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**REPORT NO. PR-407IR-900M
INSTALLATION INSTRUCTIONS**

INFRARED IMAGING SYSTEM INSTALLATION

REVISIONS

<u>REV.</u>	<u>DATE</u>	<u>DESCRIPTION</u>	<u>BY</u>
N/C	03/25/98	Original	REB
A	11/11/02	Included instructions for optional SLASS Unit	JB
B	01/20/04	Updated for additions of U7 and U8 series camera systems	RY
C	10/05/05	Updated to 407MM-130 Monitor Mount Inst'n	REB

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LIST OF REFERENCE DOCUMENTS

- 1) Drawing 407IR-100; 407IR System Configuration
Drawing 407IR-102; Mount Bracket Installation
Drawing 407IR-201; Electronic Unit Installation
Drawing 407IR-321/-322/-323; Electrical Installation
Drawing 407MM-130; Monitor Mount Installation (Replaces 407MM-120)
Drawing 407ET-100; Shelf Panel Installation
- 2) BHT-407-MM-3, BHT-407-MM-5, BHT-407-MM-8, BHT-ALL-SPM
- 3) PR-407IR-120M Instructions for Continued Airworthiness

INTRODUCTION

Infrared Imaging System installation includes the following component installations:

- 1.) A Sensor Mount Bracket Installation. This bracket allows rapid installation or removal of the gimbaled infrared sensor.
- 2.) An Electronic Control Unit Bracket Installation. This bracket allows for rapid installation and removal of the Electronics Unit.
- 3.) A Monitor Mount Installation. This mounting bracket supports the approved flat screen monitor, and is adjustable to optimize viewing angle.
- 4.) Electrical System Installation to support the system operation.
- 5.) The Infrared (IR) gimbaled imaging sensor, Electronic Control Unit, and hand-held control must be of an approved type. Optional approved SLASS (SLAved Searchlight System) may be incorporated when the 407SX-100 Searchlight installation is also incorporated in the helicopter.

This document presents a suggested procedure for installation of the IR system, and optional SLASS, to supplement the information given by the installation drawings.

The Supplemental Type Certificate is contained in Section II of this document, and should be placed in the aircraft permanent maintenance records when the installation has been completed.

The approved Rotorcraft Flight Manual Supplement (RFMS) is contained in Section III, and must be inserted in the Supplements Section of the Rotorcraft Flight Manual.

Prior to returning the aircraft to service, the aircraft weight and balance data and logbook must be revised to indicate addition of the component installations.

SYSTEM INSTALLATION AND REMOVAL

After initial installation is completed, the Infrared Imaging Gimbal (Gimbal) and Electronic Control Unit (ECU) are installed or removed as follows:

- 1.) Gimbal Installation
 - (i) Remove safety clip and unscrew the Lock Knob located at the open end of the Mount Bracket Assembly. Slide the Gimbal Support Plate fully into the Mounting Rails.
 - (ii) Re-install the Lock Knob and hand-tighten until the Mounting Plate is snug in the Mount. Install safety clip.
 - (iii) Insure that the BATTERY switch is OFF. Install the Power Supply/Control cable(s) to the proper receptacle. NOTE: Refer to INFRAMETRICS/FLIR Operations and Maintenance Instructions for cable installation.
 - (iv) Refer to Weight and Balance Data, in the Rotorcraft Flight Manual Supplement, and the Basic Flight Manual for calculation of allowable helicopter loading.

2.) ECU Installation

- (i) Remove the Hair-Pin Clip from the Mount Beam under the Equipment Shelf installation.
- (ii) Loosen both Beam Lock Knobs and pull them aft. This moves the locking knob mechanism out of the way for ECU installation.
- (iii) Place the “buttons” on the ECU into the keyholes in the mount beams, and slide the ECU forward, to insure proper engagement.
- (iv) Slide the Mount Beam Lock Knobs toward the ECU and hand-tighten.
- (v) Re-install the Hair Pin Clip. Insure that the clip passes through both sides of the beam.
- (vi) Insure Battery switch is OFF, then install Power Supply/Control cables to their proper receptacles.
WARNING: Assure that cables are routed and secured to provide adequate clearance of flight controls.
- (vii) Refer to Weight and Balance Data, in the Rotorcraft Flight Manual Supplement, and the Basic Flight Manual for calculation of allowable helicopter loading.

3.) Gimbal Removal

- (i) Insure BATtery switch is OFF.
- (ii) Remove short sensor cable(s) from Gimbal and stow on Mount Assembly.
- (iii) Remove Hair-Pin Clip from the open end of the Mount Bracket Assembly.
- (iv) Loosen and slide out lock shaft to clear support plate.
- (v) Remove Gimbal assembly from mount.
- (vi) Slide lockshaft into Mount, hand tighten and re-install Hair-Pin Clip.
- (vii) Refer to Weight and Balance Data, in the Rotorcraft Flight Manual Supplement, and the Basic Flight Manual for calculation of allowable helicopter loading.

4.) ECU Removal

- (i) Insure that the Battery switch is OFF.
- (ii) Remove Power Supply/Control Cables from ECU
- (iii) Remove the Hair-Pin Clip from the Mount Beam under the Equipment Shelf installation.
- (iv) Loosen both Beam Lock Knobs and pull them aft.
- (v) Remove ECU from beams, slide locking knobs forward and hand tighten. Re-install Hair Pin Clip.
- (vi) Stow Power Supply/Control Cables.
WARNING: Assure that cables are routed and secured to provide adequate clearance of flight controls.
- (vii) Refer to Weight and Balance Data, in the Rotorcraft Flight Manual Supplement, and the Basic Flight Manual for calculation of allowable helicopter loading.

SECTION I - INSTALLATION PROCEDURE

A. SENSOR MOUNT BRACKET, Reference Drawing 407IR-102

- 1.) Reference BHT-407-MM-5 gain access to the center console and the upper side of the forward lower shell, F.S. 45.06. Reference BHT-407MM-8, remove Tail rotor control tube from center console tunnel area. Using the provided doubler Item 5, locate doubler position and mark holes. Remove doubler and drill Ø.250 holes through aft hole locations only. Using Mount Assembly as a template, locate and drill forward holes through from belly skin into tunnel area. NOTE: Assure correct alignment of hole pattern and clearance from previously installed equipment. Re-install doubler, mark and drill Ø.375 holes through top skin only.

NOTE: (i) Refer to BHT-ALL-SPM for insert installation procedures. These inserts should be installed using EA934NA or equivalent adhesive. Seal doubler with adhesive.

NOTE: (ii) Existing aircraft modifications may prevent bracket installation at the specified location. Moderate deviation from this location is acceptable, if the bracket installation remains forward of the forward cross tube. Separation from existing inserts must be maintained in accordance with approved data. New location weight and balance data must be verified, and electrical cable length and routing must be considered.

- 2.) Allow minimum of 24 hours to cure adhesive at room temperature. (>65°F).
- 3.) Using the indicated hardware, complete the mount bracket installation.
NOTE: Optional spacer and bolts are provided to clear possible interference from pedestal attachment inserts. Trim edges of shim to clear inserts and complete mount bracket installation.
- 4.) Re-install tail rotor control tube, reference. BHT-407-MM

B. ELECTRONIC CONTROL UNIT MOUNT BRACKETS, Reference Drawings 407IR-201, 407ET-100.

- 1.) Install the beam assemblies to the shelf panel using the indicated hardware.
NOTE: Careful placement and alignment of beams is necessary for proper fit of Electronic Control Unit.
- 2.) Complete the Shelf Panel installation in accordance with drawing 407ET-100.
NOTE: Shelf Panel installation requires placement and installation of nut-plates, and screw/nut fastener assemblies. Observe minimum 2D distance to panel edges and between fasteners. Complete all wiring behind console inspection panels before proceeding.
- 3.) Complete installation of attaching hardware to Electronic Control Unit in accordance with Detail View.
- 4.) Complete the Electronic Control Unit installation in accordance with drawing 407IR-201. The Electronic Control Unit (ECU) is installed to the Shelf Panel/Beam Assemblies as follows:
 - (i) Remove the Hair-Pin Clip from the Mount Beam under the Equipment Shelf installation.
 - (ii) Loosen both Beam Lock Knobs and pull them aft. This moves the locking knob mechanism out of the way for ECU installation.
 - (iii) Place the "buttons" on the ECU into the keyholes in the mount beams, and slide the ECU forward, to insure proper engagement.
 - (iv) Slide the Mount Beam Lock Knobs toward the ECU and hand-tighten.
 - (v) Re-install the Hair Pin Clip. Insure that the clip passes through both sides of the beam.
 - (vi) Insure Battery switch is OFF, then install Power Supply/Control cables to their proper receptacles.
WARNING: Assure that cables are routed and secured to provide adequate clearance of flight controls and ease of cabin exit.
 - (vii) Refer to Weight and Balance Data, in the Rotorcraft Flight Manual Supplement, and the Basic Flight Manual for calculation of allowable helicopter loading.

C. OPTIONAL SLASS SYSTEM, IF SLASS SYSTEM IS TO BE INSTALLED, THE FOLLOWING STEPS MUST BE PERFORMED.

- 1.) The gimbal for the searchlight must have had the position sensor retrofit kit installed. If not, contact Dynametric Systems for retrofit kit and installation information.
- 2.) Attach SLASS-ECU to top of Spectrolab junction box lid per Dynametric operation and installation manual, paragraph 3.3.
- 3.) The additional fuselage bulkhead connector must be installed next to the searchlight connector using the PR-407SX-900M installation instructions and Dynametric operation and installation manual.

- 4.) Route cable 2-100 and cable 1-30 together with existing cables A & B, from light to junction box and SLASS-ECU.
- 5.) Route cable 3D3-U7 and J2 through overhead panel per PR-407SX-900M installation instructions. Install connector per instructions.
- 6.) Route cable 3 through center console to FLIR-ECU. Attach all electrical cables to existing wire bundles using clamps and ty-raps as needed to prevent damage to cables.
- 7.) Replace existing Spectrolab RCU with SLASS Universal RCU. Then connect SLASS 4-5 cable between J-box and ECU.

D. ELECTRICAL SYSTEM INSTALLATION, Reference Drawing 407IR-321/-322/-323.

- 1.) Remove instrument console access panels (left side). Reference BHT-407-MM-5. Reference drawing 407IR-102, install Mount Bracket.
- 2.) Route sensor cable pair from electronics module area through instrument console into the open area below forward seats center section. Enlarge opening as shown to pass cable pair through console bulkhead.
NOTE: The cables must penetrate the fuselage panel below the center console and forward of the seat box. Locate between tail rotor control tube and instrument lines. Ensure adequate clearance and security from installed equipment and FLIGHT CONTROLS.
- 3.) Using short cables from sensor mark optimum location for bulkhead installation. Cable routing must not interfere with installed equipment, aircraft structure, or control linkages (check extreme control travel).
- 4.) Bore indicated holes, through honeycomb panel using provided bulkhead as a template, also locating the (5) five fastener locations.
- 5.) Remove bulkhead, drill match marked locations 0.50 DIA.-X- 0.350 inch deep.
- 6.) Using metal set A-4, EA934NA, or equivalent adhesive install inserts (5 plcs), reference BHT-SPM-ALL. Ensure that epoxy fills the entire cavity and is forced out of the bleed holes. Also seal the 2-inch holes at this time. Allow adhesive to cure.
- 7.) Permanently install sensor cable(s) and the bulkhead using indicated hardware. Tie cables to internal aircraft structure to ensure clearance from moving parts.
NOTE: Ensure adequate clearance and security from installed equipment and FLIGHT CONTROLS.
- 8.) Install Power Supply cable to the ECU area. Route cable into console and to circuit breaker panel area, cut to appropriate length. Use indicated hardware to complete power supply wiring.
- 9.) Cut holes as close to lower edge of access panel as possible for cable penetration. Panel must be cut from edge to holes to allow cable installation.
- 10.) Split indicated grommets for installation over cables. Install cables and grommets; and re-install panel. Install electronics unit and shelf installation. Insure Battery switch is OFF, then install Power Supply/Control cables to their proper receptacles.
WARNING: Assure that cables are routed and secured to provide adequate clearance of flight controls and ease of cabin exit.

- 11.) Ref. detail A, locate exterior cable path, install potted inserts as required along path for exterior cable suspension.
- 12.) Connect exterior cables to gimbaled sensor when installed. Stow exterior cables on Mount Assembly when gimbaled sensor is removed.

E. MONITOR INSTALLATION, Reference Drawing 407IR-321, 407IR-120.

- 1.) Install Monitor Mount in accordance with 407MM-120 installation instructions.
- 2.) Install monitor on Mount using threaded knob. Position Monitor at desired angle and hand tighten knob.
NOTE: Mount can be swiveled on two axes to position Monitor.
- 2.) Connect power and video cables to monitor and route to E.U. Secure cables to ensure adequate clearance from installed equipment and flight controls system.

F. SYSTEM FUNCTIONAL CHECK

- 1.) With Battery switch OFF ensure all connections are secure and wires are terminated.
- 2.) Energize buss and check operation of monitor and gimbal control per Operators manuals.
- 3.) After functional check re-install all inspection panels, and interior Reference BHT-407MM.

G. DOCUMENTATION

- 1.) Following the information found in PR-407IR-120M Revision N/C or later, perform the following:
 - a.) Amend Aircraft Weight & Balance.
 - b.) Amend Installed equipment list.
 - c.) Log book entry.
 - d.) Submit FAA form 337 with any deviation from approved installation detailed.

SECTION II: SUPPLEMENTAL TYPE CERTIFICATE

SECTION III: ROTORCRAFT FLIGHT MANUAL SUPPLEMENT