TECHNICAL MANUAL

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OPERATOR, ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST AND DEPOT MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS)

FOR

FIRE CONTROL SUBSYSTEM, HELMET-DIRECTED
XM128
P/N 2277716-00
NSN 1270-00-122-9449

AND

FIRE CONTROL SUBSYSTEM, HELMET-DIRECTED
XM136
P/N 2277716-01
NSN 1270-01-041-3767

CURRENT AS OF 10 JULY 1981

REPORTING OF ERRORS

You can help improve this manual by calling attention to errors and by recommending improvements and stating your reasons for the recommendations. Your letter of DA Form 2028, Recommended Changes to Publications, should be mailed directly to Commander, U.S. Army Armament Material Readiness Command, ATTN: DRSAR-MAS, Rock Island, Illinois 61299. A reply will be furnished directly to you.

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*This publication supersedes TM 9-1270-212-14, dated April 1975, in its entirety

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CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Scope.

This manual is for your use in operating and maintaining Helmet-Directed Fire Control Subsystem XM128, utilized in the AII-1S (Mod) Cubra Helicopter, and HeImet-Directed Fire Control Subsystem XM136, utilized in the configuration of the AH-1S Cobra Helicopter (fig. 1-1). Designator symbols such as P (Production), E (Enhanced Cobra Armament System) and M (Modernized Cobra) will be used in conjunction with text contents, text headings, and illustration titles to show limited effectivity of the material. One or more designator symbols may follow a text heading or illustration title to indicate proper ffectivity, unless the material applies to all series and configurations within the manual. If' the material applies to all series and configurations, no designator symbols will be used. Where practical, descriptive information is condensed and combined for all models to avoid duplication. The common nomenclature for either Helmet-Directed Fire Control Subsystem is the helmet sight subsystem, or HSS.

1-1.1. Introduction.

a. This manual is divided into six chapters and three appendixes. Chapter 1 contains general information, the description and use of the equipment, identification plates, theory of operation, and electrical schematics. Chapter 2 describes the applicable helicopter panel controls and indicators and provides operating instructions. Chapter 3 contains operator/crew and organizational maintenance instructions. Chapter 4 provides direct-support and general-support (DS/GS) maintenance instructions, and Chapter 5 provides DS/GS repair instructions. Chapter 6 contains instructions for final inspection. Appendix A is a list of associated manuals and references; Appendix B contains repair parts and special tool lists; Appendix C provides the maintenance allocation chart.

b. The word "he", when used in this publication, represents both the masculine and feminine genders, unless otherwise specificeIly stated.

1-2. Maintenance Forms and Records.

Maintenance forms, records. and reports which are to be used by maintenance personnel at all maintenance levels are, listed and prescribed by TM 38-750, The Army Maintenance Management Systems (TAMMS).

1-3. Equipment Serviceability Criteria (ESC).

The equipment serviceability criteria (ESC) for the helmet sight subsystem are included in TM 9-1090-203 ESC.

1-4. Administrative Storage.

Administrative storage of the HSS shall be accomplished in accordance with the provisions of TM 740-90-1.

1-5. Destruction of Army Materiel to Prevent Enemy use

Refer to TM 750-244-2 for procedures to be used in destruction of helmet sight subsystem materieI to prevent use by the enemy.

1-6. Calibration.

There are no caiibration instructions for the HSS.

1-7. Quality Assurance/Quality Control (QA/QC).

There are no QA/QC requirements for the HSS.

1-8. Reporting Equipment Improvement Recommendations (EIRs).

If your Helmet Sight Subsystem Manual 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 Iikc the design. Tell us why it procedure is hard to perform. PUI it on an SF 368 (Quality Deficiency Report). Mail it to Commander. U.S. Army Armament Materiel Readiness Command. ATTN: DRSAR-MAO, Rock Island, Illinois 61299. Well send you a reply.

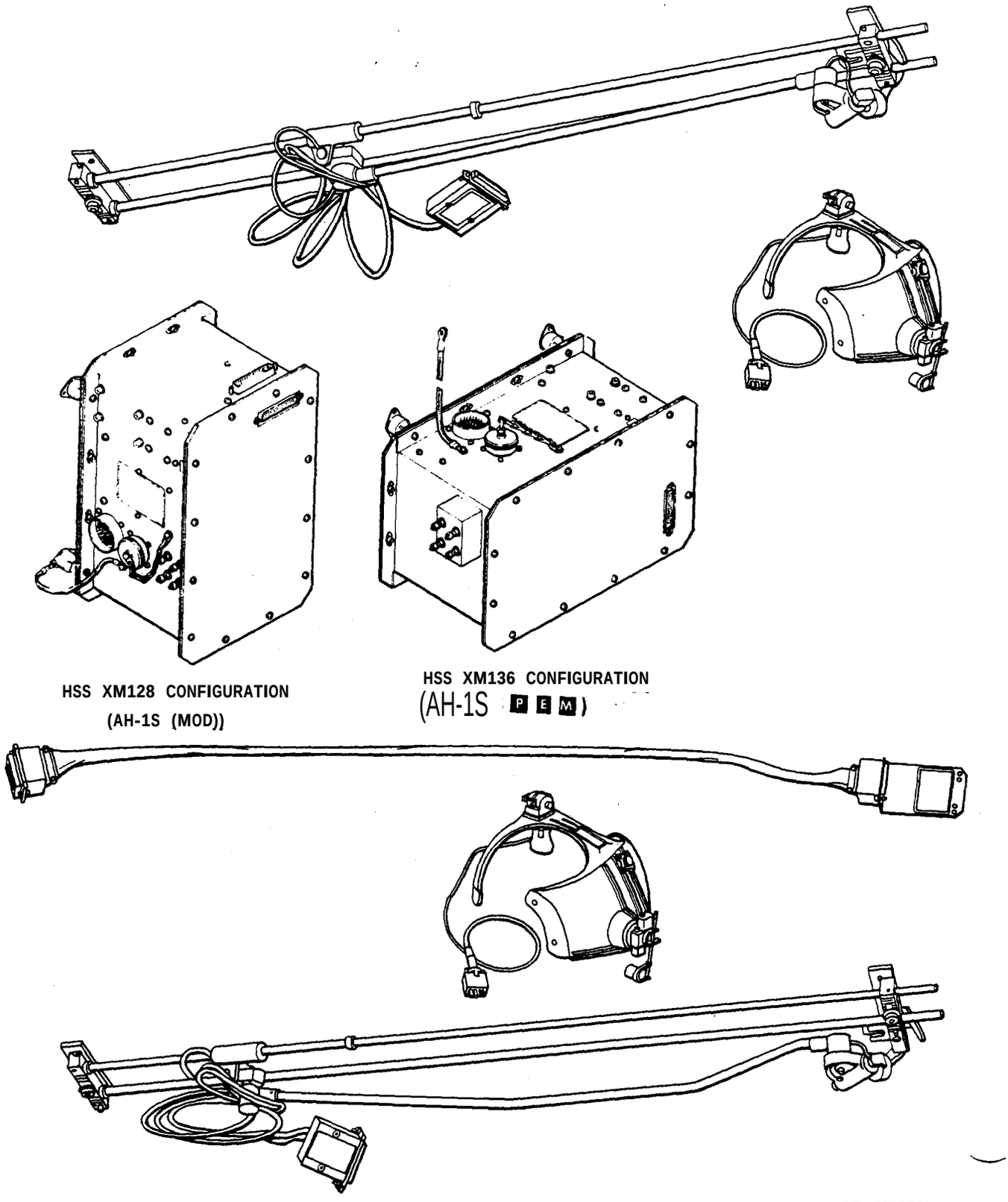


Figure 1-1. Helmet-direct fire control subsystem (HSS)

Section II. DESCRIPTION AND DATA

1-9. Subsystem Description.

The HSS is a helmet-directed sighting subsystem that interfaces with the gun turret and the telescopic sight unit (TSU) of the TOW missile subsystem in the AH-1S(Mod) and AH-1S P E M helicopters(fig. 1-2). The HSS operates from power supplied by the helicopter and consists of the following assemblies:

Helmet sight (2)

Pilot linkage

Gunner linkage

Electronic interface

Extension cable.

a. The HSS enables the helicopter pilot and copilot/gunner (hereinafter referred to as gunner) to rapidly acquire visible targets and to direct either the gun turret or the TSU to those targets. The helmet-mounted optical sight extends over the operator's right eye, and an illuminated reticle pattern is projected into the optical sight. Electromechanical linkages sense the helmet position and generate sight-line signals, which are processed by the electronic interface assembly (EIA) and used to control the angular position of the turret or the TSU.

b. Either operator can command the gun turret or TSU by means of operator-selectable cockpit switches. When necessary, the gun turret and TSU can be commanded simultaneously by the pilot and gunner, respectively.

1-10. Differences Between Models.

a. There are two models of the HSS, HSS XM128 (used in the AH-1S(Mod) helicopter) and HSS XM136 (used in the AH- 1S P E M helicopters). All of the differences, mechanical and electrical, between the two models result from differences in HSS installation in the helicopters. The only major item that differs between the two models is the EIA. The helmet sight assemblies, pilot and gunner linkage assemblies, and extension cable are identical and interchangeable between models.

b. In the HSS XM128 installation (fig. 1-2, view A), the EIA is mounted vertically, and the pilot and gunner linkage assemblies are mounted at a 0-degree azimuth angle. For HSS XM128, the pilot linkage has a down pitch angle of 4 degrees and the gunner linkage assembly has a down pitch angle of 8 degrees. In the HSS XMl36 installation (fig. 1-2, view B), the EIA is mounted horizontally, the gunner linkage assembly is mounted at a 0-degree azimuth angle, and the pilot linkage assembly is mounted at a 5.5-degree left-azimuth angle. For HSS XM136, the pilot linkage has a pitch angle of 0 degrees and the gunner linkage has a down pitch angle of 11.5 degrees.

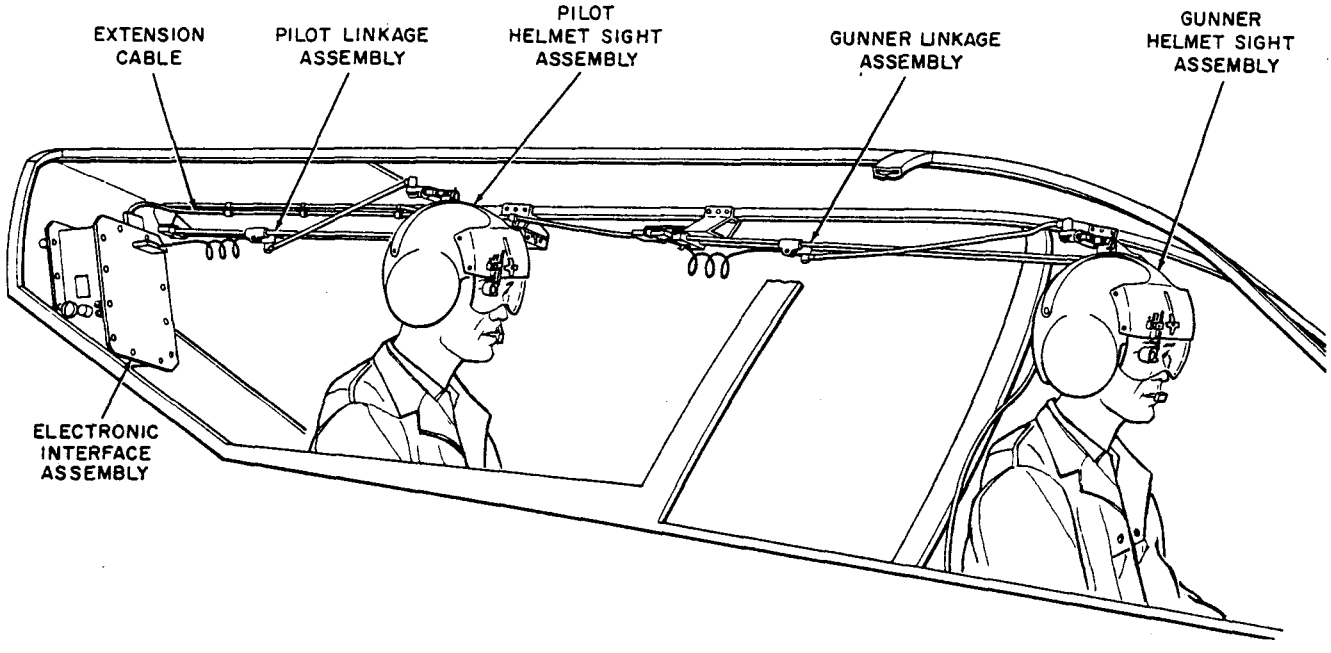
c. The four potentiometers (used for boresighting adjustments) are on the right side of the EIA used in HSS XMl28 and in a smaJl housing on the end of the EIA used in HSS XMl36. The bonding jumper on the EIA used in the HSS XM136 is approximately twice as long as that on the EIA used in HSS XMl28. The EIA used in HSS XM136 has an azimuth bias circuit which compensates for the 5.5-degree offset of the HSS XM136 pilot linkage.

1-11. Helmet Sight Assembly.

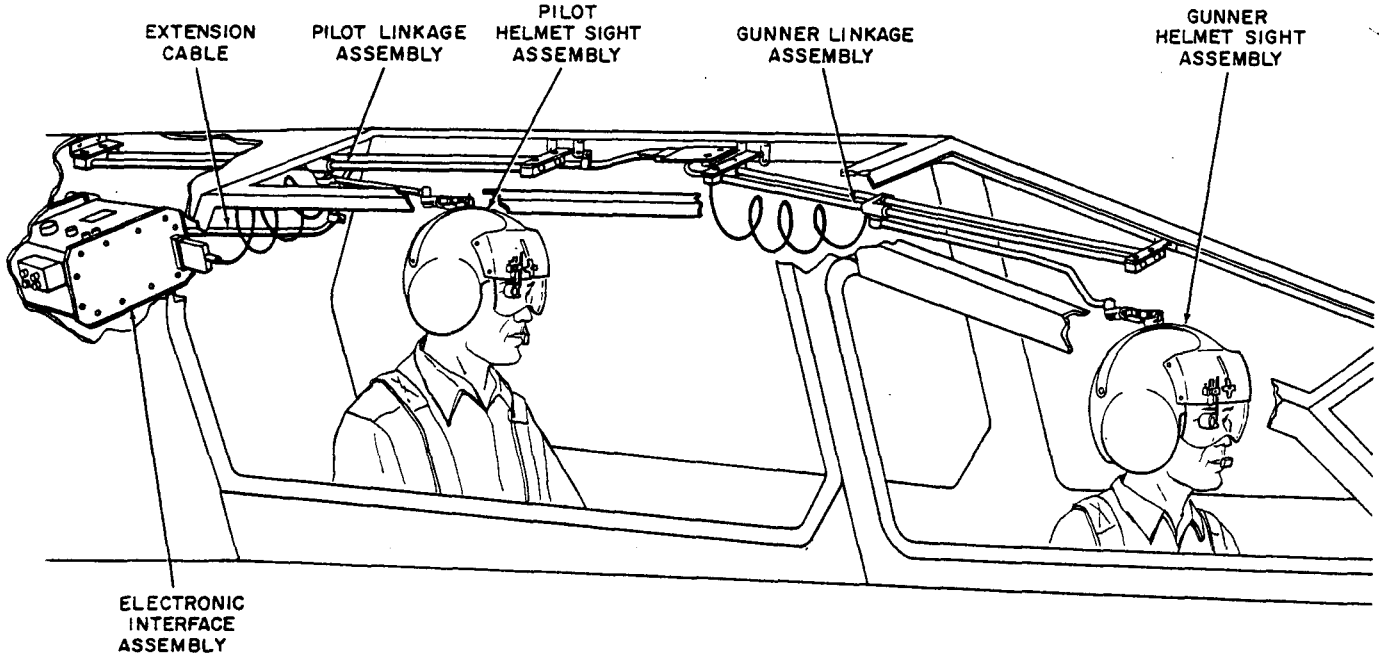
The helmet sight assembly (fig. 1-3) is a lightweight aluminum visor housing with a magnetic receptacle containing a reed switch attached near the top rear and a sight assembly attached to the front. The aluminum visor housing is precision attached to the SPH-4 helmet when the existing visor cover is removed. For initial installation, an installation kit containing special fasteners and tools and a small visor knob is furnished with each helmet sight assembly.

a. The magnetic receptacle holds the steel fastener on the front of the arm assembly (fig. 1-4) in place and a latch insures against inadvertent separation. In an emergency, the latch allows separation of the steel fastener and magnet at an axial force of approximately 20 pounds. The magnetic receptacle contains a reed switch that senses the presence of the steel fastener. The reed switch closes when the steel fastener is attached and opens when separation occurs.

b. The sight assembly consists of a sight housing and an eyepiece. The sight housing contains a lamp assembly (containing three 5-volt lamps), a reticle, and a lens system. Th sight housing projects the reticle pattern, focused at infinity, into a beam splitter within the eyepiece. The beam splitter superimposes the reticle pattern on the normal eyepiece image. A detent in the sight housing holds the eyepiece down in the sighting position over the right eye.



VIEW A. HSS XM128 INSTALLED IN AH-1S(MOD)



VIEW B. HSS XM136 INSTALLED IN AH-1S P E M

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Figure 1-2. HSS helicopter installation