2 Product Description

2.1 Chapter Overview

This chapter provides an overall description of the STRATA TX System, its components, and its capabilities.

Here are the topics covered:

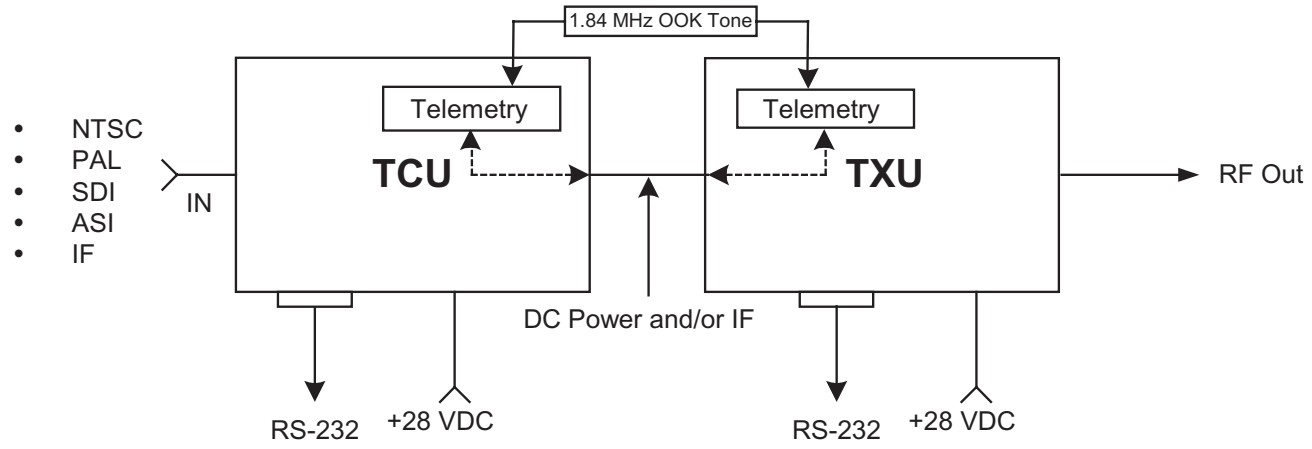
2.2 System Description

The STRATA TX System is a highly reliable, flexible, and compact portable microwave transmitter system ideal for tripod, airborne, or mobile installations. A typical STRATA TX System is composed of the Transmitter Unit (TXU) and the Transmitter Control Unit (TCU), as shown in Figure 2-1 on page 2-2. This modular architecture allows you the maximum flexibility in configuration, siting, and operation.

The STRATA TX System key features are:

- Analog, Digital, or Analog/Digital Switchable
- MPEG Encoding (4:2:0, 4:2:2)
- COFDM Modulation with Selectable Guard Band Interval
- Digital Modulation for QPSK, 16 QAM, and 64 QAM
- NTSC or PAL Modulation with Audio (4 mono or 2 stereo)
- Tripod, Half Rack, or Full Rack Mounts
- Front Panel Local Control
- Remote Control
- Bands from 3.4 to 13.25 GHz

Figure 2-1: STRATA TX System Block Diagram



The STRATA TX System TXU and the TCU may be operated in stand-alone configurations depending upon specific video applications.

2.2.1 System Options

The STRATA TX System can be ordered configured for 1 of 11 specific RF bands as follows:

- 3.4 to 3.9 GHz
- 4.4 to 5.0 GHz
- 6.4 to 7.1 GHz
- 6.9 to 7.5 GHz
- 7.4 to 8.1 GHz
- 7.8 to 8.5 GHz
- 8.2 to 8.9 GHz
- 10.0 to 10.7 GHz
- 10.5 to 11.2 GHz
- 10.8 to 11.5 GHz
- 12.7 to 13.25 GHz

MRC is constantly working to expand and upgrade the capabilities of the STRATA TX System. Consult your Sales Representative or contact the factory for the latest band availability.

The STRATA TX System (typically) consists of the following components:

TXU The Transmitter Unit (TXU) can be equipped with either an FM Modulator or COFDM/MPEG module, but not both. A High Power Unit (HPU) is also contained within the TXU housing to increase RF power output.

TCU The Transmitter Control Unit (TCU) can be equipped with either an FM Modulator or COFDM/MPEG module, or both.

ACU The optional AC to DC Power Converter (ACU) provides +28 VDC power from an AC power source to power one or more units in a system.

Remote Control Panels Optional Remote Control Panels are available to allow remote control of the STRATA TX System from an instrument panel during airborne or mobile operations.

2.2.2 Single Unit Systems

The TXU or TCU may be used independently in single-unit applications as follows:

- The TXU may be used as a stand-alone transmitter accepting an IF input.
- The TXU may be used as a stand-alone transmitter featuring FMT modulation or MPEG and COFDM.
- The TCU may be used as a stand-alone unit used for FMT modulation or MPEG and COFDM, or both FMT modulation and MPEG and COFDM.

2.2.3 Multi-Unit Systems

The TXU and TCU can be configured as part of an integrated system as follows:

- The TCU may contain the FMT modulator and MPEG/COFDM module supplying an IF signal to a TXU containing only the RF transmitter.
- The TXU may contain the RF modulator or MPEG/COFDM module supplying an RF signal directly to the transmitter antenna.
- The TCU can be separated from the TXU in applications where the transmitter needs to be placed in another location.

2.2.4 Remote Control Options

For portable mobile or airborne operations, the STRATA TX System may be controlled by one of two models of Remote Control Panels. The Remote Control Panels are mounted in mobile racks or aircraft instrument panels and are connected via an RS-232 cable between the Remote Control Panel and the STRATA TX System.

2.2.5 Antenna and Power Options

The flexible architecture of the STRATA TX System allows a number of options for both the transmit antenna and the power.

Antenna Options The STRATA TX System is fully compatible with the MRC family of transmit antennas, including:

- OmniPole omnidirectional
- Megahorn compact horn
- SectorScan flat panel
- MicroScan parabolic
- Ellipse parabolic

Contact your Sales Representative to explore the wide array of antenna choices available.

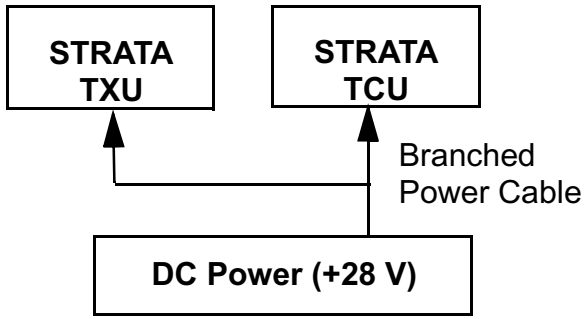
CAUTION	*To prevent damage to your STRATA TX System, MRC recommends using a +28 VDC power supply. Do not exceed +36 VDC input power or damage will occur.*

Power Options The STRATA TX System configurations operate on +28 VDC power, supplied externally. This DC power can be supplied by the optional STRATA ACU, or from another DC power source. Contact your Sales Representative for the latest details.

Note	A TCU and TXU are defined as being “co-located” when the TXU and TCU are physically separated by not greater than 6 feet.

If the TXU and TCU are co-located, power must be supplied to each unit through their individual power connectors from the same power source. See Figure 2-2. Do not use DC on coax to power the TXU or TCU when the units are co-located.

Figure 2-2: Powering the TXU and TCU Independently



If your installation calls for separating the TXU and TCU, the TXU is powered by DC supplied by the TCU or the TCU is powered by DC supplied by the TXU. The DC power is superimposed on the coaxial cable connected between the units. See Figure 2-3 and Figure 2-4.

The DC input voltage to the unit co-located with the DC power supply must be greater than +24 VDC.

Refer to the “Installation” Chapter on page 6-1 (part of the STRATA TX Technical Reference Manual only) for additional information.

For those applications that use a TCU in a standalone mode, i.e., to generate ASI or DVB-S signals, DC power from the TCU to the TXU or from the TXU to the TCU cannot be used.

Figure 2-3: Powering the TXU from the TCU

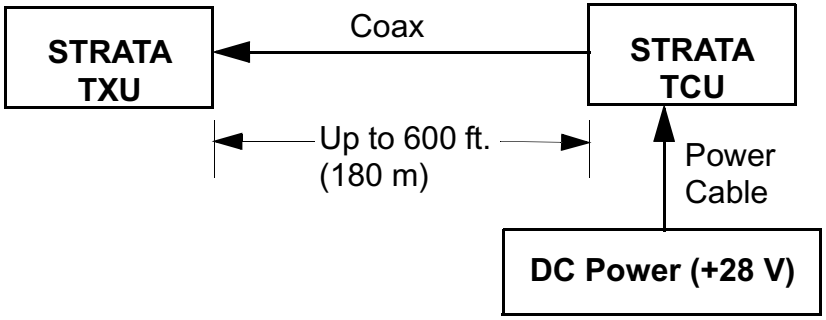
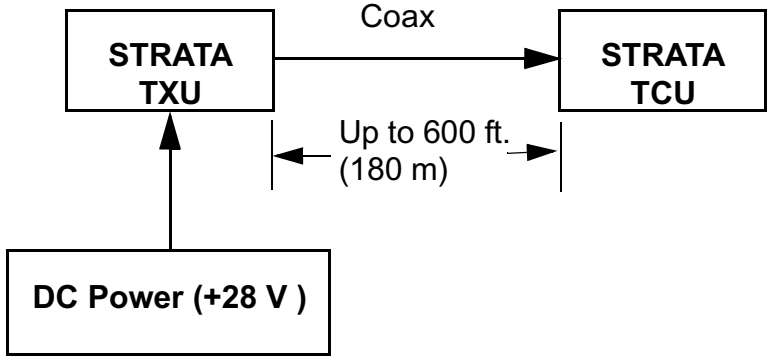


Figure 2-4: Powering the TCU from the TXU



DC power superimposed on the coaxial cable between a TCU and a TXU can be supplied from either the TCU or TXU, depending upon the location of the DC power supply. Coaxial cable length/voltage limitations exist when powering from either the TXU or TCU. These limitations are based on cable size, DC voltage input, cable resistance, and cable length. A maximum length of 600 feet (180 meters) between the TXU and TCU is supported. Contact MRC Technical Support for more information on cable requirements.

DC power required for a STRATA TX System depends upon the TX System configuration, i.e., if the TXU or TCU are operated in a standalone mode, if the TXU and TCU are co-located, or if the TXU and TCU are mounted in separate locations. See Figure 2-5 on page 2-6 for the various STRATA TX System configurations available.

For TX Systems that use DC power sources other than a STRATA ACU, contact MRC Technical Support for additional power information.

2.2.6 Mounting and Deployment Options

The STRATA TX offers a number of options for either mobile or portable applications.

For more details on installation of the STRATA TX in various applications, see the "Installation" Chapter on page 6-1 (part of the STRATA TX Technical Reference Manual only).

Mobile Installation For mobile applications such as in a vehicle or in an aircraft, the STRATA TX System is usually mounted in an MRC fixed mounting bracket and is installed in a bulkhead or compartment. The cabling is permanently installed and power comes from aircraft or vehicle power.

Portable Deployment In portable applications, the STRATA TX System will be moved from place to place and set up each time. The TXU and TCU will usually be mounted in a MRC universal mounting bracket. The bracket is attached to a tripod using a mounting plate and quick release.

The cabling between the TXU and TCU is typically left in place and the power, antenna, and audio/video connections are removed at the end of each deployment.

2.2.7 System Integration

System Communication When the TXU and TCU are connected, they automatically communicate via signals superimposed on the coaxial cable between the two units. This allows them to share information on installed hardware, preset configurations, current status, and alarms.

System Operation Once the TXU and TCU are connected and communicating, the units work seamlessly together. System settings can be selected and modified from the front panel of either unit, regardless of which unit holds the hardware being configured.

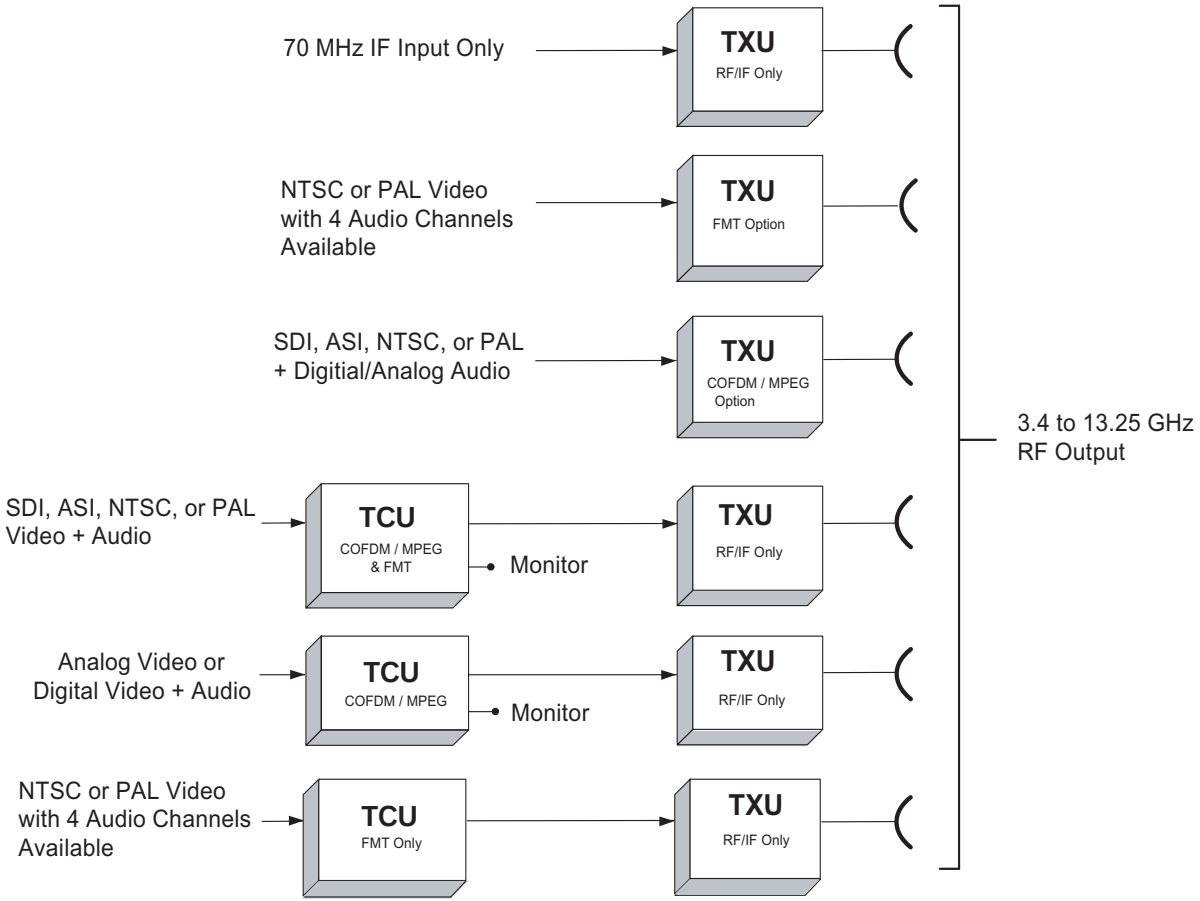
System Configuration The STRATA TX System offers two levels of system configuration, designed to match the needs of different personnel.

For the field operator, the STRATA TX System has up to 9 Presets that can be selected from the front panel. Each Preset controls key parameters such as modulation, frequency, and audio and video settings. Additional settings that are front panel-controlled include band, channel, offset, and filtering.

For the advanced operator and technical staff, the STRATA TX Configurator software allows complete control of all parameters in the STRATA TX System. The STRATA TX Configurator software runs on a Windows-based PC and connects to either the TXU or the TCU via an RS-232 serial interface cable.

Interfacing a PC to either the TXU or TCU in a connected system gives you complete control of both units. You can read the current settings, program new settings, or return the units to their factory default settings. The STRATA TX Configurator software automatically detects what hardware is installed in the system and assigns the appropriate configuration to the correct hardware, regardless of which unit holds the hardware being configured.

Figure 2-5: STRATA TX System Options



2.3 System Components

This section will provide more details about each the components of a STRATA TX System:

- STRATA TXU
- STRATA TCU
- STRATA ACU
- STRATA Remote Control Panels

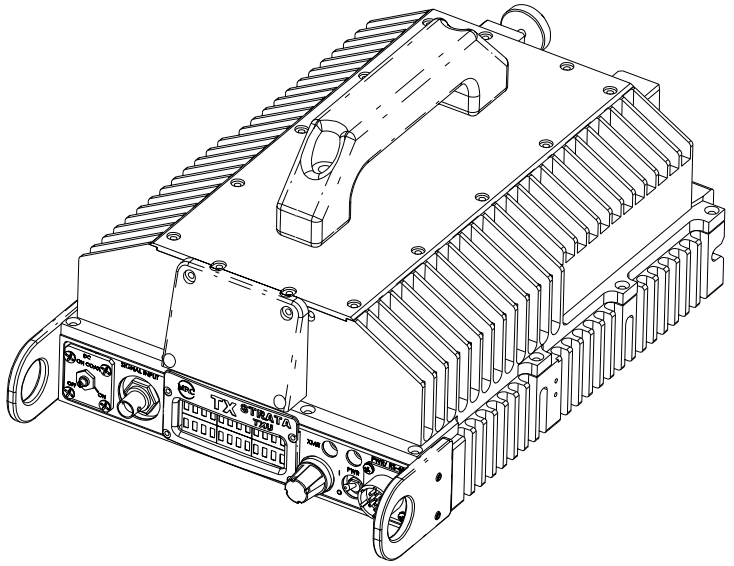
For details on connections between the STRATA TX System components, refer to the “Installation” chapter (part of the STRATA TX Technical Reference Manual only).

2.3.1 STRATA TXU

The TXU (Figure 2-6) always contains an IF/RF module that accepts either a 70 MHz COFDM, FMT IF, or external 70 MHz input signal and up-converts these signals to the required RF band. The RF frequency synthesizer circuit included in the IF/RF unit, in conjunction with the command and control power supply module, provides the means to channelize RF video and audio signals in the TX System RF band.

The TXU, with either an analog (FMT) or digital (MPEG/COFDM) module, is integrated in the same housing as the HPU components. This provides the ability to incorporate high RF power output (12 watts of saturated RF power) into a single analog or digital transmitter assembly.

Figure 2-6: STRATA TXU



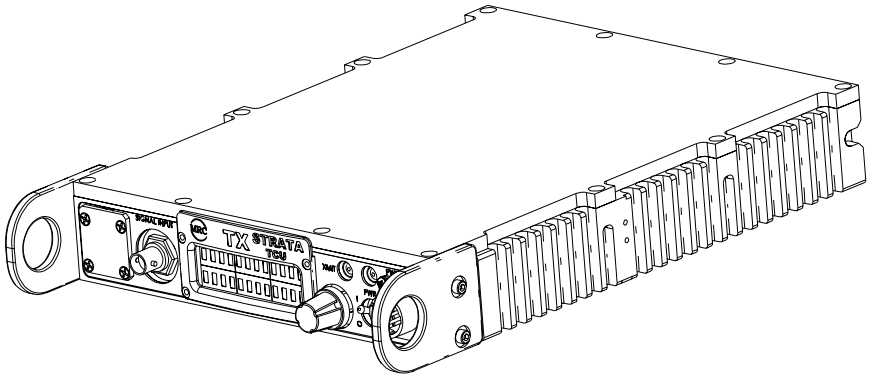
Standard U.S. FCC band plans, as well as customer-created channel plans, may be customized using the STRATA TX Configurator software.

As noted previously, the TXU may also include either an MPEG/CODFM or FMT module (but not both), in which case the TXU serves as a stand-alone digital or analog video microwave transmission system.

2.3.2 STRATA TCU

The TCU (Figure 2-7 on page 2-8) may contain either analog or digital or both analog and digital video modulation modules. Where an application might initially employ only analog video transmission but expects to migrate to dual, switchable, analog and digital operation, the TCU may be upgraded to add the MPEG/COFDM module to add this capability.

Figure 2-7: STRATA TCU



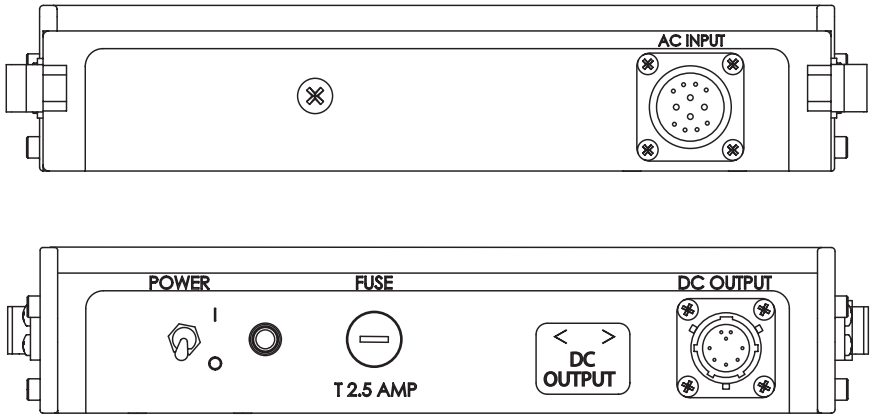
Where only digital or analog video transmission is desired, the MPEG/COFDM or FMT modules may be installed in a TXU, thereby eliminating the need for a TCU. The STRATA TX design does not permit splitting digital and analog video modulator modules between a TXU and a TCU.

A TCU may also consist of a stand-alone configuration whereby either or both MPEG/COFDM and FMT modules may be used independent of the TXU. This configuration permits use of a TCU equipped with analog and/or digital video modulation modules for a variety of signal input and output configurations, including a digital option using NTSC or PAL composite video input and ASI (digital) signal output.

2.3.3 STRATA ACU

For fixed or portable deployment applications, the STRATA TX System may be powered by the optional AC to DC Converter (ACU). Figure 2-8.

Figure 2-8: AC to DC Converter



The ACU installs as part of an integrated stack for either tripod or fixed applications. The ACU may also be used to power the TXU or TCU only when a TXU and TCU are not co-located. In this case, the TXU would receive DC power from the TCU or the TCU would receive DC power from the TXU superimposed on the coaxial cable connected between the units.

In standalone TXU or TCU operations, the optional ACU may be used to supply DC power directly to the applicable unit. In the case where a TXU and a TCU are co-located, it is recommended that both the TXU and TCU be powered directly from the ACU in lieu of supplying DC power from the TCU to the TXU or from the TXU to the TCU via the coaxial cable connected between the units.

2.3.4 STRATA Remote Control Panels

For mobile or airborne operations, two Remote Control Panel models are currently available. Contact your Sales Representative for the latest information.

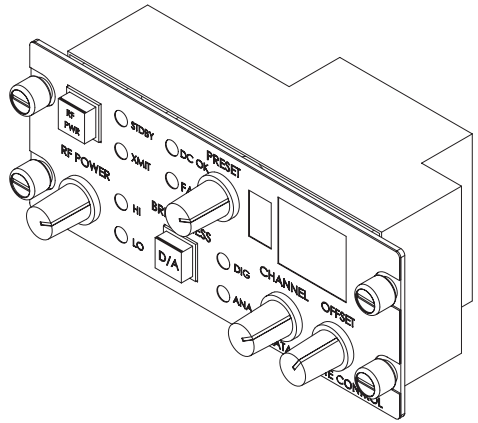
Both Remote Control Panel models provide simplified transmit

operations by allowing the operator or pilot to select either analog or digital pre-configured Presets, Channels, and Offsets, depending upon the required operating mode.

Standard Remote Control Panel The standard STRATA Remote Control Panel (Figure 2-9) provides instrument panel remote control of the STRATA TX System for mobile operations and features 9 selectable Presets.

For additional information, refer to the STRATA Remote Control Panel Operator's Guide (part no. 400489).

Figure 2-9: Standard Remote Control Panel

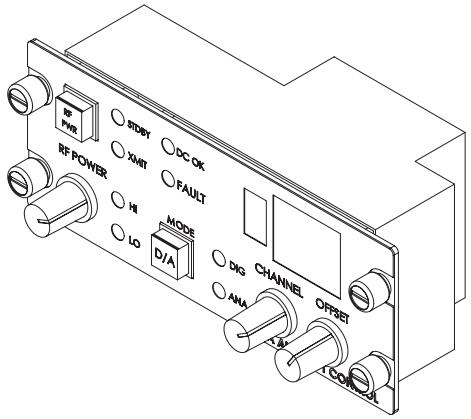


Aircraft Remote Control Panel The STRATA Aircraft Remote Control Panel (Figure 2-10) is a simplified version of the standard STRATA Remote Control Panel. This panel provides instrument panel remote control of the STRATA TX System for airborne operations. This model features only two Presets for ease of operation.

The unit is designed to fit a standard aircraft instrument panel and provides user-friendly controls, combined with well placed and easy to read LED displays and color indicators.

For additional information, refer to the STRATA Aircraft Remote Control Panel Operator's Guide (part no. 400490).

Figure 2-10: Aircraft Remote Control Panel



2.4 TXU and TCU Configurations

TXU Different configurations of the TXU are available, depending upon if your TX System contains a standalone TXU or if your TX System contains both a TXU and TCU. The different configurations are described below.

If your TXU is equipped with either an analog (FMT) module or a digital (MPEG/COFDM) module and was ordered to operate in a standalone mode without a TCU, the front panel will contain an **AUDIO** connector. See Figure 2-11 on page 2-10.

Figure 2-11: Standalone TXU Configuration

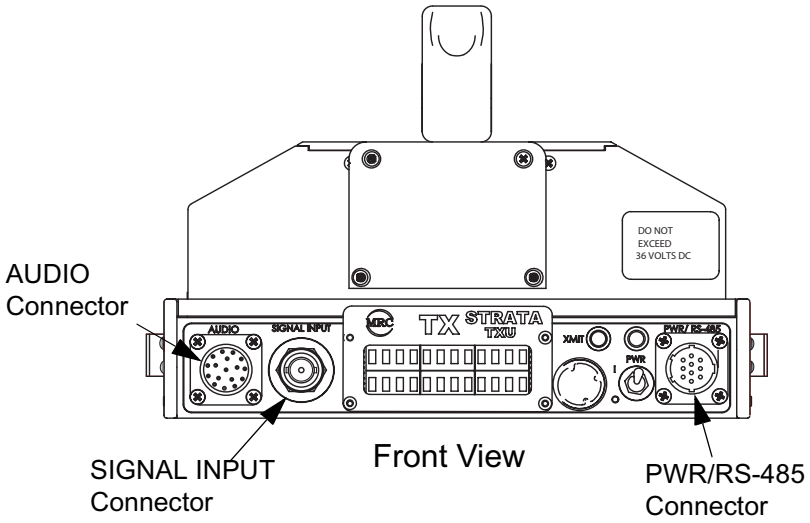
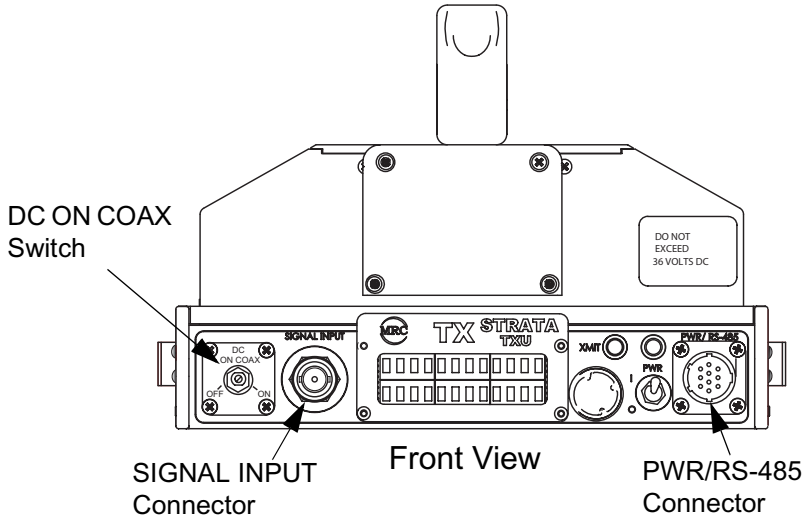
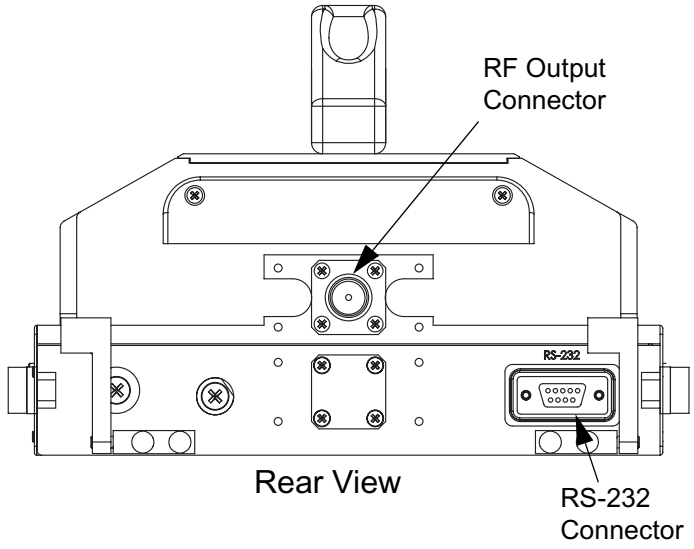


Figure 2-12: TXU - TXU with TCU Configuration





If your TXU was ordered to operate with a TCU, it will not contain either analog or digital modules and will therefore not contain an **AUDIO** connector. The **AUDIO** connector is replaced by a **DC ON COAX** switch. See Figure 2-12.

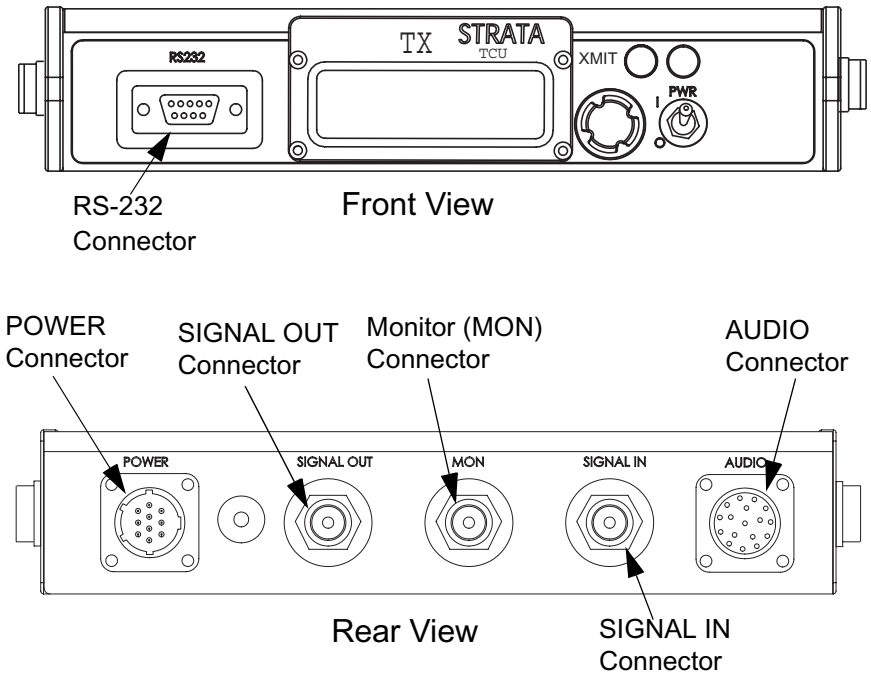
The **DC ON COAX** switch allows manual control of DC power to the TXU from the TCU or from the TCU to the TXU via DC power superimposed on the coaxial cable connected between the two units.

The rear of the TXU is identical on both configurations of the TXU, as shown in Figure 2-12.

TCU Several different configurations of the TCU also exist as the result of technical updates. Configuration differences are described below.

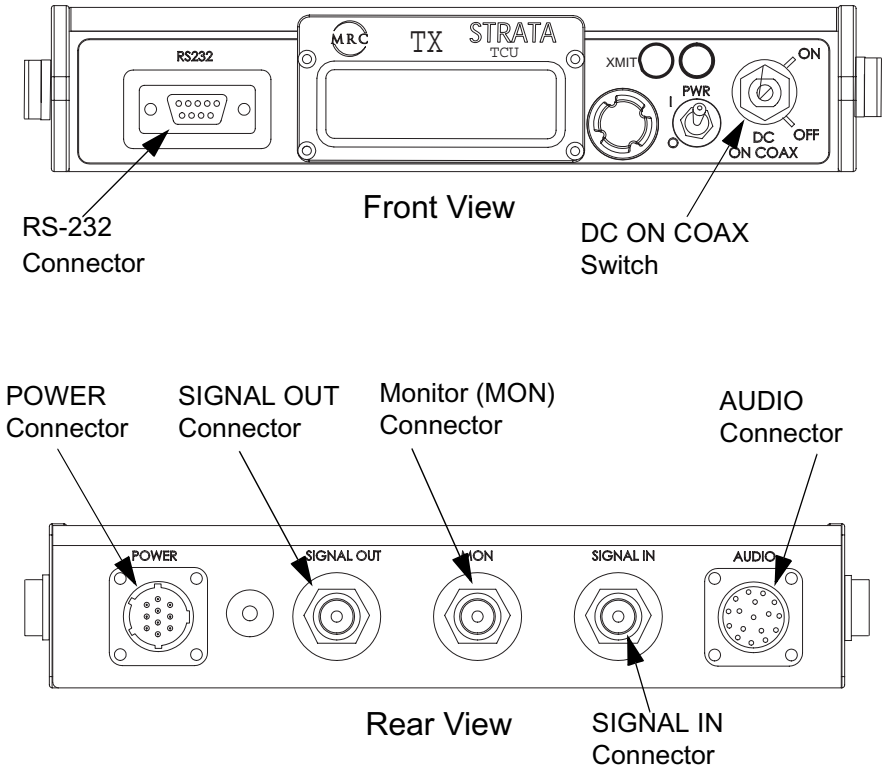
TCU - Older Configuration If your TCU is an older configuration, the controls and connectors contained on the TCU are similar to those shown in Figure 2-13. Older configurations do not contain the front panel **DC ON COAX** override switch to provide manual control of DC power to a TXU.

Figure 2-13: TCU - Older Configuration



TCU - Newer Configuration If your TCU is the newer configuration, the controls and connectors contained on the TCU are similar to those shown in Figure 2-14. A **DC ON COAX** switch is located on the front panel to provide manual control of DC power to a TXU.

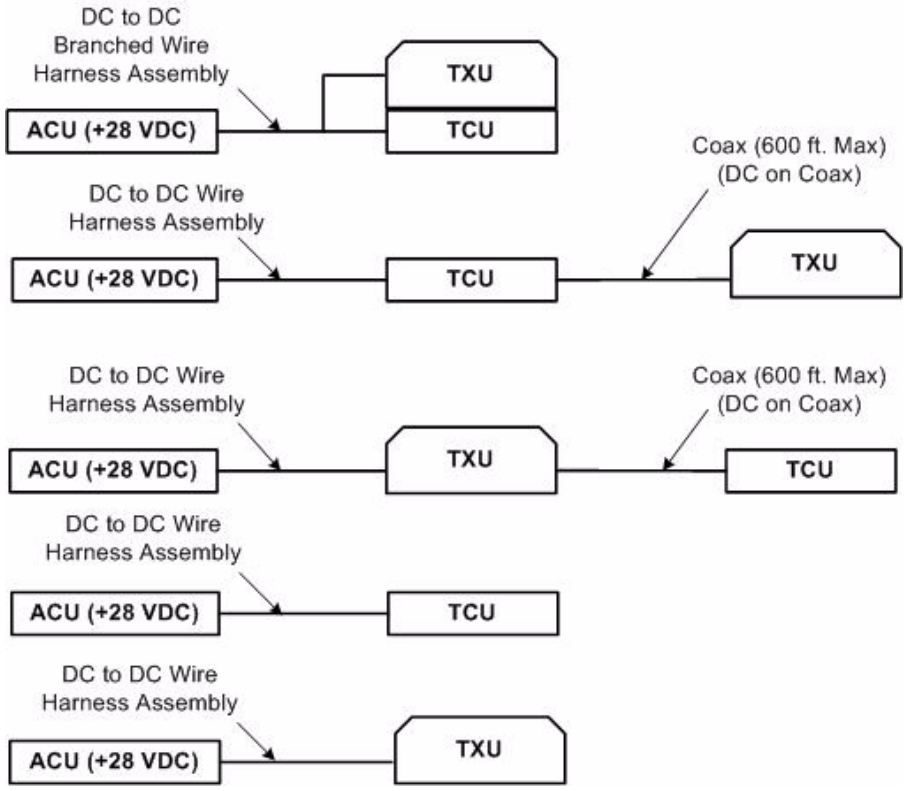
Figure 2-14: TCU - Newer Configuration



2.5 Typical System Configurations

Typical STRATA TX System configurations are shown in Figure 2-15.

Figure 2-15: STRATA TX System Configurations



2.6 For More Information

Additional detailed technical information about the STRATA TX System is contained in the STRATA TX Technical Reference Manual. Specific topics contained in the Technical Reference Manual are listed below:

Topic	Chapter
Installation	See Chapter 6, “Installation”
Connections to other equipment	See Chapter 6, “Installation”
Changing settings using the Configurator software	See Chapter 5, “Advanced Operation”
Block Diagram	See Chapter 9, “Theory of Operation”
Supported Repairs	See Chapter 7, “Repair”
Repair Parts	See Chapter 8, “Replacement Parts”