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HD Radio

ASi 10 Software Upgrade

Upgrading to v4.3.2

Application Guide

597-0125-002, Revision K
12/9/10

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Upgrading to Software v4.3.2
Application Guide

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Proprietary Notice

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Table of Contents

1. ASi 10 Software Upgrade v4.3.2 Overview

Included with this is a CD containing ASi 10 Software Upgrade v4.3.2. Please note that the I.P. Address, Analog Gain, and Magnitude / Phase Delay settings **MUST** be re-entered in the ASi 10 after loading v4.3.2. **If upgrading from version v2.4.2 or ealier, the Magnitude / Phase Delay value WILL require an adjustment from its original value.** The following steps **MUST** be followed closely to ensure a successful install.

1.1. Features

- MONO digital operation
- Increased PIDS power

1.2. Tools / Items Needed

- ☐ External Mouse
- ☐ External Keyboard
- ☐ Spectrum Analyzer to verify mask compliance

1.3. Estimated Time for Software Upgrade

It will take approximately 50 minutes to upgrade the software in the ASi 10 and check the transmitter output. Please note that the ASi 10 will be off of the air during this process. The transmitter will remain on the air in AM ONLY operation.

2. Connect an External Mouse and Keyboard

Connect an External Mouse and Keyboard to the ASi 10 (if not already connected). The unit must be completely powered down to recognize the mouse and keyboard.

3. Record all System Settings

3.1. Record the I.P. Address and Subnet Mask

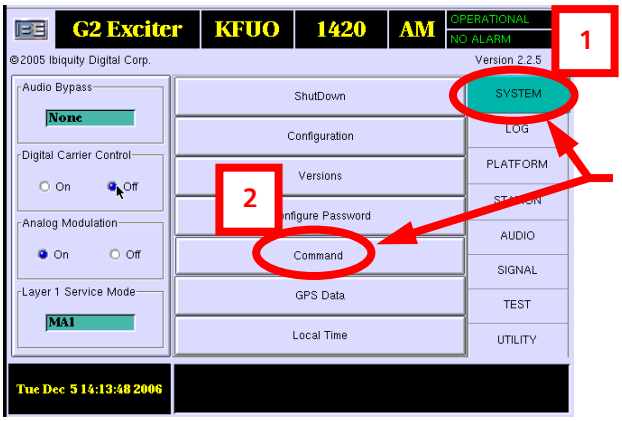
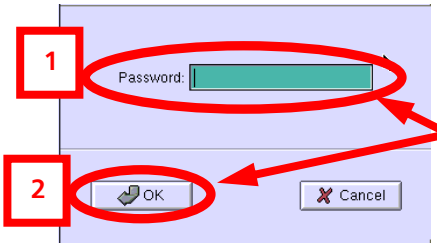


Figure 1 – Command Menu

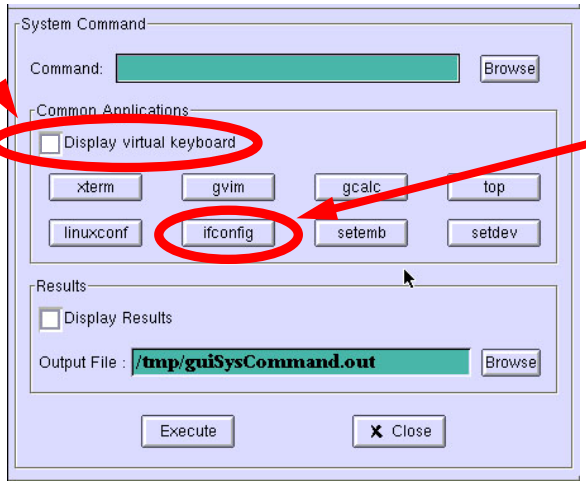


Step 2 – Enter your password and select **OK .**

The factory default password is "password" (all lowercase).

Figure 2 – Password Menu

Uncheck the virtual keyboard box as shown



Step 3 – Select **ifconfig**

Figure 3 – ifconfig Menu

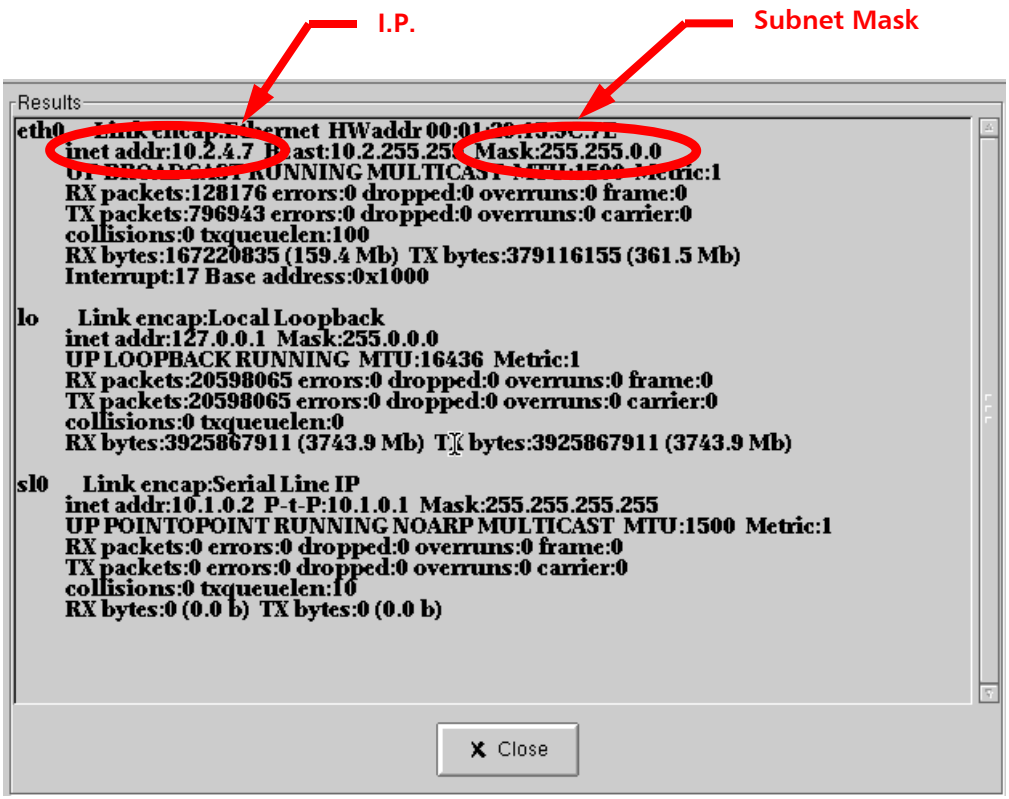


Figure 4 – Record I.P. and Subnet Mask

I.P. _____

Subnet Mask _____

3.2. Record the Station Information

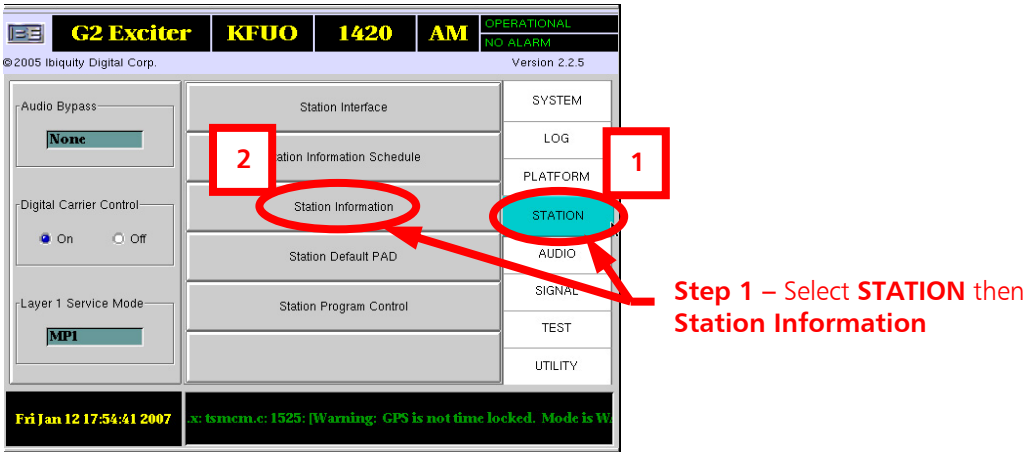
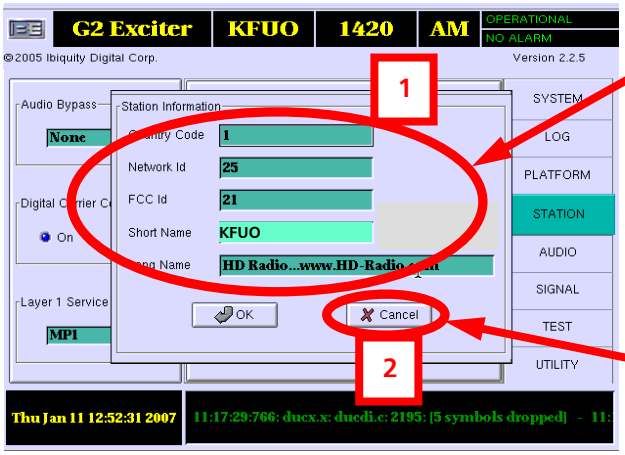


Figure 5 – Station Information



Country Code _____

Network I.D. _____

FCC I.D. _____

Short Name _____

Long Name _____

Figure 6 – ASi 10 Station Information Menu

NOTE: Window may not exist in version 2.4.2

3.3. Record the I/Q Scale Factor

Step 1 - When the ASi GUI appears, select **SIGNAL**, then **I/Q Scale Factor**.

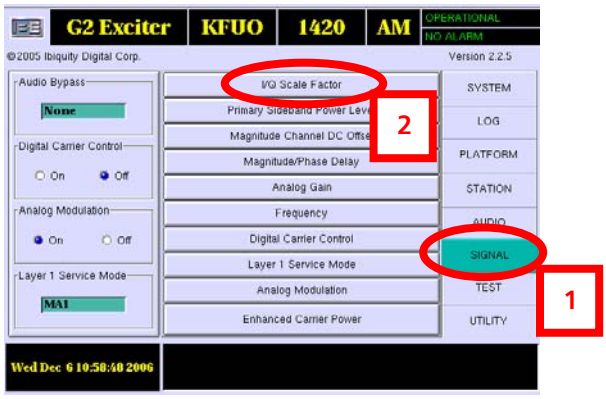


Figure 7 – I/Q Scale Factor

Step 2 – Record the **I/Q Scale Factor.** It should be set to the default of **12000.0**.

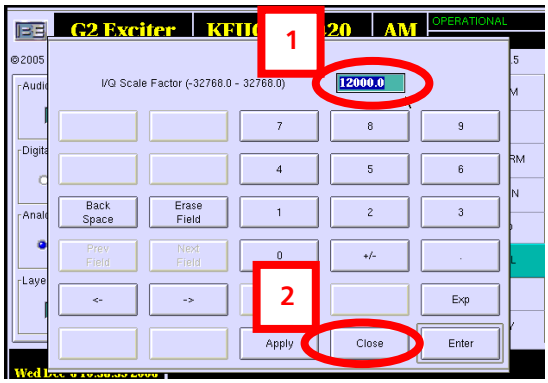


Figure 8 – I/Q Scale Factor

I/Q Scale Factor _____

3.4. Record Sideband Level Settings

Step 1 - Select **SIGNAL**, then **Primary Sideband Power Level**.

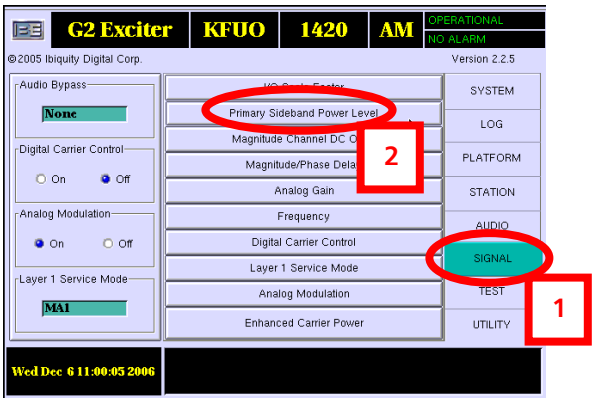


Figure 9 – Primary Sideband Power Level

Step 2 – Record the **Primary Sideband Power** Level settings. They should be set to the factory defaults.

The default is **0.000 dB** for both **Upper** and **Lower Sideband Scaling**.

The default **Scaling Increment** is **1.000 dB** for both.

Lower Sideband Scaling _____

Scaling Increment _____

Upper Sideband Scaling _____

Scaling Increment _____

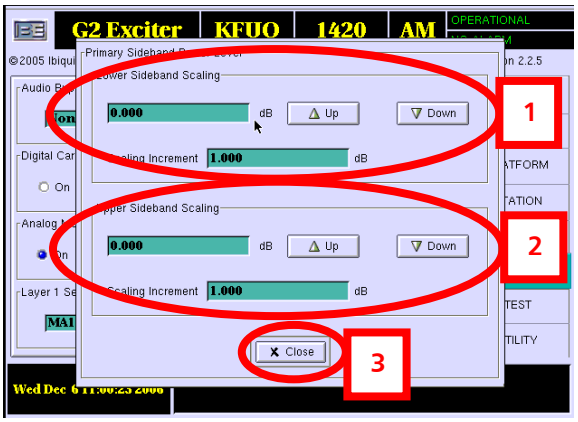


Figure 10 – Primary Sideband Power Level

3.5. Record Magnitude DC Offset

Step 1 - Select **SIGNAL**, then **Magnitude Channel DC Offset**.

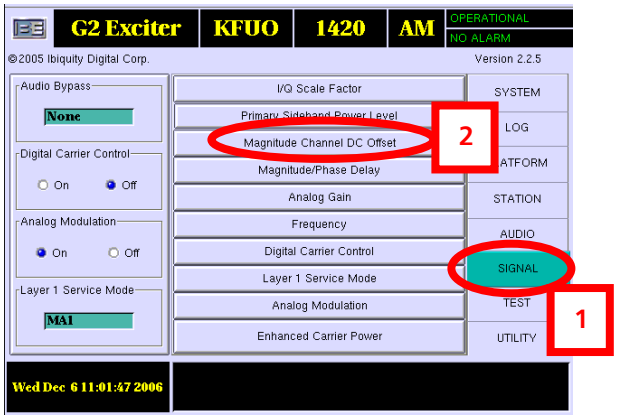


Figure 11 – Magnitude Channel DC Offset

Step 2 – Record the Magnitude DC Channel. It should be set to the default of **-1.0000.**

Magnitude DC Channel _____

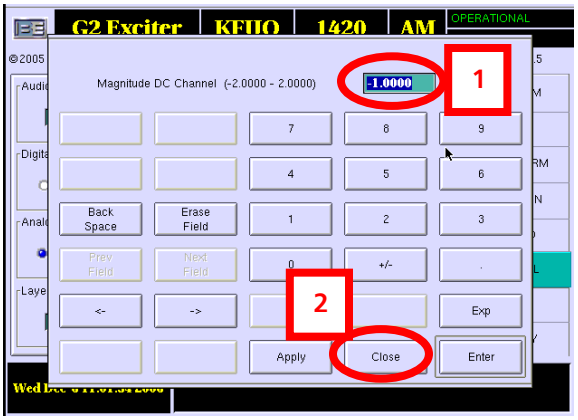


Figure 12 – Magnitude Channel DC Offset

3.6. Record the Magnitude / Phase Delay

Step 1 - Select **SIGNAL**, then **Magnitude / Phase Delay.**

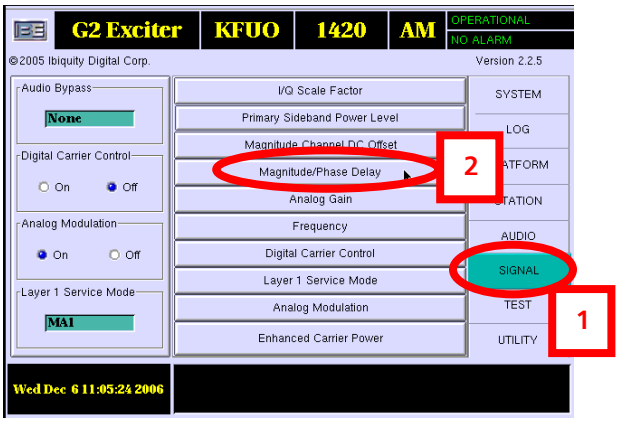


Figure 13 – Magnitude / Phase Delay

Step 2 – Record the **Magnitude / Phase Delay** values.

Day _____

Night _____

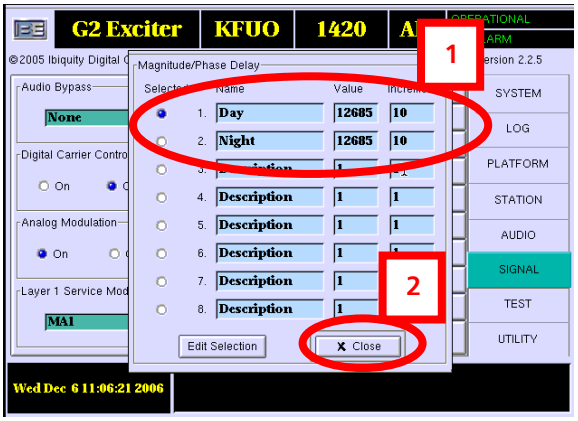


Figure 14 – Magnitude / Phase Delay

3.7. Record Analog Gain

Step 1 - Select **SIGNAL**, then **Analog Gain**.

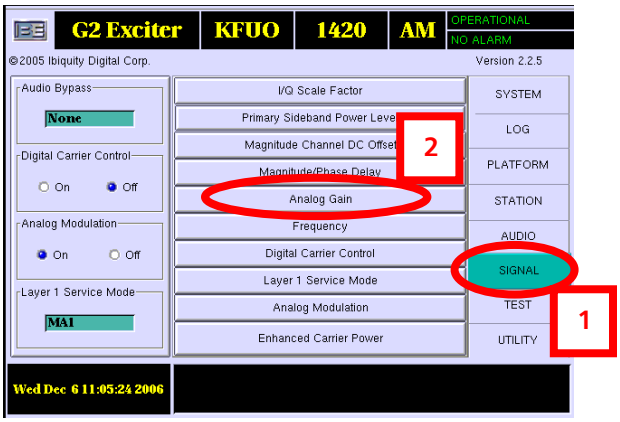


Figure 15 – Analog Gain

Step 2 – Record the **Analog Gain.** The default is **1.000**.

Analog Gain _____

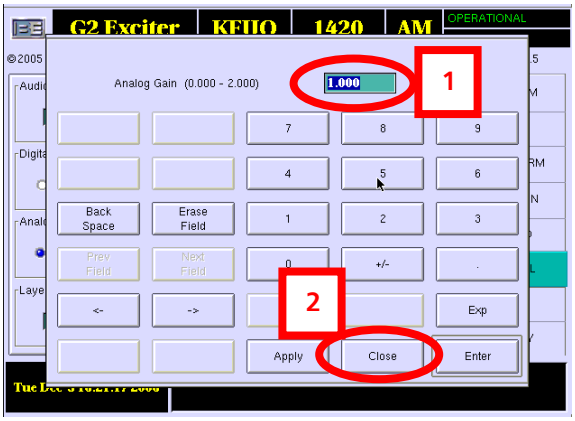


Figure 16 – Analog Gain

3.8. Record Frequency

Step 1 - Select **SIGNAL**, then **Frequency**.

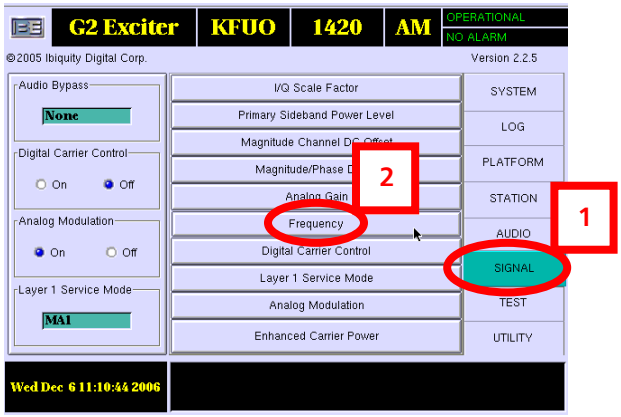


Figure 17 – Frequency

Step 2 – Record the **Frequency**.

Frequency _____

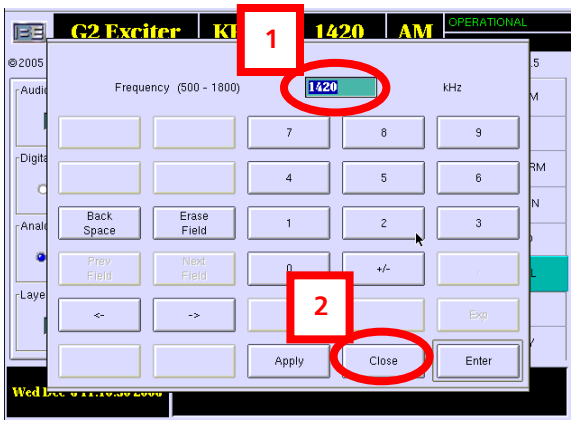


Figure 18 – Frequency

3.9. Record Enhanced Carrier Power

Step 1 - Select **SIGNAL**, then **Enhanced Carrier Power**.

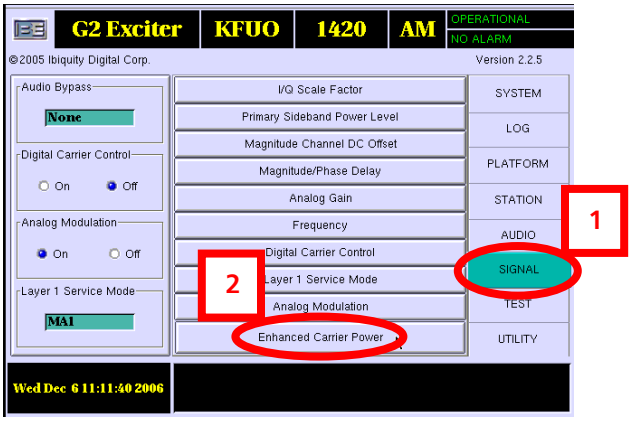


Figure 19 – Enhanced Carrier Power

Step 2 – Record the **Enhanced Carrier Power Level**. The default is **Normal**.

Enhanced Carrier Power Level _____

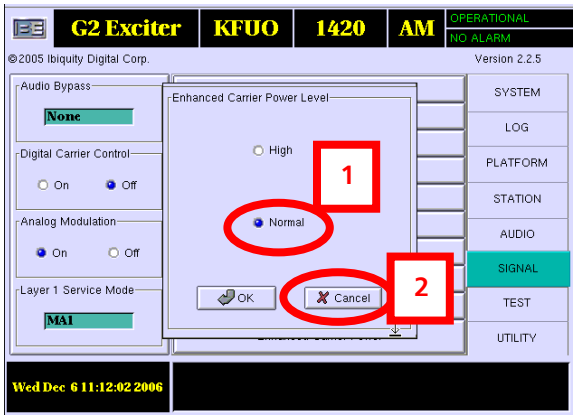


Figure 20 – Enhanced Carrier Power Level

3.10. Record Digital Carrier Control and Analog Modulation

3.11. Record Analog Audio Bandwidth

Step 1 - Select **AUDIO**, then **Analog Audio Bandwidth.**

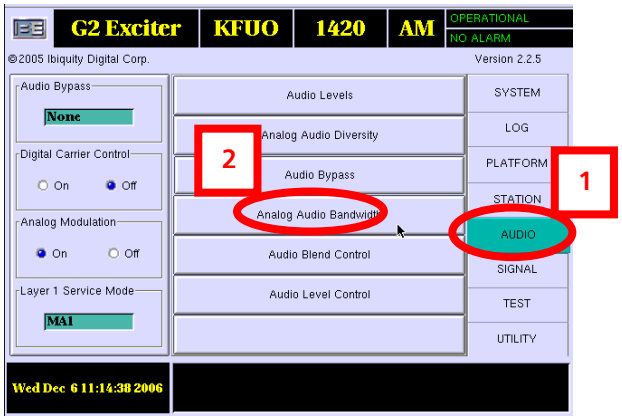


Figure 21 – Analog Audio Bandwidth

Step 2 – Record the **Analog Audio Bandwidth**.

Analog Audio Bandwidth _____

3.12. Record Analog Audio Diversity Delay

Step 1 - Select **AUDIO**, then **Analog Audio Diversity.**

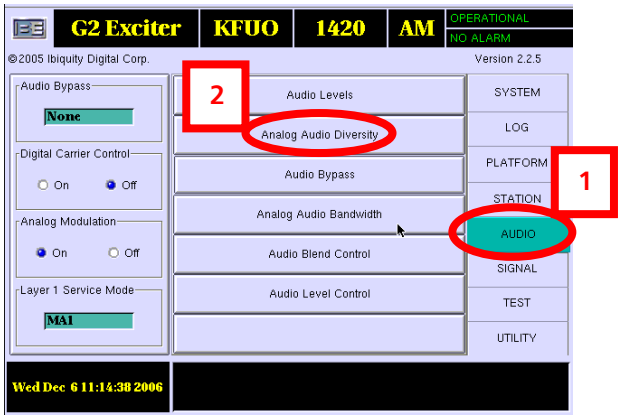


Figure 21 – Analog Audio Diversity

Step 2 – Record the **Analog Audio Diversity Delay**.

Analog Audio Diversity Delay _____

3.13. Record Audio Level Control

Step 1 - Select **AUDIO**, then **Audio Level Control.**

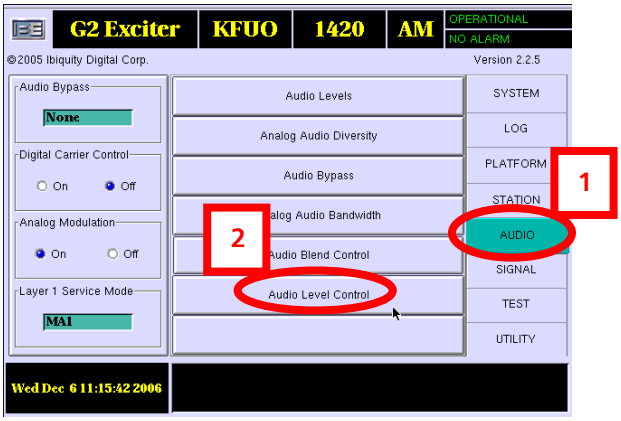


Figure 23 – Audio Level Control

Step 2 – Record the **Audio Level**.

Audio Level _____

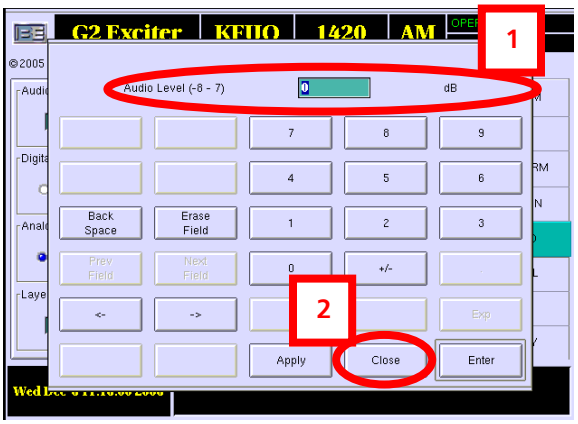


Figure 24 – Audio Level Control

4. Put the ASi into Bypass Mode

IMPORTANT! Before proceeding with the software upgrade of the ASi, it is necessary to put the ASi and Transmitter into Bypass Mode if you wish to broadcast an AM Only signal during the software upgrade. This section only applies to A & E series AM products. The 4MX series will auto switch to AM mode upon loss of the HD input signal from the ASi 10.

4.1. Put the ASi in Bypass Mode

Step 1 - Select **AUDIO**, then **Audio Bypass**

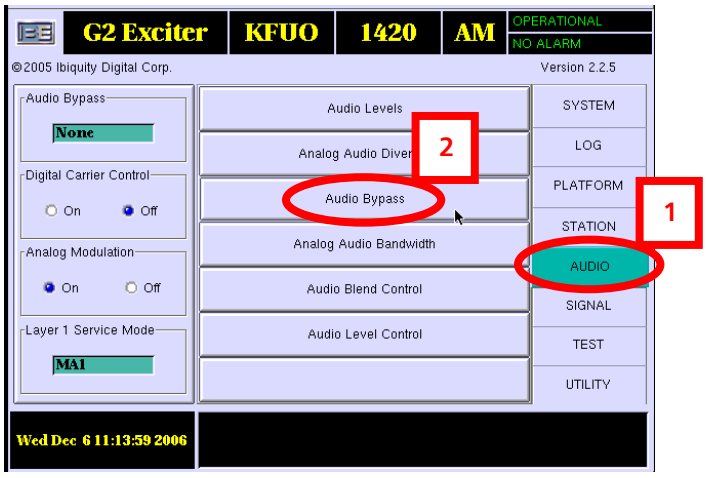


Figure 25 – Audio Bypass

Step 2 - Select **Audio-A** and **Audio-B** Bypass **ON** buttons. Next, ensure that the **Auto Startup** and **Auto Shutdown** boxes are checked, then select **OK**.

With **Audio Bypass** set to **ON**, the system will automatically route audio from the AES AM ANALOG audio processor directly to the transmitter.

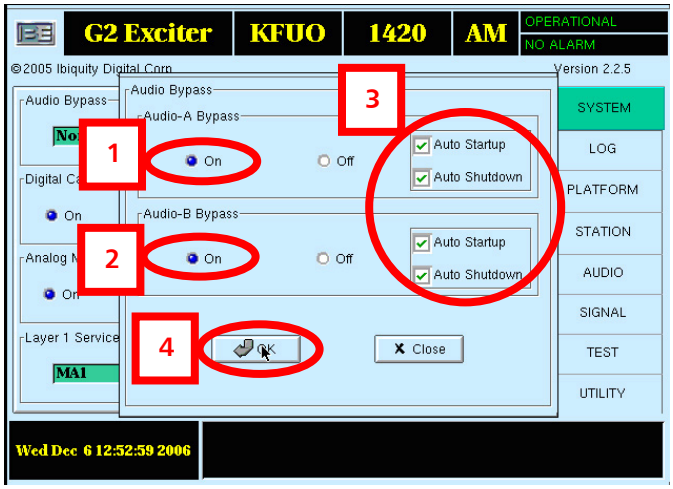


Figure 26 – Audio Bypass

4.2. Disconnect the AM Phase Out Cable from the ASi

After the ASi has been put into Bypass Mode, disconnect the **AM PHASE OUT** cable from the rear of the ASi.

Figure 27 – Disconnect AM PHASE OUT Cable

4.3. Disconnect the Audio Bypass Cable from the ASi

Disconnect the **AUDIO BYPASS** cable from the rear of the ASi.

Figure 28 – Disconnect AUDIO BYPASS Cable

4.4. Clear the Exciter Fault on the Transmitter

An Exciter fault will be displayed on the front panel of the transmitter controller. Press the reset button to clear the fault.

5. Upgrading ASi 10 Software

NOTE: On ASi 10 units that have an ITOX Brand Motherboard, a keyboard and mouse MUST both be connected to the appropriate jacks on the rear of the ASi 10 before the software upgrade process is started!

To determine what type of Motherboard is installed in the ASi 10, go to the Main GUI and select **System**, then **Versions** and note the Motherboard type.

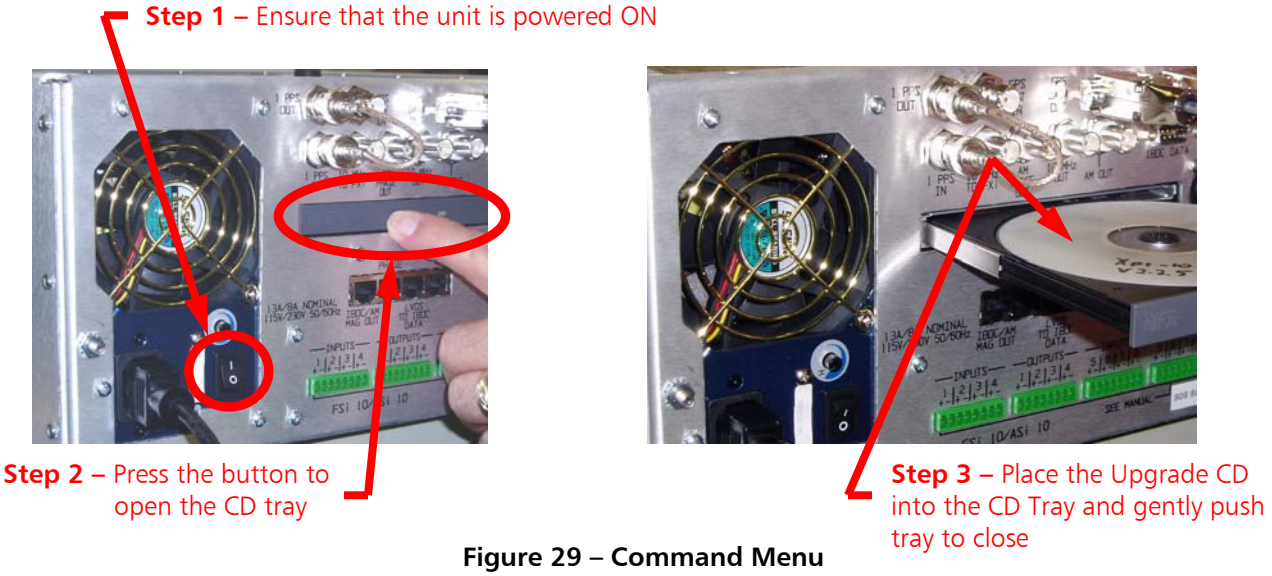


Figure 29 – Command Menu

Step 4 – On the ASi Main GUI, go to **SYSTEM** then **Shutdown.** Next, select **OS Restart**, then **OK.** The ASi will now safely power down and boot from the upgrade CD.

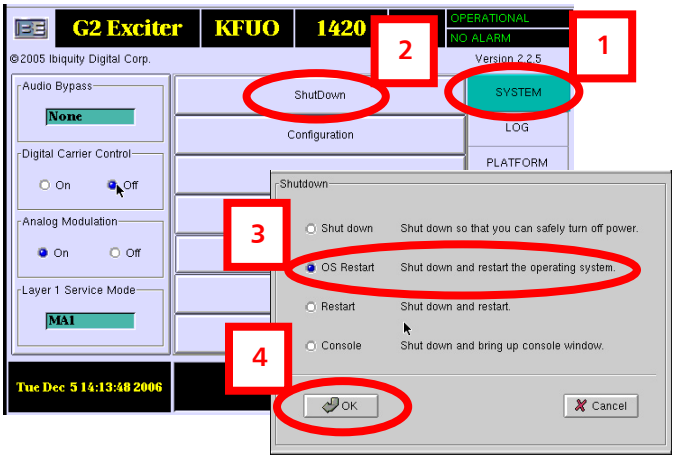


Figure 30 – OS Restart

Step 5 – The ASi 10 will boot-up from the CD and the Software Upgrade Installation will begin.
Step 6 – When the Software Upgrade Installation is complete, the CD tray will open.
Step 7 – Remove the upgrade CD and close the tray.
Step 8 – Once the ASi 10 boots up, verify the following:

- ☐ Version 4.3.2 should be displayed on the menu as shown below
- ☐ Operational block should be GREEN
- ☐ The ALARM block will be RED (since GPS is not connected or Locked at this point)
- ☐ The Alarm Log at the bottom of the screen should only contain warnings relating to GPS.

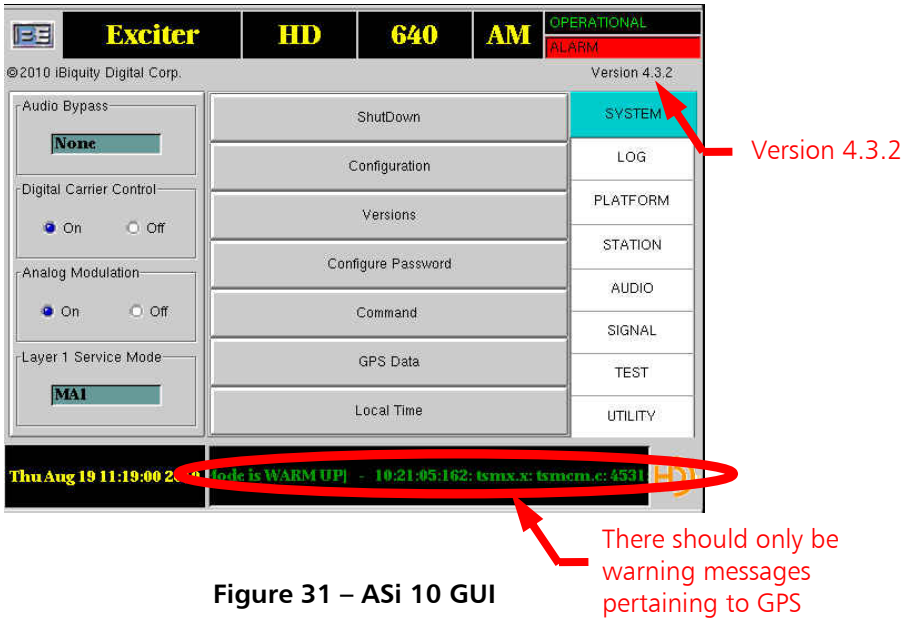
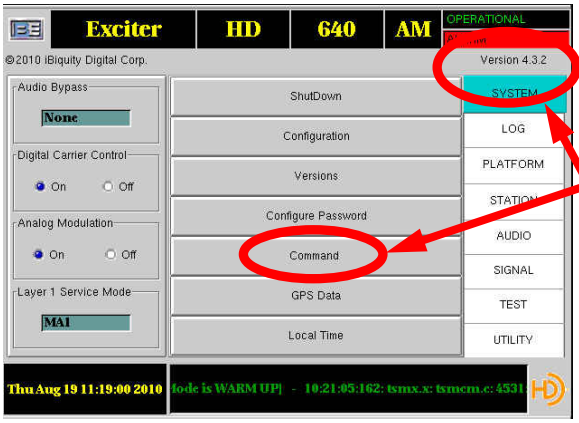


Figure 31 – ASi 10 GUI

Step 9 – With no disk in the drive, perform an **OS RESTART** as directed in step 4 above.

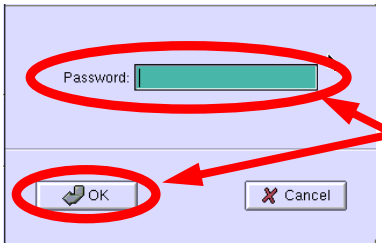
6. Enter Critical System Settings

6.1. Enter the IP Address and Subnet Mask of the ASi 10



Step 1 – Select **System** -> **Command**

Figure 32 – Command Menu

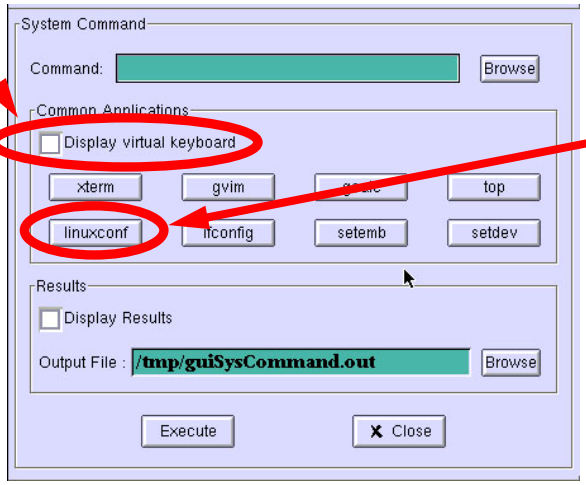


Step 2 – Enter your password if requested and select **OK .**

The factory default password is "password" (all lowercase).

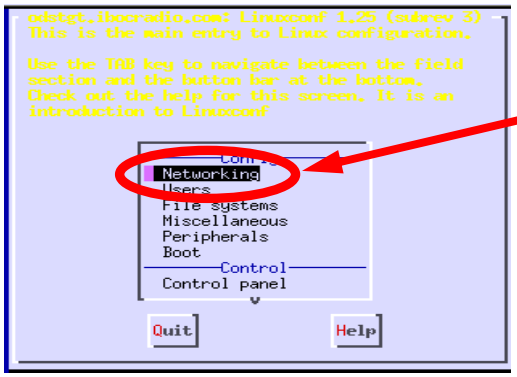
Figure 33 – Password Menu

Uncheck the virtual keyboard box as shown



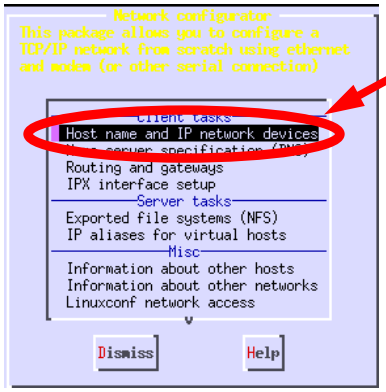
Step 3 – Select **linuxconf**

Figure 34 – linuxconf Menu



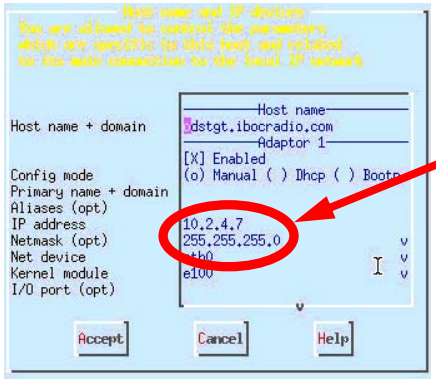
Step 4 – Select **Networking** then **<Enter>** on the keyboard

Figure 35 – Networking Menu



Step 5 – Select **Host Name and IP Network Devices** then **<Enter>** on the keyboard

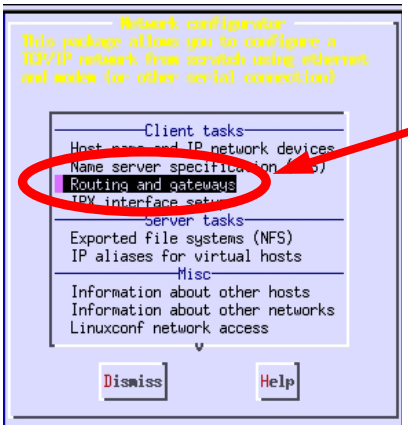
Figure 36 – Host name and IP network devices Menu



Step 6 – Use arrows to go to the XPi 10's I.P. Address and Netmask. Change both to the desired values.

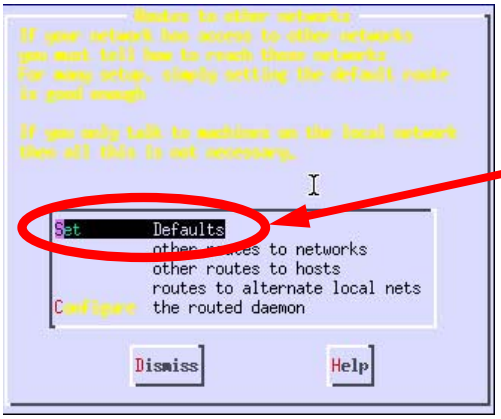
Hit **<TAB>** to accept (Accept will then highlight), type **A**, then press **<ENTER>** on the keyboard.

Figure 37 – Networking Sub-Menu



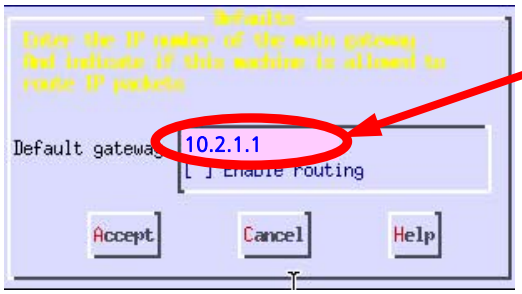
Step 7 – If you are using a Gateway, select **Routing and Gateways** then **<Enter>** on the keyboard

Figure 38 – Client , Server, and Misc Tasks Menu



Step 8 – Select **Defaults** then **<Enter>** on the keyboard

Figure 39 – Client , Server, and Misc Tasks Menu



Step 9 – Enter the Gateway Address for your network (if applicable)

Figure 40 – Gateway Menu

Step 10 - Press **<TAB>** , type **A** to Accept, then press **<Enter>** on the keyboard.
Step 11 - Press **<TAB>** , type **D** to Dismiss, then press **<Enter>** on the keyboard.
Step 12 - Press **<TAB>** , type **Q** to Quit, then press **<Enter>** on the keyboard.
Step 13 - Press **<TAB>** twice to highlight **Do It**, type **D**, then press **<Enter>** on the keyboard.
Step 14 - The System Command window should now be displayed press **<CLOSE>**

6.2. Configure the Station Information

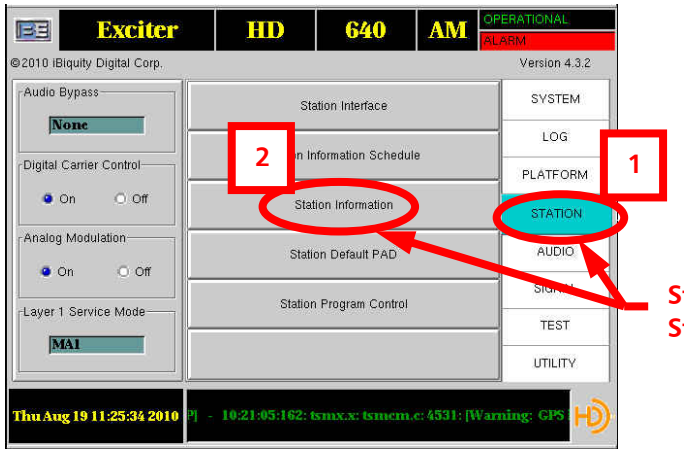


Figure 41 – Station Information

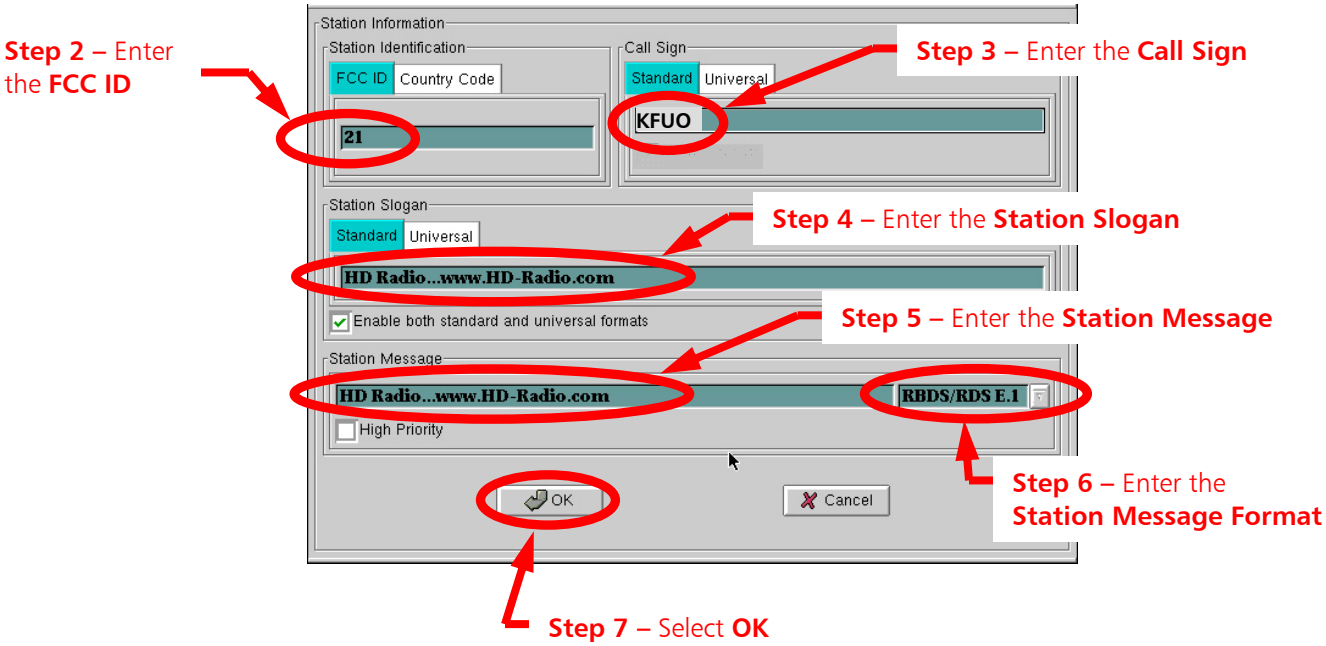


Figure 42 – Station Information Menu

6.3. Enter I/Q Scale Factor

Step 1 - When the ASi GUI appears, select **SIGNAL**, then **Signal Configuration**.

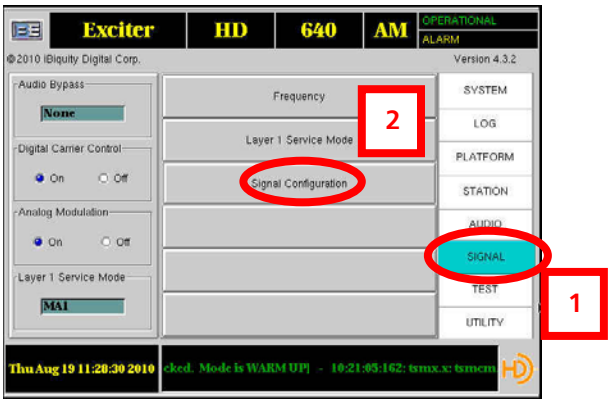


Figure 43 – I/Q Scale Factor

Step 2 – Enter the previously recorded value in the pop-up keyboard. The default **I/Q Scale Factor** is **12000.0**. Select **Apply**, the **Enter** on the keyboard.

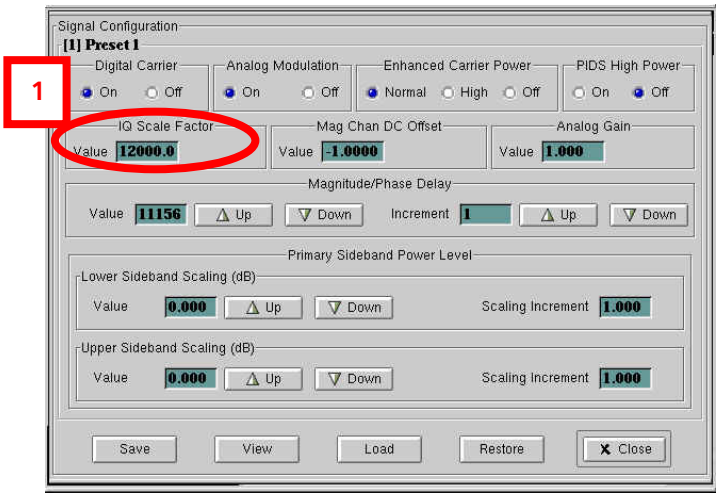


Figure 44 – I/Q Scale Factor

6.4. Enter Sideband Level Settings

Step 1 – Adjust the **Primary Sideband Power Level**.

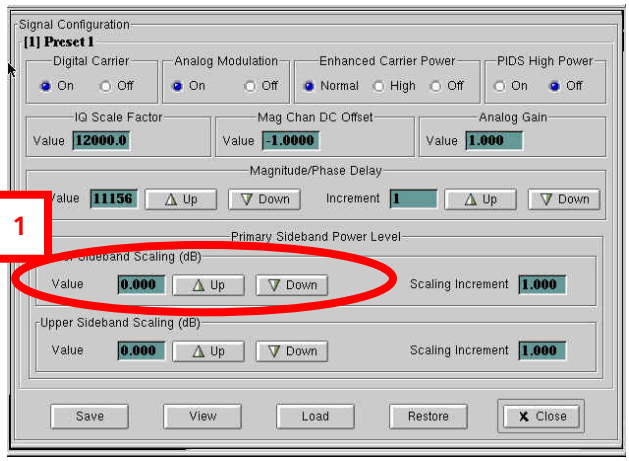


Figure 45 – Primary Sideband Power Level

Step 2 – Enter the previously recorded values using the keyboard or up/down arrows. Select Apply, then Enter on the keyboard. The default Primary Sideband Power Level settings are as follows.

The default is **0.000 dB** for both **Upper** and **Lower Sideband Scaling**.

6.5. Enter Magnitude DC Offset

Step 1 – Enter the **Magnitude Channel DC Offset** using the pop-up keyboard, select Apply and Enter on the keyboard.

Figure 46 – Magnitude Channel DC Offset

Step 2 – Enter the previously recorded values. The **Magnitude DC Channel** default is **-1.0000** as shown. If necessary, use the keypad to change, select **Apply**, then **Enter**.

6.6. Enter Magnitude / Phase Delay

Step 1 - Enter the **Magnitude / Phase Delay** value using the pop-up keyboard. Select **Apply**, then **Enter** on the keyboard.

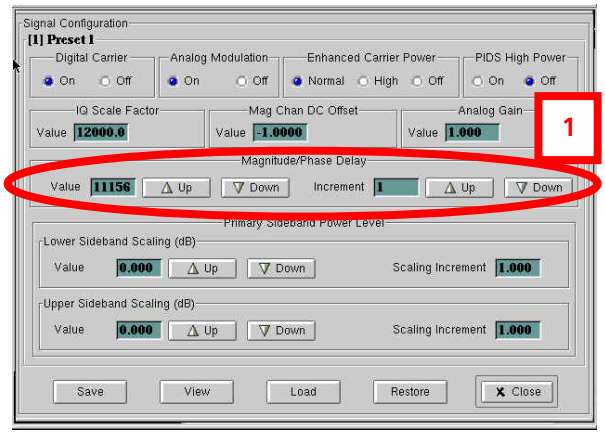


Figure 47 – Magnitude / Phase Delay

Use one of the three methods available to adjust the Mag/Phase delay;

1. Using a spectrum analyzer (most desired) and finding the value resulting in the best mask performance.
2. Using the default value supplied in the upgrade.
3. Modifying your previous value ad described below:

The 4.3.2 upgrade will have a default value of 12713. You may chose to use this value, or if upgrading from v2.4.2 add 59 to the value previously recorded.

Previously Recorded Value + 59 = New Value

6.7. Enter Analog Gain

Step 1 - Enter the previously recorded **Analog Gain** value using the pop-up keyboard. Select **Apply**, then **Enter** on the keyboard.

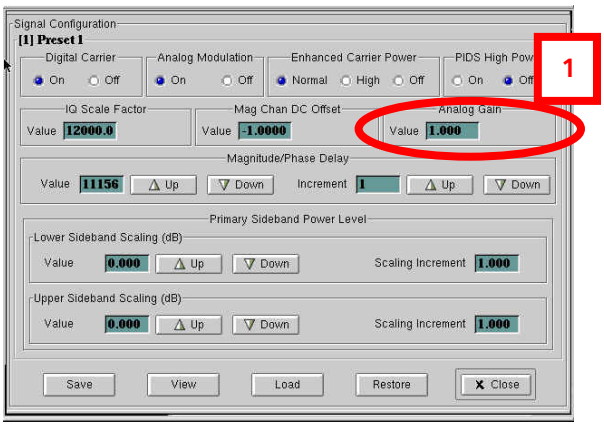


Figure 48 – Analog Gain

6.8. Enter Enhanced Carrier Power

Step 1 - Enter the previously recorded **Enhanced Carrier Power** value using the pop-up keyboard. Select **Apply**, then **Enter** on the keyboard.

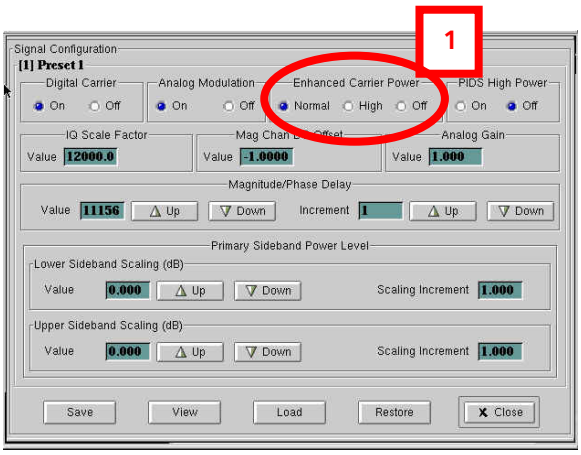


Figure 49 – Enhanced Carrier Power

6.9. Enter Frequency

Step 1 - Select **SIGNAL**, then **Frequency**.

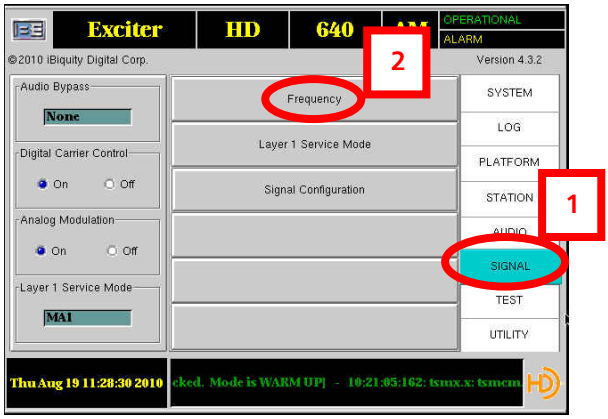


Figure 50 – Frequency

Step 2 – Enter the Frequency matching that of the AM Transmitter exactly.

PLEASE NOTE: If the frequency is set differently in the ASi than the transmitter, damage to the transmitter's PA Modules may result as the PA Modules contain frequency dependent components.

If necessary, use the keypad to change the frequency, select **Apply**, then **Enter**.

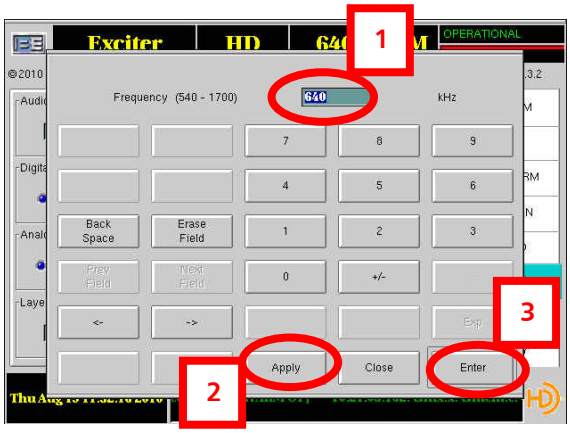


Figure 51 – Frequency

Step 3 – A message will now appear stating "**The system will now restart tuned to XXX kHz, Continue Yes or No?**"

Verify that the frequency matches that of the transmitter, then select **Yes**.

6.10. Enter Analog Audio Bandwidth

Step 1 - Select **AUDIO**, then **Analog Audio Bandwidth.**

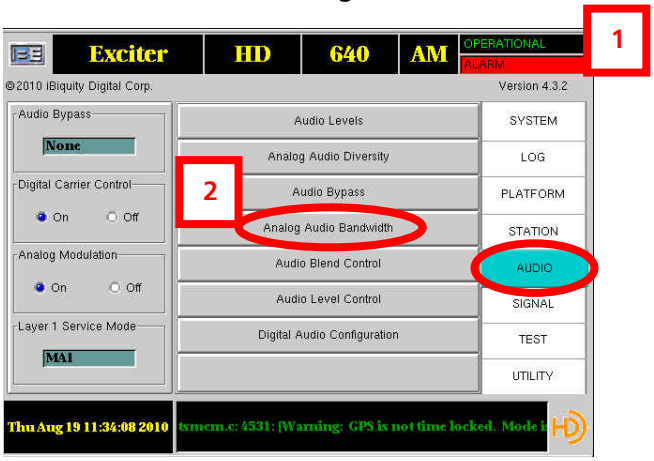


Figure 52 – Analog Audio Bandwidth

Step 2 – Enter the previously recorded value. The default is **5 kHz Internal**.

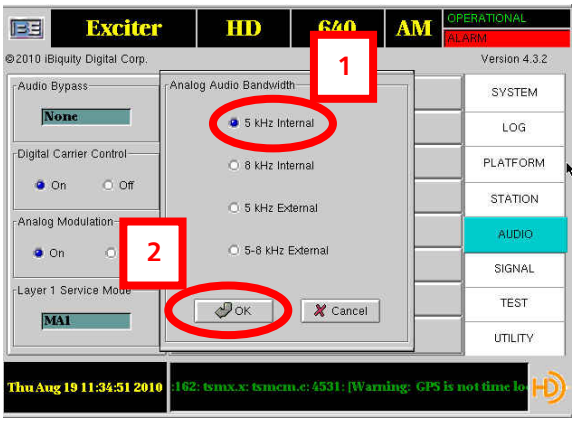


Figure 53 – Analog Audio Bandwidth

6.11. Enter Audio Level Control

Step 1 - Select **AUDIO**, then **Audio Levels.**

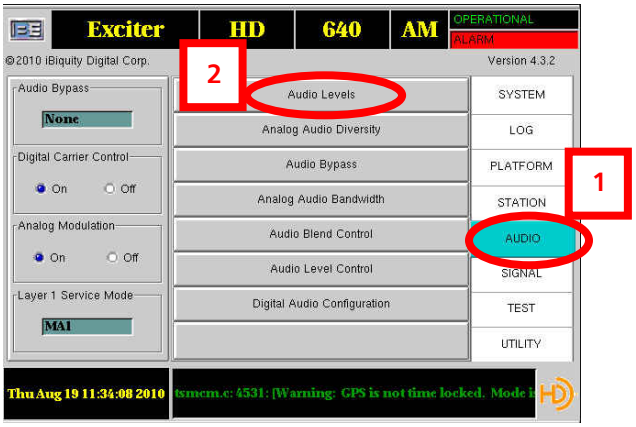


Figure 54 – Audio Level Control

Step 2 – Enter the previously recorded value. The default is **0**.

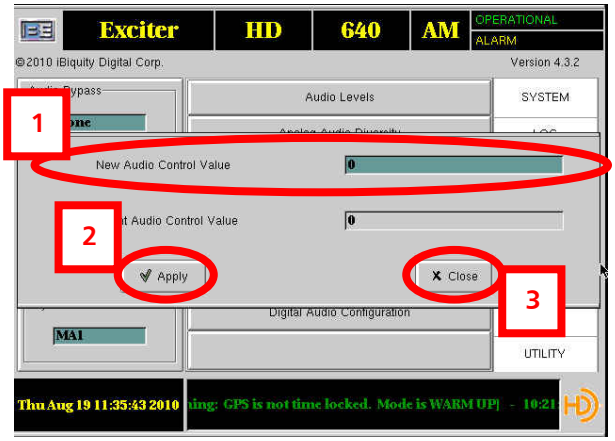


Figure 55 – Audio Level Control

6.12. Set Watchdog to Enabled

Step 1 - Select **STATION**, then **Station Interface.**

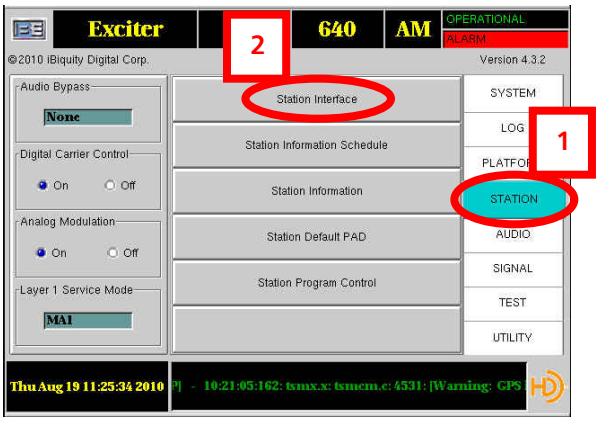


Figure 56 – Station Interface

Step 2 – Ensure that **Watchdog Enable** is selected. When Watchdog is Enabled, the Watchdog timer on the Station Interface Card (SIC) will be enabled. When it is enabled, the SIC will monitor the motherboard. If there is no activity for 1 second the host processor is assumed to be locked up. The Audio Bypass relays will be set to Bypass, the system operational relay will be opened, and the exciter will be re-booted. Enabling the Watchdog circuit may prevent a "DEAD AIR" situation if the motherboard or host processor locks up on the ASi.

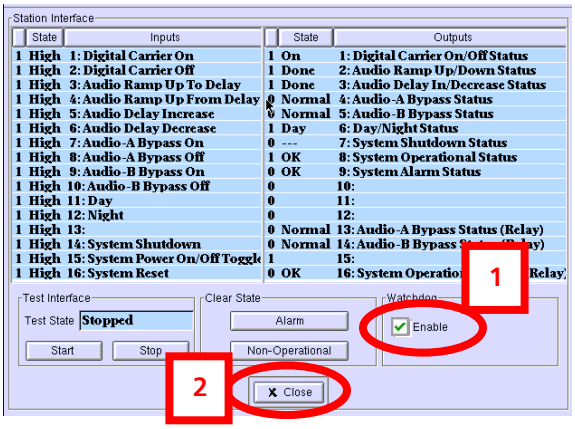


Figure 57 – Station Interface

6.13. Sync Local Time to GPS

Step 1 – On the Main GUI Menu select the **Date / Time** window.

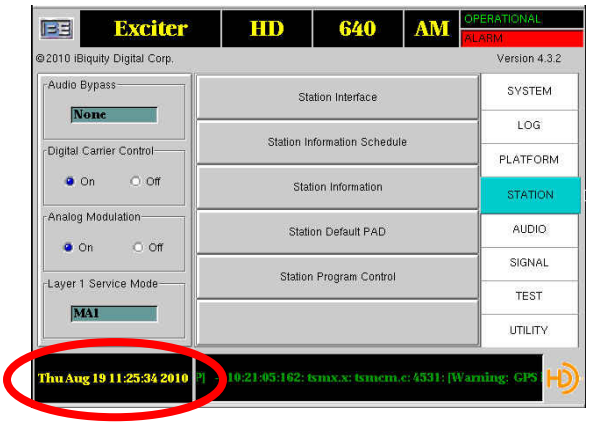


Figure 58 – Date / Time

Step 2 – Select the **Sync Local Time to GPS** check box, the select **OK**.
Next, when the "It is recommended that system be restarted to expedite GPS time synchronization" menu appears, select **OK**.

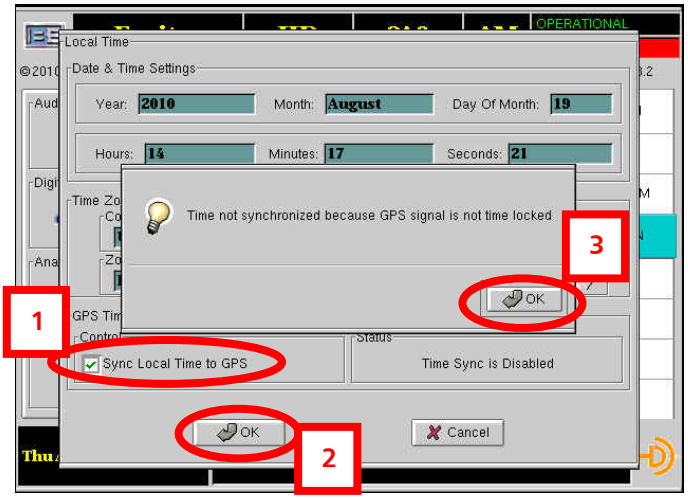


Figure 59 – Sync Local Time to GPS

7. Ensure the ASi is in Bypass Mode

This section only applies to A & E series AM products. The 4MX series will auto switch back to HD mode when the ASi 10 becomes operational.

Step 1 - Select **AUDIO**, then **Audio Bypass**

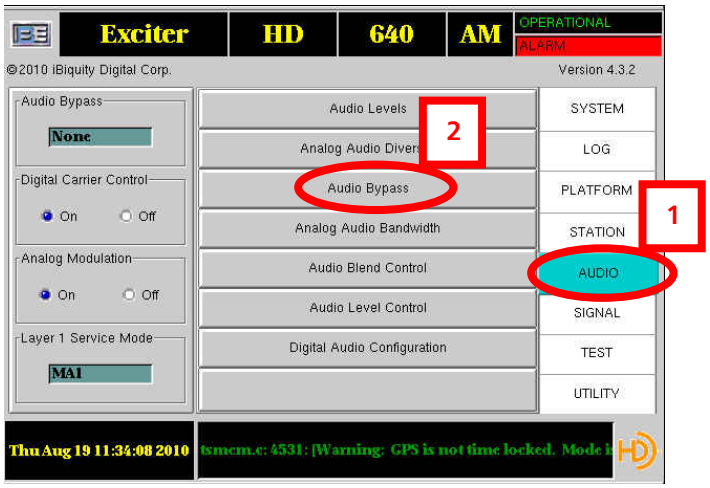


Figure 60 – Audio Bypass

Step 2 - Select **Audio-A** and **Audio-B** Bypass **ON** buttons. Next, ensure that the **Auto Startup** and **Auto Shutdown** boxes are checked, then select **OK**.

With **Audio Bypass** set to **ON**, the system will automatically route audio from the AES AM ANALOG audio processor directly to the transmitter.

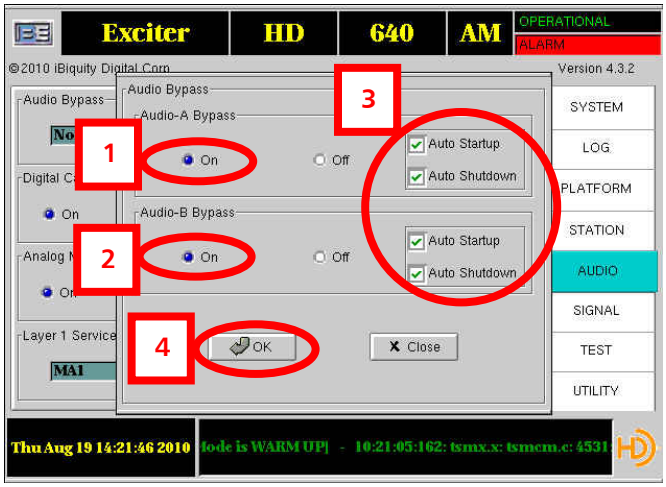


Figure 61 – Audio Bypass

8. Connect AM PHASE OUT and AUDIO BYPASS Cables to the ASi

8.1. Connect the AM Phase Out Cable to the ASi

Connect the **AM PHASE OUT** cable to the rear of the ASi.

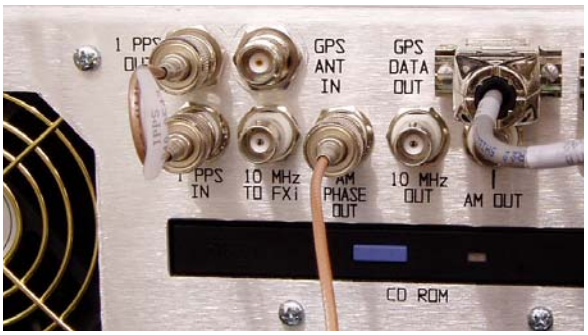


Figure 62 – Connect the AM PHASE OUT Cable

8.2. Connect the Audio Bypass Cable to the ASi

Connect the **AUDIO BYPASS** cable to the rear of the ASi.

Figure 63 – Connect the AUDIO BYPASS Cable

9. Take the ASi out of Bypass Mode

Step 1 - Select **AUDIO**, then **Audio Bypass**

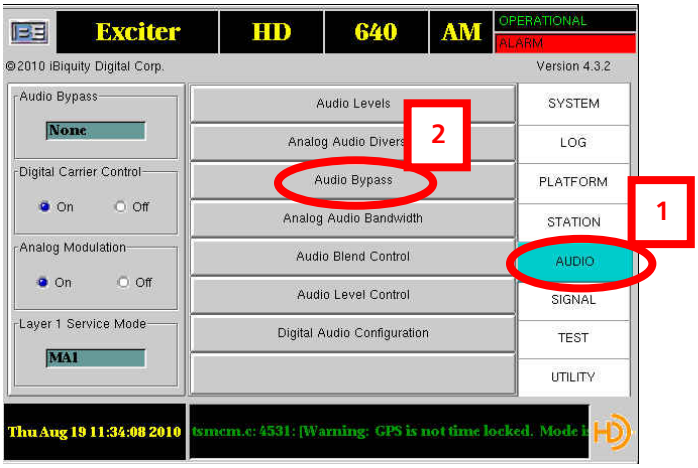


Figure 64 – Audio Bypass

Step 2 - Select **Audio-A** and **Audio-B** Bypass **OFF** buttons.

With **Audio Bypass** set to **OFF**, audio from the AES AM ANALOG audio processor will be routed through the ASi.

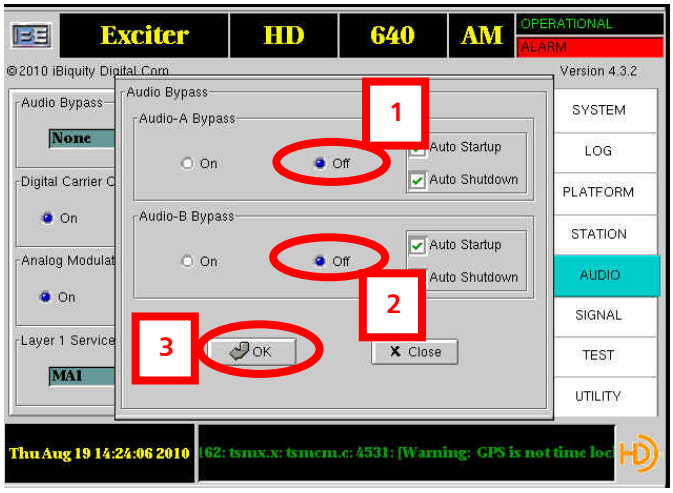


Figure 65 – Audio Bypass

10. The System Should Now be Operational

11. Additional Documentation

Reference B.E. document "**AM Transmitter Preparation and ASi 10 Setup for HD Operation Application Guide, 597-0125-001**" for additional information.

12. RF Technical Services Contact Information

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