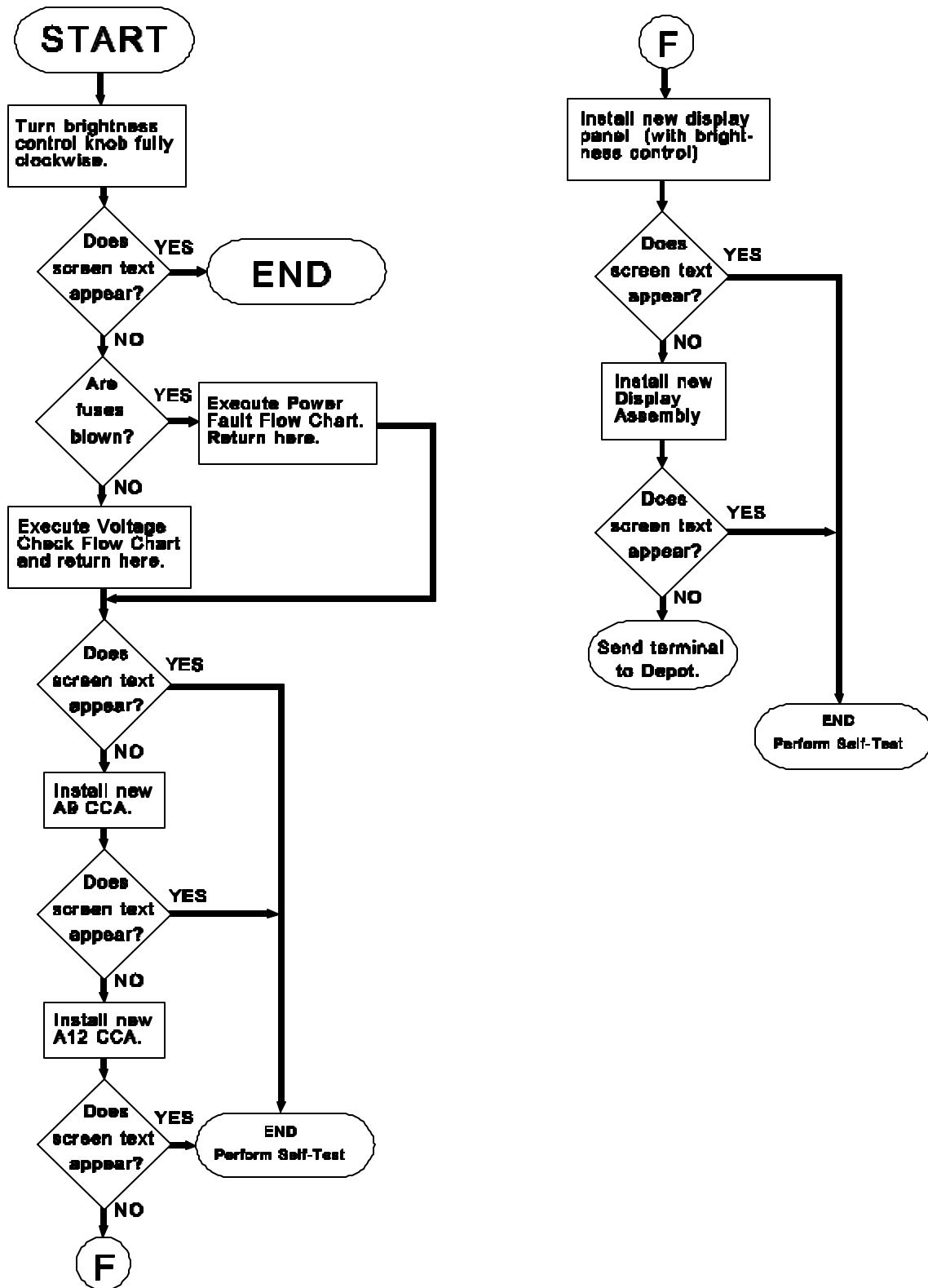


Note: After the second loop, stop troubleshooting and return the terminal to Depot .



Note: After the second loop, stop troubleshooting and return the terminal to Depot .





With the self-test, symptom index, and flow charts, you should be able to isolate most malfunctions. (If not, you should send the entire terminal back to the depot for repair.) Remember, the only corrective action at your disposal is to replace the faulty subassembly. Now that this task is complete, you need to know how to tie up all the loose ends.

Post Task Procedures. These procedures will tie up those loose ends. They will ensure your terminal is running smoothly, cleanup is complete, the system is online, and all paperwork is complete.

Step 1. Perform a final system self-test. This will ensure there are absolutely no problems before returning the equipment to the user.

Step 2. If necessary, place the system online. Your trainer will provide assistance as needed.

Step 3. Return all your materials to their proper storage locations and clean your work area.

Step 4. Complete all required maintenance documentation.

Step 5. After all malfunctions are corrected, send the faulty LRUs to the depot for repair. This involves some more paperwork with which your supervisor will assist you.

SUMMARY

This completes this part of your training. Since starting this QTP, you have become quite familiar with the UGC-144 and its printer. You probably think you're an expert UGC-144 installer—am I right? I'll bet you even think you can perform all kinds of maintenance, both scheduled and unscheduled!

I hope you are right on all of these accounts, but before you can be allowed to do all these things, you must be certified. There are three more things you must do before being certified on this final task. You must answer the Module 5 review questions and take the last part of the KEP. You must also satisfactorily complete the performance procedures. Then, and only then, will you be certified and fully qualified to maintain the UGC-144 Communications Terminal.

REVIEW QUESTIONS

Answer the questions and compare your responses with the confirmation key in the back of this book. Your responses do not have to match word-for-word, but should convey the same basic meaning. Review the

applicable portions of this module for all missed questions.

1. Name the three task preparation steps.
2. How do you know which UGC-144 subassemblies are ESD sensitive?
3. When should you use ESD precautionary procedures?
4. List the Power Supply LRUs.
5. When removing the PS Interface, ensure the ____ is disengaged from the interface power switch.
6. List the steps for removing the PS Interface.
7. Name the PS circuit cards.
8. What secures each PS circuit card?
9. With the ____ and ____ removed, you can easily remove the Power Supply Motherboard.
10. Which plug would you disconnect in the PS Motherboard removal procedure?
11. List the terminal logic CCAs.
12. The ____ are replaced with the red stripe to the left.
13. What secures the DMU Assembly to the terminal chassis?

14. Which Motherboard plugs would you disconnect to remove the DMU Assembly?
15. Which subassembly is secured with wedge locks, but is not a CCA?
16. Which plates are installed above the terminal Motherboard?
17. What secures the Keyboard Assembly to the terminal chassis?
18. Why must you use an offset Phillips screwdriver to remove the Keyboard Assembly?
19. What secures the Control Panel Assembly to the terminal chassis?
20. How do you free the POWER switch plunger if it binds during Control Panel removal?
21. Troubleshooting the UGC-144 involves three processes or steps. Name them.
22. During UGC-144 troubleshooting, what is the first preliminary analysis step?
23. During troubleshooting, what is the purpose of obtaining menu printouts?
24. During troubleshooting, what would be your next step if the self-test runs error-free?
25. During troubleshooting, what would be your next step if the self-test detects an error?
26. Name the three basic UGC-144 troubleshooting flow charts.

27. If your terminal screen doesn't display text within 10 seconds of power on, refer to ____.
28. List the post task procedures.

ADDITIONAL INSTRUCTIONS

When ready, ask your trainer to administer the KEP questions for this module. You are permitted to use all available technical references and must score 100%. Your trainer will check your answers and review any incorrectly answered questions with you. When you have achieved the KEP standard, proceed to the performance procedures.

PERFORMANCE PROCEDURES

Your trainer will explain how to accomplish these tasks. When you feel comfortable with the procedure, demonstrate to your trainer the following:

1. Gather all required materials.
2. Remove the AN/UGC-144 from service.
3. Initiate required maintenance documentation.
4. Remove the following Power Supply LRUs.
 - a. PS Interface
 - b. PS CCAs
 - c. PS Motherboard
5. Replace the following Power Supply LRUs.
 - a. PS Motherboard
 - b. PS CCAs
 - c. PS Interface
6. Remove the following terminal subassemblies.
 - a. Logic CCAs
 - b. Disk Memory Unit Assembly
 - c. Motherboard
7. Replace the following terminal subassemblies.
 - a. Motherboard

- b. Disk Memory Unit Assembly
- c. Logic CCAs
8. Remove the following display compartment subassemblies.
 - a. Keyboard assembly
 - b. Control Panel assembly
9. Replace the following display compartment subassemblies.
 - a. Control Panel assembly
 - b. Keyboard assembly
10. Remove the display subassembly.
11. Replace the display subassembly.
12. Perform a preliminary analysis of a malfunction.
13. Use the self-test to isolate a fault.
14. Use the troubleshooting flow charts to isolate a fault.
15. Perform a final system self-test.
16. If necessary, place the system on line.
17. Return all your materials to their proper storage locations and clean your work area.
18. Complete all required maintenance documentation.
19. Send the faulty LRUs to the depot for repair.

After you complete these procedures, your trainer will review your completed work. When you and your trainer feel you can perform the procedures, you may be certified on the AFJQS.

REVIEW QUESTIONS CONFIRMATION KEY

MODULE 1

1. KG-84, KY-68
2. Data control block
3. Keyboard, Control Panel, Display, 40M hard disk, 3½-inch disk drives, battery compartment, Power Supply, and electronics bay
4. Data Adapter Control Mode
5. Single Subscriber Interface (SSI) and JINTACCS Automated Message Preparation System (JAMPS) editors
6. (1) prepare messages, (2) transmit or receive messages, (3) edit messages, (4) store messages, and (5) print message copies
7. The communications and terminal sections
8. 31W4-2UGC144-1, 31W4-2UGC144-2, 31W4-2UGC144-4, 31W4-2UGC144-6WC-1
9. 31W4-2UGC144-4
10. Digital multimeter
11. 110 VAC terminal, 230 VAC terminal, and printer power; and the DSVT/DNVT, printer interface, DLED, and ANDVT data cables
12. The SSI, Printer, and Comm loopback plugs
13. Control Panel, Display, and Keyboard subassemblies
14. Emergency Erase
15. status indicators
16. function keys, main keyboard, and the key pad
17. Miltope Jet 150
18. The POWER switch
19. Communications Control CCA
20. Power Supply Interface
21. Power Supply Monitor CCA
22. The +5V Power Supply CCA
23. Dual I/O Control CCA
24. 192
25. 40 MB hard disk, ASC drive interface, and the 3.5" floppy disk drive

MODULE 2

1. Before power is applied
2. Baud rate, data bits, stop bits, and parity

3. Because you will leave dirt and finger prints on the surface which will affect the ink distribution
4. Underneath the printer top cover
5. You must activate it.
6. These batteries maintain message memory in case of a power failure.
7. 1.2 VDC Nickel-Cadmium (Nicad) batteries (P/N BB-416/U)
8. On the battery compartment wall
9. Verify the available site power.
10. It must be between 105 and 127 VAC, measured between the hot and return leads of the power outlet.
11. connectors
12. $\frac{1}{2}$
13. 1W3
14. 230 to 115 VAC step-down
15. 207 and 253 VAC, measured between the hot and return leads of the outlet
16. 105, 127
17. PRINT, COMM, SSI
18. UGC-144/STU-III interface cable
19. You must connect a strap between pins 29 (+6V) and 38 (PTTR) of the KG-84A connector.
20. ancillary equipment

MODULE 3

1. up, notch
2. square hole by the tab.
3. During acceptance inspections, pre- and post-deployment inspections, equipment installation, 56-day PMI, unscheduled maintenance, and before configuring the system software
4. The self-test will erase some of your configuration data.
5. The screen background should turn bright orange and the menu text appears as flashing black characters.
6. Five
7. From the Main menu, press **F1**, then press **F1** again to access the DTU Menu.
8. CURRENT DAY, CURRENT MONTH, CURRENT YEAR, LOCAL TIME, and ZULU TIME
9. From the Main menu, press **F1**, then press **F2** to access the terminal volume screen.
10. UP arrow, DOWN arrow
11. Caps Lock, Line Length, and Tab settings
12. 69
13. abcdef
14. Y
15. U (Unclassified), E (Unclassified, EFTO), R (Restricted), C (Confidential), S (Secret), and T (Top Secret)
16. 2400

17. Autosave, Autosave Device, Delete Safestored Message
18. I; VI
19. one; six
20. The Access Menu
21. disable
22. When you want to operate in AUTODIN
23. Originator/Destination LMF
24. <CR><CR><LF><LF><LF><LF><LF><LF><LF><LF><LF>NNNN
25. Data Adapter (DA)
26. I, II, and VI
27. I
28. II
29. Mode VI
30. 16, 32, 64, or 96
31. In the RI/PLA Table
32. When you exit the Guarded Menu
33. Lessons Learned reports, AN/TTC-39A(V)4 Software Users Guide, AN/TYC-39(V)1 Software Users Guide, JANAP 128, and the AN/UGC-144 Planners Guide
34. DSVT
35. 16000 or 32000 (as required)
36. Off, 1200 - 4800 (as required)
37. On, Mode VI
38. The ASC, OTC Floppy, and the OTC Message diskette formats
39. ASC

MODULE 4

1. Task preparation, AN/UGC-144 self-test, a routine inspection, cleaning, and the post-task procedures
2. 168-day, 356-day
3. To know the operating condition of the equipment before performing the PMI
4. Keyboard, switches, brightness control, data and power cables, cable connectors, miscellaneous connecting hardware
5. Bent pins, corrosion, and damaged keyways
6. Isopropyl alcohol
7. Task preparation, 56-day PMI, disk head cleaning, and the post-task procedures
8. Rubber seals and gaskets, keytop rubber boots, fuse assemblies, dust caps and loopback plugs, latches and cover fasteners, printer rollers and tractor feeds, cowling hinges, and the paper storage guide
9. Display assembly seals, ASC door gasket, battery compartment seal, and top cover seals and gaskets

10. Upper enclosure seal, top cover and carriage access cover
11. **ONLY** remove one keytop at a time.
12. There is no alignment procedure for the sprockets.
13. The MAIN and MEDIADIR Menus
14. **F4**
15. **The current disk is unformatted or wrong format. Do you want to FORMAT? (Y/N) :**
16. Battery replacement
17. When primary power fails, the battery backup system maintains any messages in the message memory **ONLY** if the POWER switch is left in the ON position. The messages will stay in memory only for about one hour. System setup parameters will also be saved for one hour.
18. "C" cell Nicad
19. The template on the battery compartment back wall
20. To ensure the batteries make good contact
21. Perform a final self-test, return the system to the line, return all materials to their proper storage places, clean your work area, and complete all maintenance documentation
22. To ensure the terminal and printer are operational

MODULE 5

1. Obtain system downtime, initiate maintenance documentation, and gather all required materials.
2. All UGC-144 subassemblies are ESD sensitive. They are marked with the ESDS symbol.
3. When touching, removing or inserting CCAs
4. PS Interface, PS CCAs, and the PS Motherboard
5. power switch linkage
6. Disconnect all electrical connections. Remove the top cover. Remove the eight interface mounting screws. Disconnect the interface cable connector. Remove the PS Interface.
7. The PS Monitor CCA (A15), +12 Volt PS CCA (A16), and the +5 Volt PS CCA (A17)
8. Each CCA is secured by two wedge locks.
9. interface, all the CCAs
10. P2
11. The Terminal CPU (A9), Memory (A11), Communications CPU (A10), Communications Control (A13), Rx/Tx Control (A14), Dual I/O Control (A12), Analog I/O #1 (A7), and the Analog I/O #2 (A8) CCAs
12. ribbon cable connectors
13. 18 black screws
14. Disconnect J7 (Keyboard Assembly cable connector), J6 (PS Filter Assembly connector), J3 (DMU Fan Assembly connector), J5 (hard drive power connector), and J4 (ASC power connector).
15. The metal partition
16. The lower plate and the analog connector cover plate

17. Twenty Phillips screws
18. The ASC door must be open to access the four Keyboard screws. The door hides these screws, so they must be removed using an offset Phillips screwdriver.
19. Ten Phillips screws
20. A small twisting motion should free it.
21. Preliminary analysis, self-test, and fault isolation
22. Interview the equipment operator to identify malfunction symptoms.
23. To obtain a record of all available operational information on the malfunction
24. Proceed to the fault isolation procedure.
25. Replace the LRU identified by the self- test.
26. The Power Fault Flow Chart, Voltage Check Flow Chart, and the No Display Flow Chart
27. the No Display Flow Chart
28. (a) Perform a final system self-test. (b) If necessary, place the system on line. (c) Return all your materials to their proper storage locations and clean your work area. (d) Complete all required maintenance documentation. (e) Send the faulty LRUs to the depot for repair.

TRAINEE SURVEY

NAME _____ RANK _____ DSN _____

UNIT ADDRESS _____ MAJCOM _____ DATE _____

1. What is your time in service (TIS)?
 - a. 0-3 yrs
 - b. 4-8 yrs
 - c. 9-16 yrs
 - d. 17 yrs or more

2. Have you had previous training on this equipment/function?
 - a. Yes (Please explain; use extra paper if necessary)
 - b. No

3. The purpose of AFQTPs is to provide standardized training programs for specific equipment or functions. How well do you feel this AFQTP accomplished its purpose?
 - a. Outstanding
 - b. Excellent
 - c. Satisfactory
 - d. Marginal
 - e. Unsatisfactory (Please explain)

4. The material presented in the Skill Training Material (STM) was
 - a. easy for me to understand.
 - b. unclear in some areas. (Please identify)
 - c. difficult for me to understand. (Please explain)

5. Were the modules arranged in a logical learning format (easy to difficult or simple to complex)?
 - a. Yes
 - b. No (Please explain)

6. Was information presented in the AFQTP (including reading assignments) sufficient for you to answer both the Review and KEP questions?
- Yes
 - No (Please explain)
7. Did you find any technical errors in the material?
- Yes (List errors)
 - No
8. The illustrations (diagrams, figures, and examples) in the AFQTP were
- high quality and aided learning.
 - poor quality, but still helpful.
 - limited; additional illustrations are needed.
 - non-existent in this AFQTP.
9. Would additional figures, illustrations, or examples help you better understand the material presented in the AFQTP?
- Yes (Please explain)
 - No
10. Did the tasks listed on the AFJQS cover the major requirements for this equipment/function?
- Yes
 - No (Please explain)
1. The reading grade level for this package was
- much too high.
 - slightly high.
 - about right.
 - too low.
12. What improvements would you make to this AFQTP to help meet your training needs?

KNOWLEDGE EVALUATION PAMPHLET (KEP)

This pamphlet should be separated from the package immediately and stored to prevent compromise of the questions. The KEP confirmation key located at the back of this pamphlet should be detached and stored.

After the trainee completes each module, the supervisor/trainer administers the corresponding KEP test. Using the KEP confirmation key, the supervisor/trainer checks the trainee's answers and reviews the incorrect responses. If the trainee does not achieve the minimum required score on each module test, he/she must reaccomplish the entire module.

The answer sheet for the KEP is located at the back of this pamphlet. This answer sheet may be detached to make it easier to enter the answers.

The trainee's responses to the KEP questions will aid us in evaluating the effectiveness of this training package. After the questions have been answered for all the module tests, please attach the completed and graded answer sheets and trainee/trainer surveys to the Training Certification document located in the back of the Trainer's Guide and send the package to us at this address:

81 TRSS/TSQS
601 D STREET
KEESLER AFB MS 39534-2229

KEP QUESTIONS - MODULE 1

You may use TO 31W4-2UGC144-1 to answer these questions, you must score 100%. A single blank line in the question may represent an answer with more than one word. Choose the response which best answers the question.

1. The UGC-144 is compatible with the ____, and the KG-84A.
 - a. KY-68, CV-1042
 - b. KY-68, STU-III
 - c. KY-65, CV-1031
 - d. KY-65, HYP-71

2. The UGC-144 assemblies which you are authorized to remove are called
 - a. LCUs.
 - b. subassemblies.
 - c. major subassemblies.
 - d. line replaceable units.

3. What automatically sets the UGC-144 information transfer parameters to ensure equipment compatibility?
 - a. DLED
 - b. DSVT
 - c. DACB
 - d. ANDVT

4. The UGC-144 has a ____ driven computer to build, edit, and process messages.
 - a. menu
 - b. 286SX processor
 - c. 386SX processor
 - d. 486SX processor

5. The two main sections of the UGC-144 are the ____ sections.

- a. communications and terminal
 - b. memory and communications
 - c. transmit and receive
 - d. memory and terminal
6. Which TO includes intermediate direct support maintenance information?
- a. 31W4-2UGC144-1
 - b. 31W4-2UGC144-2
 - c. 31W4-2UGC144-4
 - d. 31W4-2UGC144-6
7. Which of the following are UGC-144 loopback plugs?
- a. SSI and Printer
 - b. SSI and Keyboard
 - c. Keyboard and Comm
 - d. Printer and Interface
8. Which of the following are terminal control panel switches?
- a. Alarm Reset, Abort, Emergency Erase, and Brightness
 - b. Abort, Emergency Erase, Lamp Test, and Brightness
 - c. Alarm Reset, Abort, Emergency Erase, and Power
 - d. Abort, Emergency Erase, Power, and Lamp Test
9. Which terminal control panel switch is used to stop the transmission and printing functions?
- a. Alarm Reset
 - b. Emer Erase
 - c. Power
 - d. Abort

10. Which terminal control panel switch is protected by a cover?
- a. Emergency Erase
 - b. Alarm Reset
 - c. Abort
 - d. Power
11. Which of the following are printer control panel switches?
- a. On Line, Line Feed, and Form Feed
 - b. Power, On Line, Line Feed, and Form Feed
 - c. Power, On Line, Form Feed, and Lamp Test
 - d. Power, Paper Size, Line Feed, and Form Feed
12. You would use the ____ switches to reverse the paper one line.
- a. Power and On Line
 - b. On Line and Form Feed
 - c. Line Feed and Form Feed
 - d. Paper Size and Form Feed
13. The CCA that directs battery backup power to the Memory CCA is the
- a. Power Supply Interface.
 - b. Power Supply Monitor.
 - c. +5V Power Supply.
 - d. Memory.

14. Which of the following are DMU subassemblies?
- a. 192kB hard disk, 3½ inch floppy disk drive, and the floppy drive interface
 - b. 40MB hard disk, 3½ inch floppy disk drive, and the floppy drive interface
 - c. 192kB hard disk and a 3½ inch floppy disk drive
 - d. 40MB hard disk and a 3½ inch floppy disk drive

KEP QUESTIONS - MODULE 2

You may use TO 31W4-2UGC144-1 to answer these questions, you must score 100%. A single blank line in the question may represent an answer with more than one word. Choose the response which best answers the question.

1. Which operating parameters are set by the printer DIP switches?
 - a. Baud rate, data bits, stop bits, and parity
 - b. Data bits, stop bits, parity, and line width
 - c. Loop rate, stop bits, parity, and line width
 - d. Loop rate, data rate, data bits, and stop bits

2. Which are correct printer DIP switch settings?
 - a. 10-switch bank, switch #6 - OFF
8-switch bank, switch #5 - OFF
 - b. 10-switch bank, switch #6 - ON
8-switch bank, switch #5 - ON
 - c. 3-switch bank, switch #2 - ON
8-switch bank, switch #5 - ON
 - d. 3-switch bank, switch #1 - ON
8-switch bank, switch #5 - ON

3. When activating a new print head, push the paper clip into the ink bladder until
 - a. ink appears in the access hole.
 - b. the paper clip punctures the bladder.
 - c. a bead of ink appears on the print plate.
 - d. the ink saturates the white absorber pad.

4. To ensure correct ink distribution, don't touch the ____ of the print head.
- metal surfaces
 - access hole
 - bottom
 - sides
5. The purpose of the terminal batteries is to
- allow an incoming message to be printed.
 - power the terminal in case of a power failure.
 - provide loop current in case of a power failure.
 - maintain message memory in case of a power failure.
6. The terminal batteries should be replaced with ____ VDC Nicad batteries.
- 2
 - 1.5
 - 1.2
 - 1
7. The ____ cable connects to the KG-84A.
- 1W5 DLED
 - 1W5 DNVT
 - 1W2 DLED
 - 1W2 DSVT

8. Site power should read between ____ and 127 VAC, measured between the hot and ____ leads of the outlet.

- a. 100; ground
- b. 100; return
- c. 105; ground
- d. 105; return

9. The printer and terminal grounds must be terminated at the common site ground using

- a. the same connector.
- b. separate connectors.
- c. the same ground rod.
- d. separate ground rods.

10. For 115 VAC operation, ensure the printer has ____-amp fuses installed.

- a. $\frac{1}{4}$
- b. $\frac{1}{2}$
- c. 1
- d. $1\frac{1}{2}$

11. To configure the UGC-144 printer for 230 VAC single-phase operation, you must install a ____ transformer.

- a. 230 to 115 VAC step-up
- b. 115 to 230 VAC step-up
- c. 230 to 115 VAC step-down
- d. 115 to 230 VAC step-down

12. What is the first step of configuring your system to operate with 230 VAC single-phase power?
- Measure the output voltage of the transformer.
 - Configure for 115 VAC single-phase operation.
 - Connect the transformer ground lead.
 - Measure the line voltage.
13. Site power should read between ____ and 253 VAC, measured between the hot and ____ leads of the outlet.
- 200; ground
 - 200; return
 - 207; ground
 - 207; return
14. Which of the following are terminal cable connectors?
- PRINT, COMM, and SIGNAL
 - PRINT, SIGNAL, and SSI
 - SIGNAL, COMM, and SSI
 - PRINT, COMM, and SSI
15. The ____ cable connects the UGC-144 terminal to its ancillary equipment.
- SSI
 - COMM
 - PRINT
 - SIGNAL

16. If you have a KG-84A, you must modify the DLED cable by adding a strap between pins ____ and ____ of the KG-84A connector.

- a. 25; 39
- b. 28; 39
- c. 29; 38
- d. 38; 39

KEP QUESTIONS - MODULE 3

You may use TO 31W4-2UGC144-1 to answer these questions, you must score 100%. A single blank line in the question may represent an answer with more than one word. Choose the response which best answers the question.

1. Insert a diskette with its label side ____ and its notch to the ____ .
 - a. up; left
 - b. up; right
 - c. down; left
 - d. down; right

2. The UGC-144 floppy drives are named
 - a. A and B.
 - b. 1 and 2.
 - c. ASC and OTC.
 - d. Terminal and Communications.

3. You would **NOT** perform a system self-test during the
 - a. post-deployment inspection.
 - b. acceptance inspection.
 - c. 28-day PMI.
 - d. 56-day PMI.

4. Why should you perform a self-test before configuring your terminal?
 - a. The test will erase all configuration data.
 - b. The test will erase some configuration data.
 - c. It ensures the terminal is properly operating.
 - d. The test is part of the configuration procedure.

5. Which area is always tested when power is applied?
- RAM
 - Input power
 - Receive port
 - ASC diskette drive
6. If you press function key F4 during the video portion of the self-test, the screen background should and the menu text appear should appear as ____ characters.
- turn black; inverse video
 - turn black; flashing orange
 - turn bright orange; inverse video
 - turn bright orange; flashing black
7. Which menu allows you to set the terminal's date and time?
- DTU
 - Setup
 - Guarded
 - Autosave
8. Which is **NOT** a DTU Menu function?
- Current day of the month
 - Current day of the week
 - Current month
 - Local time
9. To access the terminal volume screen from the Main Menu, press ____, then press ____.
- F2; F4
 - F2; F2
 - F1; F4
 - F1; F2

10. Use the ____ arrow key to increase the speaker volume and the ____ arrow key to decrease the speaker volume.
- UP; DOWN
 - DOWN; UP
 - LEFT; RIGHT
 - RIGHT; LEFT
11. Which features can be set using the Set Edit screen?
- Caps Lock and Page Size
 - Num Lock and Page Size
 - Caps Lock and Tab
 - Num Lock and Tab
12. Which Set Edit line length option must you choose to use AUTODIN JANAP 128 format?
- 96
 - 80
 - 72
 - 69
13. Which menu cannot be directly accessed from the Guarded Menu?
- Autosave
 - Printer
 - System
 - DTU
14. In the Guarded Menu, you must select ____ b/s if you use a UGC-129 printer.
- 1200
 - 2400
 - 4800
 - 9600

15. Which menu enables (or disables) operator classification levels and transmission capability?
- Access Menu
 - Guarded Menu
 - Set Edit Menu
 - Password Menu
16. If your terminal is set up to operate in the Genser community, which Access Menu parameter is always enabled?
- DOI-13
 - Transmit
 - Restricted
 - Unclassified
17. The UGC-144 uses the communications software when operating in
- AUTODIN.
 - Mode VI.
 - Mode II.
 - Mode I.
18. What is the EOM validation sequence for all UGC-144 ASCII messages?
- <CR><CR><LF><LF><LF><LF><LF><LF><LF><LF><LF>NNNN
 - <LF><LF><LF><LF><LF><LF><LF>NNNN
 - <CR><CR><LF>
 - NNNN

19. Which circuit requires the SSI Menu Master/Slave parameter be set to Master?
- UGC-144 → KG-84 → KG-84 → UGC-144 dedicated circuit
 - UGC-144 → AN/TYC-39 → AN/TYC-39 → UGC-144 dedicated circuit.
 - UGC-144 → KG-84 → KG-84 → UGC-144 dedicated circuit with no digital switch.
 - UGC-144 → KY-68 → KY-68 → UGC-144 dedicated circuit with no digital switch.
20. A digital interface which allows the data rate to be less than the loop rate is called
- AUTODIN.
 - TASCID.
 - ASC.
 - DA.
21. A channel arrangement which transmits a series of blocks before requiring acknowledgement is called
- Mode I
 - Mode II
 - Mode VI
 - AUTODIN
22. Where, in the UGC-144 software, would you enter addresses and phone numbers?
- Setup Menu
 - RI/PLA Table
 - Address Table
 - Autosave Menu
23. Which publication contains actual UGC-144 circuit configuration data?
- Lessons Learned Report
 - TO 31W4-2UGC144-1
 - TO 31W4-2UGC144-2
 - JANAP 144

Use the figures at the back of this KEP to answer questions 24 thru 27.

24. Which circuit do the following parameters describe?

- Master/Slave • Slave
- DACB Protocol • On
- Data Rate • 2400 (or higher)
- SSI Interface • DSVT
- Number of Stop Bits • 1
- Data Mode Control • On
- Mode VI Storage Blocks • None
- Mode I Answer Timer • 5

- a. Dedicated, Mode VI, FSK circuit
- b. Dial-up, Mode VI, KY-68 circuit
- c. Dedicated, Mode I, FSK circuit
- d. Dial-up, Mode I, KY-68 circuit

25. Which circuit do the following parameters describe?

- Master/Slave • Slave
- DACB Protocol • Off
- Data Rate • 75 - 1200 (as required)
- SSI Interface • DLED
- Number of Stop Bits • 1
- Data Mode Control • Off
- Mode VI Storage Blocks • None
- Mode I Answer Timer • 5

- a. Dedicated, Mode I, FSK circuit
- b. Dial-up, Mode I, KY-68 circuit
- c. Dedicated, Mode VI, FSK circuit
- d. Dial-up, Mode VI, KY-68 circuit

26. Which circuit do the following parameters describe?

Master/Slave	• Slave
DACB Protocol	• Off
Data Rate	• 75 - 1200 (as required)
SSI Interface	• DLED
Number of Stop Bits	• 1
Data Mode Control	• Off
Mode VI Storage Blocks	• 16 or 32 (as required)
Mode I Answer Timer	• Default

- Dial-up, Mode VI, KY-68 circuit
- Dedicated, Mode VI, FSK circuit
- Dial-up, Mode I, KY-68 circuit
- Dedicated, Mode I, FSK circuit

27. Which circuit do the following parameters describe?

Master/Slave	• Slave
DACB Protocol	• On
Data Rate	• 2400 (or higher)
SSI Interface	• DSVT
Number of Stop Bits	• 1
Data Mode Control	• On
Mode VI Storage Blocks	• 16 or 32 (as required)
Mode I Answer Timer	• Default

- Dial-up, Mode I, KY-68 circuit
- Dedicated, Mode I, FSK circuit
- Dial-up, Mode VI, KY-68 circuit
- Dedicated, Mode VI, FSK circuit

28. Which of the following is **NOT** a UGC-144 diskette format type?
- a. ASC
 - b. OTC Floppy
 - c. ASC Message
 - d. OTC Message
29. The ___ diskette is used as a backup disk for both disk drives and the hard drive.
- a. ASC
 - b. OTC Floppy
 - c. ASC Message
 - d. OTC Message
30. The ___ diskette is used to store MS-DOS ASCII text messages.
- a. ASC
 - b. OTC Floppy
 - c. ASC Message
 - d. OTC Message
31. The ___ diskette is used to store standard messages.
- a. ASC
 - b. OTC Floppy
 - c. OTC Message
 - d. ASC Message

SYSTEM SETUP	
Terminal Community	• R (or as requested)
Content/Comm Indicator	• ZYUW (or as requested)
Originator/Destination LMF	• AA
Terminal Routing Indicator	• (as requested)
Terminal Plain Lang. Addr.	• (as requested)
Terminal Classification	• (as required)
Terminal Phone Number	• No entry
Channel ID	• (Program automatically sets)
EOL Sequence	• <CR><CR><LF>
XMIT Start Envelope	• No entry
XMIT Stop Envelope (1 - 8)	• <LF><LF><LF><LF><LF><LF><LF><LF>
XMIT Stop Envelope (9 - 16)	• NNN
RCV Start Envelope	• No entry
RCV Stop Envelope (1 - 8)	• <LF><LF><LF><LF><LF><LF><LF><LF>
RCV Stop Envelope (9 - 16)	• NNN
SSI SETUP	
Master/Slave	• Slave
DACB Protocol	• Off
Channel Control	• Mode I Continuous
Message Code/Parity	• ASCII/Odd Parity
Loop Rate	• 1200 - 16000 (as required)
Data Rate	• 1200 - 16000 (as required)
Error Control	• Multi-sampling
SSI Interface	• DLED
Auto Resync	• Off
Clock Source	• Internal
Ext. Clock Polarity	• Positive
Transmit Signal Sense	• Mark Positive
Receive Signal Sense	• Mark Positive
Serial Data Code	• NRZ
Number of Stop Bits	• 1
Data Mode Control	• Off
Mode VI Storage Blocks	• None
Mode I Answer Timer	• 5

Figure 1. Dedicated (Mode I) Wireline CDI Circuit

SYSTEM SETUP	
Terminal Community	• R (or as requested)
Content/Comm Indicator	• ZYUW (or as requested)
Originator/Destination LMF	• AA
Terminal Routing Indicator	• (as requested)
Terminal Plain Lang. Addr.	• (as requested)
Terminal Classification	• (as required)
Terminal Phone Number	• (Supplied by circuit switch)
Channel ID	• (Program automatically sets)
EOL Sequence	• <CR><CR><LF>
XMIT Start Envelope	• No entry
XMIT Stop Envelope (1-8)	• <LF><LF><LF><LF><LF><LF><LF>N •
XMIT Stop Envelope (9-16)	NNN
RCV Start Envelope	• No entry
RCV Stop Envelope (1-8)	• <LF><LF><LF><LF><LF><LF><LF>N
RCV Stop Envelope (9-16)	• NNN
SSI SETUP	
Master/Slave	• Slave
DACB Protocol	• On
Channel Control	• Mode VI
Message Code/Parity	• ASCII/Odd Parity
Loop Rate	• 16000 or 32000 (as required)
Data Rate	• 2400 (or higher)
Error Control	• Multi-sampling
SSI Interface	• DSVT
Auto Resync	• Off
Clock Source	• Internal
Ext. Clock Polarity	• Positive
Transmit Signal Sense	• Mark Positive
Receive Signal Sense	• Mark Positive
Serial Data Code	• NRZ
Number of Stop Bits	• 1
Data Mode Control	• On
Mode VI Storage Blocks	• 16 or 32 (as required)
Mode I Answer Timer	• Default

Figure 2. Dial-up (Mode VI) KY-68 Circuit

SYSTEM SETUP	
Terminal Community	• R (or as requested)
Content/Comm Indicator	• ZYUW (or as requested)
Originator/Destination LMF	• AA
Terminal Routing Indicator	• (as requested)
Terminal Plain Lang. Addr.	• (as requested)
Terminal Classification	• (as required)
Terminal Phone Number	• (Supplied by circuit switch)
Channel ID	• (Program automatically sets)
EOL Sequence	• <CR><CR><LF>
XMIT Start Envelope	• No entry
XMIT Stop Envelope (1-8)	• <LF><LF><LF><LF><LF><LF><LF><LF>N
XMIT Stop Envelope (9-16)	• NNN
RCV Start Envelope	• No entry
RCV Stop Envelope (1-8)	• <LF><LF><LF><LF><LF><LF><LF><LF>N
RCV Stop Envelope (9-16)	• NNN
SSI SETUP	
Master/Slave	• Slave
DACB Protocol	• On
Channel Control	• Mode I Continuous
Message Code/Parity	• ASCII/Odd Parity
Loop Rate	• 16000 or 32000 (as required)
Data Rate	• 2400 (or higher)
Error Control	• Multi-sampling
SSI Interface	• DSVT
Auto Resync	• Off
Clock Source	• Internal
Ext. Clock Polarity	• Positive
Transmit Signal Sense	• Mark Positive
Receive Signal Sense	• Mark Positive
Serial Data Code	• NRZ
Number of Stop Bits	• 1
Data Mode Control	• On
Mode VI Storage Blocks	• None
Mode I Answer Timer	• 5

Figure 3. Dial-up (Mode I) KY-68 Circuit

SYSTEM SETUP	
Terminal Community	• R (or as requested)
Content/Comm Indicator	• ZYUW (or as requested)
Originator/Destination LMF	• AA
Terminal Routing Indicator	• (as requested)
Terminal Plain Lang. Addr.	• (as requested)
Terminal Classification	• (as required)
Terminal Phone Number	• No entry
Channel ID	• (Program automatically sets)
EOL Sequence	• <CR><CR><LF>
XMIT Start Envelope	• No entry
XMIT Stop Envelope (1-8)	• <LF><LF><LF><LF><LF><LF><LF>N
XMIT Stop Envelope (9-16)	• NNN
RCV Start Envelope	• No entry
RCV Stop Envelope (1-8)	• <LF><LF><LF><LF><LF><LF><LF>N
RCV Stop Envelope (9-16)	• NNN
SSI SETUP	
Master/Slave	• Slave
DACB Protocol	• Off
Channel Control	• Mode I Continuous
Message Code/Parity	• ASCII/Odd Parity
Loop Rate	• Off
Data Rate	• 75 - 1200 (as required)
Error Control	• Multi-sampling
SSI Interface	• DLED
Auto Resync	• Off
Clock Source	• Internal
Ext. Clock Polarity	• Positive
Transmit Signal Sense	• Mark Positive
Receive Signal Sense	• Mark Positive
Serial Data Code	• NRZ
Number of Stop Bits	• 1
Data Mode Control	• Off
Mode VI Storage Blocks	• None
Mode I Answer Timer	• 5

Figure 4. Dedicated (Mode I) FSK Circuit

SYSTEM SETUP	
Terminal Community	• R (or as requested)
Content/Comm Indicator	• ZYUW (or as requested)
Originator/Destination LMF	• AA
Terminal Routing Indicator	• (as requested)
Terminal Plain Lang. Addr.	• (as requested)
Terminal Classification	• (as required)
Terminal Phone Number	• No entry
Channel ID	• (Program automatically sets)
EOL Sequence	• <CR><CR><LF>
XMIT Start Envelope	• No entry
XMIT Stop Envelope (1-8)	• <LF><LF><LF><LF><LF><LF><LF>N
XMIT Stop Envelope (9-16)	• NNN
RCV Start Envelope	• No entry
RCV Stop Envelope (1-8)	• <LF><LF><LF><LF><LF><LF><LF>N
RCV Stop Envelope (9-16)	• NNN
SSI SETUP	
Master/Slave	• Slave
DACB Protocol	• Off
Channel Control	• Mode VI
Message Code/Parity	• ASCII/Odd Parity
Loop Rate	• Off
Data Rate	• 75 - 1200 (as required)
Error Control	• Multi-sampling
SSI Interface	• DLED
Auto Resync	• Off
Clock Source	• Internal
Ext. Clock Polarity	• Positive
Transmit Signal Sense	• Mark Positive
Receive Signal Sense	• Mark Positive
Serial Data Code	• NRZ
Number of Stop Bits	• 1
Data Mode Control	• Off
Mode VI Storage Blocks	• 16 or 32 (as required)
Mode I Answer Timer	• Default

Figure 5. Dedicated (Mode VI) FSK Circuit

KEP QUESTIONS - MODULE 4

You may use TO 31W4-2UGC144-6WC-1 to answer these questions, you must score 100%. A single blank line in the question may represent an answer with more than one word. Choose the response which best answers the question.

1. The scheduled PMIs for the AN/UGC-144 are the ____ PMIs.
 - a. 28, 56, and 168-day
 - b. 28, 56, and 356-day
 - c. 28, 168, and 356-day
 - d. 56, 168, and 356-day

2. Which steps are part of the 56-day PMI?
 - a. Task preparation, self-test, and routine inspection
 - b. Task preparation, self-test, and major inspection
 - c. Cleaning, self-test, and disk head cleaning
 - d. Cleaning, self- test, and major inspection

3. You should perform a self-test prior to performing maintenance to
 - a. know the operating condition of the equipment.
 - b. ensure the database parameters are correct.
 - c. set the installation parameters.
 - d. initiate the terminal.

4. You should perform a self-test
 - a. after all PMIs.
 - b. before all PMIs.
 - c. before and after all maintenance.
 - d. after all unscheduled maintenance.

5. Which components are inspected in a routine inspection?
 - a. CPU, keyboard, and switches
 - b. Keyboard, switches, and power cables
 - c. CPU, switches, and brightness control
 - d. Keyboard, power supply interface, and power cables

6. When inspecting cable connectors, check for
 - a. cuts, frays, and insulation wear.
 - b. looseness, corrosion, and damaged keyways.
 - c. bent pins, corrosion, and damaged keyways.
 - d. disconnected pins, corrosion, and damaged keyways.

7. What is a printer lubrication point?
 - a. Latches
 - b. Paper bail
 - c. Both a and b
 - d. None of the above

8. Clean the exterior of the equipment with a lint-free cloth dampened with
 - a. alcohol and water solution.
 - b. isopropyl alcohol.
 - c. alcohol.
 - d. water.

9. To remove the terminal's top cover, you must take off ____ leg and 29 captive screws.
 - a. the rear lower
 - b. the front lower
 - c. each rear upper
 - d. each front upper

10. The steps performed in a 168-day PMI are task preparation, ____, disk head cleaning, and the post-task procedure.
- 56-day PMI
 - 28-day PMI
 - major inspection
 - routine inspection
11. Some of the items checked during a major inspection are rubber gaskets, the keytops rubber boots, and the
- cables.
 - brightness control.
 - interior for fungus.
 - display assembly pivot pins.
12. During a major inspection, you should check the seals and gaskets of the terminal's ____, ASC door, and top cover assembly.
- upper enclosure, battery compartment
 - display assembly, battery compartment
 - display assembly, power supply interface
 - carriage access cover, battery compartment
13. Which screen menus are accessed during floppy disk drive head cleaning?
- SETUP and MAIN
 - MAIN and GUARDED
 - MAIN and MEDIADIR
 - SETUP and MEDIADIR

14. When cleaning the disk heads, press function key ____ to select the OTC floppy drive.
- F1
 - F2
 - F3
 - F4
15. After the cleaning disk has turned for several seconds, a message appears stating: "The current disk is ____"
- unformatted or wrong format. Do you want to FORMAT?
 - clean. Do you want to clean another?
 - clean. Press **F1** to clean another.
 - clean. Press **ESC** to clean another.
16. The 336-day PMI consists of task preparation, ____, and the post-task procedure.
- 168-day PMI, major inspection
 - 56 and 168-day PMIs, routine inspection
 - 56 and 168-day PMIs, battery replacement
 - 28 and 168-day PMIs, battery replacement
17. Where would you find the battery installation template?
- On the batteries
 - In TO 31W4-2UGC144-1
 - In the battery compartment
 - On the battery compartment cover
18. Only install ____ batteries.
- "C" cell Nicad
 - "D" cell Nicad
 - "C" cell Alkaline
 - "D" cell Alkaloid

19. What is **NOT** a step of the post-task procedure?
- a. Return all materials to their proper storage places.
 - b. Call Job Control and log the system out.
 - c. Clean your work area.
 - d. Perform a self-test.

KEP QUESTIONS - MODULE 5

You may use TO 31W4-2UGC144-2 to answer these questions you must score 100%. A single blank line in the question may represent an answer with more than one word. Choose the response which best answers the question.

1. Which UGC-144 LRUs are marked with the ESD symbol?
 - a. Circuit cards
 - b. All LRUs
 - c. Keyboard
 - d. Display

2. When removing the PS Interface, you should ensure the power switch linkage is disengaged from the .
 - a. interface power switch
 - b. terminal power switch
 - c. main power switch
 - d. power source

3. How do you disconnect the PS Interface cable connector?
 - a. Release the wedge locks
 - b. Release the slide locks
 - c. Gently pull up on it
 - d. Unscrew its screws

4. The Power Supply includes the PS ____; and +5 Volt CCAs.
 - a. Monitor, ± 12 Volt
 - b. Monitor, +12 Volt
 - c. Regulator, +12 Volt
 - d. Regulator, ± 12 Volt

5. Each PS CCA has two ____ which release the CCA from its slot.
- black plastic tabs
 - slide locks
 - wedge locks
 - extractors
6. What secures the PS Motherboard to the chassis?
- Two slide locks
 - Two wedge locks
 - Two extractors
 - Eight screws
7. When positioning the PS Motherboard onto the chassis, place it so its capacitors face ____ of the chassis.
- up and toward the left
 - up and toward the rear
 - down and toward the rear
 - down and toward the front
8. Which CCAs have ribbon cables attached?
- A10 and A11
 - A11 and A12
 - A12 and A13
 - A13 and A14

9. How do you disconnect the cables attached to the Analog I/O CCAs?
- Slide the connector locks to the left.
 - Unscrew the two connector screws.
 - Unscrew the wedge-locks.
 - No cables are attached.
10. When removing the DMU Assembly, be sure the ____ connector slide lock mechanisms are ____.
- J6 and J7, open
 - J4 and J5, open
 - J6 and J7, closed
 - J4 and J5, closed
11. When removing the DMU Assembly, disconnect the ASC power, hard drive power, PS Filter, Keyboard, and the ____ cable connectors.
- Input power
 - SSI Signal
 - DMU power
 - DMU fan
12. To remove the Terminal Motherboard, you must first remove the ____ and ____ plates.
- lower, Motherboard cover
 - upper, Motherboard cover
 - lower, analog connector cover
 - upper, analog connector cover

13. When removing the Motherboard, you must pull it out to the left in order to prevent
- the Motherboard from contacting FL10.
 - the stand-offs from snapping off.
 - bending FL10's lead.
 - cable damage.
14. When removing the Keyboard Assembly, you must open the ASC door to
- ensure the ASC drive stays off.
 - gain access to some Keyboard screws.
 - ensure no diskette is loaded in the drive.
 - access the Keyboard cable through the opening.
15. Which tool would you use to remove the Keyboard Assembly?
- Wire cutters
 - #2 Phillips screwdriver
 - #2 Prince Reed screwdriver
 - Offset Phillips screwdriver
16. Materials used when removing and replacing the Control Panel include: wire cutters, #1 Phillips screwdriver, and
- a cable tie.
 - a 7-level screwdriver.
 - a #2 Prince Reed screwdriver.
 - an offset Phillips screwdriver.
17. When removing the Control Panel, the ____ may bind, but a gentle twisting motion should free it.
- switch cable harness
 - switch plunger
 - cable tie

- d. ASC door
18. When removing the Display subassembly, remove the ____ first.
- a. display CCA
 - b. four hex nuts
 - c. gas spring cover
 - d. display window panel
19. When removing the Display subassembly, which cables do you disconnect?
- a. All ribbon cables and J2
 - b. Brightness control cable and J1
 - c. Brightness control cable, J1, and J2
 - d. Brightness control and all ribbon cables
20. Troubleshooting the UGC-144 involves three processes or steps. These steps include preliminary analysis,
- a. loop back tests, and self-test.
 - b. self-test, and fault isolation.
 - c. loop back tests, and fault isolation.
 - d. self-test, and diagnostic systems testing.
21. The troubleshooting step in which you interview the equipment operator to identify malfunction symptoms is called
- a. self-test
 - b. Symptom Index
 - c. fault isolation
 - d. preliminary analysis

22. The troubleshooting step in which you perform an external visual inspection is called
- preliminary analysis
 - fault isolation
 - Symptom Index
 - self-test
23. Why should you wait at least 30 seconds before reapplying power to the UGC-144?
- To protect the hard drive motor.
 - To allow the software time to reset.
 - To allow the PS capacitors time to bleed.
 - To ensure all default settings are reset.
24. If you have an equipment malfunction, but the self-test runs error-free, you should
- use the troubleshooting flow charts.
 - perform an internal inspection.
 - proceed to the Symptom Index.
 - print each screen.
25. The three basic troubleshooting flow charts for the UGC-144 are the _____, and the No Display Flow Charts.
- Voltage Check, No RAM Test
 - Power Fault, Voltage Check
 - Voltage Check, Printer
 - Power Fault, Printer
26. If your terminal continuously blows fuses, a possible cause is
- A8 CCA.
 - A14 CCA.

- c. A16 CCA.
- d. A18 CCA.

KEP CONFIRMATION KEY

MODULE 1

1. b
2. d
3. c
4. a
5. a
6. b
7. a
8. c
9. d
10. a
11. a
12. c
13. b
14. d

MODULE 2

1. a
2. b
3. c
4. a
5. d
6. c
7. a
8. d
9. b
10. b
11. c
12. b
13. d
14. d
15. a
16. c

MODULE 3

1. b
2. c
3. c
4. b
5. a
6. b
7. a
8. b
9. d
10. a
11. d
12. d
13. d
14. b
15. a
16. d

17. a
18. a
19. c
20. d
21. c
22. b
23. a
24. d
25. a
26. b
27. c
28. c
29. a
30. b
31. c

MODULE 4

1. d
2. a
3. a
4. c
5. b
6. c
7. d
8. b
9. c
10. a
11. d
12. b
13. c
14. d
15. a
16. c
17. c
18. a
19. b

MODULE 5

1. b
2. a
3. c
4. b
5. d
6. d
7. b
8. c
9. a
10. a
11. d
12. c
13. a
14. b
15. d
16. a
17. b
18. c
19. c
20. b
21. d
22. a
23. a
24. c
25. b
26. c

KEP QUESTIONS ANSWER SHEET

NAME _____ RANK _____ DAFSC _____ DSN _____

ORGANIZATION _____ MAJCOM _____ DATE COMPLETED _____

MODULE 1

1. ____
2. ____
3. ____
4. ____
5. ____
6. ____
7. ____
8. ____
9. ____
10. ____
11. ____
12. ____
13. ____
14. ____

MODULE 2

1. ____
2. ____
3. ____
4. ____
5. ____
6. ____
7. ____
8. ____
9. ____
10. ____
11. ____
12. ____
13. ____
14. ____
15. ____
16. ____

MODULE 3

1. ____
2. ____
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16. ____

17. ____
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21. ____
22. ____
23. ____
24. ____
25. ____
26. ____
27. ____
28. ____
29. ____
30. ____
31. ____

MODULE 4

1. ____
2. ____
3. ____
4. ____
5. ____
6. ____
7. ____
8. ____
9. ____
10. ____
11. ____
12. ____
13. ____
14. ____
15. ____
16. ____
17. ____
18. ____
19. ____

MODULE 5

- | | |
|----------|----------|
| 1. ____ | 14. ____ |
| 2. ____ | 15. ____ |
| 3. ____ | 16. ____ |
| 4. ____ | 17. ____ |
| 5. ____ | 18. ____ |
| 6. ____ | 19. ____ |
| 7. ____ | 20. ____ |
| 8. ____ | 21. ____ |
| 9. ____ | 22. ____ |
| 10. ____ | 23. ____ |
| 11. ____ | 24. ____ |
| 12. ____ | 25. ____ |
| 13. ____ | 26. ____ |

NOTE: After completing and grading all tests, attach this answer sheet, along with the Trainee and Trainer Surveys, to the Training Certification document located in the back of the Trainer's Guide. Send the package to the following address:

81 TRSS/TSQS
601 D STREET
KEESLER AFB, MS 39534-2229