

Section 2.0 Installation

PRELIMINARY

2.1 Introduction

Information in this section consists of: unpacking and inspection procedures, installation procedures, post-installation checks, and installation drawings.

2.2 Unpacking and Inspection

Unpack the equipment carefully, and locate the warranty card. Inspect the unit visually for damage due to shipping and report all such claims immediately to the carrier involved. Note that each unit should have the following:

- NPX136D Radio
- Warranty Card
- Operator's Manual
- Release certification

Verify that all items are present before proceeding, and report any shortage immediately to your supplier.

Complete the warranty card information, and send it to NAT when the installation is complete. If you fail to complete the warranty card, the warranty will be activated on date of shipment from NAT.

2.3 Installation Procedures

2.3.1 Note on Cable Routing

Do not bundle any lines from this unit with **transmitter coax lines**. Do not bundle any logic, audio, or DC power lines from this unit with 400 Hz synchro wiring or AC power lines. Do not position this unit next to any device **with a strong alternating magnetic field such as an inverter or significant interference to operation will result.** In all installations, use shielded cable **exactly as shown and ground as indicated.** Significant problems may result if these guidelines are not followed.

2.3.2 Notes on Cable Wiring and Shielding

All audio installations can be severely degraded by incorrect wiring and shielding, and may result in much higher cross-talk, hum, and ground-loop interference. This should be considered when audio wiring to and from the radio installation is performed.

2.3.3 Notes on Grounding

The case of the NPX136D must be electrically grounded for maximum resistance to low frequency interference. A pin on the connector (Chassis ground) is provided and must be connected by a short wire to a clean ground, not jumpered to the power ground wire connection.

Refer to the aircraft structural repair manual and maintenance manual for instructions and information pertinent to this installation.

2.3.4 Cable and Wiring

All wire should be in accordance with MIL-W-22759 unless otherwise specified. All cable should be in accordance with MIL-C-27500 unless otherwise specified. Use solder sleeves (for shielded terminations) to make the most compact and easy to terminate interconnect. Follow the wiring diagrams in Section 2.5 as required.

Allow 3 inches from the end of the wire to the shield termination to allow the hood to be easily installed. Note that the hood is installed after the wiring is complete.

Installation cabling must allow the NPX136D to be easily withdrawn for disconnection and field service adjustments. Ensure an adequate service loop in the routing of the cables. It can be a serious issue if the unit is installed with the cables so short that the unit cannot be removed without disassembly of the surrounding structures. At least 30 cm (1 foot) of free cable is recommended.

All wiring should be 22 AWG minimum, except power and ground connections, which must be 20 AWG or larger, as indicated on the installation drawings. Ensure that the ground connection is clean and well secured. To prevent inadvertent system failure, power to this system must be supplied from a separate breaker or fuse and not connected to any other device. A 5 A fuse or breaker is recommended (28 Vdc).

Coaxial cable should be in accordance with MIL-C-17 unless otherwise specified. Do not use coax with PVC insulation. Teflon dielectric cable is encouraged at or above VHF frequencies or where cable runs exceed 8 feet. Note that at VHF frequencies, cable losses due to long cable runs and tight bends may cut the ERP (Equivalent Radiated Power) to less than 50% of spec.

To prevent RF interference between similar systems, it is recommended that VHF FM coax runs be widely separated, or be made using triaxial cable, with the outer shield bonded to the airframe at one end only (transceiver end).

In communication intensive applications, poor cable routing and shielding may drastically compromise over-all system performance. Symptoms may be spurious squelch opening, RFI (Radio-Frequency Interference), and garbled reception.

RF cables must be neatly terminated (solder or crimp), and tested for shorts prior to system check-out (**not** while connected to the radio or antenna). Keep cable bends to a minimum at the antenna. Avoid sharp bends in the coax cables (minimum 3" radius) to prevent severe reflections. If sharp bends are required, use 90° elbow adapters.

Fabrication & installation of wiring harness should be in accordance with AC 43.13-1A chapter 11, sections 3 and 7.

Grounding and bonding should be in accordance with AC 43.13-1A chapter 11, section 3.

2.3.5 Antennas

Warning:

To limit exposure from radio frequency fields that exceed exposure limits for people occupying the aircraft, install the antenna such that it is mounted; on a ground plane that is between the antenna and the occupants of the aircraft, or farther than 32 inches (80cm) from the occupants of the aircraft.

Correct antenna placement and mounting is critical in order to achieve the best possible performance. In general, keep all antennas as widely separated as possible and clear of any large airframe obstructions.

Installation of the antenna should be in accordance with AC 43.13-1A chapter 2, section 3, chapters 5 & 6, and AC 43.13-2A chapter 3. If possible, the antenna should be located a minimum of 12 ft from aircraft navigation receiver antennas and a minimum of 4 feet from aircraft communications and ELT antennas. Be careful not to choose separations that closely approximate $\frac{1}{4}$, $\frac{1}{2}$ or whole-number multiples of the navigation or communications system wavelength.

Note: Avoid any placement that puts antennas of like frequencies close together.

Bottom mounted antennas will perform best in flight, but poorest on the ground during testing. Antennas may be severely degraded by 'masking' effects of the fuselage or stabilizers, and generally give best performance when bottom mounted.

To reduce interference from rotor modulation and other undesirable stimuli, any blade or whip antenna must be surrounded by a ground plane surface (metallic, grounded material) with a radius equal to or greater than the height of the antenna. Under the same conditions, the antenna is also much less likely to cause interference to other aircraft systems (e.g. coupling into audio system, fluctuations in instrumentation, etc.). Poor grounding will result in severe reflected power and high levels of RFI throughout the airframe.

Avoid antenna locations that will become fouled with oil, water, fuel or dirt, as this will degrade performance. Roof mounts (in close proximity to rotor blades) are permissible.

2.3.6 Mechanical Mounting

Installation of the transceiver should be in accordance with AC 43.13-1A chapter 2, section 3, and AC 43.13-2A, chapter 2. Pr 35 Dzus rail or equivalent may be used.

Mounting the NPX136D requires a Dzus rail assembly with an opening width of 127 mm (5 inches) and a front clearance width of 146.1 mm (5.75 inches). Height requirement is tbd mm (tbd inches). Refer to the mounting drawings and unit mechanical specifications to determine proper clearance dimensions. Be sure that adequate clearance is allowed for the cable connections to each unit.

2.3.7 Post-Installation Checks

2.3.7.1 Voltage/resistance checks

Do not attach the NPX136D until the following conditions are met.

Check the following:

- a) P101 pins <12> and <13> for +28 Vdc relative to ground.
- b) P101 pins <22>, <23>, <24> and <25> for continuity to ground (below 0.5 Ω).
- c) Light voltage as per table below.

	P101 Pin #	Voltage
28 Volt Models	11	28 Vdc
14 Volt Models	10	14 Vdc
5 Volt Models	10	5 Vdc

Light Voltage

Ensure that the antenna is disconnected for the following test or erroneous readings may be obtained

- d) Radio coax connector for continuity to the antenna coax connector (shield and center conductor), and for open circuit from the center conductor to ground and open circuit from the center conductor to the shield.

2.3.7.2 Power On Checks

- a) Install the NPX136D and power up the ship's systems. Turn on the radio. Check the operation of all front panel controls. Adjust brightness and volume levels as required.
- b) Check all transmit and receive functions. Ensure the RX/TX status indicator lights green when the radio is keyed to transmit and amber when receiving.
- c) Check the SCAN function. Note: you **may be unable to hear the received audio** if the tones do not match those set in the radio. To avoid any confusion, tones should be set to **OFF** (via the settings menu) before scanning so that all channels will be heard.
- d) Check the antenna feedline at the R/T with a through-line wattmeter and suitable frequency elements to ensure correct antenna matching. Reflected power in excess of 25% represents a serious problem, and should be investigated carefully, or serious RFI and system interference as well as possible radio damage may result. A VSWR measurement over 3.0:1 represents a significant loss in signal power to the antenna. Check that forward power is to specifications over the frequency band of the radio.

2.3.8 Post Installation EMI Test

The purpose of this test is to identify any interference that the NPX136D may cause with existing aircraft systems. The NPX136D should be tested in accordance with the Installation Approval Test Procedure (see section 2.5), and the test results documented on the record sheets.

2.4 Continued Airworthiness

Maintenance of the NPX136D is 'on condition' only. Periodic maintenance of these products is not required.

2.5 Installation Drawings

DRAWING	REV.	DESCRIPTION	TYPE
NPX136D\403-0	1.00	Panel Mount Radio	Interconnect
NPX136D\403-1	1.00	Panel Mount Radio	Interconnect
NPX136D \405-0	1.00	Panel Mount Radio	Connector Map
NPX136D\905-0	1.00	Panel Mount Radio	Faceplate
NPX136D\922-0	1.00	Panel Mount Radio	Mechanical
NPX136D\634-0	1.00	Post Installation EMI Test	Installation Approval Test Procedure

Section 2.0 ends after these Drawings