

***TM 1-5855-265-30**

TECHNICAL MANUAL

**AVIATION INTERMEDIATE
MAINTENANCE MANUAL**

**PILOT NIGHT VISION SENSOR
(PNVS) ASSEMBLY
AN/AAQ-11
(NSN 5855-01-120-7831)**

* This manual supersedes TM 11-5855-265-30 dated 1 February 1986; including all changes.

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AH-64A ATTACK HELICOPTER

**HEADQUARTERS, DEPARTMENT OF THE ARMY
30 August 2001**

TECHNICAL MANUAL

No. 1-5855-265-30

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 30 AUGUST 2001

AVIATION INTERMEDIATE MAINTENANCE MANUAL
PILOT NIGHT VISION SENSOR (PNVS) ASSEMBLY
AN/AAQ-11
(NSN 5855-01-120-7831)
(AH-64A ATTACK HELICOPTER)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any errors or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms) or DA 2028-2 located in the back of this manual directly to: Commander, U.S. Army Aviation and Missile Command, ATTN: AMSAM-MMC-MA-NP, Redstone Arsenal, AL 35898-5000. A reply will be furnished to you. You may also send in your comments electronically to our e-mail address: 2028@redstone.army.mil or FAX us at (256) 842-6546/DSN 788-6546. Instructions for sending an electronic 2028 may be found at the end of this TM immediately preceding the hard copy 2028.

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HOW TO USE THIS MANUAL

If you cannot find the information you are looking for, you cannot properly do your job. Take a few minutes to look through this manual. You will find it easier to use once you have become familiar with it.

Each chapter and section is set up to lead you through it step by step. For example:

1. On the chapter page, you will see a listing of the sections in that chapter. Listed under the section titles is a listing of the tasks for that section. Find the task (by title) that you have been assigned. Now, look across from the task title and you will find the paragraph and page number for the task. Notice that the chapter number forms part of the page number.
2. Now that you have located the page number, turn to that page and review the task requirements before starting the procedures.
3. Did you notice that each task or job begins with an initial setup?
 - a. INITIAL SETUP lists the configuration, test equipment, tools and special tools, materials/parts, military occupational specialty (MOS), references, safety instructions, condition equipment should be in, and general instructions for you to complete the task. FOLLOWUP lists the procedures to be performed after you have completed the basic task.
 - b. Now, what exactly does INITIAL SETUP mean to you? The term "INITIAL SETUP" means, "DO THIS FIRST BEFORE STARTING THE TASK." Review one of the initial setup tables and become familiar with the requirements.
4. An explanation of the initial setup headings is presented below.
 - a. Tools and Special Tools. Special tools needed to perform the task. Be sure to acquire all the tools before you start the task.
 - b. Materials/Parts. Materials and parts needed to perform the task. Materials can be found in Appendix C. Next to the name of the material listed in the initial setup you will find an item number. This number matches the item number in column (1) of Appendix C. Be sure to acquire all the materials and parts before you start the task.
 - c. Personnel Required. MOS required to do the task. This will also tell you the number of persons needed to perform the task.
5. You can also use the table of contents on page i of this manual to locate page number for chapters, sections, and the appendixes.
6. Let's see if you understand how to find a specific task. Suppose your supervisor wants you to replace a part or assembly.

Here's how you would find it:

 - a. Obtain the correct TM for the task and look up the procedure in the chapter covering the type of task you are to perform.
 - b. For example: Replacement is a maintenance task you can find located in the maintenance chapter.

HOW TO USE THIS MANUAL (cont)

- c. Looking at the section titles listed in the maintenance chapter index, you should have located the page number for the maintenance procedures. Going to that page you found the section index and located the paragraph and page number of the replacement task.
7. Another approach would be to look in the alphabetical index in the rear of the manual.

CHAPTER 1
INTRODUCTION

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Equipment Description and Data	II	1-7

Section I. GENERAL INFORMATION

Subject	Para	Page
Scope	1-1	1-1
Consolidated Index of Army Publications and Blank Forms	1-2	1-1
Maintenance Forms, Records, and Reports	1-3	1-1
Destruction of Army Materiel to Prevent Enemy Use	1-4	1-2
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Official Nomenclature, Names, and Designations	1-6	1-2
Reporting Equipment Improvements Recommendations (EIR)	1-7	1-6
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1-1. SCOPE

a. Type of Manual

Aviation Intermediate Maintenance (AVIM)

b. Model Number and Equipment Name

Pilot Night Vision Sensor (PNVS) Assembly AN/AAQ-11

c. Purpose of Equipment

Provides a sighting system for night navigation, night takeoff and landing, and searching for targets during night operations.

1-2. CONSOLIDATED INDEX OF ARMY PUBLICATIONS AND BLANK FORMS

Refer to the latest issue of DA Pam 25-30 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

1-3. MAINTENANCE FORMS, RECORDS, AND REPORTS

a. Reports of Maintenance and Unsatisfactory Equipment.

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-751, The Army Maintenance Management System-Aviation (TAMMS).

1-3. MAINTENANCE FORMS, RECORDS, AND REPORTS (cont)

b. Reporting of Item and Packaging Discrepancies.

Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735-11-2/DLAR 4140.55/SECNAVINST 4355.18/AFR 400-54/MCO 4430.3J.

c. Transportation Discrepancy Report (TDR) (SF 361).

Fill out and forward Transportation and Discrepancy Report (TDR) (SF 361) as prescribed in AR 55-38/NAVSUPINST 4610.33C/AFR 75-18/MCO P4610.19D/DLAR 4500.15.

1-4. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

Destruction of Army electronics materiel to prevent enemy use shall be in accordance with TM 750-244-2.

1-5. PREPARATION FOR STORAGE OR SHIPMENT

Refer to chapter 5 for applicable information.

1-6. OFFICIAL NOMENCLATURE, NAMES, AND DESIGNATIONS

- a. This listing includes nomenclature cross-references used in this manual.

Official Nomenclature	Common Name	Reference Designation
PNVS Turret Assembly		1
Night Sensor Assembly	NSA	1A1
Video IR Preampfier CCA		1A1A1
Video IR Preampfier CCA		1A1A2
Video IR Preampfier CCA		1A1A3
Video IR Preampfier CCA		1A1A4
Video IR Preampfier CCA		1A1A5
Video IR Preampfier CCA		1A1A6
Video IR Preampfier CCA		1A1A7
Video IR Preampfier CCA		1A1A8
Video IR Preampfier CCA		1A1A9
Bias Voltage Regulator CCA		1A1A10
Postampfier Control Driver CCA		1A1A12
Postampfier Control Driver CCA		1A1A13
Postampfier Control Driver CCA		1A1A14
Postampfier Control Driver CCA		1A1A15
Postampfier Control Driver CCA		1A1A16

Official Nomenclature	Common Name	Reference Designation
Postamplifier Control Driver CCA		1A1A17
Postamplifier Control Driver CCA		1A1A18
Postamplifier Control Driver CCA		1A1A19
Postamplifier Control Driver CCA		1A1A20
ACM CCA		1A1A21
Power Regulator CCA		1A1A22
Postamplifier Motherboard CCA		1A1A23
Focus Control CCA		1A1A26
Cooler/Dewar Assembly		1A1A29/A30
Focusing Assembly		1A1A31
Visual Relay/Multiplexer Assembly		1A1A33
Power Supply Assembly		1A1A33A2
Controller CCA		1A1A33A4
Connector		1A1A33A4J1
Fan		1A1A33A42
Elevation Mirror and Afocal Lens Assembly		1A1A35
Azimuth Gyroscope Assembly		1A1A36
Capacitor		1A1A36C1-C2
Gyroscope		1A1A36MP1
Connector		1A1A36P1
Transistor Assembly		1A1A38
Transistor		1A1A38Q1-Q4
Connector		1A1A38P1
Capacitor/Relay Assembly		1A1A39
Capacitor		1A1A39C1-C2
Connector		1A1A39J1
Relay		1A1A39K1
Capacitor Assembly or Electronic Component Assembly		1A1A40

Official Nomenclature	Common Name	Reference Designation
Capacitor		1A1A40C1-C3
Semiconductor		1A1A40CR1
Connector		1A1A40J1-J2
Relay		1A1A40K1
Power Reactor		1A1A40L1
Semiconductor		1A1A40VR1
Capacitor Assembly		1A1A41
Capacitor		1A1A41C1-C2
Connector		1A1A41J1-J2
Boresight Assembly		1A1A43
Vaneaxial Fan		1A1B1
Pickoff Choke		1A1L1
Flexible Printed Cable Assembly		1A1W1
Flexible Printed Cable Assembly		1A1W2
Flexible Printed Cable Assembly		1A1W3
Flexible Printed Cable Assembly		1A1W4
Flexible Printed Cable Assembly		1A1W5
Flexible Printed Cable Assembly		1A1W6
Flexible Printed Cable Assembly		1A1W7
Flexible Printed Cable Assembly		1A1W8
Flexible Printed Cable Assembly		1A1W9
Branched Wiring Harness Assembly		1A1W10
Connector		1A1W10J2/J4
Connector		1A1W10P3
Connector		1A1W10P9-P14
Connector		1A1W10P16
Resistor		1A1W10R1-R2
Azimuth Gimbal Assembly		1A2
Azimuth Drive Assembly		1A2A1

Official Nomenclature	Common Name	Reference Designation
PNVS Shroud Assembly		1A3
Anti-ice CCA		1A3A1
Thermostat		1A3S1
Branched Wiring Harness Assembly		1A3W1
Connector		1A3W1P1-P2
Diode		1A3W1CR1
Electronic Control Amplifier Assembly	Torque Amplifier	1A4
PNVS Electronic Unit Assembly	PEU	2
Series/FLIR Regulator CCA		2A1
Interface CCA		2A2
BITE/Control CCA		2A3
Video Processor CCA		2A4
Chassis Assembly		2A5
Power Frame Assembly		2A5A1
Power Interconnect CCA		2A5A1A1
Voltage Regulator CCA		2A5A1A2
Capacitor		2A5A1C1-C2
Rectifier		2A5A1CR1-CR9
Semiconductor		2A5A1CR10-CR14
Relay		2A5A1K1-K4
Connector		2A5A1P7-P8
Semiconductor		2A5A1Q1-Q2
Transformer		2A5A1T1-T4
Microcircuit		2A5A1U1-U9
Semiconductor		2A5A1VR1

1-6. OFFICIAL NOMENCLATURE, NAMES, AND DESIGNATIONS (cont)

b. Refer to the glossary in the back of the manual for abbreviations used as common names, but not having official nomenclature.

1-7. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your PNVs needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Put it on an SF 368 (Quality Deficiency Report).

Mail it to us at:

Commander
U.S. Army Aviation and Missile Command
ATTN: AMSAM-MMC-MA-NM
Redstone Arsenal, AL 35898-5230

We'll send you a reply.

1-8. WARRANTY INFORMATION

Certain assemblies may be warranted. Refer to Appendix G. Check the DA Form 2408-15 overprint 2 and proceed as prescribed in DA PAM 738-751.

Section II. EQUIPMENT DESCRIPTION AND DATA

Subject	Para	Page
System Description and Data	1-9	1-7
Description of PNVS Turret Assembly	1-10	1-7
Description of Azimuth Drive Gimbal Assembly.	1-11	1-9
Description of PNVS Electronic Unit (PEU) Assembly.	1-12	1-9
Difference Between Models	1-13	1-10

1-9. SYSTEM DESCRIPTION AND DATA

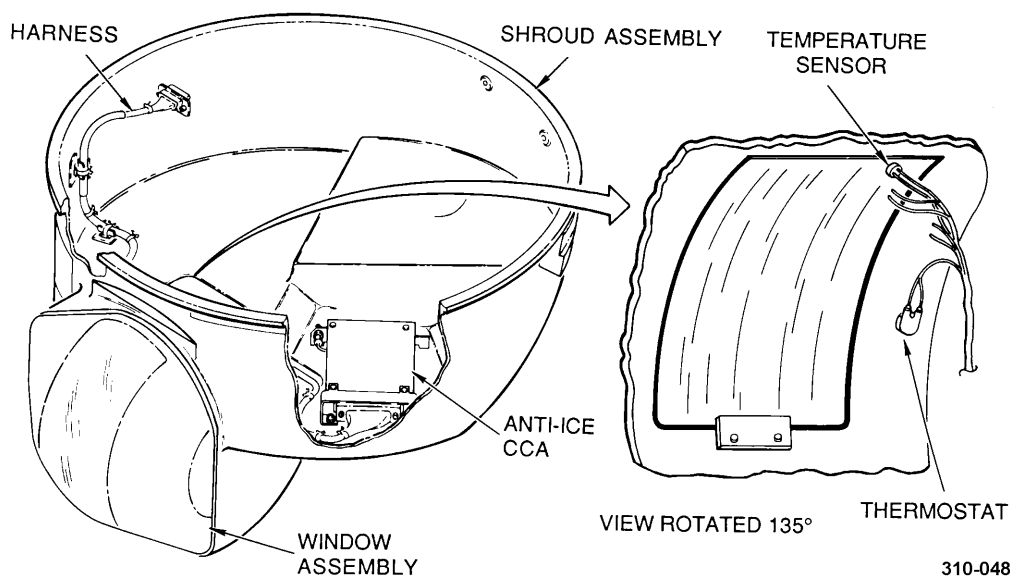
The following paragraphs give a description of some of the assemblies and their major subassemblies maintained at the AVIM level. For an overall description of PNVS, a listing of equipment data, and location of major maintained components refer to TM 1-5855-265-20.

1-10. DESCRIPTION OF PNVS TURRET ASSEMBLY

The PNVS turret assembly consists of the PNVS shroud assembly and the night sensor assembly.

a. Description of PNVS Shroud Assembly.

The PNVS shroud assembly contains a window assembly, anti-ice circuit card assembly (CCA), and interconnecting harness. The window assembly consists of a window made of germanium mounted in a fiberglass housing. Heater wires are imbedded in the fiberglass housing. A temperature sensor and thermostat are bonded to the window assembly. The anti-ice CCA contains an electrostatic discharge sensitive (ESDS) device and requires special preparation for storage or shipment when removed from the PNVS shroud assembly.



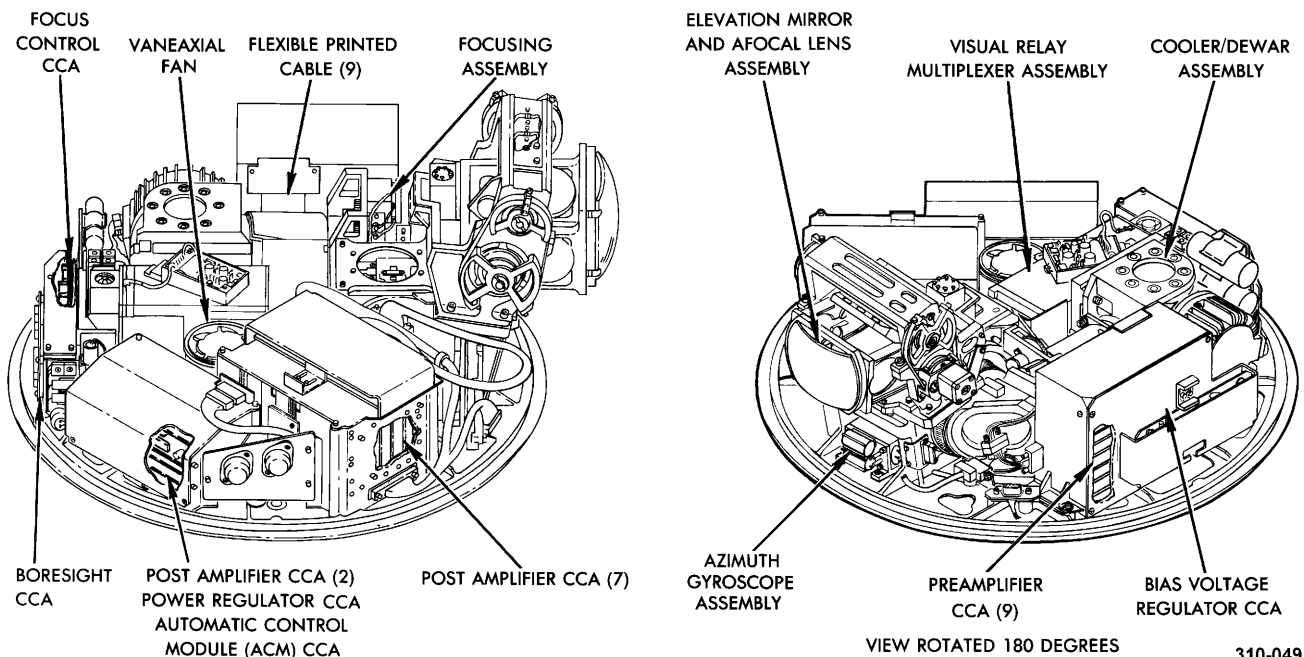
1-10. DESCRIPTION OF PNVS TURRET ASSEMBLY (cont)

b. Description of Night Sensor Assembly (NSA).

The NSA is a forward-looking infrared (FLIR) imaging device. It contains the following shop repairable or replaceable units:

- Boresight CCA
- Elevation mirror and afocal lens assembly
- Focus control CCA
- Focusing assembly
- Cooler/Dewar assembly
- Nine preamplifier CCAs, postamplifier CCAs, and innerconnecting flexible printed cables
- Automatic control module (ACM), power regulator, and bias voltage regulator CCAs
- Visual relay/multiplexer assembly or solid state camera assembly
- Vaneaxial fan
- Azimuth gyroscope assembly
- Miscellaneous electronic component assemblies (two capacitor assemblies, capacitor relay assembly, transistor assembly, choke, and two switch actuators)

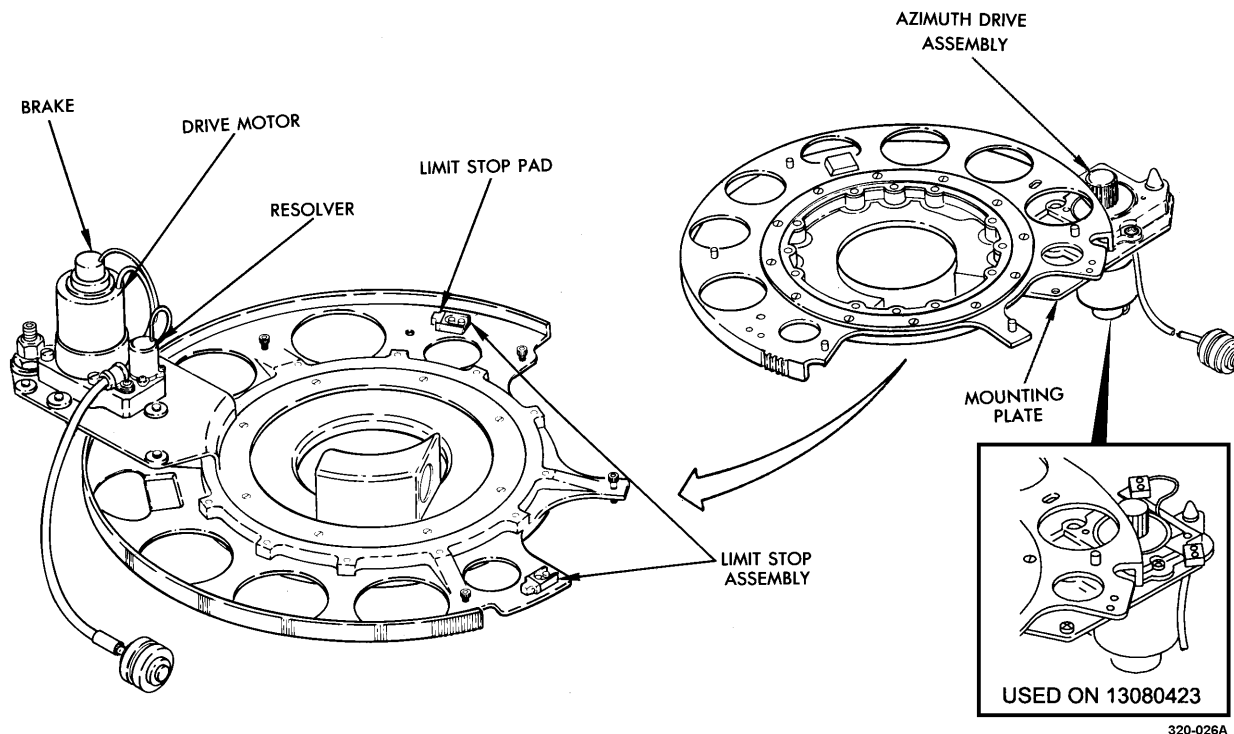
The ACM, focus control, power regulator CCAs and solid state camera assembly contain ESDS devices and require special preparation for storage or shipment when removed from the NSA.



1-11. DESCRIPTION OF AZIMUTH DRIVE GIMBAL ASSEMBLY

The azimuth drive gimbal assembly contains the azimuth drive assembly and two limit stop assemblies. The azimuth drive assembly is an SRU which contains the drive motor, brake and resolver.

An azimuth drive assembly affects gear backlash and resolver null. The limit stop switches contain replaceable pads.



1-12. DESCRIPTION OF PNV5 ELECTRONIC UNIT (PEU) ASSEMBLY

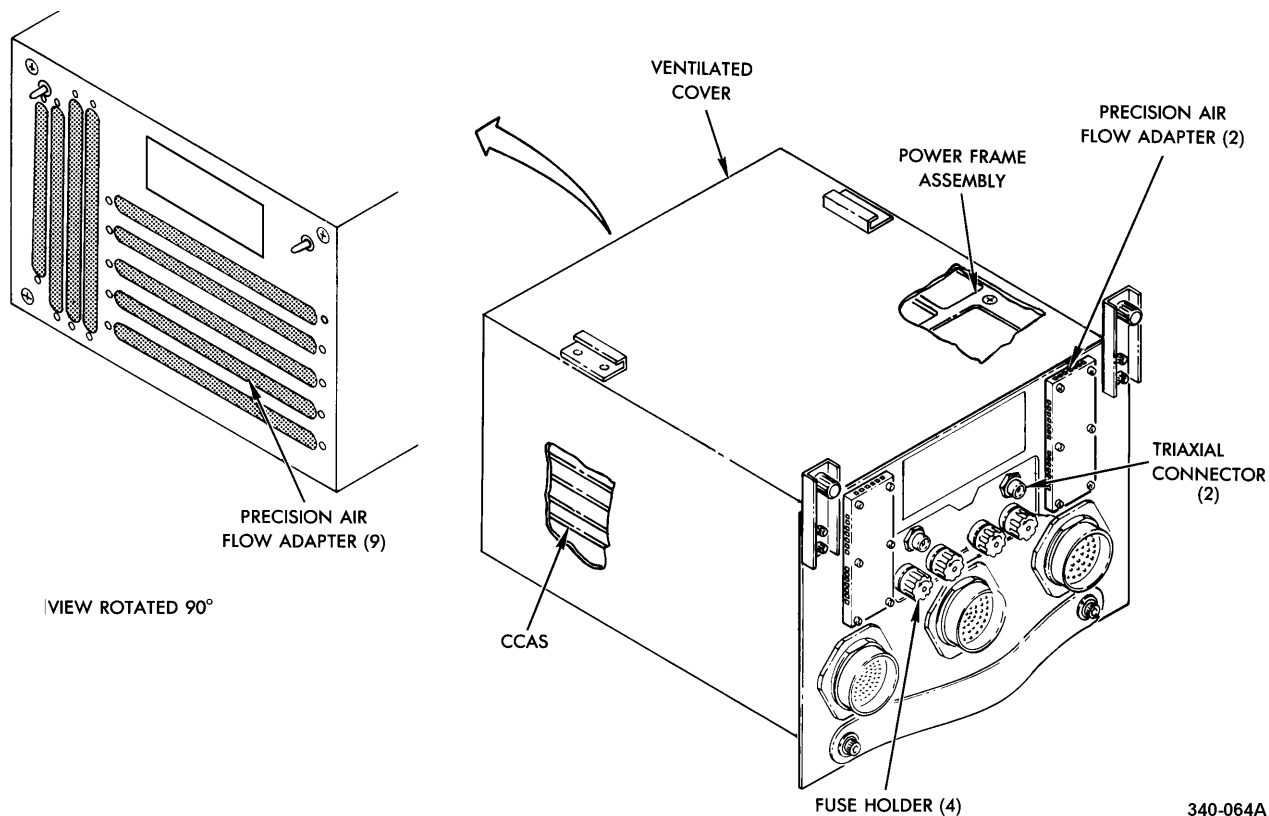
The PEU consists of a ventilated cover, four CCAs, and chassis assembly. The CCAs are the series regulator, interface, BITE/control, and video processor. The CCAs contain ESS devices and require special preparation for storage or shipment when removed from the PEU. The cover contains nine precision air flow adapters. The chassis houses the power frame assembly, four fuseholders, two triaxial connectors, and two precision air flow adapters. The power frame assembly contains the following replaceable electronic components:

- Nine rectifiers
- Eight semiconductors
- Four relays
- Four transformers
- Nine microcircuits
- Two capacitors
- Two CCAs

The power frame assembly contains ESS devices and require special preparation for storage or shipment when removed from the PEU. The nine microcircuits are the ESS devices that require special handling when they are removed.

1-12. DESCRIPTION OF PNVS ELECTRONIC UNIT (PEU) ASSEMBLY (cont)

Some older models of the PEU have Elapsed Time Indicators (ETI). These ETI units are being eliminated and replaced by a cover. If you have a unit with an ETI, see para 4-20, step 8 for instructions for its removal.



1-13. DIFFERENCES BETWEEN MODELS

There is only one model (AN/AAQ-11) of PNVS. Some differences exist between part numbers that may preclude direct replacement of assemblies. Refer to Repair Parts and Special Tools List (RPSTL) TM 1-5855-265-23P for interchangeable assemblies. If no interchangeable assembly exists, contact your supervisor and/or refer the PNVS system to the next higher level of maintenance.