



**OPERATOR'S MANUAL
MODEL
TPX 720**

VHF PORTABLE TRANSCEIVER



TO OUR CUSTOMER:

You have just received one of the newest and most exciting additions to the TERRA line of fine avionics. Your TPX 720 hand held transceiver is not only versatile, but unique as well. TERRA has cut no corners in the design which has resulted in several engineering breakthroughs. These features have allowed the TPX 720 to remain small and simple, yet retain all the performance you demand from a communications transceiver.

The TPX 720 has been designed with you, the user, in mind. All controls are located on top of the unit for easy access, with the exception of the push-to-talk switch which is on the side for one-hand activation. In addition, jacks are provided for standard aircraft type external microphone and headphones. The TPX 720 is battery operated for true portability and the batteries are rechargeable. Even the antenna is removable for connecting to the aircraft antenna system. All in all, the TPX 720 is truly a versatile and functional aircraft band transceiver.

Should service ever be needed for any reason, the TPX 720 is to be returned prepaid to the factory as follows:

Attention: Customer Service
TERRA Corporation
3520 Pan American Freeway, N.E.
Albuquerque, New Mexico 87107
Telephone: 505-884-2321

TPX 720 SPECIFICATIONS

GENERAL

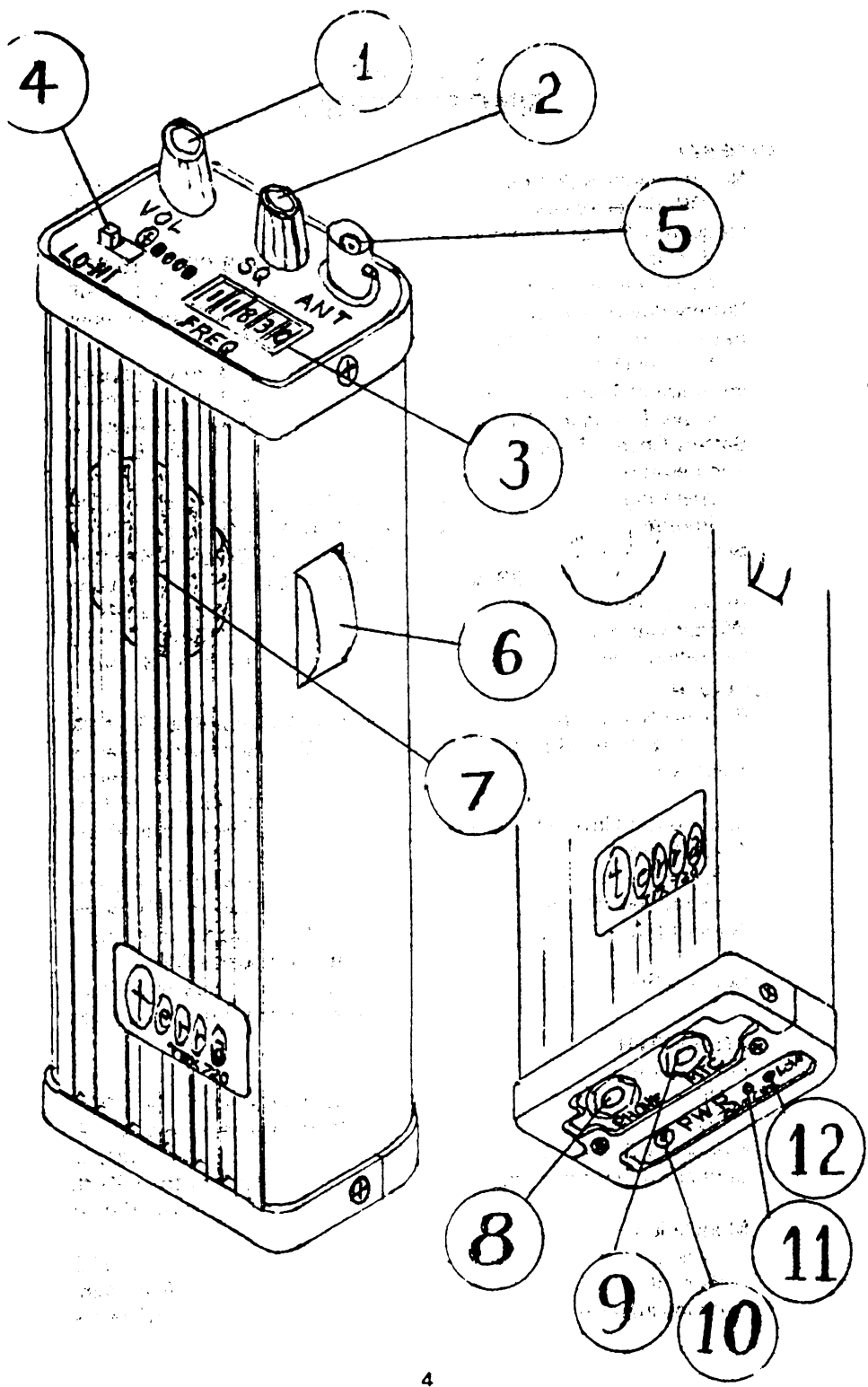
No. of Channels Communication	920
VOR, Receiver Only	200
Frequency Range Communication,	
25 KHz	118.000-135.975
VOR Receiver, 50 KHz	108.00-117.95
Battery Power Supply	10 "AA" Ni Cad Batteries
Battery Life on Each Charge	
Receiver Only	8 Hours Approx.
Intermittent Transmit 10%	4-6 Hours Approx.
Heavy Transmit 30%	2-4 Hours Approx.
Battery Charge Time	12-18 Hours
Temperature	
Operating	-4 °F to +122 °F, -20 °C to +50 °C
Storage	-40 °F to +176 °F, -40 °C to +80 °C
Size	3.27" Wide x 1.9" Deep x 9.5" High, 83mm Wide x 48mm Deep x 241mm Long
Antenna Length	9.25", 234mm
Weight with Batteries	2.1 lbs., 0.95kg
Operating Voltage	11.8 to 13.7 volts

RECEIVER

Receiver Sensitivity	Less than 1 μ V for 6 db (S + N)/N 118 thru 136 MHz; 108 thru 117 MHz Somewhat Greater
Selectivity	25 KHz Bandwidth 60 db at \pm 20 KHz
Spurious and Image Rejection	Greater than 60db
Audio Output	
Speaker Output	.5 watt into 8 ohms
Headphone Output	25mw into 600 ohms
Audio Input	Standard Microphone or Internal Speaker/Microphone
Squelch Sensitivity	3 μ V to 200 μ V Adjustable Carrier AGC Type

TRANSMITTER

Power Output	
HI	2 Watts Carrier (8 watts PEP)
LO	.5 Watts Carrier (2 watts PEP)
Frequency Stability	.002%
Spurious and Harmonics	Greater than 50 db below Carrier
Modulation	
Type	6A3
Percent	80% Min.
Antenna Impedance	50 ohms



CONTROLS

1. Volume/"ON-OFF" Switch: Turns unit "ON" and sets the listening level.
2. Squelch: Adjust squelch level for area of reception.
3. Frequency Selector: Selects desired channel of operation. Example:
118.10 = 118.100
118.12 = 118.125
118.15 = 118.150
118.17 = 118.175
CAUTION: Last digit of Channel Selector switch must NOT indicate a blank space for proper frequency selection and operation.
4. "HI-LO" Switch: Sets the transmitter power output at either 2.0 watts or 0.5 watts to conserve battery charge when possible or desired.
5. Antenna Jack: Standard BNC connector for either the supplied antenna or connection to a 50 ohm impedance transmission line for remote antenna use.
6. Push-to-Talk Switch: Turns off the receiver and turns on the transmitter when pressed.
7. Speaker/Microphone: Dual purpose for portability.
8. Headphone Jack: Disconnects the internal speaker when headphones are used.
9. Microphone Jack: Disconnects the internal speaker/microphone when an external microphone is used.
10. Battery Charger Jack: Should be used only with the charger supplied and only with NiCad batteries.
11. Battery Check Push Button: Test to determine if charging is required (Units manufactured after January 1982).
12. Battery Charge Indicator Light: Lights when battery check push button is pressed if batteries need a charge.

SPECIAL FEATURES

Application of the latest advances in circuit design, and the use of modern miniature components, allows many special features that enhance the versatility of the TPX 720 Transceiver.

Receive and transmit frequencies are digitally synthesized to make 720 communication channels and 200 VOR channels available. Any of these channels can be selected simply by setting the desired frequency on the thumbwheel switches on the control panel. Digital circuitry prohibits transmission on VOR channels and other channels not permitted for communications.

Electronic tuning reduces the weight and insures operating stability. A unique modulation system eliminates the bulky modulation transformer and results in weight and size reduction and reduced battery drain.

The flexible antenna reduces the possibility of personal injury or for antenna damage. The case is of aluminum. It is finished with chrome, blue vinyl and matt finished aluminum, which form an attractive package that weighs slightly more than two pounds (.95 Kg) with batteries installed.

Battery power is conserved wherever possible. A "Hi-Lo" switch allows low power transmit to nearby receivers when greater range is not required. All non-essential circuits operate at reduced drain when the receiver is in the standby (squelched) mode. These circuits demand power only when a signal breaks the squelch or the transmit button is pressed. The conservation of battery power eliminates the need for large, heavy battery packs.

The modern design of the TPX 720 results in a lightweight, portable, hand-held unit with base-station features and performance. The unit may be used with an external microphone, a headset, or earphones. An external antenna, mounted on an aircraft, building or vehicle, and connected by 50-ohm cable may be used in place of the flexible antenna. An optional telescopic antenna is offered as an accessory which may provide greater range of operation.

PREPARATION FOR USE

Your TERRA TPX 720 portable transceiver is shipped with everything necessary for immediate operation on 720 channels; however, a few precautions should be taken:

Remove the unit carefully from the packing material and inspect it for damage that might have occurred in transit. If you should find any physical damage, retain the carton and the packing material and notify TERRA at once.

In addition to the TPX 720 itself, you should find the following accessories:

1. Antenna
2. Battery Charger
3. Warranty Card
4. FCC Forms & License Application*
5. Operator's Manual

If any of these articles are missing or damaged, notify TERRA immediately.

Your TPX 720 battery pack was fully charged at the factory, but some discharge may have occurred in shipment or in storage. Inspect the lower end of your radio. Late models have a battery test circuit. There is a test pushbutton and an indicator lamp. Press the pushbutton. If the lamp lights it indicates that a full charge is necessary. See charging instructions for proper procedures.

If the test lamp does not light or if your radio does not have the battery tester, it is recommended that the battery be charged for about 2 hours before using the radio.

When the unit is fully charged, remove the charger from the jack. Connect the supplied antenna. Turn the squelch control fully clockwise and select a frequency that you know has activity.

OPERATION

To Receive: Turn the volume clockwise until it clicks, then set the volume to a comfortable level. Next, turn the squelch control counter clockwise just until the noise between transmission ceases. Your TPX 720 is now set in standby (squelched) and will activate during received transmissions.

For weak signals, or when using the TPX 720 at long distances, adjust the squelch control so that noise is heard; this provides maximum receiver sensitivity. When using the flexible antenna supplied and the reception is weak, use the external antenna or the optional telescopic antenna to extend the receiving range.

To Transmit: CAUTION: Damage to the transmitter can occur if the transmit button is depressed for long periods if the antenna jack is not connected to an antenna.

*The Federal Communications Commission requires that all transmitters be licensed before operation. We have enclosed Application Forms 404 and 406 for your convenience. Either one or both forms shall be submitted to the Federal Communication Commission.

Select either the "HI" or "LO" position, depending upon proximity to the intended receiver. **Hold the transceiver speaker/microphone three to four inches from your mouth.** Press the push-to-talk switch and listen for a click on the speaker. The click tells you that the transceiver has changed to the transmit mode. **Talk in a normal voice** and release the push-to-talk switch. Again, the click will signal change to the receive mode. Higher battery drain will occur when transmitting in the "HI" position.

External Microphone Operation: The internal microphone is disconnected when an external microphone is plugged into the microphone jack. A noise-cancelling carbon microphone is recommended if the radio

is to be used in high noise locations. Terra offers a suitable microphone or a headset-microphone combination for this purpose. See the accessory listing on page 15 for description.

CAUTION!! This radio is designed for use with a carbon external microphone. Carbon microphones require a polarizing voltage. This voltage may damage transistorized microphones. Terra is not responsible for damage to any external equipment not specifically recommended by Terra.

NOTE: Non-carbon microphones may cause a squeal on the signal during transmission. This is usually caused by transmitted power being picked up by microphone because it is too close to the antenna. An external antenna some distance from the microphone will help eliminate the problem. If that is not possible, a different microphone should be used. A carbon type is recommended.

If distortion of audio is reported during transmissions from your TPX 720, the problem may be caused by holding the microphone too close or by speaking above the normal level of voice. If distortion persists, contact Terra for further information.

Headset Operation: Standard aircraft headsets should be used in high noise environments. Just plug into the headset jack and adjust the volume for proper audio level.

CHARGING

Depending upon the demand placed on the transmitter, the batteries should give between 3 to 6 hours of use before requiring a charge. Radios with the test circuit should be tested frequently after the first 3 hours of use. When the low battery indicator lights, operation should be discontinued and the battery pack should be charged.

Radios that do not have the test circuit should be put

on charge when the radio exhibits performance indicating low batteries.

The charger should be connected to the radio for 14 to 16 hours to insure that the batteries become fully recharged.

CAUTION: Damage to the batteries could result if the charging time exceeds 24 hours by a great deal.

Always remove the charger plug from the jack on the TPX 720 when charging is completed.

The TPX 720 should not be stored in a discharged state nor should it be completely discharged (left on overnight as an example; see caution below) between chargings. Both cases could result in considerably reduced battery life. It is a good practice to fully charge the unit after each use. Overnight charging is ideal.

CAUTION: Never allow the supplied batteries to completely discharge in the "ON" position for over 6 hours. If this should happen turn radio "OFF" and let the batteries rest for 12 to 24 hours. Then charge for at least 24 hours. Should the batteries fail to take a charge, replace the batteries or return the TPX 720 transceiver to TERRA Corporation for replacement of the batteries.

NOTICE

Operating the Terra TPX series of radios continuously with the charger plugged in will not damage or cause any loss of performance. However, due to the current drain of the radio when operated with the charger plugged in, the batteries will eventually (24 to 48 hours of continuous operation) discharge.

The TPX radio will normally receive properly on a low or discharged battery, however, when one wishes to transmit, the current drain is increased nearly ten times, causing the battery voltage to drop below the designed operating level resulting in your transmissions being reported "weak," "garbled," or "unreadable."

To assure that the batteries are fully charged you should always allow at least 12 to 14 hours of charging with the radio turned "OFF."

BATTERY REPLACEMENT

Remove the two Phillips head screws on the bottom of the radio. Be careful not to lose them. Pull the battery pack (part with the power jack) slowly out of the radio. Disconnect the polarized connector when it is accessible. Replace the pack with another fully charged assembly and reassemble the unit taking care to connect the pack to the radio and not to damage the connector and wires.

If it is necessary to replace the batteries, remove the nut on the hold down clip and remove the clip and the plastic battery holder. Remove the batteries. Install a new set of AA size Ni-Cad batteries. Be careful to install them in proper polarity. There are markings in the compartments of the plastic holder. The bottom or base end (-) is installed against the spring, the top or terminal end (+) is installed against the button terminal or rivet. Reassemble battery pack and reinstall it in the radio unit.

CAUTION! Ni-Cad batteries are capable of heavy discharge currents. An inadvertent short circuit can damage the battery pack or unit. Do not dispose of Ni-Cad batteries in a fire. Do not cut apart, cadmium is highly toxic!

NOTE: Most rechargeable batteries when installed should be charged for a minimum period of 14 hours and cycled two to three times before they are fully active.

SERVICING













Should anything go wrong with your TPX 720, it should be returned prepaid to TERRA Corporation with a note explaining the problem. We will repair the unit and return it within 48 hours.

ACCESSORIES

Should any special accessories be desired please contact TERRA Corporation. Many special adaptations are possible and can be supplied on request. A few are listed on the following page:

1. Batteries
2. Battery Pack Assembly
3. Cigar Lighter Charger/Adapter, 14V DC
4. Carrying Case, Padded Vinyl
5. Combination Boom Mike and Headset
6. Headset
7. Holster, Leather
8. Manuals
9. Microphone
10. Antenna, Telescope
11. Vehicle Magnetic Antenna
12. 1020 Hz Tone Oscillator
13. 28 to 14V DC Cigar Lighter Converter

TPX 720 ACCESSORIES

	DESCRIPTION	PART NUMBER
	ADAPTOR Cigarette lighter; for operating the TPX 720 from auto or aircraft 12 to 14 volt electrical systems.	0900-0721-21
	ANTENNA TA 100 flexible rubber for 118 thru 136 MHz. Has BNC quick disconnect connector.	1900-0160-10
	BATTERY Size "AA" Penlite nickel cadmium (Ni Cad), 10 required for TPX 720.	9-4001-007-00
	CARRYING HOLSTER Leather; 100% top grain cowhide for carrying on belt. Unit is open for ease of operation.	0900-1832-21
	CASE Completely covers unit yet allows for easy operation while it protects the TPX 720 from weather and abuse.	0900-1832-11
	CHARGER In-line battery charger for 120V AC. In-line battery charger for 220V AC for foreign use.	1901-0120-01 1901-0120-21
	HEADSET with dual magnetic receivers.	0900-0201-01
	HEADSET/MICROPHONE with dual magnetic receivers and noise cancelling carbon boom microphone.	0900-0201-11
	MICROPHONE Carbon, noise cancelling; includes mike hanger and hardware; has right angle plug.	0900-0151-01
	OPERATORS MANUAL Describes the "care and feeding" of the TPX 720. Overhaul maintenance manual.	1900-0720-11 1900-0720-21
	PUSH-TO-TALK SWITCH Attaches to any stick or control wheel for convenience.	0900-0203-01
	STRAP Shoulder; for use on carrying holster or with carrying case.	0900-1831-31

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LIMITED WARRANTY OF TERRA PRODUCTS

The TPX 720 equipment delivered with this stated warranty is manufactured by TERRA Corporation and is guaranteed against defective materials and workmanship for a period of one year from date of shipment. A second and third year 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. 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 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. Tubes, transistors, 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, alterations of any manner, or repair by other than the factory, the repairs will be billed at cost. 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.

**THE IMPLIED WARRANTY AND ALL OTHER IMPLIED
WARRANTIES ARE HEREBY EXCLUDED.**

JULY 1, 1982

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Tel.: 505-884-2321

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