TECHNISONIC INDUSTRIES LIMITED

P25 MULTI-BAND TDFM TRANSCEIVER AIRBORNE SYSTEM

INSTRUCTIONS for CONTINUED AIRWORTHINESS

ICA13015-1

Mfg: Airbus Helicopters

Type: AS-350

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Revision No.	Revision Date	Affected Pages	By
B	May 12, 2014	Changes as per redlines in margin. All pages revision B.	R. Macdonald
C	June 29, 2014	Changes as per redlines in margin. All pages revision C.	R. Macdonald
D	November 4, 2014	Changes as per redlines in margin. All pages revision D.	R. Macdonald
E	September 15, 2021	All pages at revision E. Changes as per redlines in margin.	J. Haber
F	October 13, 2023	All pages at revision F. Changes as per redlines in margin.	J. Haber
G	October 07, 2025	All pages at revision G. Changes as per redlines in margin.	A. Sakthivel/ J. Haber
H	March 4, 2026	All pages at revision H. Changes as per redlines in margin.	D. Stargard

Date: March 4, 2026

LOG OF PAGE REVISIONS

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CHAPTER 1.0 - INTRODUCTION

A. General

The Technisonic Industries Limited Multi-band P25 Airborne transceiver system installation is defined by Avionics Design Services Master Drawing List MDL13015. The following equipment is installed as applicable:

CHAPTER	MAKE	MODEL / UNIT	P/N	LOCATION
23-10-00	Technisonic	TDFM-9000 Multi-band Digital FM Transceiver or TDFM-9100 Multi-band Digital FM Transceiver or TDFM-9200 Multi-band Digital FM Transceiver or TDFM-9300 Multi-band Digital FM Transceiver	TDFM-9000 or TDFM-9100 or TDFM-9200 or TDFM-9300	Instrument Panel or Pedestal
	Technisonic	RC-9000 or RC-9100 Remote Control Unit If installed	RC-9000 or RC-9100	Mission Crew Station As per Structural Diagram 5004272 and EO13015-3 See Appendix A
	Technisonic	ASU-9000 Antenna Switching Unit	223116-1	Installer determined
	Technisonic	DAS-9000 Digital Audio Splitter	241309-1	Installer determined

CHAPTER	MAKE	MODEL / UNIT	P/N	LOCATION
23-10-00 (continued)	Comant Industries	Dual Band / Dual Port Antenna	CI- 295-250	As per Structural Diagram 5004272 See Appendix A
		Dual Band / Dual Port Antenna	CI-295-200	
		Radiophone Antenna	CI-285	
		806-870 MHz Antenna	CI-306	
		Radiophone Antenna	CI-275	
		FM 136 to 174 MHz Ext Band Antenna	CI-292-4	
		FM 136 to 174 MHz Ext Band Antenna	CI-292-3	
		VHF AM 118 to 138 MHz Antenna	CI-292-1	
	Rami Antennas	VHF/UHF/700/800 Antenna	AV-925	
		UHF 225 to 400 MHz Antenna	AT-256/ARC	
		VHF/UHF Antenna	AT-1108/ARC	
	Cooper Antennas	Multi-Band FM COMM Antenna	21-50-45	
	Foxtronics	Antenna / Tuner, 30 to 50 MHz	FLX-3050B	
	Sensor Systems	Alternate Antenna, 30 to 50 MHz	S65-8282-34	
		UHF AM 225 to 400 MHz Antenna	S65-8282-51	
		UHF Antenna 225 to 400 MHz	S65-1227( )	
	Comant Industries	Tri-Band/ Single Port Antenna	CI-295-300	As per Structural Diagram, MD21068. See Appendix A.

The inspection and maintenance practices described herein relate to the Multi-band P25 Airborne transceiver system installation as described above. Component part numbers and wiring diagrams are included in Appendix A.

B. Reference Data

a) Access equipment in accordance with Eurocopter Description and Operation Manual, AS 350, Chapter 06.

b) Perform all maintenance procedures in accordance with the AS350 Standard Practices Manual, Chapter 20.

c) Refer to Appendix A for documents required to supplement the information in this manual concerning the maintenance of the above components.

C. ICA Distribution

a) This document and any revisions hereto shall be distributed to the authorized users of the (S)STC approved data. They will be distributed by courier in paper or electronic format.

b) It is the responsibility of the person(s) performing maintenance, on the installed system, to ensure that the ICA document is current prior to performing maintenance. Contact the following:

Contact Name:	Technisonic Industries Ltd.
Contact Address:	240 Traders Blvd. E. Mississauga, ON L4Z 1W7
Contact Phone Number:	905-890-2113
Contact Website:	www.til.ca

D. Acronyms

ATA	Airline Transport Association
AM	Amplitude Modulation
FAA	Federal Aviation Administration
FM	Frequency Modulation
MHz	Mega Hertz
RF	Radio Frequency
RX	Receive
STC	Supplemental Type Certificate
TX	Transmit
UHF	Ultra High Frequency
VHF	Very High Frequency
VHFLO	Very High Frequency Low

E. Supplement Identities: Chapter, Page, Paragraph Numbers

The supplement format follows the general requirements of iSpec ATA-2200 with respect to Chapter and Title. However, since the extent of the supplemental information is relatively small in scope, the page numbering for each chapter is consecutive. Reference can be made to the following Chapter/Subject Listing:

Subject	Page Number
Title page	0
Table of Contents, Index, Page Listing	i, ii, iii, etc.
Content page(s)	1, 2, 3, etc.

Paragraph or component titles are listed via A. B. C. D. etc.

Sub-paragraphs are listed according to:

Subject	Sub-Para. Number
Description / Operation	1.0
Troubleshooting	101
(Reserved)	201
Servicing	301
Removal / Installation	401
Adjustment / Test	501
Inspection / Check	601
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CHAPTER 4.0 - AIRWORTHINESS LIMITATIONS

A. General

There are no airworthiness limitations associated with this type design change.

B. Canadian Approval

The Airworthiness Limitations section is approved by the Minister, and specifies maintenance required by any applicable airworthiness or operating rule, unless an alternative program has been approved by the Minister.

C. FAA Approval

The Airworthiness Limitations section is FAA approved, and specifies maintenance required under Section 43.16 and 91.403 of the Federal Aviation Regulations, unless an alternative program has been FAA approved.

D. EASA Approval (if applicable)

The Airworthiness Limitations Section is approved and variations must also be approved.

CHAPTER 5.0 - TIME LIMITS/MAINTENANCE CHECKS
5-20-00: SCHEDULED CHECKS

A. General

Perform the following General Visual Inspections. The inspections are to be performed referencing the applicable wiring diagrams included in Appendix A. Follow standard maintenance practices of the EC AS 350 Master Servicing Recommendations, Chapter 5.20.01.

Description	Inspection	Inspection Details
Antenna Installation;	Type "T" - 500 hours OR Type "A" - 24 months Whichever occurs first.	Perform general visual inspection of external skin around periphery of connector cutouts and all rivet locations. Check for damage such as fastener deterioration, skin cracks, corrosion, paint exfoliation and other signs of structural deterioration of the skin structure. Any flaw indication is cause for rejection.
TDFM-9000, TDFM-9100, TDFM-9200, or TDFM-9300 Transceiver; Wiring;		Visually examine all external surfaces for possible damage. Check external connectors for dust, corrosion, or damage. Check external parts for loose or damaged hardware. Make visual check of wiring and connectors for damage.
RC-9000, or RC-9100 Remote Control Unit; Wiring;		Visually examine all external surfaces for possible damage. Check external connectors for dust, corrosion, or damage. Check external parts for loose or damaged hardware. Make visual check of wiring and connectors for damage.
ASU-9000 Antenna Switching Unit Wiring;		Visually examine all external surfaces for possible damage. Check external connectors for dust, corrosion, or damage. Check external parts for loose or damaged hardware. Make visual check of wiring and connectors for damage.
DAS-9000 Digital Audio Splitter		Visually examine all external surfaces for possible damage. Check external parts for loose or damaged hardware.

B. Component Overhaul Schedule

No component overhaul required for this type design change.

CHAPTER 5.0 - TIME LIMITS/MAINTENANCE CHECKS
5-50-00: UNSCHEDULED CHECKS

A. General

Hard Landing

Perform inspection, in accordance with Eurocopter AS350 Maintenance Manual, Chapter 5-53-00 - Inspection Following An Incident, Card 05.53.00.605.

Aircraft Struck by Lightning

Perform inspection, in accordance with Eurocopter AS350 Maintenance Manual, Chapter 5-53-00 - Inspection Following An Incident, Card 05.53.00.609.

CHAPTER 23.0 - COMMUNICATIONS
23-10-00: TDFM TRANSCEIVER

1.0 Description / Operation

The TDFM-9000, TDFM-9100, TDFM-9200, or TDFM-9300 transceiver is installed in the instrument panel or pedestal. The RC-9000 remote control unit is installed as an option on secondary structure at a mission crew location.

TDFM-9000 Series is a multi-band airborne analog and digital P25 9600 trunking system FM system. Frequencies in the VHF, UHF-LO, UHF-HI and 700-800 MHz bands are supported.

TDFM-9300, or TDFM-9200 have one, or up to two analog modules installed respectively. Each analog module is in the space of two of the digital modules.

The TDFM-9000, TDFM-9200, and TDFM-9300 transceivers have a colour TFT display with data entry and function control accomplished using the 24-button keypad.

The TDFM-9100 transceiver has green LED night vision display with data entry and function control accomplished using the 18 button keypad.

The RC-9000, or RC-9100 provides transceiver functions to mission crew. The display / control panel is the same as the corresponding TDFM-9000 series transceiver(s).

The ASU-9000 is an antenna switching unit that interfaces with a TDFM-9x00 series transceiver. It allows each main and guard antenna port to utilize the same antenna, reducing the total number of antennas that need to be installed.

The DAS-9000 is a Digital Audio Splitter installed near the applicable TDFM-9000 transceiver to minimize digital audio harness length. It enables a single TDFM-9000 transceiver to interface with up to five TDAP-650 Digital Audio Panels, allowing each to operate independently without cross-interference. The unit is designed to reduce long analog audio wiring, enhancing installation efficiency.

101. Troubleshooting

NOTE:

Prepare aircraft in accordance with the procedures of the AS 350 Standard Practices Manual, Chapter 20.

Condition	Action
No power.	Ensure connectors are properly affixed. Check applicable fuse(s)/ circuit breaker(s).
Not operating correctly.	Inspect wiring and ring out harness in accordance with Avionics Design Services WD13004 and correct irregularities as required.
Not operating correctly after above action completed.	Remove in accordance with Section 401. A of this chapter and return to Technisonic Industries Ltd. for evaluation and repair.

201. Reserved

Not Applicable

301. Servicing

There are no servicing procedures associated with the components of this chapter.

401. Removal / Installation

The components of this chapter are protected by the following fuses:

LABEL	AMPS	LOCATION	BUS
Effectivity: Rotorcraft with Fuse Panel			
FM RADIO	10 A	CENTER CONSOLE, FUSE PANEL	28VDC PP6 BUS
FM CONTROL (IF INSTALLED)	2.5 A	CENTER CONSOLE, FUSE PANEL	28VDC PP6 BUS
FLX ANTENNA TUNER (IF INSTALLED)	1.5 A	CENTER CONSOLE, FUSE PANEL	28VDC PP6 BUS
ASU (IF INSTALLED)	1A	CENTER CONSOLE, FUSE PANEL	28VDC PP6 BUS

LABEL	AMPS	LOCATION	BUS
Effectivity: Rotorcraft with Geneva Console (per STC SH93-83 or other Foreign Equivalent)			
FM RADIO	10A	CENTER CONSOLE, LEFT TOP	28VDC PP6 BUS or AVIONICS / RADIO BUS (If installed)
FM CONTROL (IF INSTALLED)	2.5A	CENTER CONSOLE, LEFT TOP	28VDC PP6 BUS or AVIONICS / RADIO BUS (If installed)
FLX ANT TUNER (IF INSTALLED)	1.5A	CENTER CONSOLE, LEFT TOP	28VDC PP6 BUS or AVIONICS / RADIO BUS (If installed)
ASU (IF INSTALLED)	1A	CENTER CONSOLE, LEFT TOP	28VDC PP6 BUS or AVIONICS / RADIO BUS (If installed)

A. TDFM-9000, TDFM-9100, TDFM-9200, or TDFM-9300 Transceiver

Removal

a) Remove the above indicated fuses (or pull and collar the circuit breakers).
b) Release six (four on TDFM-9100) Dzus fasteners from front of transceiver.
c) Slide transceiver forward of the panel cutout.
d) Disconnect electrical connector and antenna connector(s) from the rear of the transceiver.
e) Remove transceiver from the panel cutout.

Installation

a) Reconnect electrical connector and antenna connector(s) to the rear of the transceiver.
b) Slide transceiver into the panel cutout.
c) Secure six (four on TDFM-9100) Dzus fasteners on the front of transceiver.
d) Install the above indicated fuses (or reset circuit breakers).
e) Perform the Function Test in accordance with Sections 501.A, of this chapter.

B. RC-9000, or RC-9100 Remote Control Unit

Removal

a) Remove the above indicated fuses (or pull and collar the circuit breakers).
b) Release six (four on RC-9100) Dzus fasteners from front of remote control unit.
c) Slide remote control unit forward of the panel cutout.
d) Disconnect electrical connector from the rear of the remote control unit.
e) Remove remote control unit from the panel cutout.

Installation

a) Reconnect electrical connector to the rear of the remote control unit.
b) Slide remote control unit into the panel cutout.
c) Secure six (four on RC-9100) Dzus fasteners on the front of remote control unit.
d) Install the above indicated fuses (or reset circuit breakers).
e) Perform the Function Test in accordance with Sections 501.A, of this chapter.

C. Antenna(s)

Removal

a) Remove the above indicated fuses (or pull and collar the circuit breakers).
b) Gain access to antenna(s).
c) Disconnect coaxial cable(s) from the antenna(s).
d) Remove the sealant from periphery of antenna base(s).
e) Remove screws and washers securing the antenna(s) to the mounting surface(s).
f) Remove the antenna(s) from the aircraft.

Installation

a) Re-connect coaxial cable(s) to antenna coax connectors(s).
b) Secure fastening screws used to attach antenna(s) to fuselage.
c) Seal around periphery of antenna(s) with PRC-DeSoto PR-1422B2, or equivalent.
d) Perform electrical bonding procedure in accordance with Standard Practices Manual, Section 20.02.07.101. Ensure an electrical bonding reading of .003 ohms between each antenna base plate and ground.
f) Install the above indicated fuses (or reset circuit breakers).
e) Perform the Function Test in accordance with Sections 501.A, of this chapter.

D. ASU-9000 Antenna Switching Unit

Removal

a) Remove the above indicated fuses (or pull and collar the circuit breakers).
b) Gain access to ASU-9000 antenna switching unit.
c) Disconnect antenna coaxial cables and electrical connectors from the ASU-9000.
d) Remove screws and washers securing the ASU-9000 to the mounting surface.
e) Remove the ASU-9000 from the aircraft.

Installation

a) Reconnect electrical connectors and antenna coax cables to the rear of the ASU-9000.
b) Secure the four sets of fastening screws and washers used to attach the ASU-9000 to the mounting surface.
c) Install the above indicated fuses (or remove collars and reset circuit breakers).
d) Perform the Function Test in accordance with Sections 501.A, of this chapter.

E. DAS-9000 Digital Audio Splitter

Removal

a) Remove the above indicated fuses (or pull and collar the circuit breakers).
b) Gain access to DAS-9000 digital audio splitter.
c) Disconnect the electrical connectors from the DAS-9000 unit.
d) Remove the four sets of fastening screws and washers securing the DAS-9000 to the mounting surface.
e) Remove the DAS-9000 from the aircraft.

Installation

a) Place the DAS-9000 to the mounting surface.
b) Secure the four sets of fastening screws and washers used to attach the DAS-9000 to the mounting surface.
c) Reconnect the electrical connectors to the DAS-9000 unit.
d) Install the above indicated fuses (or remove collars and reset circuit breakers).
e) Perform the Function Test in accordance with Sections 501.A, of this chapter.

501. Adjustment / Test

A. Function Test

NOTE:

Perform the following function test using the front panel of the TDFM-9000, TDFM-9100, TDFM-9200, or TDFM-9300 Transceiver.

a) Power up the Aircraft's avionics systems. Turn on the transceiver and remote controller (as applicable).
b) Adjust the volume levels as required.
c) Press the guard knob to defeat squelch to open receiver.
d) Ensure receiver is operational, the RX status indicator light is on and channels are open.

NOTE: For configuration with DAS-9000 digital audio splitter installed, perform steps e) and g). For all other configurations perform steps f) and g).

e) Tune to an operating channel and carry out a radio check using each installed TDAP-650 audio controller. Ensure the TX status indicator lights when receiver is transmitting and RX status indicator lights when receiver is receiving.
f) Tune an operating frequency and carry out a radio check using each installed audio controller. Ensure the TX status indicator lights when receiver is transmitting and RX status indicator lights when receiver is receiving.
g) Check the operation of all front panel controls.

B. Weight and Balance

Refer to Structural Diagrams 5004272 and MD21068, included in Appendix A, for equipment weights. Exact frame stations are to be taken from the exact rotorcraft installation.

601. Inspection / Check

Inspections for this chapters components are to be performed in accordance with Chapter 5-20-00, paragraph A, of these Instructions for Continued Airworthiness.

701. Cleaning / Painting

There are no additional cleaning or painting procedures to be added to the Aircraft Maintenance Manual for the components of this chapter.

801. Approved Repairs

A. TDFM-9000, TDFM-9100, TDFM-9200, and TDFM-9300 Transceivers

There are no approved field repairs for the transceiver. Failed units caused by defective parts or workmanship, should be returned to:

Technisonic Industries Limited
240 Traders Blvd. E
Mississauga, ON
L4Z 1W7
[905] 890-2113

B. RC-9000, and RC-9100 Remote Control Units

There are no approved field repairs for the remote control unit. Failed units caused by defective parts or workmanship, should be returned to:

Technisonic Industries Limited
240 Traders Blvd. E
Mississauga, ON
L4Z 1W7
[905] 890-2113

C. Antennas

The antennas associated with this system are non-repairable. If they are determined to be faulty they must be removed and replaced.

D. ASU-9000 Antenna Switching Unit

There are no approved field repairs for the ASU-9000 antenna switching unit. Failed units caused by defective parts or workmanship, should be returned to:

Technisonic Industries Limited
240 Traders Blvd. E
Mississauga, ON
L4Z 1W7
[905] 890-2113

E. DAS-9000 Digital Audio Splitter

There are no approved field repairs for the DAS-9000 Digital Audio Splitter. Failed units caused by defective parts or workmanship, should be returned to:

Technisonic Industries Limited
240 Traders Blvd. E
Mississauga, ON
L4Z 1W7
[905] 890-2113

901. Storage

There are no storage procedures associated with the components of this chapter.

APPENDIX A		
ITEM	**TITLE**	**REV***
1	WIRING DIAGRAM WD13004 'TIL FM TRANSCEIVER, EC AS-350'	I
2	STRUCTURAL DIAGRAM 5004272 TECHNISONIC ANTENNA INSTALLATION - AS350	D
3	ENGINEERING ORDER EO13015-3 TECHNISONIC RC-9100 REMOTE CONTROL PANEL OPTION (AS-350)	2
4	STRUCTURAL DIAGRAM, MD21068, TRI-BAND ANTENNA INSTL OPTION - AS350	N/C
5	ENGINEERING ORDER EO13015-6 INSTALLATION INSTRUCTIONS FOR THE TECHNISONIC DIGITAL AUDIO SPLITTER (AS350)	2

* Or later approved revision.