Remote Graphical User Interface (RGUI) For STX LP FM Transmitters

Instruction Manual

RGUI For STX LP Transmitters

Instruction Manual

Broadcast Electronics
Product Warranty (Two-Year Limited)

BE hereby warrants all new products manufactured by BE against any defects in material or workmanship at the time of delivery thereof, or that develop under normal use within a period of two (2) years from the date of shipment.

BE reserves the right to repair equipment under warranty with new or refurbished equipment or parts. BE's sole responsibility with respect to any equipment or parts not conforming to this warranty is to replace or repair such equipment upon the return thereof F.O.B. to BE's factory in Quincy, Illinois, U.S.A. In the event of replacement pursuant to the foregoing warranty, only the unexpired portion of the warranty from the time of the original purchase will remain in effect for any such replacement.

This warranty shall exclude the following products, component parts and/or assemblies:

(a)   Transmitter power output tubes shall only carry the original manufacturers' or suppliers' standard warranty in effect on their original shipment date.

(b)   All computers, computer peripherals, cables, hard disk drives, etc., shall only carry the manufacturers' or suppliers' standard warranty in effect on their original shipment date.

(c)   "Components", defined as separate and individual parts (e.g. transistors, integrated circuits, capacitors, resistors, inductors, fans, etc), resold by BE from another manufacturer or supplier, shall only carry a 90 day warranty, effective the date of shipment. Any such 'Components' being returned for warranty claim must be (1) returned in their original packaging and (2) must be in new, unused condition.
BE is unable to process or resolve component defects or performance concerns on components that have been soldered, installed, wired or in any way altered from new their new condition.

(d)   "Resale Equipment", defined as equipment purchased from another manufacturer or supplier, then resold by BE, shall only carry such manufacturer's or suppliers' standard warranty in effect as of the original shipment date. All warranty claims against any and all 'resale equipment' sold by BE must be filed directly with the original equipment manufacturer. BE is unable to process or resolve equipment defects or performance concerns on products or services not manufactured by BE.

This warranty shall not extend to claims resulting from any acts of God, terrorism, war, defects or failures caused by Purchaser or user abuse or misuse, operator error, or unauthorized attempts to repair or alter the equipment in any way.

Under no circumstances shall BE be responsible for indirect, incidental or consequential damages, including, but not limited to transportation costs, non-authorized repair or service costs, downtime costs, costs for substituting equipment or loss of anticipated profits or revenue, incurred by Purchaser, whether based in contract, tort or for negligence or breach of statutory duty or otherwise.
The terms of the foregoing warranty shall be null and void if the equipment has been altered or repaired without specific written authorization from BE, or if not installed according to BE's instruction manuals, including, but not limited to, the absence of proper grounding, surge (TVSS) protection on the AC circuit panel or proper lightning protection/grounding on all output circuits, or if equipment is operated under environmental conditions or circumstances other than those specifically described in BE's product literature or instruction manual which accompany the equipment. **The warranty shall be voided if the product or subassembly is equipped with a tamper seal and that tamper seal is broken.** BE shall not be liable for any expense of any nature

whatsoever incurred by the original user without prior written consent of BE. The warranty provided herein shall terminate at the end of the period set forth above. **This warranty extends only to the original Purchaser and is not transferable.** There are no third party beneficiaries of any of the provisions of this warranty. If the equipment is described as "used" equipment, it is sold as is and where is and no warranty applies unless authorized in writing. .

EXCEPT AS SET FORTH HEREIN, AS TO TITLE AND AS SPECIFICALLY REQUIRED BY LAW, THERE ARE NO OTHER WARRANTIES, OR ANY AFFIRMATIONS OF FACT OR PROMISES BY BE, WITH REFERENCE TO THE EQUIPMENT, OR TO MERCHANTABILITY, FITNESS FOR A PARTICULAR APPLICATION, SIGNAL COVERAGE, INFRINGEMENT, OR OTHERWISE, WHICH EXTEND BEYOND THE DESCRIPTION OF THE EQUIPMENT ON THE FACE HEREOF.

IMPORTANT INFORMATION

EQUIPMENT LOST OR DAMAGED IN TRANSIT -

When delivering the equipment to you, the truck driver or carriers' agent will present a receipt for your signature. Do not sign it until you have:

1) Inspected the containers for visible signs of damage and 2) Counted the containers and compared with the amount shown on the shipping papers. If a shortage or evidence of damage is noted, insist that notation to that effect be made on the shipping papers before you sign them.

Further, after receiving the equipment, unpack it and inspect thoroughly for concealed damage. If concealed damage is discovered, immediately notify the carrier, confirming the notification in writing, and secure an inspection report. This item should be unpacked and inspected for damage WITHIN 15 DAYS after receipt. Claims for loss or damage will not be honored without proper notification of inspection by the carrier.

RF PRODUCT TECHNICAL ASSISTANCE, REPAIR SERVICE, PARTS -

Technical assistance is available from Broadcast Electronics by letter, prepaid telephone or E-mail. Equipment requiring repair or overhaul should be sent by common carrier, prepaid, insured, and well protected. If proper shipping materials are not available, contact the RF Technical Services Department for a shipping container. Do not mail the equipment. We can assume no liability for inbound damage, and necessary repairs become the obligation of the shipper. Prior arrangement is necessary. Contact the RF Technical Services Department for a Return Authorization.

Emergency and warranty replacement parts may be ordered from the following address. Be sure to include the equipment model number, serial number, part description, and part number. Non-emergency replacement parts may be ordered directly from the Broadcast Electronics stock room at the number shown below.

RF TECHNICAL SERVICES -

Telephone: +1 (217) 224-9617
E-Mail: rfservice@bdcast.com
Fax: +1 (217) 224-6258

FACILITY CONTACTS -

Broadcast Electronics, - Quincy Facility
4100 N. 24th St. P.O. BOX 3606
Quincy, Illinois 62305
Telephone: +1 (217) 224-9600
Fax: +1 (217) 224-6258
General E-Mail: bdcast@bdcast.com
Web Site: www.bdcast.com

PARTS -

Telephone: +1 (217) 224-9617
E-Mail: parts@bdcast.com

RETURN, REPAIR, AND EXCHANGES -

Do not return any merchandise without our written approval and Return Authorization. We will provide special shipping instructions and a code number that will assure proper handling and prompt issuance of credit. Please furnish complete details as to circumstances and reasons when requesting return of merchandise. All returned merchandise must be sent freight prepaid and properly insured by the customer.

MODIFICATIONS -

Broadcast Electronics, reserves the right to modify the design and specifications of the equipment in this manual without notice. Any modifications shall not adversely affect performance of the equipment so modified.

SAFETY PRECAUTIONS

PLEASE READ AND OBSERVE ALL SAFETY PRECAUTIONS//

ALL PERSONS WHO WORK WITH OR ARE EXPOSED TO POWER TUBES, POWER TRANSISTORS, OR EQUIPMENT WHICH UTILIZES SUCH DEVICES MUST TAKE PRECAUTIONS TO PROTECT THEMSELVES AGAINST POSSIBLE SERIOUS BODILY INJURY. EXERCISE EXTREME CARE AROUND SUCH PRODUCTS. UNINFORMED OR CARELESS OPERATION OF THESE DEVICES CAN RESULT IN POOR PERFORMANCE, DAMAGE TO THE DEVICE OR PROPERTY, SERIOUS BODILY INJURY, AND POSSIBLY DEATH.

DANGEROUS HAZARDS EXIST IN THE OPERATION OF POWER TUBES AND POWER TRANSISTORS -

The operation of power tubes and power transistors involves one or more of the following hazards, any one of which, in the absence of safe operating practices and precautions, could result in serious harm to personnel.

A. **HIGH VOLTAGE -** Normal operating voltages can be deadly. Additional information follows.

B. **RF RADIATION -** Exposure to RF radiation may cause serious bodily injury possibly resulting in Blindness or death. Cardiac pacemakers may be affected. Additional information follows.

C. **HOT SURFACES** Surfaces of air-cooled radiators and other parts of tubes can reach temperatures of several hundred degrees centigrade and cause serious burns if touched. Additional information follows.

D. **RF BURNS** Circuit boards with RF power transistors contain high RF potentials. Do not operate an RF power module with the cover removed.

HIGH VOLTAGE –

Many power circuits operate at voltages high enough to kill through electrocution. Personnel should always break the primary AC Power when accessing the inside of the transmitter.

RADIO FREQUENCY RADIATION

Exposure of personnel to RF radiation should be minimized, personnel should not be permitted in the vicinity of open energized RF generating circuits, or RF transmission systems (waveguides, cables, connectors, etc.), or energized antennas. It is generally accepted that exposure to "high levels" of radiation can result in severe bodily injury including blindness. Cardiac pacemakers may be affected.

The effect of prolonged exposure to "low level" RF radiation continues to be a subject of investigation and controversy. It is generally agreed that prolonged exposure of personnel to RF radiation should be limited to an absolute minimum. It is also generally agreed that exposure should be reduced in working areas where personnel heat load is above normal. A 10 mW/cm^2 per one tenth hour average level has been adopted by several U.S. Government agencies including the Occupational Safety and Health Administration (OSHA) as the standard protection guide for employee work environments. An even stricter standard is recommended by the American National Standards Institute which recommends a 1.0 mW/cm^2 per one tenth hour average level exposure between 30 Hz and 300 MHz as the standard employee protection guide (ANSI C95.1-1982).

RF energy must be contained properly by shielding and transmission lines. All input and output RF connections, such as cables, flanges and gaskets must be RF leak proof. Never operate a power tube without a properly matched RF energy absorbing load attached. Never look into or expose any part of the body to an antenna or open RF generating tube or circuit or RF transmission system while energized. Monitor the tube and RF system for RF radiation leakage at regular intervals and after servicing.

HOT SURFACES –

The power components in the transmitter are cooled by forced-air and natural convection. When handling any components of the transmitter after it has been in operation, caution must always be taken to ensure that the component is cool enough to handle without injury.

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1. Overview

The Remote Graphical User Interface (RGUI)) option for the **STXLP** FM transmitter series is designed to provide control and monitoring services for up to 8 STXLP transmitters (refer to **Figure 1**). The option consists of a Windows application which communicates with each transmitter via I.P. Each transmitter can support three simultaneous users. A user is divided into 3 login types: 1) view only, 2) operator, and 3 chief.

View only login allows the user to only look at the transmitter data. The operator login allows the user to view data and control some transmitter parameters such as output power. The chief login allows the user to view and control all transmitter parameters.

The RGUI application is a multi-screen intuitive interface presenting all transmitter and PA operating and control parameters. Typical monitoring parameters include: 1) forward power, 2) reflected power, 3) frequency, 4) faults, and 5) PA voltages. Typical control functions include: 1) output power, 2) frequency, and 3) audio input.

Additional features include event logging and fault analysis systems. The event log monitors and logs events such as transmitter on and faults. The log is presented on screen to allow the user to determine a sequence of events. In the event of a fault, the fault analysis system presents the highest priority fault with suggested solutions.

Installation of the system consists of assigning passwords, connecting the transmitter to the network/internet, and installing the RGUI program.
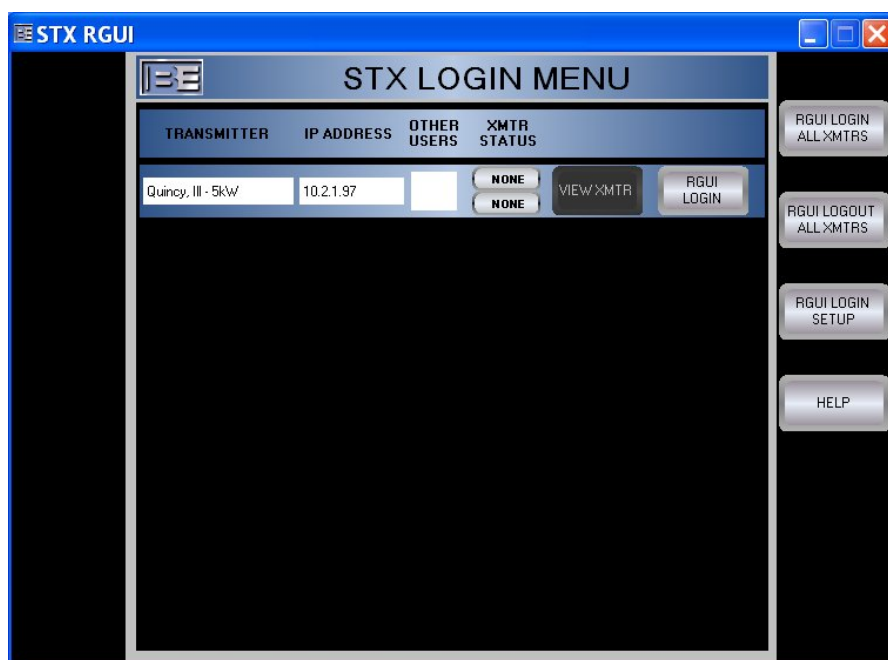

Figure 1: RGUI Option For STXLP Transmitters

2. PC Requirements

The RGUI option requires a Windows computer. The following text presents the computer requirements

- Windows XP – Capable of running .NET 2.0 software.
- Windows Explorer Version 6 or 7
- High speed I.P. connection.

3. Setup – At The Transmitter

⚠ **NOTE: TO ENSURE OPERATIONAL INTEGRITY OF THE STX LP TRANSMITTER WHILE USING IP CONTROL, IT IS STRONGLY RECOMMENDED THAT THE UNIT BE INSTALLED ON A PRIVATE NETWORK, BEHIND A FIREWALL, WITH SECURED VIRTUAL PRIVATE NETWORK (VPN) ACCESS.**

Transmitter setup includes assigning passwords and connecting the transmitter to the network/internet. It is strongly recommended the control system be implemented using a VPN and behind a firewall.

3.1. Transmitter I.P. Connections

The transmitter must be connected to the desired network or internet. **Figure 2** presents typical network connections. Refer to the **Installation** section in the STXLP instruction manual and perform the procedures in **Ethernet Connections**.

3.2. Transmitter I.P. Setup

The transmitter must be assigned the desired I.P. address, subnet mask, and gateway. Refer to **Operation and Setup** in the STXLP instruction manual and perform the procedures in **Ethernet Setup**.

### 3.3. RGUI/Operator/Chief Password Setup

The RGUI, Operator, and Chief passwords must be assigned at the transmitter. The RGUI password is the password that allows a connection and view of the transmitter data (view login). These passwords also limit/allow access to data using the standard web interface. Refer to **Operation and Setup** in the STXLP instruction manual and perform the procedures in **Optional RGUI System – Password Set**.

4. Check The I.P. Connection

Once the transmitter has been setup and connected to the network/internet, the connection must be checked. The connection can be checked using a browser such Internet Explorer or using the PING command from a Command prompt as in **Figure 5**. To check the connection using a web browser, proceed as follows:

1. If the PC is directly connected to the transmitter, ensure the PC is configured for the transmitter IP family. This is not required if the transmitter is connected to a network or the Internet.
2. On the PC, start Internet Explorer.
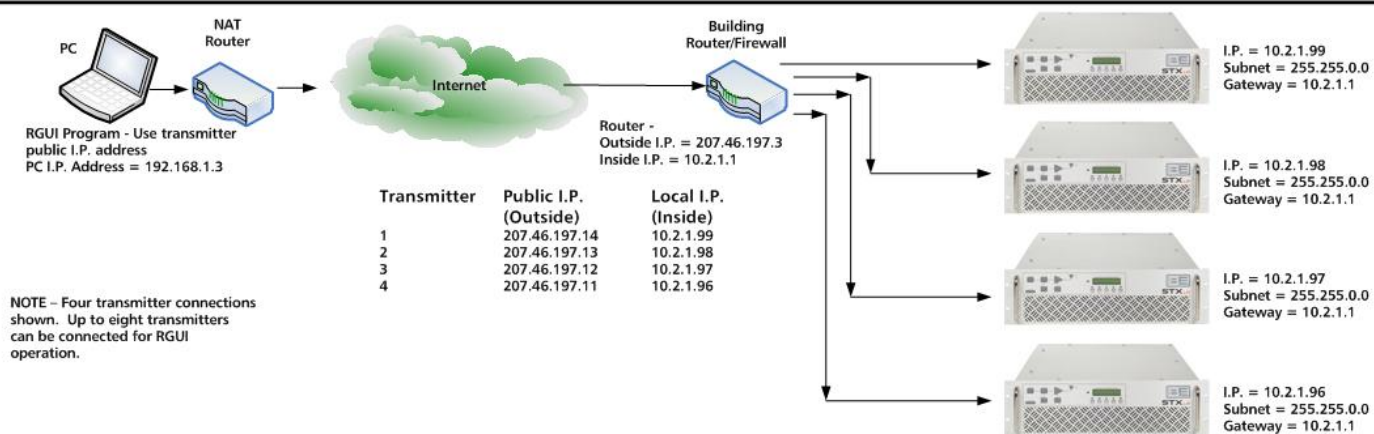3. Enter the transmitter IP address as shown.
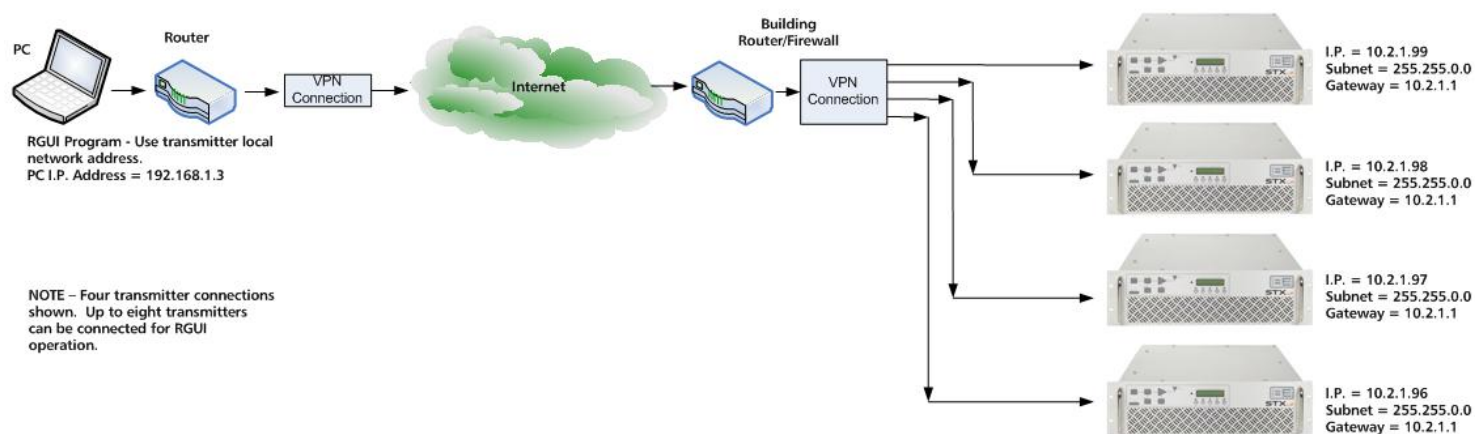
STX Transmitter Networking - With VPN
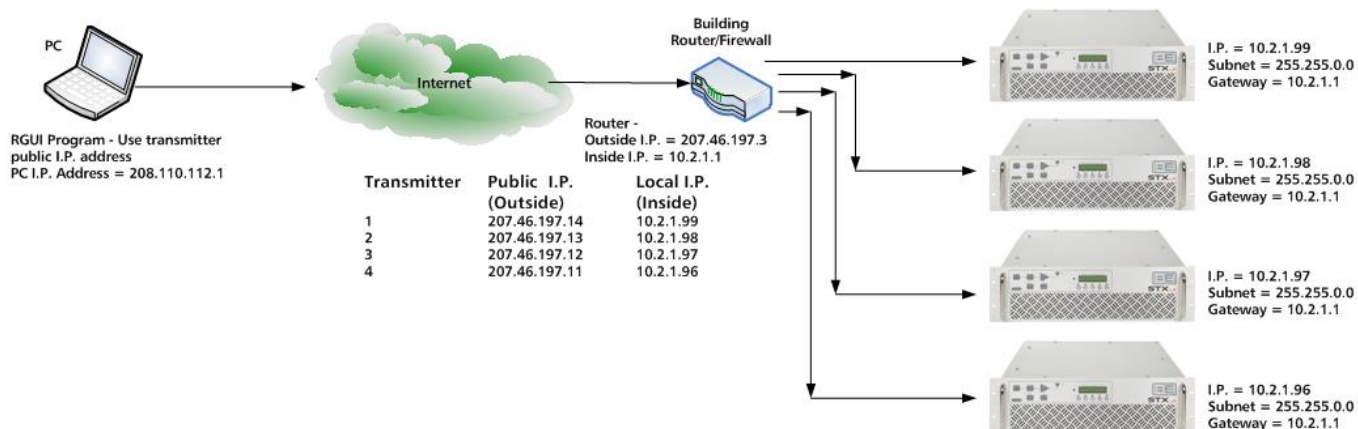
STX Transmitter Networking - Without VPN And No Client NAT Router

STX Transmitter Networking - Without VPN And Client NAT Router

Figure 2: STXLP Network Configurations

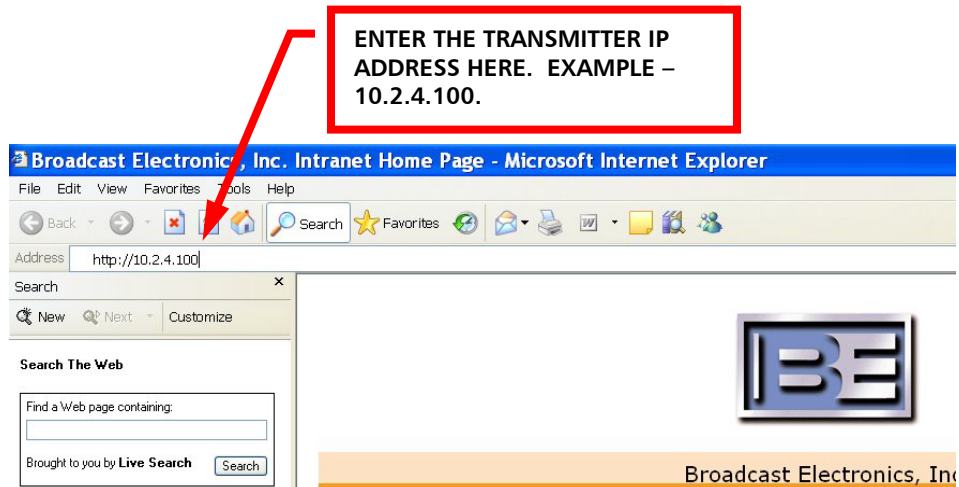**ENTER THE TRANSMITTER IP ADDRESS HERE. EXAMPLE – 10.2.4.100.**

Figure 3: Transmitter IP

4. Depress Enter.
   The standard STXLP web page will appear.

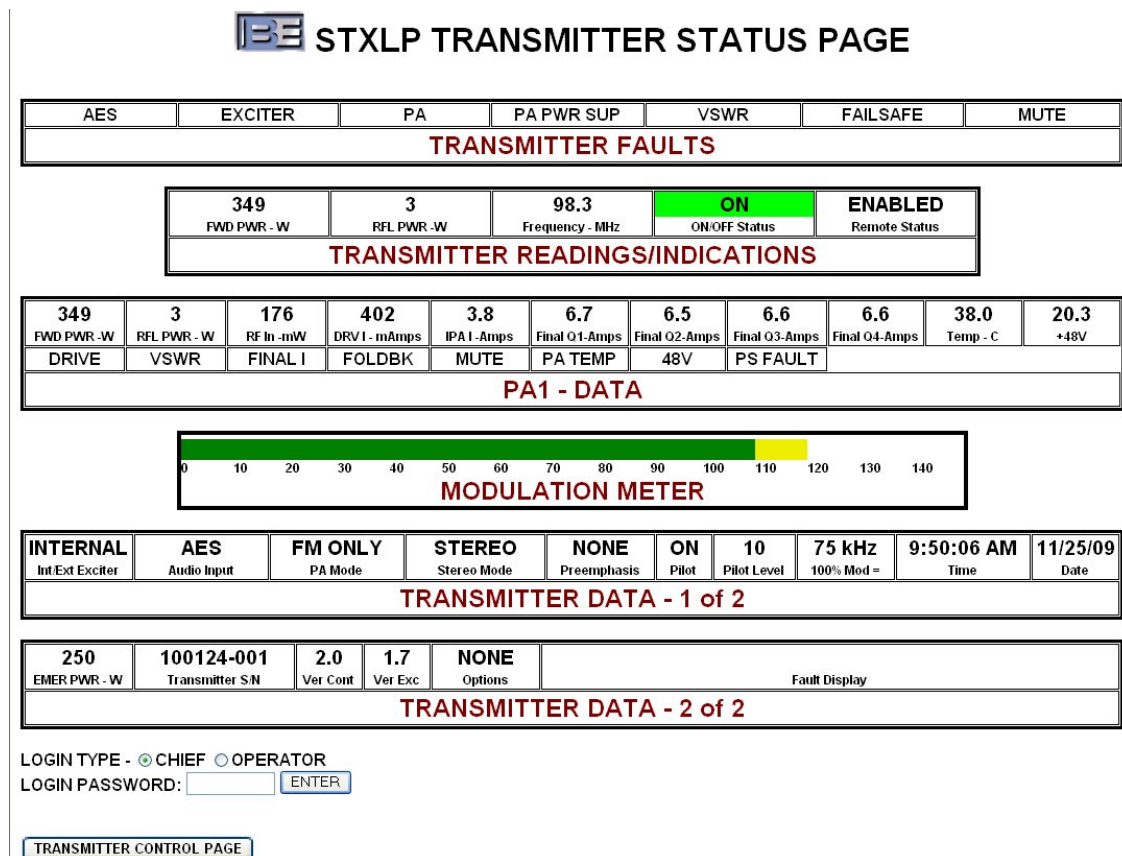**Figure 4: Status Page**

5. If the standard web page does not appear, use the Ping command to check and troubleshoot the connection.

Figure 5: Command Prompt

5. Installation For STX Transmitters With Ver 1.9 Or Earlier

For customers with transmitter version 1.9 or earlier, a few additional steps will be required prior to enabling the RGUI system. First, new STX transmitter software must be installed. Once the new software is installed, a controller board ID number must be recorded and returned to the factory. Once this number is sent to the factory, an RGUI key will be returned for installation. To perform an RGUI installation for transmitter ver 1.9 or earlier, proceed as follows:

1. Refer to the STX transmitter manual and perform the **Software Update - Controller/Exciter** procedure to install ver 2.0 or later software.
2. On the STX transmitter, record the controller board serial number. The number is located in: DIAGNOSTICS→VERSIONS/JUMPERS→CONT BD S/N.
3. Send the serial number to the Broadcast Electronics customer service or sales group.
4. Broadcast electronics will return an RGUI key for installation. This key is a text file to be installed using the web interface.
5. Perform the following **Install the RGUI Key In The Transmitter (Field Install Only)** procedure in the following text to install the key.

6. Install The RGUI Key In The Transmitter (Field Install Only)

If the RGUI system was not installed at the factory, an RGUI key must be installed in each transmitter to be used with the RGUI system. The key is a file containing a series of characters that allow the RGUI system to be enabled. One key is provided for each transmitter and is installed using the STXLP web interface. A key is generated for a specific transmitter and only operates with that specific transmitter. Each key is identified by a file name which contains the transmitter controller board ID number. To install the key: 1) determine the transmitter controller board id number, 2) locate the key file, and 3) install the key for that transmitter. If the system was installed at the factory, key installation will not be required. To install an RGUI software key, proceed as follows:

1. Select the transmitter for RGUI key installation.
2. Locate the RGUI key for the transmitter. The key is identified by the file name which contains the transmitter controller board ID number. For example, key 000000198492.txt is for a transmitter with a controller board ID number 000000198492. The controller board ID number is located in menu DIAGNOSTICS→VERSIONS/JUMPERS→CONT BD S/N.
3. The key is installed using STXLP web interface. To use the web interface, proceed as follows:

a) On a PC with connectivity to the transmitter network, start Internet Explorer.
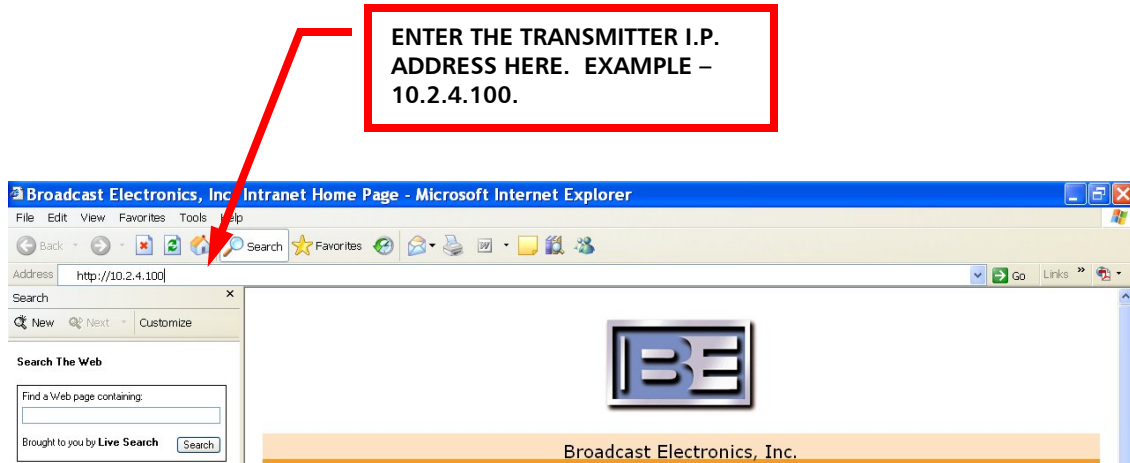b) Enter the I.P. address as shown.

ENTER THE TRANSMITTER I.P. ADDRESS HERE. EXAMPLE – 10.2.4.100.

Figure 6: Transmitter IP

c) Depress Enter.
The standard web status interface page will appear.

Figure 7: Status Page

DISPLAYS NONE WHEN NO KEY IS INSTALLED OR RGUI WHEN THE KEY IS INSTALLED.
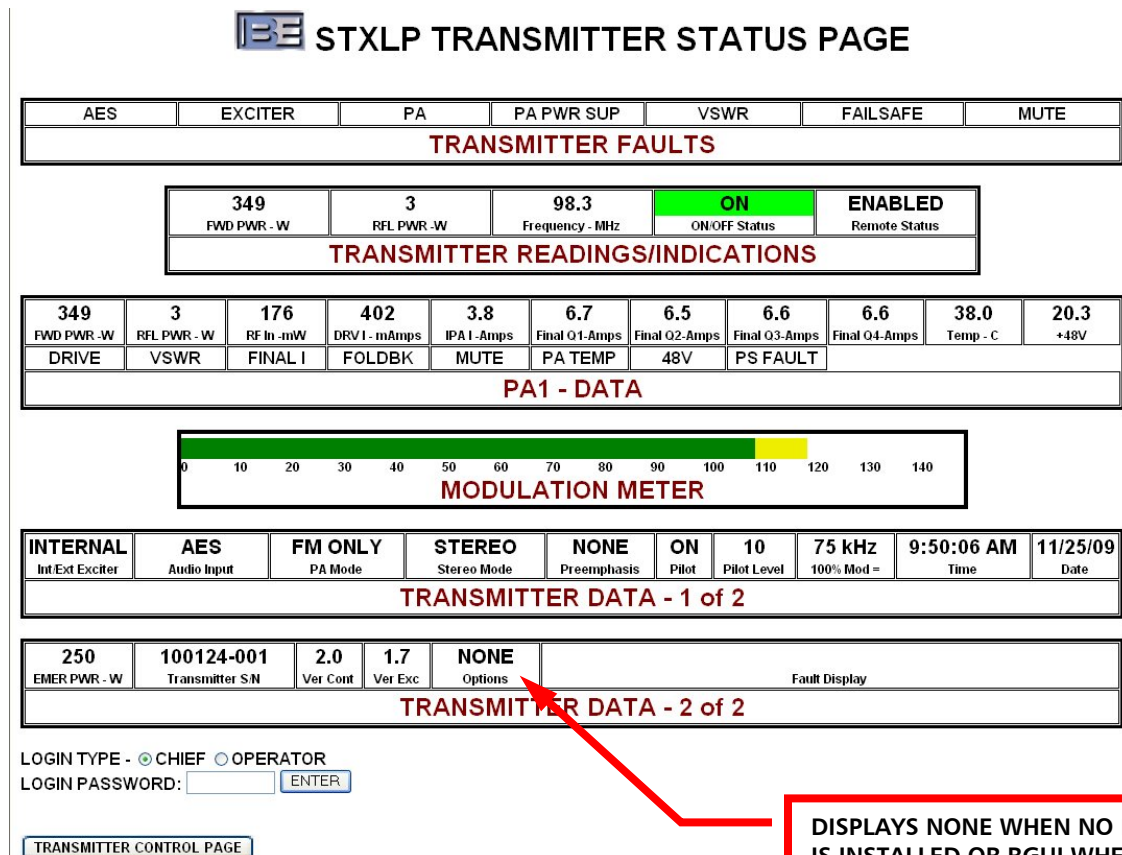
d) Enter the Chief login password.
e) Select ENTER.
The standard web Chief control interface page will appear.

Figure 8: Control Page

Figure 9: Paste Key

PASTE ALL CHARACTERS IN THE KEY FILE HERE.

4. Open the key .txt file with a text editor such as Windows Notepad.
5. Select all the text and copy.
6. Paste the text in INSTALL OPTION KEY form.
7. Select ENTER.

---

8. A message box will appear. The box presents information on the key installation process. If the key is valid, the status page will display RGUI in the Options box. If key installation is unsuccessful, NONE will remain in the Options box on the status page. For unsuccessful key installs, check key file. Ensure the file name matches the transmitter controller board ID. If the file name is ok, ensure no characters are changed when the key is pasted into the INSTALL OPTION KEY box.

9. Select OK to install the key.

10. Repeat the procedure for each transmitter to be used with the RGUI system.

7. Install the RGUI Program

The next step is to install the RGUI program. To install the program, proceed as follows:

1. Copy the 2 RGUI program files (BroadcastElectronics.STX.RGUI.Installer.msi and setup.exe) from the RGUI usb drive to a local PC subdirectory such as C:\Program Files\Broadcast Electronics\STX Remote GUI 1.0\. Setup.exe is only used if the computer is not equipped with Microsoft Installer.

2. Double-click the BroadcastElectronics.STX.RGUI.Installer.msi file.
   A Launching Application dialog will appear.
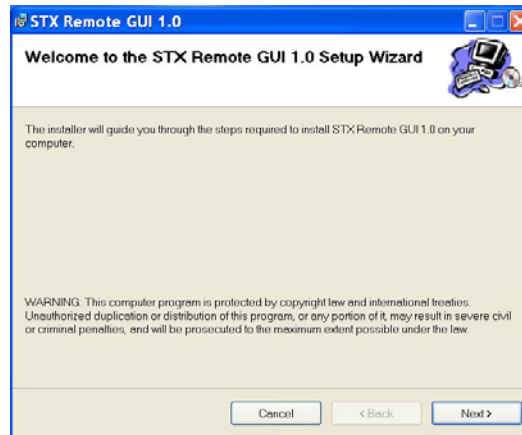
Figure 10: Setup Wizard

3. Follow the on-screen prompts to install the software.
   The program will install.
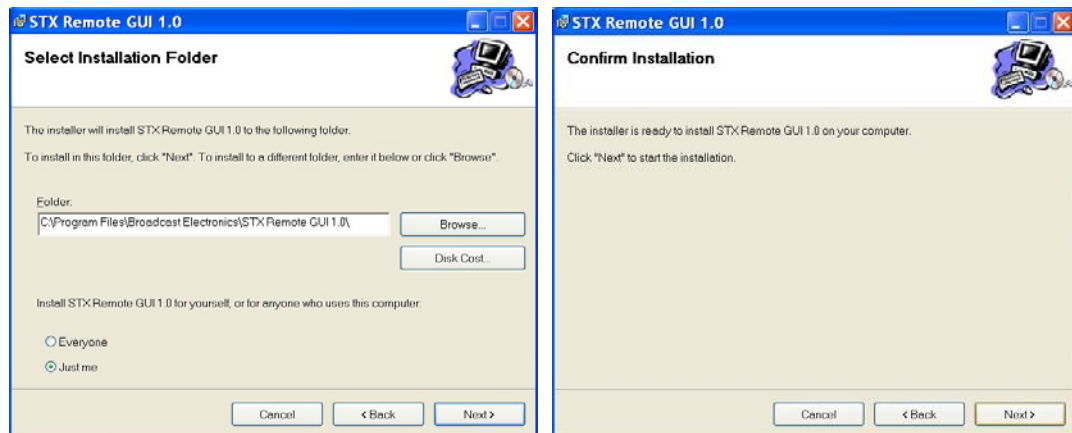
Figure 11: Select file and Confirm
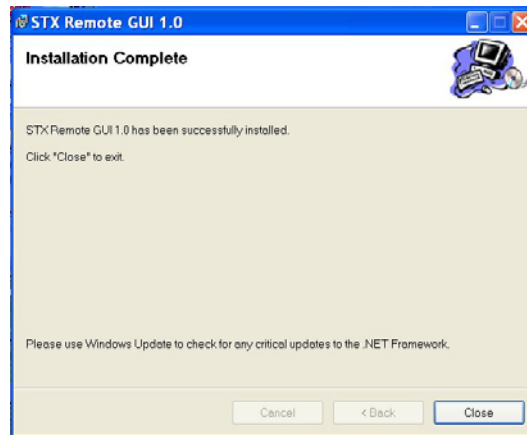
Figure 12: Installation Complete

4. When finished, the RGUI program will appear.
5. Add the RGUI icon to the desktop if desired.
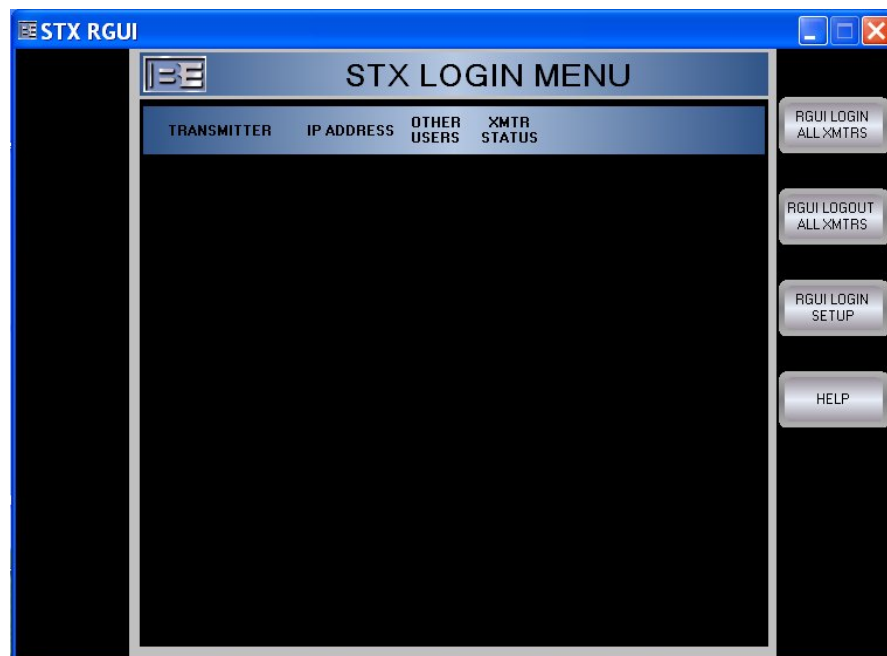
Figure 13: Login Screen

8. Operation

8.1. RGUI User Interface – Standards

The RGUI interface standards consist of pop-up messages and the gray-out of features when not active. The interface will display pop-up messages when special conditions occur such as when during data entry errors or login errors. If a feature is not available such as when the optional stereo generator board is not installed, the resulting features on the interface will be grayed-out.
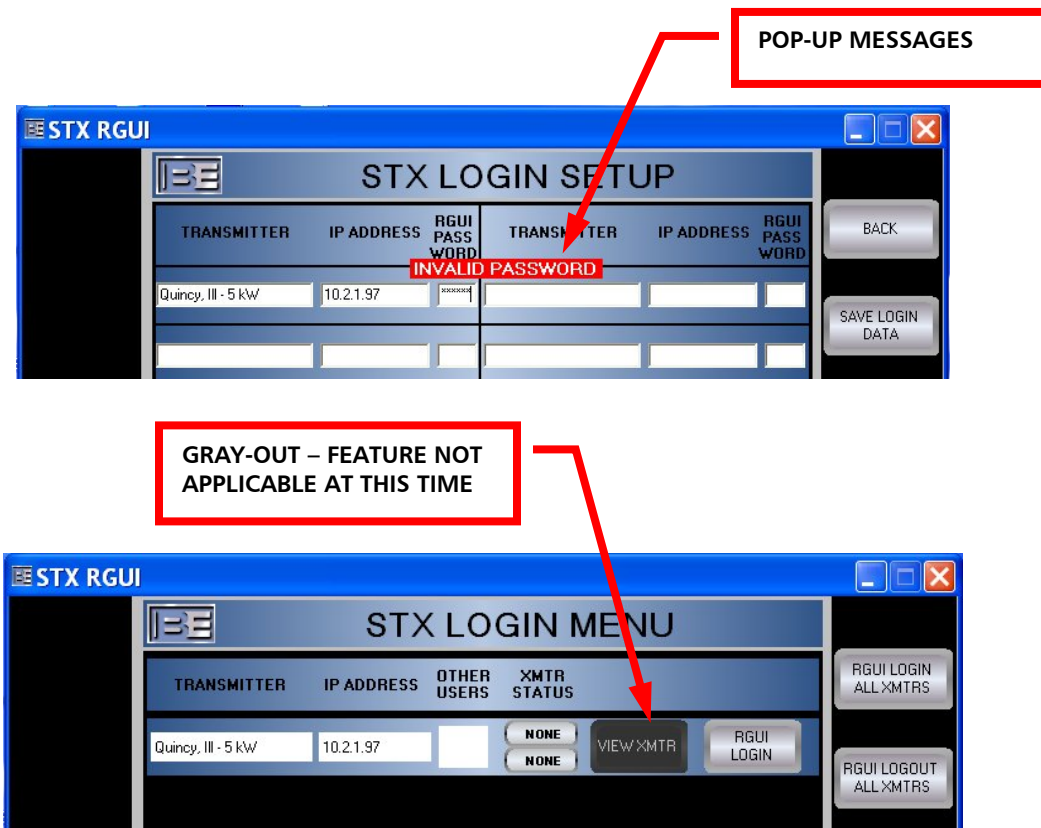
Figure 14: Message Standards

8.2. Maximum Number And Type Of RGUI/Web Users -

The transmitter can support up to a maximum of 3 simultaneous RGUI/Web users. The RGUI system allows the login of only one chief and one operator user. A chief, an operator, and a view user can access the transmitter simultaneously. Web interface users will also be able to login if less than 3 RGUI users are connected to the transmitter. If 2 RGUI users and one web user are connected and another RGUI user logs in, the web user session will be terminated. RGUI users have precedence.

8.3. RGUI Login Setup

Login setup consists of entering a transmitter name, IP address and RGUI password for each transmitter licensed for RGUI communication. If the transmitter is not licensed for RGUI operation, the RGUI option will not be enabled. Enter the STXLP login data as follows:

1. Locate the RGUI MAIN MENU.
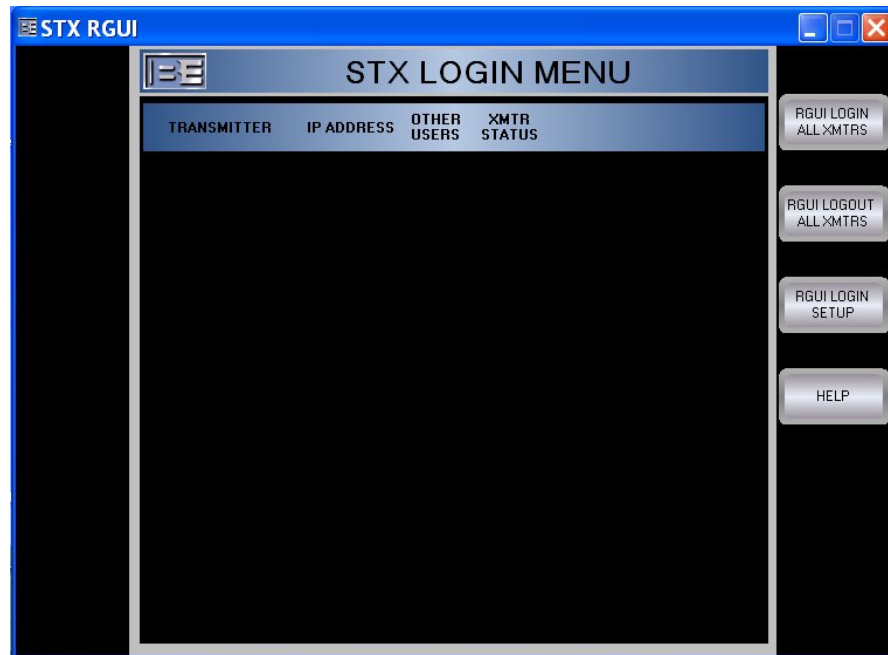
Figure 15: Login Screen

2. On the STX LOGIN MENU, click RGUI LOGIN SETUP.
   The STX LOGIN SETUP menu will appear.
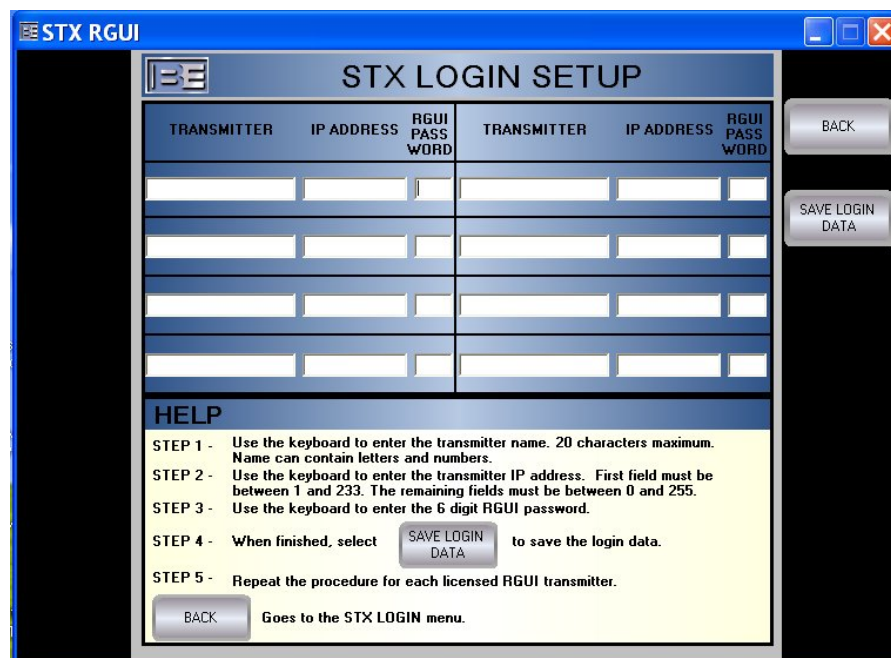
Figure 16: Login Setup

3. Enter the transmitter data as follows:
   A. Use the mouse/keyboard to enter a transmitter name in the
      TRANSMITTER field. The name can be up to 20 characters in length and
      contain characters, numbers, and special characters.

B. Use the mouse/keyboard to enter the transmitter IP address in the **IP ADDRESS** field.

C. Use the mouse/keyboard to enter the RGUI password in the **RGUI PASSWORD** field.

4. Repeat the procedure for each transmitter for use with the RGUI option.

5. Select **SAVE LOGIN DATA** when finished.

   The STX LOGIN menu will appear with the transmitter data.

8.4. RGUI Transmitter Login/Logout

The RGUI login allows the user to access transmitter data. The user can login to a single transmitter or all the transmitters shown on the STX LOGIN menu. To login to the transmitters, proceed as follows:

SINGLE TRANSMITTER -

1. To login to a single transmitter, click the **RGUI LOGIN** button on the desired transmitter display pane.
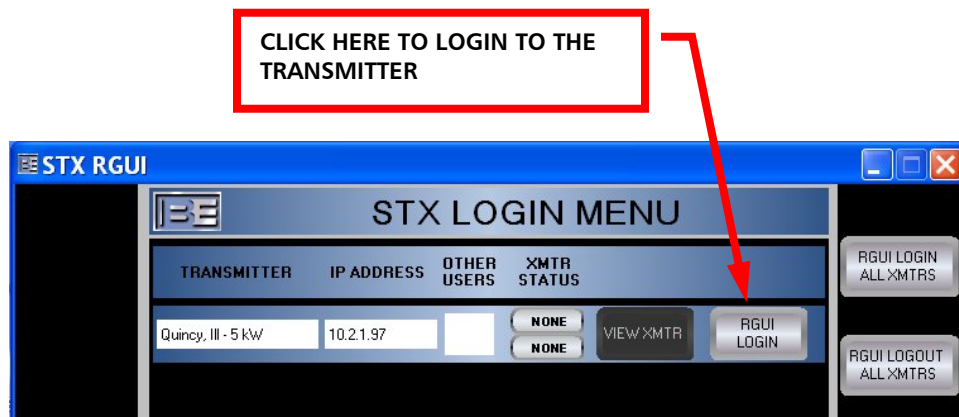
Figure 17: Login

If the login is successful -
- The *VIEW XMTR* button will un-gray.
- The *RGUI LOGIN* button will change to *RGUI LOGOUT.*
- The *XMTR STATUS* indicators will be active.

If the login is not successful -
- The *VIEW XMTR* button will remain gray.
- The *RGUI LOGIN* button will not change.
- A *NO CONNECTTION* message will appear.
- The *XMTR STATUS* indicators will not be active.

Figure 18: Login Features

MENU FEATURES		
No.	**Feature**	**Description**
1	XMTR STATUS - Faults	Displays if any faults are active in the transmitter.
2	XMTR STATUS – On/Off	Displays the on/off status of the transmitter.
3	OTHER USERS	Displays other RGUI users connected to the transmitter. The users can be View, Chief, or Operator.
4	IP ADDRESS	Displays the transmitter IP address.
5	TRANSMITTER	Text describing the transmitter.
6	HELP Button	Accesses the Login menu help information.
7	RGUI LOGIN SETUP Button	Accesses the menu to setup transmitter IP address, passwords, and text information.
8	RGUI LOGOUT ALL XMTRS Button	Logs out of all the transmitters in this menu.
9	RGUI LOGIN ALL XMTRS Button	Logs into all the transmitters in this menu.
10	RGUI LOGOUT Button	Logs into this transmitter.
11	VIEW XMTR Button	Logs out of this transmitter.
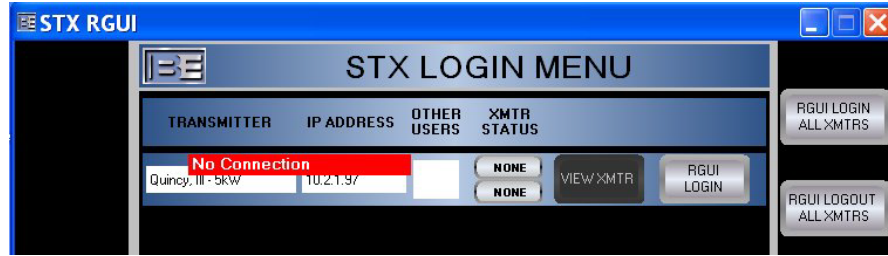
Figure 19: No connection message

2. To logout of the transmitter, click the **RGUI LOGOUT** button on the desired transmitter display pane.
   - The *VIEW XMTR* button will change to gray.
   - The button will change to *RGUI LOGOUT.*

ALL TRANSMITTERS -
1. To login to all transmitters on the menu, click the **RGUI LOGIN ALL XMTRS** button.
   If the login is successful -
   - Each transmitter *VIEW XMTR* button will un-gray.
   - Each transmitter *RGUI LOGIN* button will change to *RGUI LOGOUT.*
   - The *XMTR STATUS* indicators for each transmitter will be active.
   If the login is not successful -
   - Each transmitter *VIEW XMTR* button will remain gray.
   - Each transmitter *RGUI LOGIN* button will not change.
   - A *NO CONNECTION* message will appear for each transmitter.
   - The *XMTR STATUS* indicators for each transmitter will not be active.
2. To logout of all transmitters, click the **RGUI LOGOUT ALL XMTRS** button.
   - Each transmitter *VIEW XMTR* button will change to gray.
   - Each transmitter button will change to *RGUI LOGOUT.*

8.5. User Login Types

The RGUI system is designed with three types of users: 1) view, 2) operator, and 3) chief. The logins control what type of access the user has to the transmitter.

When a user first accesses the main transmitter menu, the user is automatically logged in as view. The user can access any menu to view any transmitter details. However, a view user can not control any transmitter operations. If the user needs control, the user can log in as an operator or chief. The operator has limited control authorization. The chief can perform all transmitter control functions. The following text presents the controls and the authorization required to perform each task.

TRANSMITTER CONTROLS AND REQUIRED LOGIN TYPE		
CONTROL	**CHIEF**	**OPER**
Set Operator Password	X	
Audio Select	X	X
Audio Level Set	X	
Pilot On/Off	X	
Pilot Level Entry	X	

CONTROL	CHIEF	OPER
Change Stereo Mode	X	
Change Preemphasis	X	
Change Frequency	X	
Set RF Output Power	X	X
Fault Reset	X	X
Erase Log	X	
Save Log	X	X
Set Time/Date	X	X
Remote Enable	X	
Select Exciter	X	X

8.6. Main Transmitter Menu

The main transmitter menu presents all the transmitter vital information. When a user first accesses this menu, the user is automatically logged in as view. The user can access any menu to view any transmitter details but can not control any transmitter operations. To access the transmitter and view details, proceed as follows:

1. On the STXLP LOGIN MENU, click **VIEW XMTR**.
   The STXLP main menu will appear.
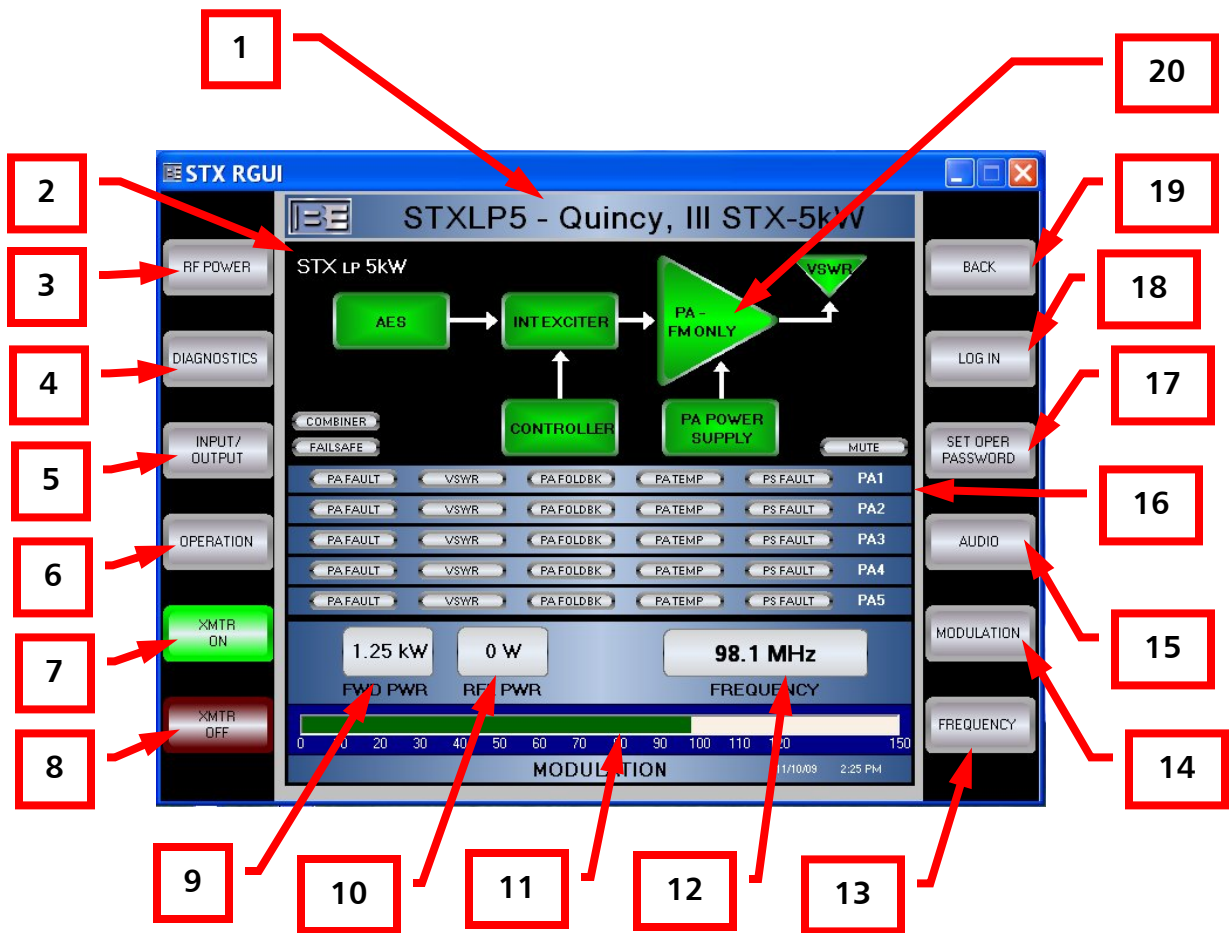
Figure 20: Main Menu

MENU FEATURES		
No.	Feature	Description
1	Menu Title	Displays the name of the transmitter being viewed.
2	Model Display	Displays the STXLP model – 1 kW, 2 kW, 3 kW, or 5 kW
3	RF POWER Button	Accesses the RF power menu.
4	DIAGNOSTICS Button	Accesses the Diagnostics menu.
5	INPUT/OUTPUT Button	Accesses the Input/Output menu.
6	OPERATION Button	Accesses the Operation menu.
7	Transmitter On Button	Transmitter On button.
8	Transmitter Off Button	Transmitter Off button.
9	FWD PWR	Active forward power.
10	RFL PWR	Active reflected power.
11	Modulation Meter	Displays the transmitter modulation in %. When level is below 15%, meter changes to a 0 to 15% scale to view low level signals such as the pilot tone and SCA/RDS signals.
12	Frequency	Transmitter frequency.
13	FREQUENCY Button	Accesses the Frequency menu.
14	MODULATION Button	Accesses the Modulation menu.
15	AUDIO Button	Accesses the Audio menu.
16	PA Display	Displays the status of the transmitter PAs. The number of PAs is determined by the model.

MENU FEATURES		
No.	**Feature**	**Description**
17	SET OPERATOR PASSWORD Button	Accesses the Set Operator Password menu.
18	LOG IN Button	Allows the user to login to the transmitter as chief or operator.
19	BACK Button	Accesses the multi transmitter login menu.
20	Block Diagram	Displays the status of the transmitter components. Displays green during normal operation. Displays red during a fault. Failsafe displays red if open. Mute displays amber during mute conditions. Combiner displays red during combiner faults.

8.7. Transmitter Login

When a user first accesses the transmitter, the user is automatically logged in as view. The user can access any menu to view any transmitter details but can not control any transmitter operations. If control of the transmitter is desired, the user must login as an operator or chief. The operator login allows a user to perform some control functions. The chief login allows a user to perform all control functions. Prompts will appear if a user attempts to use a control without the correct login. This menu will also re-establish connection to the transmitter if the connection is terminated during normal operation (example – the transmitter ac power is cycled). To login, proceed as follows:

1. In the STXLP main menu, click **LOGIN**.
   The STXLP login menu will appear.

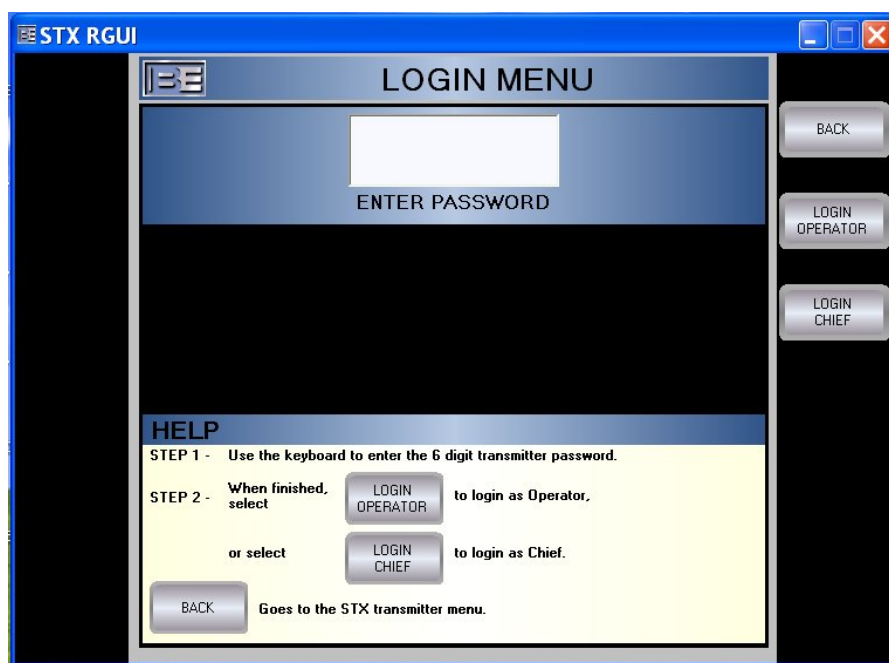

Figure 21: Transmitter Login

2. In the LOGIN menu, use the mouse/keyboard to enter an operator or chief password in the enter password field. The password entered must match an operator or chief password entered into the transmitter.
3. Select the **LOGIN OPERATOR** or **LOGIN CHIEF** button when finished. If a login is unsuccessful, a pop-up message will appear such as invalid password.

8.8.   Set Operator Password

If the user is logged in as Chief, the user can set the operator password. To set the operator password, proceed as follows:

1.   Refer to **Transmitter Login** and login as Chief.
2.   In the STXLP main menu, select the **SET OPER PASSWORD** button.
     The SET OPERATOR PASSWORD menu will appear.
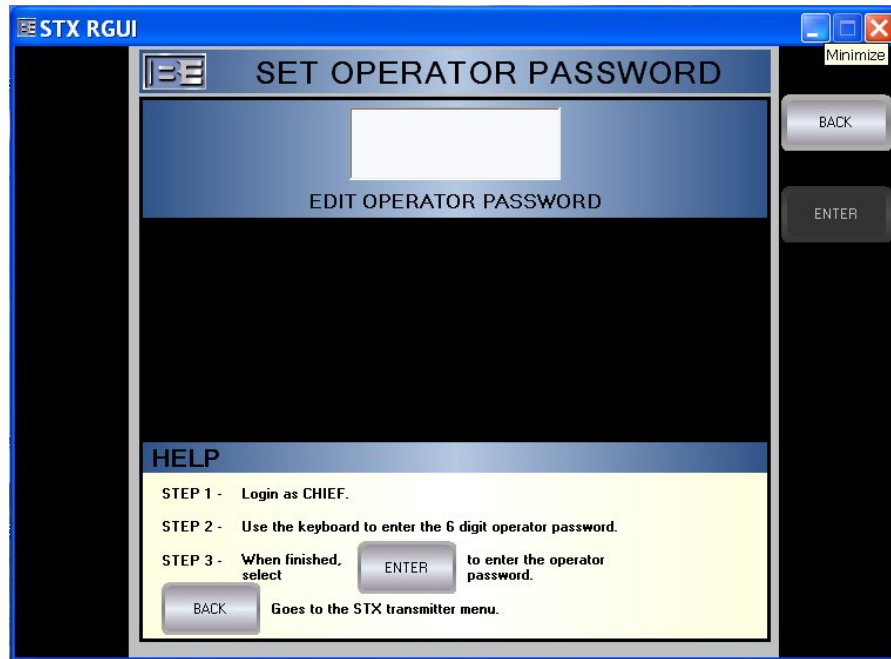
Figure 22: Set Password

3.   In the SET OPERATOR PASSWORD menu, use the mouse/keyboard to enter a 6 digit operator password in the password field.
4.   Select the **ENTER** button when finished.

8.9.   Audio Menus

The audio menu allows the selected audio level to be adjusted. To adjust the audio levels, proceed as follows:

8.9.1. Audio Menu

If the optional stereo generator board is installed, the audio menu allows the composite, AES, or analog L/R audio to be selected. To select the audio input, proceed as follows:

1.   Refer to **Transmitter Login** and login as Chief or Oper.
2.   In the STXLP main menu, click the **AUDIO** button.
     The AUDIO menu will appear.
3.   To change the input, use the **COMPOSITE SELECT**, **ANALOG L/R SELECT**, and **AES SELECT** buttons.
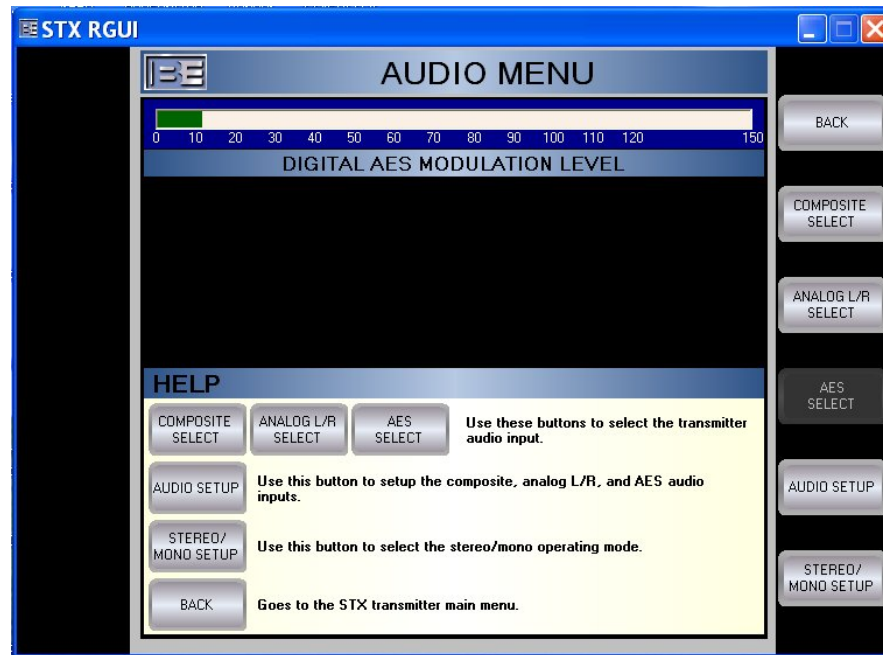
Figure 23: Audio Menu

8.9.2. Audio Setup Menu

If the optional stereo generator board is installed and the composite, AES, or analog L/R levels require adjustment, proceed as follows:

1. Refer to **Transmitter Login** and login as Chief.
2. Click the **AUDIO SETUP** button from the AUDIO menu.
   The AUDIO SETUP menu will appear.
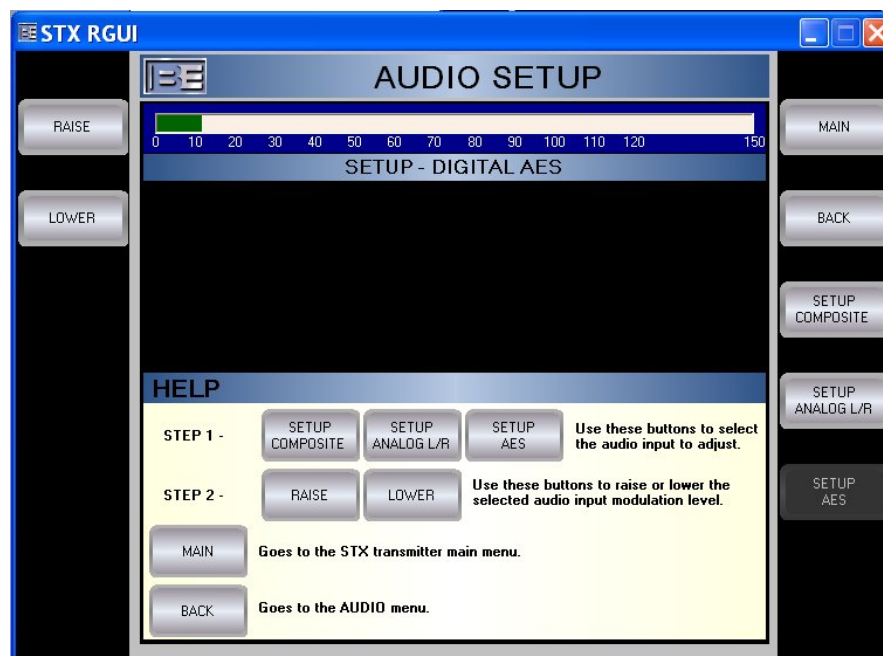
Figure 24: Audio Setup

3. To adjust the composite input, proceed as follows:
   A. Select **SETUP COMPOSITE**.
   B. Select **RAISE** or **LOWER** buttons to adjust the level on the meter.
4. Repeat for ANALOG L/R and AES.

8.9.3. Stereo/Mono Menu

If the optional stereo generator board is installed, a user can change the mono/stereo mode, enable/disable the pilot, or change the pilot level. To change these parameters, proceed as follows:

1. Refer to **Transmitter Login** and login as Chief.
2. Click the **STEREO/MONO SETUP** button from the AUDIO menu.
   The STEREO/MONO menu will appear.
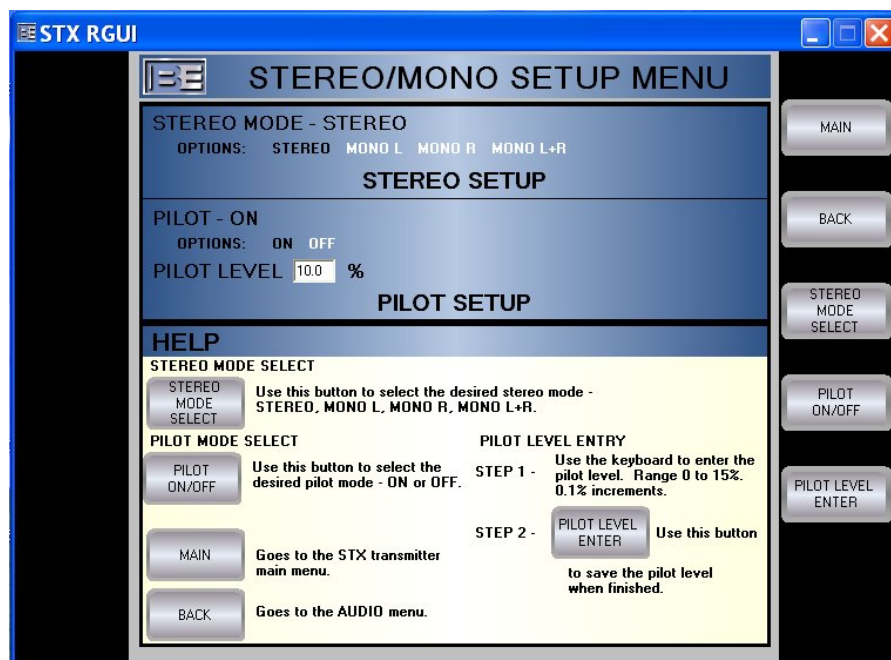
Figure 25: Stereo/Mono setup

3. To set the stereo mode, use the **STEREO MODE SELECT** button to select **STEREO**, **MONO L**, **MONO R**, or **MONO L+R**.
4. To enable/disable the pilot, use the **PILOT ON/OFF** button to select **ON** or **OFF**.
5. To enter a pilot level, use the mouse/keyboard to enter a value in the **PILOT LEVEL** field. The pilot level can be from 0 to 15% in 0.1% increments. Select the **PILOT LEVEL ENTER** button when finished.

8.10. Modulation Menu

The modulation menu allows a user to change the preemphasis and displays the value of 100% modulation. To change the modulation parameter, proceed as follows:

1. Refer to **Transmitter Login** and login as Chief.
2. In the STXLP main menu select the **MODULATION** button.
   The MODULATION menu will appear.
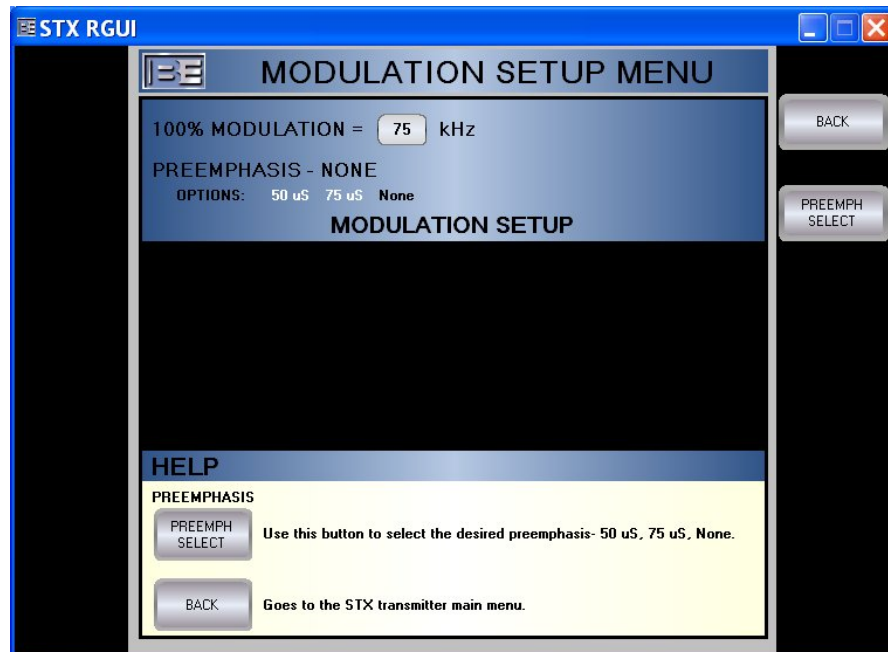
Figure 26: Modulation

3. To determine the transmitter deviation, locate the 100% modulation = display. The display presents either 75 kHz, 125 kHz, or 200 kHz.
4. To set the preemphasis, use the **PREEMPH SELECT** button to select **50 uS**, **75 uS**, or **NONE**.

8.11. Frequency Menu

With the appropriate login, the transmitter frequency can be changed. To change the transmitter frequency, proceed as follows:

1. Refer to **Transmitter Login** and login as Chief.
2. In the STXLP main menu select the **FREQUENCY** button.
   The FREQUENCY menu will appear.
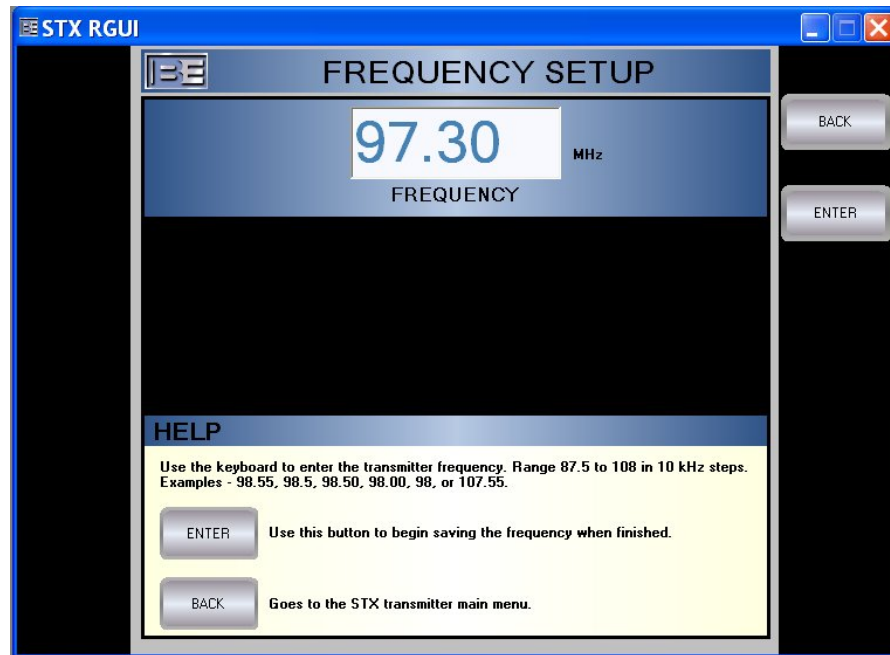
Figure 27: Frquency

3. To set the frequency, use the mouse/keyboard to enter a value in the **FREQUENCY** field. The frequency can be from 87.5 to 108 MHz in 10 kHz steps.
4. Select the **ENTER** button when finished.
    The FREQUENCY CONFIRM menu will appear.
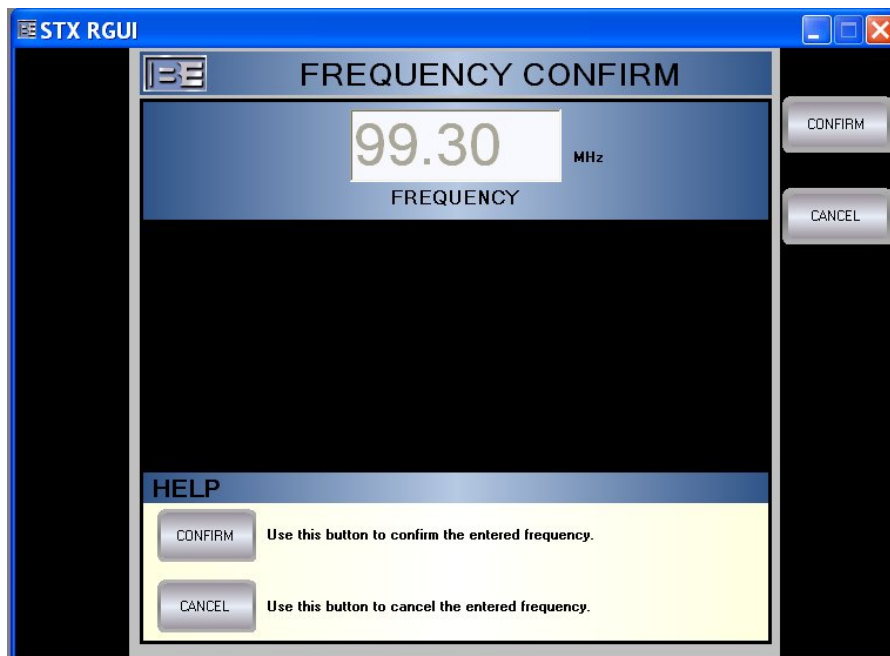
Figure 28: Confirm Frequency

5. Select the **CONFIRM** button to enter the frequency or the **CANCEL** button to cancel the frequency.

8.12. RF Power Menu

The RF power output can be set for the active mode of operation. If the transmitter is operating with the internal exciter, only the FM ONLY mode is available. If the transmitter is operating with an HD external exciter, power can be set for each of the operating modes (FM ONLY, FM+HD, or HD only) when the mode is active. The RF power menu also allows the entry of backup power. To change the transmitter RF power, proceed as follows:

1. Refer to **Transmitter Login** and login as Chief or Operator.
2. In the STXLP main menu select the **RF POWER** button.
   *The RF POWER menu will appear.*
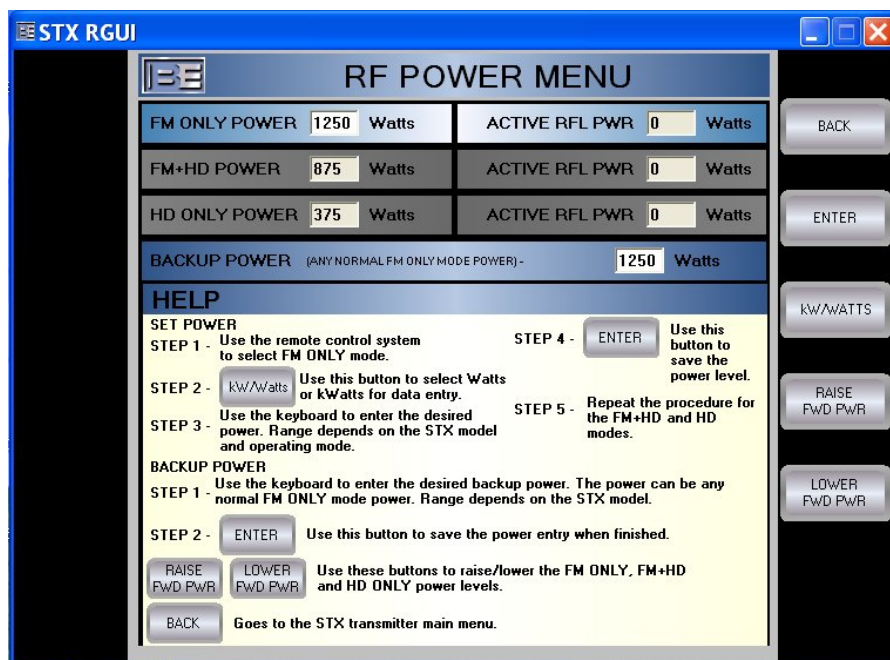
Figure 29: RF Power

3. Set the FM ONLY power as follows:
   A. To enter the power in Watts or kW, use the **kW/Watts** button to set the data fields for kW or Watts entry.
   B. To set the FM ONLY power, perform the following. The power limits are listed below.
      a. Use the mouse/keyboard to enter a value in the **FM ONLY POWER** field
      b. Select the **ENTER** button when finished.
              Or
      a. Use the **RAISE FWD PWR** or **LOWER FWD PWR** buttons.

MODEL	FM ONLY -WATTS	FM+HD WATTS	HD ONLY - WATTS
STXLP – 1kW	250 to 1100	175 to 770	75 to 330
STXLP – 2kW	500 to 2000	350 to 1280	150 to 600
STXLP – 3kW	750 to 3000	525 to 1920	225 to 900
STXLP – 5kW	1250 to 5000	875 to 3200	375 to 1500

4. Repeat the procedure for FM+HD and HD ONLY modes when each mode is active.
5. Set the emergency power as follows:
   A. Use the mouse/keyboard to enter a value in the **EMERGENCY POWER** field. The value can be any FM ONLY power value with the exception of STX-5kW models. For 5kW models, the maximum emergency power is 3300W.
   B. Select the **ENTER** button when finished.

8.13. Diagnostics Menu

The diagnostics menu presents transmitter and PA faults. The menu also allows access to the event log, PA data, and time/date setup. A fault reset button allows the user to reset transmitter/PA faults. A fault analysis display presents the highest priority faults and the possible causes and solutions.

1. In the STXLP main menu select the **DIAGNOSTICS** button.
   The DIAGNOSTICS menu will appear.
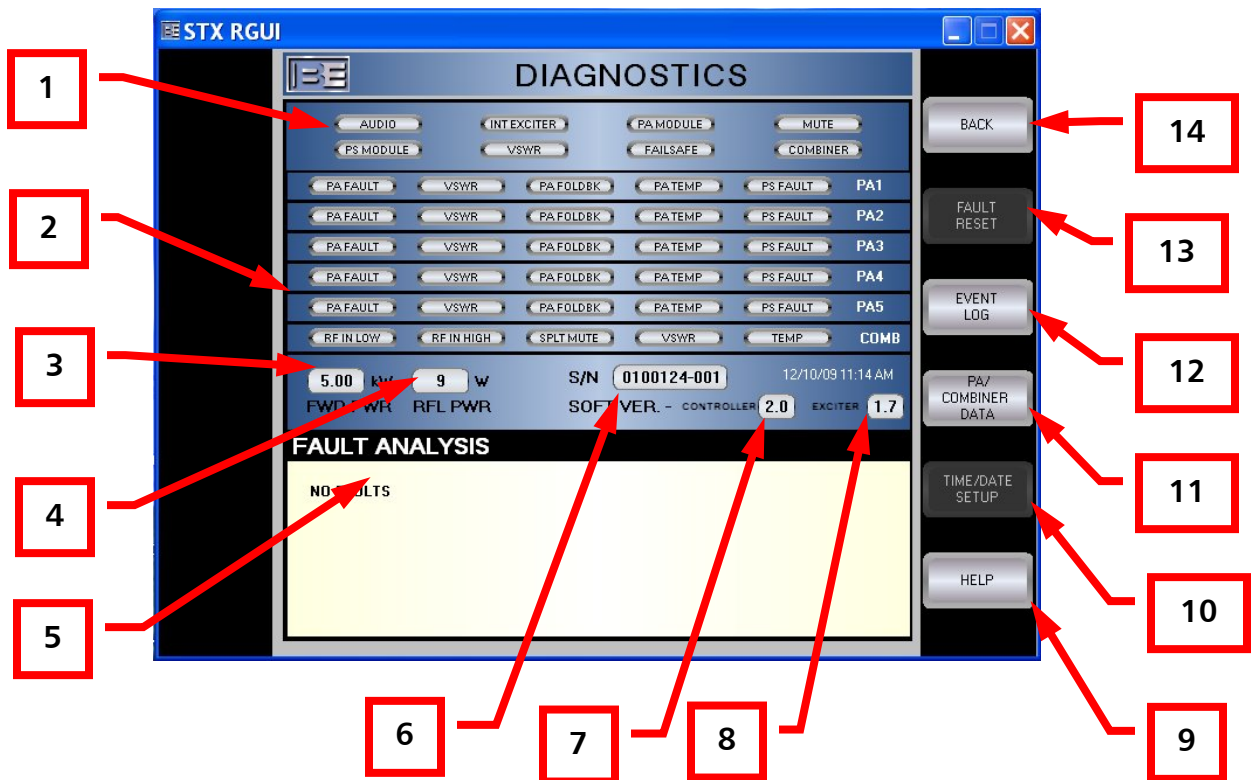
Figure 30: Diagnostics Menu

MENU FEATURES		
No.	Feature	Description
1	Transmitter Faults	Displays the status of the transmitter components. All indicators with the exception of mute display red during a fault. Mute displays amber during mute conditions.
2	PA Faults	Displays the status of the transmitter PAs. The number of PAs is determined by the model.
3	FWD PWR	Active forward power.
4	RFL PWR	Active reflected power.

MENU FEATURES		
No.	Feature	Description
5	Fault Analysis	Fault analysis display. Displays the highest priority fault with possible solutions.
6	S/N	Transmitter serial number
7	Controller Soft Version	Controller software version.
8	Exciter Soft Version	Exciter software version.
9	HELP Button	Accesses the Diagnostics Help menu.
10	TIME/DATE Button	Accesses the Time/Date setup menu.
11	PA/COMBINER DATA Button	Accesses the PA and combiner (if transmitter is equipped with a combiner) data display.
12	EVENT LOG Button	Accesses the event log display.
13	FAULT RESET Button	Resets the transmitter and PA faults.
14	BACK Button	Goes back to the STX LOGN menu.

FAULT RESET -

1. To reset a fault, select the **FAULT RESET** button.

8.13.1. Event Log

The event log allows the user to view transmitter actions. The following text presents the events captured in the log system.

LOG EVENTS	
Exciter Firmware Mis-Match	Transmitter On
Audio Modulation Fault	Transmitter Off
PA Temp Faults	Fault Reset
PA VSWR Faults	Audio Selection Change
PA Final Current Fault	Power Level Change
PA Drive Fault	Frequency Change
PA Mute Condition	PA Mode Change
PA Temp Foldback	Internal/External Exciter Change
PA VSWR Foldback	Password Change
PA Power Supply Fault	Exciter Reset
External Exciter Fault	Emergency Power Change
AFC Unlock	Exciter Firmware Update
Failsafe Open	Controller Firmware Update
Combiner Temp Fault	Combiner VSWR Shutdown
Combiner Splitter Mute	Transmitter Mute
Combiner RF In Low	Transmitter Unmute
Combiner RF In High	Transmitter Power Up
Combiner VSWR Shutdown	

The transmitter will store and view up to 100 events. The latest event will always be presented at the top of page 1. All other events will scroll down. A Stop Display button allows the user to stop the display scrolling to view a specific event. Events will continue to be captured and not displayed unit the event log is returned to Update mode. The Update Display button returns the display to scrolling operation. A log can be saved to a file using the Save Log To File button. An Erase Log

button allows the user to delete the log when desired. To view the event log, proceed as follows:

1. In the DIAGNOSTICS menu, select the **EVENT LOG** button.
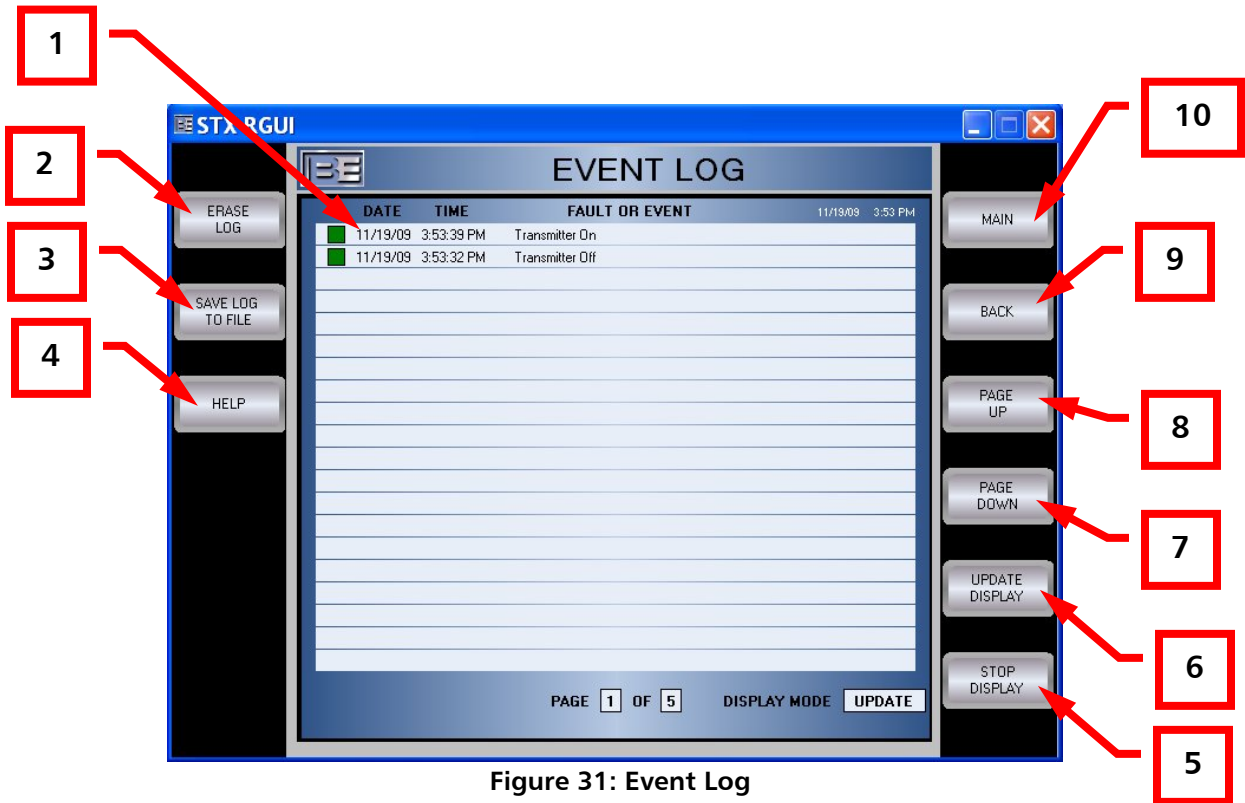   *The EVENT LOG menu will appear.*

Figure 31: Event Log

MENU FEATURES		
No.	**Feature**	**Description**
1	Event Log Display	The event log consists of 100 events. The display presents 20 events on a page. Each event consists of: 1) an indicator displaying the event severity, 2) time and date of the event, and 3) an event description. The indicator color: 1) green – normal event, 2) red – fault, 3) amber – mute. Latest event is displayed on the top of page 1.
2	ERASE LOG Button	Erases the event log.
3	SAVE LOG TO FILE Button	Saves the log file in a comma delineated .xls file with the current date.
4	HELP Button	Accesses the Event Log help menu.
5	STOP DISPLAY Button	This button selects the stop mode. The stop mode prevents the event log from updating and scrolling. This allows the currently displayed events to be easily viewed. The system will continue to log events. The events will not be displayed until the Update Display button is selected.
6	UPDATE DISPLAY Button	This button selects the update mode. The update mode allows the event log to add events as they occur. The event will be placed on the top line of page 1.
7	PAGE DOWN Button	Moves the event log display to later events.
8	PAGE UP Button	Moves the event log display to present earlier events.

No.	Feature	Description
9	BACK Button	Accesses the Diagnostics menu.
10	MAIN Button	Goes to the main menu.

2. To view pages in the event log, use the **PAGE UP** and **PAGE DOWN** buttons.
3. To prevent the log from scrolling, select the **STOP DISPLAY** button. To re-start the display, select the **UPDATE** button.
4. To erase the event log, select the **ERASE LOG** button. This will require a Chief login.
5. To save the log to a .xls file, select the **SAVE LOG TO FILE** button. Follow the on-screen prompts to save the file to the desired directory.

8.13.2. PA Data Menu

The PA data menu presents voltages, currents, RF levels, and fault details for each PA in the transmitter. The number of PAs shown is determined by the transmitter model.

1. In the DIAGNOSTICS menu, select the **PA DATA** button.
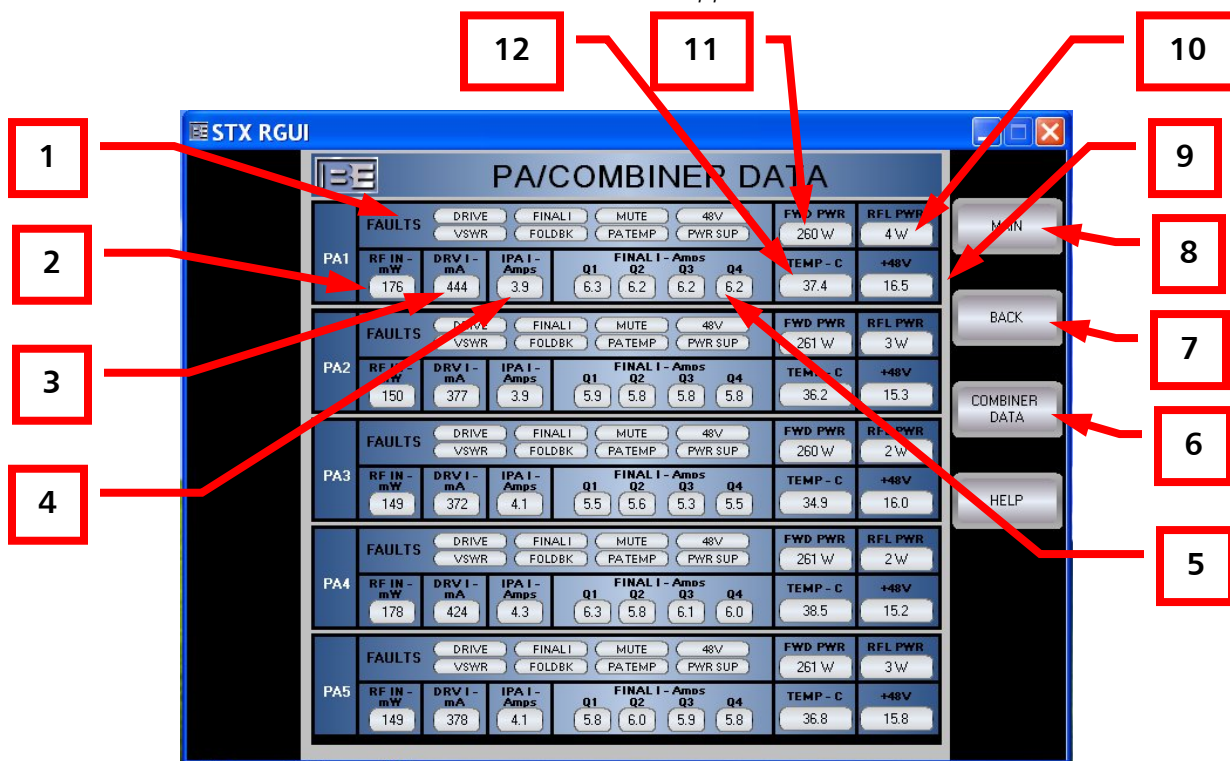   *The PA DATA menu will appear.*
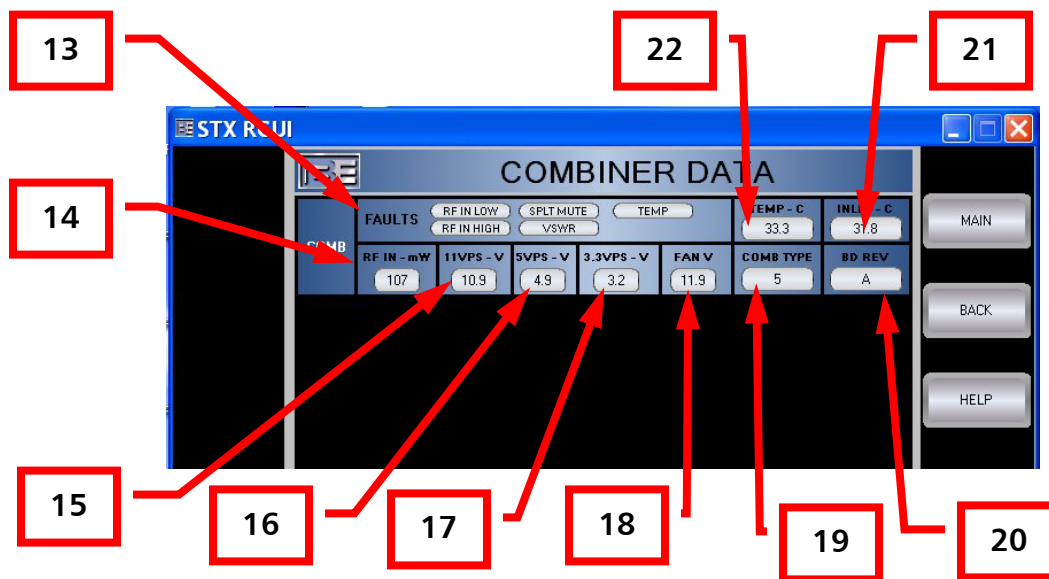

Figure 32: PA Data

Figure 33: Combiner Data

MENU FEATURES		
No.	**Feature**	**Description**
1	Faults Display	Displays the PA faults. All indicators with the exception of mute will display red during a fault. Mute will display amber during mute conditions.
2	RF IN	Displays the RF input in mWatts
3	DRV I	Displays the driver current in mAmps.
4	IPA I	Displays the IPA current in Amps.
5	FINAL I	Displays the current of the four final transistors in Amps.
6	HELP Button	Accesses the PA Data help menu.
7	BACK Button	Goes back to the Diagnostics menu.
8	MAIN Button	Goes to the main menu.
9	+48V	Displays the +48V supply. The voltage presented varies as determined by the output power.
10	RFL PWR	Active PA reflected power.
11	FWD PWR	Active PA forward power.
12	TEMP	Displays the PA temperature in degrees C.
13	Faults Display	Displays the combiner faults. All indicators will display red during a fault.
14	RF IN	Displays the RF input in mWatts.
15	11VPS	Displays the 11V power supply voltage.
16	5VPS	Displays the 5V power supply voltage.
17	3.3VPS	Displays the 3.3V power supply voltage.
18	FAN V	Displays the fan voltage.
19	COMB TYPE	Displays the combiner type. 5 = 5 kW model.
20	BD REV	Displays the board revision.
21	INLET	Displays the combiner inlet temperature.
22	TEMP	Displays the combiner heatsink temperature.

8.13.3. Time/Date Setup Menu

The time/date setup menu allows the time and date to be set.

1. Refer to **Transmitter Login** and login as Chief or Operator.
2. On the DIAGNOSTICS menu, select the **TIME/DATE SETUP** button.
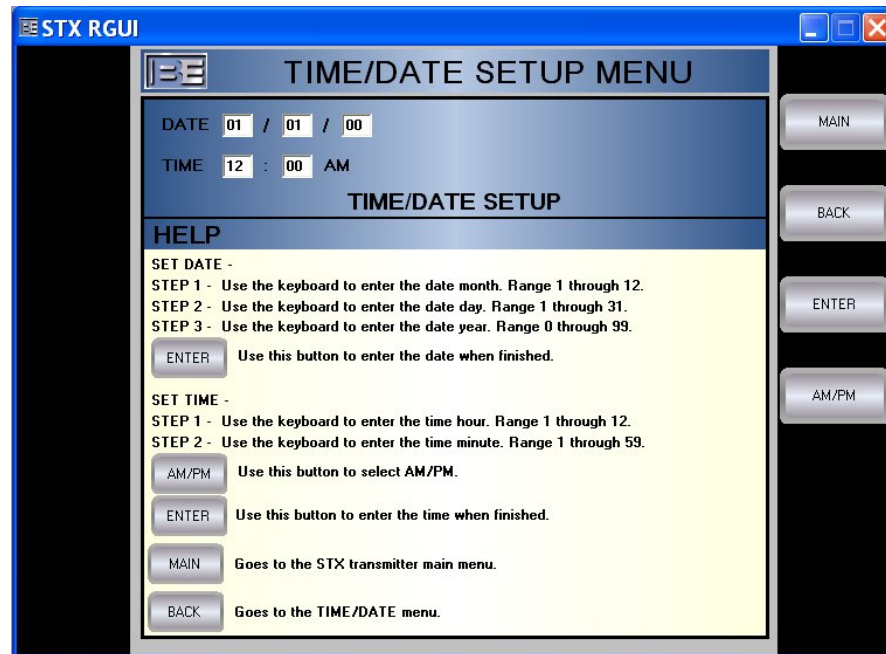   *The TIME/DATE SETUP menu will appear.*

Figure 34: Time/Date setup

3. To set the date, proceed as follows:
   A. Use the mouse/keyboard to enter a value in the **DATE** month, day, or year field.
   B. Select the **ENTER** button when finished.
4. To set the time, proceed as follows:
   A. Use the mouse/keyboard to enter a value in the **TIME** hour or minute field.
   B. Select AM or PM using the **AM/PM** button.
   C. Select the **ENTER** button when finished.

8.14. Input/Output Menu

The input/output menu allows the remote input/output pins to be checked.

1. On the STXLP main menu select the **INPUT/OUTPUT** button.
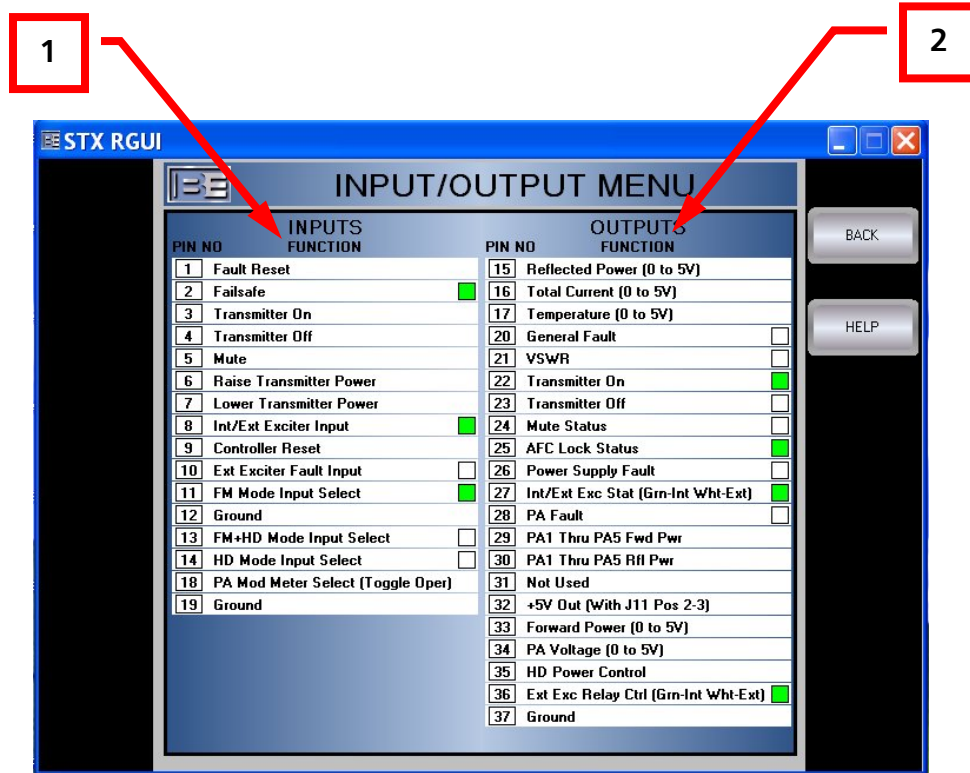   *The INPUT/OUTPUT menu will appear.*

Figure 35: Input/Output

MENU FEATURES		
No.	**Feature**	**Description**
1	INPUTS	Displays the status of the transmitter sustained remote inputs. Each indicator is active when the input is asserted.
2	OUTPUTS	Displays the status of the transmitter remote outputs. Each indicator is active when the output is active.

8.15. Operation Menu

The operation menu provides access to the internal/external exciter and remote enable functions. The remote function will enable the GPIO and I.P. control inputs.

1. In the STXLP main menu select the **OPERATION** button.
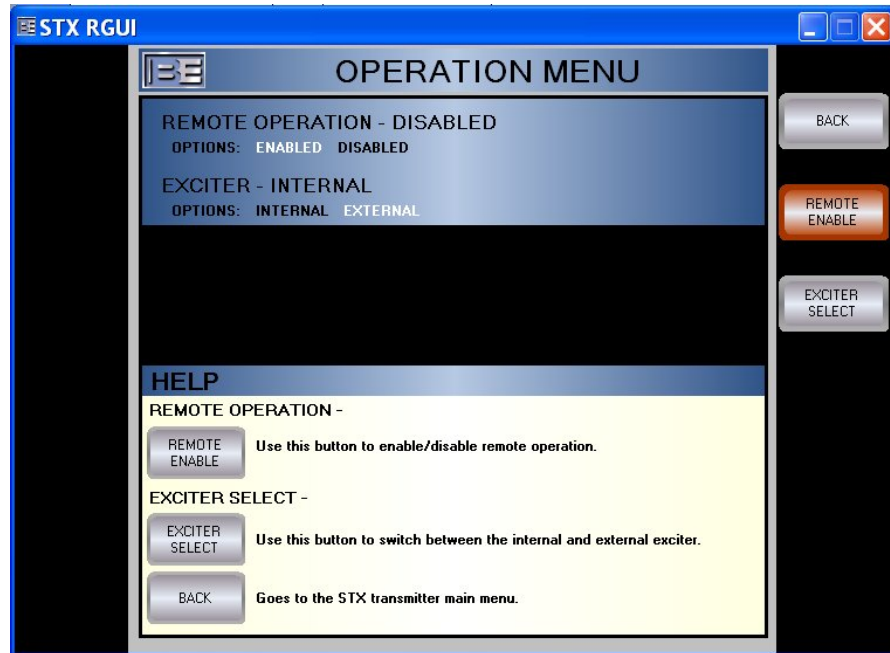   *The OPERATION menu will appear.*

Figure 36: Operation

2. To enable the remote, proceed as follows:
    A. Refer to TRANSMITTER LOGIN in the preceding text and login as Chief.
    B. With **REMOTE OPERATION** displaying **DISABLED**, select the **REMOTE ENABLE** button
    A warning message will appear.
    C. Select the **CONFIRM** button.
    The REMOTE OPERATION display will present ENABLED and the remote will be enabled.
3. To select either the internal or external exciter, proceed as follows:
    A. Refer to TRANSMITTER LOGIN in the preceding text and login as Chief or Operator.
    B. Select the EXCITER SELECT button to configure the transmitter with the internal exciter or the external exciter.

9. Upgrading The RGUI Program

The RGUI program may be upgraded in the future. To install a new version of the RGUI program, the prior version must be removed. To install a new version, proceed as follows:

1. In Windows XP, access CONTROL PANEL→ADD OR REMOVE PROGRAMS.
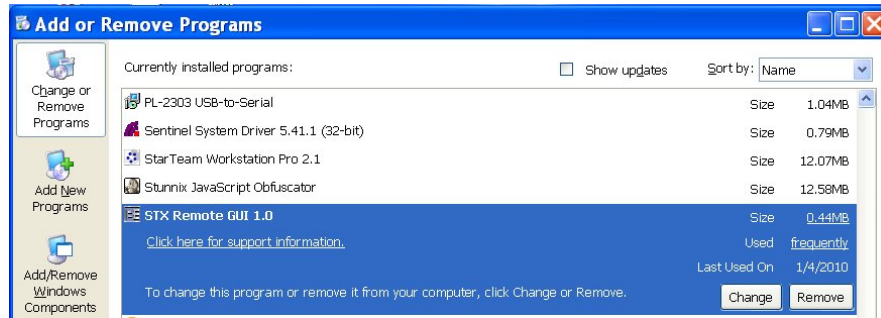2. Locate STX Remote GUI program.

Figure 37: Program Upgrade

3. Select REMOVE.
4. If an RGUI icon is on the desktop, delete the icon from the desktop.
5. Refer to Install the RGUI Program in the preceding text and perform the procedure to install the new RGUI program version.

10. RF Technical Service Contact Information

RF technical Service -

Telephone: **(217) 224-9617**
E-Mail: **rfservice@bdcast.com**
Fax: **(217) 224-6528**
Web: **www.bdcast.com**

11. PARTS LIST

This section provides parts lists for the STX LP RGUI. The parts lists provide descriptions and part numbers of electrical components, assemblies, and selected mechanical parts required for maintenance. Each parts list entry in this section is indexed by reference designators appearing on the applicable schematic diagrams.

This bill of material uses an indented structure to show relationships of parts into sub assemblies. Example; all BOM LEVEL 2 parts are contained in the BOM LEVEL 1 part immediately above it.

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
0	909-4600	RGUI OPTION, STXLP, KEY		

BOM LEVEL	PART NO.	DESCRIPTION	QTY	REF. DES.
0	979-4601	KIT,STX,RGUI,(REQ 909-4600 KEY)		
..1	597-4103	INSTRUCTION MANUAL, STX LP REMOTE GRAPHICAL USER INTERFACE	1	
..1	808-2060	USB FLASH DRIVE WITH BE LOGO	1	
..1	979-4600-C01	KIT,SOFTWARE,STXRGUI V1.0	1	