

TXN 920 NAV/COMM
INSTALLATION AND OPERATION MANUAL
TERRA CORPORATION

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Part Number 1900-1714-00
Rev. A

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TXN 920 NAV/COMM

TERRA CORPORATION

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TXN 920 NAV/COMM

SECTION I

1. INTRODUCTION

1.1. SCOPE

This manual provides installation and operating instructions for the Terra TXN 920 self-contained Nav/Comm system manufactured by Terra Corporation, Albuquerque, New Mexico.

1.2. DESCRIPTION

The Terra TXN 920 is an all solid-state, self-contained 720 channel transceiver and 200 channel navigation receiver. The TXN 920 utilizes state-of-the-art components to increase reliability and quality.

The Comm portion is an amplitude modulated VHF transceiver. It provides simplex communication on any one of the 720 channels with 25 KHz channel spacing. The transceiver features a digital frequency synthesizer that employs only four crystals for generating the frequencies required for all 720 transmit and receive channels. Other features include automatic voice leveling on transmit and receive, crystal monolithic IF filters and integrated circuit IF amplifiers, a low noise MOSFET RF amplifier, automatic squelch circuit with manual override, solid-state antenna switching and tuning.

The navigation receiver features a digital frequency synthesizer that employs 2 crystals for generating the frequencies required for all 200 channels with 50 KHz channel spacing. Other features include automatic gain control, crystal monolithic IF filters, integrated circuit IF amplifiers and solid-state tuning.

The optional glideslope section is a 40 channel glideslope receiver tuning the band from 329.00 MHz to 335 MHz in 150 KHz steps, furnishing glidepath indication and flag information to the ILS indicator.

The TXN 920 requires 13.75 volts for operation. A Terra MLC 28-5 DC converter is required for 27.5 volt operation.

1.3. SPECIFICATIONS

1.3.1. Mechanical Specifications

Mounting: Panel mounted using mounting tray supplied

Overall dimensions: 9.5" long, 6.1" wide, 1.45" high

Mounting dimensions: 10.35" behind panel, 6.3" wide, 1.65" high

Weight: 2.15 lbs. without glideslope; 2.45 lbs. with glideslope; mounting tray without glideslope, .51 lbs; with glideslope .55 lbs.

Power requirements: 13.75 VDC input

Standby: 350mA typical
full audio - 2.5 amp typical
instrument lights - 300mA typical

1.3.2. Electrical Specifications

Comm transmitter:

Frequency range: 118.00 to 135.975 MHz

Number of channels: 720

Channel spacing: 25 KHz

Frequency stability: +.002% per FCC Type Acceptance

Power output: 5 Watts nominal, unmodulated carrier; 20 Watts PEP

Modulation: Automatic audio leveling for a minimum of 80% and a limit of 95%

Output termination: 50 ohm nominal

Spurious response: Greater than 50dB below carrier level

Sidetone: Up to 25 milliwatts into 600 ohm headphones

1.3.2 ELECTRICAL SPECIFICATIONS (Continued)

FCC Approval: Type Accepted per FCC Part 87

Com Receiver:

Frequency range: 118.00 to 135.975 MHz

Number of channels: 720

Channel spacing: 25 KHz

Sensitivity: Less than 1 microvolt for 6dB signal plus noise to noise ratio

Selectivity: Typically -6dB at 14 KHz; -60dB at 40 KHz

Squelch sensitivity: Automatic 5 to 10 microvolts; manual 25 to 250 microvolts

Automatic gain control (AGC): Audio out within 3dB for 3 microvolt to 30,000 microvolt input

Audio output: 5 Watts into 3.2 ohms, 25mw into 600 ohms.

Undesired response: Greater than 60dB

Incidental radiation: Certified per FCC Part 15 requirements

Nav Receiver:

Frequency range: 108.00 to 117.95 MHz

Number of channels: 200

Channel spacing: 50 KHz

Sensitivity: 1.0 uV for 6dB S+N/N ratio

Selectivity: Typical 6dB at +17 KHz, 50dB at +50 KHz

Audio output: 100mW into 500 ohms

1.3.2 ELECTRICAL SPECIFICATIONS (Continued)

Glideslope receiver:

Frequency range: 329.150 to 335.00 MHz

Number of channels: 40

Channel spacing: 150 KHz

Sensitivity: 20uV hard

SECTION II

2. INSTALLATION AND OPERATION

2.1. GENERAL

This section contains all necessary installation and operating instructions for the Terra TXN 920.

2.2. PREPARATION FOR USE

Every precaution has been taken to protect your TXN 920 during shipment. Upon receipt of the equipment, perform the following inspections:

1. Remove the unit from the shipping container and visually inspect for damage.
2. Check controls and switches to determine if they may have been damaged.
3. Make sure that all hardware and connectors listed in Section II under "Equipment Supplied" are present.

If the unit is damaged, a claim must be filed with the carrier. Retain the shipping carton and contact Terra Corporation for shipping instructions.

2.3. EQUIPMENT SUPPLIED

1. 1 ea. Terra TXN 920 self-contained Nav/Comm system.
Option #1 - without glideslope
Terra part number..... 0900-0727-00
Option #2 - with glideslope
Terra part number..... 0900-0727-10
2. 1 ea. Mounting Tray (sleeve),
without glideslope
Terra part number..... 1900-1716-00
with glideslope
Terra part number 1900-1716-10
3. 1 ea. Installation Kit
Terra part number..... 1901-2671-10
Consisting of:
4 ea. MCSC 6-32 x 3/8 FHP 100 deg
Terra part number..... 9-2806-063-11
4 ea. Nat Hex 6-32 Std.
Terra part number..... 9-2832-060-00
4 ea. Washer, Int-Shake CBS #6
Terra part number..... 9-2824-060-00
4. 1 ea. Operator's Manual
Terra part number..... 1900-1714-00

2.4. MECHANICAL INSTALLATION

1. Select location that provides ease of operation.
2. Avoid installing the system near heat sources unless forced air cooling is provided.
3. Insure that adequate clearance exists behind the panel for the mounting tray and cable assemblies. A minimum of 11" is recommended.
4. Refer to Terra TXN 920 outline drawings for panel cutout details and mounting dimensions.
5. Install tray assembly on the instrument panel supports with the open side of the mounting tray up and the leading edge of the tray mounted flush with the front of the instrument panel. Comply with the standards set forth in the FAA Aircraft Inspection and Repair Document AC 43.13.2.
6. A rear support bracket should be utilized to prevent resonant vibrations.
7. A 50 ohm broad band VHF communications antenna covering the range of 118.00 to 135.975 MHz and a 50 ohm navigational antenna covering the range of 108.00 to 117.95 MHz is recommended. For glidescope, a 50 ohm glideslope antenna covering the range of 329 to 335 MHz is recommended.
8. Connect the antennas to the Terra TXN 920, using standard 50 ohm coaxial cable such as RG 58A/U. Terminate the cable with BNC coaxial cable connectors as required. CAUTION! Proper installation of the coaxial cable and the antenna as per FAA Aircraft Inspection & Repair Document AC 43.13.2, chapter 3, is very important to prevent possible mismatch of the transmitter output.

2.5. ELECTRICAL INSTALLATION

1. Fabricate the necessary cable assemblies per Drawing #147-0030-000. Comply with standards set forth in FAA Aircraft Inspection & Repair Document AC 43.13.1, Section 7.
2. Install the cable assemblies to the proper position on the connector bracket and then mount them on the rear of the mounting tray assembly.

2.5. ELECTRICAL INSTALLATION (Continued)

3. Complete the interconnecting wiring to the aircraft system.
4. The Terra TXN 920 system operating voltage is 13.75 VDC. If the aircraft electrical system is 28-24 VDC, it will be necessary to utilize a converter rated at 5 amps to reduce the aircraft bus voltage to 13.75 VDC. The Terra MLC 28-5 is specifically designed for this purpose.
5. Install the TXN 920 in the mounting tray assembly. Use caution as the rear connectors mate. After the float mounts are positioned correctly, the unit will fully engage the connectors with light to medium pressure on the front panel.
6. Insert a 7/64" Allen wrench in the front panel hole and engage the locking screw. Turn clockwise until the cam has engaged itself in the tray and moderately tightened. Use caution to prevent stripping the threads on the locking cam or screw.
7. To remove the unit from the mounting tray, insert the 7/64" Allen wrench in the locking screw and turn counterclockwise. The cam will move the unit outwards about 1/4" and disengage the connectors. Turn locking screw several turns in the clockwise direction until it feels loose to disengage the cam. The unit may now be pulled out of the mounting tray by hand.

2.6 OPERATION

Communications

1. Rotate the Comm volume control clockwise to turn on the TXN 920 Comm.
2. Adjust to desired frequency by pressing either upper or lower frequency select switches on Comm.
3. Rotate Comm squelch control until switch clicks into a fully counterclockwise position. This is the automatic squelch mode. No background noise should be heard. Adjusting the squelch control in a clockwise direction activates the manual squelch mode. Rotate the control clockwise until background noise is heard, then rotate it slightly counterclockwise until noise stops.
4. Adjust volume control for desired level during receipt of transmissions.

2.6. OPERATION (Continued)

5. Plug microphone into the aircraft microphone jack.
6. Verify transmitter operation by communicating with another station. Verify at high, middle and low frequency channels if possible.
7. Plug headset into the aircraft headphone jack and observe quality of output. If transmit sidetone and/or intercom is used, verify quality and level in headset.

Nav Receiver

1. Rotate the Nav volume control clockwise to turn on the TXN 920 Nav receiver and external Nav indicator.
2. Adjust to desired frequency by pressing either upper or lower frequency select switches on Nav.
3. Adjust Nav volume control for desired level.
4. Rotate IDENT switch counterclockwise for "voice" reception or clockwise for "IDENT".

SECTION III

3. LIMITED WARRANTY OF TERRA PRODUCTS

All equipment manufactured by TERRA Corporation is guaranteed against defective materials and workmanship for a period of one year from the date of shipment. An extended second and third year limited warranty becomes valid at the end of the first year, which warrants that the original owner will not pay more than \$100.00 in each of the second and third years should repairs be necessary. Should warranty not be required in the second and only in the third year, then the original owner will not pay more than \$200.00 should repairs be necessary. Any unit found to be defective due to material and workmanship during the warranty period will be repaired and put in original manufactured operating condition. Any labor charges which are incurred as a result of said defects are included in this warranty.

TERRA Corporation's liability under this warranty is limited to servicing, repairing, or adjusting any equipment returned prepaid to the factory by express written or oral authorization for that purpose and to repair or replace defective parts thereof. Fuses and batteries are specifically excluded from any liability.

If, upon examination, it is determined that a malfunction has been caused by misuse of the equipment, installation or operation not in accordance with factory instructions, accident or negligent damage, alternations of any manner, or repair by other than the factory, the repairs will be billed. In such cases, an estimate will be submitted for approval before repair is initiated.

This TERRA Corporation Limited Warranty is void unless the Warranty Registration Card is filled out and returned within 10 days after purchase.

Warranty Assurance to the aircraft owner/end-user cannot be maintained if the equipment is not installed in a certified aircraft by an authorized TERRA dealer. Exception, to assure warranty for the aircraft owner/enduser, for homebuilt/experimental aircraft without installation by an authorized TERRA dealer, is allowed when the end-user notifies TERRA that the homebuilt/experimental aircraft has been issued a special airworthiness certificate by the FAA.

3. LIMITED WARRANTY OF TERRA PRODUCTS (Continued)

No warranty will be activated for TERRA products unless the installation is approved and the warranty card is completed by the supplying dealer or upon receipt by TERRA of FAA form(s) 337 or 8130-().

TERRA CORPORATION

THE IMPLIED WARRANTY AND ALL OTHER IMPLIED
WARRANTIES ARE HEREBY EXCLUDED