MTX5000

Transmitter System

MRC
VISLINK GROUP

User and Technical Manual

Manual Part No. 400591-1 Rev. A June 2009

NOTE TO USER

Overview

The MTX5000 Transmitter System (MTX5000) is a state-of-the-art transmitter system. The MTX5000 Indoor Unit (IDU) contains a central processor used to control all functions and operations of the system. To avoid potential software hang-ups or software corruption, please read and follow the guidelines contained in the following paragraphs.

Avoid Potential Operational Problems

Information contained in the following paragraphs identify potential problems that can be avoided by reading and following the operating procedures provided in this manual.

To avoid potential operational problems, please review the information contained in the "Routine Operation" Chapter on page 3-1. The Routine Operation Chapter contains step-by-step procedures that, when performed correctly, will eliminate potential problems that could be caused by operator error or by lack of experience with the MTX5000 system.

Radio Unable to Transmit or Generally Unstable

- If the radio is unable to transmit or is generally unstable, perform "Select Preset" on page 3-24 to select or re-select the proper Preset. Then verify proper transmitter operation by transmitting and receiving.
- If the radio remains unstable, it may be necessary to cycle power off and on. See "Powering the MTX5000 System" on page 3-7 to power down and power up the MTX5000. ***Always wait a minimum of 10 seconds between powering the radio down and then powering the radio up again.***
- After cycling power to off and back to on, perform "Select Preset" on page 3-24 to select the proper Preset. Then verify proper transmitter operation by transmitting and receiving.
- If the radio is still unable to transmit or remains unstable, contact MRC Technical Support for assistance.

Improper Power Up/Power Down

If the radio is unable to transmit, is unstable, or if the software appears to be corrupted, the Preset may have been selected or changed too soon after power was applied or the wrong Preset was selected.

- Always wait a minimum of 5 seconds after the Main screen is displayed following power up before selecting a Preset.
- If the wrong Preset is selected, you must wait a minimum of 5 seconds before attempting to select another Preset. Failure to wait 5 seconds minimum between Preset selections will cause software hang-ups.

If the radio is unable to transmit, is unstable, or if the software appears to be corrupted, power to the radio may have been removed and reapplied too quickly.

The MTX5000 central processor requires a minimum of 10 seconds to properly shutdown to avoid possible software corruption.

- Software corruption can occur if the external input power to the radio was momentarily lost and was then reapplied without waiting a minimum of 10 seconds between loss of power and reapplication of input power.
- The problem may also occur if the power switch was pressed to off and back to on without waiting a minimum of 10 seconds.
- ***To avoid problems, always wait a minimum of 10 seconds between removal or loss of power and reapplication of power to the radio.***
- The problem may also occur if the progress bar was displayed when power was removed from the radio. ***Always ensure the progress bar is not displayed on the color LCD display panel when power is removed from the radio.***

If this problem has occurred, press the power switch to off, wait 10 seconds minimum, and press the power switch to on. The internal processor will attempt to perform a self-recovery of the software.

- During the software recovery attempt, a progress bar will be displayed on the color LCD display panel indicating the progress of the process. This progress bar will take more time to reach 100% than during a normal power up.
- ***Do not become impatient during the software recovery process due to the time it may take for recovery. Do not remove and reapply power while the progress bar is displayed during the software self-recovery process. Software corruption will occur!***
- When the power up is complete and the Main screen is displayed on the color LCD display panel, verify proper transmitter operation by transmitting and receiving.
- If the software is corrupted and the Main screen is not displayed, contact MRC Technical Support for assistance.

Radio State Incorrect

If the radio state is incorrect, the correct Preset may not have been selected. Select the proper Preset per “Select Preset” on page 3-24.

PA Voltage Adjust Setup Software Hang-up

When performing “Perform PA Voltage Adjust Setup” on page 3-44, ensure the Outdoor Unit (ODU) is properly connected to the IDU. If the ODU is not connected to the IDU and you attempt to perform this procedure, the software will hang up.

- ***To avoid software hang-up, always ensure the ODU is connected to the IDU when performing the PA Voltage Adjust Setup procedure.***
- Check the Main screen **ODU** status indicator. If a major fault exists in the ODU, do not perform the PA Voltage Adjust Setup procedure until the fault has been corrected or until the ODU is connected to the IDU.
- If the ODU is not connected to the IDU or if the ODU has suffered a failure, the PA Voltage Adjust Setup Screen will remain displayed on the color LCD display panel if the PA Voltage Adjust Setup screen **Start** option button is selected.

If the software hangs up due to the ODU not being connected to the IDU or if the ODU has failed, perform the following:

- Press the power switch to off.
- Connect the ODU to the IDU or go to “Troubleshooting” on page 4-1 to correct the fault.

- Press the power switch to on, perform “Select Preset” on page 3-24 to select the proper Preset.
- “Perform PA Voltage Adjust Setup” on page 3-44 and then verify proper transmitter operation by transmitting and receiving.

RF Levels Too High

If the transmitted RF levels are too high, “Perform RF Level Adjust” on page 3-49.

Software Recovery

If the software becomes corrupted, the MTX5000 IDU will attempt to self-recover the software. During the software self-recovery, the previously configured parameters may be recovered - not the latest parameters. This may happen if a fault occurs when installing software updates.

If the software becomes corrupted, press the power switch to off, wait 10 seconds minimum, and press the power switch to on. The internal processor will attempt to perform a self-recovery of the software.

- During the software recovery attempt, a progress bar will be displayed on the color LCD display panel indicating the progress of the recovery process. This progress bar may take considerably more time to reach 100% than during a normal power up.
- ***Do not become impatient during the software recovery process due to the time it may take for recovery. Do not remove and reapply power while the progress bar is displayed during the software recovery process. Software corruption will occur!***
- When the power up is complete and the Main screen is displayed on the color LCD display panel, you may need to perform “Select Preset” on page 3-24. Then verify proper transmitter operation by transmitting and receiving.

If the software is no longer corrupted, perform “Firmware Update” on page 5-114 to verify that you have the latest software installed in your MTX5000 IDU. Update the software, as required.

If the software is corrupted or if the Main screen is not displayed, contact MRC Technical Support for assistance.

Color Bar Generator Operations

All MTX5000 Indoor Units (IDU) contain a built-in digital Color Bar Generator (CBG) as standard equipment. The IDU is also available with an optional analog CBG. Potential operator problems can occur when using the optional analog CBG or the built-in digital CBG.

Potential operator-induced problems may include the following:

- Selection of the CBG **On** operating mode during test, troubleshooting, or CBG setup and failure to select the **Off**, **A Gen**, or **A Stby** operating mode for normal operation when test, troubleshooting, or CBG setup is completed.
- Selection of the CBG **On**, **A Gen**, or **A Stby** operating mode when the optional Analog Color Bar Generator is not installed in the MTX5000 IDU.

To avoid potential operator problems that can impact operation of the MTX5000 System, the following information is provided:

- The optional analog CBG and the digital CBG both include **Off**, **On**, **A Gen** (Auto Generated), or **A Stby** (Auto Standby) operating mode options.
- The CBG mode should only be set to the **On** operating mode for test, troubleshooting, or for setup of the

applicable Color Bar Generator.

- During normal operation, the CBG **Off**, **A Gen**, or **A Stby** operating mode must be selected for proper operation and video transmission.
- CBG operating modes are not Preset-specific or mode-specific. If your IDU contains the optional analog CBG and you select the **Off**, **A Gen**, or **A Stby** operating mode for an analog Preset, the selected option is applicable for all analog Presets, as well as for all digital Presets.
- If the CBG **On** operating mode is selected, the output of the MTX5000 IDU will be color bars only, not video, regardless if an analog or a digital Preset is selected.

  When color bars are set to **On** (enabled), color bars take priority over all analog and digital Preset settings.
- If the IDU output consists of color bars only, please verify that the analog and/or digital CBG operation mode is not set to **On** before you call customer service. The problem may be nothing more than having selected the **On** operating mode.

  Perform "Select Color Bar Generator Mode" on page 3-52 to select the **Off**, **A Gen**, or **A Stby** operating mode.
- It is possible to select analog CBG options if you do not have the optional CBG installed in your MTX5000 IDU, but the options are not active and will result in transmission problems.
- ***Be careful when setting CBG options if you do not have the optional analog CBG installed.***
- If you attempt to set the CBG operating mode to **On**, **A Gen**, or **A Stby** and you do not have the optional analog CBG installed in your MTX5000 IDU, you will have a blank screen displayed for analog Presets. Before calling Customer Service, please verify that the analog CBG operating mode has not been set to **On**.

  Go to "Select Color Bar Generator Mode" on page 3-52 and select the **Off**, **A Gen**, or **A Stby** operation mode.
- When utilizing a digital Preset with an ASI video input and the digital CBG option setting is **A Gen** or **A Stby**, loss of the ASI video input will not display color bars or will not change the MTX5000 IDU operation to standby indicating loss of the ASI signal. This is normal operation for ASI video loss.

Using the Color LCD Display Panel Touch Screen

CAUTION ***Avoid damage to the color LCD display panel!***

The color LCD display panel touch screen may be damaged if a sharp, hard-pointed object, such as a pencil or a pen, is used to select the displayed options.

Touch screen options must only be selected using your fingers, a soft-pointed stylus, or the front panel function keys.

Damage to the color LCD display panel caused by using a hard-pointed object or other misuse may void your warranty on the MTX5000 IDU.

Whenever you use the MTX5000 IDU color LCD display panel

touch screen to select options, use care to avoid damage. Sharp-pointed objects or excessive force can render the color LCD display Panel touch screen inoperable.

Use your fingers, a soft-pointed stylus, or the front panel function keys to select the displayed options. A cotton swab works very well as a soft-pointed stylus.

Remote Location Operations

It is highly recommended that remote operations be performed using a Microsoft Windows-based PC that meets the following requirements:

- Microsoft Windows XP Operating System with SP2
- 1.2 GHz processor
- 500 MB of system memory
- 1.0 Gb of free hard disk space
- Super VGA 800 x 600 pixels
- Internet Explorer 7.0 or later

Remote location operations must be performed using Internet Explorer 7.0 or later.

Note	When operating in the remote mode, if the web page on the PC display should become blank when switching between option tabs, select the web browser refresh option. The correct screen will then be displayed

Ethernet Connections

If you are connected to the Ethernet via the IDU rear panel **ETHERNET** RJ45 connector and you find that the color LCD display panel appears to be operating very slowly or has locked up completely, disconnect the Ethernet cable from the **ETHERNET** connector.

This should free up the color LCD display Panel and the IDU should resume operating properly.

Notes

Notices

About This Manual

Part number **400591-1**

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MTX5000 Transmitter System (MTX5000)

Copyright

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Proprietary Material

Quality Certification

Microwave Radio Communications is certified to ISO 9001:2000.

Changes or modifications not expressly approved by MRC could void the user's authority to operate the equipment.

General Safety Information

The following safety requirements, as well as local site requirements and regulations, must be observed by personnel operating and maintaining the equipment covered by this manual to ensure awareness of potential hazards.

WARNING - RF Power Hazard

High levels of RF power are present in the unit. Exposure to RF or microwave power can cause burns and may be harmful to health.

Remove power from the unit before disconnecting any RF cables and before inspecting damaged cables and/or antennas.

Avoid standing in front of high gain antennas (such as a dish antenna) and never look into the open end of a waveguide or cable where RF power may be present.

RF Exposure - Safe Working Distances

MRC provides this warning for safety purposes with the intent to inform the user of the potential hazard to RF exposure. The following guidelines for safe operation were derived from OET bulletin 65, August 1997, as recommended by the Federal Communications Commission (FCC).

The MTX5000 Transmitter System is a mobile transmitter system designed to provide services to broadcast ENG users under CFR 74 subpart F and 74.601 TV pickup stations. This unit, operated without an antenna, will not create RF energy exceeding 1.0 mW/cm^2, the FCC limit for exposure. Once connected to an antenna, the potential for harmful exposure will be greatly enhanced.

In this situation, a certain distance from the radiator is to be maintained. Calculations need to be performed to understand what that safe margin for exposure is. This is known as the Maximum Permissible Exposure (MPE) limit.

Note	Hazardous RF radiation limits and recommended distances may vary by country. Ensure that all applicable state and federal regulations are observed when using this transmitter.

Calculations provided are for common antennas often utilized in the ENG environment. The following formula used is that suggested by OET 65.

Calculating MPE

EIRP = P * (10 ^ (G / 10)) = (antilog of G/10) * P

P = RF power delivered to the antenna in mW
G = Power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna in centimeters
S = MPE in mW/cm² (milliwatts per square centimeters)

Conversions
dBi to numeric gain = Antilog (dBi/10)
Feet to centimeters = Feet * 30.48
Centimeters to Feet = cm * .0328
4 π = 12.57

User Input

RF power delivered to the antenna = Watts
Antenna gain (referenced to isotropic antenna) = dBi
Distance from the center of radiation = Feet

Calculation steps:

1. [P] RF power input. Convert watts to milliwatts = Watts * 1000
2. [G] Antenna gain dBi. Convert to numeric gain = Antilog (dBi/10)
3. [EIRP] Multiply P * G
4. [R] Convert centimeters to feet = Centimeters * .0328
5. Square R
6. Multiply $R^2 * 4\pi$
7. [S] Divide ($R^2 * 4\pi$) into EIRP

S = Power Density in milliwatts per square centimeters. Note: At frequencies above 1500 MHz, S must not be greater than 1.

Reference

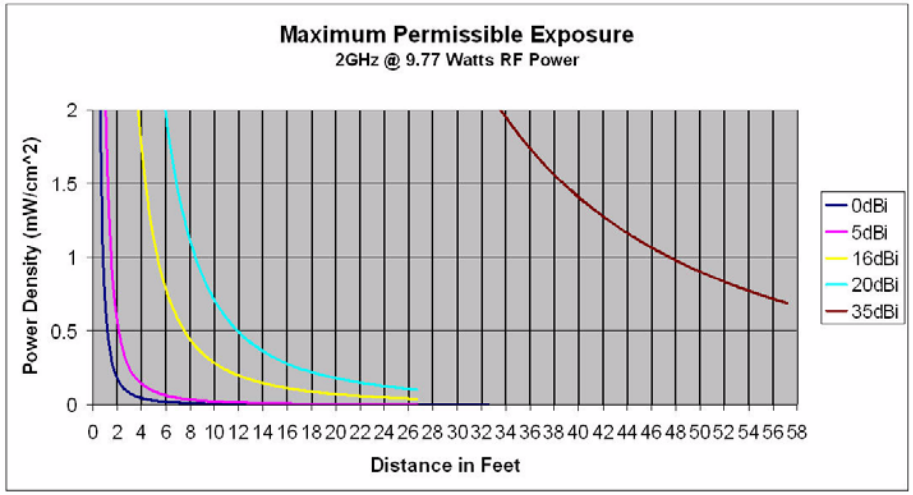
FCC OET Bulletin 65, August 1997 - Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields

The examples shown in Figure 1 and Figure 2 are typical graphs for an MRC STRATA Transmitter and show the permissible exposure distance for various antennas. Graphs and data will vary, based on the actual transmitter, output power, frequency, and antenna utilized. One plot provides the permissible output of the transmitter for digital modulation, and the other plot for analog modulation.

MRC, in accordance with the requirements set forth by the FCC, provides this information as a guide to the user. It is assumed that the users of this equipment are licensed and qualified to operate the equipment per the guidelines and recommendations contained within the product user guides and in accordance with any FCC rules that may apply.

Figure 1 with its corresponding table shows the 2GHz MPE.

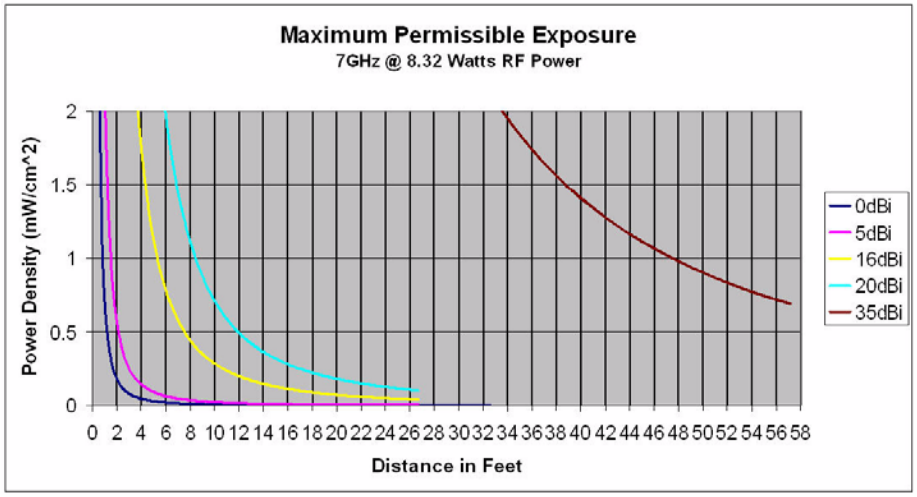
Figure 1: MTX5000 MPE 2GHz



Antenna Gain (dBi)	Minimum Distance from Antenna (cm)	Minimum Distance from Antenna (inch)
0	28	11.02
5	50	19.68
16	177	69.67
20	279	109.81
35	1569	617.56

Figure 2 with its corresponding table shows the 7GHz MPE.

Figure 2: MTX5000 MPE 7GHz



Antenna Gain (dBi)	Minimum Distance from Antenna (cm)	Minimum Distance from Antenna (inch)
0	26	10.23
5	46	18.11
16	163	64.16
20	258	101.55
35	1448	569.93

Conventions

Pay special attention to information marked in one of the following ways:

WARNING	Follow WARNINGS closely to prevent personal injury or death.
CAUTION	*Follow CAUTIONS to prevent damage to the equipment.*
Note	Notes provide additional information to assist you in using and maintaining the equipment.

Symbols Used

The following symbols may be used on the equipment or in this manual:

Symbol	Meaning
	WARNING: General Warning. Risk of Danger.
	WARNING: Risk of Electric Shock.
	WARNING: Electrostatic Discharge. Possible Damage to Equipment.
 OR 	Fuse - Identifies fuses or their location.
	Frame or Chassis Ground - Identifies the frame or chassis terminal.
	Earth Ground - Identifies the earth ground terminal.
	Protective Earth Ground - Identifies any terminal which is intended for connection to an external conductor for protection against electric shock in case of a fault, or the terminal on a protective earth electrode.

	Waste Electrical and Electronic Equipment (WEEE) - The product must not be disposed of with other waste at the end of its life cycle. It is the user's responsibility to dispose of the waste equipment by handing it over to a designated collection point for recycling.

Contents

1 *Introduction*

1.1 For Whom It's Written

This manual is intended for use by qualified operators, installers, and service personnel. Users of this manual should already be familiar with the basic concepts of radio, video, and audio.

1.2 Related Documents

- MTX5000 Preset Settings (part no. 400558-1)
- Glossary of Terms and Abbreviations (part no. 400576-1)
- Channels and Frequencies Technical Information (part no. 400580-1)

1.3 Ordering Documentation

Any of the above manuals may be ordered by contacting MRC Customer Service:

Business Hours: **Monday - Friday**
8:00 AM - 5:00 PM Eastern Time (US)
(0800 - 1700 hrs US ET)
Telephone: 800.490.5700 (Press 3)
+1.978.671.5700 (Press 3)
E-mail: customerservice@mrcbroadcast.com

When contacting Customer Service, please have the following information available:

- Model number and serial number of the unit. This is located on a label on the right-hand side of each unit.
- Approximate purchase date.

1.4 Calling for Service

MRC Technical Support is available 24 hours a day, 7 days a week. During regular business hours you can reach our expert staff directly.

Business Hours: **Monday - Friday**
8:00 AM - 5:00PM Eastern Time (US)
(0800 - 1700 hrs US ET)
Telephone: 888.777.9221 (US and Canada)
+1.978.671.5929
E-mail: technicalsupport@mrcbroadcast.com

After regular business hours and on weekends and holidays, you can also reach our expert staff as follows:

Telephone: 888.777.9221 (US and Canada)
+1.978.671.5929

Your call will be automatically forwarded to the on-call Technical Support specialist.

When contacting Technical Support, please have the following information available:

- Model number and serial number of the unit. This is located on a label on the right-hand side of each unit.
- Approximate purchase date.

1.5 Tell Us What You Think!

We'd appreciate any comments or suggestions you have about this manual. The more feedback we get, the better the manuals get!

If you're viewing this manual electronically, it's easy - just click on the link below to send us an E-mail.

Feedback

Or, you can E-mail our Technical Support team at:

technicalsupport@mrcbroadcast.com

Be sure to tell us what product you're writing about, and which manual.

2 Product Description

2.1 Chapter Overview

This chapter provides an overall description of the MTX5000 Transmitter System (MTX5000), its components, and its capabilities.

Here are the topics covered:

2.2 Description

2.2.1 General

The MTX5000 is a highly reliable, flexible, and compact video microwave transmitter system with modulation and encoding functions. The MTX5000 system includes an Indoor Unit (IDU) consisting of the 19-inch wide, 2-rack unit (2RU) high, rack-mounted transmitter and a mast-mounted Outdoor Unit (ODU), also called an RF Unit (RFU) or an RF head.

For dual band MTX5000 Transmitter System configurations, the system will contain both a 2 GHz and a 7 GHz ODU. All configurations of the MTX5000 IDU provide a 70 MHz IF output and control to the 2 GHz and/or 7 GHz ODU.

The MTX5000 is a rack-mounted, RF High Definition (HD)-ready video transmission system with both analog and digital modulation capabilities. The MTX5000 provides a sophisticated user interface with an intuitive keypad scheme and an adjustable color LCD display panel with touch screen control.

A fully equipped MTX5000 package is HD-ready and provides a robust HD link from the field to the studio. Several digital video input formats are accepted, as well as analog composite for both COFDM (DVB-T) and analog FM transmission. In addition, the MTX5000 can accept several analog audio inputs for FM analog transmission.

The MTX5000 has two mast-mounted ODU bands available. Consult your Sales Representative or contact the factory for the latest bands available. These ODUs contain integrated RF up-conversion circuitry and high power RF amplifiers for maximum power and signal quality.

With the new demands for digital modulation, the ODUs have been optimized for improved Modulation Error Ratio/Error Vector Magnitude (MER/EVM) performance with COFDM transmission.

2.2.2 MPEG Encoding and COFDM Transmission

The MTX5000 is capable of encoding both Standard Definition (SD) and HD video, depending upon the options contained in your MTX5000 system. Available inputs include SD Serialized Digital video (ASI-SDI), HD-SDI, and composite video.

Audio input formats currently include digital AES/EBU and analog formats. Future enhancements will include AC-3 SMPTE-302. The encoder is also capable of encoding an RS-232 signal as Wayside data. The MTX5000 is capable of generating a fully compliant DVB-T compliant output signal. This provides a robust digital link in any hostile transmission environment.

2.2.3 Analog Video Encoding and FM Modulation

When in the analog FM mode, the MTX5000 will accept a standard composite video input. It will also accept analog audio inputs. The FM analog signal is useful when working with older legacy equipment or when an analog transmission is desired.

The MTX5000 IDU communicates with the ODU to set operating frequencies and power levels. This interface is also used for calibration of the ODU power supply and to monitor error conditions.

2.2.4 RF Control

The MTX5000 IDU (Figure 2-1) is designed to accept a variety of external video and audio signals in different digital format streams and analog signals and to provide a modulated 70 MHz IF output.

Figure 2-1: MTX5000 Indoor Unit

The MTX5000 IDU allows you to switch between analog and digital modes where both applications are used. The MTX5000 also provides separate video and audio or baseband composite operations.

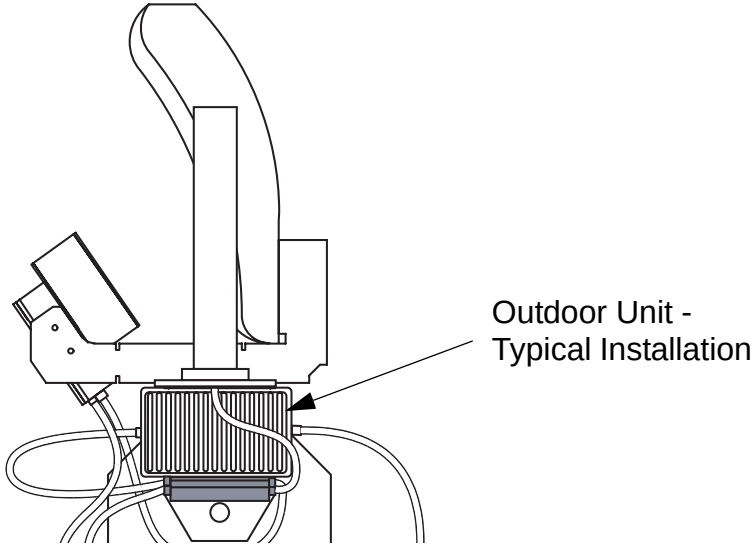
Key features of the MTX5000 IDU are as follows:

- Switchable Analog or Digital modes
- SD/HD SDI interfaces with multiplexing
- Integrated SD/HD MPEG-2/H.264 encoding technologies
- FM transmitter modulation technology (analog)
- DVB-T COFDM modulation technology (digital)
- IF (70 MHz) signal input and monitoring
- Video monitoring output
- Video and audio inputs for NTSC or PAL video/audio signal transmission

- Front panel keypad and touch screen display for operation and control
- Multiple configuration options available
- Built-in digital Color Bar Generator
- Optional analog Color Bar Generator is available.

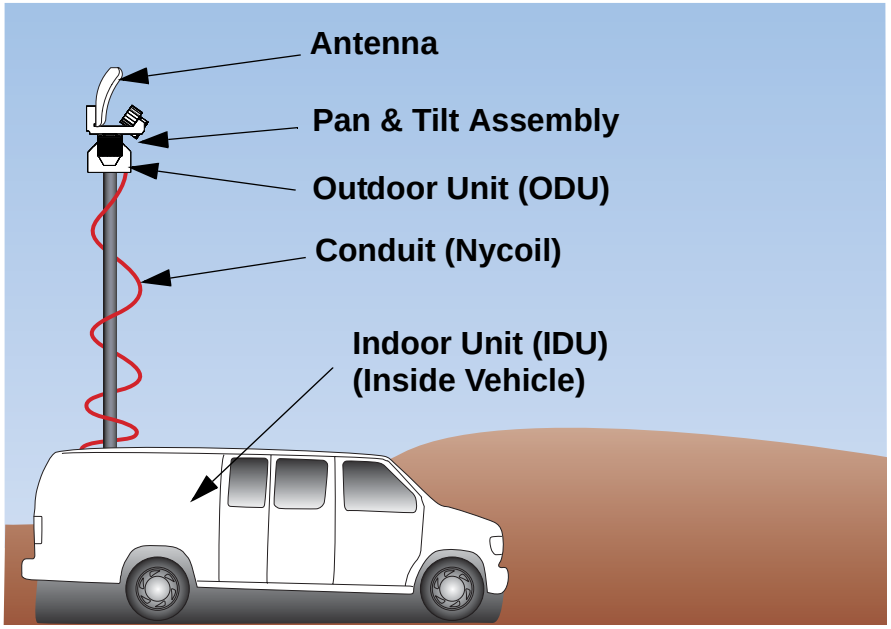
The MRC ODU (See Figure 2-2) performs the signal up-conversion from 70 MHz IF to RF (2 GHz or 7 GHz) and provides signal amplification, as required. For dual band operation, two separate ODUs are required, one for 2 GHz operation, and one for 7 GHz operation.

Figure 2-2: Outdoor Unit - Typical



A typical installation is shown in Figure 2-3. The MTX5000 IDU is typically mounted in a standard 19-inch (48.3 cm) rack for mobile installations. The ODU is mounted on an antenna mast.

Figure 2-3: Typical MTX5000 Transmitter System

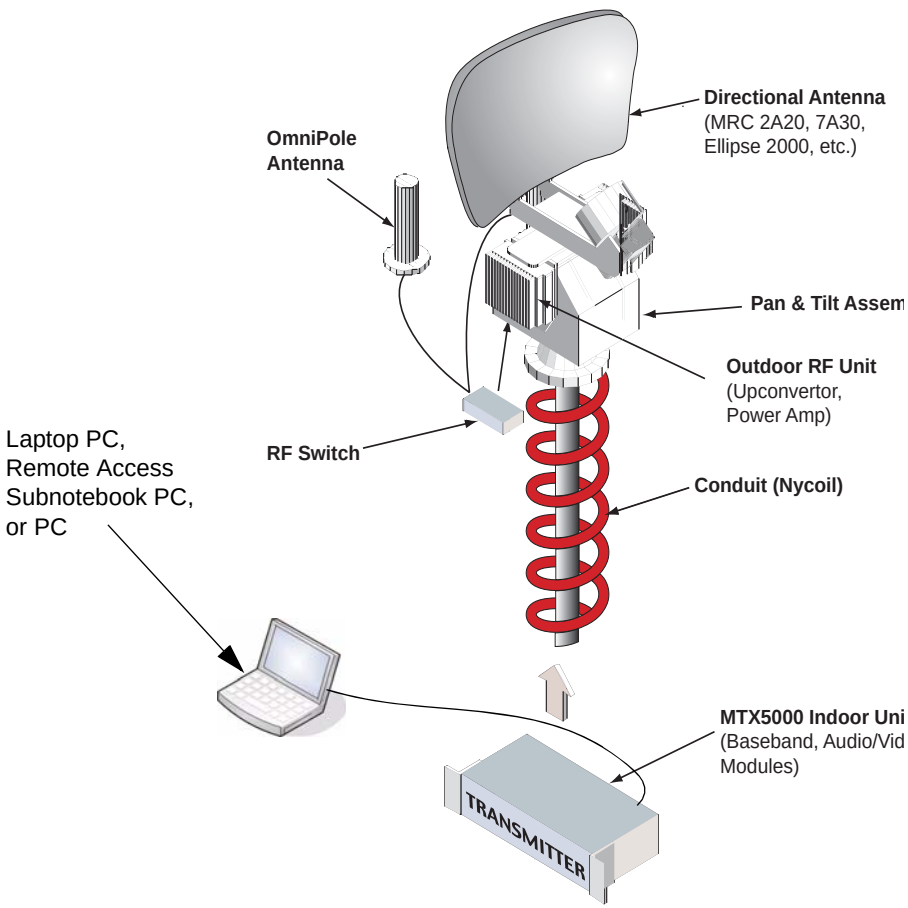


2.3 System Components

The MTX5000 system consists of the IDU and the ODU(s). A typical system is shown in Figure 2-4 on page 2-4. The IDU contains the baseband circuitry, power supply, and control modules. It accepts a wide variety of audio and video inputs, both analog and digital, and generates a 70 MHz IF output. The IDU also accepts IF inputs from external modulators.

The IDU can be controlled locally from the front panel controls or it can be controlled remotely. The IDU can be controlled from a PC at a remote location, such as a studio, via the PC web browser. The optional Remote Access Subnotebook PC can also be used to provide remote control of the IDU during mobile operations.

Figure 2-4: MTX5000 System Components - Typical



For digital operation, the IDU is equipped with an internal MPEG/ COFDM module.

The ODU contains the upconverters and the power amplifier. The ODU accepts the 70 MHz IF output from the IDU, converts the IF to the RF operating band required, and amplifies the RF output, as required.

All installations will include an antenna, either directional, omnidirectional, or both. An MRC RF switch can be mounted on the antenna mast to select the antenna required.

When using the mast-mounted antenna(s), a Nycoil conduit sheath covers the wiring harness between the IDU and the ODU. The wiring harness carries the DC power, 70 MHz IF, and antenna band and polarization switching control. Additional wiring is contained in the Nycoil conduit sheath for controlling the antenna pan and tilt mechanism and for implementing additional functions such as off-air monitors, mast lights, etc.

2.4 IDU Operating Controls

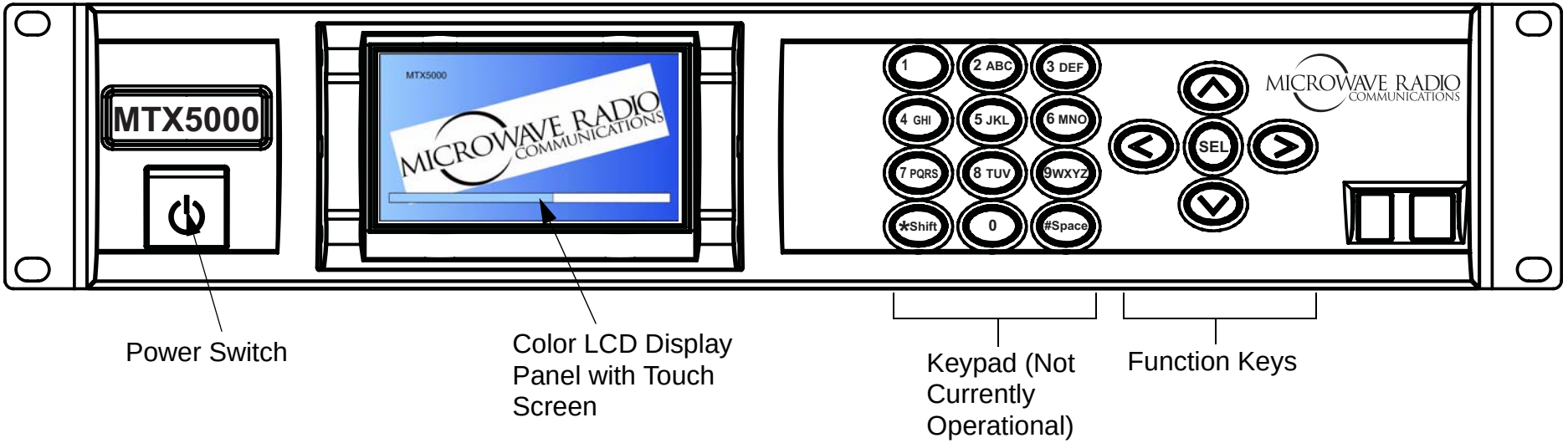
All controls are located on the front panel of the MTX5000 IDU. There are no controls on the ODU.

All transmitter functions are controlled using the color LCD display panel touch screen and/or function keys, as shown in Figure 2-5 on page 2-5.

The color LCD display panel with touch screen and function keys are used to select control and diagnostic menu screens for both the IDU and the ODU. Option buttons displayed on the color LCD display panel are used to control Preset selection, RF band selection, channel selection, offset selection, antenna selection, antenna polarization, transmitter operation (on or off), power (low or high), and to monitor the status of the IDU and ODU.

The option buttons displayed on the color LCD display panel may be selected using either the color LCD display panel touch screen or the function keys.

Figure 2-5: MTX5000 Front Panel View



2.5 External Connectors

The rear panels of the MTX5000 IDU configurations contain the I/O connectors and an input fuse, as shown in Figure 2-6 on page 2-6. Connectors contained on the ODU are shown in Figure 2-7 on page 2-6.

The MTX5000 system is designed to make upgrading from an older radio as easy as possible. The IDU and ODU can be ordered with a variety of connectors to plug into an existing wiring harness. Connectors available for the cable connection between the IDU and ODU are as follows:

- Triax (both ends)
- Type “N” (both ends)
- TNC (both ends).

If your MTX5000 system contains the TNC connector option on the IDU, a TNC connector must be attached to the ODU end of the cable for weather and reliability purposes.

All ODU configurations contain a standard Type “N” connector for connection to the antenna.

If your MTX5000 system IDU is equipped with either Type “N” or TNC connectors, the IDU will contain an 8-pin Weidmuller connector to provide DC power and control to the ODU via the ODU **POWER** connector.

If your system is equipped with Triax connectors, the 8-pin Weidmuller connector will not be present on the rear panel of the IDU. With the Triax connector option, both DC power and control are provided to the ODU via the Triax cable connected between the IDU and the ODU. If the Triax connector option is contained on your MTX5000 system, a **POWER** connector will not be present on the ODU.

For additional information, refer to the “ Installation” Chapter on page 6-1.

Figure 2-6: MTX5000 IDU Rear Panel Configurations

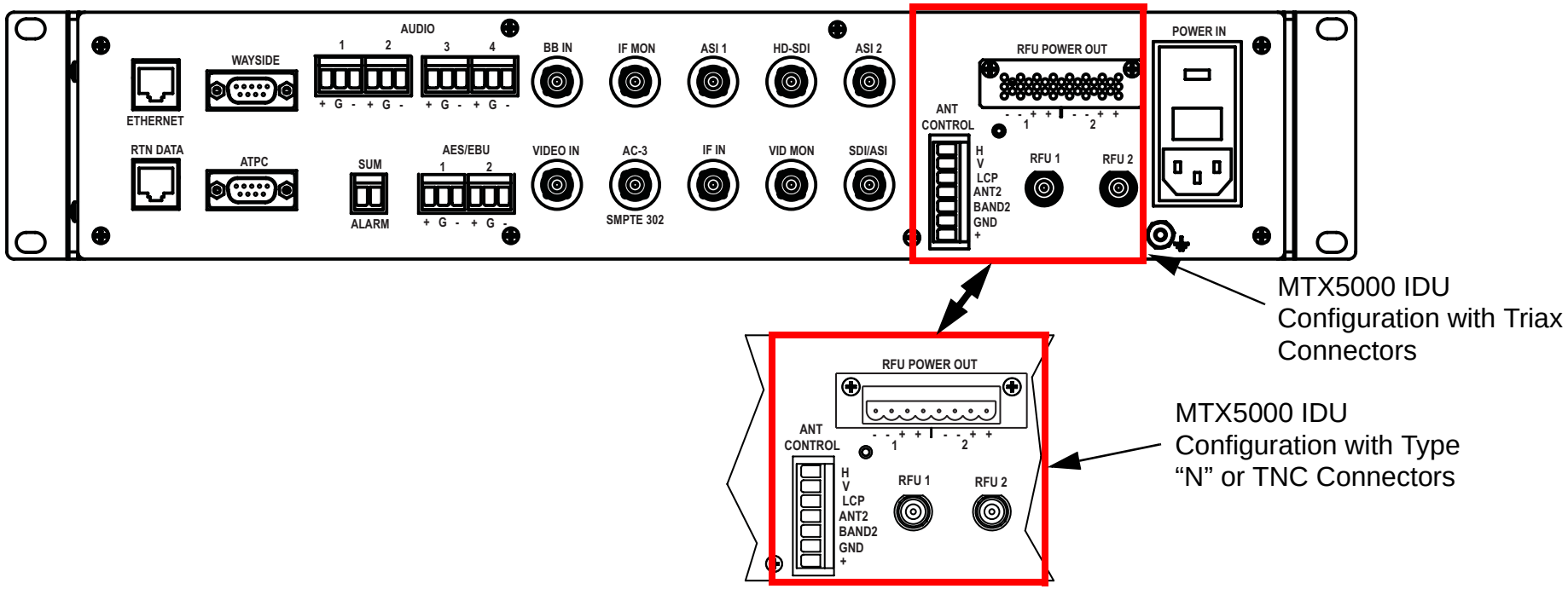
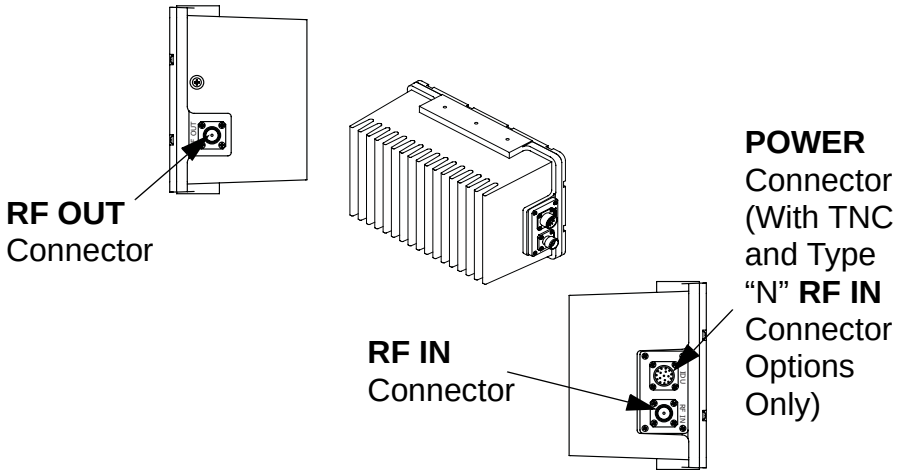


Figure 2-7: MTX5000 ODU Connectors



The IDU connects to the ODU through the wiring harness between the units. The wiring harness contains DC power, 70 MHz IF, and control for all components mounted on the top of the antenna mast. Functions and control contained in the wiring harness typically include the following:

- 70 MHz IF, control, and alarms between the IDU and the ODU
- DC power to the ODU
- Power and control for an RF switch to select antennas
- Power and control for antenna switching functions (band, polarization, and power)

- Power for mast top lights
- Control and power for the Pan and Tilt assembly
- RF and control for an off-air antenna
- Mast top safety sensors for proximity, high voltage, etc.

Since each installation may be different, the harness must be specified for each installation. The harness can be supplied by MRC, or it is often supplied by the van integrator.

2.6 Configuration Options

MRC is constantly working to expand and upgrade the capabilities of the MTX5000. Consult your Sales Representative or contact the factory for the latest information.

2.6.1 IDU Configurations

Your MTX5000 IDU consists of an MPEG encoder, a COFDM modulator, and an analog FMT module.

2.6.2 AC Power

The MTX5000 IDU operates on the following AC power:

- 120/240 VAC, 50/60 Hz

Fuse ratings for the AC power sources are listed in Table 2-1.

Table 2-1: AC Fuse Ratings

Operating Voltage	Fuse Rating
120 VAC, 50/60 Hz	3.0A SB 250V 3AG or 5 x 20 mm
240 VAC, 50/60 Hz	1.5A SB 250V 3AG or 5 x 20 mm

AC power is applied to the MTX5000 IDU, which in turn, provides DC power to the ODU via the wiring harness between them.

Refer to the “ Installation” Chapter on page 6-1 for additional information.

2.6.3 Remote Control Options

For portable mobile operations, the MTX5000 system may be controlled using either a Windows-based laptop PC or by the optional Windows-based Remote Access Subnotebook PC. See Figure 2-8.

Figure 2-8: Remote Access Subnotebook PC

Using either PC eliminates the need for a separate panel-mounted remote control panel to control the MTX5000 system.

An RJ-45 crossover cable is required for connection to either PC for mobile remote control operations.

The MTX5000 system may also be controlled from a Windows-based PC at a remote location. When controlling the MTX5000 system from a remote location, the remote PC is connected to the MTX5000 system via the Ethernet.

To connect Windows-based PCs to the MTX5000 system, see "Select Local/Remote Operation Mode" on page 3-20. To connect the optional Windows-based Remote Access Subnotebook PC to the MTX5000 system, refer to the Remote Access Subnotebook PC Operator's Guide, part number 400573-1, provided with the optional Remote Access Subnotebook PC.

Information and procedures required to control the MTX5000 system for either portable mobile applications or for remote location operations are provided in "Using the MTX5000 in Remote Mode" on page 3-60 and "Remote Location Operations" on page 3-67. Procedures required to control the MTX5000 system using either a Windows-based laptop PC, the optional Windows-based Remote Access Subnotebook PC, or a Windows-based PC at a remote location are identical.

2.6.4 Antenna Options

The MTX5000 system is fully compatible with a variety of antennas, including:

- MRC ProStar, models
  - 2A20 and 2A20SS (2 GHz)
  - 7A30 and 7A30SS (7 GHz)
  - 2A20/7A30 (dual band 2 & 7 GHz)
  - 2A20/7A30SS (dual band 2 & 7 GHz, solid state switching)
- MRC Ellipse 2000
- MRC OmniPole Omnidirectional.

Switching functions for band and antenna polarization are controlled from the front panel of the IDU.

If your installation involves more than one antenna, this can be easily accommodated by using an MRC RF Switch. The RF Switch is also controlled from the front panel of the IDU.

2.6.5 Band and Frequency Options

The MTX5000 system is designed to cover one or more bands. It can be ordered as a single-band unit or as a dual-band configuration to cover the following bands.

- 2 GHz (17 MHz)
- 2 GHz (12 MHz)
- 7 GHz Lower.

Band and frequency information is stored in the RFU, which means switching bands after installation is very simple: just plug in the RFU for the new band and the IDU will automatically configure itself for the new band.

Within these bands, channels can be pre-programmed at the factory to match either the U.S. broadcast channel plan or a plan specified by the customer.

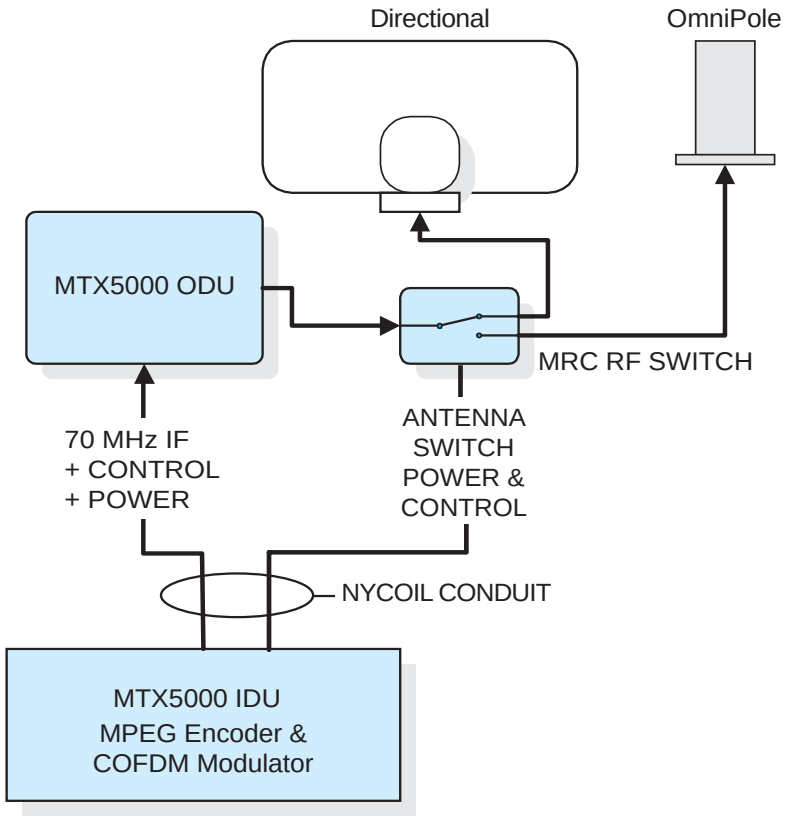
2.7 System Configurations

The MTX5000 system provides several antenna configuration options to transmit using either an omni antenna or a directional antenna, in either single-band or dual-band operation.

2.7.1 Single-Band/Dual Antenna Transmission

The antenna configuration for single-band transmission using either an omni antenna or a directional antenna with one IDU and one ODU is shown in Figure 2-9. The RF switch allows switching between the two types of antennas.

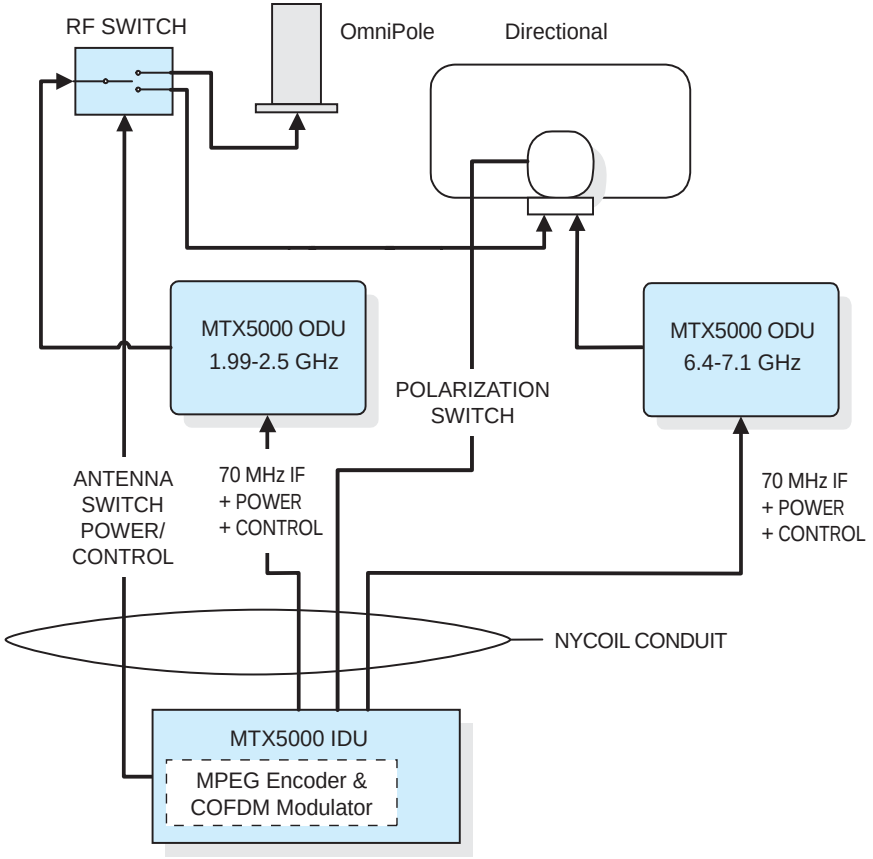
Figure 2-9: Single-Band Transmission with Two Antennas



2.7.2 Dual-Band Non-Simultaneous Transmission

Figure 2-10 illustrates the antenna configuration for non-simultaneous transmission using one IDU and two ODUs. In this example, the ODUs are operating on 2 GHz and 7 GHz bands. In addition, an RF switch allows switching between an omni and a directional antenna.

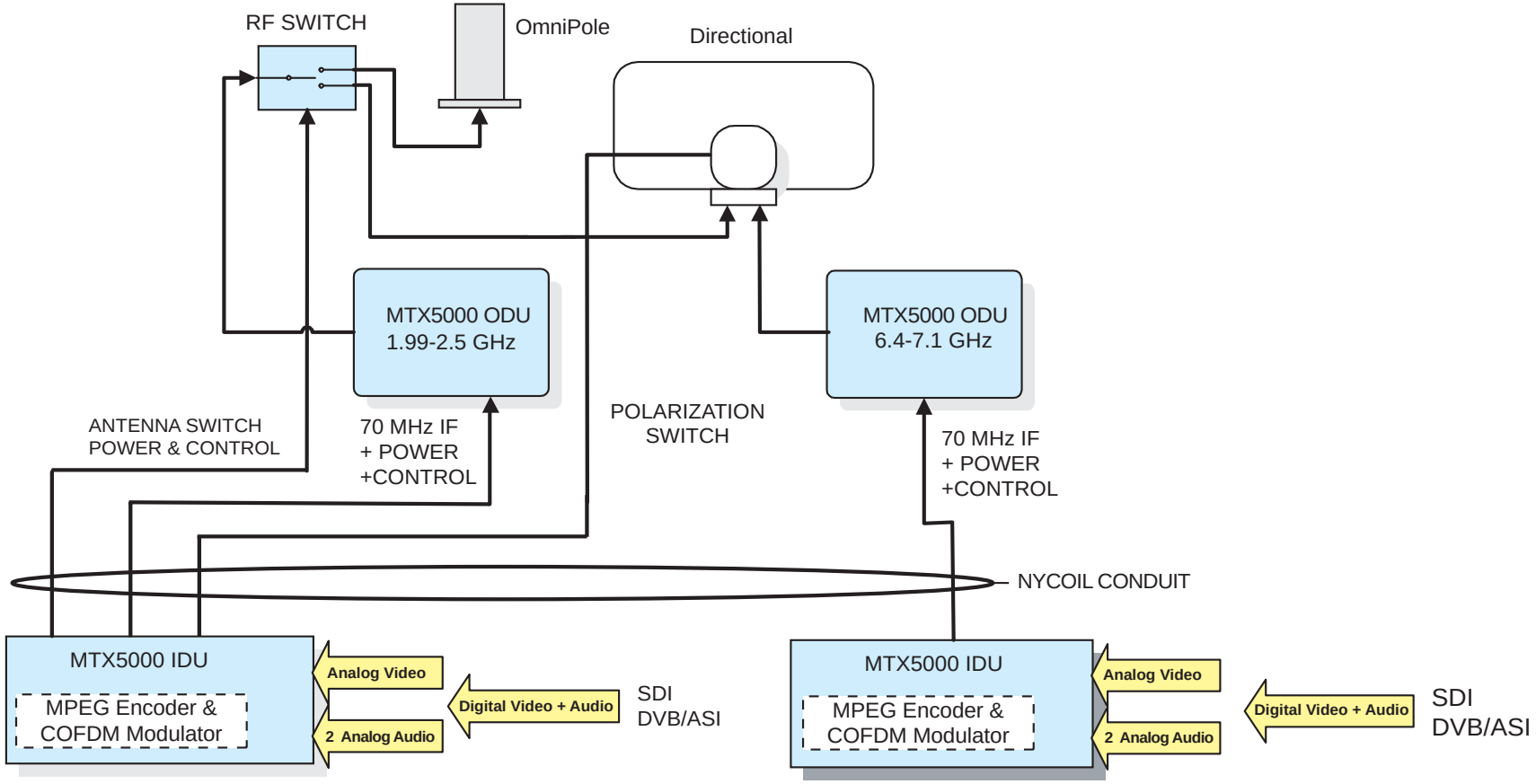
Figure 2-10: Dual Band Non-Simultaneous Transmission



2.7.3 Dual-Band Simultaneous Transmission

Figure 2-11 illustrates the antenna configuration for simultaneous transmissions using two IDUs and two ODUs. In this example, the ODUs are operating on the 2 GHz and 7 GHz bands. In addition, an RF switch allows switching one of the ODUs between an omni and a directional antenna.

Figure 2-11: Dual-Band Simultaneous Transmission



2.8 Operating System Modes

2.8.1 General

The MTX5000 IDU offers two levels of operating system modes, designed to match the needs of different personnel. These operating modes are the ***Normal User Mode*** and the ***System Setup Mode***.

Regardless if you are operating in the normal user mode or in the system setup mode, you can read the current settings using the front panel color LCD display panel with either the touch screen or the function keys. The MTX5000 IDU internal software automatically detects what hardware is installed in the system and applies the appropriate configuration.

The MTX5000 IDU also offers the ability to operate the system either locally using the IDU front panel color LCD display panel with either the touch screen or the function keys, or remotely via an Ethernet connection to a PC at a remote location.

2.8.2 Normal User Mode

For the field operator, the MTX5000 IDU provides multiple Presets that can be selected from the front panel. Each Preset is configured with options applicable to the configuration of your MTX5000 IDU.

Each Preset controls key parameters such as modulation and audio and video settings. See ”Using the MTX5000 Screens in Local Mode” on page 3-10 for additional information.

All normal user mode operations may be performed either locally at the IDU or remotely via the Ethernet from a PC at a remote location. Normal user mode operations may also be performed remotely during mobile operations using the optional Remote Access Subnotebook PC. See ”Using the MTX5000 in Remote Mode” on page 3-60 for additional information.

2.8.3 System Setup Mode

For the advanced operator and technical staff, the MTX5000 IDU allows password control of parameters in the MTX5000. For additional information on the system setup mode, see ”Advanced Operations” on page 5-1.

System setup mode operations may be performed locally at the MTX5000 IDU using the front panel color LCD display panel with either the touch screen or the function keys or remotely using the remote web page software.

2.9 For More Information

Additional detailed technical information about the MTX5000 is listed below:

Topic	Chapter
Routine Operation	**See Chapter 3, “**Routine Operation**”**
Advanced Operation	**See Chapter 5, “**Advanced Operations**”**
Installation	**See Chapter 6, “** Installation**”**
Connections to other equipment	**See Chapter 6, “** Installation**”**
Supported Repairs and Repair Parts	**See Chapter 7, “**Replacement Parts and Supported Repairs**”**
Theory of Operation	**See Chapter 8, “**Theory of Operation**”**

3 Routine Operation

3.1 Chapter Overview

This chapter provides basic information that will enable you to operate your MTX5000 Transmitter System (MTX5000).

Here are the topics covered:

3.2 Overview of Controls, Indicators, and Connectors

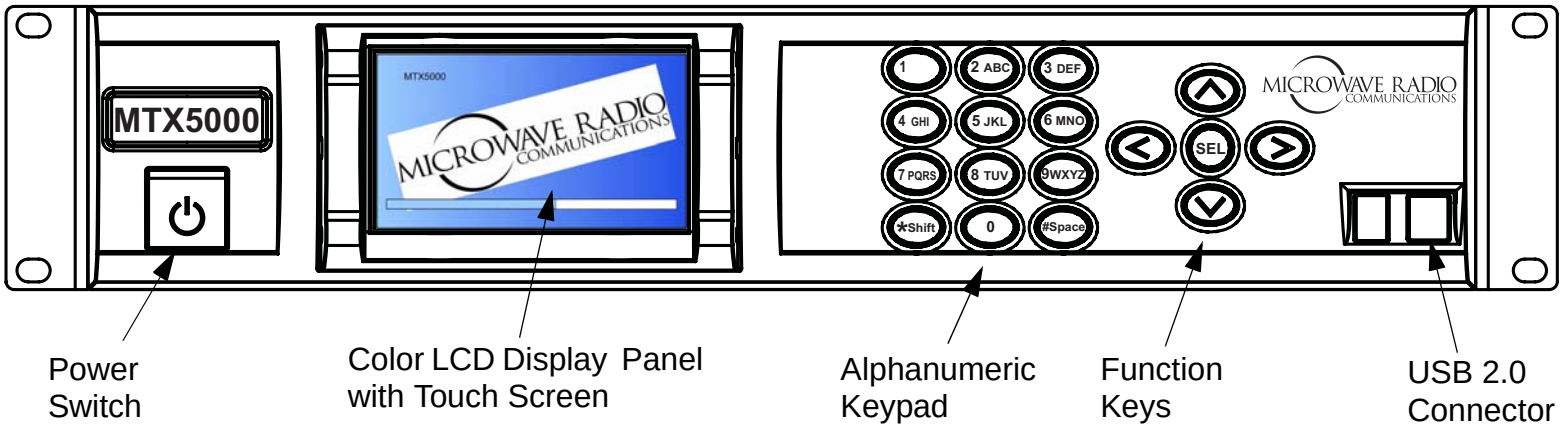
This section describes the controls, indicators, and connectors used on the MTX5000 Indoor Unit (IDU) and Outdoor Unit (ODU).

3.2.1 MTX5000 IDU Controls, Indicators, and Connectors

Each of the controls, indicators, and connectors contained on the MTX5000 IDU are described in the following paragraphs. Controls and indicators contained on all configurations of the IDU are identical and are identified in Figure 3-1.

Controls, indicators, and connectors contained on the front panel of the IDU are described in the following paragraphs.

Figure 3-1: MTX5000 IDU Front Panel Controls, Indicators, and Connector



Power Switch The power switch is located on the front panel and controls application of power to the MTX5000 system. When power is applied to the MTX5000 system, the symbol on the switch illuminates.

Color LCD Display Panel with Touch Screen The front panel color LCD display panel with touch screen is mounted on a tilting mechanism that allows you to adjust the viewing angle, based on the rack-mounted location and lighting conditions. The color LCD display panel is used in conjunction with the touch screen or function keys to make option selections displayed on the color LCD display panel.

The color LCD display panel provides user interface control of the MTX5000 IDU and provides full monitoring capability for the system. The color LCD display panel, in conjunction with the touch screen or function keys, allows you to perform the following:

- Recall Presets
- Select RF head and/or RF band
- Select operating channel
- Select channel offset
- Select between two antennas
- Set antenna polarization
- Select between low and high power operation of the transmitter
- Turn the transmitter on and off
- Monitor error conditions within the MTX5000 IDU and the ODU
- Monitor RF power output
- Monitor individual Preset settings
- Select local or remote operating mode.

All option selections are made using the color LCD display panel and either the color LCD display panel touch screen or the function keys, as required.

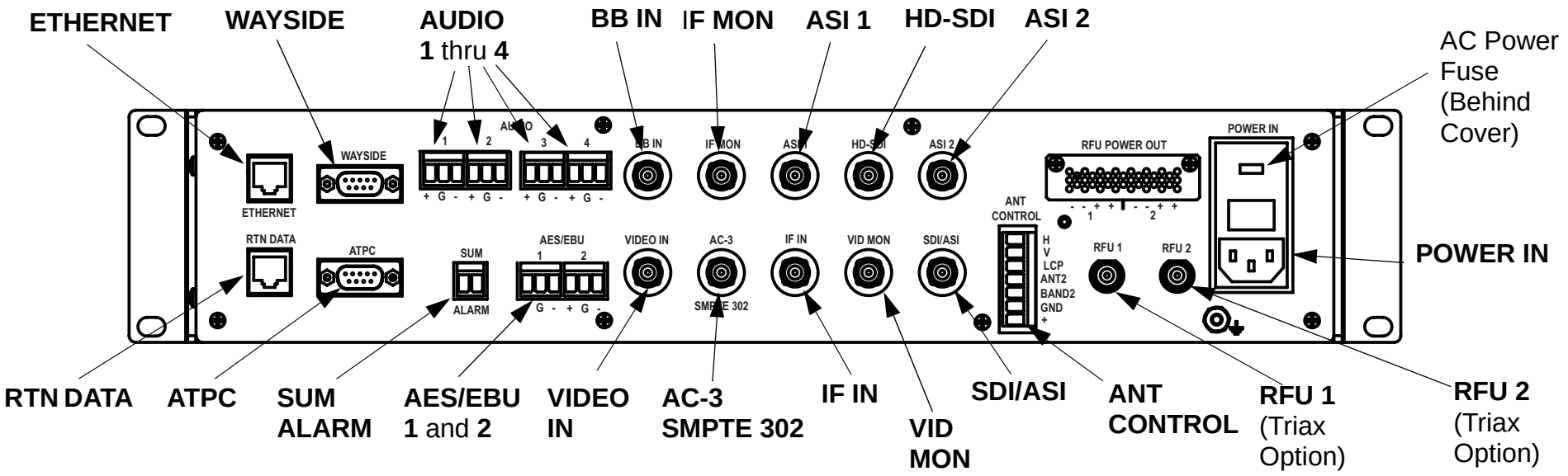
Alphanumeric Keypad (The front panel alphanumeric keypad is currently inactive.)

Function keys The Left, Right, Up, and Down arrow keys may be used to select options displayed on the color LCD display panel. Pressing the **SEL** (select) key selects the option button required after the option button has been selected using the arrow keys. For ease of operation in low-light conditions, the keys are illuminated when power is applied to the unit.

USB 2.0 Connector The front panel USB 2.0 connector provides the connection required to upgrade software into the MTX5000 using a USB flash drive and a USB-A to USB-B adapter.

Rear panel connectors contained on the IDU are shown in Figure 3-2 on page 3-4 and are described in the following paragraphs.

Figure 3-2: MTX5000 IDU Rear Panel Connectors - Typical



Topics covered are as follows:

ETHERNET Connector The **ETHERNET** RJ-45 connector provides connection via your web browser to a PC at a remote location or to the optional Remote Access Subnotebook PC for remote control of the MTX5000 IDU.

WAYSIDE Connector The **WAYSIDE** 9-pin male D-connector provides connection for the MPEG encoder Wayside input data.

AUDIO 1 thru 4 Connectors The **AUDIO 1** thru **4** male 3-pin Weidmuller connectors provide analog/digital switchable stereo audio signal inputs to the FMT or MPEG modules.

BB IN Connector The **BB IN** 75 ohm BNC female connector provides baseband input video from an external baseband source.

IF MON Connector The **IF MON** 75 ohm BNC female connector provides a 70 MHz output for external signal monitoring purposes.

ASI 1 Connector (The 75 ohm BNC female **ASI 1** connector is currently inactive.)

HD-SDI Connector The **HD-SDI** 75 ohm BNC female connector provides the HD-SDI data stream input to the MTX5000.

ASI 2 Connector (The 75 ohm BNC female **ASI 2** connector is currently inactive.)

RFU POWER OUT Connector The **RFU POWER OUT** 8-pin Weidmuller male connector is present only if the **RFU 1** and **RFU 2** connectors are type “N” or TNC connectors. The **RFU POWER OUT** connector is not present on IDU configurations that have Triax **RFU 1** and **RFU 2** connectors.

The **RFU POWER OUT** connector provides DC power to Outdoor Units (ODU) RFU 1 and RFU 2 via DC on coax.

AC Power Fuse The AC power fuse provides AC input power protection for the unit.

POWER IN Connector Assembly The **POWER IN** connector assembly provides connection to the removable external AC power cable. The AC power connector contains the AC input power fuse.

RTN DATA Connector (The **RTN DATA** RJ-45 connector is currently inactive.)

ATPC Connector (The **ATPC** 9-pin male D-connector is currently inactive.)

SUM ALARM Connector (The **SUM ALARM** 2-pin male Weidmuller connector is currently inactive.)

AES/EBU Connectors The **AES/EBU 1** and **2** male 3-pin Weidmuller connectors provide channel 1 and 2 external AES/EBU digital audio inputs to the unit.

VIDEO IN Connector The 75 ohm BNC female **VIDEO IN** connector receives the analog video input to the unit.

AC-3 SMPTE 302 Connector (The **AC-3 SMPTE 302** 75 ohm BNC female connector is currently inactive.)

IF IN Connector The **IF IN** 75 ohm BNC female connector provides the 70 MHz IF input to the unit.

VID MON Connector The **VIDEO MON** 75 ohm BNC female connector provides a video output for external monitoring purposes.

SDI/ASI Connector The **SDI/ASI** 75 ohm BNC female connector provides SDI and ASI inputs to the unit.

ANT CONTROL Connector The **ANT CONTROL** 7-pin male Weidmuller connector provides control for antenna polarization, antenna band selection, and the RF switch. The connector also provides DC power for the antenna and the RF switch.

RFU 1 Connector The **RFU 1** connector will either be a Triax, type “N”, or TNC, depending upon the options ordered with your MTX5000 system. This connector provides 70 MHz IF output to RF unit 1.

If your IDU contains a Triax **RFU 1** connector, the **RFU POWER OUT** connector will not be present. If your IDU contains a Triax connector, 70 MHz IF will be supplied to RFU 1 and DC power to RFU 1 will be supplied via DC on coax from the IDU.

If your IDU contains a type “N” or TNC **RFU 1** connector, 70 MHz IF will be supplied to RFU 1 and DC power to RFU 1 will be supplied via the **RFU POWER OUT** connector.

RFU 2 Connector The **RFU 2** connector will either be a Triax, type “N”, or TNC, depending upon the options ordered with your MTX5000 system. This connector provides 70 MHz IF output to RF unit 2.

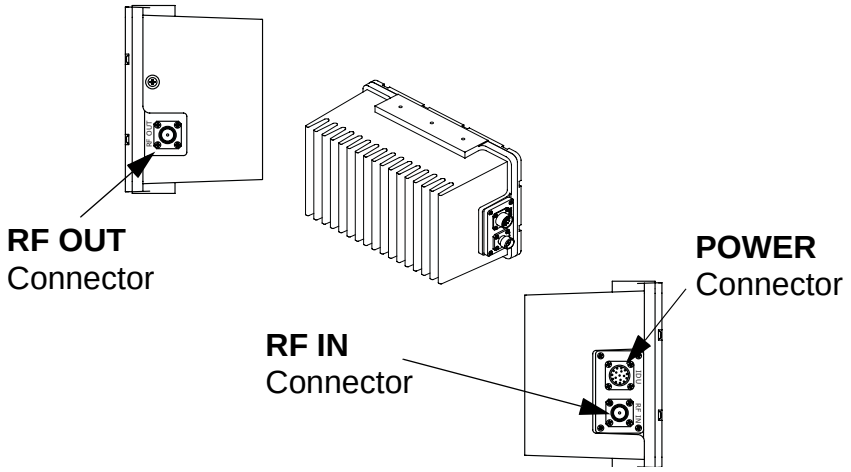
If your IDU contains a Triax **RFU 2** connector, the **RFU POWER OUT** connector will not be present. If your IDU contains a Triax connector, 70 MHz IF will be supplied to RFU 2 and DC power to RFU 2 will be supplied via DC on coax from the IDU.

If your MTX5000 contains a type “N” or TNC **RFU 1** connector, 70 MHz IF will be supplied to RFU 2 and DC power to RFU 2 will be supplied via the **RFU POWER OUT** connector.

3.2.2 MTX5000 ODU Connectors

Controls and indicators contained on the MTX5000 ODU (See Figure 3-3) are described in the following paragraphs. Topics covered are as follows:

Figure 3-3: MTX5000 ODU Connectors



RF OUT Connector The Type “N” **RF OUT** connector provides the RF output connection to the antenna or antenna switch. This connector is a type “N” connector for all configurations of the ODU.

RF IN Connector The **RF IN** connector is either a Type “N”, TNC, or Triax, as applicable to the options ordered with your MTX5000 system. The **RF IN** connector receives 70 MHz IF from the IDU for up-conversion to the 2 GHz or 7 GHz bands and amplification, as required.

If the **RF IN** connector option is a Type “N” or TNC, DC power to the ODU is provided from the IDU via the ODU **POWER** connector. If the **RF IN** connector is a Triax connector, DC power and control is provided to the ODU from the IDU via the **RF IN** connector.

POWER Connector The **POWER** connector receives DC power from the IDU via the wiring harness between the IDU and the ODU. The **POWER** connector is present on the ODU only if your MTX5000 system contains either the TNC or Type “N” **RF IN** connector options.

3.3 Preparing for Operation

The procedures required to use the color LCD display panel with touch screen and function keys locally, in the normal user mode of operation, are contained in the following paragraphs.

The color LCD display panel is used in conjunction with the color LCD display panel touch screen or the function keys to make selections displayed on the color LCD display panel.

The normal user mode is designed for you to recall existing system Presets in order to properly transmit the video stream back to the studio from a remote location.

Along with recalling a Preset that is appropriate for a given broadcast situation, you can select between two antennas, select between two ODUs (if your system contains two ODUs), select an operating band, select a channel within the operating band, select a channel offset, and select antenna polarization.

You can also select between high and low power operation of the transmitter, you can turn the transmitter on and off, and you can monitor any fault conditions that may exist within the MTX5000 IDU and/or ODU.

When power is applied to the MTX5000, it automatically enters the local normal user operation mode. The MTX5000 will remember the last settings that were in use, regardless if they were a stored Preset or user-defined settings, and will return to those settings. If the MTX5000 was transmitting when power was removed, the IDU will not automatically return to the transmit mode. If the MTX5000 was in the remote mode when power was removed, the IDU will not return to the remote mode.

3.3.1 Mobile Installation

For mobile applications, the MTX5000 is typically mounted in a bulkhead or compartment in a 19-inch (48.3 cm) rack and the ODU is mounted on the vehicle antenna mast. The cabling is permanently installed and power comes from the mobile AC power source.

Each installation or deployment will have its own specific tasks according to the application and the installed hardware options.

For additional information, refer to the “ Installation” section on page 6-1.

3.3.2 Powering the MTX5000 System

CAUTION *Corruption of software contained in the MTX5000 may occur if proper power down or power up of the MTX5000 does not occur.*

The MTX5000 must be properly powered up and powered down to prevent possible corruption of the software contained in the radio. It will take approximately 60 seconds for the MTX5000 to power up properly. As with a personal computer, it takes time for the internal software to become initialized and the Main screen to be displayed.

When the power switch is pressed to on and power is applied to the MTX5000, a blank display initially appears on the color LCD display panel. After a short delay, the introduction screen will be displayed and a status bar will appear on the introduction screen. Then, after a very short delay, the Main screen will be displayed.

Power to the MTX5000 must never be cycled off and on without a minimum delay of 10 seconds between removal of power and application of power. Just like a personal computer, a proper shutdown of the MTX5000 is required to prevent corruption of software.

CAUTION *The MTX5000 must never be powered down when the progress bar is displayed. The software will become corrupted and the MTX5000 may have to be returned to the factory for repair.*

Conversely, power to the MTX5000 must never be cycled to on and then immediately to off, as corruption of software contained in the radio may also occur. The MTX5000 must only be powered down when the Main screen is displayed.

CAUTION *Under no circumstances should you remove and re-apply power to the MTX5000 when the progress bar is displayed during a self-recovery.*

The software will become corrupted and the MTX5000 may have to be returned to the factory for repair.

If power to the MTX5000 is lost and is then re-applied immediately or if the power switch is set to off and then to on in less than 10 seconds, the MTX5000 internal software will attempt a self-recovery when the power switch is set to on.

During the self-recovery process, the blank screen will initially appear, followed by the introduction screen. The progress bar will appear on the introduction screen, but progress will be much slower than during a normal power up. Do not interrupt the self-recovery process by cycling power to off and then to on, as software corruption will occur.

Power Up

The steps required to properly power up the MTX5000 system are contained in the following steps.

CAUTION *If power is accidentally lost or if the power switch is pressed to off, do not immediately power up the MTX5000 again.*

Internal software corruption may occur if power is applied immediately after a power loss or if the power switch is pressed to off and immediately back to on.

To avoid possible software corruption, wait a minimum of 10 seconds before applying power or before pressing the power switch to on.

Note If you are unsure of the power requirements or connections to the MTX5000, refer to the “ Installation” section on page 6-1.

1. Verify the power cable is properly connected to the MTX5000 IDU rear panel AC **POWER IN** connector.
2. Verify all coaxial cables and cable connectors are properly connected to the rear panel connectors and verify the ODU or ODUs, as applicable to your system options, are properly connected.
3. Connect the MTX5000 IDU power cable to AC power of the correct type and voltage.
4. Verify the power source is turned on.
5. Press the power switch and observe the symbol on the switch illuminates.

Notes

When power is applied to the MTX5000, it will automatically enter the local normal user mode of operation.

The MTX5000 will return to the last settings that were in use when the unit was powered down, but the MTX5000 will not resume transmitting if the unit was transmitting when it was powered down.

If the MTX5000 was in the remote mode when power was removed, the IDU will not return to the remote mode.

---

6. The normal power-up sequence is as follows:
   - After approximately 30 seconds, the introduction screen will be displayed on the color LCD display panel. See Figure 3-4.
   - A progress bar will also be displayed indicating power up progress and, approximately 30 seconds after the introduction screen is displayed, the Main screen will be displayed on the color LCD display panel. See Figure 3-5.

Figure 3-4: Introduction Screen

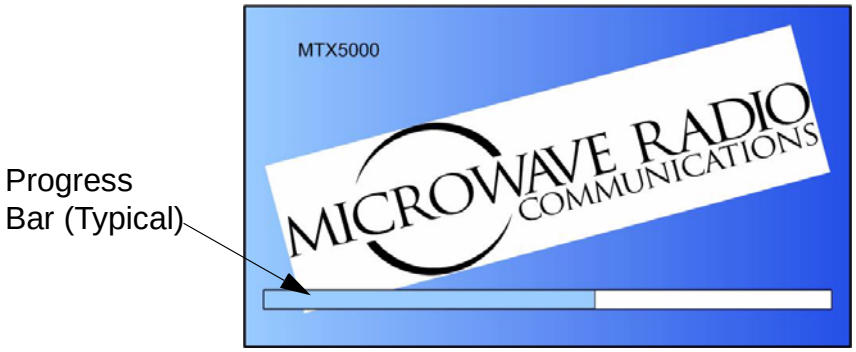
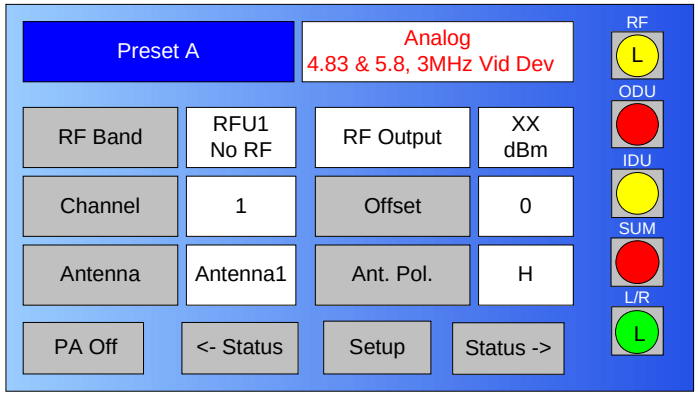


Figure 3-5: Main Screen - Typical



CAUTION *Always wait a minimum of 5 seconds after the Main screen is displayed following power up before selecting a Preset.*

---

7. Select the Preset required per "Select Preset" on page 3-24.

Power Down

The steps required to properly power down the MTX5000 system are contained in the following steps.

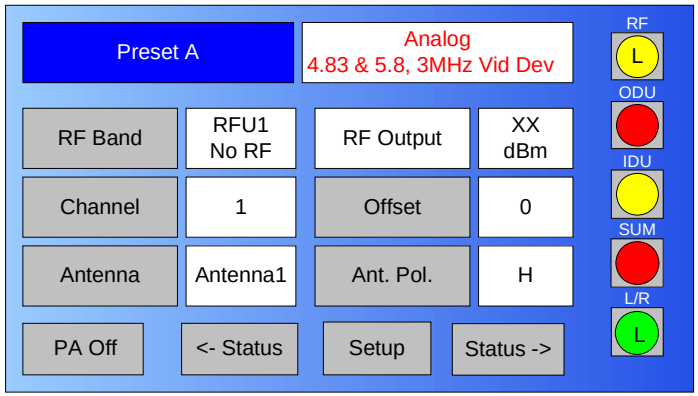
CAUTION *To allow proper shutdown of MTX5000 internal software, the progress bar must not be displayed when the power switch is pressed to off.*

Failure to properly power down the MTX5000 may corrupt the internal software.

---

1. Verify the Main screen is displayed on the color LCD display panel. See Figure 3-6.

Figure 3-6: Main Screen - Typical



2. Press the power switch and observe the symbol on the switch goes off.
3. Set the power source off, as required.

3.4 Using the MTX5000 Screens in Local Mode

Once the MTX5000 is powered up, you will be able to monitor and/or change certain operating parameters through the use of the options displayed on the color LCD display panel. All options are dependent upon the actual configuration of your MTX5000 and the Preset settings.

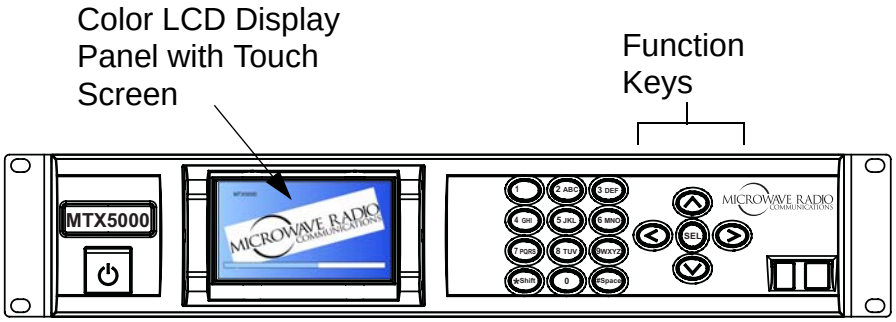
The sections listed in Table 3-1 describe use of the screens displayed on the color LCD display panel in the local operating mode.

Table 3-1: Using MTX5000 Menus

3.4.1 Overview

As you use the MTX5000, you will interact exclusively with the color LCD display panel. All operations are performed using either the color LCD display panel touch screen or function keys to select options. See Figure 3-7 on page 3-11.

Figure 3-7: MTX5000 Front Panel

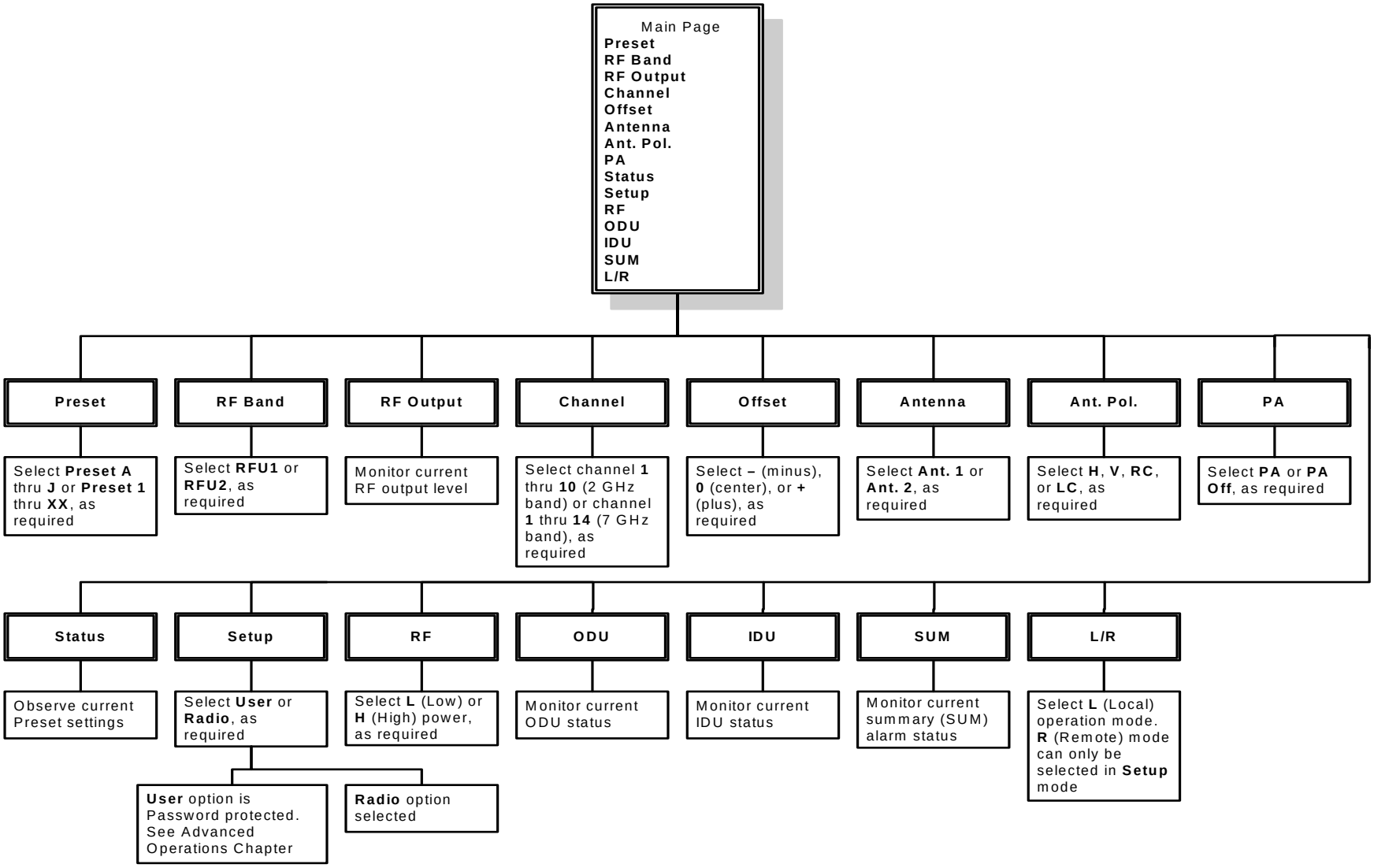


3.4.2 Main Screen

The Main screen is your starting point for navigating through the various status screens. The Main screen provides access to the current values of the selected Preset options.

The top level menu hierarchy is illustrated in Figure 3-8 on page 3-12. From the top level menu page, you will descend into the lower levels of the menu hierarchy until the operational parameter required is reached. All routine operations and options are described in the following paragraphs.

Figure 3-8: Top Level Main Menu Hierarchy

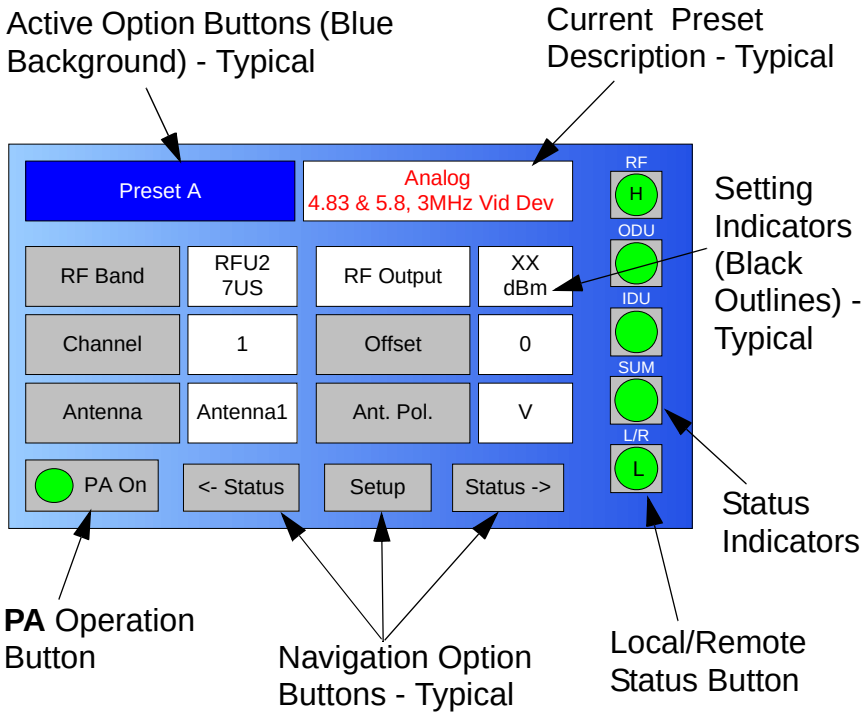


Each menu page has multiple selections available. Once you have navigated to the menu page required, you can observe or change an operating parameter, as required. To observe or change a parameter, different screens are displayed, indicating the different options available.

3.4.3 Color LCD Display Panel

All menus and screens displayed on the color LCD display panel consist of active option buttons, setting indicators, or status indicators. See Figure 3-9. The currently selected active option button will be blue with white text. Active option buttons that may be selected are grey with black text or white text on the blue background (e.g., the **Preset** option button). Grey option buttons with dark grey text are inactive and cannot be selected.

Figure 3-9: Color LCD Display Panel - Typical



On the Main screen, a brief description of the currently selected Preset is displayed in white with red text, surrounded by a black outline.

3.4.4 Touch Screen and Function Keys

CAUTION ***Avoid damage to the color LCD display panel!***

The color LCD display panel touch screen may be damaged if a sharp, hard-pointed object, such as a pencil or a pen, is used to select the displayed options.

Touch screen options must only be selected using your fingers, a soft-pointed stylus, or the front panel function keys.

Damage to the color LCD display panel caused by using a hard-pointed object or other misuse may void your warranty on the MTX5000 IDU.

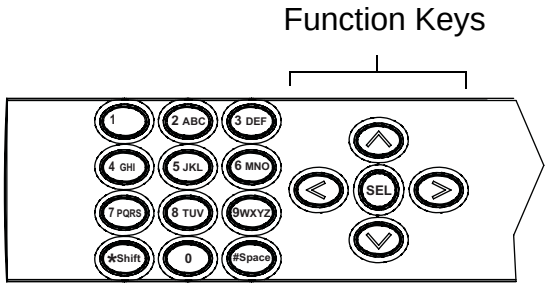
The color LCD display panel touch screen or function keys may be used to select active option buttons displayed on the color LCD display panel. To select a specific active option button using the touch screen, simply touch the required active option button on the color LCD display panel to select the option.

When active option buttons are selected, the option button will change from grey to blue and the text color will change accordingly. Setting indicators are white with black text, surrounded by a black outline. Active option buttons are selected using either the color LCD display panel touch screen or the function keys.

To use the function keys (See Figure 3-10 on page 3-14) to select a specific active option, use the Up, Down, Left, and Right function keys to select the required active option button, press

the **SEL** (select) function key, and observe the required option screen is displayed.

Figure 3-10: Function Keys



3.4.5 Navigation Between Main and Status Screens

Different Status screens are displayed depending upon the Preset mode (Analog or Digital) selected. At the bottom of each Main screen, navigation option buttons are provided that point to the Status screen(s). When a navigation option button that points to a Status screen is selected, the applicable Status screen will be displayed.

At the bottom of most Status screens, navigation option buttons pointing to the Main screen and the next Status screen, if any, are provided. When navigation option buttons pointing to the Main or Status screens are selected, the applicable screen will be displayed.

3.4.6 Transmitter Operation Buttons

Transmitter operation buttons are displayed on most screens to indicate or to change the current state of the transmitter. Transmitter operation buttons are described in the following paragraphs.

PA Operation Button The **PA** operation button status indicator is blue when selected, is labelled **PA Off** when the transmitter is off, indicates **PA** with an amber button in warm-up mode, and is green and is labelled **PA On** when the transmitter is on (transmitting).

When the **PA** operation button is selected using the touch screen or the function keys and **SEL** key, the state of the transmitter (**PA On** or **PA Off**) will change. The **PA** status indicator will then change to the alternate green (on) or grey (off) indicator, as applicable.

RF Operation Button The **RF** operation button will display a blue background when selected. The operation button will display a yellow status indicator labelled **L** (low power) when the transmitter is operating in the low power mode and will display a green status indicator labelled **H** (high power) when the transmitter is operating in the high power mode.

When the **RF** operation button is selected using the touch screen or the function keys and **SEL** key, the functional state of the transmitter will change and the **RF** status indicator will change to the alternate yellow (low power) or green (high power) status indicator, indicating the current state of the transmitter.

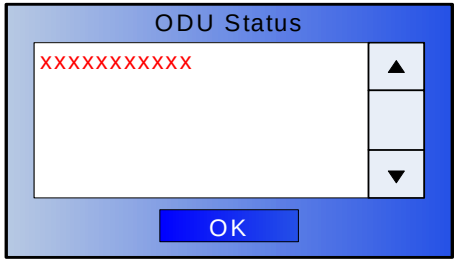
ODU Status Button The **ODU** status button displays the current Outdoor Unit (ODU) alarms. The **ODU** status button will display a green status indicator to indicate no alarm conditions exist in the ODU. The **ODU** status button will display a yellow status indicator if a minor alarm is detected that does not adversely affect transmit operations. The **ODU** status button will display a red status indicator if the ODU is reporting at least one major alarm that adversely affects transmit operations.

When the **ODU** status button is selected using the touch screen or the function keys and **SEL** key, the **ODU Status** screen (See Figure 3-11 on page 3-15) will be displayed indicating the current

ODU alarms. If no alarms are present, the dialog box will indicate **No Errors**. If alarms are present, the alarms will be listed in the dialog box. See "Error Messages" on page 4-1 for a list of possible alarms that may be listed in the dialog box.

The screen contains an **OK** option button that, when selected, removes the screen from the display.

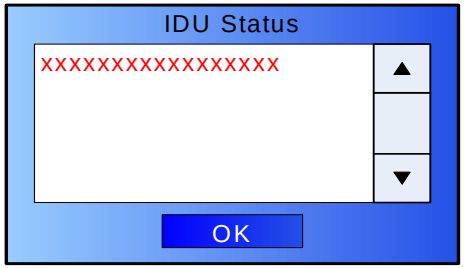
Figure 3-11: ODU Status Dialog Box - Typical



IDU Status Button The **IDU** status button displays the current condition of the Indoor Unit (IDU). The **IDU** status button will display a green status indicator indicating no alarm conditions exist in the IDU. The **IDU** status button will display a yellow status indicator if a minor alarm is detected that does not adversely affect transmit operations. The **IDU** status button will display a red status indicator if the IDU is reporting at least one major alarm that adversely affects transmit operations.

When the **IDU** status button is selected using the touch screen or the function keys and **SEL** key, the **IDU Status** screen (See Figure 3-12) will be displayed indicating the current status of the IDU.

Figure 3-12: IDU Status Dialog Box - Typical



If no alarms are present, the dialog box will indicate **No Errors**. If alarms are present, the alarms will be listed in the dialog box. See "Error Messages" on page 4-1 for a list of possible alarms that may be listed in the dialog box.

The screen contains an **OK** option button that, when selected, removes the screen from the display.

SUM Status Button The **SUM** status button displays the summary alarm status. The **SUM** status button will display a green status indicator to indicate no alarms exist in the MTX5000 system. The **SUM** status button will display a yellow status indicator if a minor IDU and/or ODU alarm is detected that does not adversely affect transmit operations. The **SUM** option button will display a red status indicator if the IDU and/or ODU is reporting at least one major alarm that adversely affects transmit operations.

The **SUM** status button will not display a red status indicator for all alarm conditions reported by the ODU or the IDU. Only alarm conditions that are considered major to the operation of the transmitter will change the state of the **SUM** status button status indicator to red.

When the **SUM** status button is selected using the touch screen or the function keys and **SEL** key, the **Summary Alarm** screen (See Figure 3-13 on page 3-16) will be displayed indicating the current status of the MTX5000 system.

Figure 3-13: Summary Alarm Dialog Box - Typical

If no alarms are present, the dialog box will indicate **No Errors**. If alarms are present, the IDU and/or ODU alarms will be listed in the dialog box. See "Error Messages" on page 4-1 for a list of possible alarms that may be listed in the dialog box.

The screen contains an **OK** option button that, when selected, removes the screen from the display.

3.4.7 Local/Remote Control Status Button

The Main page local/remote **L/R** status button indicates the MTX5000 is in either the local operation mode or in the remote operation mode. When the **L** option is displayed, the status indicator will be green. When the **R** option is selected, the status indicator will be amber.

When the option button is in the **L** mode, all control operations must be performed at the MTX5000. When in the **R** mode and the MTX5000 is connected via your web browser to a PC at a remote location or to the optional Remote Access Subnotebook PC during mobile operations, the operations must be performed at the remote PC.

You can connect to the MTX5000 from a remote location when the MTX5000 is in either the local or remote operation mode. If you are connected to the MTX5000 via your web browser from a remote location or to the optional Remote Access Subnotebook PC and the MTX5000 is in the local operation mode, you can monitor status settings from the remote location, but no settings may be changed from the remote PC. You must be in the remote operation mode to monitor and control the MTX5000 remotely.

To select the remote operation mode, you must use the **Setup** screens. To change from the remote mode to the local mode, you must select the Main screen **L/R** status button.

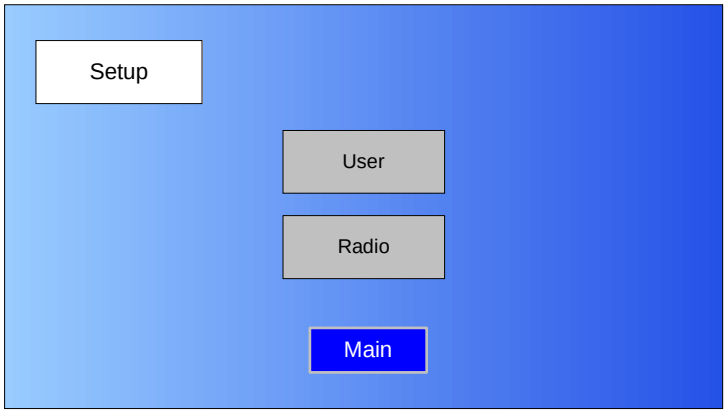
Selection of the local/remote operating mode can only be performed at the MTX5000. You cannot change the local/remote operating mode from the remote location. For information on using the MTX5000 in the remote operating mode, see "Using the MTX5000 in Remote Mode" on page 3-60.

3.4.8 Setup Screen Options

The Main screen **Setup** option button and the associated setup option screens are described in the following paragraphs.

Setup Screen The Main screen **Setup** option button provides you with access to the **Setup** screen when the **Setup** option button is selected. See Figure 3-14.

Figure 3-14: Setup Screen



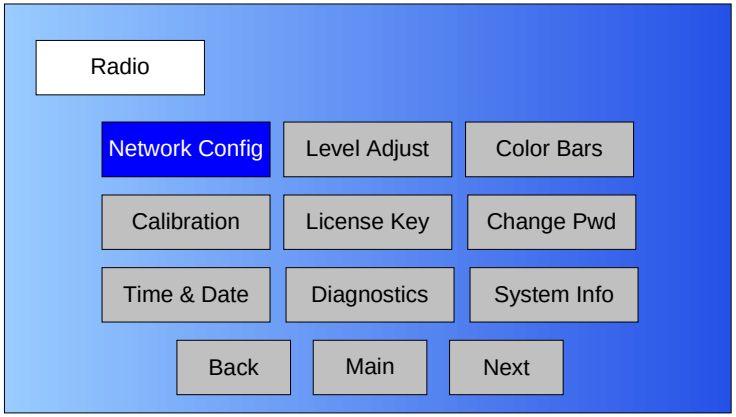
The **Setup** screen provides **User**, **Radio**, and **Main** option buttons. The option buttons are described in the following paragraphs.

Main Option Button Selection of the **Main** option button provides return from the **Setup** screen to the Main screen.

User Option Button The **User** option button is password-controlled and provides access to custom radio Preset settings. For information on the **User** option button, see "Advanced Operations" on page 5-1.

Radio Option Button Selection of the **Setup** screen **Radio** option button provides entry into the **Radio** screen. See Figure 3-15.

Figure 3-15: Radio Screen

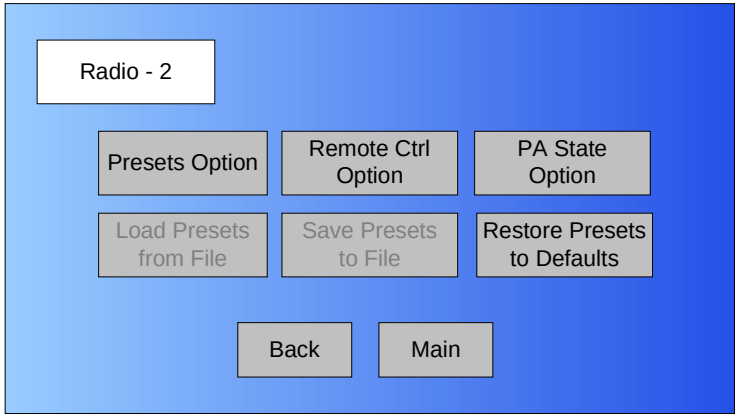


Back Option Button Selection of the **Radio** screen **Back** option button provides return from the **Radio** screen to the **Setup** screen.

Main Option Button Selection of the **Radio** screen **Main** option button provides return from the **Radio** screen to the Main screen.

Next Option Button Selection of the **Radio** screen **Next** option button takes you to the **Radio- 2** screen. See Figure 3-16.

Figure 3-16: Radio - 2 Screen

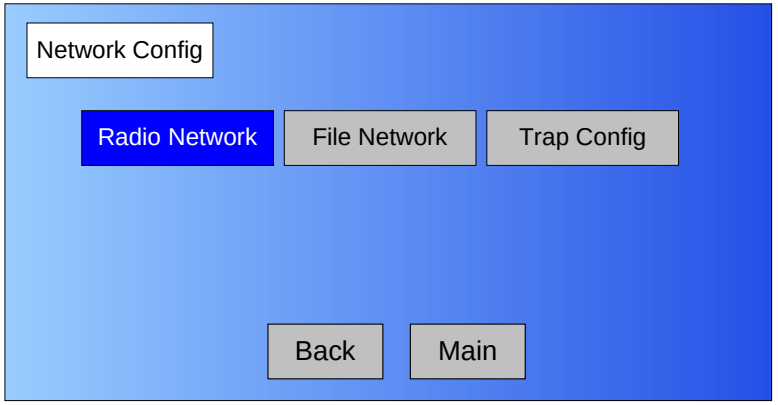


3.4.9 Radio Screen Options

The option buttons contained on the **Radio** screen are described in the following paragraphs.

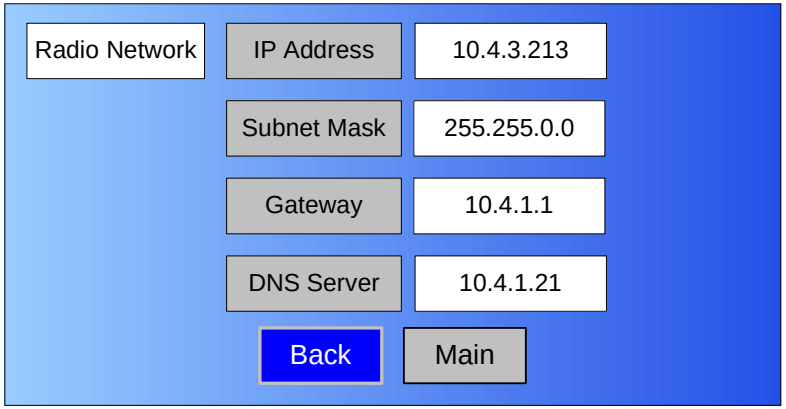
Network Config Option Button When the **Radio** screen **Network Config** option button is selected, the **Network Config** screen is displayed. See Figure 3-17.

Figure 3-17: Network Config Screen



When the **Network Config** screen **Radio Network** option button is selected, the **Radio Network** screen is displayed. See Figure 3-18.

Figure 3-18: Radio Network Screen - Typical

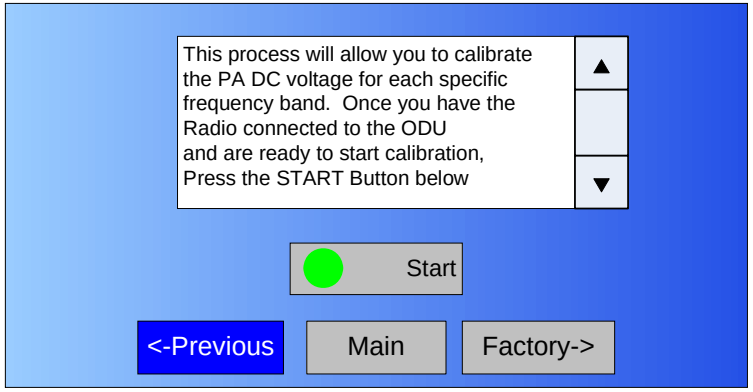


Selection of the **Radio IP**, **Subnet Mask**, **Gateway**, and **DNS Server** option buttons allows you to change the network addresses required to operate your MTX5000 System from a remote location. ***Any changes to your network addresses must be coordinated with your Network Administrator.***

Calibration Option Button When the **Setup** screen **Calibration** option button is selected, the PA Voltage Adjust Setup screen will be displayed. See Figure 3-19.

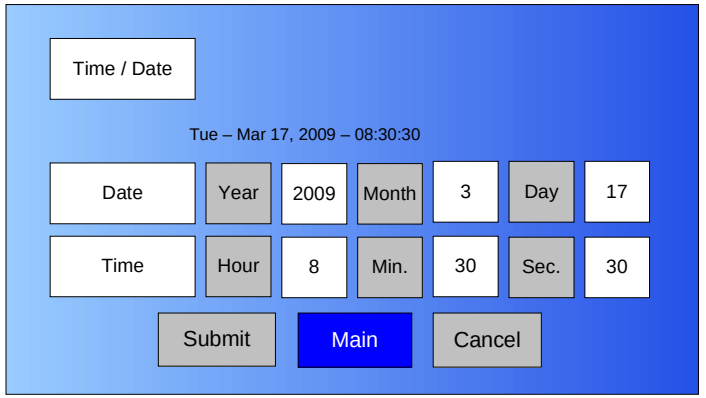
The PA Voltage Adjust Setup screen provides you with the ability to calibrate the PA DC power for individual ODUs (RF Units), as applicable to the options contained in your MTX5000 system, by selecting the **Start** option button. The **Factory** option button is password-protected for factory use only.

Figure 3-19: PA Voltage Adjust Setup Screen



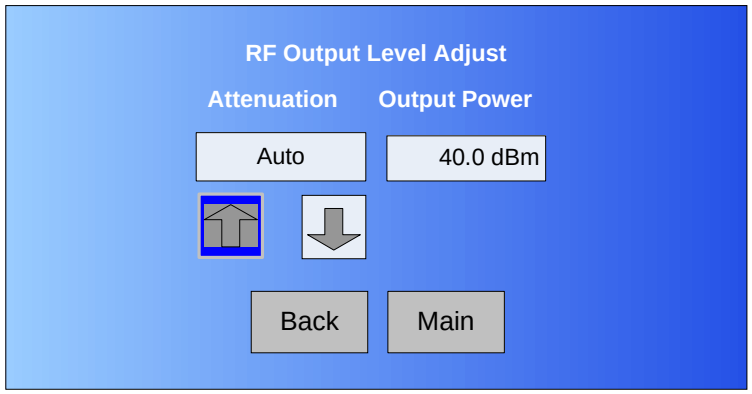
Time & Date Option Button When the **Date & Time** option button is selected, the **Time/Date** screen is displayed. See Figure 3-20. This screen allows you to set the current time and date.

Figure 3-20: Date & Time Screen - Typical



Level Adjust Option Button When the **Setup** screen **Level Adjust** option button is selected, the **RF Output Level Adjust** screen will be displayed. See Figure 3-21 on page 3-19.

Figure 3-21: RF Output Level Adjust Screen



The **RF Output Level Adjust** screen is used to adjust the RF power output level, as applicable to the options contained in your MTX5000 system.

The **Attenuation** level and the resulting **Output Power** level are adjusted by selecting the **Attenuation** Up or Down arrow option keys, as required, using either the touch screen or function keys and **SEL** key to toggle through the **Attenuation** level options.

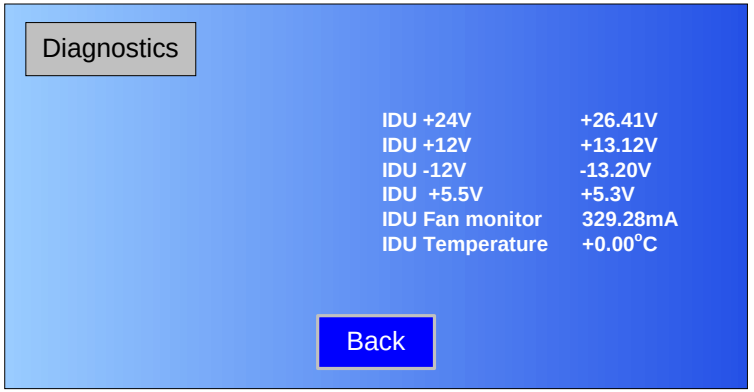
License Key Option Button The **License Key** option button allows you to add optional factory licensed options to your MTX5000 IDU without having to return your IDU to the factory for upgrade. This option button should only be used by the technical staff.

In order to add a licensed option to your MTX5000 IDU, you must purchase the license key applicable to the option required. This license key is available only from MRC.

For information on adding licensed features to your MTX5000 IDU, see "License Manager" on page 5-117.

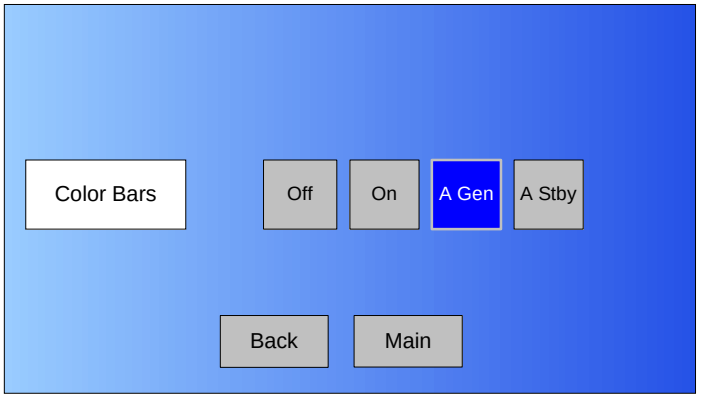
Diagnostics Option Button This option is provided to assist in troubleshooting the IDU. See Figure 3-22.

Figure 3-22: Diagnostics Screen - Typical



Color Bars Option Button When the **Color Bars** option button is selected, the **Color Bars** screen will be displayed. See Figure 3-23.

Figure 3-23: Color Bars Screen



Note	A digital color bar generator is contained in each MTX5000 IDU. An optional analog color bar generator is also available.

The Color Bar Generator (CBG) has four operating modes that may be selected as follows:

- **Off** - Color bars and audio test tones are turned off.
- **On** - Color bars and audio test tones are continuously turned on. This mode should be used for test or troubleshooting only.
- **A Gen** (Auto Generated) - If a loss of video signal occurs, color bars and/or audio test tones are transmitted after a specified delay.
- **A Stby** (Auto Standby) - If a loss of video signal occurs, the transmitter is automatically placed into standby (PA is turned off).

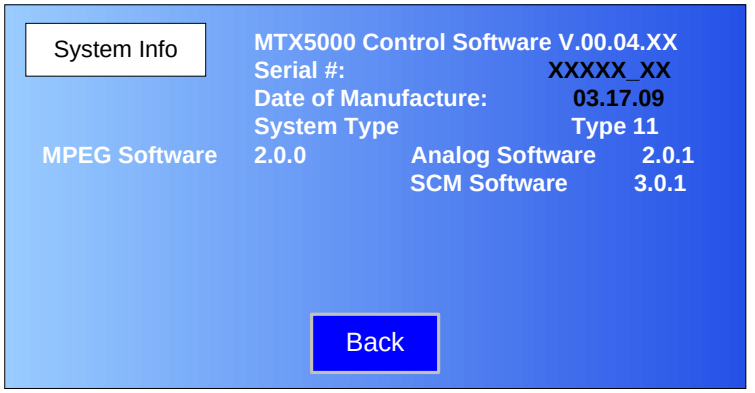
Change Pwd Option Button The **Change Pwd** option button provides the means to change the system password. This option button should only be used by the technical staff.

For information on changing the system password, see "Local Mode Password Control" on page 5-3.

System Info Option Button When the **System Info** option button is selected, the **System Info** screen will be displayed. See Figure 3-24.

The **System Info** screen will display the current software versions contained in the MTX5000 IDU.

Figure 3-24: System Info Screen - Typical



3.5 Select Local/Remote Operation Mode

CAUTION

Avoid damage to the color LCD display panel!

The color LCD display panel touch screen may be damaged if a sharp, hard-pointed object, such as a pencil or a pen, is used to select the displayed options.

Touch screen options must only be selected using your fingers, a soft-pointed stylus, or the front panel function keys.

Damage to the color LCD display panel caused by using a hard-pointed object or other misuse may void your warranty on the MTX5000 IDU.

Note	***Remote operations must performed using Internet Explorer 7.0 or later.***

The procedure required to select the local or remote operation mode is contained in the following steps. In order to operate the MTX5000 remotely, you must connect the MTX5000 to a PC via your web browser.

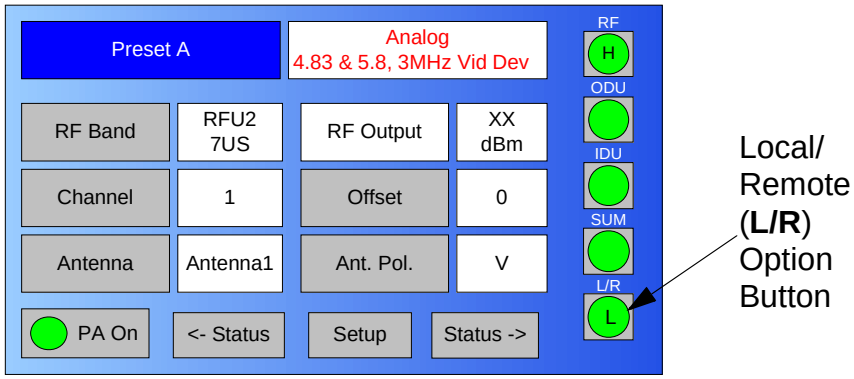
In order to operate the MTX5000 via remote control using the optional Remote Access Subnotebook PC, refer the Remote Access Subnotebook PC Operator's Guide, part no. 400573-1.

Selection of the local/remote operation modes can only be performed at the MTX5000.

Note	When performing steps at the MTX5000 in the following steps, option buttons may be selected using either the touch screen or the function keys and the **SEL** key.

1. Observe the Main screen is displayed. See Figure 3-25.

Figure 3-25: Main Screen - Typical



Note	To select the local operation mode when the MTX5000 is in the remote mode, perform step 2 and step 3. To select the remote operation mode when the MTX5000 is in the local mode and you do not know the MTX5000 IP address, go to step 4. If you know the IP address, go to step 9.

2. Observe the **L/R** option button label indicates **R**.
3. Select the **L/R** option button and observe the **L/R** option button label changes to **L**. Procedure is complete.
4. Select the **Setup** option button and observe the **Setup** screen is displayed.
5. Select the **Radio** option button and observe the **Radio** screen is displayed.
6. Select the **Network Config** option button and observe the **Network Config** screen is displayed.
7. Select the **Radio** option button and observe the **Radio** screen is displayed.
8. Record the **IP Address**, select the **Main** option button, and observe the Main screen is displayed.

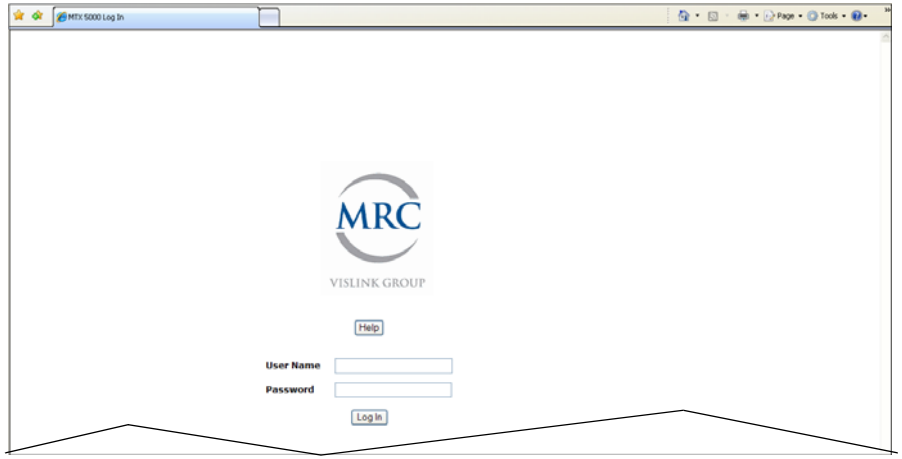
Note	In the following step, **XX.X.X.XXX** is the IP address of your MTX5000 IDU.

9. At the remote PC, open your web browser, enter the IP address for your MTX5000, and press the PC keyboard **Enter** key. The IP address should be entered as follows:

http://XX.X.X.XXX/nfs/main.html

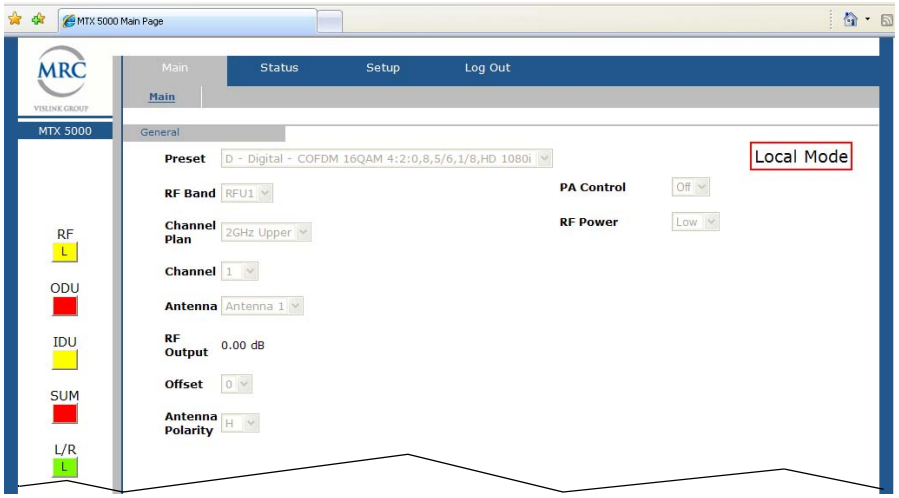
10. After a short delay, observe the remote log in screen is displayed. See Figure 3-26.

Figure 3-26: Remote Log In Screen - Typical



11. Enter your user name in the **User Name** text box, enter your password in the **Password** text box, select the **Log In** option button, and observe the **MTX5000 Main Page** is displayed. See Figure 3-27.

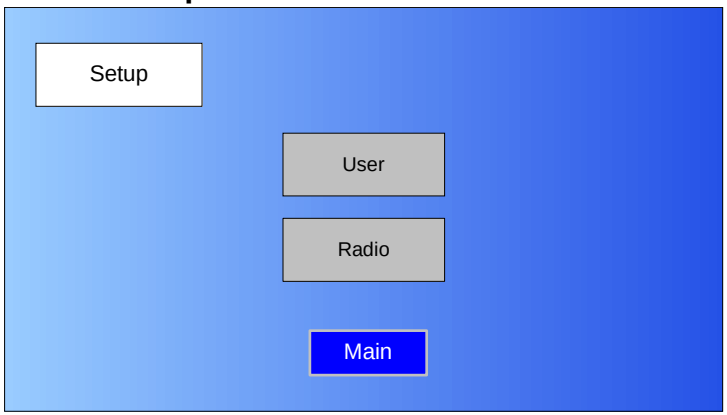
Figure 3-27: MTX5000 Main Page - Typical



12. At the MTX5000, verify the **L/R** option button indicates **L**.

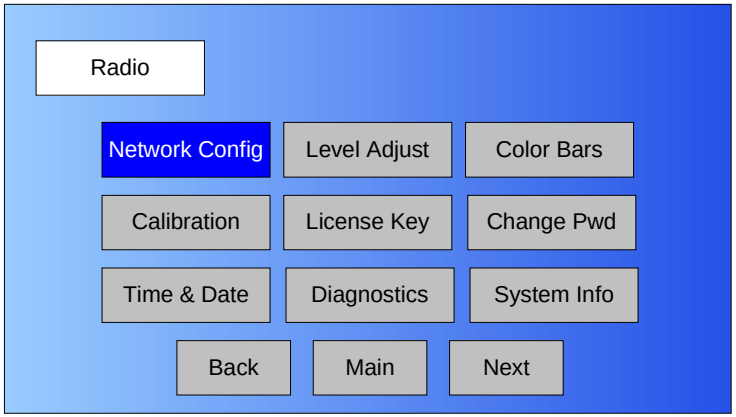
13. Select the **Setup** option button and observe the **Setup** screen is displayed. See Figure 3-28.

Figure 3-28: Setup Screen



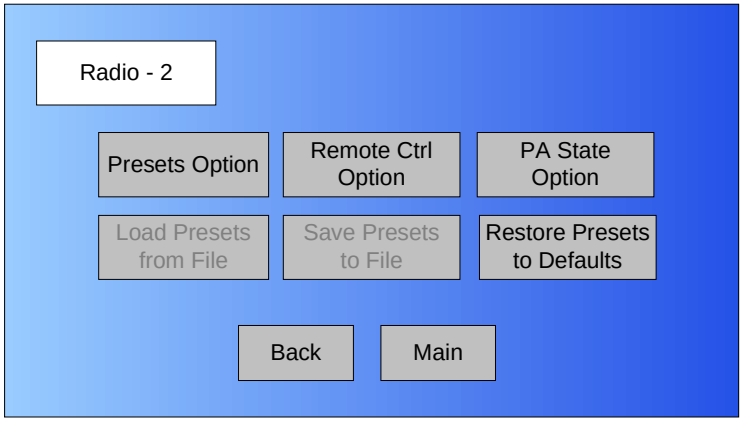
14. Select the **Radio** tab and observe the **Radio** screen is displayed. See Figure 3-29 on page 3-23.

Figure 3-29: Radio Screen



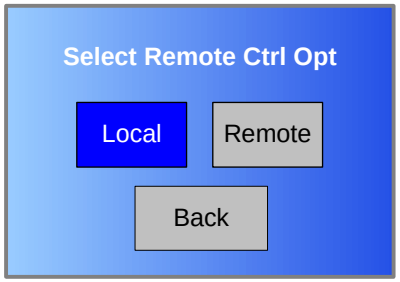
15. Select the **Next** tab and observe the **Radio - 2** screen is displayed. See Figure 3-30.

Figure 3-30: Radio - 2 Screen



16. Select the **Remote Ctrl Option** option button and observe the **Select Remote Ctrl Opt** screen is displayed. See Figure 3-31.

Figure 3-31: Select Remote Ctrl Opt Screen



17. Select the **Remote** option button and observe the **Radio - 2** screen is displayed.
18. Select the **Main** option button and observe the Main screen is displayed.
19. Observe the **L/R** status button label indicates **R** and the option button status indicator is amber.
20. Observe the **Local Mode** status indicator disappears from the remote screen PC display.

3.6 MTX5000 Local Operations

CAUTION ***Avoid damage to the color LCD display panel when performing the following procedures!***

The color LCD display panel touch screen may be damaged if a sharp, hard-pointed object, such as a pencil or a pen, is used to select the displayed options.

Touch screen options must only be selected using your fingers, a soft-pointed stylus, or the front panel function keys.

Damage to the color LCD display panel caused by using a hard-pointed object or other misuse may void your warranty on the MTX5000 IDU.

Note

If you are connected to the Ethernet via the IDU rear panel **ETHERNET** RJ45 connector and you find that the color LCD display panel appears to be operating very slowly or has locked up completely, disconnect the Ethernet cable from the **ETHERNET** connector.

This should free up the color LCD display Panel and the IDU should resume proper operation.

Once the MTX5000 is powered up, you will be able to check its configuration and monitor and control its operation in the local operating mode.

The procedures required to use the Main and Status screens in the local operating mode are as follows:

3.6.1 Select Preset

During performance of this procedure, you may select from a list of factory **Default** Presets or from a list of custom **User** Presets. Factory **Default** Presets are identified alphabetically from **Preset A** thru **Preset J**. Custom **User** Presets are identified numerically from **Preset 1** thru **Preset XX**, with "**XX**" being the last Preset available.

Notes

If selecting factory **Default** Presets in the following steps, **Preset J** is not currently active.

Preset F and **I** are active only if your MTX5000 IDU contains the applicable licensed factory options.

The procedure required to select a different Preset is contained in the following steps. You can select a different Preset from a list of factory-configured Presets and multiple custom Presets.

When performing the following steps, a **Main** option button to

return you to the Main screen will be displayed at the bottom of the Preset screen.

If the MTX5000 IDU is transmitting when a Preset is selected, the **PA** operation button will become greyed out, indicating the system is no longer transmitting. The **PA** operation button must then be selected to resume transmitting.

CAUTION

If you select the wrong Preset in the following steps, wait a minimum of 5 seconds before attempting to select another Preset.

Failure to wait a minimum of 5 seconds between selection of Presets may cause unstable operation.

When a Preset is selected, the Main screen will be displayed after a short delay, the Preset on the Main screen will be updated to display the selected Preset, and the updated system settings and status of the selected Preset will be displayed.

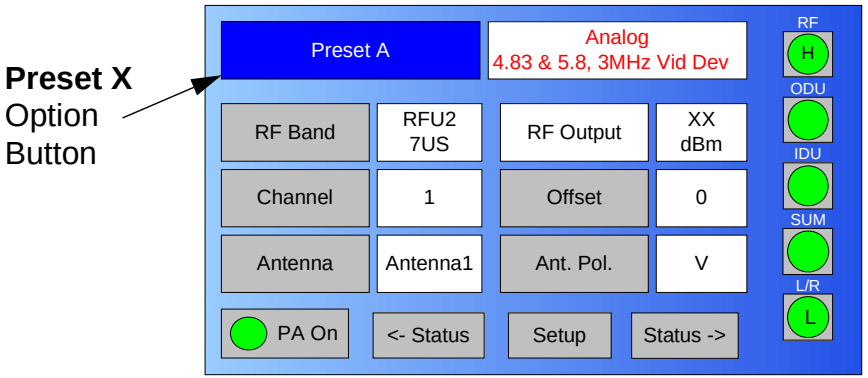
If the **Main** option button is selected to return to the Main screen without selecting a different Preset, the Main screen will be displayed and no changes will be made to the current MTX5000 settings.

Note

In the following steps, option buttons may be selected using either the touch screen or the function keys and the **SEL** key.

1. Observe the Main screen is displayed. See Figure 3-32.

Figure 3-32: Main Screen - Typical



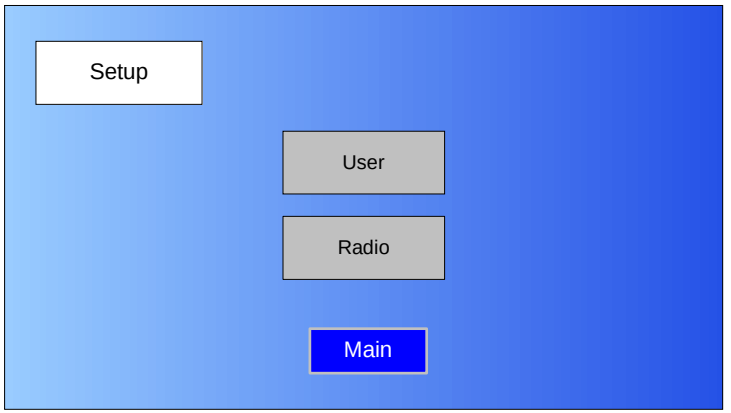
Note

To switch between factory **Default** or custom **User** defaults, go to step 2.

If you do not need to switch between factory **Default** or custom **User** defaults, go to step 8.

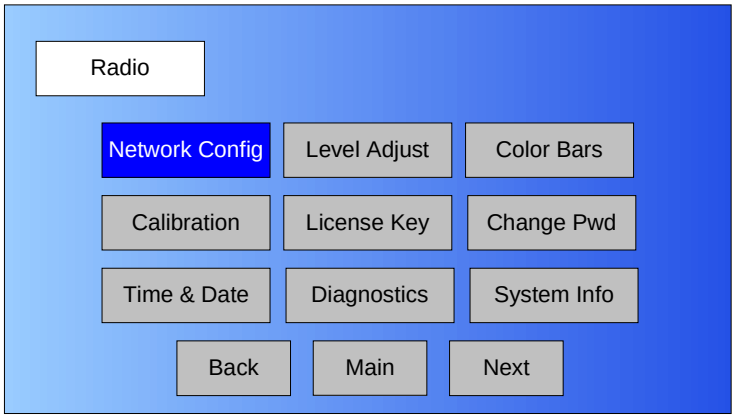
2. Select the **Setup** option button and observe the **Setup** screen is displayed. See Figure 3-33.

Figure 3-33: Setup Screen



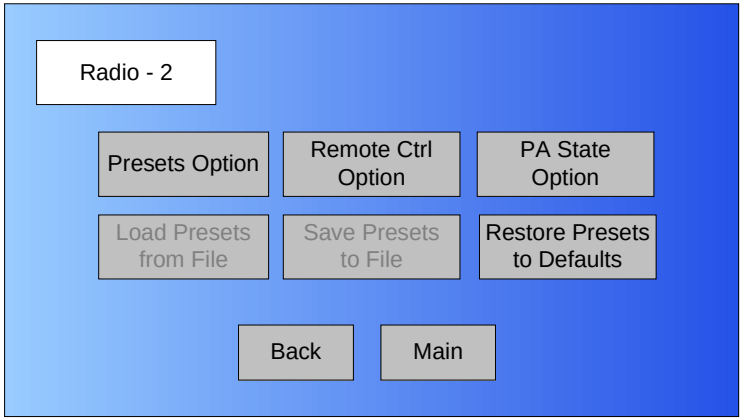
3. Select the **Radio** tab and observe the **Radio** screen is displayed. See Figure 3-34.

Figure 3-34: Radio Screen



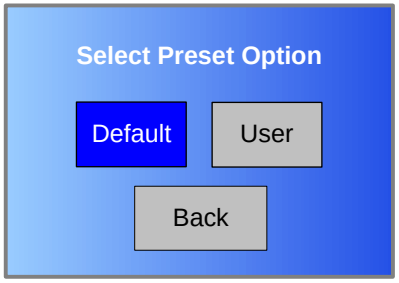
4. Select the **Next** tab and observe the **Radio - 2** screen is displayed. See Figure 3-35.

Figure 3-35: Radio - 2 Screen



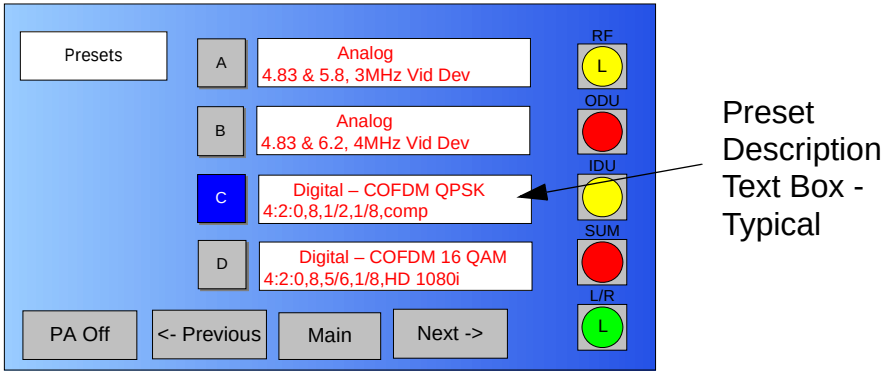
5. Select the **Presets Option** option button and observe the **Select Preset Option** screen is displayed. See Figure 3-36.

Figure 3-36: Select Preset Option Screen



6. Select the **Default** or **User** option button, as required, and observe the **Radio - 2** screen is displayed.
7. Select the **Main** option button and observe the Main screen is displayed.
8. Select the Main screen **Preset X** option button and observe the **Presets** screen is displayed. See Figure 3-37.

Figure 3-37: Preset X Screen - Typical



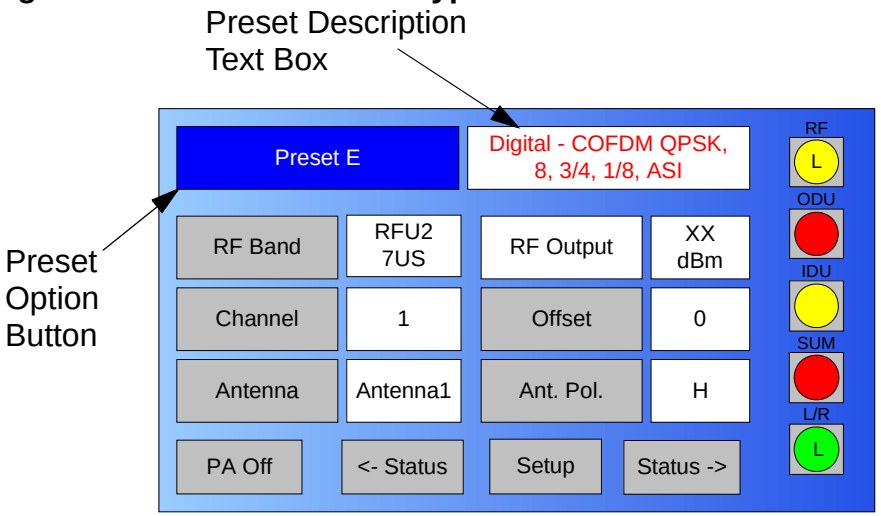
Note	If you decide not to select a different Preset in the following step and select the **Main** option button instead, no configuration changes will be made, the **RECONFIGURING RADIO** screen will not be displayed, the Main screen will be displayed, and no changes will be displayed in the Preset description box.

9. Use the **Previous** and **Next** option buttons, as required, select the required Preset option button, and observe the **RECONFIGURING RADIO** screen is displayed. See Figure 3-38.

Figure 3-38: RECONFIGURING RADIO Screen - Typical

10. After a short delay, observe the Main screen is displayed and observe the new Preset and status data applicable to the Preset is displayed. See Figure 3-39.

Figure 3-39: Main Screen - Typical



11. Select the **PA** operation button to resume transmitting, as required.

3.6.2 Select RF Band

The procedure required to select an RF band ODU is contained in the following steps.

If your MTX5000 system is a dual band configuration containing both a 2 GHz and a 7 GHz ODU (RF head), the procedure required to select the RF head required for either 2 GHz or 7 GHz operation is contained in the following steps. This procedure is also used to select either the 2 GHz, 17 MHz channel plan or the 2 GHz, 12 MHz channel plan, as required for 2 GHz operation.

In a dual band configuration, the 2 GHz RF head is typically connected to the IDU **RFU 1** rear panel connector and the 7 GHz RF head is typically connected to the **RFU 2** rear panel connector. The RF heads may, however, be connected to either

rear panel connector. The MTX5000 software automatically detects the 2 GHz and 7 GHz RF heads and assigns **RFU1** and **RFU2** to the respective RF heads on the **RF Band** screen, as required.

If your MTX5000 system is a single 2 GHz or 7 GHz configuration, the RF head may be connected to either the IDU **RFU 1** or **RFU 2** rear panel connector. The MTX5000 software automatically detects the RF head configuration and connection and assigns **RFU1** or **RFU2** to the RF head on the **RF Band** screen, as applicable.

When performing the following steps, a navigation option button to return you to the Main screen will be displayed at the bottom of the **RF Band** screen.

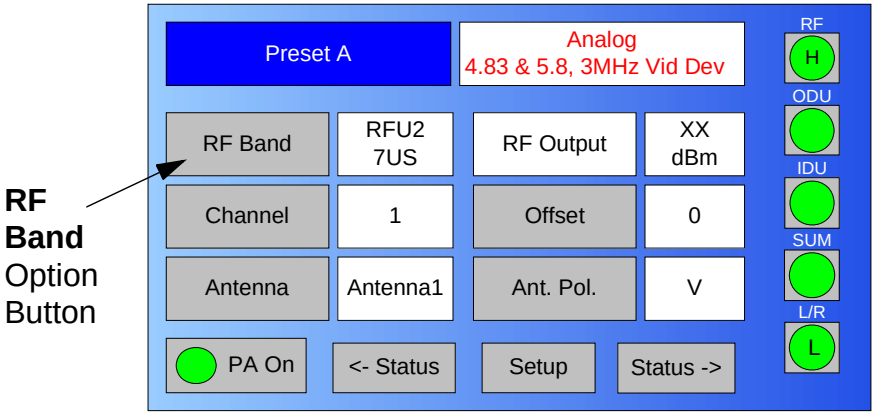
When the new RF head is selected, the updated system status associated with the **RF Band** option button will display the new selected RF head, after a short delay. The **Main** option button must then be selected to return to the Main screen.

If the **Main** option button is selected to return to the Main screen without selecting a new RF head, the Main screen will be displayed and no changes will be made to current MTX5000 settings.

Note	In the following steps, option buttons may be selected using either the touch screen or the function keys and the **SEL** key.

1. Observe the Main screen is displayed. See Figure 3-40.

Figure 3-40: Main Screen - Typical



2. Select the **RF Band** option button and observe the **RF Band** screen is displayed and the current RF band option button is highlighted. See Figure 3-41, Figure 3-42 on page 3-29, Figure 3-43 on page 3-29, or Figure 3-44 on page 3-29.

Figure 3-41: RF Band 2 GHz RFU1 Option Screen

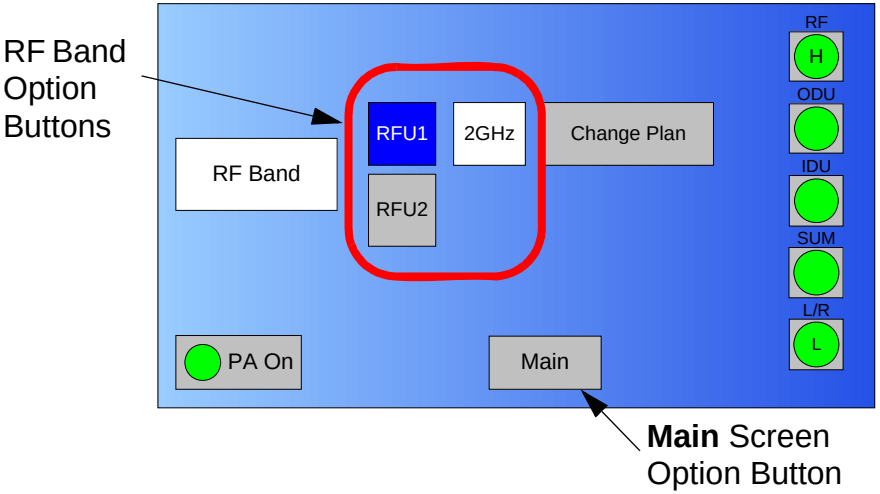


Figure 3-42: RF Band 2 GHz RFU2 Option Screen

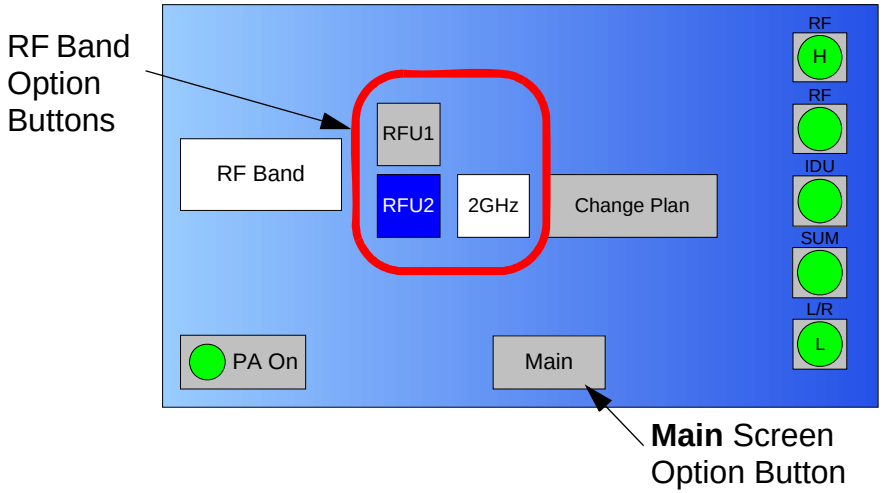


Figure 3-43: RF Band 7 GHz RFU1 Option Screen

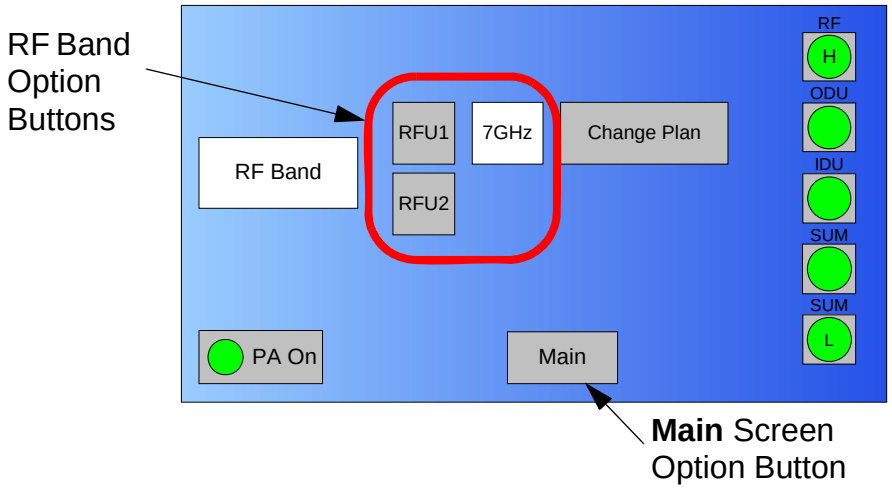
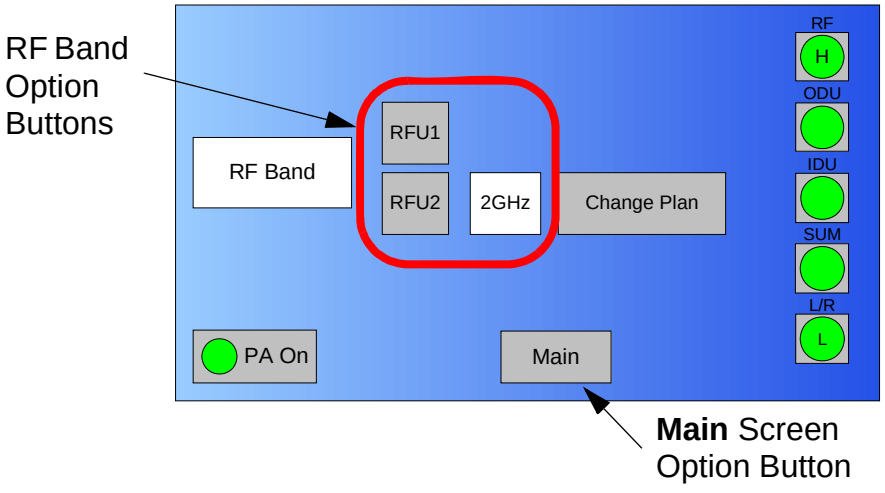


Figure 3-44: RF Band 7 GHz RFU2 Option Screen

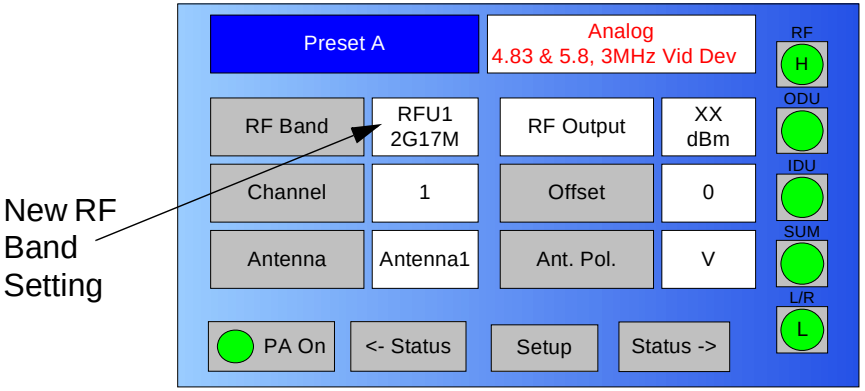


3. Select the **RFU1** or **RFU2** 2 GHz or 7 GHz RF head option button, as required, and observe the **RECONFIGURING RADIO** screen is displayed. See Figure 3-45.

Figure 3-45: RECONFIGURING RADIO Screen - Typical

4. After a short delay, observe the new RF Band is active (blue), select the **Main** option button, and observe the new RF band setting is displayed. See Figure 3-46.

Figure 3-46: Main Screen - Typical



5. To select a new operating channel, perform "Select/ Customize Operating Channels", as required.

3.6.3 Select/Customize Operating Channels

The procedure required to select an operating channel or to prepare a customized channel is contained in the following steps.

When performing the following steps, a navigation option button to return you to the Main screen will be displayed at the bottom of the **Channel** screen.

When the new channel options are selected, the Main screen will be displayed and the updated system status associated with the **Channel** option button will display the newly selected channel.

When a channel is customized, the channel number that was changed will not automatically be displayed on the Main page unless that channel was already selected. If a channel is customized that was not selected on the Main page, the customized channel number must be selected from the Main page using the **Channel** option button and the **Channel** screen.

If the **Main** option button is selected to return to the Main screen without selecting a new channel, the Main screen will be displayed and no changes will be made to current MTX5000 settings.

Note In the following steps, option buttons may be selected using either the touch screen or the function keys and the **SEL** key.

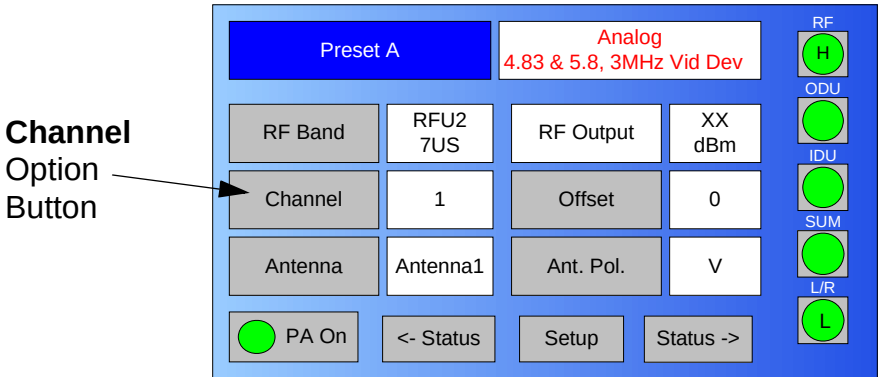
Note To select the operating channel only, perform step 1 thru step 3.

To customize individual channels, go to step 4.

---

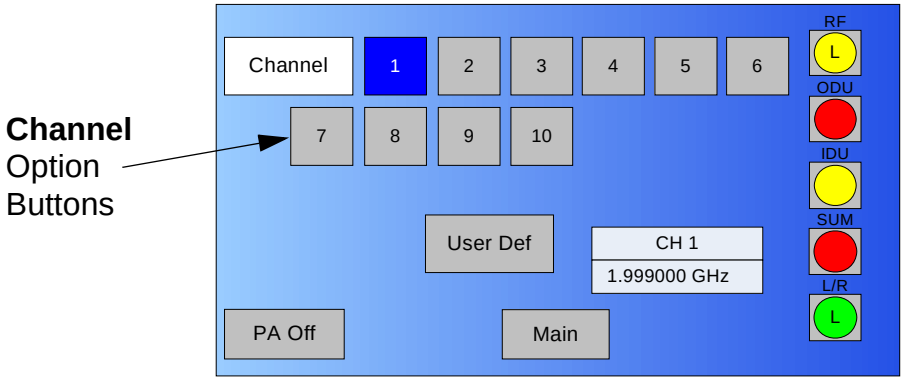
1. Observe the Main screen is displayed. See Figure 3-47.

Figure 3-47: Main Screen - Typical



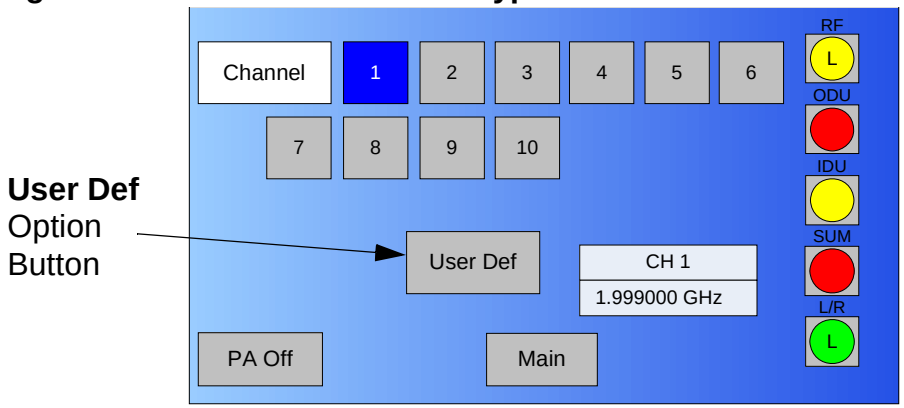
2. Select the **Channel** option button and observe the **Channel** screen is displayed. See Figure 3-48.

Figure 3-48: Channel Screen - Typical



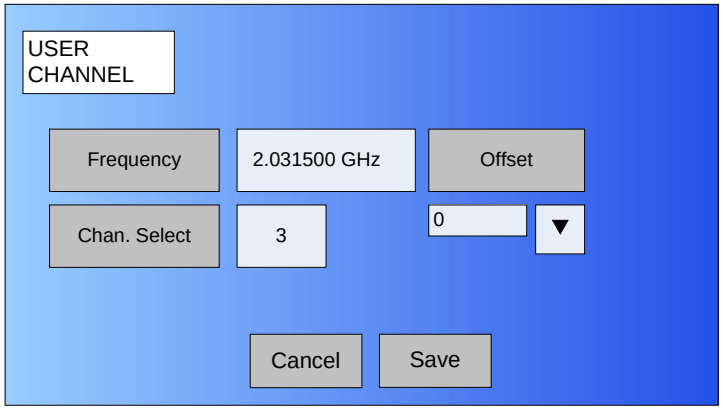
3. Select the **Channel** option button required, observe the Main screen is displayed, and observe the **Channel** option has been changed. Procedure is complete.
4. Select the Main screen **Channel** option button and observe the **Channel** screen is displayed. See Figure 3-49.

Figure 3-49: Channel Screen - Typical



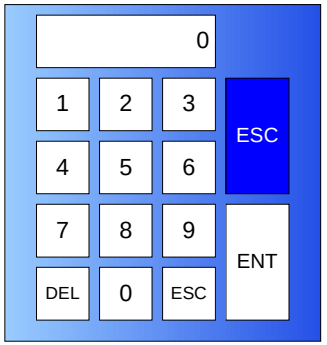
5. Select the **User Def** option button and observe the **USER CHANNEL** screen is displayed. See Figure 3-50.

Figure 3-50: USER CHANNEL Screen - Typical



6. Select the **Frequency** option button and observe the numeric keypad is displayed. See Figure 3-51.

Figure 3-51: Numeric Keypad

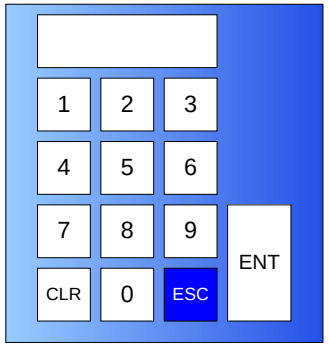


7. Enter frequency required, select the **ENT** option button, and observe the **USER CHANNEL** screen is displayed.

Note	The **++** offset option is not a valid option for 2 GHz and 7 GHz channel plans.

8. Select the **Offset** pull-down menu and select **-** (minus), **0** (center), or **+** (plus) offset, as required.
9. Select the **Chan. Select** option button and observe the numeric keypad is displayed. See Figure 3-52.

Figure 3-52: Numeric Keypad



Note	In the following step, channels **1** thru **10** may be selected for the 2 GHz band; channels **1** thru **14** may be selected for the 7 GHz band.

10. Enter the channel number required, select the **ENT** option button, and observe the **USER CHANNEL** screen is displayed.
11. Select the **Save** option button and observe the **Channel** screen is displayed.
12. Select the **Main** option button and observe the Main screen is displayed.

3.6.4 Select Channel Offset

The procedure required to select the channel frequency offset is contained in the following steps.

When performing the following steps, a navigation option button to return you to the Main screen will be displayed at the bottom of the **Offset** screen.

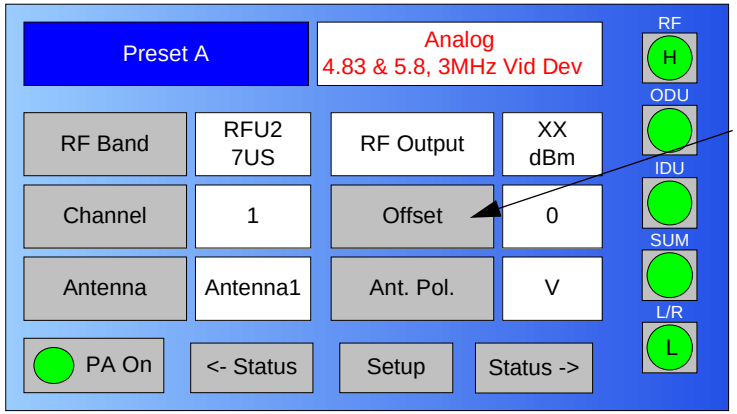
When the new offset is selected, the Main screen will automatically be displayed and the updated system status associated with the **Offset** option button will display the new offset.

If the **Main** option button is selected to return to the Main screen without selecting a new offset, the Main screen will be displayed and no changes will be made to current MTX5000 settings.

Note	In the following steps, option buttons may be selected using either the touch screen or the function keys and the **SEL** key.

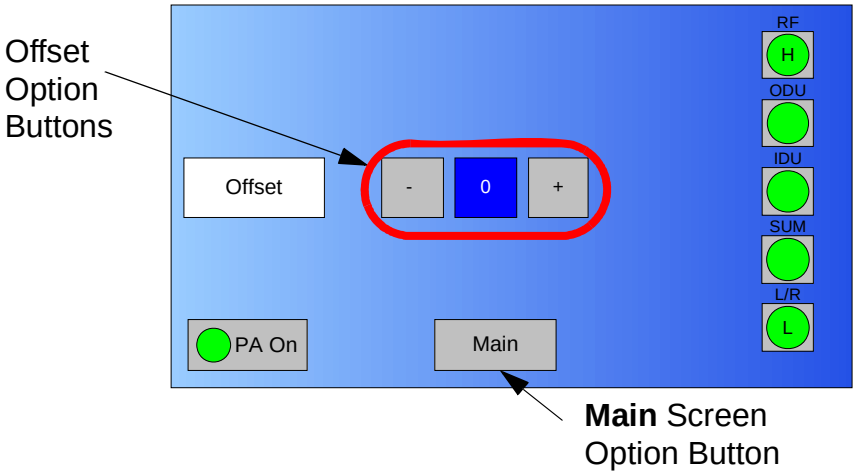
1. Observe the Main screen is displayed. See Figure 3-53.

Figure 3-53: Main Screen - Typical



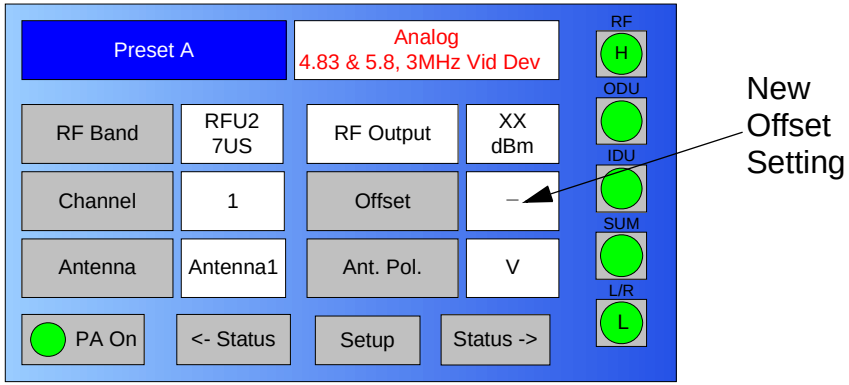
2. Select the **Offset** option button and observe the **Offset** screen is displayed. See Figure 3-54.

Figure 3-54: Offset Screen - Typical



3. Select the **Offset** option button required, observe the Main screen is displayed, and observe the new offset setting is displayed. See Figure 3-55.

Figure 3-55: Main Screen - Typical



3.6.5 Select Antenna

The procedure required to select a different antenna is contained in the following steps. When performing the following steps, a navigation option button to return you to the Main screen will be displayed at the bottom of the **Antenna** screen.

When the new antenna is selected, the **Main** option button must be selected, the Main screen will automatically be displayed, and the updated system status associated with the **Antenna** option button will display the new selected antenna.

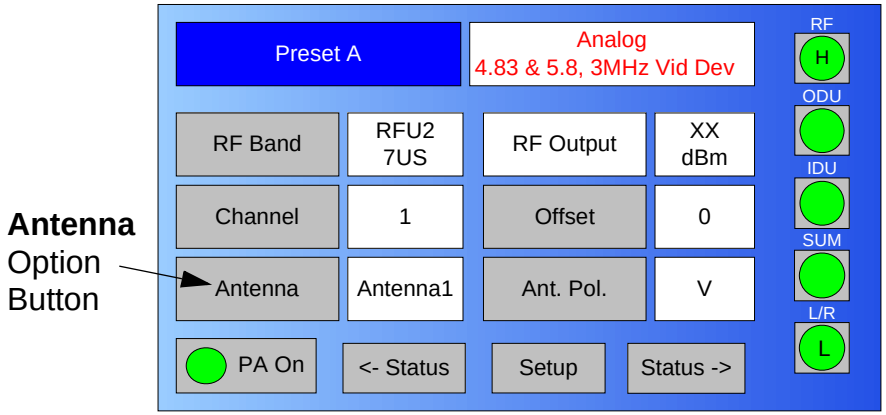
If the **Main** option button is selected to return to the Main screen without selecting a different antenna, the Main screen will be displayed and no changes will be made to current MTX5000 settings.

Note In the following steps, option buttons may be selected using either the touch screen or the function keys and the **SEL** key.

---

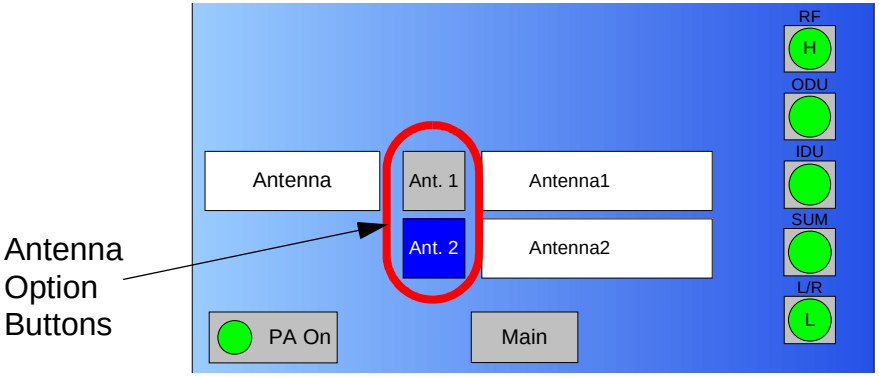
1. Observe the Main screen is displayed. See Figure 3-56.

Figure 3-56: Main Screen - Typical



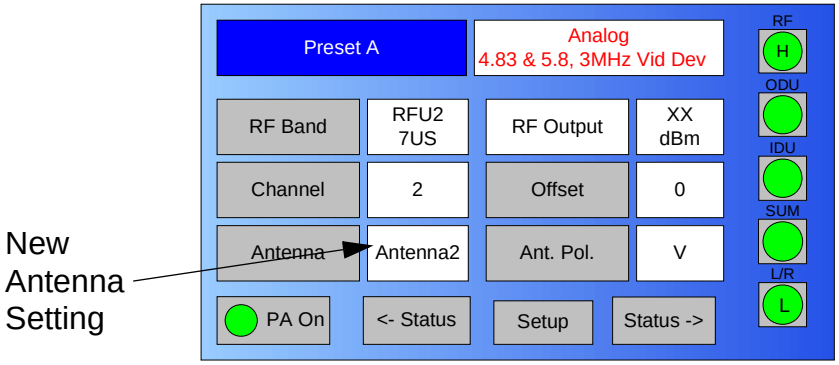
2. Select the **Antenna** option button and observe the **Antenna** screen is displayed. See Figure 3-57.

Figure 3-57: Antenna Screen - Typical



3. Select the **Antenna** option button required, select the **Main** option button, observe the Main screen is displayed, and observe the antenna selected is displayed. See Figure 3-58.

Figure 3-58: Main Screen - Typical



3.6.6 Select Antenna Polarization

The procedure required to select the antenna polarization is contained in the following steps.

When performing the following steps, a navigation option button to return you to the Main screen will be displayed at the bottom of the **Antenna Polarity** screen.

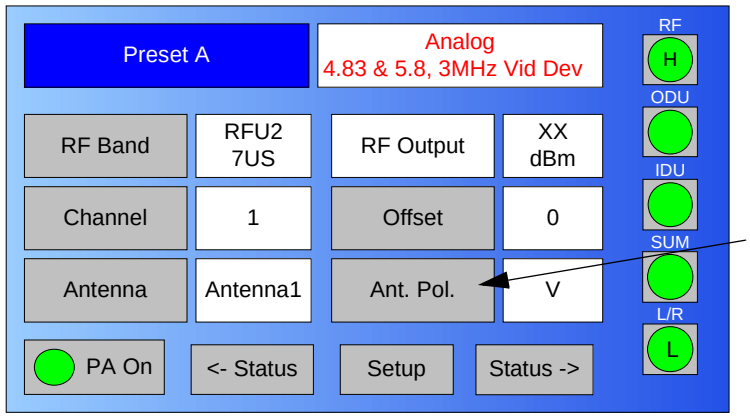
When the new antenna polarization is selected, the **Main** option button must be selected, the Main screen will be displayed, and the updated system status associated with the **Ant. Pol.** option button will display the new selected antenna polarization. The options available are **H** (Horizontal), **V** (Vertical), **RC** (Right Circular), and **LC** (Left Circular).

If the **Main** option button is selected to return to the Main screen without selecting a new antenna polarization setting, the Main screen will be displayed and no changes will be made to current MTX5000 settings.

Note	In the following steps, option buttons may be selected using either the touch screen or the function keys and the **SEL** key.

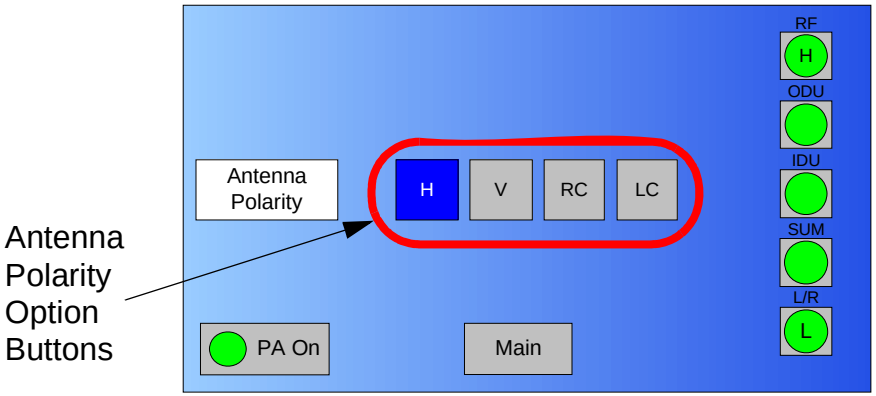
1. Observe the Main screen is displayed. See Figure 3-59.

Figure 3-59: Main Screen - Typical



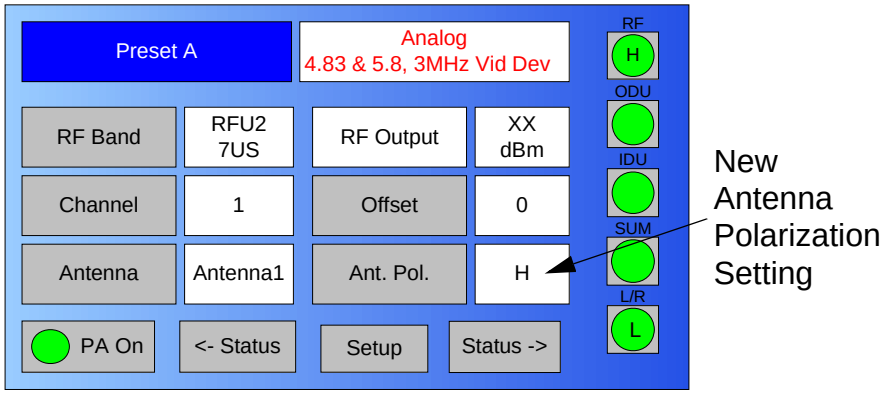
2. Select the **Ant. Pol.** option button and observe the **Antenna Polarity** screen is displayed. See Figure 3-60.

Figure 3-60: Antenna Polarity Screen - Typical



3. Select the **Antenna Polarity** option button required, select the **Main** option button, observe the Main screen is displayed, and observe the new antenna polarization is displayed. See Figure 3-61.

Figure 3-61: Main Screen - Typical



3.6.7 Enable/Disable Transmitter

The procedure required to enable or disable the transmitter is contained in the following steps.

Note	In the following procedure, the **PA** option button may be selected using either the touch screen or the function keys and the **SEL** key.

Note	The transmitter may be enabled or disabled from the Main screen or from any screen that is accessible from the Main screen. The screen shown in Figure 3-62 on page 3-36 is therefore typical.

In the following steps, selecting the **PA** option button will change the state of the transmitter from enabled to disabled or from disabled to enabled.

When the transmitter is disabled (not transmitting), the **PA** option button will be grey and the label will display **PA Off**. When the option button is selected, an orange indicator will initially be displayed indicating the PA is preparing to transmit and the option button label will indicate **PA**.

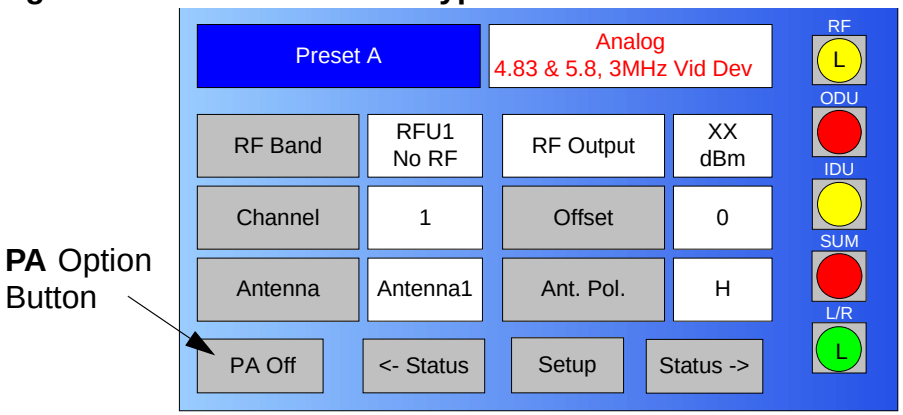
When the unit begins to transmit, the indicator will change to green and the option button label will change to **PA On**.

Note	To enable the transmitter, perform step 1 only. To disable the transmitter, go to step 2.

1. Select the **PA** operation button, observe the **PA** option button becomes active (green) after a short delay, and

the option button label changes to read **PA On**. See Figure 3-62.

Figure 3-62: Main Screen - Typical



2. Select the **PA** option button and observe the option button label changes to **PA Off**.

3.6.8 Select High/Low Power Mode

The procedure required to select the transmitter high or low power output mode is contained in the following steps.

Note	In the following procedure, the **RF** option button may be selected using either the touch screen or the function keys and the **SEL** key.

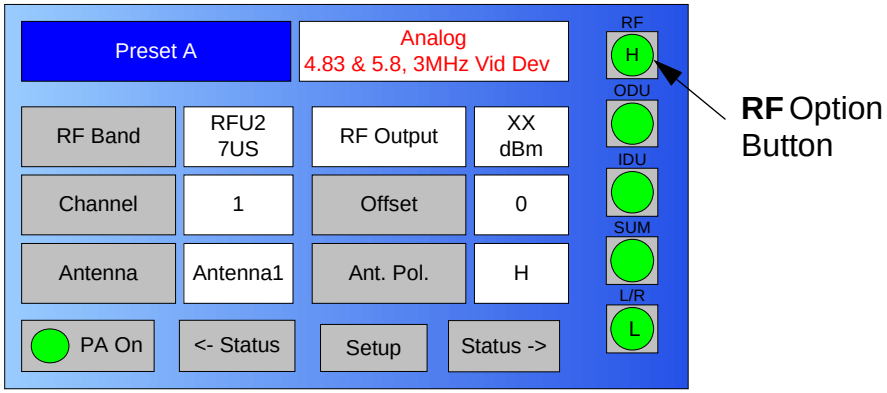
Notes	The transmitter output power mode may be selected from the Main screen or from any screen that is accessible from the Main screen. The screen shown in Figure 3-63 is therefore typical.

In the following steps, selecting the **RF** option button will change the state of the transmitter from low power to high power or from high power to low power.

When the transmitter is in the low power mode, the **RF** status indicator will be yellow and the button label will display **L**. When the transmitter is in the high power mode, the **RF** status indicator will be green and the button label will display **H**.

1. Select the **RF** option button and observe the **RF** option button becomes active. See Figure 3-63.

Figure 3-63: Main Screen - Typical



2. Select the **RF** option button, as required, until the **RF** status indicator changes to the required state.

3.6.9 Monitor ODU Status

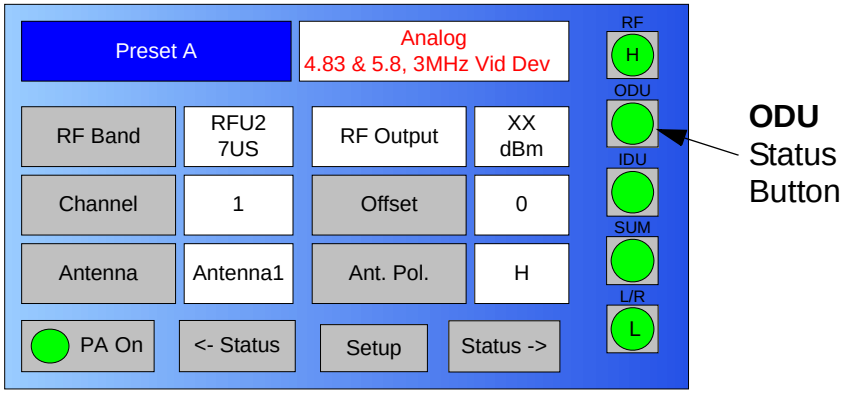
The procedure required to monitor the current alarm status of the ODU is contained in the following steps.

Note	In the following procedure, the **ODU** status button may be selected using either the touch screen or the function keys and the **SEL** key.

Note	The **ODU** status button may be selected from the Main screen or from any screen that is accessible from the Main screen. The screen shown in Figure 3-64 is therefore typical.

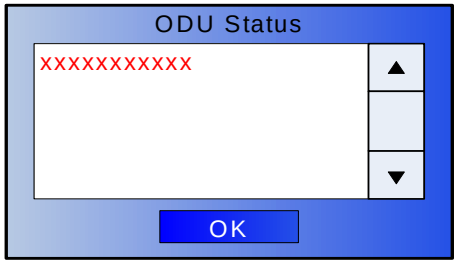
1. Select the **ODU** status button. See Figure 3-64.

Figure 3-64: Main Screen - Typical



2. Observe the **ODU Status** screen is displayed. See Figure 3-65.

Figure 3-65: ODU Status Dialog Box - Typical



3. When review of **ODU Status** messages is complete, select the **OK** option button and observe the **ODU Status** screen is no longer displayed.

3.6.10 Monitor IDU Status

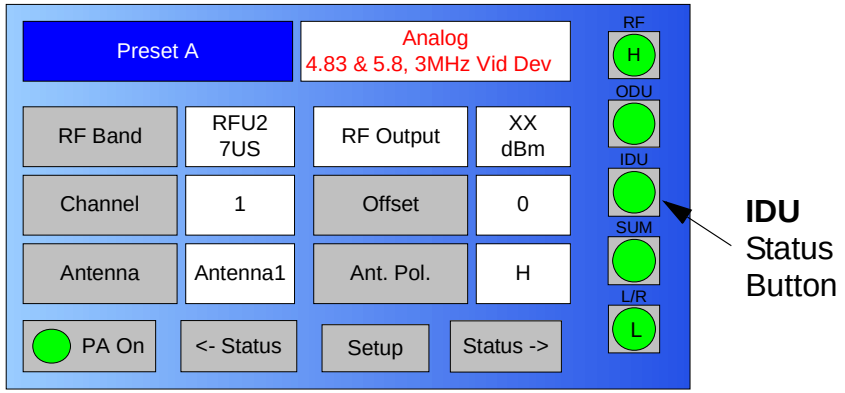
The procedure required to monitor the current alarm status of the IDU is contained in the following steps.

Note	In the following procedure, the **IDU** status button may be selected using either the touch screen or the function keys and the **SEL** key.

Note	The **IDU** status button may be selected from the Main screen or from any screen that is accessible from the Main screen. The screen shown in Figure 1 is therefore typical.

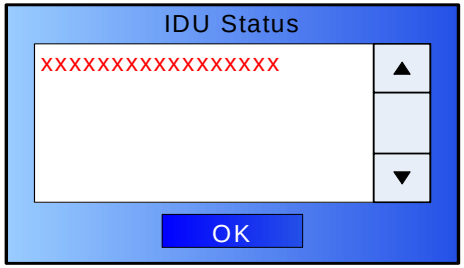
1. Select the **IDU** status button. See Figure 3-66.

Figure 3-66: Main Screen - Typical



2. Observe the **IDU Status** screen is displayed. See Figure 3-67.

Figure 3-67: IDU Status Dialog Box - Typical



3. When review of **IDU Status** messages is complete, select the **OK** option button and observe the **IDU Status** screen is no longer displayed.

3.6.11 Monitor SUM Errors

The procedure required to monitor current summary alarms in the MTX5000 Transmitter System is contained in the following steps.

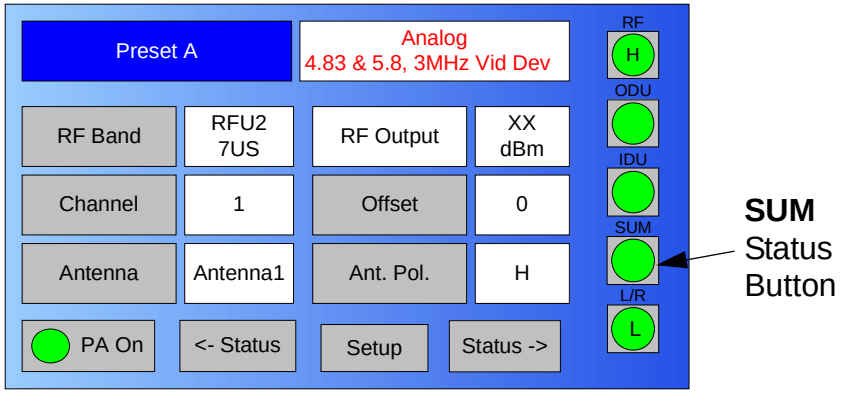
Note — In the following procedure, the **SUM** status button may be selected using either the touch screen or the function keys and the **SEL** key.

Note — The **SUM** status button may be selected from the Main screen or from any screen that is accessible from the Main screen. The screen shown in Figure 3-68 on page 3-38 is therefore typical.

---

1. Select the **SUM** status button. See Figure 3-68.

Figure 3-68: Main Screen - Typical



2. Observe the **Summary Alarm** screen is displayed. See Figure 3-69.

Figure 3-69: Summary Alarm Dialog Box - Typical

3. When review of **Summary Alarm** messages is complete, select the **OK** option button and observe the **Summary Alarm** screen is no longer displayed.

3.6.12 Monitor Current Preset Status Settings

The procedure required to monitor Preset status settings are contained in the following steps.

Note In the following steps, option buttons may be selected using either the touch screen or the function keys and the **SEL** key.

1. Select the Preset to be monitored per "Select Preset" on page 3-24, as required.

Notes If the Preset to be monitored is an External IF Input Preset, status settings are not applicable.

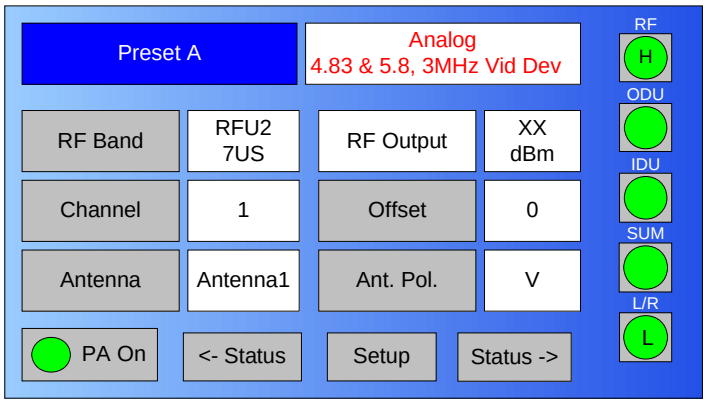
If the Preset to be monitored is an analog Preset, go to step 2.

If the Preset to be monitored is a digital COFDM ASI Preset, go to step 5.

If the Preset to be monitored is a digital COFDM, LMS-T, DVB-S, or digital IP Preset, go to step 11.

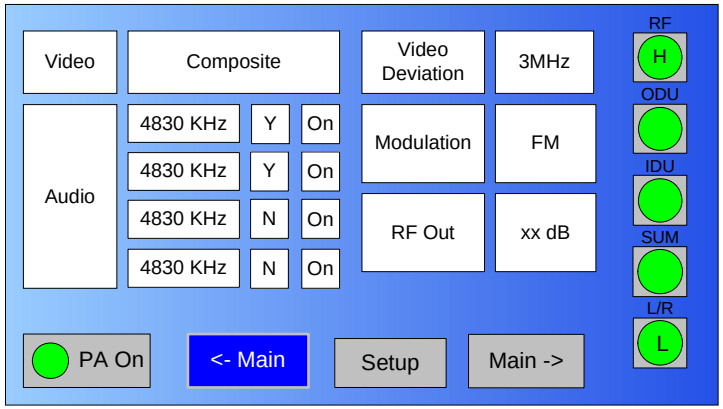
2. Observe the Main screen is displayed. See Figure 3-70.

Figure 3-70: Main Screen (Analog Mode) - Typical



3. Select either **Status** option button and observe the selected analog Preset status screen is displayed. See Figure 3-71.

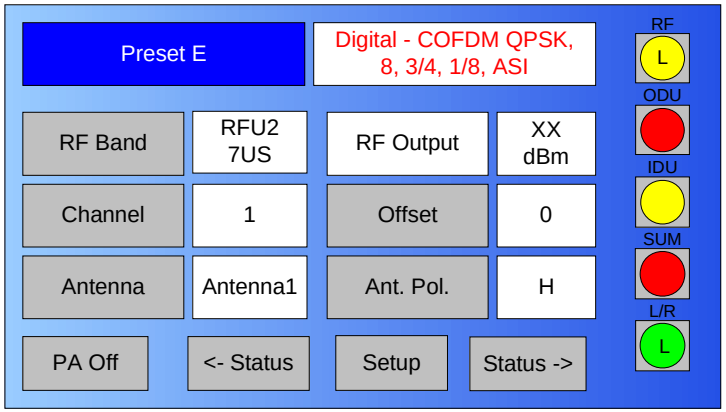
Figure 3-71: Status Screen (Analog Mode) - Typical



4. When review of the analog Preset **Status** screen is complete, select either of the **Main** option buttons and observe the Main screen is displayed. Procedure is complete.

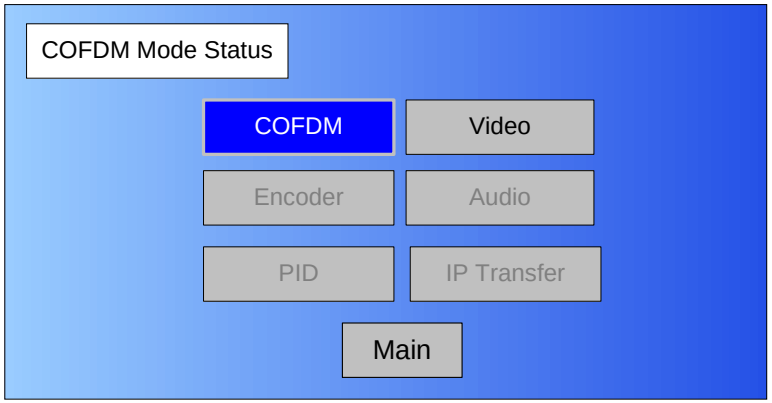
5. Observe the Main screen is displayed. See Figure 3-72 on page 3-40.

Figure 3-72: Main Screen (Digital ASI Preset) - Typical



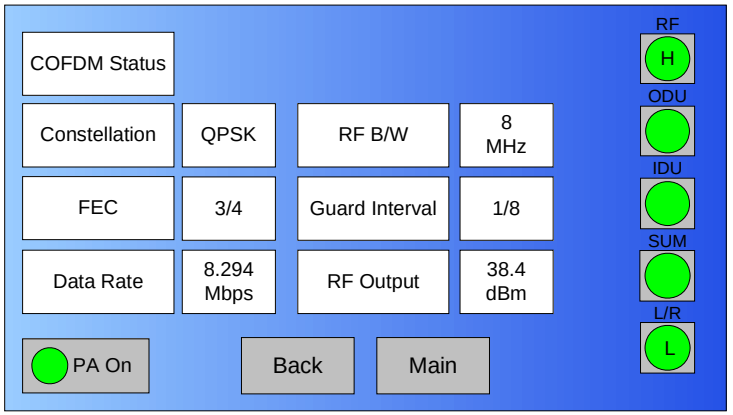
6. Select either **Status** option button and observe the **COFDM Mode Status** screen is displayed. See Figure 3-73.

Figure 3-73: COFDM Mode Status Screen



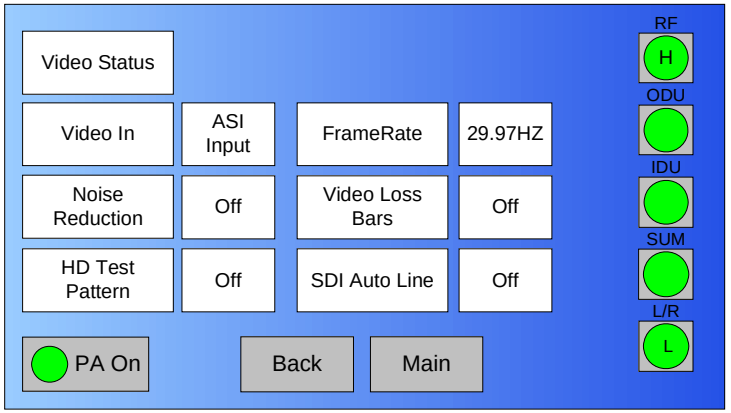
7. Select the **COFDM** option button and observe the selected Preset **COFDM Status** screen is displayed. See Figure 3-74.

Figure 3-74: COFDM Status Screen



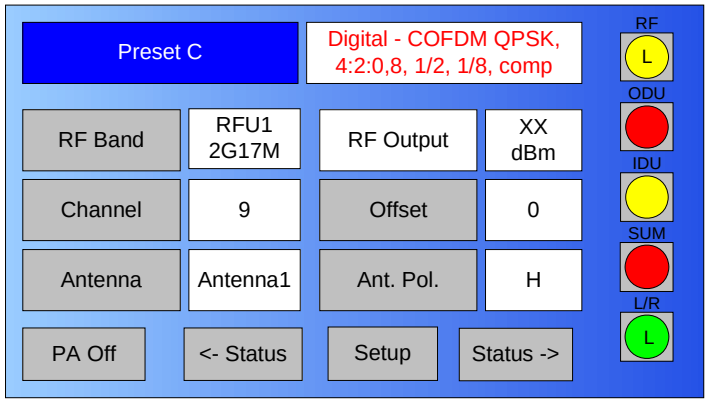
8. When review of the **COFDM Status** screen is complete, select the **Back** option button and observe the **COFDM Mode Status** screen is displayed.
9. Select the **Video** option button and observe the **Video Status** screen is displayed. See Figure 3-75.

Figure 3-75: Video Status Screen - Typical



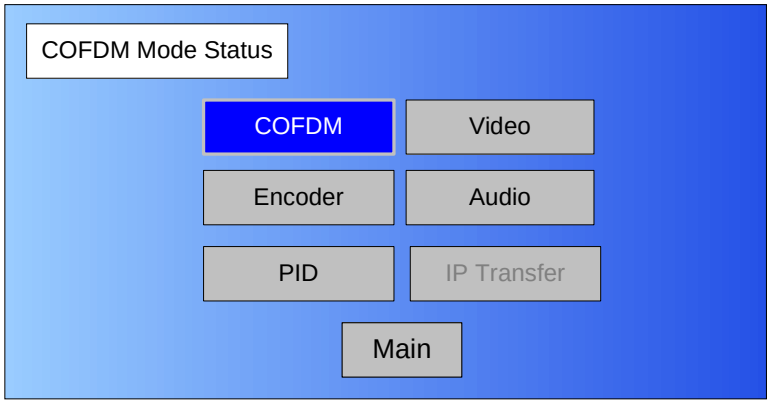
10. When review of the **Video Status** screen is complete, select the **Main** option button and observe the Main screen is displayed. Procedure is complete.
11. Observe the Main screen is displayed. See Figure 3-76.

Figure 3-76: Main Screen (Digital COFDM/LMS-T/DVB-S/ Digital IP Preset) - Typical



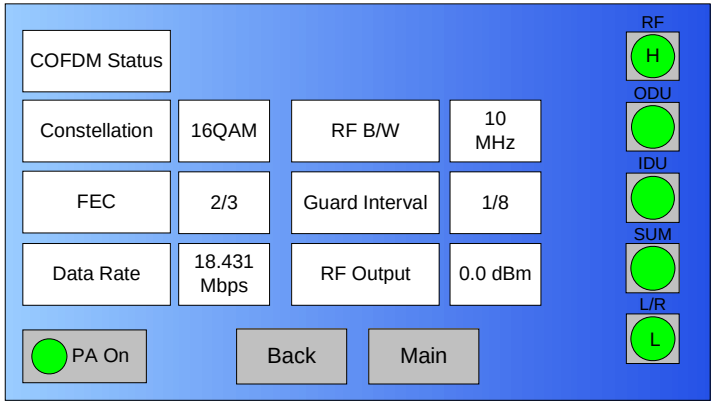
12. Select either **Status** option button and observe the **COFDM Mode Status** screen is displayed. See Figure 3-77.

Figure 3-77: COFDM Mode Screen



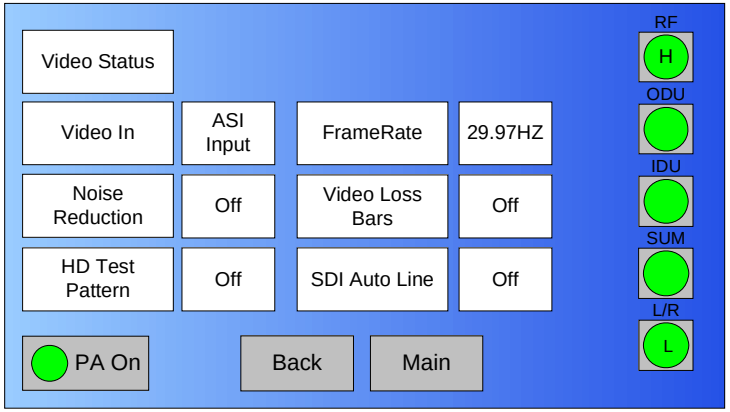
13. Select the **COFDM** option button and observe the **COFDM Status** screen is displayed. See Figure 3-78.

Figure 3-78: COFDM Status Screen - Typical



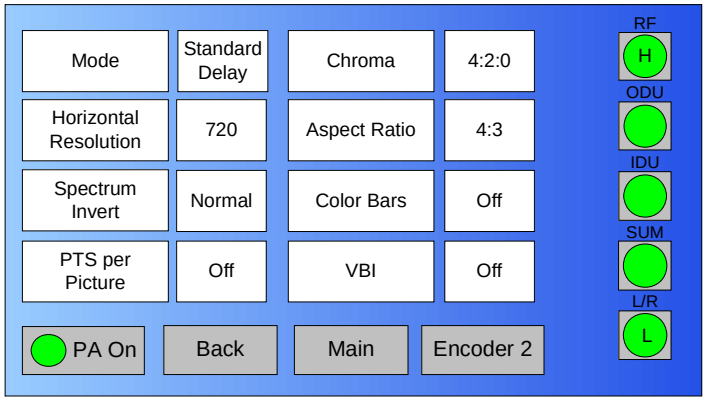
14. When review of the **COFDM Status** screen is complete, select the **Back** option button and observe the **COFDM Mode Status** screen is displayed.
15. Select the **Video** option button and observe the **Video Status** screen is displayed. See Figure 3-79 on page 3-42.

Figure 3-79: Video Status Screen - Typical



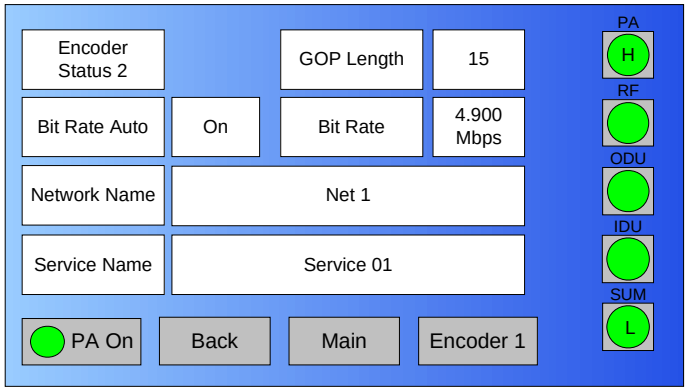
16. When review of the **Video Status** screen is complete, select the **Back** option button and observe the **COFDM Mode Status** screen is displayed.
17. Select the **Encoder** option button and observe the Encoder screen is displayed. See Figure 3-80.

Figure 3-80: Encoder Screen - Typical



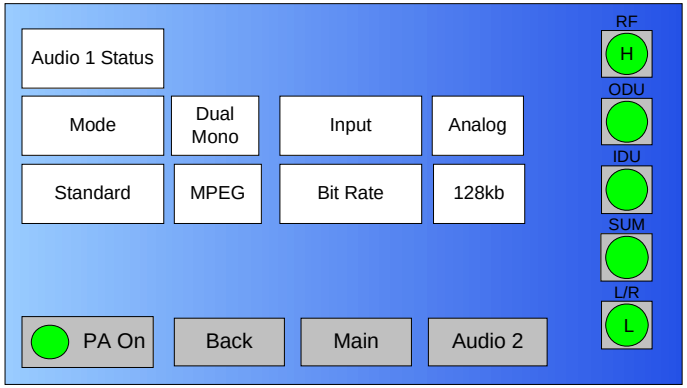
18. When review of the Encoder screen is complete, select the **Encoder 2** option button and observe the **Encoder Status 2** screen is displayed. See Figure 3-81.

Figure 3-81: Encoder Status Screen - Typical



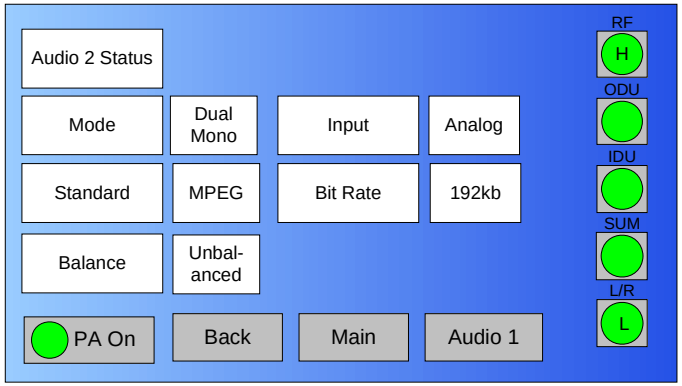
19. When review of the **Encoder Status 2** screen is complete, select the **Back** option button and observe the **COFDM Mode Status** screen is displayed.
20. Select the **Audio** option button and observe the **Audio 1 Status** screen is displayed. See Figure 3-82.

Figure 3-82: Audio 1 Status Screen - Typical



21. When review of the **Audio 1 Status** screen is complete, select the **Audio 2** option button and observe the **Audio 2 Status** screen is displayed. See Figure 3-83.

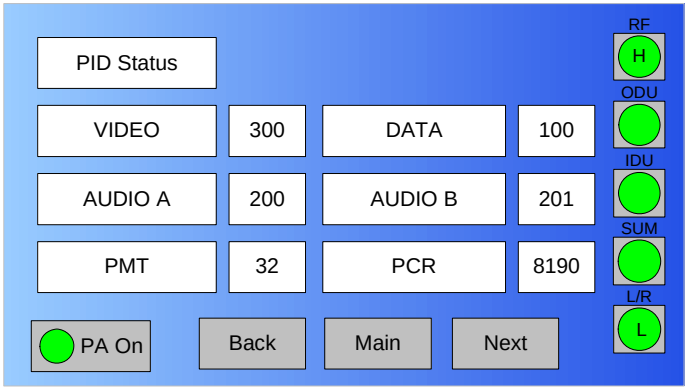
Figure 3-83: Audio 2 Status Screen - Typical



22. When review of the **Audio 2 Status** screen is complete, select the **Back** option button and observe the **COFDM Mode Status** screen is displayed.

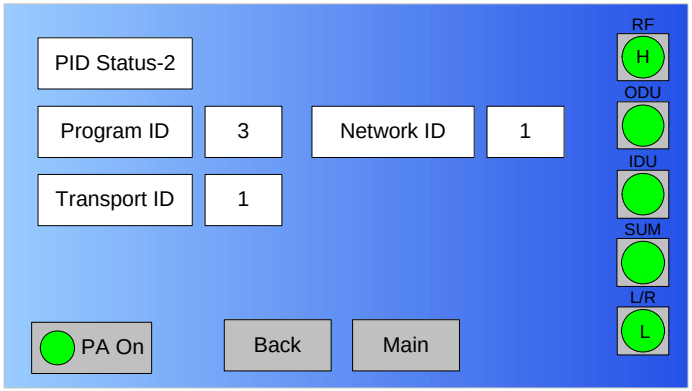
23. Select the PID option button and observe the **PID Status** screen is displayed. See Figure 3-84.

Figure 3-84: PID Status Screen - Typical



24. When review of the **PID Status** screen is complete, select the next option button and observe the **PID Status-2** screen is displayed. See Figure 3-85.

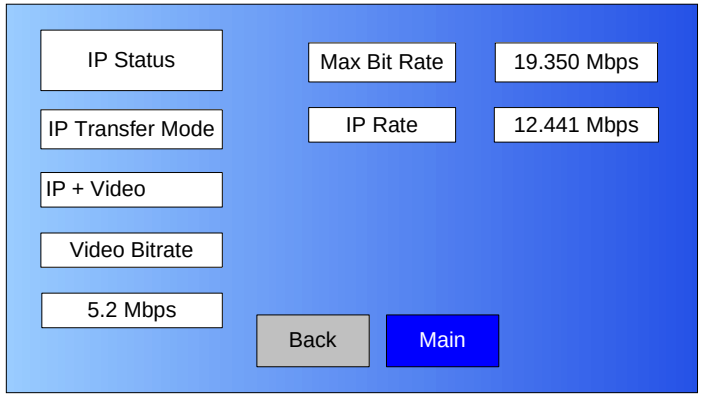
Figure 3-85: PID Status-2 Screen - Typical



Note	
	If the Preset being monitored is a digital COFDM, LMS-T, or DVB-S Preset, go to step 25. If the Preset being monitored is a digital IP Preset, go to step 26.

25. When review of the **PID Status-2** screen is complete, select the **Main** option button and observe the Main screen is displayed. Procedure is complete.
26. When review of the **PID Status-2** screen is complete, select the **Back** option button and observe the **PID Status** screen is displayed.
27. Select the **Back** option button and observe the **COFDM Mode Status** screen is displayed.
28. Select the **IP Transfer** option button and observe the **IP Status** screen is displayed. See Figure 3-86.

Figure 3-86: IP Status Screen - Typical



29. When review of the **IP Status** screen is complete, select the **Main** option button and observe the Main screen is displayed. Procedure is complete.

3.6.13 Perform PA Voltage Adjust Setup

The procedure required to calibrate the PA DC voltage for each Standard ODU (RF Unit) is contained in the following steps.

This procedure is to be performed for Standard ODUs only. Do not perform this procedure for High Power ODUs. The PA voltage for High Power ODUs is fixed and cannot be adjusted.

CAUTION	*To avoid potential software hang-ups, always ensure the ODU is connected to the IDU before attempting to perform this procedure.* *Do not attempt to perform this procedure if the ODU is not connected to the IDU, as the software will hang up.*

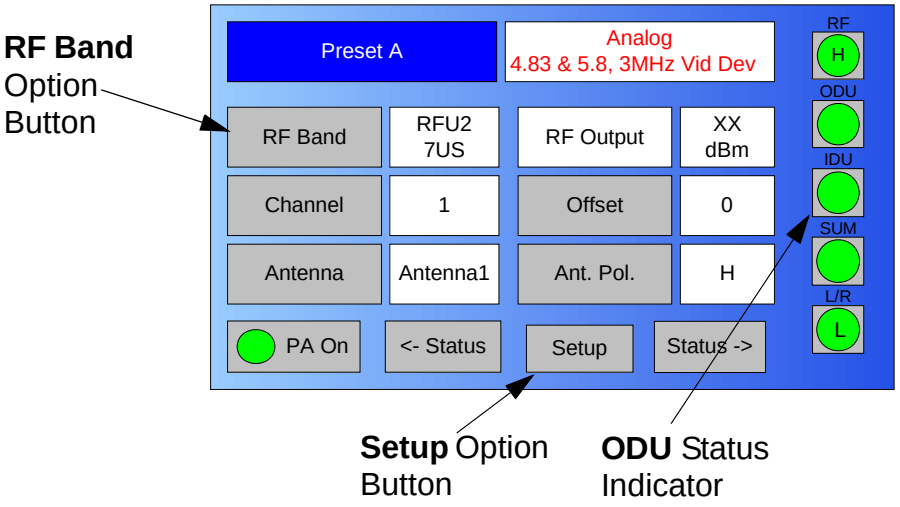
CAUTION	*To avoid potential software hang-ups, check the Main screen **ODU** status indicator and verify no major faults exist in the ODU.* *If faults exist in the ODU, they must be corrected prior to performing this procedure.*

Note	This procedure should be performed following initial installation of the MTX5000 System with a Standard ODU, after replacement of the IDU or Standard ODU, or following any repairs to the cable assembly providing power from the IDU to the Standard ODU.

Note	In the following procedure, option buttons may be selected using either the touch screen or the function keys and the **SEL** key.

1. Verify the **ODU** status indicator does not indicate a major fault (indicator is not red). See Figure 3-87.

Figure 3-87: Main Screen - Typical



Notes	If your MTX5000 system is a single band system, go to step 5. If your MTX5000 system is a dual band system, perform step 2 thru step 12 for both bands.

2. Select the **RF Band** option button and observe the **RF Band** screen is displayed and the current RF band option button is highlighted. See Figure 3-88, Figure 3-89 on page 3-46, Figure 3-90 on page 3-46, or Figure 3-91 on page 3-46.

Figure 3-88: RF Band Screen - Typical

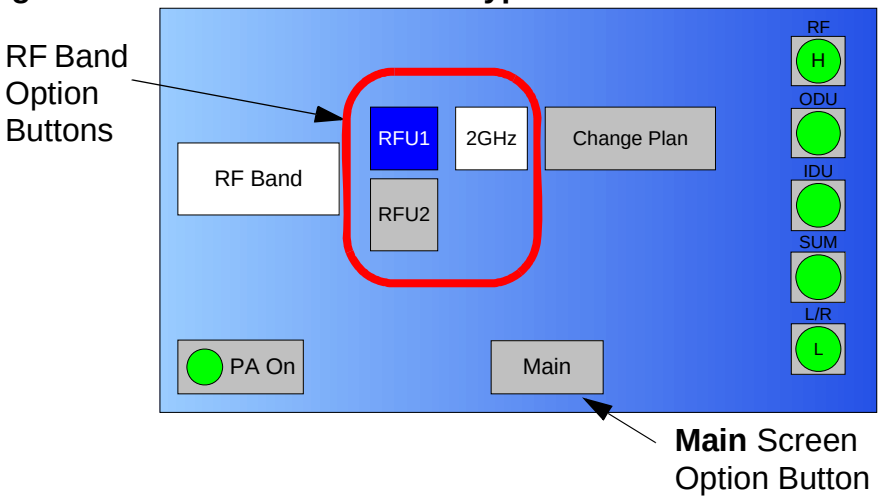


Figure 3-89: RF Band 2 GHz RFU2 Option Screen

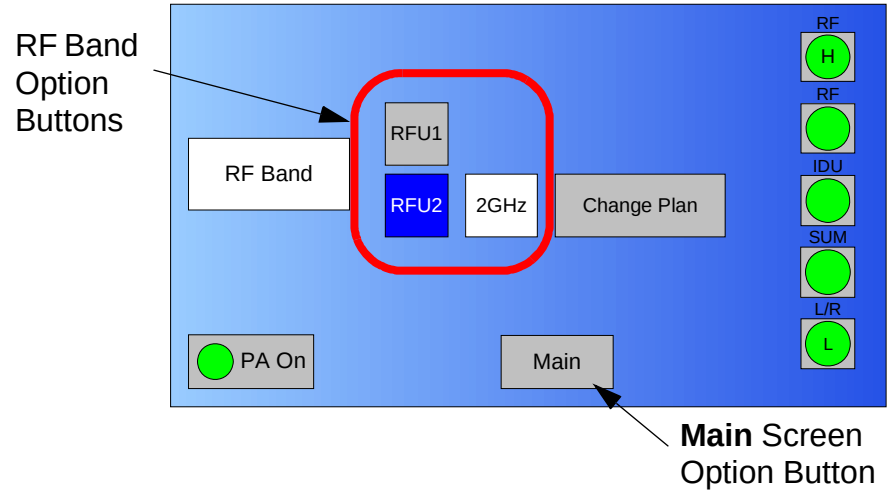


Figure 3-90: RF Band 7 GHz RFU1 Option Screen

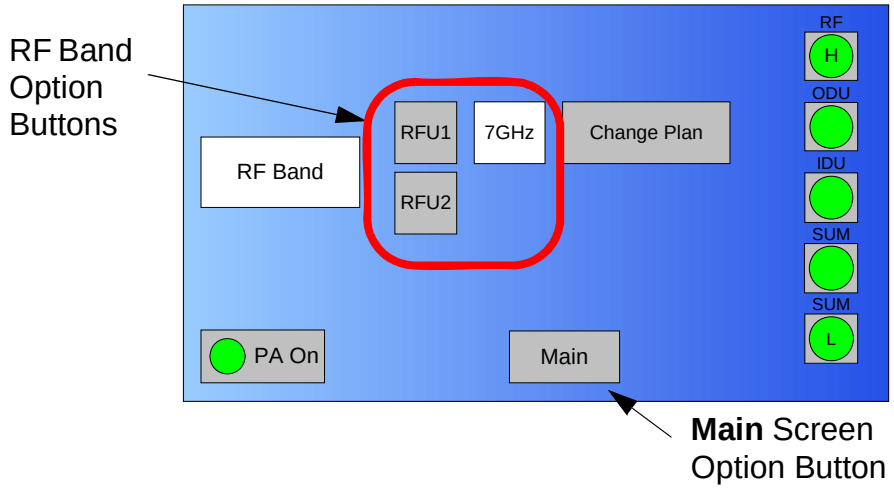
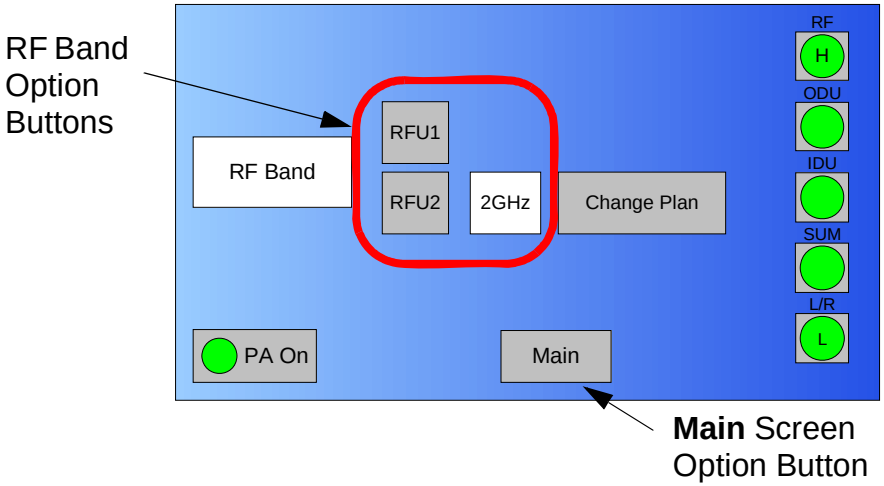


Figure 3-91: RF Band 7 GHz RFU2 Option Screen



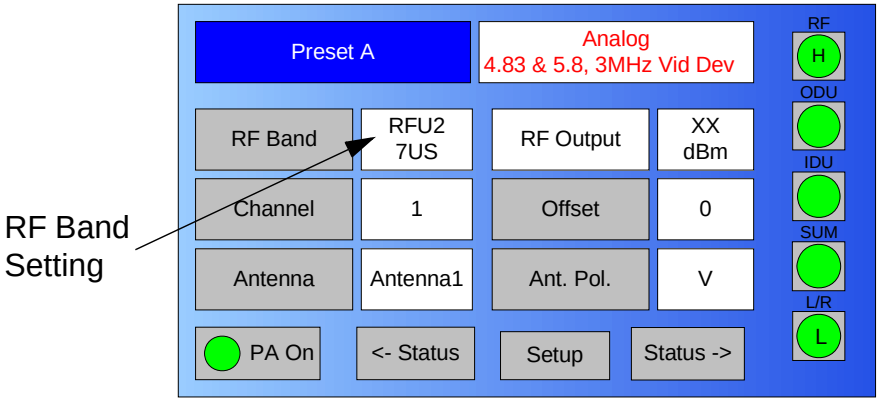
Note	In the following step, the **RECONFIGURING RADIO** screen (Figure 3-92 on page 3-47) will be displayed only if the RF Band **RFU1** or **RFU2** option switch option is changed.

3. Select the **RFU1** or **RFU2** option button, as required, and observe the **RECONFIGURING RADIO** screen (Figure 3-92 on page 3-47) is displayed.

Figure 3-92: RECONFIGURING RADIO Screen - Typical

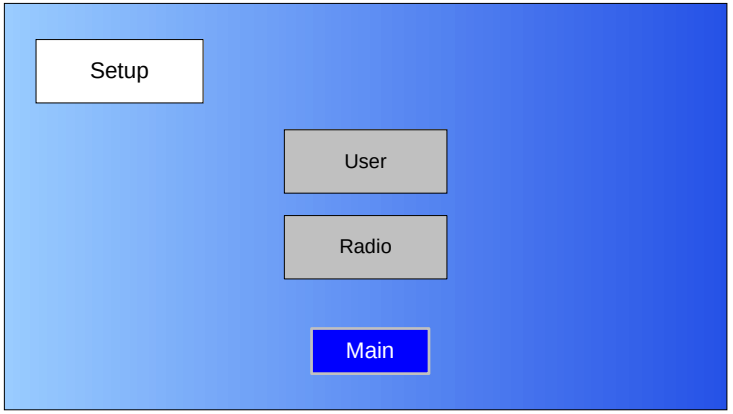
4. After a short delay, observe the **RF Band** screen is displayed, select the **Main** option button, and observe the RF band setting required is displayed. See Figure 3-93.

Figure 3-93: Main Screen - Typical



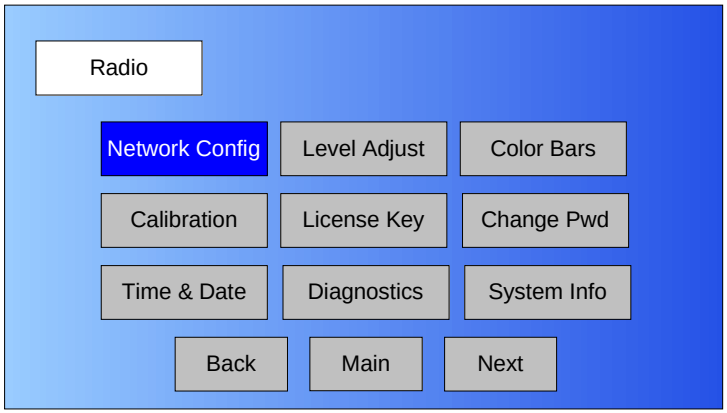
5. Select the **Setup** option button and observe the **Setup** screen is displayed. See Figure 3-94.

Figure 3-94: Setup Screen



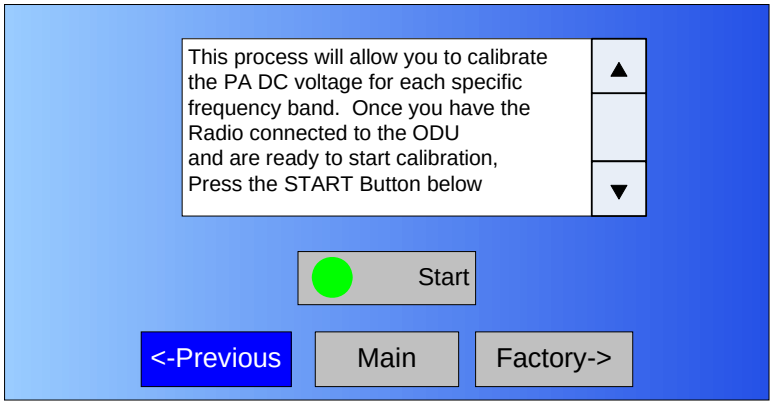
6. Select the **Radio** option button and observe the **Radio** screen is displayed. See Figure 3-95.

Figure 3-95: Radio Screen



7. Select the **Calibration** option button and observe the PA Voltage Adjust Setup screen is displayed. See Figure 3-96 on page 3-48.

Figure 3-96: PA Voltage Adjust Setup Screen



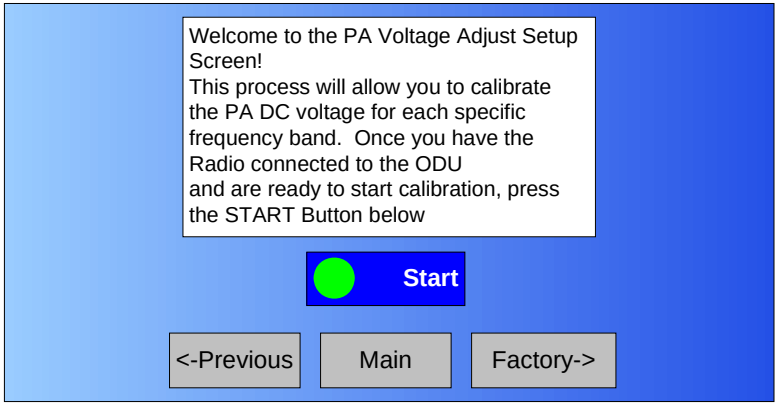
Notes

If using the function keys and **SEL** key to select the **Start** option button, go to step 8.

If using the touch screen, go to step 9.

8. Select the **Start** option button and observe the **Start** option button becomes active (blue). See Figure 3-97.

Figure 3-97: PA Voltage Adjust Setup Screen - Start



Notes

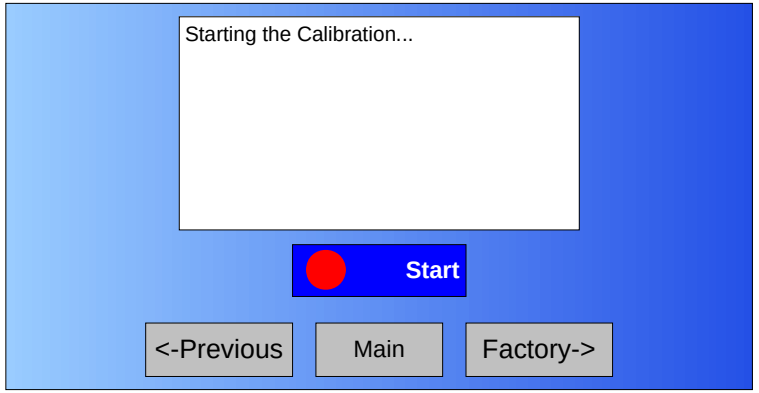
When the **Start** option button is selected in the following step, calibration will begin and the **Start** option button indicator will change from green to red.

It will take approximately 30 seconds for the calibration process to be completed.

When calibration is complete, the **Start** option button indicator will change from red to green.

9. Select the **Start** option button and observe the **Start** option button indicator turns red and the **Starting the Calibration...** message is displayed. See Figure 3-98.

Figure 3-98: Starting Calibration

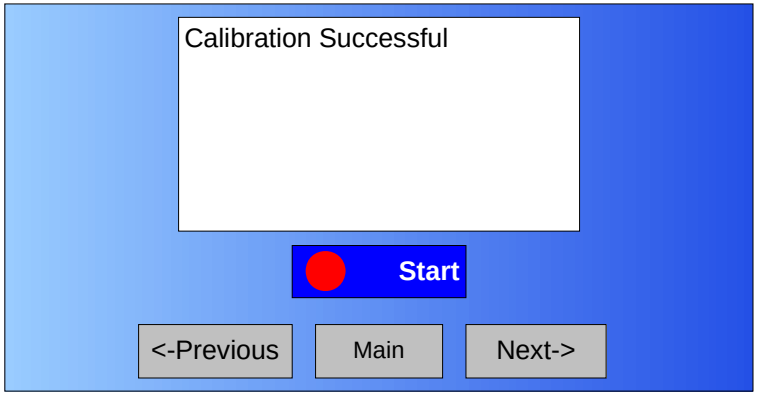


Note

Do not select the **Factory** option button. The **Factory** option button is used for factory test only.

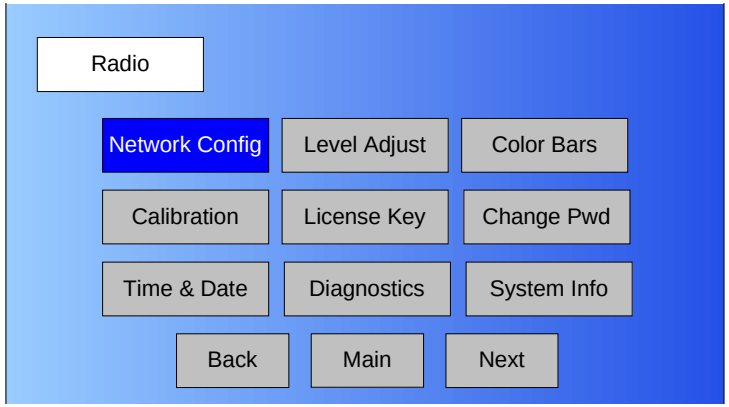
10. When calibration is complete, observe the **Calibration Successful** message is displayed. See Figure 3-99 on page 3-49.

Figure 3-99: Calibration Successful



11. Select the **Previous** option button and observe the **Radio** screen is displayed. See Figure 3-100.

Figure 3-100: Radio Screen



12. Select the **Main** option button and observe the Main screen is displayed.

3.6.14 Perform RF Level Adjust

The procedure required to adjust the RF output level when operating in the digital mode is contained in the following steps.

This procedure provides the means to adjust the RF level output manually (not recommended), if required. This procedure also provides the steps to select the **Auto** mode (recommended).

CAUTION	*It is highly recommended that the RF output level be set to the **Auto** mode for optimum performance.* *Manually setting the RF output level runs the risk of exceeding the FCC mask or of deteriorating digital performance.*

Notes	The RF output level can only be adjusted if you are operating in the digital mode with a digital Preset selected. The RF output level cannot be adjusted if you are operating in the analog mode.

Note	In the following procedure, option buttons may be selected using either the touch screen or the function keys and the **SEL** key.

1. Observe the Main screen is displayed. See Figure 3-101 on page 3-50.

Figure 3-101: Main Screen - Typical

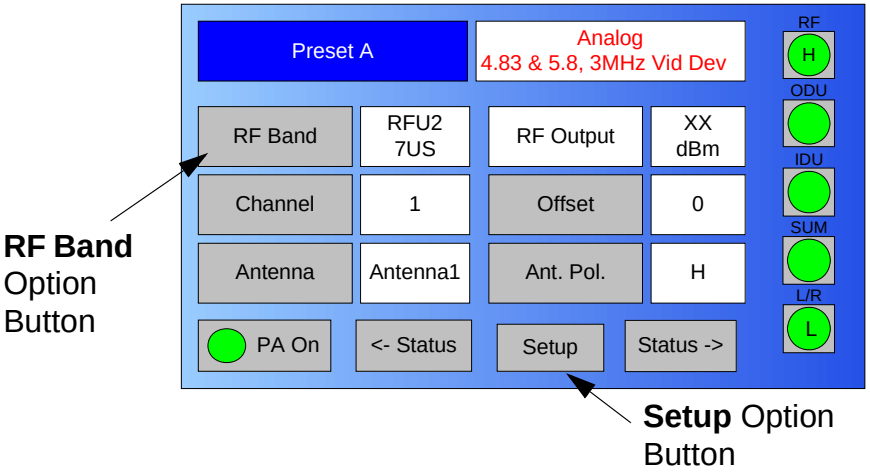
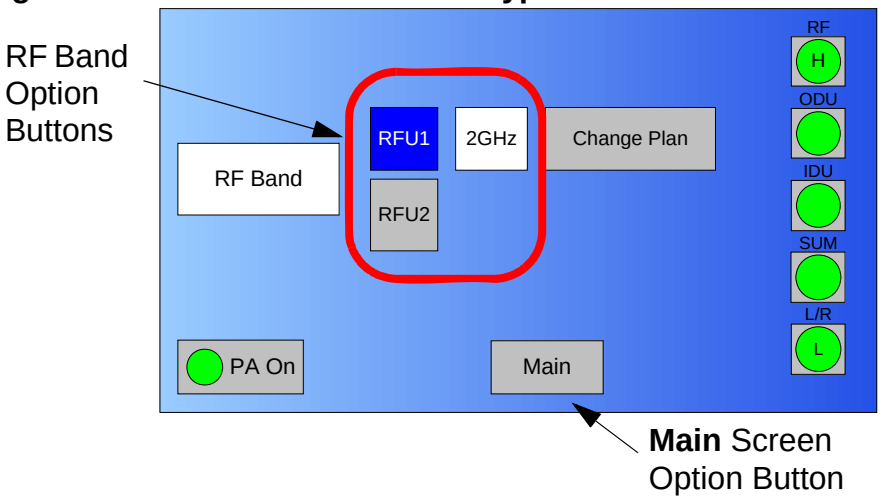


Figure 3-102: RF Band Screen - Typical



2. Select a digital Preset per "Select Preset" on page 3-24, as required.

Note — If your MTX5000 system is a dual band system, step 3 thru step 10 must be performed for both bands.

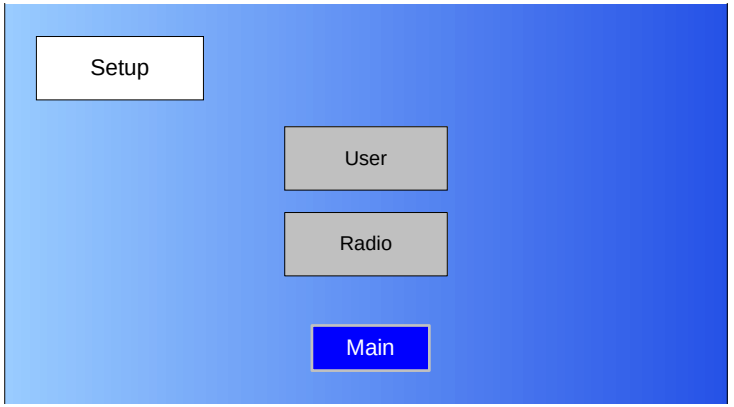
---

3. Select the **RF Band** option button and observe the **RF Band** screen is displayed and the current RF band option button is highlighted. See Figure 3-102.

4. Select the RF band option button required, observe the **RF Band** screen is displayed, select the **Main** option button, observe the Main screen is displayed, and observe the new RF band setting is displayed.

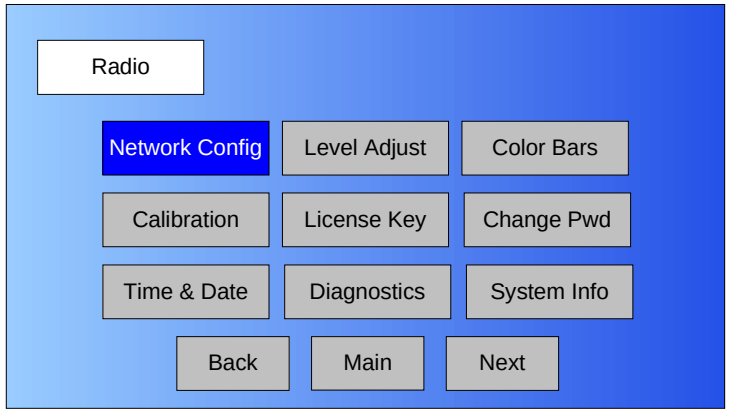
5. Select the **Setup** option button and observe the **Setup** screen is displayed. See Figure 3-103.

Figure 3-103: Setup Screen



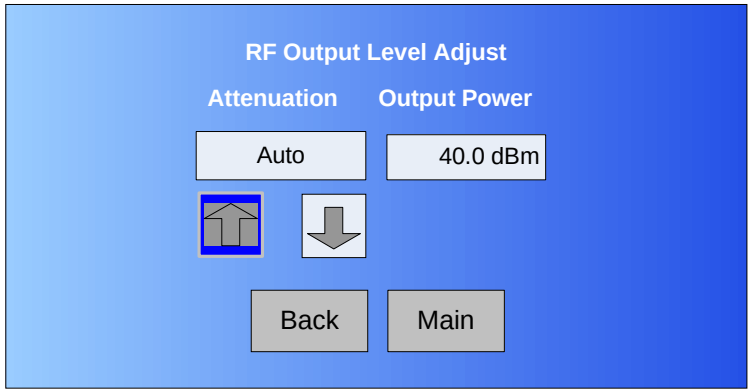
6. Select the **Radio** option button and observe the **Radio** screen is displayed. See Figure 3-104.

Figure 3-104: Radio Screen



7. Select the **Level Adjust** option button and observe the **RF Output Level Adjust** screen is displayed. See Figure 3-105.

Figure 3-105: RF Output Level Adjust Screen



CAUTION

*It is highly recommended that the RF output level be set to the **Auto** mode for optimum performance.*

Manually setting the RF output level runs the risk of exceeding the FCC mask or deteriorating digital performance.

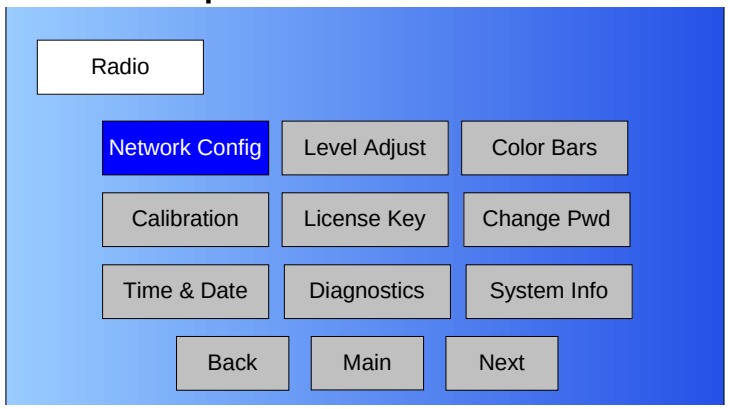
Notes

In the following steps, **Attenuation** level options available are **Auto** or **0** to **15**.

The **Auto** option is the optimum attenuation level set at the factory and is the ***recommended*** **Attenuation** level option.

8. Select the **RF Output Level Adjust** screen Up or Down arrow option buttons to select the **Attenuation** level required. Options are **Auto** or **0** to **15** (**Auto** recommended).
9. When the **Attenuation** setting required has been selected, select the **Back** option button and observe the **Radio** screen is displayed. See Figure 3-106 on page 3-52.

Figure 3-106: Setup Screen



10. Select the **Main** option button and observe the Main screen is displayed.

3.6.15 Select Color Bar Generator Mode

All MTX5000 IDUs contain a built-in digital Color Bar Generator (CBG). An optional analog CBG is available. The procedure required to select the CBG operating mode is contained in the following steps.

The CBG has four operating modes that may be selected as follows:

- **Off** - Color bars and audio test tones are turned off.
- **On** - Color bars and audio test tones are continuously turned on. This mode should be used for test or troubleshooting only.
- **A Gen** (Auto Generated) - If a loss of video signal occurs, color bars and/or audio test tones are transmitted after a specified delay.
- **A Stby** (Auto Standby) - If a loss of video signal occurs, the transmitter is automatically placed into standby (PA is turned off).

The same **Color Bars** screen is displayed when making either analog or digital CBG option selections. When configuring your IDU CBG options, the following rules must be observed:

- If you have the optional analog CBG contained in your IDU, selection of the **Color Bars** screen **Off**, **On**, **A Gen**, or **A Stby** option will be applicable to all analog and digital Presets. You cannot select different **Color Bars** screen options for different Presets.
- If you do not have the optional analog CBG installed in your IDU, selection of the **Color Bars** screen **On**, **A Gen**, or **A Stby** option will be applicable to digital Presets only. No options are available for analog Presets if you do not have the optional analog CBG.
- If you do not have the optional analog CBG installed in your IDU and you select the **Color Bars** screen **On**, **A Gen**, or **A Stby** option, selection of an analog Preset will result in no audio, video, or color bar outputs.

CAUTION *If you do not have the optional Analog Color Bar Generator installed in your MTX5000 IDU and you set the Color Bar Generator to **On**, **A Gen**, or **A Stby**, a blank screen will be displayed for all analog Presets.*

CAUTION *To avoid potential problems that could impact operation of the MTX5000 System, always select the **Color Bars** screen **Off**, **A Gen**, or **A Stby** options for normal operation*.

*The **On** operating mode should only be selected when testing or troubleshooting. When the **On** option is selected, color bars take priority over all Preset settings.*

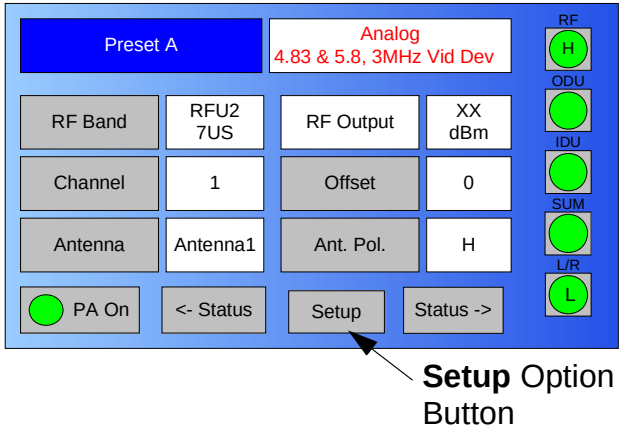
*Selection of the **On** option will transmit color bars at all times in both analog and digital Presets if you have the optional analog CBG and will transmit color bars at all times in digital Presets only, if you do not have the optional analog CBG.*

Note — In the following procedure, option buttons may be selected using either the touch screen or the function keys and the **SEL** key.

---

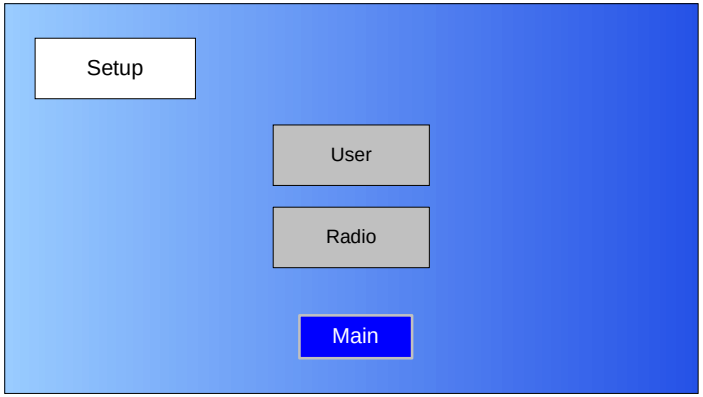
1. Observe the Main screen is displayed. See Figure 3-107.

Figure 3-107: Main Screen - Typical



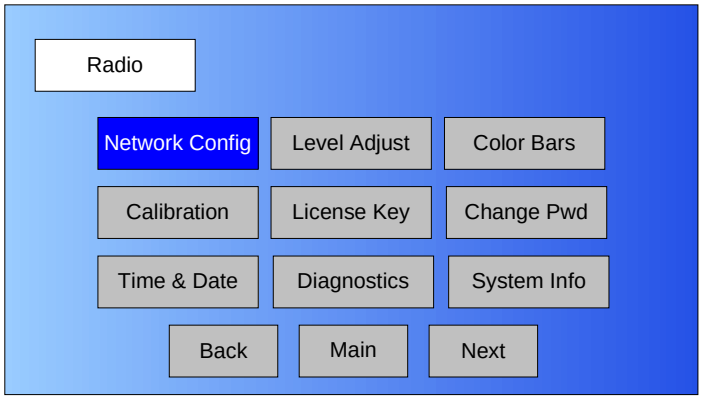
2. Select any Preset per "Select Preset" on page 3-24, as required.
3. Verify the Main screen is displayed.
4. Select the **Setup** option button and observe the **Setup** screen is displayed. See Figure 3-108.

Figure 3-108: Setup Screen



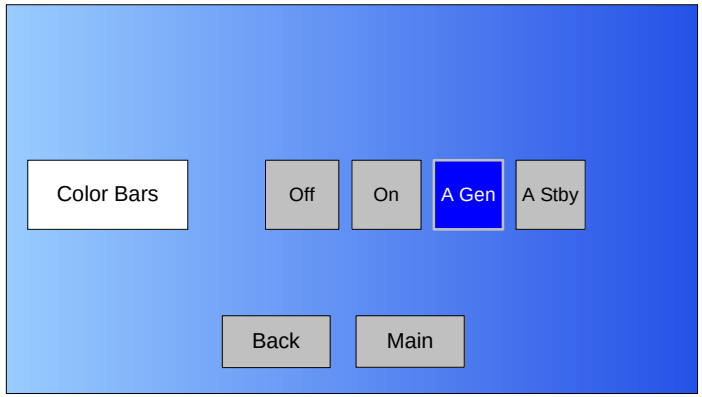
5. Select the **Radio** option button and observe the **Radio** screen is displayed. See Figure 3-109.

Figure 3-109: Radio Screen



6. Select the **Color Bars** option button and observe the **Color Bars** screen is displayed. See Figure 3-110.

Figure 3-110: Color Bars Screen



Note — If the **On** operating mode option is selected in the following step for test or troubleshooting, repeat step 7 to select **Off**, **A Gen**, or **A Stby**, as required, when test or trouble-shooting is complete.

---

7. Select the **Off**, **On**, **A Gen**, or **A Stby** operating mode option button, as required.
8. Select the **Color Bars** screen **Main** option button and observe the Main screen is displayed.

3.6.16 Set Time and Date

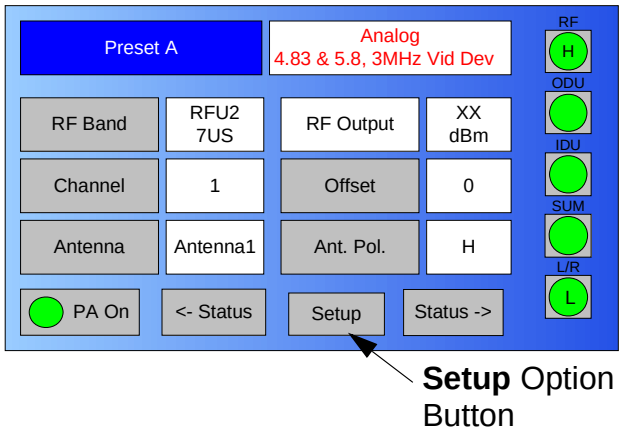
The procedure required to set the date and time is contained in the following steps.

Note — In the following procedure, option buttons may be selected using either the touch screen or the function keys and the **SEL** key.

---

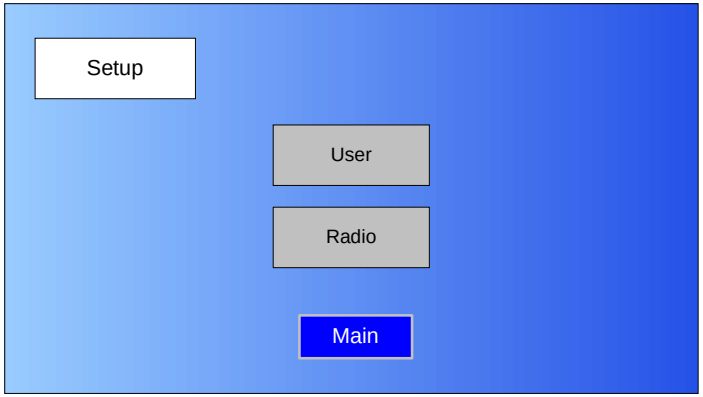
1. Observe the Main screen is displayed. See Figure 3-111.

Figure 3-111: Main Screen - Typical



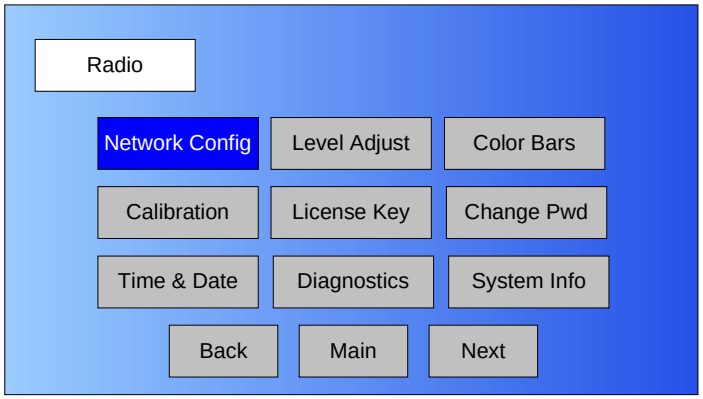
2. Select the **Setup** option button and observe the **Setup** screen is displayed. See Figure 3-112 on page 3-55.

Figure 3-112: Setup Screen



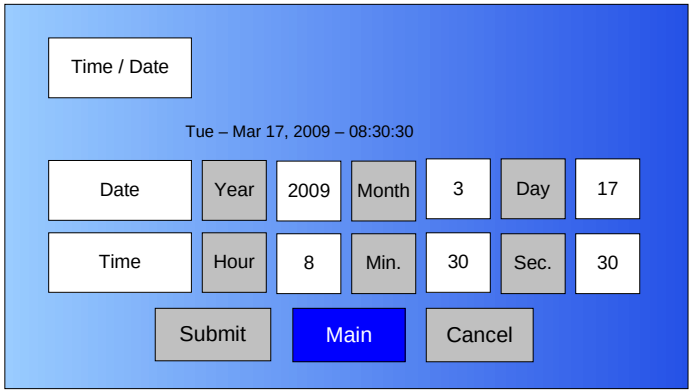
3. Select the **Radio** option button and observe the **Radio** screen is displayed. See Figure 3-113.

Figure 3-113: Radio Screen



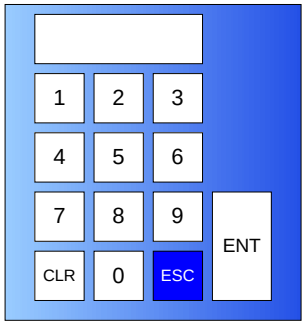
4. Select the **Time & Date** option button and observe the **Time/Date** screen is displayed. See Figure 3-114.

Figure 3-114: Time / Date Screen - Typical



5. Select the **Year**, **Month**, **Day**, **Hour**, **Min.**, and/or **Sec.** option buttons, as required, and observe the numeric keypad is displayed. See Figure 3-115.

Figure 3-115: Keypad



6. Enter the value required, select the **ENT** key, and observe the **Time / Date** screen is displayed.
7. When all date and time entries are complete, select the **Submit** option button and observe the **Radio** screen is displayed.
8. Select the **Main** option button and observe the Main screen is displayed.

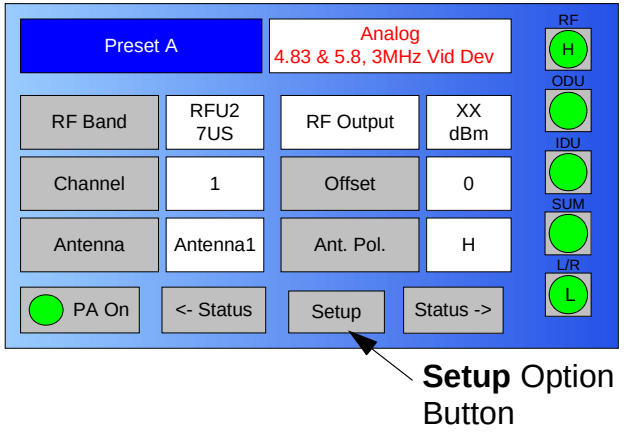
3.6.17 Perform IDU Diagnostics

The procedure required to perform IDU diagnostics are contained in the following steps.

Note	In the following procedure, option buttons may be selected using either the touch screen or the function keys and the **SEL** key.

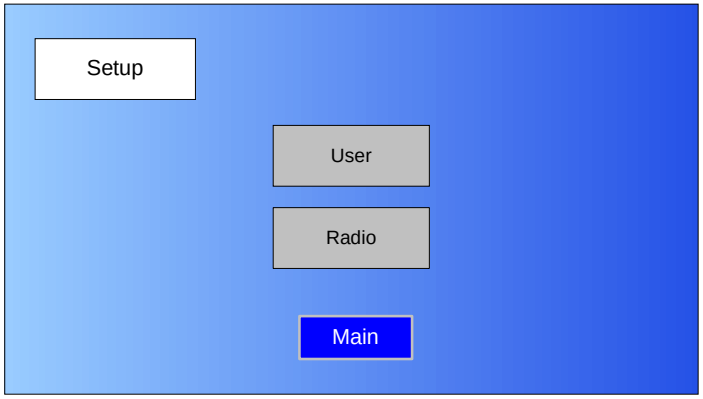
1. Observe the Main screen is displayed. See Figure 3-116.

Figure 3-116: Main Screen - Typical



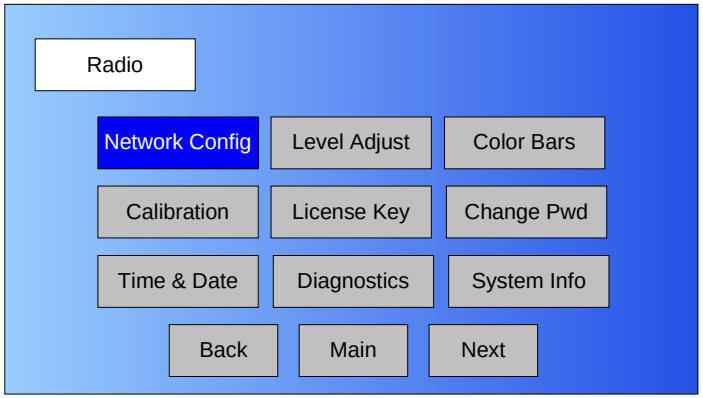
2. Select the **Setup** option button and observe the **Setup** screen is displayed. See Figure 3-117.

Figure 3-117: Setup Screen



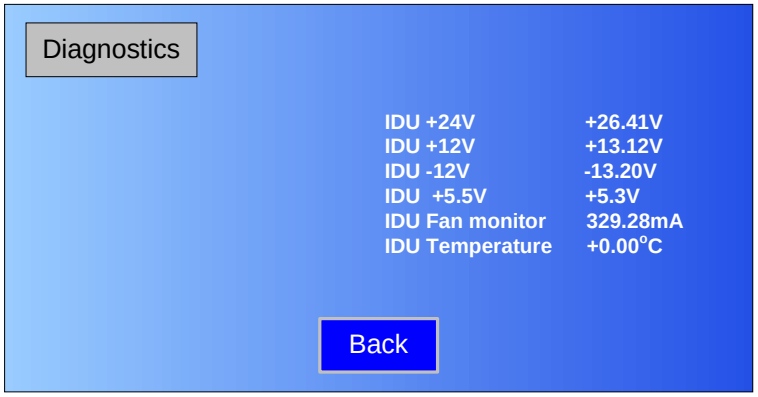
3. Select the **Radio** option button and observe the **Radio** screen is displayed. See Figure 3-118.

Figure 3-118: Radio Screen



4. Select the **Diagnostics** option button and observe the **Diagnostics** screen is displayed. See Figure 3-119 on page 3-57.

Figure 3-119: Diagnostics Screen - Typical



5. When review of the **Diagnostics** screen is complete, select the **Back** option button and observe the **Radio** screen is displayed.
6. Select the **Main** option button and observe the Main screen is displayed.

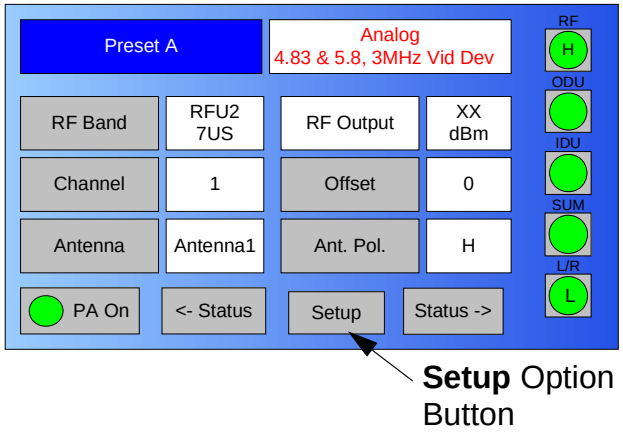
3.6.18 Review System Information

The procedure required to review the current software versions contained in your MTX5000 IDU is contained in the following steps.

Note	In the following procedure, option buttons may be selected using either the touch screen or the function keys and the **SEL** key.

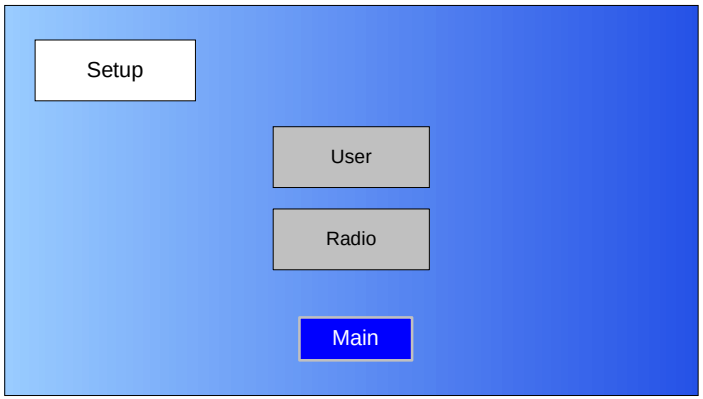
1. Observe the Main screen is displayed. See Figure 3-120.

Figure 3-120: Main Screen - Typical



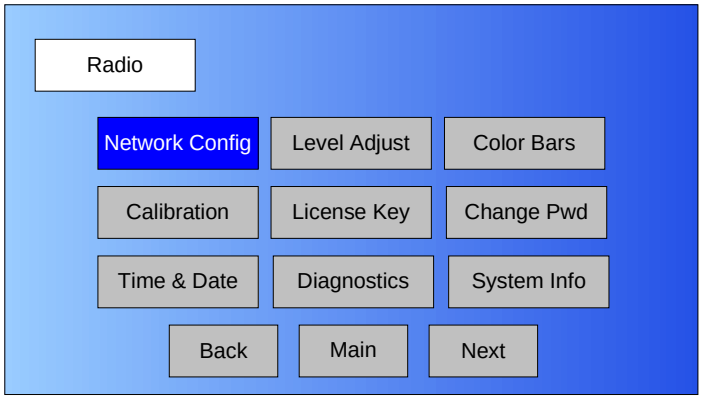
2. Select the **Setup** option button and observe the **Setup** screen is displayed. See Figure 3-121.

Figure 3-121: Setup Screen



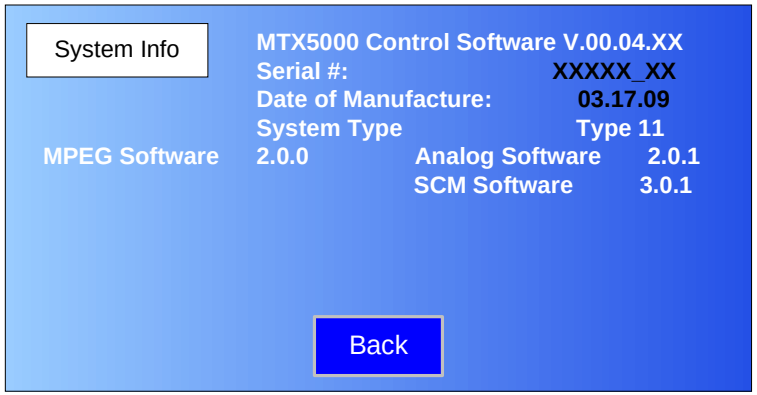
3. Select the **Radio** option button and observe the **Radio** screen is displayed. See Figure 3-122 on page 3-58.

Figure 3-122: Radio Screen



4. Select the **System Info** option button and observe the **System Info** screen is displayed. See Figure 3-123.

Figure 3-123: System Info Screen - Typical



5. When review of the **System Info** screen is complete, select the **Back** option button and observe the **Radio** screen is displayed.
6. Select the **Main** option button and observe the Main screen is displayed.

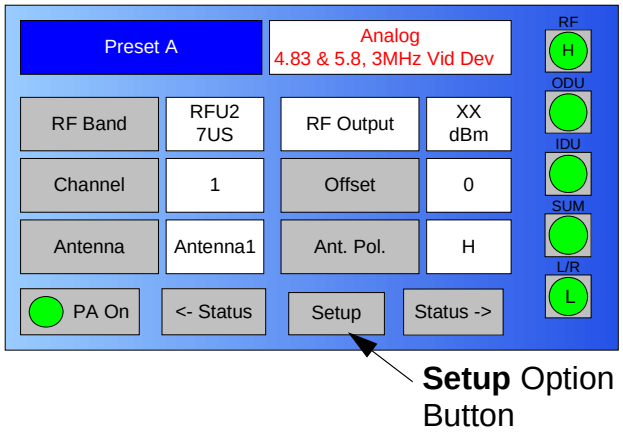
3.6.19 Set Last PA State

The IDU can be configured to return the PA to the last operating state (**PA Off**, **PA On**, or always **PA Off**) when the unit is powered down and is then powered up again. After powering down, the next time the IDU is powered up, the PA will return to the state selected. The procedure required to set the last PA state is contained in the following steps.

Note	In the following procedure, option buttons may be selected using either the touch screen or the function keys and the **SEL** key.

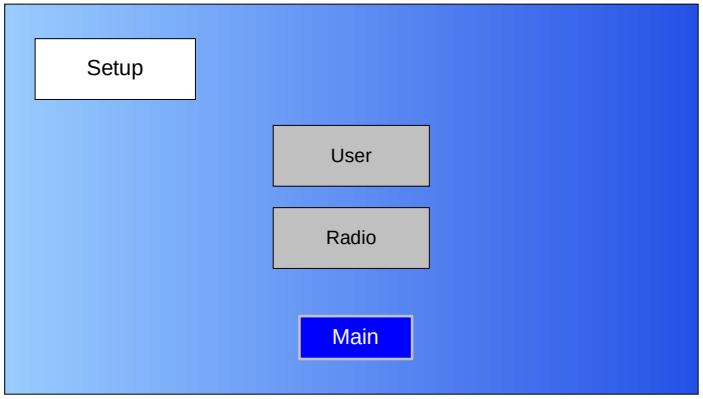
1. Observe the Main screen is displayed. See Figure 3-124.

Figure 3-124: Main Screen - Typical



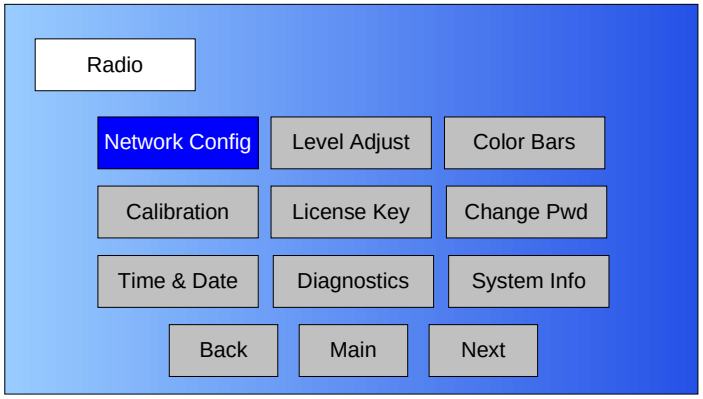
2. Select the **Setup** option button and observe the **Setup** screen is displayed. See Figure 3-125 on page 3-59.

Figure 3-125: Setup Screen



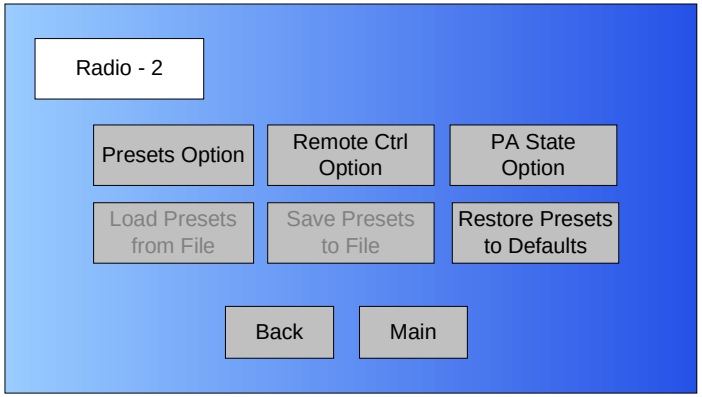
3. Select the **Radio** option button and observe the **Radio** screen is displayed. See Figure 3-126.

Figure 3-126: Radio Screen



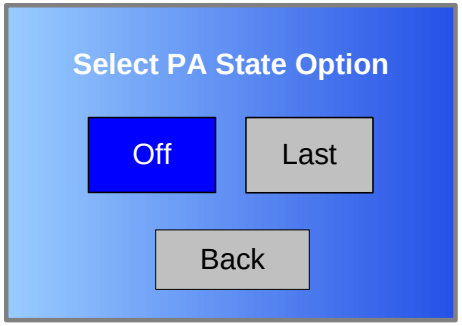
4. Select the **Next** option button and observe the **Radio - 2** screen is displayed. See Figure 3-127.

Figure 3-127: Radio - 2 Screen



5. Select the **PA State Option** button and observe the **Select PA State Option** screen is displayed. See Figure 3-128.

Figure 3-128: Select PA State Option Screen



Note	In the following step, if the **Off** option button is selected, the PA will return to the **PA Off** state when the IDU is powered up again. If the **Last** option button is selected, the IDU will return to the last PA settings that were in use when the unit was powered down, including frequency and power levels and **PA On** or **PA Off** state, when the unit is powered up again.

6. Select **Off** or **Last**, as required, and observe the **Radio - 2** screen is displayed.
7. Select the **Main** option button and observe the Main screen is displayed.

3.7 Using the MTX5000 in Remote Mode

Note	***Remote location operations are best performed using Internet Explorer 7.0 or later.***

Once the MTX5000 is powered up, you will be able to monitor and/or change certain operating parameters through the use of options displayed on a PC at a remote location. The PC must be connected to your MTX5000 via your web browser.

Notes	If you are using the optional Remote Access Subnotebook PC for remote control operations, refer to the Remote Access Subnotebook PC Operator's Guide, part no. 400573-1, for the procedures required to connect to the MTX5000 IDU and to power up the Remote Access Subnotebook PC. The procedures required to control the MTX5000 IDU remotely using a PC from a remote location or for remote control using the optional Remote Access Subnotebook PC are identical.

3.7.1 Overview

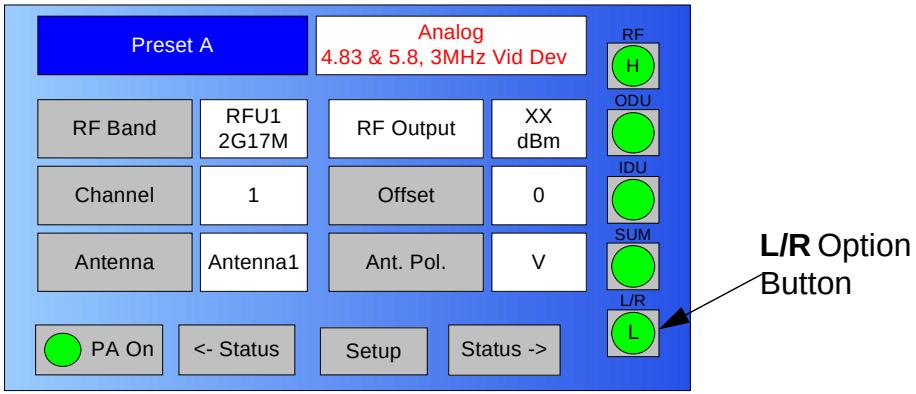
As you operate the MTX5000 from a PC at a remote location, you will interact with the MTX5000 via a web browser. The optional Remote Access Subnotebook PC may also be used for mobile remote control operations.

In order to control the MTX5000 remotely via either method, perform "Select Local/Remote Operation Mode" on page 3-20 to place the MTX5000 in the remote mode.

The **L/R** option button on the MTX5000 color LCD display panel touch screen may be selected to change the operating mode to local (**L**) only. See Figure 3-129 on page 3-61. Selecting the **L/R** option button when the system is in the local mode will not change to the remote mode.

When the option button is in the local mode, all operations must be performed at the MTX5000. When the option button is in the remote mode, all operations must be performed at the remote PC.

Figure 3-129: MTX5000 Color LCD Display Panel - Typical



Selection of the local/remote operating mode may only be performed at the MTX5000. You cannot change the local/ remote operating mode from the remote PC.

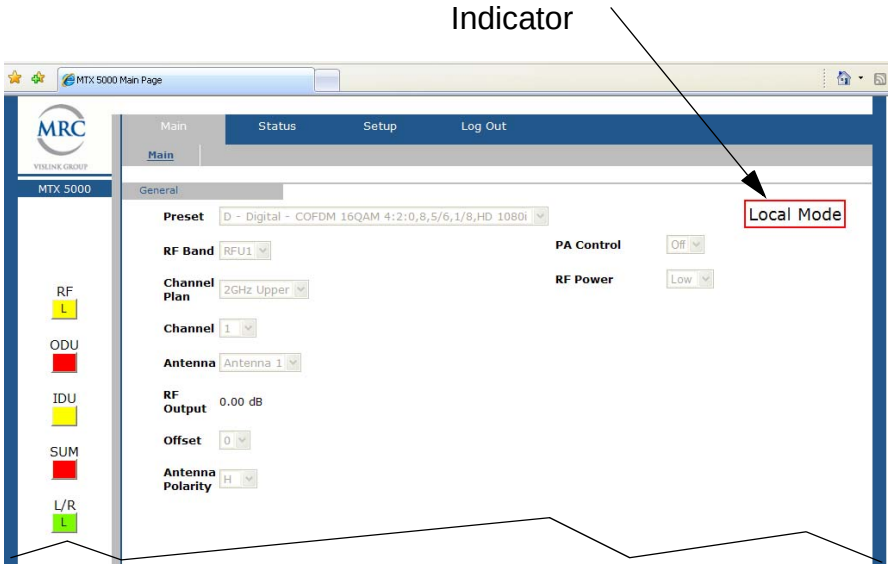
3.7.2 Remote Screen Display

Notes	Preset configuration settings will be displayed in the local mode when you are connected to the MTX5000 IDU via your web browser. All configuration option settings are inactive in the local mode, however.

When you are connected to the MTX5000 via your web browser and are logged in as a user, the display shown in Figure 3-130 will appear on your remote PC display.

When the MTX5000 is in the local mode, the **Local Mode** indicator on the remote screen **Main** tab will be displayed after logging in using the user password. In the local mode, the current MTX5000 Preset configuration settings may be monitored from the remote PC, but no settings can be changed in the local mode. When the MTX5000 is in the remote mode, no indicator is displayed on the remote screen.

Figure 3-130: Remote Screen Display - Typical



In the remote mode, the following MTX5000 settings can be monitored and/or changed using the remote PC. These settings are controlled using the **Main** tab.

- Select **Preset**
- Select **RF Band**
- Select **Channel Plan**
- Select frequency **Channel**
- Select **Antenna**
- Monitor current **RF Output** level
- Select channel frequency **Offset**

- Select **Antenna Polarity**
- Select **PA Control** (transmitter) operation
- Select **RF Power** level
- Monitor **ODU**, **IDU**, and **SUM** (summary) alarms
- Monitor currently selected Preset configuration settings.

See Figure 3-131 on page 3-63 for the top level remote menu hierarchy.

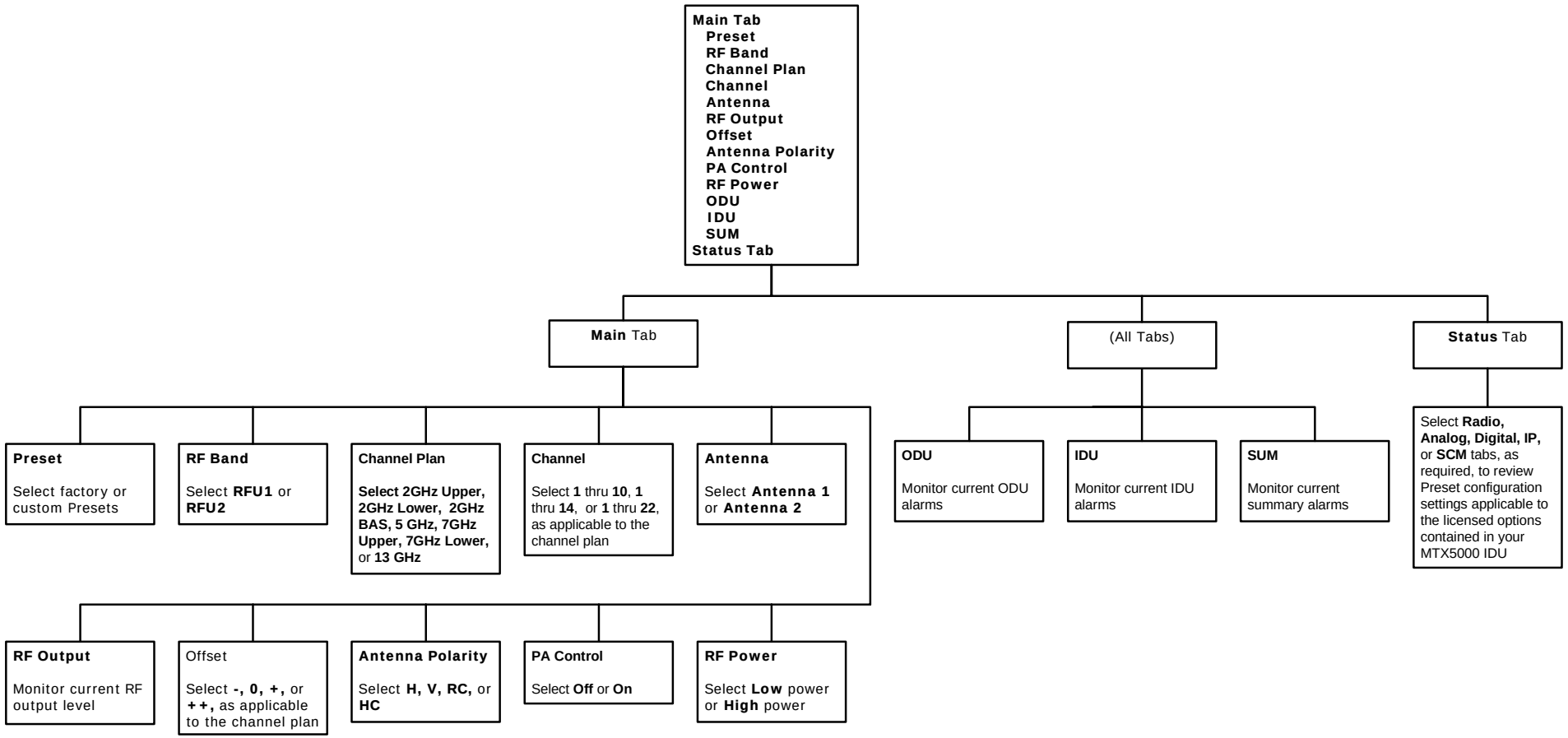
The remote screen **Main** tab is your starting point for navigating through various option selections available. The remote screen provides access to options available in your MTX5000 through the use of various tabs and pull-down menus.

When a tab is selected, the tab is grey. Tabs will be blue when they are not selected. The mouse cursor will change to a “hand” icon () when the cursor is moved over an active tab. If an active tab is selected and the cursor is moved over the active tab, the cursor will not change to the “hand” icon, however.

When an active tab is selected, any additional active tabs associated with the active tab may be selected. For example, if an analog Preset is selected, the **Main**, **Status**, and **Log Out** tabs will be active. The **Setup** tab is active only when a custom user or the system administrator has logged in.

Tab options available from the **Status** tab are those applicable to the licensed options contained in your MTX5000 IDU only.

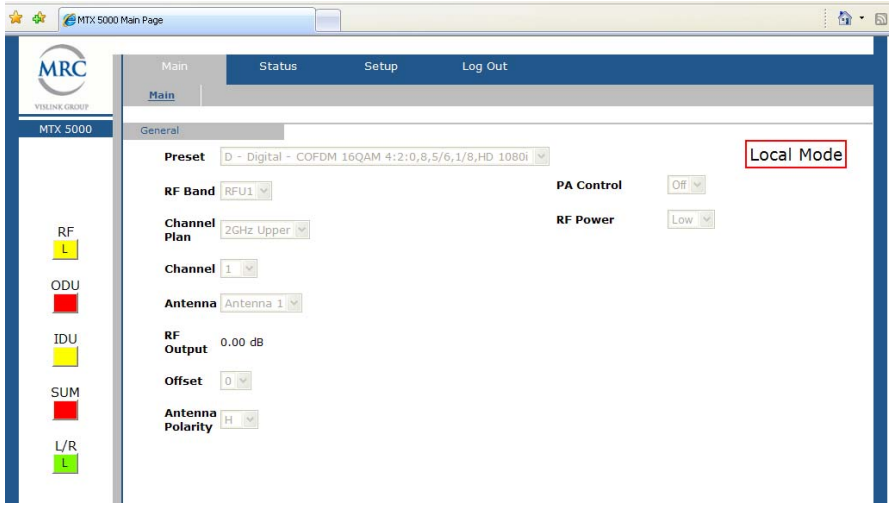
Figure 3-131: Top Level Remote Menu Hierarchy



3.7.3 Remote Configuration Setting Selections

When you interact with the MTX5000 remotely, you will use the remote screen display (Figure 3-132) **Main** tab to make operation option selections.

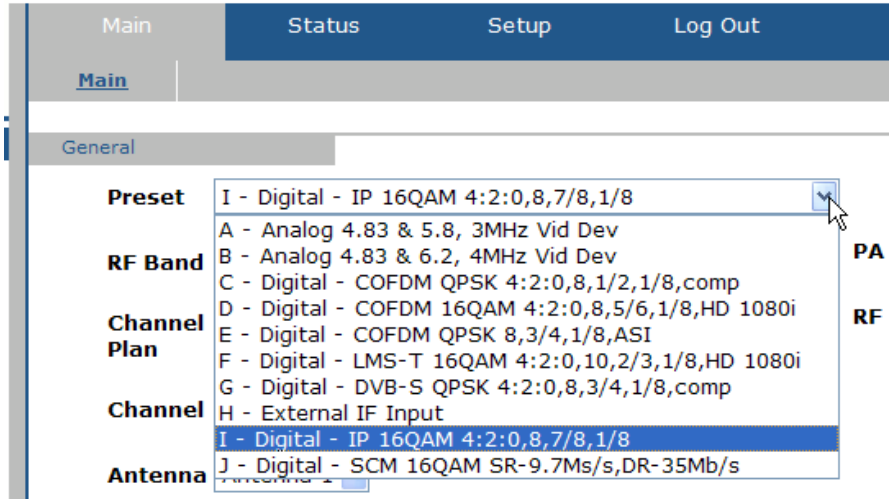
Figure 3-132: Remote Screen Display - Typical



Option selections are discussed in the following paragraphs.

Option Selections MTX5000 IDU option selections are made using the **Main** tab **General** settings pull-down menus such as the **Preset** pull-down menu shown in Figure 3-133. Preset selection options consist of both factory Presets and custom Presets.

Figure 3-133: Preset Pull-Down Menu - Typical



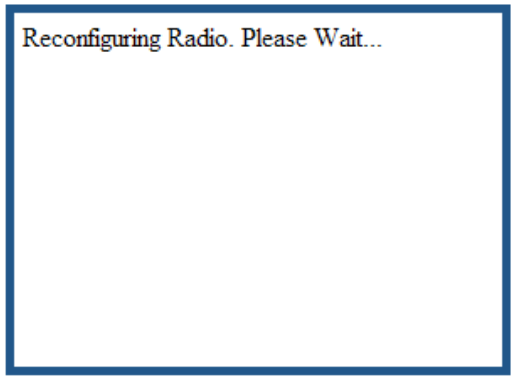
Other option pull-down menu selections include **RF Band**, **Channel Plan**, **Channel**, **Antenna**, **Offset**, **Antenna Polarity**, **PA Control**, and **RF Power**.

Please note that when pull-down menu options, other than the **Preset** pull-down menu option, are selected, the change occurs almost instantaneously. When a new **Preset** pull-down menu option is selected, it will take a short time to change all of the current Preset settings in the IDU.

When a new Preset is selected, a progress bar will be displayed on the MTX5000 display, the **PA Control** state will change to **Off** if the IDU was transmitting when the new Preset was selected, and the **Reconfiguring Radio. Please Wait...** screen will be displayed. See Figure 3-134 on page 3-65.

If the IDU was transmitting, it may be necessary to select the **PA Control** pull-down menu **On** option to resume transmitting.

Figure 3-134: Reconfiguring Radio. Please Wait... Screen - Typical



Preset Configuration Settings After selecting a new Preset, the new Preset configuration settings will be displayed on the **Radio**, **Analog**, **Digital**, or **IP** tabs, as applicable to the Preset selected and the licensed options contained in your MTX5000 IDU.

If the Preset selected is analog, the selected Preset information will be displayed on the **Radio** tab (Figure 3-135) and on the **Analog** tab (Figure 3-136).

Figure 3-135: Radio Tab - Typical

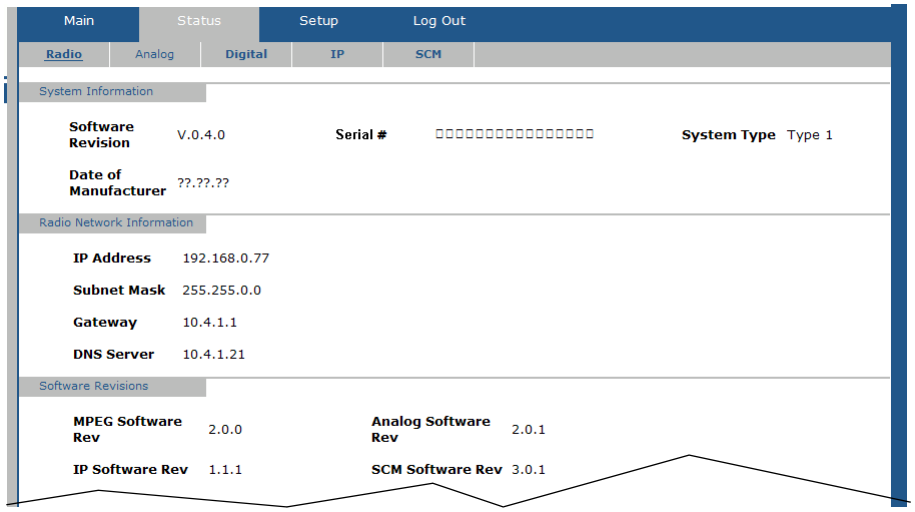
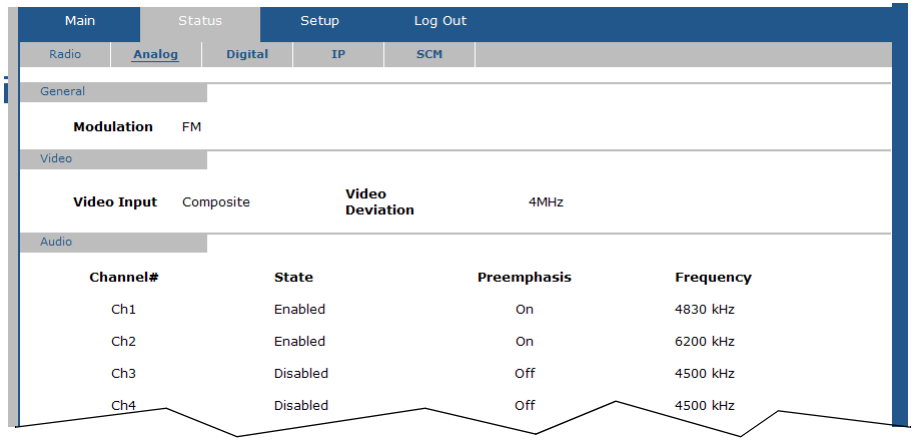


Figure 3-136: Analog Tab - Typical

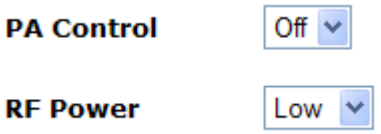


If the Preset selected is digital or IP, Preset information will be displayed on the tabs applicable to the Preset selected.

3.7.4 Transmitter Controls

Control option selections are made using the **PA Control** and **RF Power** pull-down menus. See Figure 3-137.

Figure 3-137: Transmitter Controls Pull-Down Menus



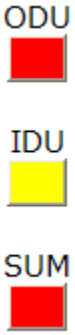
PA Control Pull-Down Menu Selection of the **PA Control** pull-down menu options enable or disable the transmitter (**On** or **Off**).

RF Power Pull-Down Menu Selection of the **RF Power** pull-down menu options allow you to set the power output to **Low** or **High**.

3.7.5 Alerts

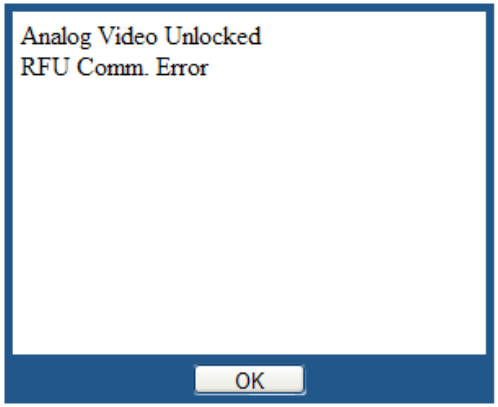
The alerts status indicators display the current Outdoor Unit (**ODU**), Indoor Unit (**IDU**), and Summary (**SUM**) alarms. See Figure 3-138. If an error exists in either the IDU or ODU, the status indicators will change from green (no faults) to yellow, indicating a fault is present that does not affect transmit operations, or will change to red, indicating a major fault exists that adversely affects transmit operations.

Figure 3-138: Alert Option Buttons



If one or both of the **ODU** or **IDU** status indicators are yellow or red, the **SUM** indicator will also reflect yellow or red. Selecting the applicable option button(s) will display error message windows applicable to the current faults in the system. See Figure 3-139.

Figure 3-139: Alert Error Message Window - Typical



Select the **OK** option button to close the error message window.

3.8 Remote Location Operations

Note	You must be in the remote operation mode to perform the following procedures.

Once the MTX5000 system is powered up and has been set for remote operation per “Select Local/Remote Operation Mode” on page 3-20, you will be able to check the MTX5000 configuration and monitor and/or control its operation from a PC at a remote location.

The procedures required to use the remote screen in the remote operating mode are as follows:

3.8.1 Select Preset

CAUTION	*If you select the wrong Preset in the following steps, wait a minimum of 5 seconds before attempting to select another Preset.* *Failure to wait a minimum of 5 seconds between selection of Presets may cause unstable operation.*

The procedure required to select a new Preset is contained in the following steps. You can select a new Preset from a list of 10 factory-configured individual Presets or from up to 99 custom Presets.

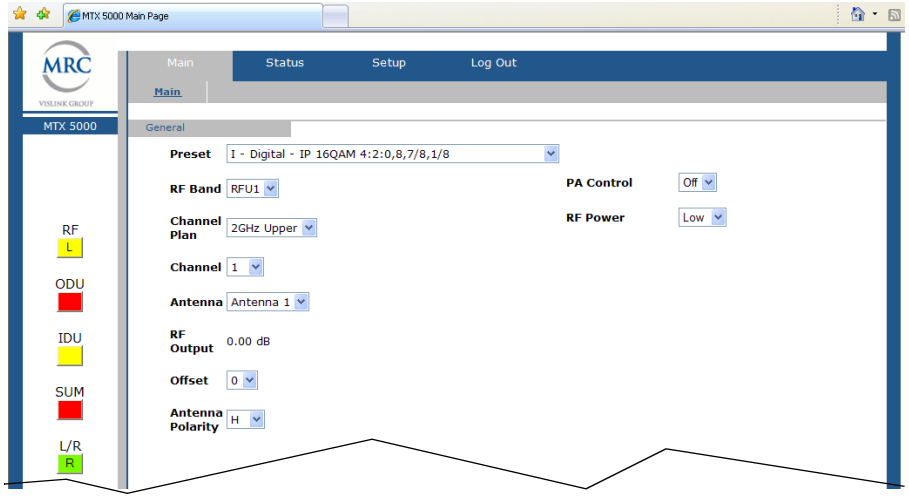
If factory **Default** Presets were selected locally on the MTX5000 IDU Main screen, only **Default** Presets may be selected remotely by the user. If **User** Presets were selected, only **User** Presets may be selected remotely by the user.

When a new Preset is selected in the following steps, the new Preset will be displayed in the **Main** tab **Preset** pull-down menu. The Preset parameters will also be displayed on the **Status** tab **Radio**, **Analog**, **Digital**, and/or **IP** tabs, as applicable to the Preset selected, after a short delay.

The **PA Control** state will also change to **Off**, if you were transmitting prior to selecting the new Preset, and it may be necessary to select the **PA Control** pull-down menu **On** option to resume transmitting.

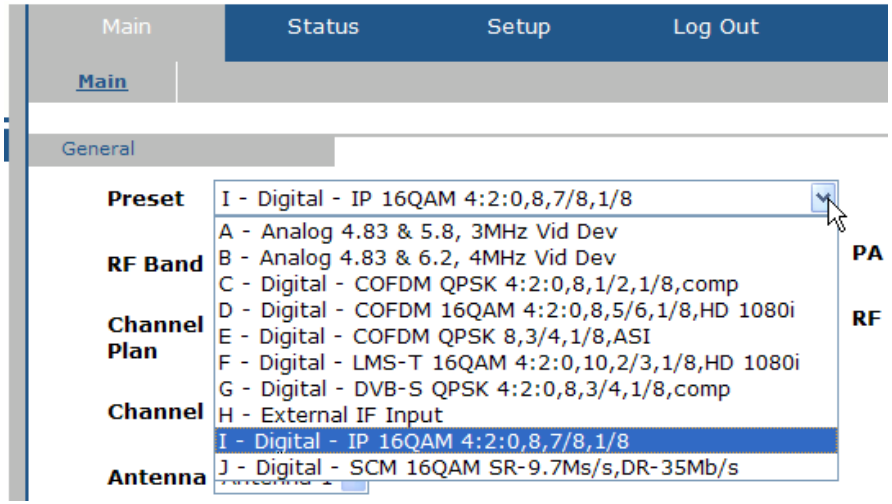
1. Verify the MTX5000 system is powered up and the system is in the remote operating mode.
2. Observe the remote screen is displayed on the remote PC display. See Figure 3-140 on page 3-68.

Figure 3-140: Remote Screen Display - Typical



3. Select the **Main** tab **Preset** pull-down menu (Figure 3-141) and select the Preset required.

Figure 3-141: CONFIGURATION - Preset Pull-Down Menu - Typical



CAUTION It may take approximately 30 seconds to change Presets from the remote location.

Do not become impatient during the configuration process in the following steps. If you do not allow processing to complete, software corruption will occur!

4. Observe the **Reconfiguring Radio. Please Wait...** window is displayed until the MTX5000 has been re-configured.
5. Observe the parameters for the selected Preset are displayed in the **Status** tab **Analog**, **Digital**, and/or **IP** tabs, as applicable.
6. Select the **Main** tab **PA Control** pull-down menu **On** option to resume transmitting, as required.

3.8.2 Select RF Band and Channel Plan

The procedure required to select an RF band (RFU) and a channel plan from a remote location is contained in the following steps.

If your MTX5000 system is a dual band configuration, the procedure required to select the RFU required for dual band operation is contained in the following steps. This procedure is also used to select the channel plan required for operation.

In a typical 2 GHz and 7 GHz dual band configuration, the 2 GHz RF head is typically connected to the IDU **RFU 1** rear panel connector and the 7 GHz RF head is typically connected to the **RFU 2** rear panel connector. The RF heads may, however, be connected to either rear panel connector. The MTX5000 software automatically detects the RF heads and assigns **RFU1**

and **RFU2** to the respective RF heads on the **RF Band** drop-down menu, as required.

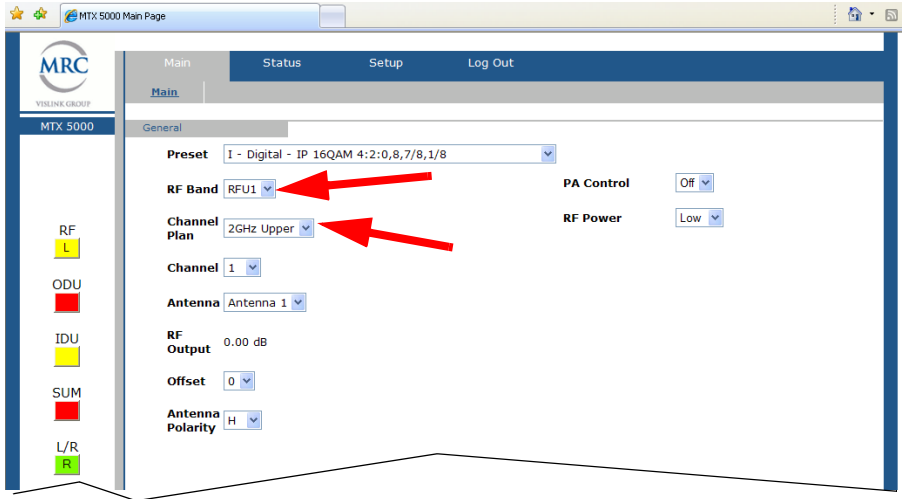
If your MTX5000 system is a single band configuration, the RF head may be connected to either the IDU **RFU 1** or **RFU 2** rear panel connector. The MTX5000 software automatically detects the RF head configuration and connection and assigns **RFU 1** or **RFU 2** to the RF head, as applicable.

When the required RF head is selected, the **RF Band** pull-down menu will display the selected RF head.

After selecting the RF head, the **Channel Plan** pull-down menu option must be selected. When the **Channel Plan** pull-down menu option required is selected, the **Channel Plan** pull-down menu will display the selected RF band.

1. Verify the MTX5000 system is powered up and the system is in the remote operating mode.
2. Observe the remote screen is displayed on the remote PC display. See Figure 3-142.

Figure 3-142: Remote Screen Display - Typical



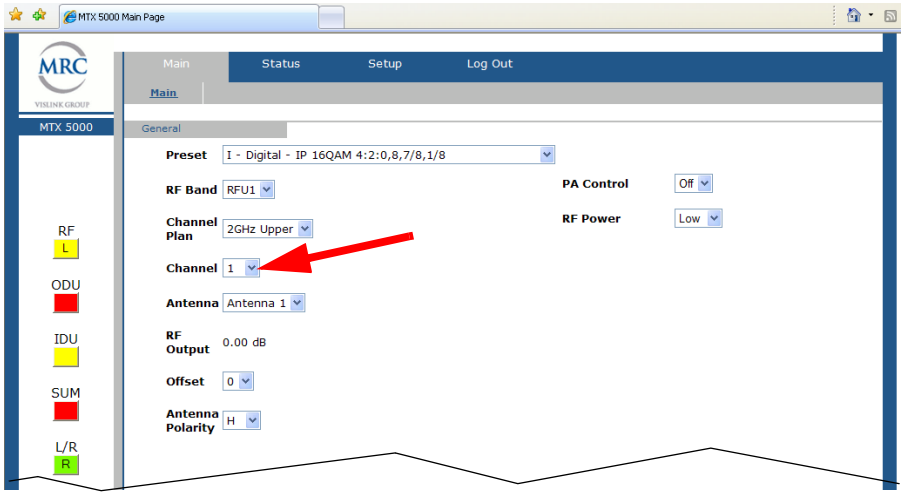
3. Select the **Main** tab **RF Band** pull-down menu and select the **RFU1** or **RFU2** option required.
4. Select the **Channel Plan** pull-down menu and select the **Channel Plan** option required.

3.8.3 Select Operating Channel

The procedure required to select an operating channel is contained in the following steps. When the **Channel** pull-down menu option required is selected, the **Channel** pull-down menu will display the selected channel.

1. Verify the MTX5000 system is powered up and the system is in the remote operating mode.
2. Observe the Remote screen is displayed on the remote PC display. See Figure 3-143.

Figure 3-143: Remote Screen Display - Typical



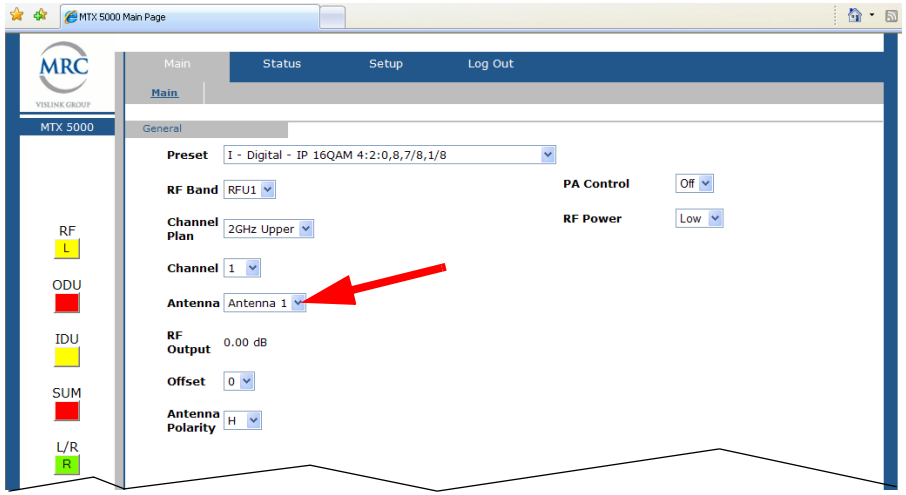
3. Select the **Main** tab **Channel** pull-down menu and select the **Channel** pull-down menu option required.

3.8.4 Select Antenna

The procedure required to select the operating antenna is contained in the following steps. When the **Antenna** pull-down menu option is selected, the **Antenna** pull-down menu will display the selected antenna.

1. Verify the MTX5000 system is powered up and the system is in the remote operating mode.
2. Observe the Remote screen is displayed on the remote PC display. See Figure 3-144.

Figure 3-144: Remote Screen Display - Typical



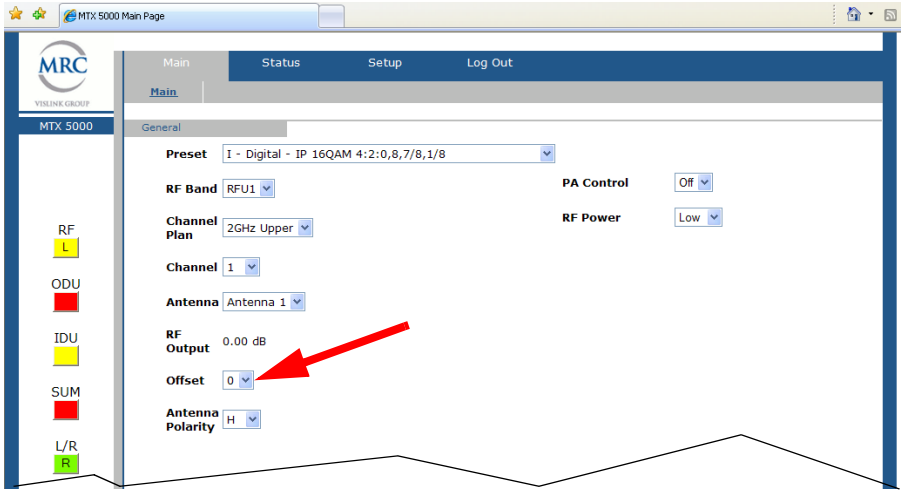
3. Select the **Main** tab **Antenna** pull-down menu and select the **Antenna** pull-down menu option required.

3.8.5 Select Frequency Offset

The procedure required to select the operating channel offset is contained in the following steps. When the **Offset** pull-down menu is selected, the **Offset** pull-down menu will display the selected channel offset.

1. Verify the MTX5000 system is powered up and the system is in the remote operating mode.
2. Observe the Remote screen is displayed on the remote PC display. See Figure 3-145.

Figure 3-145: Remote Screen Display - Typical



3. Select the **Main** tab **Offset** pull-down menu and select the **Offset** menu option required.

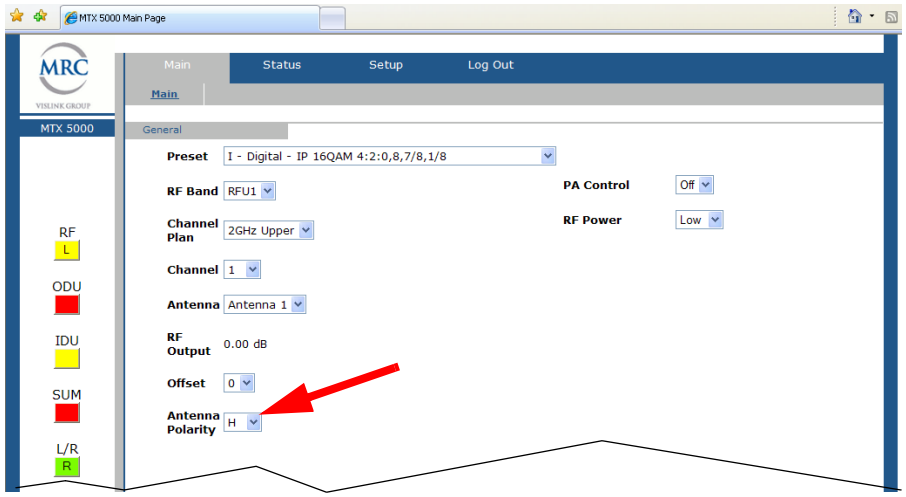
3.8.6 Select Antenna Polarization

The procedure required to select antenna polarization is contained in the following steps. When the new antenna polarization is selected, the updated **Antenna Polarity** pull-down menu will display the selected antenna.

1. Verify the MTX5000 system is powered up and the system is in the remote operating mode.

2. Observe the Remote screen is displayed on the remote PC display. See Figure 3-146.

Figure 3-146: Remote Screen Display - Typical



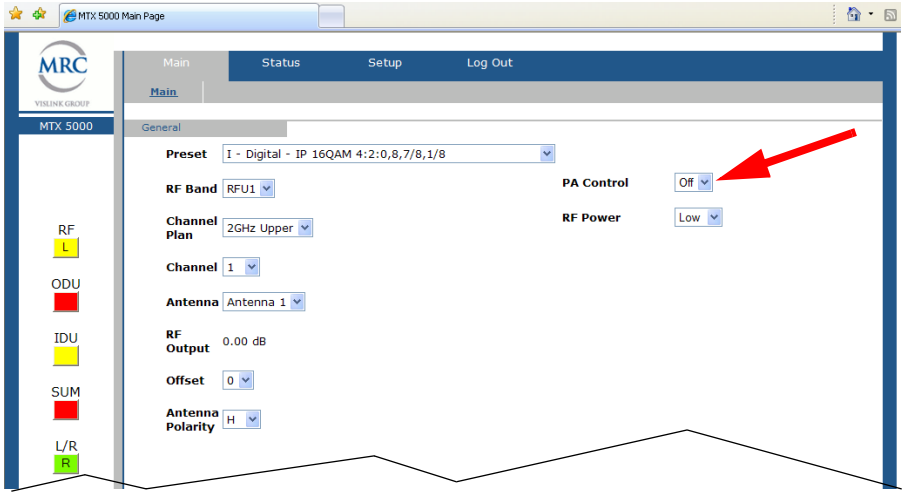
3. Select the **Main** tab **Antenna Polarity** pull-down menu and select the **Antenna Polarity** pull-down menu option required.

3.8.7 Enable/Disable Transmitter

The procedure required to enable or disable the Power Amplifier (PA) (transmitter) is contained in the following steps. When the new power amplifier operating mode is selected, the **PA Control** pull-down menu will display the new operating mode.

1. Verify the MTX5000 system is powered up and the system is in the remote operating mode.
2. Observe the Remote screen is displayed on the remote PC display. See Figure 3-147.

Figure 3-147: Remote Screen Display - Typical



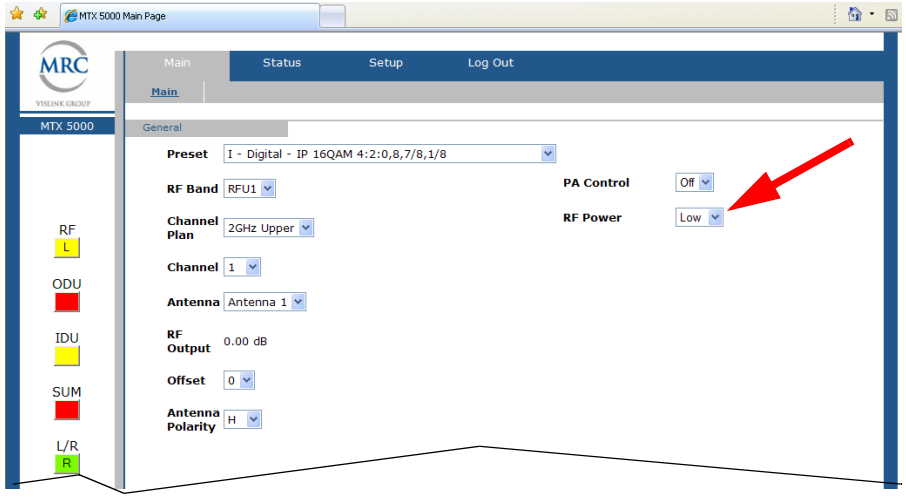
3. Select the **Main** tab **PA Control** pull-down menu and select the **PA Control** pull-down menu option required.

3.8.8 Select High/Low RF Power Mode

The procedure required to select the power amplifier (transmitter) high or low RF power output is contained in the following steps. When the power amplifier output power mode is selected, the **RF Power** pull-down menu will display the new operating mode.

1. Verify the MTX5000 system is powered up and the system is in the remote operating mode.
2. Observe the Remote screen is displayed on the remote PC display. See Figure 3-148 on page 3-72.

Figure 3-148: Remote Screen Display - Typical



3. Select the **Main** tab **RF Power** pull-down menu and select the **RF Power** pull-down menu option required.

3.8.9 Monitor Alerts

The procedure required to monitor the current alarm status of the ODU, IDU, and summary (SUM) alarms is contained in the following steps.

The **ODU**, **IDU**, and **SUM** status indicators will be green if no alarms are present in the system. If a minor IDU and/or ODU alarm is detected that does not adversely affect transmit operations, the applicable status indicator will be yellow. If a major alarm is detected in either the IDU or ODU that adversely impacts transmit operations, the **IDU** or **ODU** status indicators will be red.

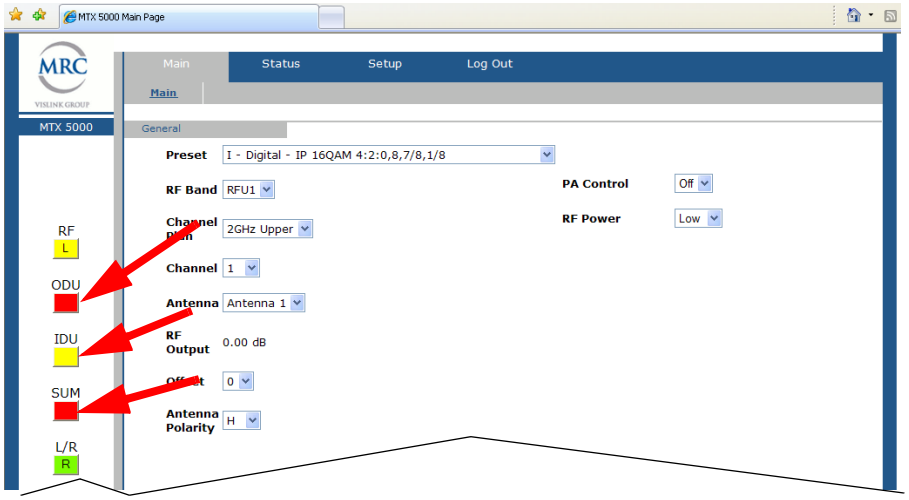
The **SUM** status indicator will display a red status indicator if the IDU and/or ODU is reporting at least one major alarm that adversely affects transmit operations.

The **SUM** status indicator will not display a red status indicator for all alarm conditions reported by the ODU or the IDU. Only alarm conditions that are considered major to the operation of the transmitter will change the state of the **SUM** status indicator status indicator to red.

Note	This procedure may be used to select either the **ODU**, **IDU**, or **SUM** option buttons to review the current alert status of the MRX5000 System.

1. Verify the MTX5000 system is powered up and the system is in the remote operating mode.
2. Observe the Remote screen is displayed on the remote PC display. See Figure 3-149.

Figure 3-149: Remote Screen Display - Typical



3. Observe the **ODU**, **IDU**, and **SUM** status indicators.

Note — In the following step, if no alerts are present, the **No Errors** window will be displayed.

If alerts are present, the alerts will be displayed in the alert window. Refer to the "Error Messages" section on page 4-1 for a list of possible alarms and suggested corrective actions.

4. Select the **ODU**, **IDU**, or **SUM** option button, as required.
   - If a green status indicator is selected, a **No Errors** window will be displayed.
   - If a red or yellow status indicator is selected, an alert window will be displayed indicating all current alert messages.
5. When review of the alerts window is complete, select the **OK** option button, observe the alerts window closes, and observe the Remote screen is displayed.

3.9 Routine vs. Advanced Operation Configuration Settings

The design of the MTX5000 and the internal software makes commonly available settings accessible from the MTX5000 color LCD display during routine operations and during advanced operations.

A summary of settings that can be controlled by each method is shown in Table 3-2.

Table 3-2: Front Panel vs. Configuration Setting

Parameter	Available Settings	Routine Operation	Advanced Operation
Preset in use	• Factory Default Presets: **A** thru **J** • Custom Presets: **1** thru **99**	✔	✔
Preset text	Any alphanumeric characters		✔
RF Band	Dependent upon system options	✔	
Channel	Dependent upon system options: • 2 GHz Band: Channels **1** thru **10** • 7 GHz Band: Channels **1** thru **14**	✔	
Offset	**-**, **0**, or **+**	✔	
Antenna	• **Antenna 1** • **Antenna 2**	✔	
Antenna Polarity	• Horizontal (**H**) • Vertical (**V**) • Right Circular (**RC**) • Left Circular (**LC**)	✔	
Power Amplifier (**PA**) select mode	• **PA Off** • **PA On**	✔	
RF power select (**RF**)	• Low (**L**) • High (**H**)	✔	

Table 3-2: Front Panel vs. Configuration Setting (Continued)

Parameter	Available Settings	Routine Operation	Advanced Operation
Radio:			
Network Configuration:			
Radio IP	Enter address		✔
Subnet Mask	Enter address		✔
Gateway	Enter address		✔
DNS Server	Enter address		✔
File Network			
IP Address	Enter address		✔
Subnet Mask	Enter address		✔
Gateway	Enter address		✔
Trap Configuration			
Destination Address	Enter address		✔
Port #	Enter port number		✔
Level Adjust	Perform Output Level Adjust	✔	
Color Bars	• **Off** • **On** • **A Gen** • **A Stby**	✔	
RF Calibration	Perform PA Voltage Adjust	✔	

Table 3-2: Front Panel vs. Configuration Setting (Continued)

Parameter	Available Settings	Routine Operation	Advanced Operation
License Key	Enter alphanumeric key to activate licensed option		✔
Change Pwd (Password)	Enter alphanumeric password, as required		✔
Time & Date	Enter time and date	✔	
Diagnostics	Perform IDU diagnostics test	✔	
Presets Option	Select factory default or custom user Presets	✔	
Remote Control Option	Select remote control	✔	
PA State Option	Select PA off or last state option	✔	
Restore Presets to Defaults	Restore all Presets to factory defaults (deletes all custom user Presets)		✔
System Info	Review software revision number	✔	

Table 3-2: Front Panel vs. Configuration Setting (Continued)

Parameter	Available Settings	Routine Operation	Advanced Operation
Analog Presets:			
User:			
FMT Setup:			
Video Deviation			
Video Deviation	• **3 MHz** • **4 MHz**		✔
Video Input	• **Composite** • **Baseband**		✔
Audio CH1, **CH2**, **CH3**, and **CH4**			
Enable	• **On** • **Off**		✔
Frequency	• **4830 kHz** • **5200 kHz** • **5800 kHz** • **6200 kHz** • **6800 kHz** • **7020 kHz** • **7500 kHz** • **8065 kHz** • **8300 kHz** • **8590 kHz** • **Custom**		✔
Pre-Emphasis	• **On** • **Off**		✔
Digital COFDM Presets:			
User:			

Table 3-2: Front Panel vs. Configuration Setting (Continued)

Parameter	Available Settings	Routine Operation	Advanced Operation
COFDM Setup:			
FEC	• **1/2** • **2/3** • **3/4** • **5/6** • **7/8**		✔
Guard Interval	• **1/32** • **1/16** • **1/8** • **1/4**		✔
Constel-lation	• **QPSK** • **16-QAM** • **64-QAM**		✔
RF B/W	• **6 MHz** • **7 MHz** • **8 MHz**		✔
MPEG Setup:			
Video In			
Input (SD NTSC Mode)	• **NTSC** • **NTSC No Pedestal** • **SDI 525**		✔
Input (SD PAL Mode)	• **PAL** • **PAL-M** • **PAL-N** • **SDI 625**		✔

Table 3-2: Front Panel vs. Configuration Setting (Continued)

Parameter	Available Settings	Routine Operation	Advanced Operation
Input (HD Mode)	• **720p50** • **720p59** • **720p60** • **1080i25** • **1080i29** • **1080i30** • **1080p24** • **1080p25** • **1080p29** • **1080p30** • **1080psf23** • **1080psf24** • **1080psf25** • **1080psf29** • **1080psf30**		✔
Noise Reduction	• **On** • **Off**		✔
SDI Auto Line	• **On** • **Off**		✔
HD Test Pattern	• **On** • **Off**		✔
Audio In			
AUDIO 1 and AUDIO 2			
Mode	• **Stereo** • **Dual Mono**		✔

Table 3-2: Front Panel vs. Configuration Setting (Continued)

Parameter	Available Settings	Routine Operation	Advanced Operation
Standard	• **Off** • **MPEG Layer II** • **Linear PCM** • **MPEG Layer I**		✔
Bit Rate	• **128 Kbps** • **160 Kbps** • **192 Kbps** • **224 Kbps** • **256 Kbps** • **320 Kbps** • **384 Kbps**		✔
Input	• **Test Tone** • **Analog** • **SDI EMB**		✔
Balance (AUDIO 2 Only)	• **Unbalanced** • **Balanced**		✔
Spectrum Invert	• **Normal** • **Inverted**		✔
Encoder			
Mode	• **Standard** • **Low Delay**		✔
Bit Rate	• **MP@ML** • **422P@ML**		✔
Bit Rate (Manual)	Enter bit rate required		✔

Table 3-2: Front Panel vs. Configuration Setting (Continued)

Parameter	Available Settings	Routine Operation	Advanced Operation
Bit Rate Auto	• **On** • **Off**		✔
GOP Length	Enter Group of Pictures (GOP) length as required		✔
Horiz Resolution	• **720** • **704** • **544** • **528** • **480** • **352**		✔
Aspect Ratio	• **4:3** • **16:9**		✔
PTS per Picture	• **On** • **Off**		✔
VBI	• **On** • **Off**		✔
PID Data			
Default	Select default PIDs		✔
PMT	Enter PID required		✔
VIDEO	Enter PID required		✔
DATA	Enter PID required		✔
AUDIO A	Enter PID required		✔
AUDIO B	Enter PID required		✔
PCR	Enter PID required		✔

Table 3-2: Front Panel vs. Configuration Setting (Continued)

Parameter	Available Settings	Routine Operation	Advanced Operation
Encoding			
Service Name	Enter service name		✔
Network Name	Enter network name		✔
EBS/BISS	Enable encryption (license required)		✔
Wayside data			
Data Enable	• **Off** • **TTV Format** • **CJM2 Format** • **Low Delay CJM2**		✔
Baud Rate	• **1200** • **2400** • **4800** • **9600** • **19200** • **38400**		✔
Digital ASI Presets:			
User:			
ASI Setup:			
FEC	• **1/2** • **2/3** • **3/4** • **5/6** • **7/8**		✔

Table 3-2: Front Panel vs. Configuration Setting (Continued)

Parameter	Available Settings	Routine Operation	Advanced Operation
Guard Interval	• **1/32** • **1/16** • **1/8** • **1/4**		✔
Constel-lation	• **QPSK** • **16-QAM** • **64-QAM**		✔
RF B/W	• **6 MHZ** • **7 MHZ** • **8 MHZ**		✔
Digital LMS-T Presets:			
User:			
LMS-T Setup			
Constel-lation	• **QPSK** • **16-QAM**		✔
RF B/W	• **10 MHZ** • **20 MHZ**		✔
Guard Interval	• **1/16** • **1/8**		✔
FEC	• **2/3**		✔
MPEG Setup:			
Video In			
Input (SD NTSC Mode)	• **NTSC** • **NTSC No Pedestal** • **SDI 525**		✔

Table 3-2: Front Panel vs. Configuration Setting (Continued)

Parameter	Available Settings	Routine Operation	Advanced Operation
Input (SD PAL Mode)	• **PAL** • **PAL-M** • **PAL-N** • **SDI 625**		✔
Input (HD Mode)	• **720p50** • **720p59** • **720p60** • **1080i25** • **1080i29** • **1080i30** • **1080p24** • **1080p25** • **1080p29** • **1080p30** • **1080psf23** • **1080psf24** • **1080psf25** • **1080psf29** • **1080psf30**		✔
Noise Reduction	• **On** • **Off**		✔
SDI Auto Line	• **On** • **Off**		✔
HD Test Pattern	• **On** • **Off**		✔

Table 3-2: Front Panel vs. Configuration Setting (Continued)

Parameter	Available Settings	Routine Operation	Advanced Operation
Audio In			
AUDIO 1 and AUDIO 2			
Mode	• **Stereo** • **Dual Mono**		✔
Standard	• **Off** • **MPEG Layer II** • **Linear PCM** • **MPEG Layer I**		✔
Bit Rate	• **128 Kbps** • **160 Kbps** • **192 Kbps** • **224 Kbps** • **256 Kbps** • **320 Kbps** • **384 Kbps**		✔
Input	• **Test Tone** • **Analog** • **SDI EMB**		✔
Balance (AUDIO 2 only)	• **Unbalanced** • **Balanced**		✔
Spectrum Invert	• **Normal** • **Inverted**		✔
Encoder			
Mode	• **Standard** • **Low Delay**		✔

Table 3-2: Front Panel vs. Configuration Setting (Continued)

Parameter	Available Settings	Routine Operation	Advanced Operation
Bit Rate	• **MP@ML** • **422P@ML**		✔
Bit Rate (Manual)	Enter bit rate required		✔
Bit Rate Auto	• **On** • **Off**		✔
GOP Length	Enter Group of Pictures (GOP) length as required		✔
Horiz Resolution	• **720** • **704** • **544** • **528** • **480** • **352**		✔
Aspect Ratio	• **4:3** • **16:9**		✔
PTS per Picture	• **On** • **Off**		✔
VBI	• **On** • **Off**		✔
PID Data			
Default	Select default PIDs		✔
PMT	Enter PID required		✔
VIDEO	Enter PID required		✔
DATA	Enter PID required		✔
AUDIO A	Enter PID required		✔

Table 3-2: Front Panel vs. Configuration Setting (Continued)

Parameter	Available Settings	Routine Operation	Advanced Operation
AUDIO B	Enter PID required		✔
PCR	Enter PID required		✔
Encoding			
Service Name	Enter service name		✔
Network Name	Enter network name		✔
EBS/BISS	Enable encryption (license required)		✔
Wayside data			
Data Enable	• **Off** • **TTV Format** • **CJM2 Format** • **Low Delay CJM2**		✔
Baud Rate	• **1200** • **2400** • **4800** • **9600** • **19200** • **38400**		✔

Table 3-2: Front Panel vs. Configuration Setting (Continued)

Parameter	Available Settings	Routine Operation	Advanced Operation
Digital DVB-S Presets			
User:			
COFDM Setup:			
FEC	• **1/2** • **2/3** • **3/4** • **5/6** • **7/8**		✔
Guard Interval	• **1/32** • **1/16** • **1/8** • **1/4**		✔
Constel-lation	• **QPSK** • **16-QAM** • **64-QAM**		✔
RF B/W	• **6 MHz** • **7 MHz** • **8 MHz**		✔
DVB-S Setup:			
DVBS Roll Off	• **20%** • **25%** • **35%**		✔

Table 3-2: Front Panel vs. Configuration Setting (Continued)

Parameter	Available Settings	Routine Operation	Advanced Operation
MPEG Setup:			
Video In			
Input (SD NTSC Mode)	• **NTSC** • **NTSC No Pedestal** • **SDI 525**		✔
Input (SD PAL Mode)	• **PAL** • **PAL-M** • **PAL-N** • **SDI 625**		✔
Input (HD Mode)	• **720p50** • **720p59** • **720p60** • **1080i25** • **1080i29** • **1080i30** • **1080p24** • **1080p25** • **1080p29** • **1080p30** • **1080psf23** • **1080psf24** • **1080psf25** • **1080psf29** • **1080psf30**		✔
Noise Reduction	• **On** • **Off**		✔

Table 3-2: Front Panel vs. Configuration Setting (Continued)

Parameter	Available Settings	Routine Operation	Advanced Operation
SDI Auto Line	• **On** • **Off**		✔
HD Test Pattern	• **On** • **Off**		✔
Audio In			
AUDIO 1 and AUDIO 2			
Mode	• **Stereo** • **Dual Mono**		✔
Standard	• **Off** • **MPEG Layer II** • **Linear PCM** • **MPEG Layer I**		✔
Bit Rate	• **128 Kbps** • **160 Kbps** • **192 Kbps** • **224 Kbps** • **256 Kbps** • **320 Kbps** • **384 Kbps**		✔
Input	• **Test Tone** • **Analog** • **SDI EMB**		✔
Balance (AUDIO 2 only)	• **Unbalanced** • **Balanced**		✔
Spectrum Invert	• **Normal** • **Inverted**		✔

Table 3-2: Front Panel vs. Configuration Setting (Continued)

Parameter	Available Settings	Routine Operation	Advanced Operation
Encoder			
Mode	• **Standard** • **Low Delay**		✔
Bit Rate	• **MP@ML** • **422P@ML**		✔
Bit Rate (Manual)	Enter bit rate required		✔
Bit Rate Auto	• **On** • **Off**		✔
GOP Length	Enter Group of Pictures (GOP) length as required		✔
Horiz Resolution	• **720** • **704** • **544** • **528** • **480** • **352**		✔
Aspect Ratio	• **4:3** • **16:9**		✔
PTS per Picture	• **On** • **Off**		✔
VBI	• **On** • **Off**		✔
PID Data			
Default	Select default PIDs		✔
PMT	Enter PID required		✔
VIDEO	Enter PID required		✔
DATA	Enter PID required		✔
AUDIO A	Enter PID required		✔
AUDIO B	Enter PID required		✔
PCR	Enter PID required		✔
Encoding			
Service Name	Enter service name		✔
Network Name	Enter network name		✔
EBS/BISS	Enable encryption (license required)		✔
Wayside data			
Data Enable	• **Off** • **TTV Format** • **CJM2 Format** • **Low Delay CJM2**		✔
Baud Rate	• **1200** • **2400** • **4800** • **9600** • **19200** • **38400**		✔

Table 3-2: Front Panel vs. Configuration Setting (Continued)

Table 3-2: Front Panel vs. Configuration Setting (Continued)

Parameter	Available Settings	Routine Operation	Advanced Operation
Digital IP Presets:			
User:			
IP Setup:			
IP Config			
FEC	• **1/2** • **2/3** • **3/4** • **5/6** • **7/8**		✔
Guard Interval	• **1/32** • **1/16** • **1/8** • **1/4**		✔
Constel-lation	• **QPSK** • **16-QAM** • **64-QAM**		✔
RF B/W	• **6 MHZ** • **7 MHZ** • **8 MHz**		✔
IP Setup			
IP Transfer Mode	• **IP Only** • **IP + Video**		✔
Video Bitrate	Enter bit rate required		✔

Table 3-2: Front Panel vs. Configuration Setting (Continued)

Parameter	Available Settings	Routine Operation	Advanced Operation
MPEG Setup:			
Video In			
Input (SD NTSC Mode)	• **NTSC** • **NTSC No Pedestal** • **SDI 525**		✔
Input (SD PAL Mode)	• **PAL** • **PAL-M** • **PAL-N** • **SDI 625**		✔
Input (HD Mode)	• **720p50** • **720p59** • **720p60** • **1080i25** • **1080i29** • **1080i30** • **1080p24** • **1080p25** • **1080p29** • **1080p30** • **1080psf23** • **1080psf24** • **1080psf25** • **1080psf29** • **1080psf30**		✔
Noise Reduction	• **On** • **Off**		✔

Table 3-2: Front Panel vs. Configuration Setting (Continued)

Parameter	Available Settings	Routine Operation	Advanced Operation
SDI Auto Line	• On • Off		✔
HD Test Pattern	• On • Off		✔
Audio In			
AUDIO 1 and AUDIO 2			
Mode	• Stereo • Dual Mono		✔
Standard	• Off • MPEG Layer II • Linear PCM • MPEG Layer I		✔
Bit Rate	• 128 Kbps • 160 Kbps • 192 Kbps • 224 Kbps • 256 Kbps • 320 Kbps • 384 Kbps		✔
Input	• Test Tone • Analog • SDI EMB		✔
Balance (AUDIO 2 only)	• Unbalanced • Balanced		
Spectrum Invert	• Normal • Inverted		✔

Table 3-2: Front Panel vs. Configuration Setting (Continued)

Parameter	Available Settings	Routine Operation	Advanced Operation
Encoder			
Mode	• Standard • Low Delay		✔
Bit Rate	• MP@ML • 422P@ML		✔
Bit Rate (Manual)	Enter bit rate required		✔
Bit Rate Auto	• On • Off		✔
GOP Length	Enter Group of Pictures (GOP) length as required		✔
Horiz Resolution	• 720 • 704 • 544 • 528 • 480 • 352		✔
Aspect Ratio	• 4:3 • 16:9		✔
PTS per Picture	• On • Off		✔
VBI	• On • Off		✔
PID Data			
Default	Select default PIDs		✔
PMT	Enter PID required		✔

Table 3-2: Front Panel vs. Configuration Setting (Continued)

Parameter	Available Settings	Routine Operation	Advanced Operation
VIDEO	Enter PID required		✔
DATA	Enter PID required		✔
AUDIO A	Enter PID required		✔
AUDIO B	Enter PID required		✔
PCR	Enter PID required		✔
Encoding			
Service Name	Enter service name		✔
Network Name	Enter network name		✔
EBS/BISS	Enable encryption (license required)		✔
Wayside data			
Data Enable	• **Off** • **TTV Format** • **CJM2 Format** • **Low Delay CJM2**		✔
Baud Rate	• **1200** • **2400** • **4800** • **9600** • **19200** • **38400**		✔
PMT	Enter PID required		✔
VIDEO	Enter PID required		✔
DATA	Enter PID required		✔

Table 3-2: Front Panel vs. Configuration Setting (Continued)

Parameter	Available Settings	Routine Operation	Advanced Operation
AUDIO A	Enter PID required		✔
AUDIO B	Enter PID required		✔
PCR	Enter PID required		✔

4 Troubleshooting

4.1 Chapter Overview

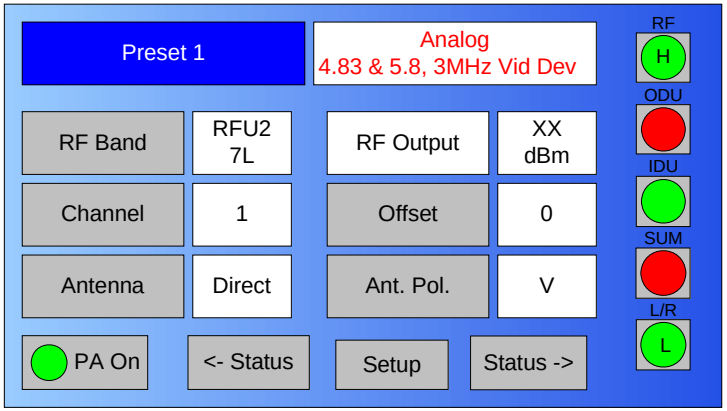
This chapter describes how to troubleshoot your MTX5000 Transmitter System (MTX5000).

4.2 Error Messages

The MTX5000 has a library of diagnostic error messages to help you pinpoint any problems.

Errors detected during normal operation of the MTX5000 system will cause the MTX5000 Indoor Unit (IDU) color LCD display panel Main screen **ODU**, **IDU**, or **SUM** status indicators to turn yellow or red, alerting you to investigate the problem. See Figure 4-1.

Figure 4-1: Color LCD Display Panel - Typical



Red **ODU**, **IDU**, or **SUM** status indicators indicate at least one major fault is present that adversely effects transmit operation. Yellow status indicators indicate a minor fault is present that does not impact transmit operations. Green status indicators indicate no faults are present.

The applicable **ODU**, **IDU**, or **SUM** status button must be selected using the IDU color LCD display panel touch screen or front panel function keys and **SEL** key to view the error messages.

The error messages are displayed on the MTX5000 color LCD display screen **ODU Status**, **IDU Status**, or **Summary Alarm** dialog boxes. See Figure 4-2, Figure 4-3, and Figure 4-4 on page 4-2.

Figure 4-2: ODU Status Dialog Box - Typical

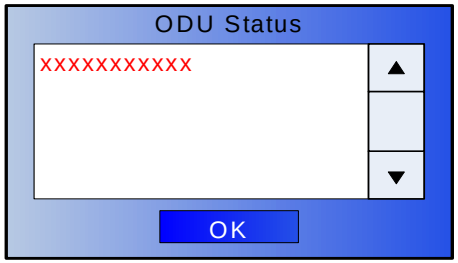


Figure 4-3: IDU Status Dialog Box - Typical

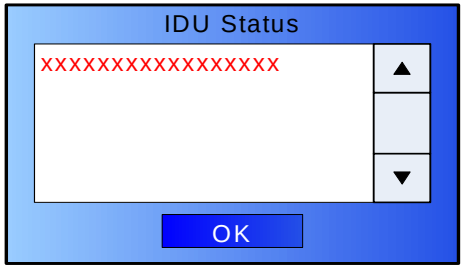
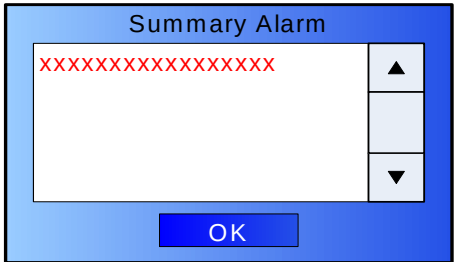


Figure 4-4: Summary Alarm Dialog Box - Typical



In all cases, the error message will uniquely identify the problem, i.e., **+5.5V Powersupply Error**.

To isolate possible IDU problems, see “Perform IDU Diagnostics” on page 3-56.

See Table 4-1 for a list of Indoor Unit (IDU) error messages and what to do when they appear.

Table 4-1: IDU Error Messages

Error Message	Error Type	Suggested Technical Staff Action
+5.5V Powersupply Error	Major	• Indicates internal power supply failure and potential unstable operation. Verify IDU input power. • Call MRC Technical Support.
+12V Powersupply Error		

Table 4-1: IDU Error Messages

Error Message	Error Type	Suggested Technical Staff Action
+24V Powersupply Error	Minor	• Indicates minor internal power supply failure. Verify IDU input power. • Call MRC Technical Support.
-12V Powersupply Error		
Ext IF Level Too High	Minor	• Indicates external IF level is above recommended level. Attenuate or disconnect signal to avoid system damage. • Call MRC Technical Support.
FMT Fault Alarm	Major	• Indicates internal hardware fault. • Call MRC Technical Support.
Audio1 Unlocked	Minor	Verify audio input is connected
Audio2 Unlocked		
Audio3 Unlocked		
Audio4 Unlocked		
Analog Video Unlocked	Minor	Verify composite video input is connected.

Table 4-1: IDU Error Messages

Error Message	Error Type	Suggested Technical Staff Action
Audio Modulator Fault	Minor	• Indicates internal hardware fault. • Call MRC Technical Support.
Digital Modulator Fault	Major	• Indicates internal hardware fault. • Call MRC Technical Support.
Digital Mod. Transport Unlocked	Minor	May indicate internal hardware fault or invalid input.
Digital Mod. Video Unlocked	Minor	Verify input video connection.

See Table 4-2 for a list of Outdoor Unit (ODU) error messages and what to do when they appear.

Table 4-2: ODU Error Messages

Error Message	Error Type	Suggested Technical Staff Action
+15V Powersupply Error	Major	• Indicates internal power supply failure and potential unstable operation. Verify IDU input power. • Call MRC Technical Support.
+12V Powersupply Error	Minor	• Indicates ODU power supply failure. Verify ODU cabling. • Call MRC Technical Support.
+11V Powersupply Error		
RFU Comm. Error	Major	• Indicates a communication error between the IDU and ODU. Verify DC power is being supplied to the ODU and verify RF cable connection between the IDU and ODU. • Call MRC Technical Support.

Table 4-2: ODU Error Messages

Error Message	Error Type	Suggested Technical Staff Action
Transmit Power Low	Major	• If error persists for more than 10 seconds, verify cabling between IDU and ODU. If in External IF operating mode, verify 70 MHz input is properly connected. • Call MRC Technical Support.
RFU UHF Unlocked RFU Synth. Unlocked	Minor	• Indicates RF circuitry is unlocked. Wait 5-10 seconds and error should clear. • Call MRC Technical Support.

4.3 Ethernet Connections

If you are connected to the Ethernet via the IDU rear panel **ETHERNET** RJ45 connector and you find that the color LCD display panel appears to be operating very slowly or has locked up completely, disconnect the Ethernet cable from the **ETHERNET** connector.

This should free up the color LCD display Panel and the IDU should resume operating properly.

5 Advanced Operations

5.1 Chapter Overview

This chapter describes how to use the software contained in the MTX5000 to provide password control of advanced operations, to create or update Preset settings in the Local or Remote mode, to set an Internet Protocol (IP) address for remote operations, and to update the MTX5000 software. This information is provided and intended for use by the technical staff.

Here are the topics covered:

5.2 Before You Begin

Before you begin, you should review the following topics.

5.2.1 MTX5000

The procedures described in this chapter assume you already know how to operate your MTX5000. If this is not the case, please review the information presented in the following Chapters of this manual:

"Introduction" Chapter on page 1-1
"Product Description" Chapter on page 2-1
"Routine Operation" Chapter on page 3-1

5.2.2 Software

This chapter assumes the MTX5000 software is operating properly on your MTX5000 and that you are familiar with the MTX5000 color LCD display panel screens, touch panel, and function keys. You must also be familiar with both Local and Remote operations.

5.2.3 Settings

Before beginning to create, modify, or program a Preset configuration or channel plan into your MTX5000, you must define what settings are required.

5.2.4 System Rules

The IDU does not need to be removed from its rack-mounted position to perform these procedures. The procedures can be performed when the IDU is installed in its normal rack-mounted position.

It is important, however, that the MTX5000 must not be transmitting when these procedures are performed.

When performing procedures contained in this Chapter, you must observe the following ***CAUTIONS*** to avoid corrupting software.

CAUTION *Do not power down the MTX5000 system when the software update progress bar is displayed, as the software update can become corrupted.*

CAUTION *Do not attempt to perform IDU software updates or make changes to Preset settings while the MTX5000 system is actively transmitting.*

Attempts to program software updates or make changes to Preset settings into the IDU when the system is transmitting will interrupt broadcast operations and may corrupt the software.

CAUTION ***Avoid damage to the color LCD display panel!***

The color LCD display panel touch screen may be damaged if a sharp, hard-pointed object, such as a pencil or a pen, is used to select the displayed options.

Touch screen options must only be selected using your fingers, a soft-pointed stylus, or the front panel function keys.

Damage to the color LCD display panel caused by using a hard-pointed object or other misuse may void your warranty on the MTX5000 IDU.

When configuring your MTX5000 IDU, the following rules must be observed:

- ***You can only select configuration settings applicable to the hardware configuration and the licensed options contained in your MTX5000 IDU.***
- ***The MTX5000 IDU must not be placed in the transmit mode when performing any procedures contained in this Chapter.***

5.2.5 Configuration Settings

New configuration settings can be prepared from scratch using an existing factory default Preset or from a custom user Preset. The factory default Presets and your custom user Presets must be used as “make-froms” to prepare any new Preset from scratch. Preset configuration settings may be prepared in either the Local or Remote operating mode. Other advanced operations must be performed in the Local mode only. Custom user Presets can also be modified, as required.

Your MTX5000 IDU was delivered with 10 factory default Presets. The factory default Presets cannot be changed or deleted from your IDU. When preparing a new Preset, you must first select a Preset to be used as a “make-from” to prepare the new Preset configuration. If a factory Preset is inactive, the licensed option is not contained in your IDU.

If you are preparing a new Preset configuration in the Local mode and the licensed option is not contained in your IDU, the option will be inactive (greyed-out) on the IDU color LCD display. If you are preparing a new Preset in the Remote mode and the licensed option is not contained in your IDU, a message window indicating **This preset cannot be selected.** will be displayed on the remote PC display. Only licensed options contained in your IDU may be used to prepare new custom user Presets.

Once a Preset configuration is created or changed, it should be saved. The IDU will remember the last operating state, but there is no guarantee that it will remember the state unless the Preset configuration settings are saved into the Preset list. The steps required to save the settings are contained in the applicable procedures.

5.3 Local Mode Password Control

CAUTION

Avoid damage to the color LCD display panel!

The color LCD display panel touch screen may be damaged if a sharp, hard-pointed object, such as a pencil or a pen, is used to select the displayed options.

Touch screen options must only be selected using your fingers, a soft-pointed stylus, or the front panel function keys.

Damage to the color LCD display panel caused by using a hard-pointed object or other misuse may void your warranty on the MTX5000 IDU.

The MTX5000 IDU provides password control of the system to prevent unauthorized personnel from making changes to Preset settings. Local mode password control of the system may only be performed with the MTX5000 IDU in the Local mode of operation.

All passwords are case-sensitive. The MTX5000 IDU is delivered with a default password. When your IDU is received from the factory, the default password is **PASSWORD**.

The default password should be changed to your own personal password upon receipt of the MTX5000 System. Your new password should be recorded and should be maintained in a secure location.

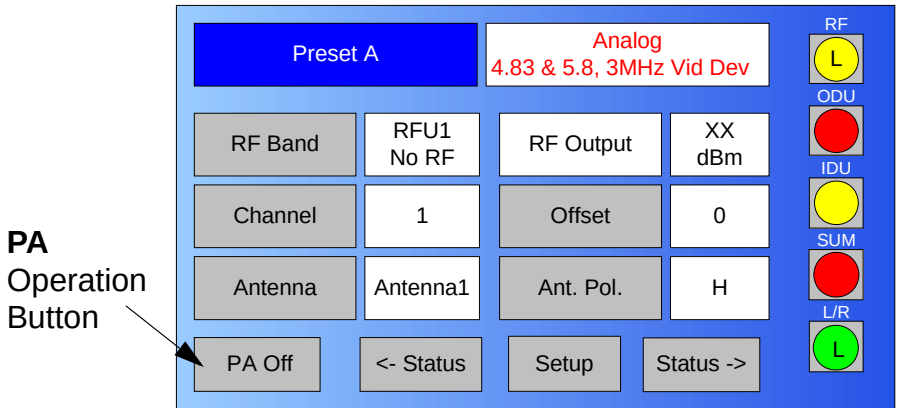
The procedure required to change the default or current password to another password of your choice is contained in the following steps.

Note — In the following steps, the color LCD display option buttons and pull-down menu options may be selected using either the touch screen or the function keys and the **SEL** key.

---

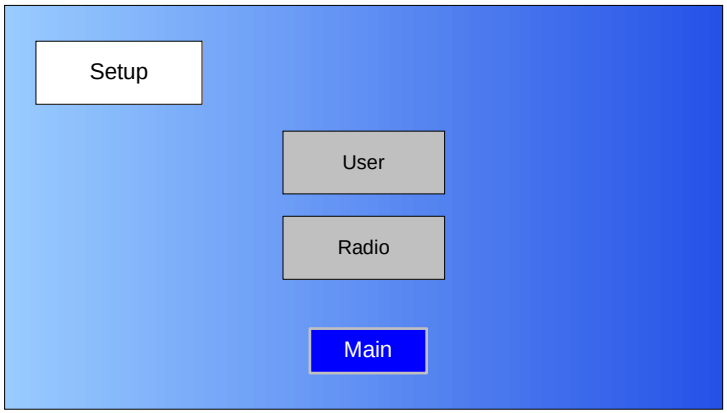
1. Verify the MTX5000 IDU is powered up. See "Powering the MTX5000 System" on page 3-7.
2. Observe the Main screen is displayed. See Figure 5-1.

Figure 5-1: Main Screen - Typical



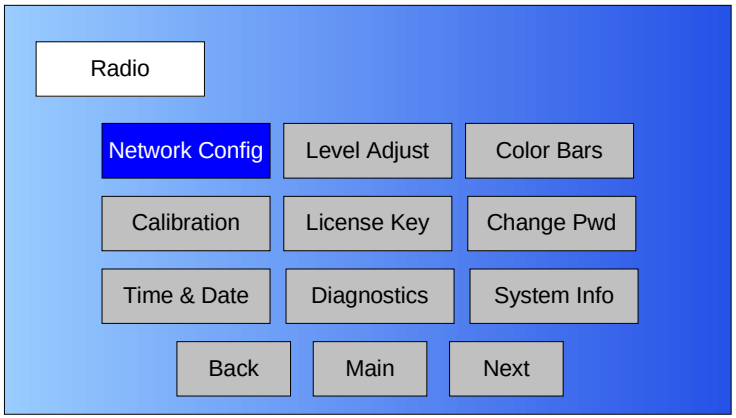
3. Select the Main screen **PA** operation button for **PA Off**, as required.
4. Select the **L/R** option button for **L** (local mode), as required.
5. Select the **Setup** option button and observe the **Setup** screen is displayed. See Figure 5-2.

Figure 5-2: Setup Screen



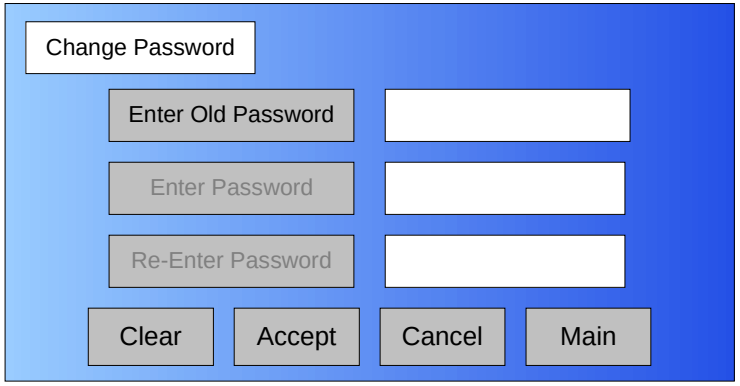
6. Select the **Radio** option button and observe the **Radio** screen is displayed. See Figure 5-3.

Figure 5-3: Radio Screen



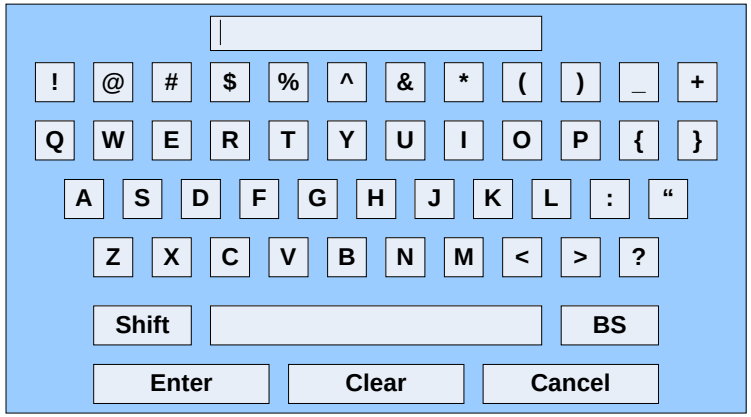
7. Select the **Change Pwd** option button and observe the **Change Password** screen is displayed. See Figure 5-4.

Figure 5-4: Change Password Screen



8. Select the **Enter Old Password** option button and observe the keyboard screen is displayed. See Figure 5-5.

Figure 5-5: Keyboard Screen



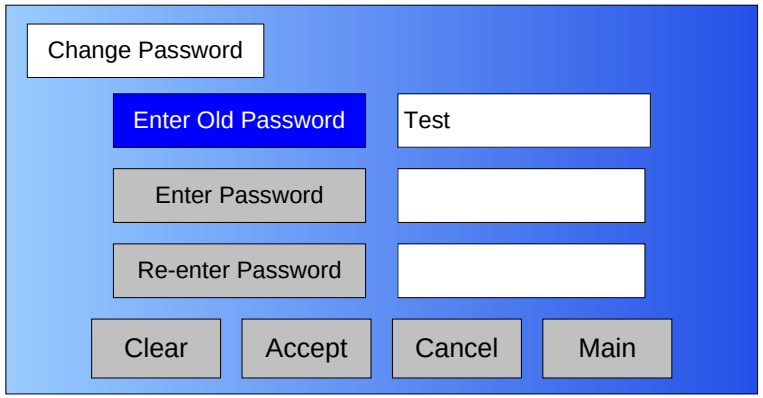
Notes

When entering passwords in the following steps, the password is case-sensitive. Passwords may consist of from 1 to 15 alphanumeric characters.

If any errors are made when entering a password, an error message will be displayed in the keyboard screen text box. Select the keyboard **Clear** key and re-enter the correct password.

9. Enter the old password, select the **Enter** key, and observe the **Change Password** screen is displayed. See Figure 5-6 on page 5-6.

Figure 5-6: Change Password Screen



10. Observe the **Enter Password** option button is active, select the **Enter Password** option button, and observe the keyboard screen is displayed.
11. Enter your new password, select the **Enter** key, and observe the **Change Password** screen is displayed.
12. Select the **Re-enter Password** option button, and observe the keyboard screen is displayed.
13. Re-enter your new password, select the **Enter** key, and observe the **Change Password** screen is displayed.
14. Select the **Accept** option button and observe the **Radio** screen is displayed.
15. Select the **Main** option button and observe the Main screen is displayed.

5.4 Create or Update Preset Configuration Settings in Local Mode

CAUTION

Avoid damage to the color LCD display panel when performing the following procedures!

The color LCD display panel touch screen may be damaged if a sharp, hard-pointed object, such as a pencil or a pen, is used to select the displayed options.

Touch screen options must only be selected using your fingers, a soft-pointed stylus, or the front panel function keys.

Damage to the color LCD display panel caused by using a hard-pointed object or other misuse may void your warranty on the MTX5000 IDU.

The procedures required to create or update Preset configuration settings in the Local mode are contained in the following paragraphs. Preset configuration settings may be created or updated for the following types of Presets:

- Analog FMT Presets
- Digital COFDM Presets
- Digital ASI Presets
- Digital LMS-T Presets

- Digital DVB-S Presets
- Digital IP Presets.

Please note that an External IF In Preset is also available for normal operation using the factory default External IF In Preset, but no configuration settings may be made to this Preset. No procedures are therefore applicable or are provided in this chapter for External IF In Presets.

5.4.1 Create or Update Custom Analog Preset Configuration In Local Mode

The procedure required to create a new custom analog Preset configuration or to update an existing Preset configuration is contained in the following steps.

When preparing a new analog Preset, you must first select an existing analog Preset from either one of the analog factory default Presets or from your custom user analog Presets. The selected Preset will be used as a "make-from" to prepare the new analog Preset configuration.

Please note that while factory default analog Presets may be used to prepare a new Preset configuration, these ***factory default Presets cannot be changed or deleted***. They can only be used as "make-froms".

When the new configuration is prepared using the factory default Preset, it cannot be saved with the factory Preset number or Preset name. A new Preset number and Preset name must be assigned to the new Preset.

When using a custom Preset as a "make-from", the new Preset should be saved with a new Preset number. When you save the new Preset, the Preset number will automatically be increased to the next available Preset number.

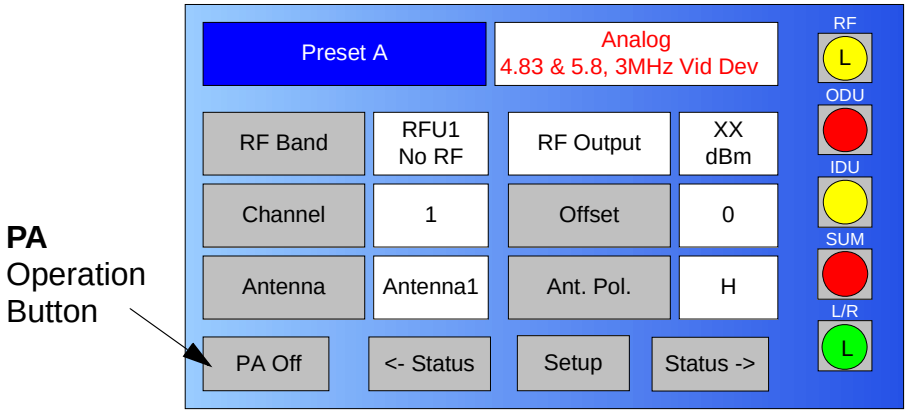
If you select an existing Preset number when saving the new Preset, the original custom Preset will be overwritten and cannot be recovered. The only way to restore a Preset that has been overwritten is to re-enter the custom Preset data from scratch.

If you are updating configuration settings on an existing custom user Preset, when you save the configuration settings, the Preset number will automatically be increased to the next available Preset number. You must enter and save the configuration settings using the original Preset number.

Note	In the following steps, the color LCD display option buttons and pull-down menu options may be selected using either the touch screen or the function keys and the **SEL** key.

1. Verify the MTX5000 IDU is powered up. See "Powering the MTX5000 System" on page 3-7.
2. Observe the Main screen is displayed. See Figure 5-7.

Figure 5-7: Main Screen - Typical



3. Select the **L/R** option button for **L** (local mode), as required.

Notes

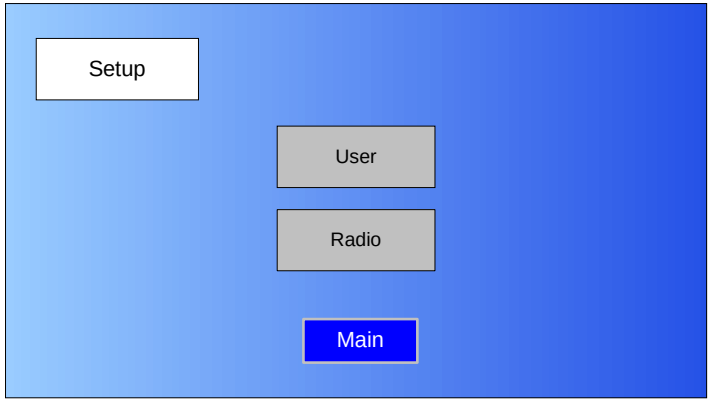
If you are updating an existing analog Preset configuration, select the Preset to be updated in the following step.

If you are creating a new analog Preset configuration, any analog Preset may be selected in the following step.

---

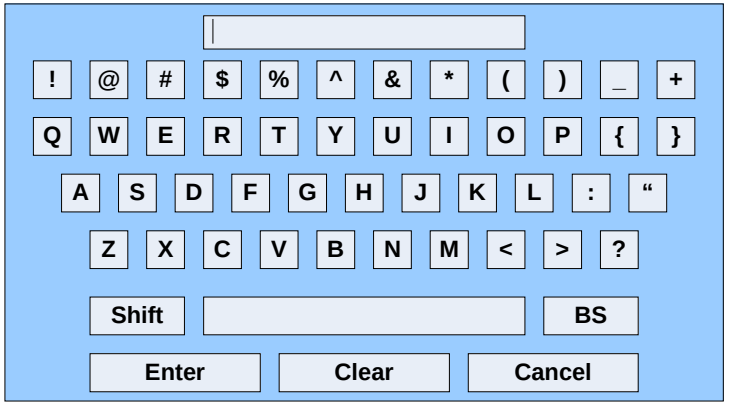
4. Perform “Select Preset” on page 3-24 to select the analog Preset required to be updated or to be used as a “make-from”.
5. Select the Main screen **PA** operation button for **PA Off**, as required.
6. Select the Main screen **Setup** option button and observe the **Setup** screen is displayed. See Figure 5-8.

Figure 5-8: Setup Screen



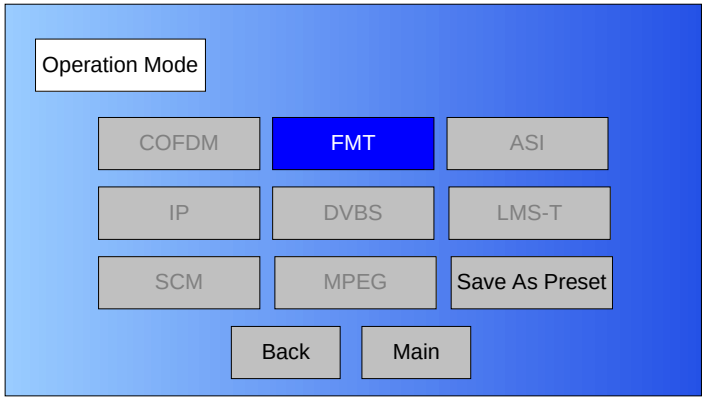
7. Select the **User** option button and observe the keyboard screen is displayed. See Figure 5-9.

Figure 5-9: Keyboard Screen



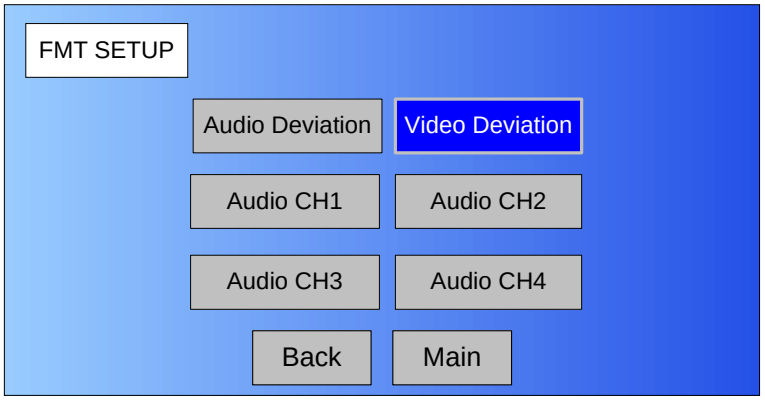
8. Enter your password, select the **Enter** key, and observe the **Operation Mode** screen is displayed. See Figure 5-10.

Figure 5-10: Operation Mode Screen



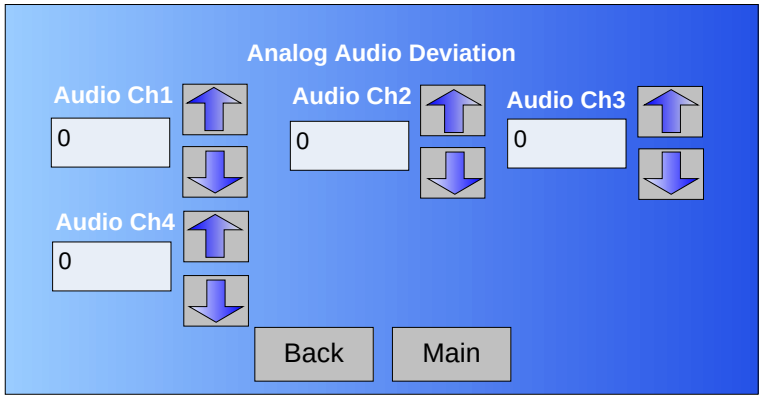
9. Select the **FMT** option button and observe the **FMT SETUP** screen is displayed. See Figure 5-11 on page 5-9.

Figure 5-11: FMT SETUP Screen - Typical



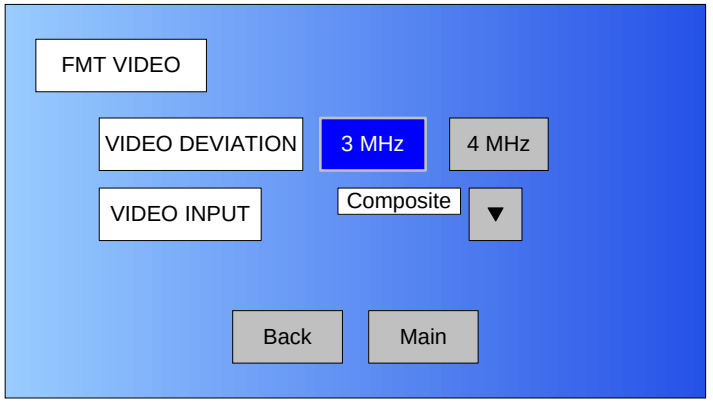
10. Select the **Audio Deviation** option button and observe the **Analog Audio Deviation** screen is displayed. See Figure 5-12.

Figure 5-12: Analog Audio Deviation Screen - Typical



11. Use the up and down arrows, as required, to select the audio deviation for **Audio Ch1** thru **Audio Ch4**. Audio deviation range is **0** thru **31** for each audio channel.
12. Select the **Back** option button and observe the **FMT SETUP** screen is displayed.
13. Select the **Video Deviation** option button and observe the **FMT VIDEO** screen is displayed. See Figure 5-13.

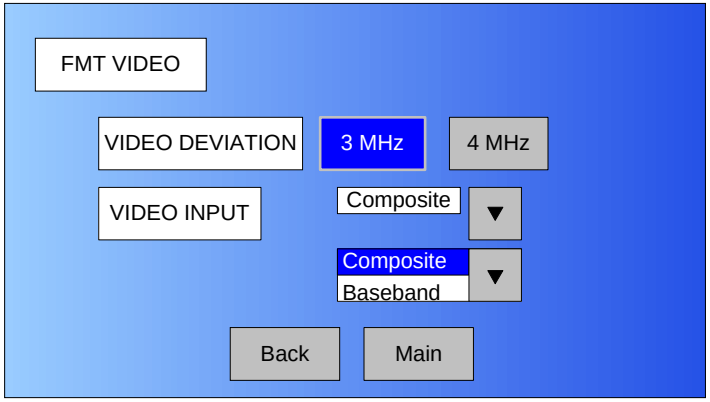
Figure 5-13: FMT VIDEO Screen - Typical



Note In the following step, the **VIDEO DEVIATION - 4 MHz** option button will be active only if the 17 MHz or 25 MHz channel plan is active in your MTX5000 System.

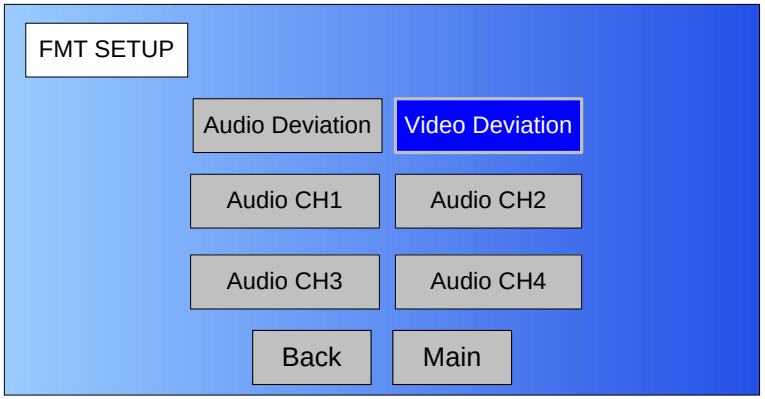
14. Select the **VIDEO DEVIATION - 3 MHz** or **4 MHz** option button, as required, and observe the selected option button becomes active (blue).
15. Select the **VIDEO INPUT** pull-down menu and select the **Composite** or **Baseband** option, as required. See Figure 5-14 on page 5-10.

Figure 5-14: VIDEO INPUT Options - Typical



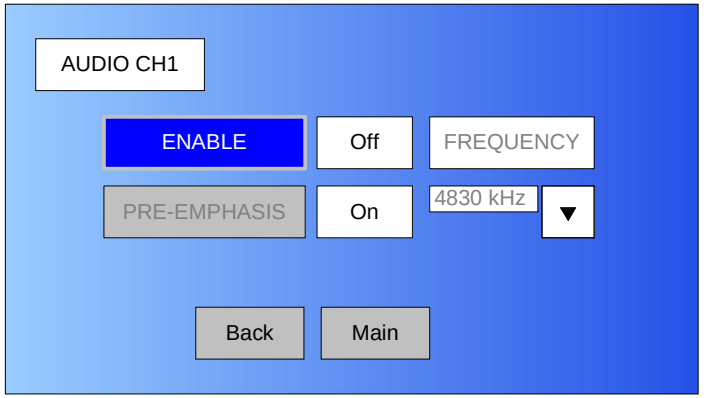
16. Select the **Back** option button and observe the **FMT SETUP** screen is displayed. See Figure 5-15.

Figure 5-15: FMT SETUP Screen



17. Select the **Audio CH1** option button and observe the **AUDIO CH1** screen is displayed. See Figure 5-16.

Figure 5-16: AUDIO CH1 Screen - Typical



Notes

The **ENABLE** setting must be set to **On** to enable the **PRE-EMPHASIS** option button and the audio **FREQUENCY** pull-down menu.

If the **ENABLE - Off** option is required, go to step 18.

To enable **PRE-EMPHASIS** and/or select the audio **FREQUENCY**, go to step 19.

18. Select the **ENABLE** option button to select the **Off** option and observe the **PRE-EMPHASIS** option button and the **FREQUENCY** pull-down menu become inactive (greyed-out). Go to step 25.
19. Select the **ENABLE** option button to select the **On** option and observe the **PRE-EMPHASIS** option button becomes active (not greyed-out).
20. Select the **PRE-EMPHASIS** option button and select **On** or **Off**, as required.

Note

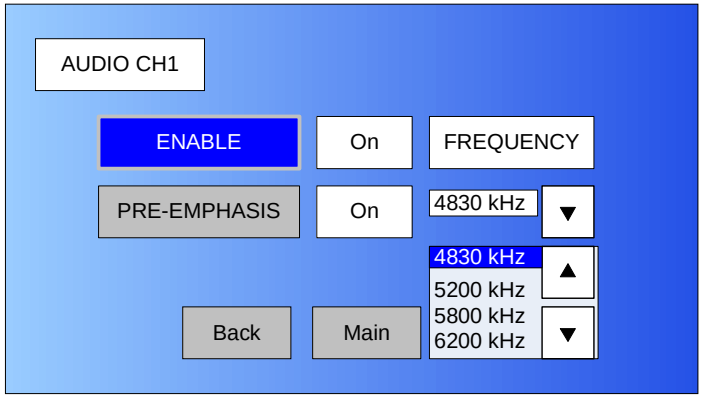
In the following step, the **FREQUENCY** pull-down menu may be used to select fixed audio frequencies or you may select the **Custom** option to create custom audio frequencies.

To select a fixed audio frequency, go to step 21.

To select a custom audio frequency, go to step 22.

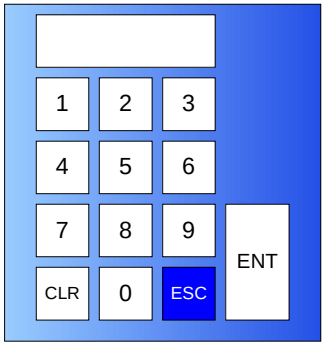
21. Use the **FREQUENCY** pull-down menu (See Figure 5-17) to select the frequency option required and go to step 25.

Figure 5-17: Frequency Pull-Down Menu - Typical



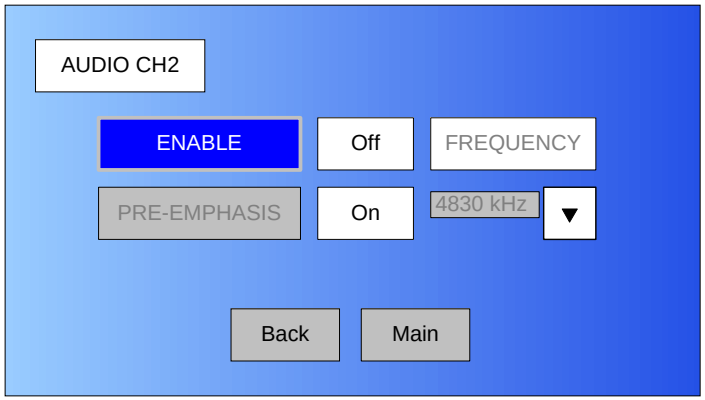
22. Use the **FREQUENCY** pull-down menu to select the **Custom** option and observe the **FREQUENCY** option button becomes active (not greyed-out).
23. Select the **FREQUENCY** option button and observe the numeric keypad is displayed. See Figure 5-18.

Figure 5-18: Numeric Keypad



24. Enter the custom audio frequency required (range is 4830 kHz to 8590 kHz), select the **ENT** key, and observe the **AUDIO CH1** screen is displayed.
25. Select the **Back** option button and observe the **FMT SETUP** screen is displayed.
26. Select the **Audio CH2** option button and observe the **AUDIO CH2** screen is displayed. See Figure 5-19.

Figure 5-19: AUDIO CH2 Screen - Typical



Notes

The **ENABLE** setting must be set to **On** to enable the **PRE-EMPHASIS** option button and the audio **FREQUENCY** pull-down menu.

If the **ENABLE - Off** option is required, go to step 27.

To enable **PRE-EMPHASIS** and/or select the audio **FREQUENCY**, go to step 28.

27. Select the **ENABLE** option button to select the **Off** option and observe the **PRE-EMPHASIS** option button and the **FREQUENCY** pull-down menu become inactive (greyed-out). Go to step 34.
28. Select the **ENABLE** option button and observe the **PRE-EMPHASIS** option button becomes active (not greyed-out).
29. Select the **PRE-EMPHASIS** option button and select **On** or **Off**, as required.

Note

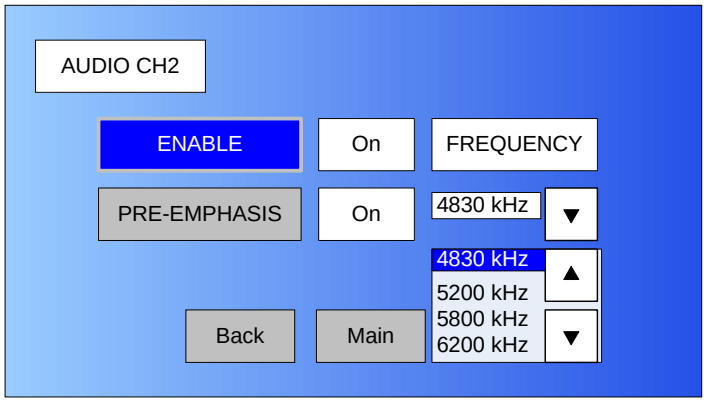
In the following step, the **FREQUENCY** pull-down menu may be used to select fixed audio frequencies or you may select the **Custom** option to create custom audio frequencies.

To select a fixed audio frequency, go to step 30.

To select a custom audio frequency, go to step 31.

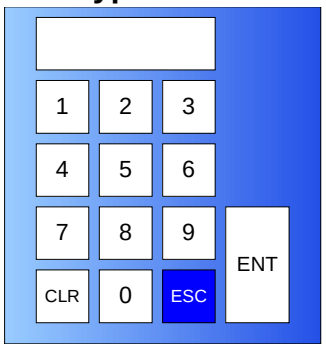
30. Use the **FREQUENCY** pull-down menu (See Figure 5-20) to select the frequency option required and go to step 34.

Figure 5-20: Frequency Pull-Down Menu - Typical



31. Use the **FREQUENCY** pull-down menu to select the **Custom** option and observe the **FREQUENCY** option button becomes active (not greyed-out).
32. Select the **FREQUENCY** option button and observe the numeric keypad is displayed. See Figure 5-21.

Figure 5-21: Numeric Keypad

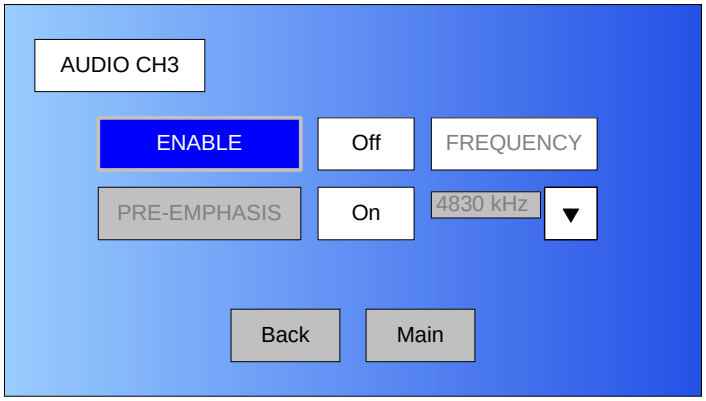


33. Enter the custom audio frequency required (range is 4830 kHz to 8590 kHz), select the **ENT** key, and observe the **AUDIO CH2** screen is displayed.

34. Select the **Back** option button and observe the **FMT SETUP** screen is displayed.

35. Select the **Audio CH3** option button and observe the **AUDIO CH1** screen is displayed. See Figure 5-22.

Figure 5-22: AUDIO CH3 Screen - Typical



Notes

The **ENABLE** setting must be set to **On** to enable the **PRE-EMPHASIS** option button and the audio **FREQUENCY** pull-down menu.

If the **ENABLE - Off** option is required, go to step 36.

To enable **PRE-EMPHASIS** and/or select the audio **FREQUENCY**, go to step 37.

36. Select the **ENABLE** option button to select the **Off** option and observe the **PRE-EMPHASIS** option button and the **FREQUENCY** pull-down menu become inactive (greyed-out). Go to step 43.

37. Select the **ENABLE** option button and observe the **PRE-EMPHASIS** option button becomes active (not greyed-out).

38. Select the **PRE-EMPHASIS** option button and select **On** or **Off**, as required.

Note

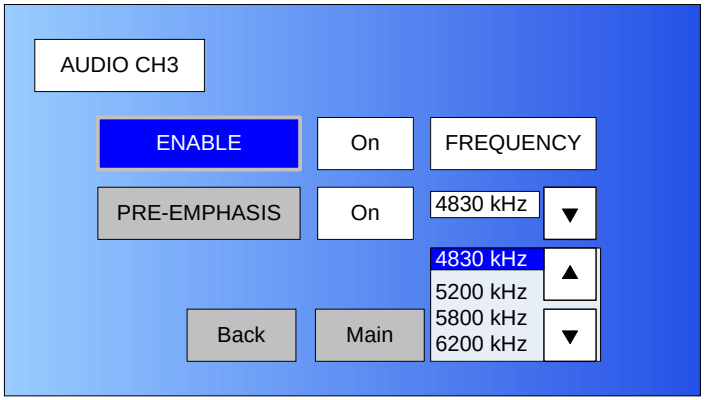
In the following step, the **FREQUENCY** pull-down menu may be used to select fixed audio frequencies or you may select the Custom option to create custom audio frequencies.

To select a fixed audio frequency, go to step 39.

To select a custom audio frequency, go to step 40.

39. Use the **FREQUENCY** pull-down menu (See Figure 5-23) to select the frequency option required and go to step 43.

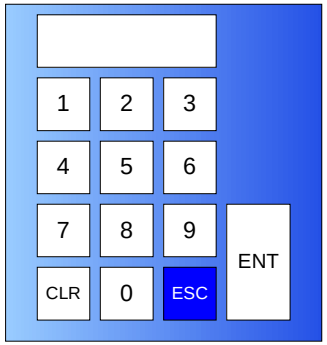
Figure 5-23: Frequency Pull-Down Menu - Typical



40. Use the **FREQUENCY** pull-down menu to select the **Custom** option and observe the **FREQUENCY** option button becomes active (not greyed-out).

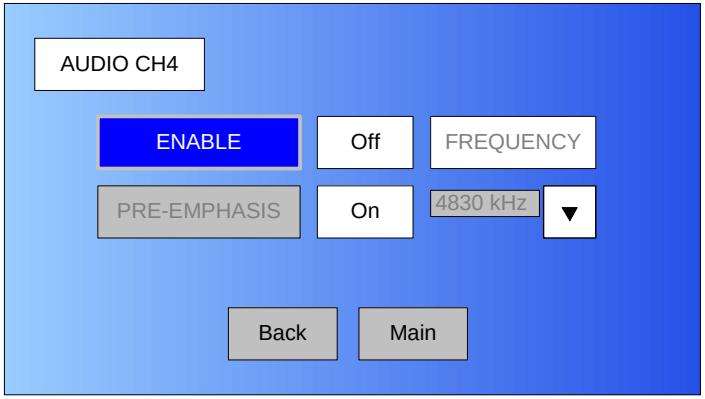
41. Select the **FREQUENCY** option button and observe the numeric keypad is displayed. See Figure 5-24.

Figure 5-24: Numeric Keypad



42. Enter the custom audio frequency required (range is 4830 kHz to 8590 kHz), select the **ENT** key, and observe the **AUDIO CH3** screen is displayed.
43. Select the **Back** option button and observe the **FMT SETUP** screen is displayed.
44. Select the **Audio CH4** option button and observe the **AUDIO CH4** screen is displayed. See Figure 5-25.

Figure 5-25: AUDIO CH4 Screen - Typical



Notes

The **ENABLE** setting must be set to **On** to enable the **PRE-EMPHASIS** option button and the audio **FREQUENCY** pull-down menu.

If the **ENABLE - Off** option is required, go to step 45.

To enable **PRE-EMPHASIS** and/or select the audio **FREQUENCY**, go to step 46.

45. Select the **ENABLE** option button to select the **Off** option and observe the **PRE-EMPHASIS** option button and the **FREQUENCY** pull-down menu become inactive (greyed-out). Go to step 52.
46. Select the **ENABLE** option button and observe the **PRE-EMPHASIS** option button becomes active (not greyed-out).
47. Select the **PRE-EMPHASIS** option button and select **On** or **Off**, as required.

Note

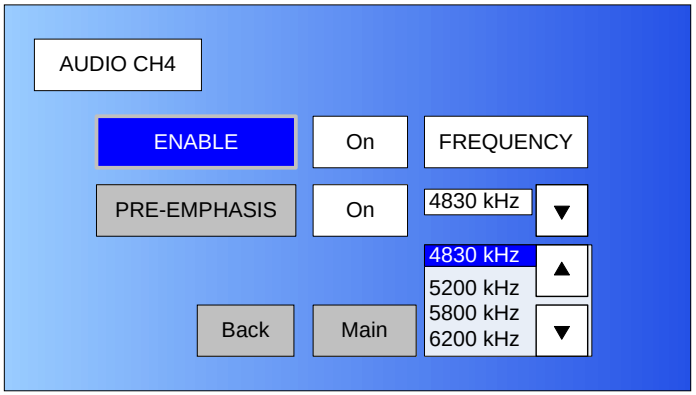
In the following step, the **FREQUENCY** pull-down menu may be used to select fixed audio frequencies or you may select the Custom option to create custom audio frequencies.

To select a fixed audio frequency, go to step 48.

To select a custom audio frequency, go to step 49.

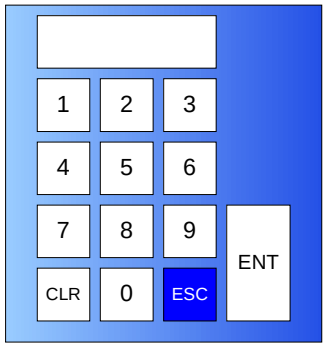
48. Use the **FREQUENCY** pull-down menu (See Figure 5-26 on page 5-15) to select the frequency option required and go to step 53.

Figure 5-26: Frequency Pull-Down Menu - Typical



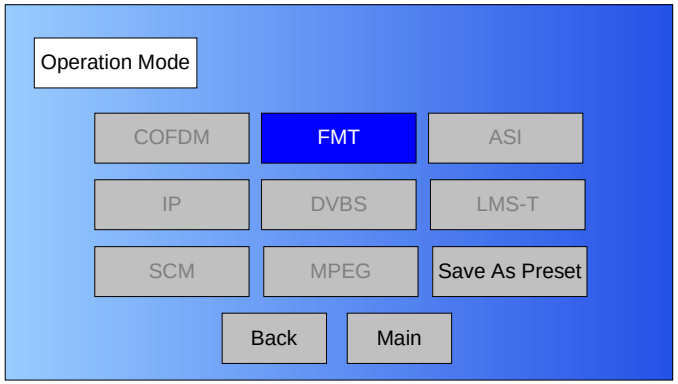
49. Use the **FREQUENCY** pull-down menu to select the **Custom** option and observe the **FREQUENCY** option button becomes active (not greyed-out).
50. Select the **FREQUENCY** option button and observe the numeric keypad is displayed. See Figure 5-27.

Figure 5-27: Numeric Keypad



51. Enter the custom audio frequency required (range is 4830 kHz to 8590 kHz), select the **ENT** key, and observe the **AUDIO CH4** screen is displayed.
52. Select the **Back** option button and observe the **FMT SETUP** screen is displayed.
53. Select the **Back** option button and observe the **Operation Mode** screen is displayed. See Figure 5-28.

Figure 5-28: Operation Mode Screen



Note	When the **Save As Preset** screen is displayed in the following step, the **Preset Text** and **Save** text boxes will display the name and identification of the analog Preset currently being used as the analog "make-from" for this custom Preset.

54. Select the **Save As Preset** option button and observe the **Save As Preset** screen is displayed. See Figure 5-29 on page 5-16.

Figure 5-29: Save As Preset Screen - Typical

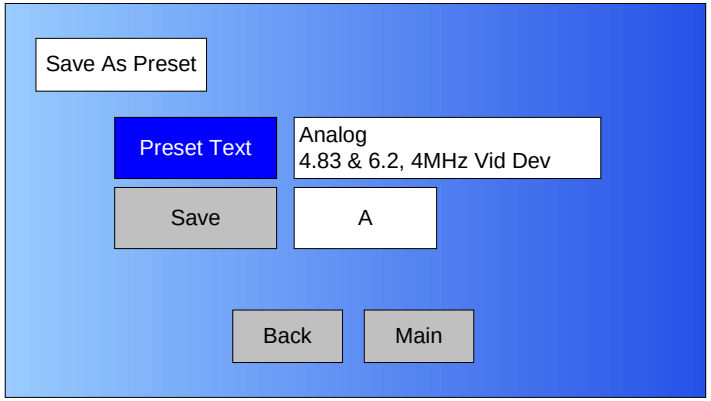
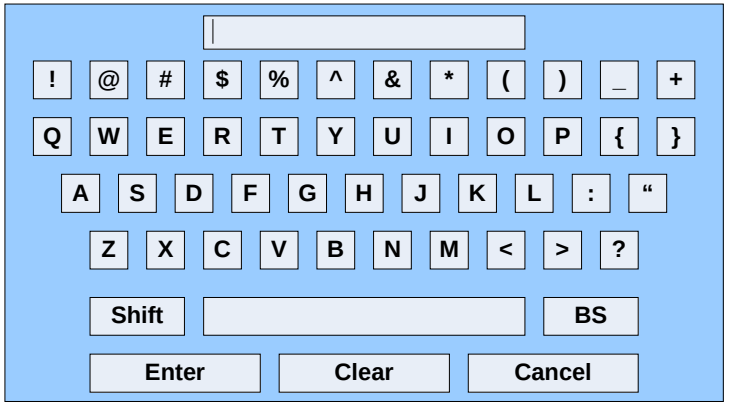


Figure 5-30: Keyboard Screen



Notes

In the following steps, if a factory default analog Preset was used as a "make-from" to prepare this custom Preset, the **Preset Text** text box and the **Save** text box ***must be*** changed. ***You cannot change or overwrite any factory default Presets!***

If a custom analog Preset was used as a "make-from" to prepare this custom Preset, a brief description of the custom Preset should be entered in the **Preset Text** text box for easy identification purposes.

55. Select the **Preset Text** option button and observe the keyboard screen is displayed. See Figure 5-30.

56. Enter a unique analog Preset description, as required, and select the **Enter** key.

57. Observe the **Save As Preset** screen is displayed and the **Preset Text** text box displays the Preset description.

Notes

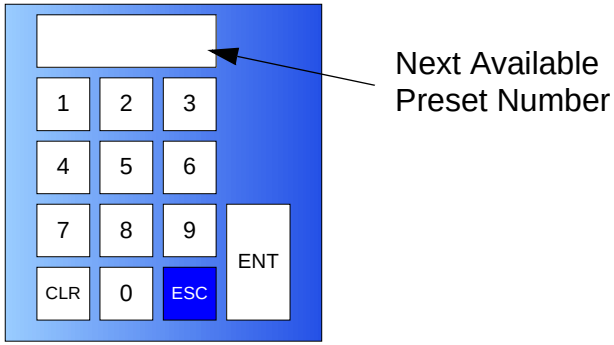
When saving the new custom analog Preset in the following step, the Preset number will automatically be increased to the next available Preset number to avoid overwriting an existing Preset.

If you wish to overwrite the existing Preset number (unless it is a factory default Preset), enter the Preset number to be overwritten. A warning message will be displayed asking "**Are you sure?**". Select the **Yes** option button.

Once an existing custom Preset is overwritten, it cannot be recovered. It must be re-entered from scratch.

58. Select the **Save** option button and observe the numeric keypad is displayed. See Figure 5-31.

Figure 5-31: Numeric Keypad - Typical



Notes

When saving Presets in the following steps, **Preset A** thru **Preset J** are factory default Presets. The factory default Presets cannot be changed.

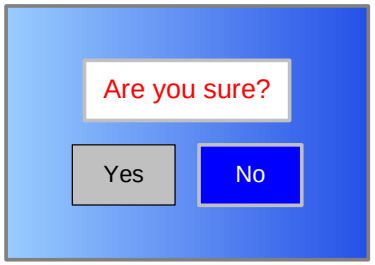
Notes

To change the default Preset number, perform step 59 and go to step 60.

To accept the next available Preset number, go to step 60.

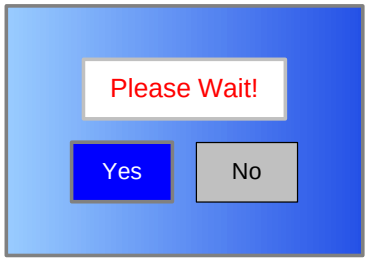
59. Select the **CLR** key and enter the Preset number required.
60. Select the **ENT** key and observe the **Are you sure?** confirmation screen is displayed. See Figure 5-32.

Figure 5-32: Confirmation Screen



61. Select the **YES** option button and observe the **Please Wait!** message box is displayed. See Figure 5-33.

Figure 5-33: Please Wait Message Box



62. After a short delay, observe the **Save As Preset** screen is displayed.
63. Select the **Main** option button and observe the Main screen is displayed.

5.4.2 Create or Update Digital COFDM Preset Configuration Settings in Local Mode

The procedure required to create a new custom digital COFDM Preset configuration or to update an existing digital COFDM Preset configuration is contained in the following steps.

When preparing a new digital COFDM Preset, you must first select an existing digital COFDM Preset from either one of the

digital COFDM factory default Presets or from your own custom digital COFDM Presets. The selected Preset will be used as a "make-from" to prepare the new digital COFDM Preset configuration.

Please note that while factory default COFDM Presets may be used to prepare a new Preset configuration, these ***factory default Presets cannot be changed or deleted***. They can only be used as "make-froms".

When the new configuration is prepared using the factory default Preset, it cannot be saved with the factory Preset number or Preset name. A new Preset number and Preset name must be assigned to the new Preset.

When using a custom Preset as a "make-from", the new Preset should be saved with a new Preset number. When you save the new Preset, the Preset number will automatically be increased to the next available Preset number. If you select an existing Preset number when saving the new Preset, the original custom Preset will be overwritten and cannot be recovered. The only way to restore a Preset that has been overwritten is to re-enter the custom Preset data from scratch.

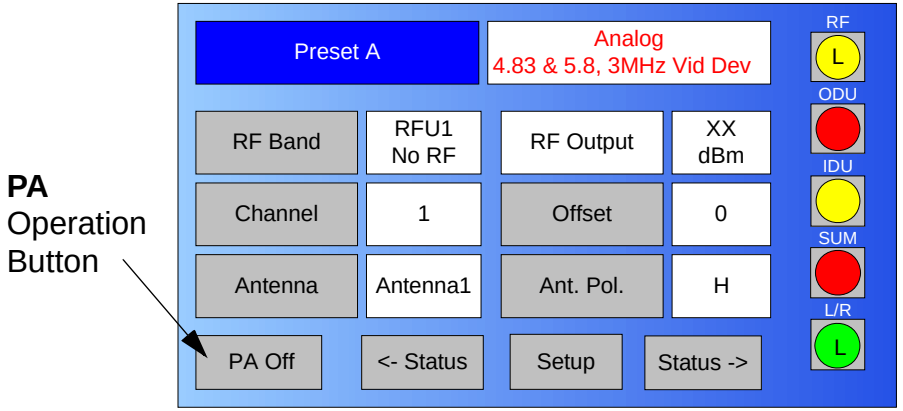
If you are updating configuration settings on an existing custom Preset, when you save the configuration settings, the Preset number will automatically be increased to the next available Preset number. You must enter and save the configuration settings using the original Preset number.

Note In the following steps, the color LCD display option buttons and pull-down menu options may be selected using either the touch screen or the function keys and the **SEL** key.

---

1. Verify the MTX5000 IDU is powered up. See "Powering the MTX5000 System" on page 3-7.
2. Observe the Main screen is displayed. See Figure 5-34.

Figure 5-34: Main Screen - Typical



3. Select the **L/R** option button for **L** (local mode), as required.

Notes If you are updating an existing digital COFDM Preset configuration, select the Preset to be updated in the following step.

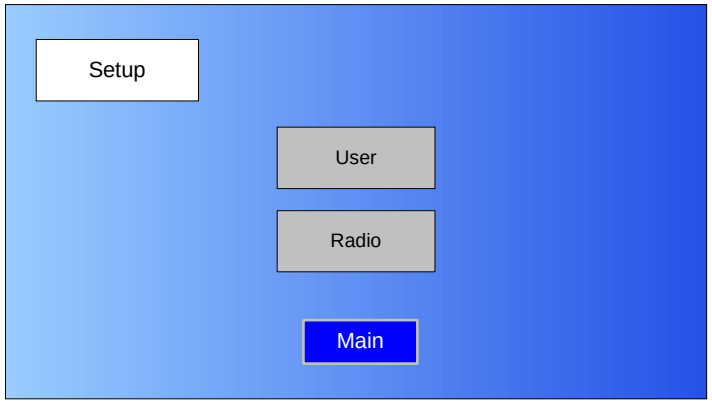
If you are creating a new digital COFDM Preset configuration, any digital COFDM Preset may be selected in the following step.

---

4. Perform "Select Preset" on page 3-24 to select the digital COFDM Preset required to be updated or to be used as a "make-from".
5. Select the Main screen **PA** operation button for **PA Off**, as required.

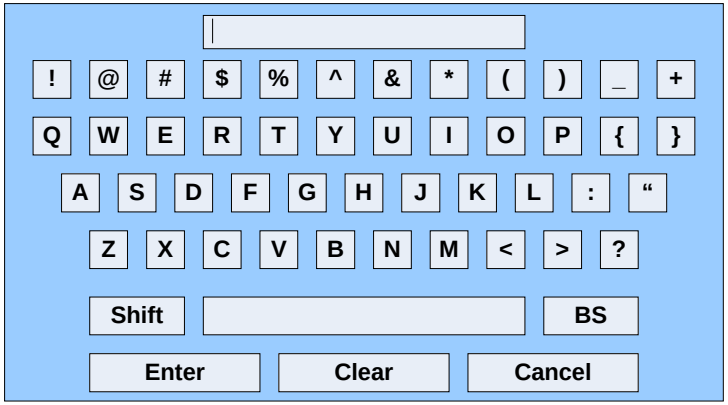
6. Select the Main screen **Setup** option button and observe the **Setup** screen is displayed. See Figure 5-35.

Figure 5-35: Setup Screen



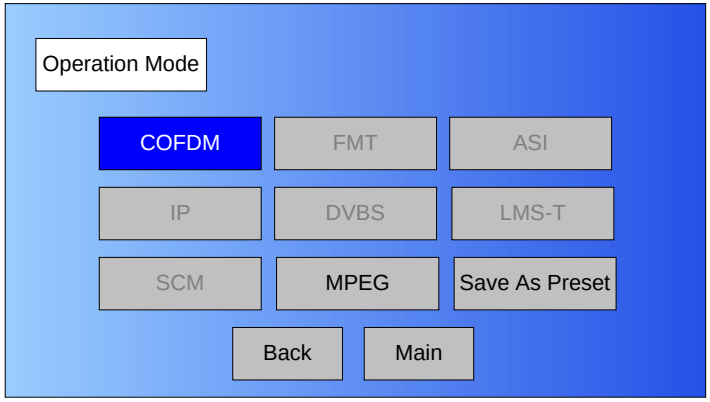
7. Select the **User** option button and observe the keyboard screen is displayed. See Figure 5-36.

Figure 5-36: Keyboard Screen



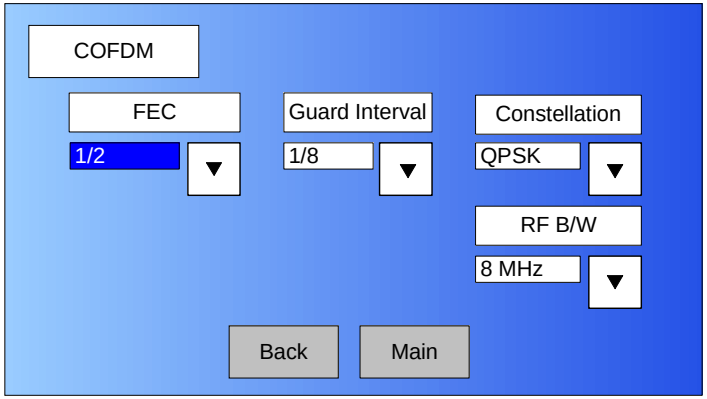
8. Enter your password, select the **Enter** key, and observe the **Operation Mode** screen is displayed. See Figure 5-37.

Figure 5-37: Operation Mode Screen



9. Select the **COFDM** option button and observe the **COFDM** screen is displayed. See Figure 5-38.

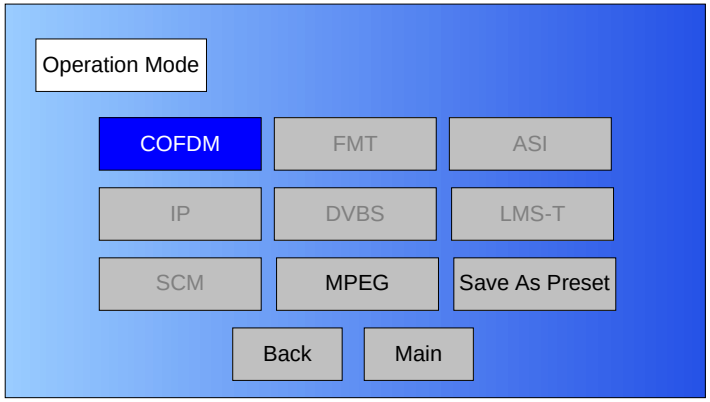
Figure 5-38: COFDM Screen - Typical



10. Use the **FEC** (Forward Error Correction) pull-down menu and select **1/2**, **2/3**, **3/4**, **5/6**, or **7/8**, as required.

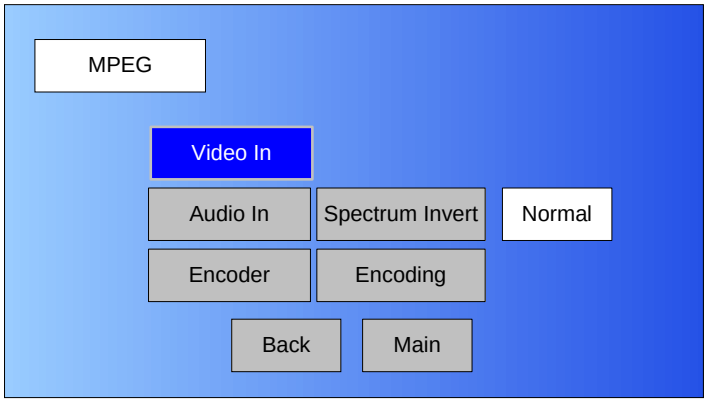
11. Use the **Guard Interval** pull-down menu and select **1/32**, **1/16**, **1/8**, or **1/4**, as required.
12. Use the **Constellation** pull-down menu to select **QPSK**, **16-QAM**, or **64-QAM**, as required.
13. Use the **RF B/W** pull-down menu to select **6 MHZ**, **7 MHZ**, or **8 MHZ**, as required.
14. Select the **Back** option button and observe the **Operation Mode** screen is displayed. See Figure 5-39.

Figure 5-39: Operation Mode Screen



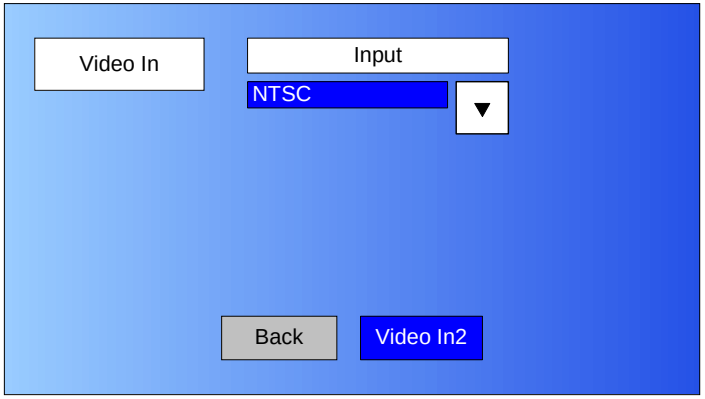
15. Select the **MPEG** option button and observe the **MPEG** screen is displayed. See Figure 5-40.

Figure 5-40: MPEG Screen - Typical



16. Select the **Video In** option button and observe the **Video In** screen is displayed. See Figure 5-41.

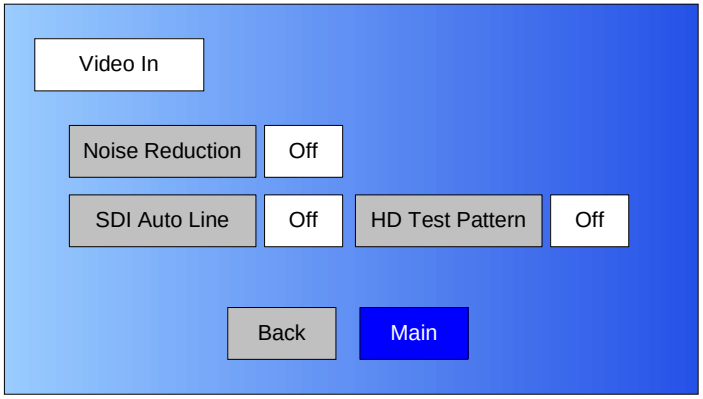
Figure 5-41: Video In Screen - Typical



Note	In the following step, select an **Input** option applicable to the licensed options contained in your MTX5000 IDU only. Selection of an option that is not licensed in your radio will cause the IDU to operate in the NTSC default mode.

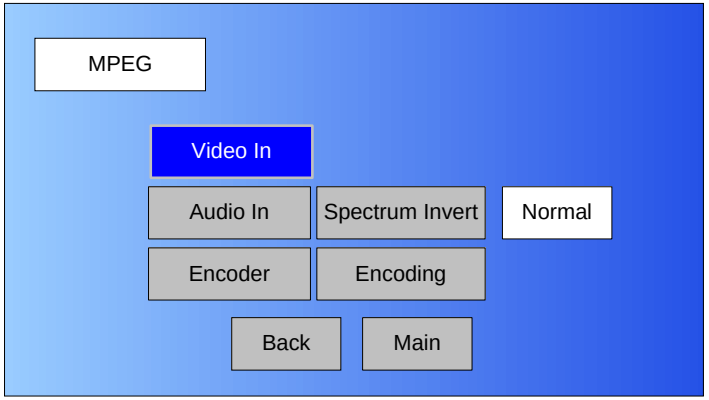
17. Use the **Input** pull-down menu to select the video input option required.
18. Select the **Video In2** option button and observe the **Video In** screen 2 is displayed. See Figure 5-42.

Figure 5-42: Video In Screen 2 - Typical



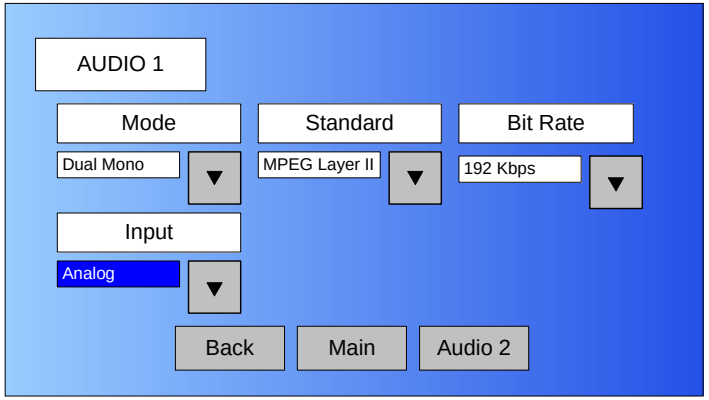
19. Select the **Noise Reduction** option button for **On** or **Off**, as required.
20. Select the **SDI Auto Line** option button for **On** or **Off**, as required.
21. Select the **HD Test Pattern** option button for **On** or **Off**, as required.
22. Select the **Back** option button and observe the **Video In** screen is displayed.
23. Select the **Back** option button and observe the **MPEG** screen is displayed. See Figure 5-43.

Figure 5-43: MPEG Screen - Typical



24. Select the **Audio In** option button and observe the **AUDIO 1** screen is displayed. See Figure 5-44.

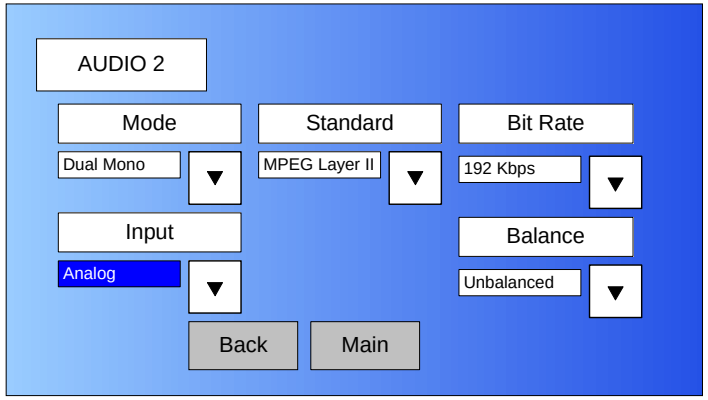
Figure 5-44: AUDIO 1 Screen - Typical



25. Use the **Mode** pull-down menu to select **Stereo** or **Dual Mono**, as required.
26. Use the **Standard** pull-down menu to select **Off**, **MPEG Layer II**, **Linear PCM**, or **MPEG Layer I**, as required.

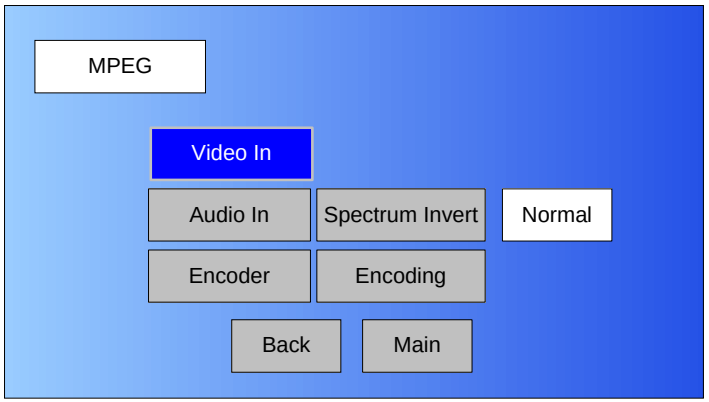
27. Use the **Bit Rate** pull-down menu to select **128 Kbps**, **160 Kbps**, **192 Kbps**, **224 Kbps**, **256 Kbps**, **320 Kbps**, or **384 Kbps**, as required.
28. Use the **Input** pull-down menu to select **Test Tone**, **Analog**, or **SDI Emb**, as required.
29. Select the **Audio 2** option button and observe the **AUDIO 2** screen is displayed. See Figure 5-45.

Figure 5-45: AUDIO 2 Screen - Typical



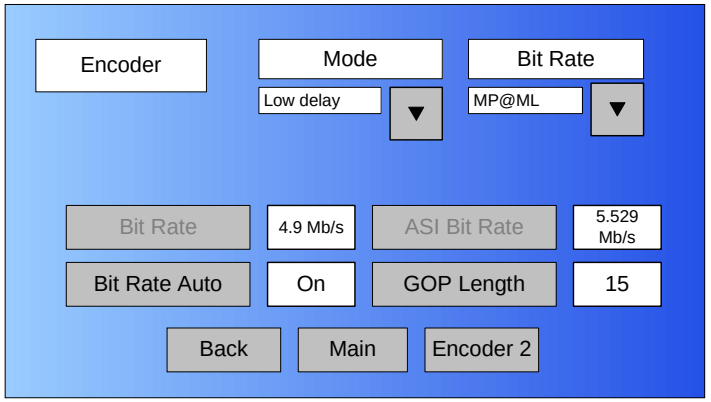
30. Use the **Mode** pull-down menu to select **Stereo** or **Dual Mono**, as required.
31. Use the **Standard** pull-down menu to select **Off**, **MPEG Layer II**, **Linear PCM**, or **MPEG Layer I**, as required.
32. Use the **Bit Rate** pull-down menu to select **128 Kbps**, **160 Kbps**, **192 Kbps**, **224 Kbps**, **256 Kbps**, **320 Kbps**, or **384 Kbps**, as required.
33. Use the **Input** pull-down menu to select **Test Tone**, **Analog**, **SDI Emb**, **AES-EBU**, or **Channel Ide**, as required.
34. Use the **Balance** pull-down menu to select **Unbalanced** or **Balanced**, as required.
35. Select the **Back** option button and observe the **AUDIO 1** screen is displayed.
36. Select the **Back** option button and observe the **MPEG** screen is displayed. See Figure 5-46.

Figure 5-46: MPEG Screen - Typical



37. Select the **Spectrum Invert** option button to select **Normal** or **Inverted**, as required.
38. Select the **Encoder** option button and observe the **Encoder** screen is displayed. See Figure 5-47.

Figure 5-47: Encoder Screen - Typical



39. Select the **Mode** pull-down menu and select **Standard** or **Low delay**, as required.
40. Select the **Bit Rate** pull-down menu and select **MP@ML** or **422P@ML**, as required.

Notes

In the following step, if the **Bit Rate Auto** option button option selected is **On**, the **Bit Rate** option button will be inactive (greyed out). Go to step 44.

If the **Bit Rate Auto** option button option selected is **Off**, the **Bit Rate** option button will be active. Go to step 42.

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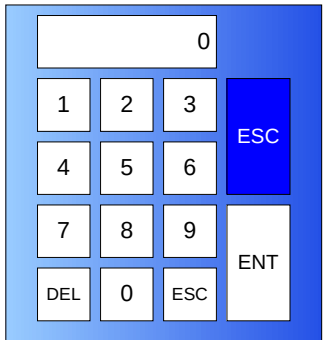
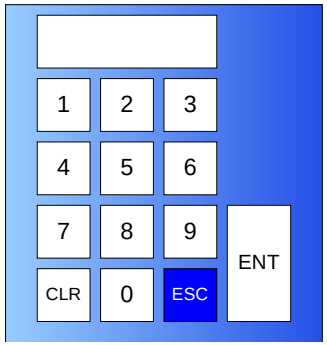
41. Select the **Bit Rate Auto** option button for **Off** or **On**, as required.
42. Observe the **Bit Rate** option button is active. Select the **Bit Rate** option button and observe the numeric keypad is displayed. See Figure 5-48.

Figure 5-48: Numeric Keypad



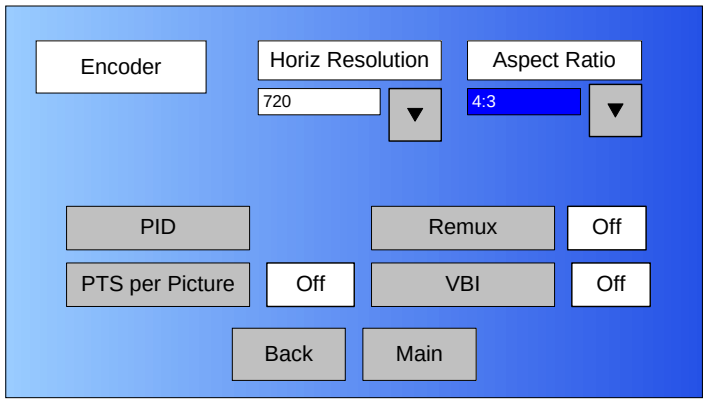
43. Enter the bit rate required, select the **ENT** key, and observe the **Encoder** screen is displayed.
44. Select the **GOP Length** option button and observe the numeric keypad is displayed. See Figure 5-49.

Figure 5-49: Numeric Keypad



45. Enter the Group of Pictures (GOP) number required, select the **ENT** key, and observe the **Encoder** screen is displayed.
46. Select the **Encoder 2** option button and observe the **Encoder** screen 2 is displayed. See Figure 5-50.

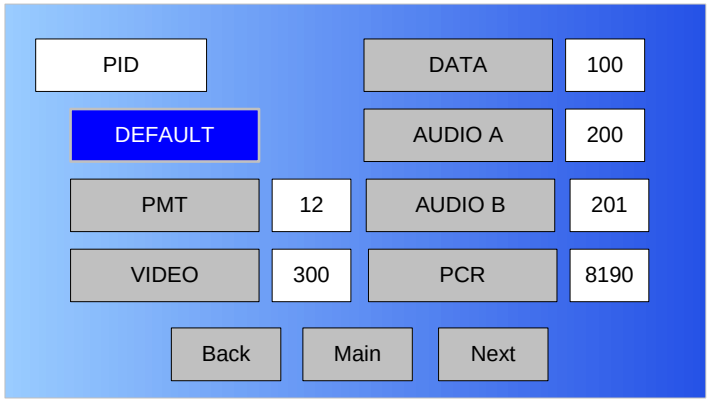
Figure 5-50: Encoder Screen 2 - Typical



47. Select the **Horiz Resolution** pull-down menu and select **720**, **704**, **544**, **528**, **480**, or **352**, as required.
48. Select the **Aspect Ratio** pull-down menu and select **4:3** or **16:9**, as required.

49. Select the **PID** option button and observe the **PID** screen is displayed. See Figure 5-51.

Figure 5-51: PID Screen - Typical



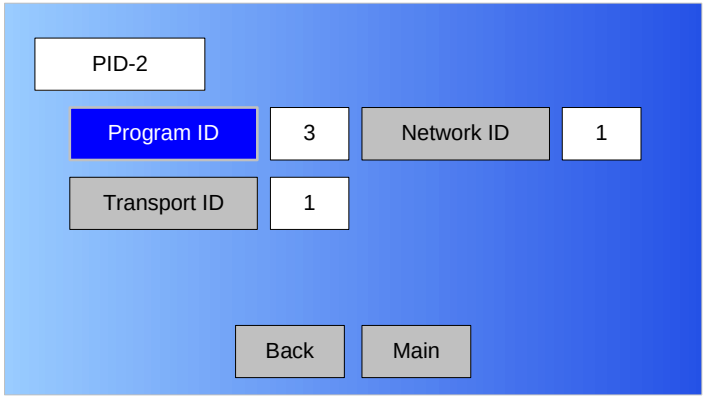
Notes

To select the default PID settings, go to step 50.

To enter individual PID settings, go to step 51.

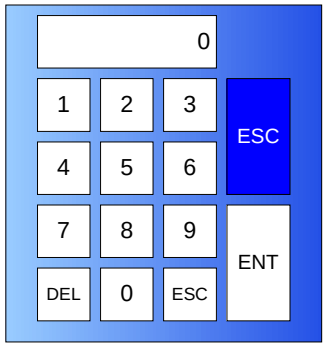
50. Select the **DEFAULT** option button and observe the default PID settings are displayed. Go to step 71.
51. Select the **DATA** option button and observe the numeric keypad is displayed.
52. Enter the **DATA** PID required, select the **ENT** key, and observe the **PID** screen is displayed.
53. Select the **AUDIO A** option button and observe the numeric keypad is displayed.
54. Enter the **AUDIO A** PID required, select the **ENT** key, and observe the **PID** screen is displayed.
55. Select the **PMT** option button and observe the numeric keypad is displayed.
56. Enter the **PMT** PID required, select the **ENT** key, and observe the **PID** screen is displayed.
57. Select the **AUDIO B** option button and observe the numeric keypad is displayed.
58. Enter the **AUDIO B** PID required, select the **ENT** key, and observe the **PID** screen is displayed.
59. Select the **VIDEO** option button and observe the numeric keypad is displayed.
60. Enter the **Video** PID required, select the **ENT** key, and observe the **PID** screen is displayed.
61. Select the **PCR** option button and observe the numeric keypad is displayed.
62. Enter the **PCR** PID required, select the **ENT** key, and observe the **PID** screen is displayed.
63. Select the **Next** option button and observe the **PID-2** screen is displayed. See Figure 5-52.

Figure 5-52: PID-2 Screen - Typical



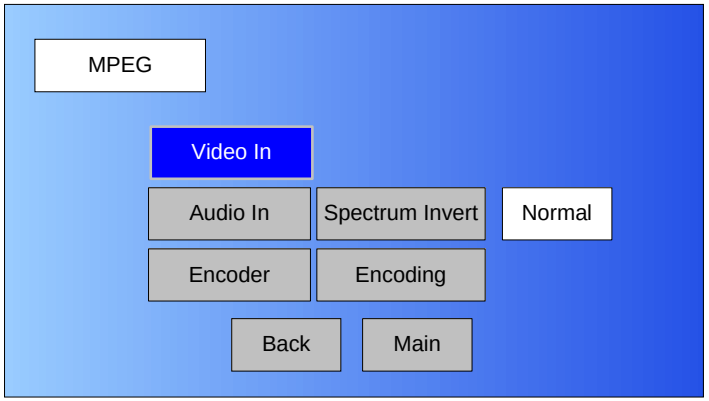
64. Select the **Program ID** option button and observe the numeric keypad is displayed. See Figure 5-53 on page 5-25.

Figure 5-53: Numeric Keypad



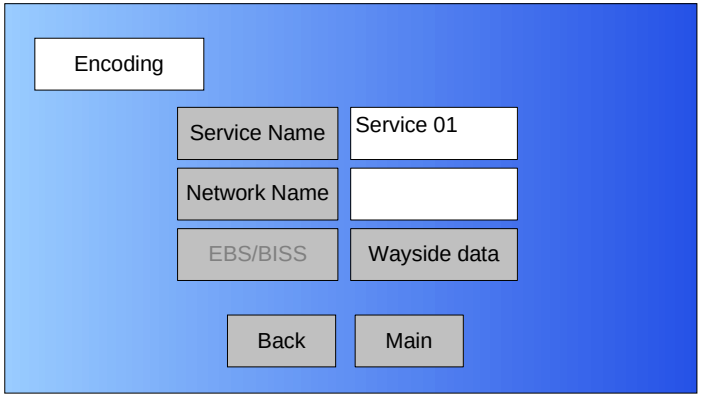
65. Enter the **Program ID** PID required, select the **ENT** key, and observe the **PID-2** screen is displayed.
66. Select the **Network ID** option button and observe the numeric keypad is displayed.
67. Enter the **Network ID** PID required, select the **ENT** key, and observe the **PID-2** screen is displayed.
68. Select the **Transport ID** option button and observe the numeric keypad is displayed.
69. Enter the **Transport ID** PID required, select the **ENT** key, and observe the **PID-2** screen is displayed.
70. Select the **Back** option button and observe the **PID** screen is displayed.
71. Select the **Back** option button and observe the **Encoder** screen is displayed.
72. Select the **Remux** option button for **On** or **Off**, as required.
73. Select the **PTS per Picture** option button for **On** or **Off**, as required.
74. Select the **VBI** option button for **On** or **Off**, as required.
75. Select the **Back** option button and observe the **Encoder** screen is displayed.
76. Select the **Back** option button and observe the **MPEG** screen is displayed. See Figure 5-54.

Figure 5-54: MPEG Screen - Typical



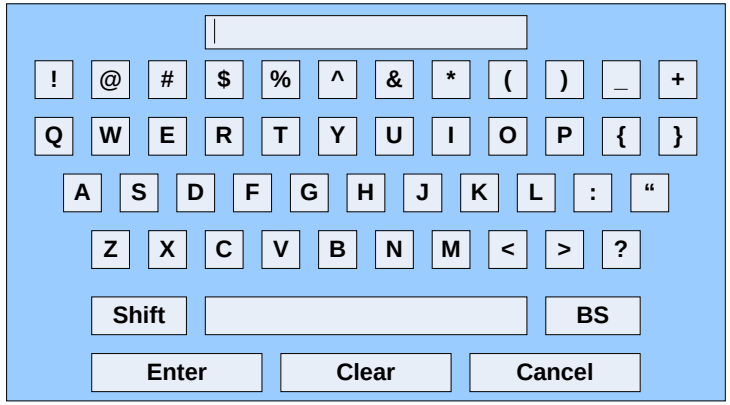
77. Select the **Encoding** option button and observe the **Encoding** screen is displayed. See Figure 5-55.

Figure 5-55: Encoding Screen - Typical



78. Select the **Service Name** option button and observe the keyboard screen is displayed. See Figure 5-56 on page 5-26.

Figure 5-56: Keyboard Screen



79. Enter the service name required, select the **Enter** key, and observe the **Encoding** screen is displayed.
80. Select the **Network Name** option button and observe the keyboard screen is displayed.
81. Enter the network name required, select the **Enter** key, and observe the **Encoding** screen is displayed.

Notes

If your MTX5000 IDU contains a licensed EBS or BISS encryption option, go to step 82.

If your MTX5000 IDU does not contain a licensed EBS or BISS encryption option, go to step 88.

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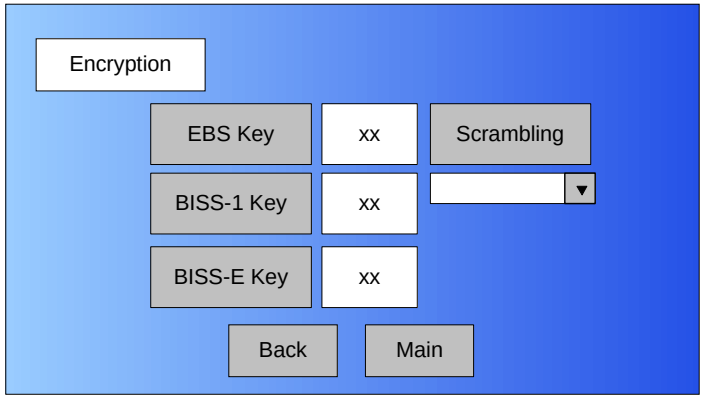
82. Observe the **EBS/BISS** option button is active (not greyed-out).
83. Select the **EBS/BISS** option button and observe the **Encryption** screen is displayed. See Figure 5-57.

Figure 5-57: Encryption Screen



Notes

You can only have one licensed encryption option contained in your MTX5000 IDU.

When the **Scrambling** pull-down menu **EBS**, **BISS-1**, or **BISS-E** option is selected in the following step, the selected option key will be active, but the two remaining option buttons will become inactive (greyed-out).

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84. Select the **Scrambling** pull-down menu **EBS**, **BISS-1**, or **BISS-E** option, as required, and observe the selected **EBS**, **BISS-1**, or **BISS-E Key** option button is active.
85. Select the **EBS**, **BISS-1**, or **BISS-E Key** option button, as required, and observe the alphanumeric keypad is displayed. See Figure 5-58 on page 5-27.