



Broadcast Electronics.

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## **FXi 60/250 Exciter w/Exgine and XPi 10 Exporter Quick Installation Guide**

597-0542-XM3 Revision G  
6/16/11

## **FXi 60/250 Exciter w/Exgine and XPi 10 Exporter Quick Installation Guide**

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## 1. 2<sup>nd</sup> Generation HD Radio™ System Architecture

Broadcast Electronics' XPi 10 Exporter and FXi 60/250 Exciter (w/Exgine card) together enable 2<sup>nd</sup> Generation HD Radio™ System Architecture.

The main function of the XPi 10 Exporter is to receive audio and data from the IDi 20 Data Importer and/or other audio processing equipment, then compress this audio and data for delivery via ethernet to the Exgine card in the FXi 60/250 Exciter.

The Exgine card receives the compressed ethernet audio and data, and then creates OFDM data carriers for HD Radio™. FM signals are then added to the OFDM carriers by the Exciter for reception by HD receivers.

The XPi 10 Exporter would normally be installed at the studio site along with all of the audio processing equipment and the FXi 60/250 Exciter (w/Exgine) would normally reside at the transmitter site as shown in the Figure 1 block diagram. Under this configuration, the Studio to Transmitter Link may be UNI-DIRECTIONAL (for additional information on this configuration type, see Typical HD Radio™ System Connection Diagrams - Figures 2 thru 5 ).

The XPi 10 Exporter along with the audio processing equipment may be installed at the transmitter site **ONLY** if the Studio to Transmitter Link between the IDi 20 Data Importer and the XPi 10 Exporter is BI-DIRECTIONAL (for additional information on this configuration type, see Typical HD Radio™ System Connection Diagrams - Figures 6 thru 9).

This document specifically describes the Installation and Setup of the FXi 60/250 (w/Exgine) and the XPi 10 Exporter.

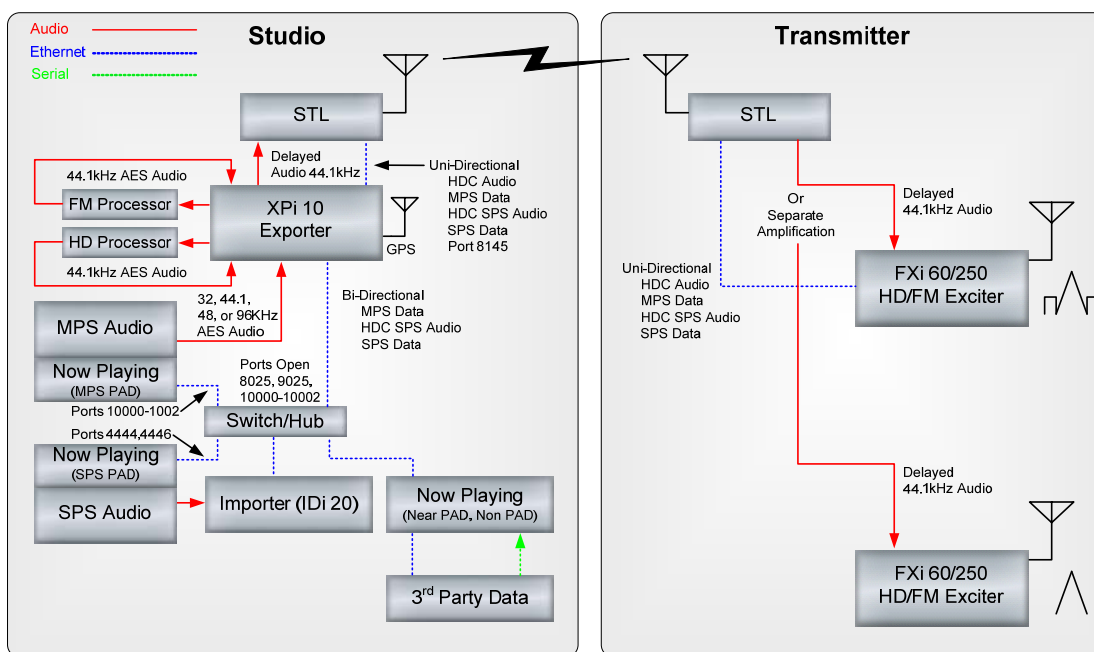


Figure 1 – 2<sup>nd</sup> Generation HD Radio™ System Architecture (Normal Installation)

## **2. Prepare for Installation of the FXi 60/250 Exciter (w/Exgine) and the XPi 10 Exporter**

### **2.1. System Cabling (What is Supplied by B.E. and What is NOT)**

The Installation Kits for the FXi 60/250 Exciter (w/Exgine) and XPi 10 Exporter contain the necessary System Interconnect Cables for the Audio Paths as well as External Jumper Cables for both the FXi and XPi (jumpers are removed at the factory before shipment). These External Jumper Cables MUST be installed on the FXi and XPi prior to operation.

Spare XLR connectors are supplied for STL connections but the AES/EBU cable for such connections is not. The Installation Kits do not contain the Ethernet cables, Ethernet switches, hubs, or RF Output cables.

Refer to the HD Radio™ System Interconnect Diagrams for additional information regarding the type of system you are implementing as well as cable identification.



## 2.2. Verify FXi 60/250 Exciter (w/Engine) Shipping Contents

**NOTE: All items are Qty (1) unless noted otherwise.**

- ☐ 909-9060, FXi 60 Exciter (w/Engine)
  - or -
  - ☐ 909-9250, FXi 250 Exciter (w/Engine)
  - ☐ 979-0540, Kit, Installation, Digital Exciter
    - ☐ 417-0291, Plug, 25-Pin D connector with solder cups
    - ☐ 417-0910, Kit, Backshell for 9-pin D connector
    - ☐ 417-2510, Kit, Backshell for 25-pin D connector
    - ☐ 417-3288, Adapter, BNC Jack to N plug, 50 Ohm
    - ☐ 420-0007, Screw, 12-24 X .75", SST, Truss Head, Qty (4)
    - ☐ 420-0710, Screw, 10-32 X .625", SST, Truss Head, Qty (4)
    - ☐ 421-0002, Speed Nut, 12-24, Qty (4)
    - ☐ 550-111, Connector, 9-pin D
    - ☐ 682-0001, AC Line Cord
    - ☐ 682-0003, AC Line Cord, European, Right Angle
    - ☐ 829-4217, XLR Connector, Male, Qty (3)
  - ☐ 979-0600-001, Kit, Installation, FXi 60/250 Exciter (w/Engine)
    - Miscellaneous Items:
      - ☐ 417-0910, Kit, Backshell for 9-pin D Connector
      - ☐ 418-1550-010, 10 Pin Cage Clamp Connector, Qty (2)
      - ☐ 550-111, 9-pin D connector
      - ☐ 829-4216, Plug, Female XLR

System Interconnect Cables (system configuration will determine which of these are used):

- ☐ 949-0600-101, Assy, Cable, FXi (FM AES/EBU) to STL
- ☐ 949-0600-102, Assy, Cable, FXi (FM AES/EBU) to FM Audio Processor (OUT)
- ☐ 949-0600-103, Assy, Cable, FXi (FM AES/EBU) to XPi (FM AES OUT TO STL/TX)

External Jumper Cable MUST be installed on the FXi 60/250 prior to operation:

- ☐ 949-0613, Assy, Cable, Jumper, FXi (10MHz IN) to (10MHz OUT)

**NOTE: If you are upgrading an existing FXi 60/250 Exciter for Engine, you will also receive the following:**

- ☐ 597-0545 Manual, FXi 60 / 250 Engine Upgrade
- ☐ 919-0600 Assy, PCB, Engine
- ☐ 959-0600 Assy, Sub, Engine, Ethernet and I/O
  - ☐ 919-0601 Assy, PCB, I/O
  - ☐ 919-0602 Assy, PCB, Ethernet
  - ☐ 949-0600 Kit, Cable, Engine Upgrade
    - ☐ 471-5369 Cover Plate
    - ☐ 949-0610 Assy, Cable, Serial to Engine
    - ☐ 949-0611 Assy, Cable, Ethernet to Engine
    - ☐ 949-0612 Assy, Cable, I/O to Engine
- ☐ 979-0541-XXX Software Upgrade, FXi 60 / 250 Exciter (see Note below)
- ☐ 804-5002 Adaptor, Null Modem Cable, DB9 Male to DB9 Female
- ☐ 710-2618 Small Flat Blade Jeweler's Screwdriver
- ☐ 949-0545 Assy, Cable, 10MHz

**Note:** Software Upgrade part numbers dependent upon revision level at time of shipment.

## 2.3. Verify XPi 10 Exporter Shipping Contents

**NOTE: All items are Qty (1) unless noted otherwise.**

- ☐ 909-6027-MB3, XPi 10 Exporter
- ☐ 979-0544-100, Kit, Installation, XPi 10 Exporter

Miscellaneous Items:

- ☐ 417-0910, Kit, Backshell for 9-pin D connector
- ☐ 418-1550-008, Kit, Connector, Plug, 8 Pin Cage Clamp, Qty (7)
- ☐ 420-0007, Screw, 12-24 X .75", SST, Truss Head, Qty (4)
- ☐ 420-0710, Screw, 10-32 X .625", SST, Truss Head, Qty (4)
- ☐ 421-0002, Speed Nut, 12-24, Qty (4)
- ☐ 550-111, Connector, 9-pin D
- ☐ 682-0001, AC Line Cord
- ☐ 682-0003, AC Line Cord, European, Right Angle
- ☐ 829-4216, XLR Connector, Female
- ☐ 846-0020, Assy, Cable, Ethernet, Cross Over (for troubleshooting)
- ☐ 979-6027-XXX, XPi 10 Boot Disk (see Note below)

**Note:** Software Upgrade part numbers dependent upon revision level at time of shipment.

System Interconnect Cables (system configuration will determine which of these are used):

- ☐ 809-0830, AES/EBU Splitter
- ☐ 949-0544-101, Assy, Cable, Splitter (IN) to FM/HD Processor (OUT 1)
- ☐ 949-0544-102, Assy, Cable, XPi (IBOC AES IN) to FM/HD Processor (OUT 2)
- ☐ 949-0544-103, Assy, Cable, XPi (IBOC AES OUT) to FM/HD Audio Processor (EXT SYNC IN)
- ☐ 949-0544-104, Assy, Cable, XPi (STUDIO AES IN) to AES Splitter (OUT)
- ☐ 949-0544-105, Assy, Cable, XPi (BYPASS STUDIO AES IN) to AES Splitter (OUT)
- ☐ 949-0544-106, Assy, Cable, XPi (FM AES OUT TO STL/TX) to STL
- ☐ 949-0544-107, Assy, Cable, XPi (IBOC AES OUT) to HD Audio Processor (IN)
- ☐ 949-0544-108, Assy, Cable, XPi (IBOC AES IN) to HD Audio Processor (OUT)
- ☐ 949-0544-109, Assy, Cable, FM Audio Processor (OUT) to STL
- ☐ 949-0544-110, Assy, Cable, FM Audio Processor (IN) to XPi (FM AES/OUT TO STL/TX)

External Jumper Cables that MUST be installed on the XPi 10 prior to operation:

- ☐ 949-0542, Assy, Cable, Jumper, XPi (GPS DATA OUT) to (GPS DATA IN)
- ☐ 949-0543, Assy, Cable, Jumper, XPi (1 PPS OUT) to (1 PPS IN)
- ☐ 949-0608, Assy, Cable, Jumper, XPi (DELAYED AES OUT) to (DELAYED AES IN)
- ☐ 949-0609, Assy, Cable, Jumper, XPi (AUDIO BYPASS) to (SYSTEM STATUS OUTPUT)
- ☐ 949-0614, Assy, Cable, Jumper, XPi (FM AES OUT) to (FM AES IN)

## 2.4. Tools/Items Required for Installation (not supplied by B.E.)

- ☐ Ethernet Cables, Switches or Hubs (refer to HD Radio™ System Connection Diagrams)
- ☐ AES/EBU Cable (for the supplied XLR connectors for STL connections)
- ☐ Wire Strippers
- ☐ Soldering Iron
- ☐ Ty-raps

## 2.5. Estimated Time for Installation

Providing you have the proper materials and tools listed above, it will take approximately 90 minutes to install and setup the XPi 10 Exporter and the FXi 60/250 Exciter (w/Exgine).





### 3. HD Radio™ System Connection Diagrams

The following HD Radio™ System Connection Diagrams all illustrate 2<sup>nd</sup> Generation HD Radio™ System Architecture. These diagrams show single and dual audio processors for two channel (1 MPS and 1 SPS) and three channel (1 MPS and 2 SPS) applications. These diagrams should all be studied to have a good understanding of the particular system configuration that you are planning to implement.

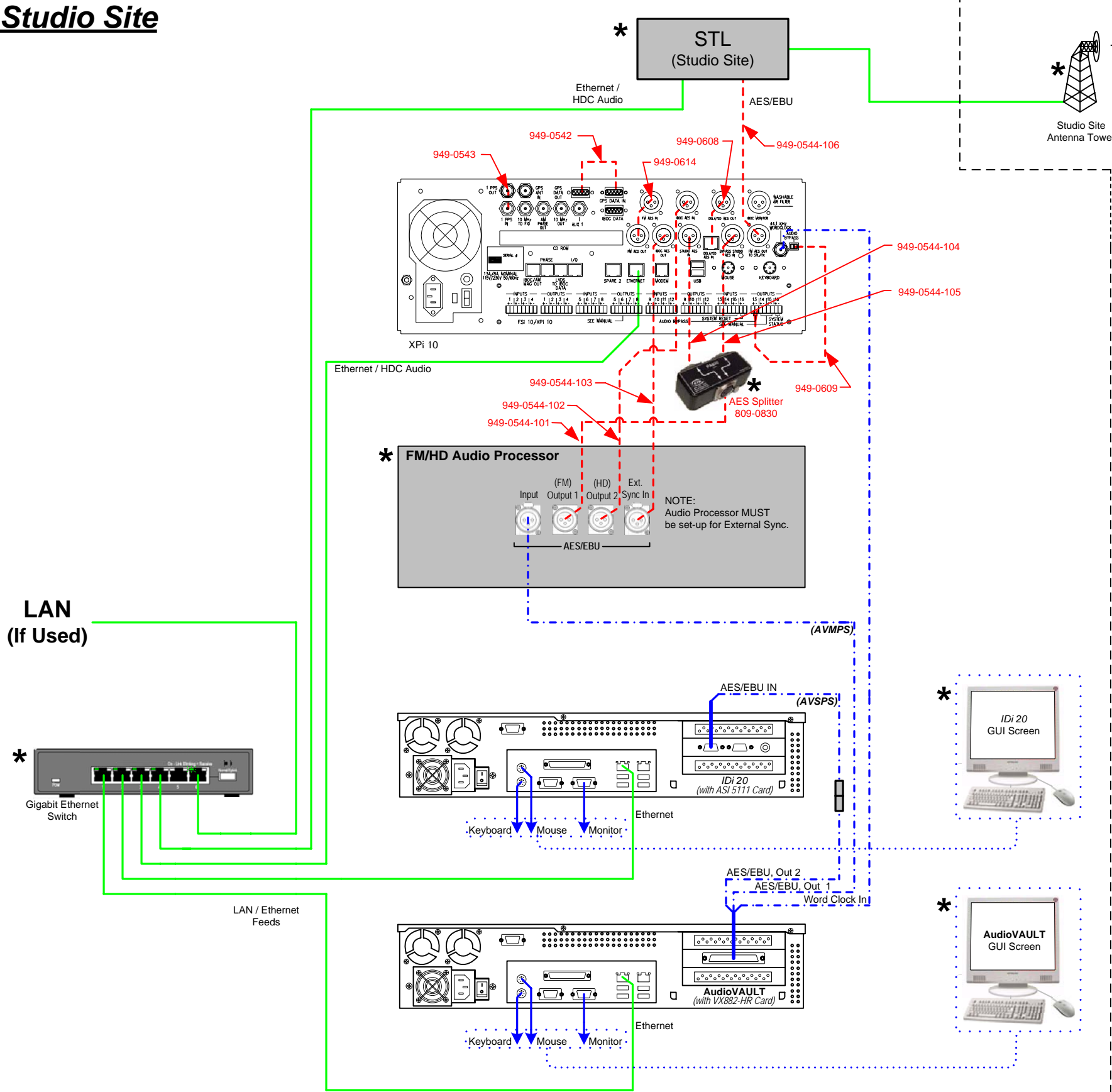
Figures 2 thru 5 illustrate systems with the XPi 10 Exporter and Audio Processing equipment at the Studio Site (may use a UNI-DIRECTIONAL LINK).

Figures 6 thru 9 illustrate systems with the XPi 10 Exporter and Audio Processing equipment at the Transmitter Site (requires BI-DIRECTIONAL LINK).

The HD Radio™ System Connection Diagrams indicate which cables are supplied by B.E. in the FXi and XPi Installation Kits.

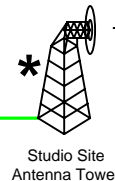
**NOTE:** Cables are supplied for all possible system architectures in the Installation Kits. There will be several unused cables after the installation of the FXi 60/250 Exciter (w/Engine) and the XPi 10 Exporter.

**Studio Site**

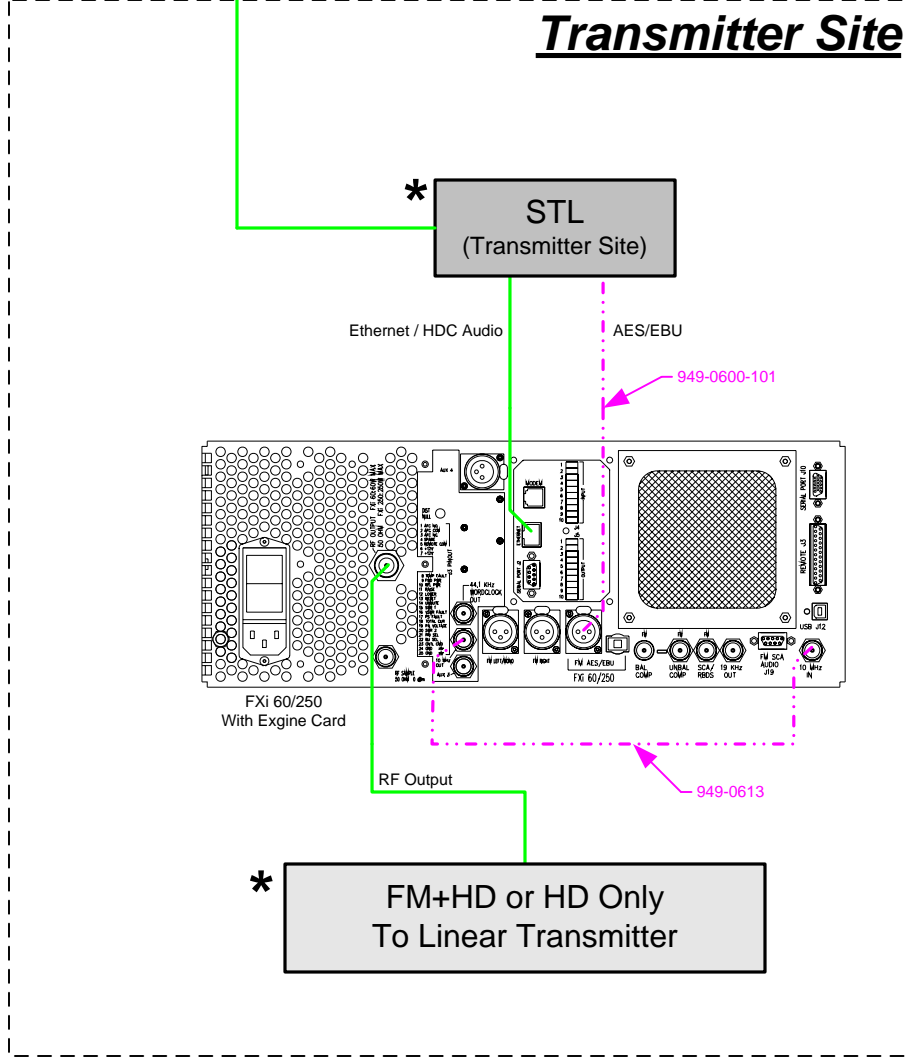


\* : Equipment may not be manufactured by Broadcast Electronics, Inc.

STL May Be  
Uni-Directional



**Transmitter Site**



**NOTE:** Use Category 6 Ethernet Cables and Gigabit Ethernet Switches or Hubs for all Studio & Transmitter Site Ethernet / HDC Audio connections shown in this configuration.

**- Cable Legend -**

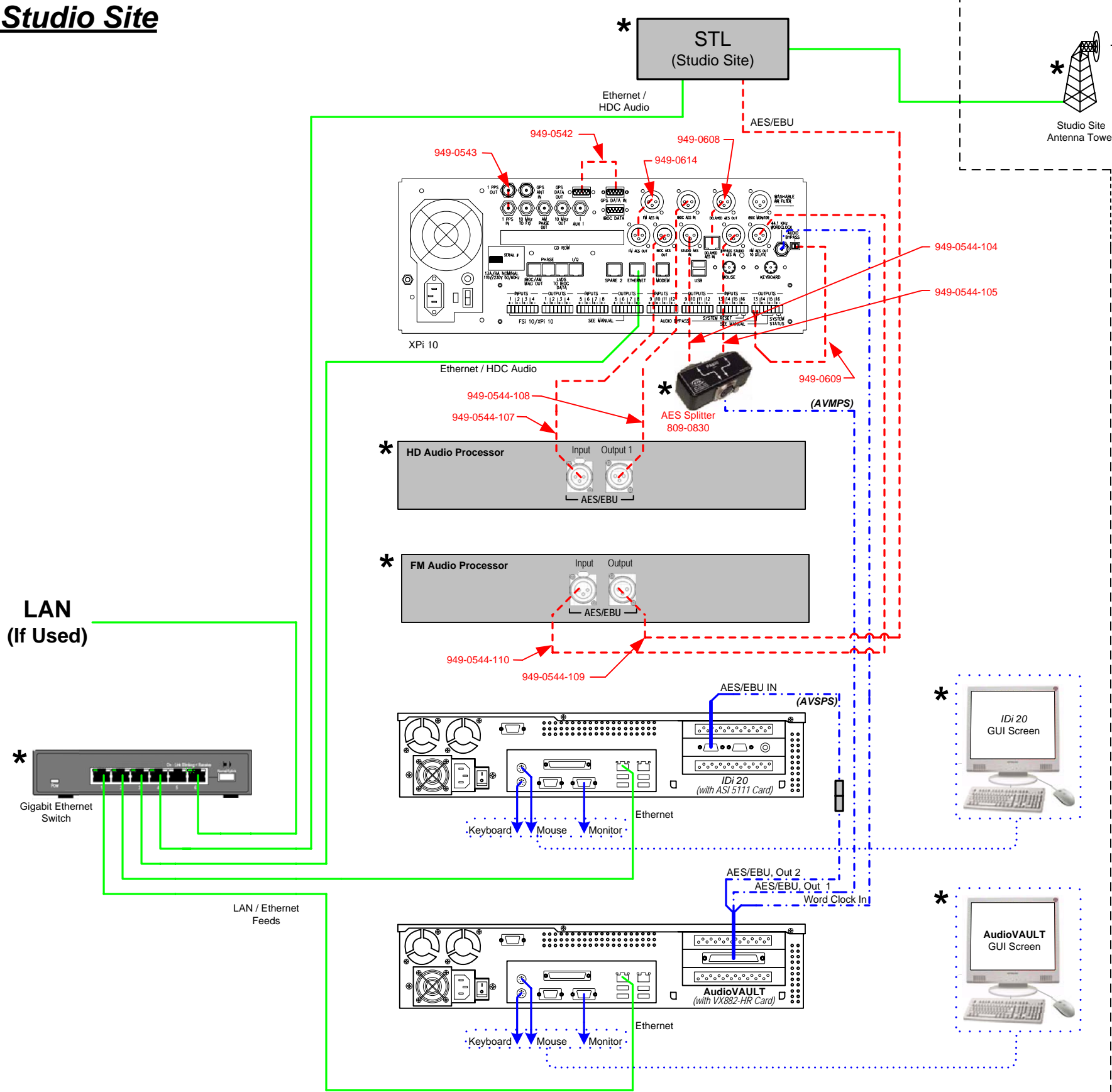
- Supplied in XPi 10 Exporter Installation Kit (979-0544-100) -----
- Supplied in FXi 60/250 Exciter Installation Kit (979-0600-100) -----
- STL and Ethernet Cables, and Switches to be Supplied by the Customer -----
- Supplied by B.E. with the IDi 20 Data Importer and/or the Audio Vault -----

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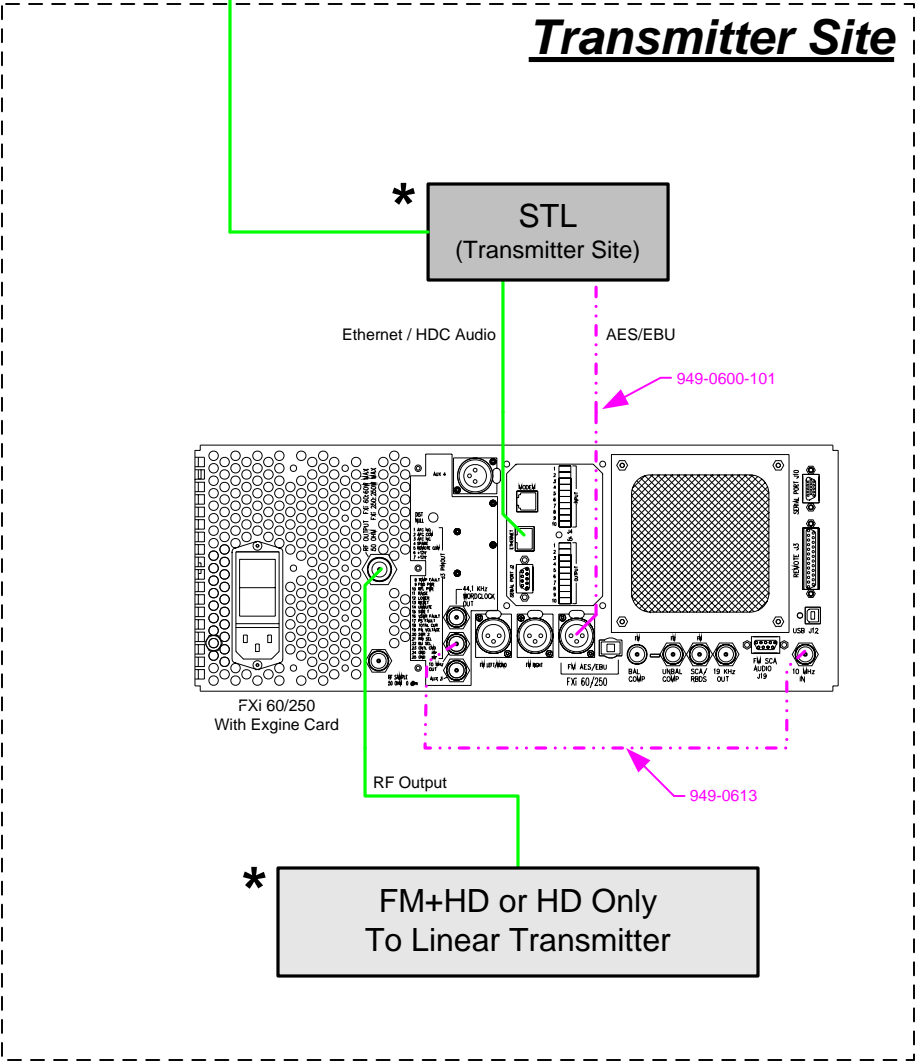
**Broadcast Electronics, Inc.**  
IDi 20 Data Importer, XPi 10 Exporter & FXi 60/250 Exciter (w/Exgine)  
Basic AES Bypass Configuration  
for a "Single" Audio Processor with  
1 MPS & 1 SPS Channel(s)  
(Exporter & Audio Processing at Studio Site)

**FIGURE 2**

**Studio Site**



**Transmitter Site**



**NOTE: Use Category 6 Ethernet Cables and Gigabit Ethernet Switches or Hubs for all Studio & Transmitter Site Ethernet / HDC Audio connections shown in this configuration.**

**- Cable Legend -**

- Supplied in XPi 10 Exporter Installation Kit (979-0544-100) — Red dashed line
- Supplied in FXi 60/250 Exciter Installation Kit (979-0600-100) — Purple dashed line
- STL and Ethernet Cables, and Switches to be Supplied by the Customer — Green solid line
- Supplied by B.E. with the IDi 20 Data Importer and/or the Audio Vault — Blue dashed line

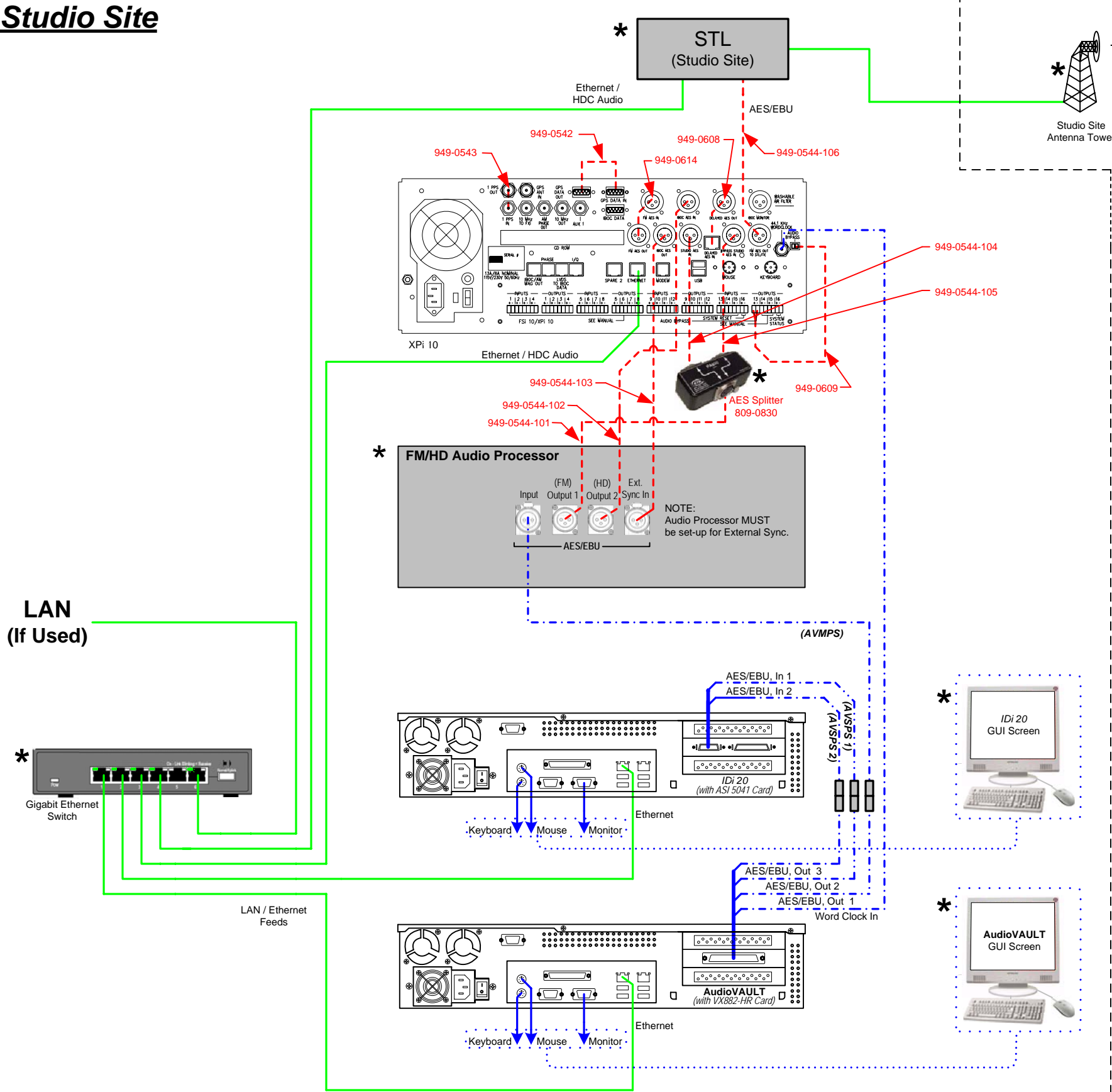
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**Broadcast Electronics, Inc.**  
IDi 20 Data Importer, XPi 10 Exporter & FXi 60/250 Exciter (w/Exgine)  
Basic AES Bypass Configuration for "Dual" Audio Processors with 1 MPS & 1 SPS Channel(s)  
(Exporter & Audio Processing at Studio Site)

\* : Equipment may not be manufactured by Broadcast Electronics, Inc.

**FIGURE 3**

**Studio Site**

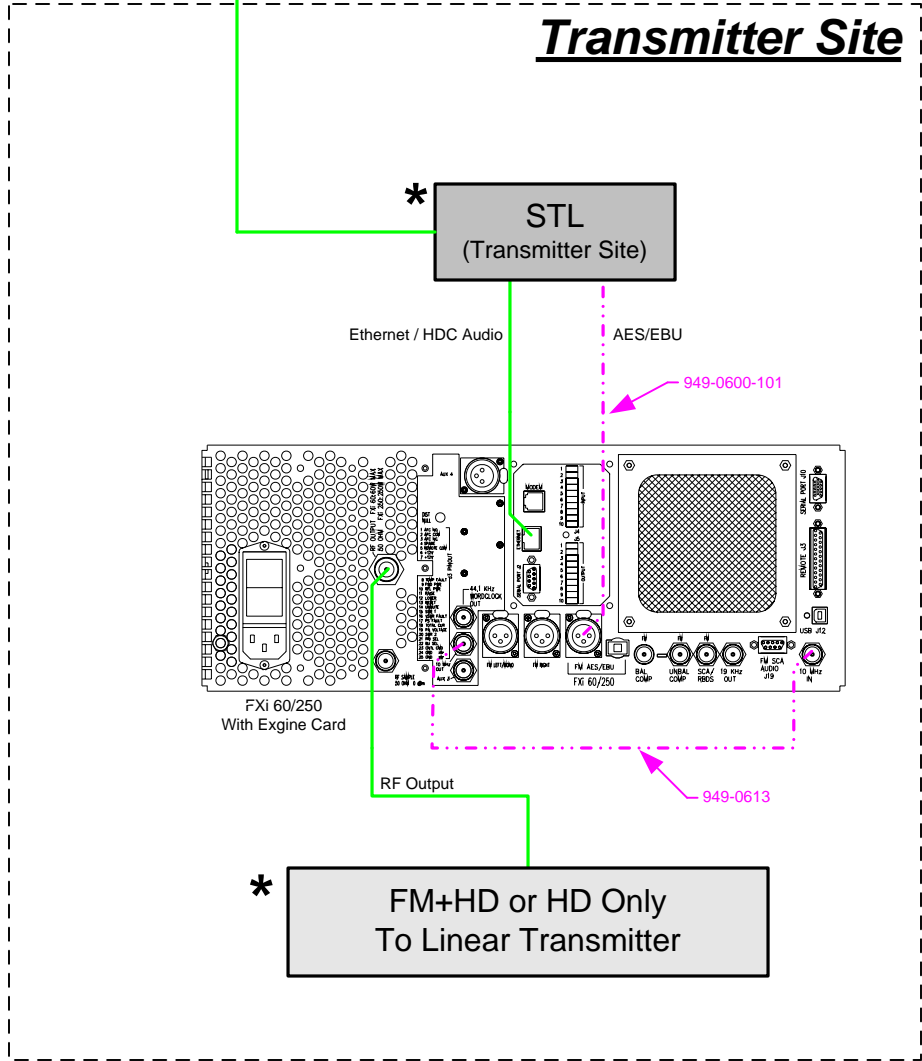


\* : Equipment may not be manufactured by Broadcast Electronics, Inc.

STL May Be  
Uni-Directional



**Transmitter Site**



**NOTE: Use Category 6 Ethernet Cables and Gigabit Ethernet Switches or Hubs for all Studio & Transmitter Site Ethernet / HDC Audio connections shown in this configuration.**

**- Cable Legend -**

- Supplied in XPi 10 Exporter Installation Kit (979-0544-100) -----
- Supplied in FXi 60/250 Exciter Installation Kit (979-0600-100) -----
- STL and Ethernet Cables, and Switches to be Supplied by the Customer -----
- Supplied by B.E. with the IDi 20 Data Importer and/or the Audio Vault -----

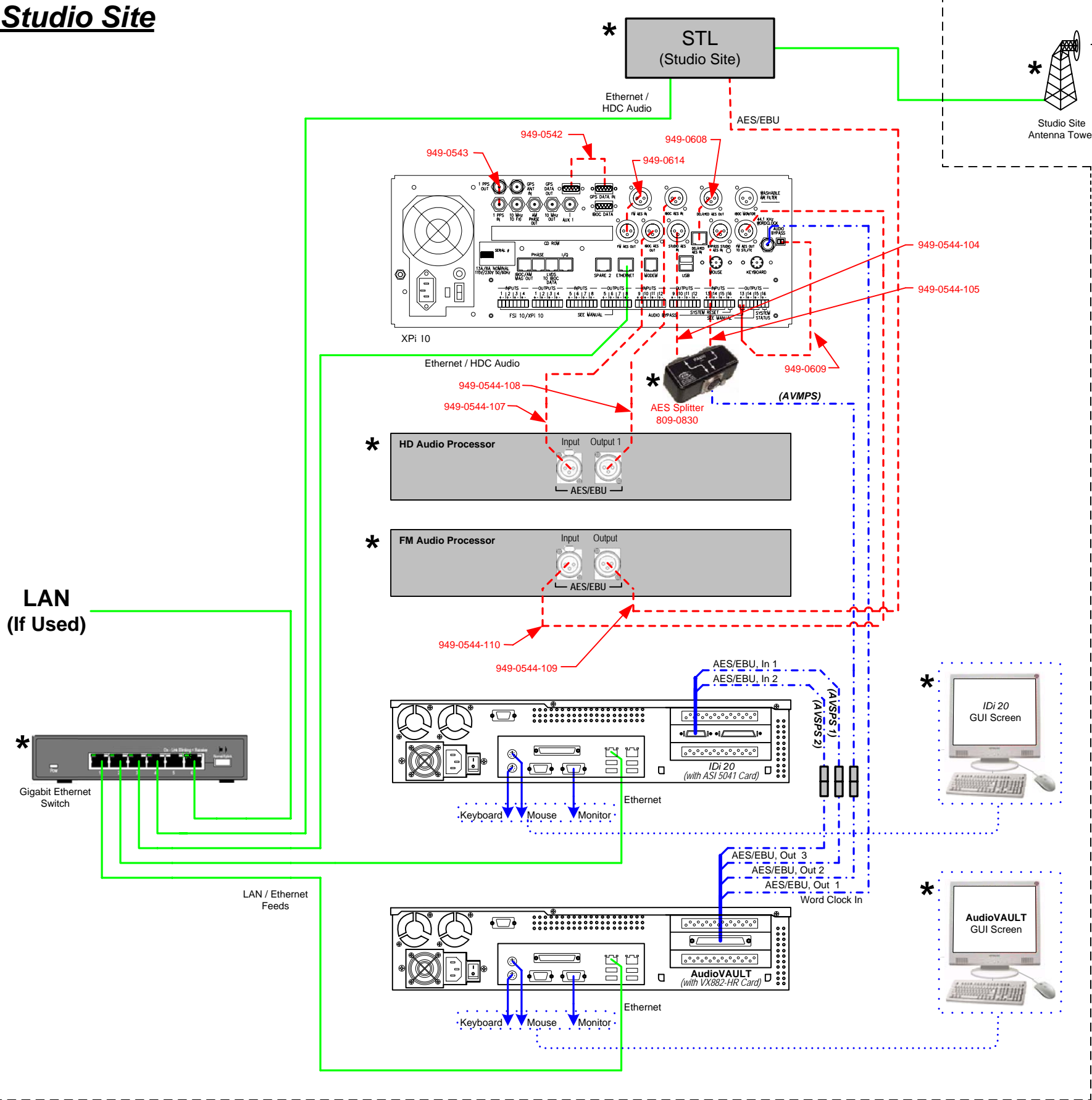
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**Broadcast Electronics, Inc.**  
IDi 20 Data Importer, XPi 10 Exporter & FXi 60/250 Exciter (w/Exgine)  
Basic AES Bypass Configuration  
for a "Single" Audio Processor with  
1 MPS & 2 SPS Channel(s)  
(Exporter & Audio Processing at Studio Site)

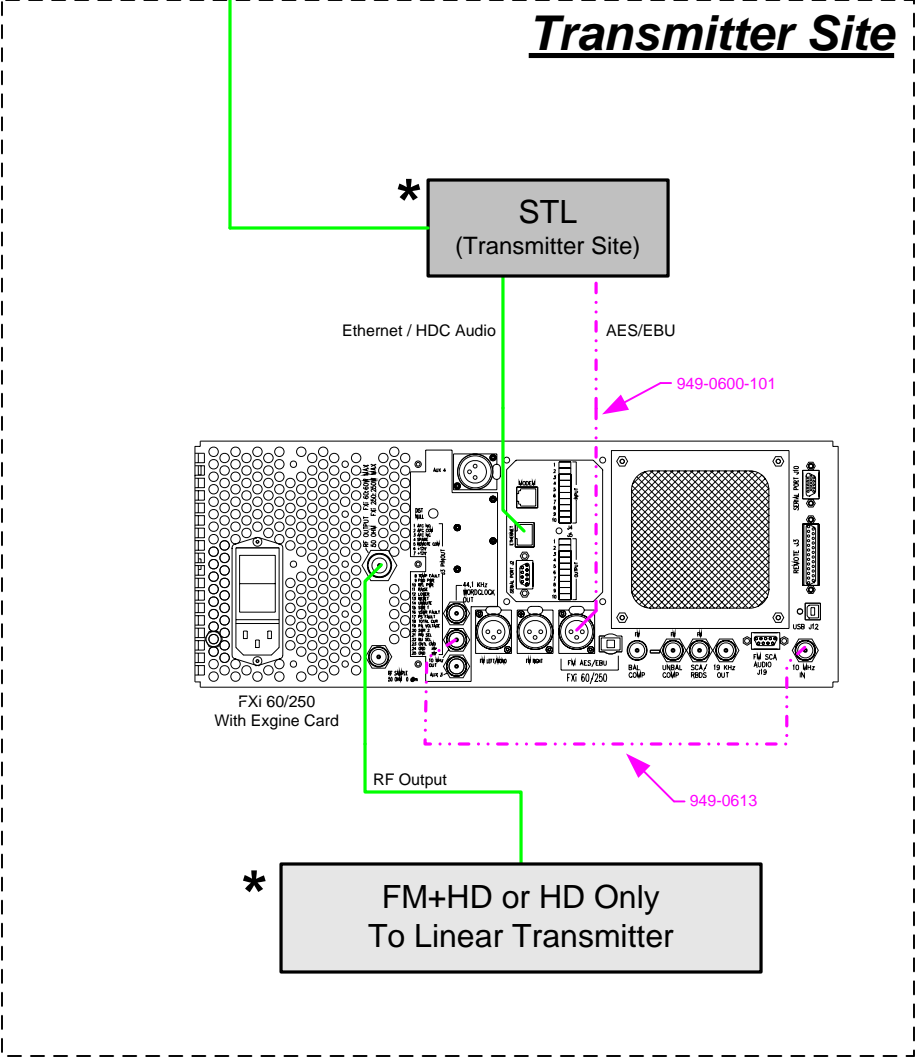
**FIGURE 4**



**Studio Site**



**Transmitter Site**



**NOTE: Use Category 6 Ethernet Cables and Gigabit Ethernet Switches or Hubs for all Studio & Transmitter Site Ethernet / HDC Audio connections shown in this configuration.**

**- Cable Legend -**

- Supplied in XPi 10 Exporter Installation Kit (979-0544-100) - Red dashed line
- Supplied in FXi 60/250 Exciter Installation Kit (979-0600-100) - Magenta dashed line
- STL and Ethernet Cables, and Switches to be Supplied by the Customer - Green solid line
- Supplied by B.E. with the IDi 20 Data Importer and/or the Audio Vault - Blue dotted line

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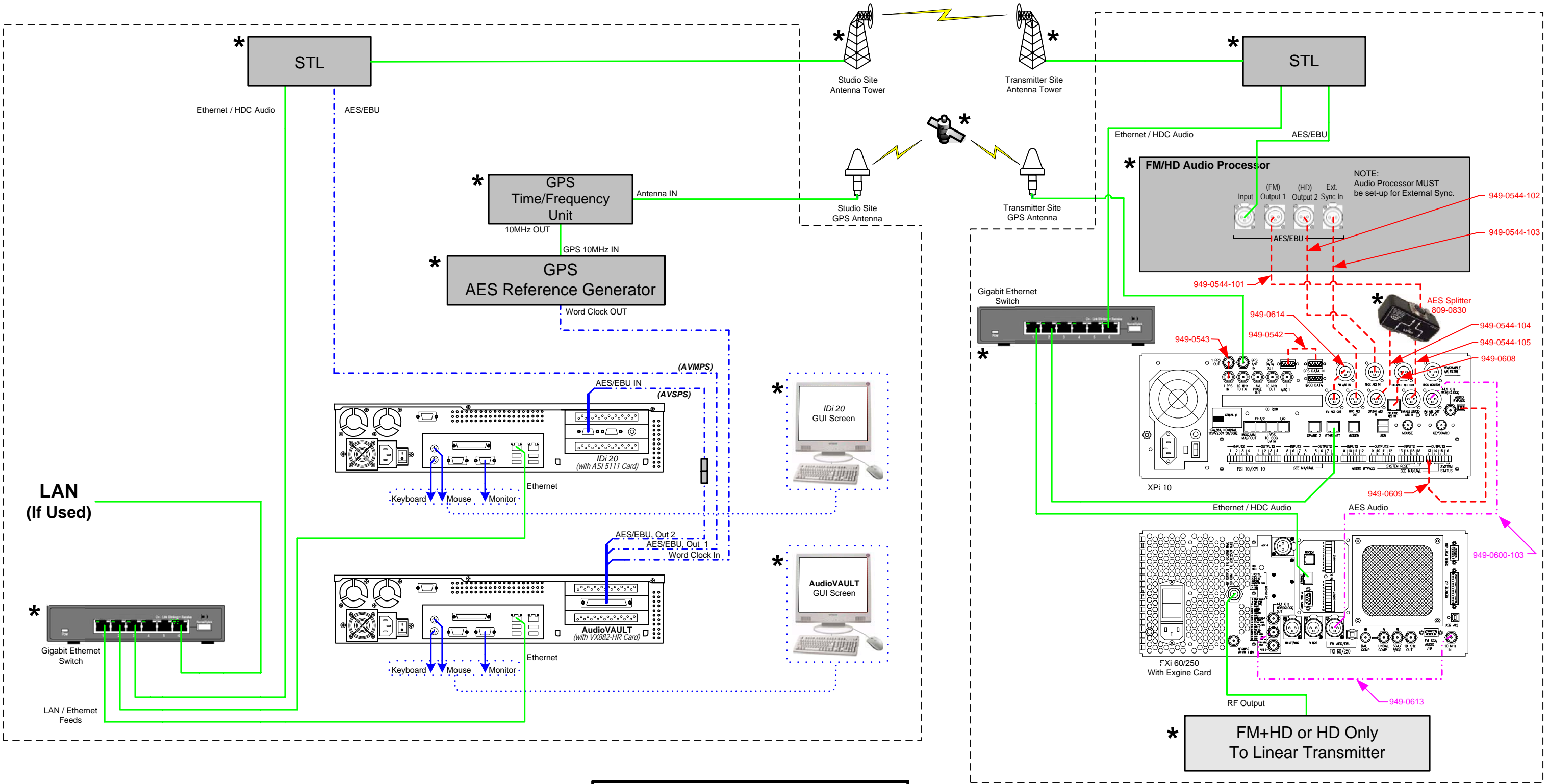
**Broadcast Electronics, Inc.**  
IDi 20 Data Importer, XPi 10 Exporter & FXi 60/250 Exciter (w/Exigine)  
Basic AES Bypass Configuration for "Dual" Audio Processors with 1 MPS & 2 SPS Channel(s)  
(Exporter & Audio Processing at Studio Site)

**FIGURE 5**

\* : Equipment may not be manufactured by Broadcast Electronics, Inc.

Studio Site

Transmitter Site



NOTE: Use Category 6 Ethernet Cables and Gigabit Ethernet Switches or Hubs for all Studio & Transmitter Site Ethernet / HDC Audio connections shown in this configuration.

\* : Equipment may not be manufactured by Broadcast Electronics, Inc.

- Cable Legend -

- Supplied in XPi 10 Exporter Installation Kit (979-0544-100) -----
- Supplied in FXi 60/250 Exciter Installation Kit (979-0600-100) -----
- STL, GPS, Ethernet Cables, and Switches, to be Supplied by the Customer \_\_\_\_\_
- Supplied by B.E. with the IDi 20 Data Importer and/or the Audio Vault -----

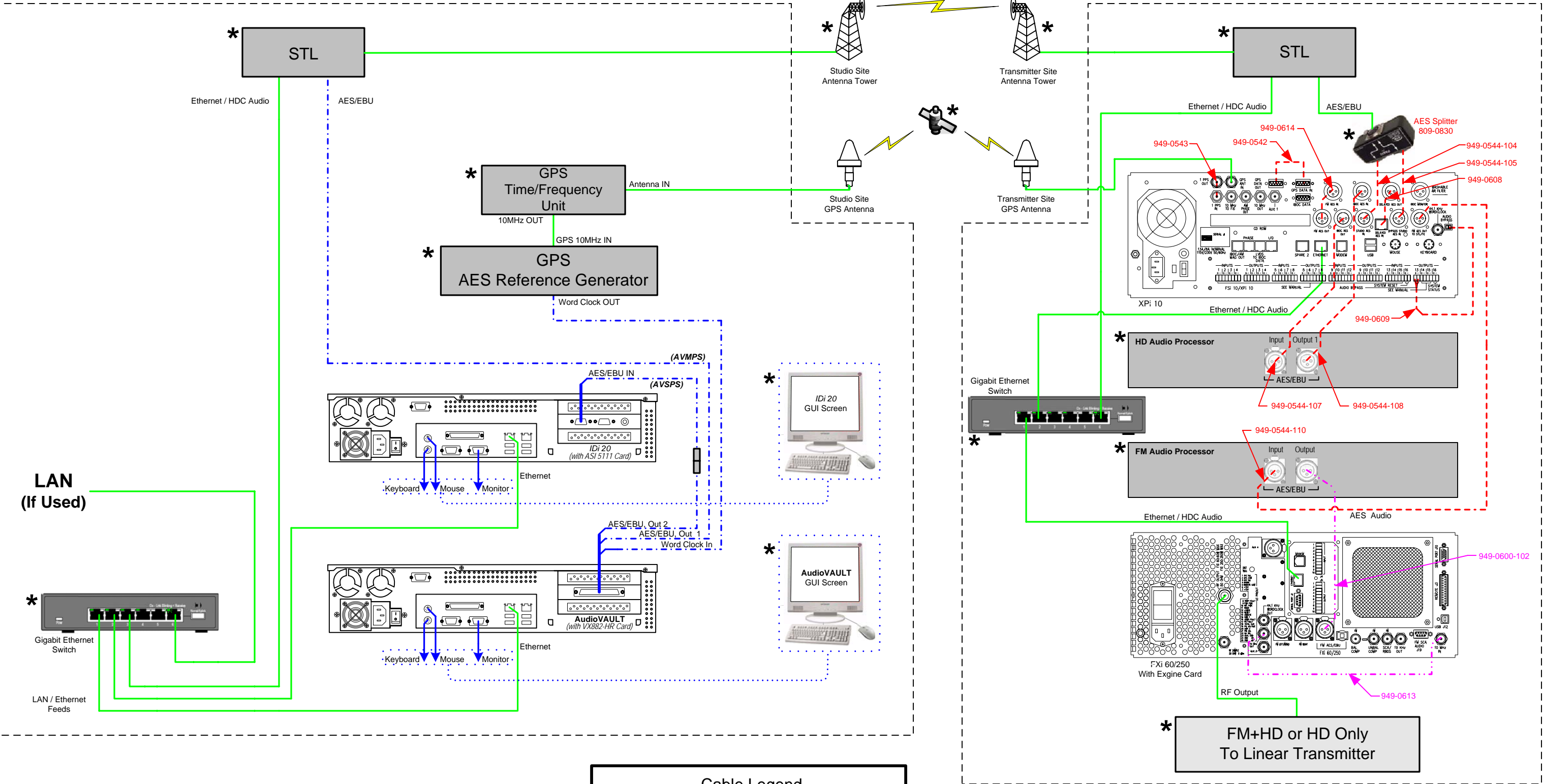
(XPi 10 and Audio Processing Equipment at Transmitter Site.)

**Broadcast Electronics, Inc.**  
IDi 20 Data Importer, XPi 10 Exporter & FXi 60/250 Exciter (w/Exigne)  
Basic AES Bypass Configuration for a "Single" Audio Processor with 1 MPS & 1 SPS Channel(s)  
(Exporter & Audio Processing at Transmitter Site)

FIGURE 6

Studio Site

Transmitter Site



NOTE: Use Category 6 Ethernet Cables and Gigabit Ethernet Switches or Hubs for all Studio & Transmitter Site Ethernet / HDC Audio connections shown in this configuration.

\* : Equipment may not be manufactured by Broadcast Electronics, Inc.

- Cable Legend -

Supplied in XPi 10 Exporter Installation Kit (979-0544-100) -----

Supplied in Fxi 60/250 Exciter Installation Kit (979-0600-100) -----

STL, GPS, Ethernet Cables, and Switches, to be Supplied by the Customer \_\_\_\_\_

Supplied by B.E. with the IDi 20 Data Importer and/or the Audio Vault -----

(XPi 10 and Audio Processing Equipment at Transmitter Site.)

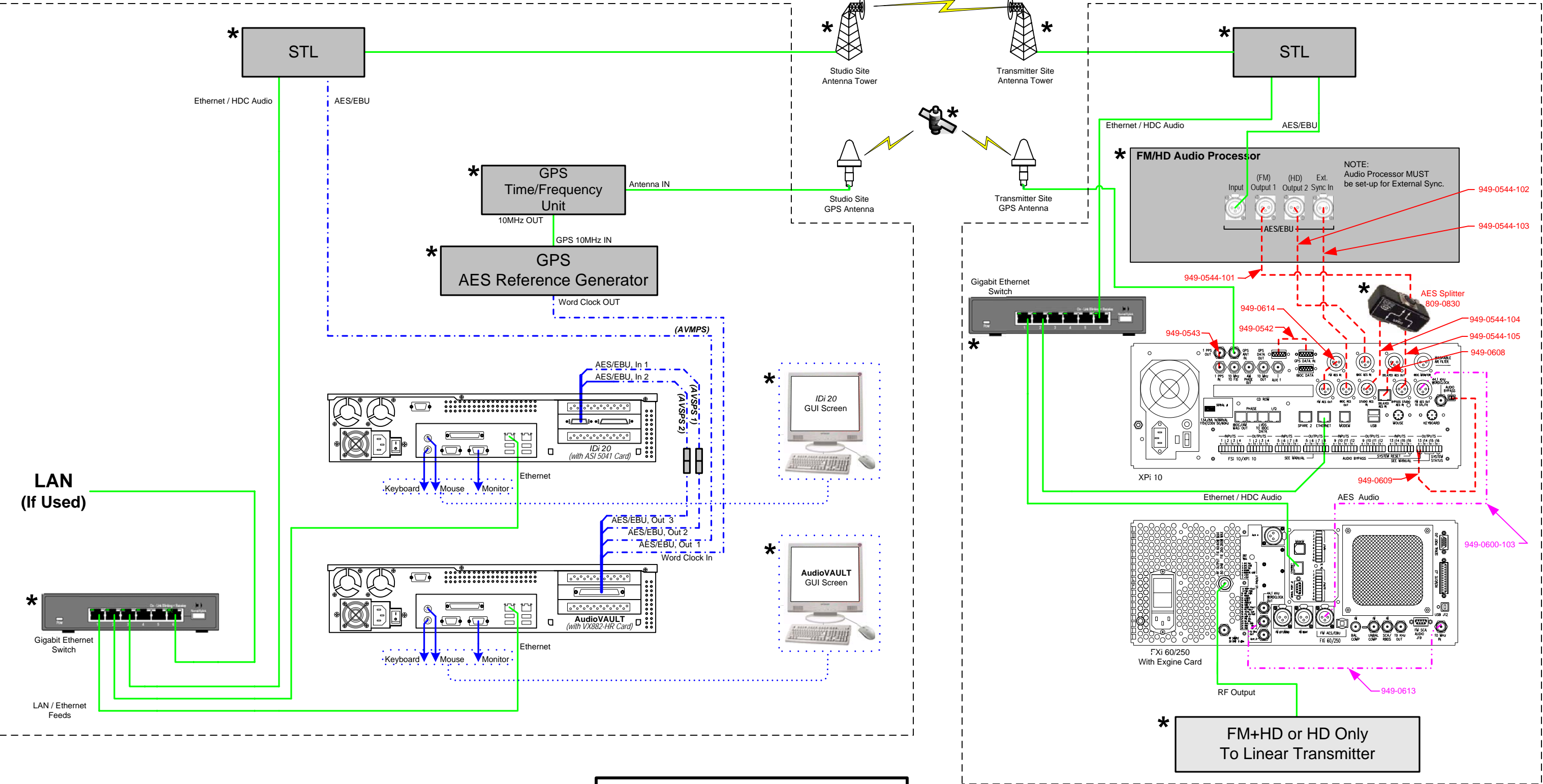
**Broadcast Electronics, Inc.**  
IDi 20 Data Importer, XPi 10 Exporter & Fxi 60/250 Exciter (w/Engine)  
Basic AES Bypass Configuration  
For "Dual" Audio Processors with 1 MPS & 1 SPS Channel(s)  
(Exporter & Audio Processing at Transmitter Site)

FIGURE 7



Studio Site

Transmitter Site



NOTE: Use Category 6 Ethernet Cables and Gigabit Ethernet Switches or Hubs for all Studio & Transmitter Site Ethernet / HDC Audio connections shown in this configuration.

\* : Equipment may not be manufactured by Broadcast Electronics, Inc.

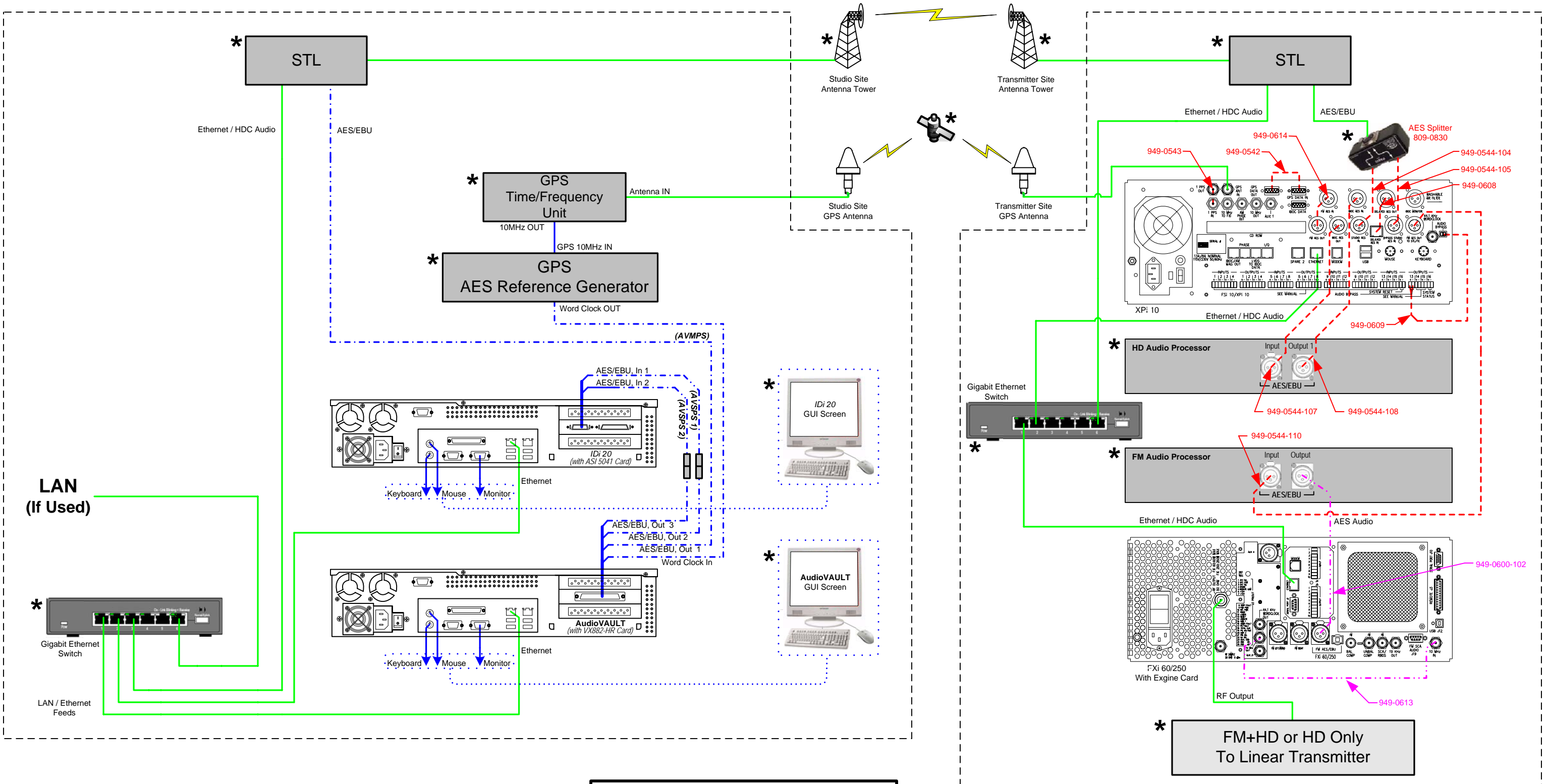
(XPi 10 and Audio Processing Equipment at Transmitter Site.)

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IDi 20 Data Importer, XPi 10 Exporter & FXi 60/250 Exciter (w/Exigne)  
Basic AES Bypass Configuration for a "Single" Audio Processor with 1 MPS & 2 SPS Channel(s)  
(Exporter & Audio Processing at Transmitter Site)



Studio Site

Transmitter Site



**NOTE:** Use Category 6 Ethernet Cables and Gigabit Ethernet Switches or Hubs for all Studio & Transmitter Site Ethernet / HDC Audio connections shown in this configuration.

\* : Equipment may not be manufactured by Broadcast Electronics, Inc.

- Cable Legend -	
Supplied in XPi 10 Exporter Installation Kit (979-0544-100)	-----
Supplied in Fxi 60/250 Exciter Installation Kit (979-0600-100)	-----
STL, GPS, Ethernet Cables, and Switches to be Supplied by the Customer	-----
Supplied by B.E. with the IDi 20 Data Importer and/or the Audio Vault	-----

(XPi 10 and Audio Processing Equipment at Transmitter Site.)

**Broadcast Electronics, Inc.**  
IDI 20 Data Importer, XPi 10 Exporter & Fxi 60/250 Exciter (w/Exigne)  
Basic AES Bypass Configuration  
For "Dual" Audio Processors with 1 MPS & 2 SPS Channel(s)  
(Exporter & Audio Processing at Transmitter Site)

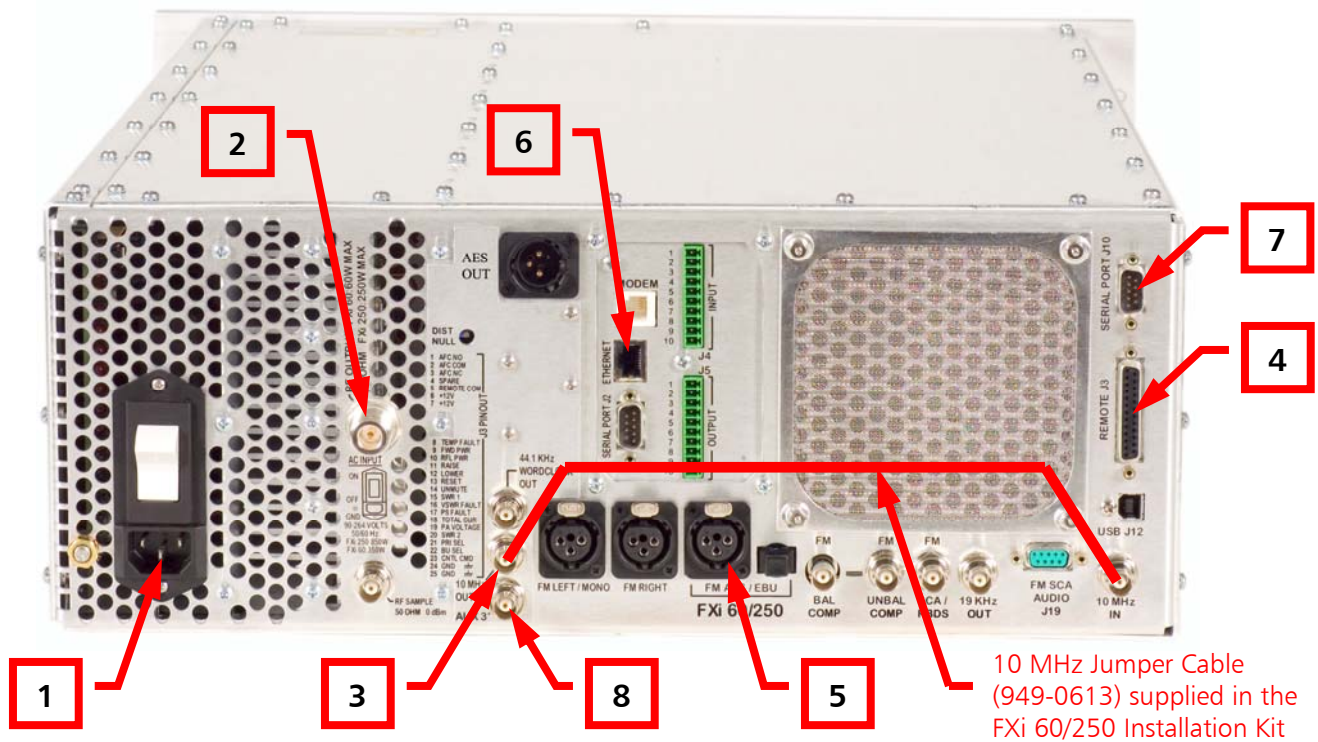
## 4. Install and Setup the FXi 60/250 Exciter (w/Exgine)

### 4.1. Install the FXi 60/250 Exciter (w/Exgine)

Install the FXi 60/250 Exciter (w/Exgine) at the transmitter site into an equipment rack or cabinet.

### 4.2. FXi 60/250 Exciter (w/Exgine) Cable Connections

**Figure 10** below shows the connections that should be made to the FXi 60/250 Exciter at the Transmitter Site. Refer to the HD Radio™ System Interconnect Diagrams for additional information regarding the type of system you are implementing as well cable identification.



**Figure 10 – FXi Exciter 60/250 (w/Exgine) Primary Connections**

1. **AC POWER** – Connect AC Power line cord (682-0001 or 682-0003) supplied in the Digital Exciter Installation Kit (979-0540).
2. **RF OUTPUT** – Connect to the Transmitter (cable supplied by customer).
3. **10 MHz OUT to 10 MHz IN** – Jumper Cable (949-0613) supplied in the FXi 60/250 Exciter (w/Exgine) Installation Kit (979-0600-001).
4. **REMOTE J3** – If you are using a B.E. Transmitter, connect the Exciter Interface cable here. This connection provides remote control and indications to/from the Exciter. This connection **MUST** be made to “un-mute” the Exciter. If you are using the FXi as a stand-alone (without a Transmitter), reference the “Remote Control” section of the FXi Manual for configuring the J3 Connector.



5. **FM AES/EBU** – Depending upon your System's Configuration, connect to one of the following (Reference the HD Radio™ System Configuration drawings for additional information):

Connect to the STL using Cable (949-0600-101) supplied in the FXi 60/250 Exciter (w/Engine) Installation Kit (979-0600-001).

- or -

Connect to the FM Audio Processor (OUT) using Cable (949-0600-102) supplied in the FXi 60/250 Exciter (w/Engine) Installation Kit (979-0600-001).

- or -

Connect to the XPi 10 (FM AES OUT TO STL/TX) using Cable (949-0600-103) supplied in the FXi 60/250 Exciter (w/Engine) Installation Kit (979-0600-001).

6. **ETHERNET** – Depending upon your System's Configuration, connect to either the LAN or directly to the STL. (Reference the HD Radio™ System Configuration drawings for additional information).

Reference Figures 11 and 12 for typical HD System I.P. Addressing and Subnet assignment.

For additional information on networking, use the following links to access ibiquity and Broadcast Electronics networking documents.

ibiquity Networking Documents:

<http://www.bdcast.com/bulletins/iBiquityDocs/index.php>

Broadcast Electronics Networking Technical Bulletin:

[http://www.bdcast.com/fgal/tech\\_bull/cat6\\_gigabit\\_technical\\_bulletin\\_jan\\_BCEBUL.pdf](http://www.bdcast.com/fgal/tech_bull/cat6_gigabit_technical_bulletin_jan_BCEBUL.pdf)

**NOTE:** All Ethernet Cables, Switches and/or Hubs to be supplied by the customer. **Use Category 6 cables and Gigabit Ethernet Switches or Hubs** for all Studio and Transmitter Site Ethernet/HDC Audio connections.

7. **SERIAL PORT** – Connects to a PC via a Null Modem Cable (not supplied) for Software Upgrades.
8. **AUX 3** – Auxiliary 10 MHz Out from the Engine Card (cable supplied by customer).

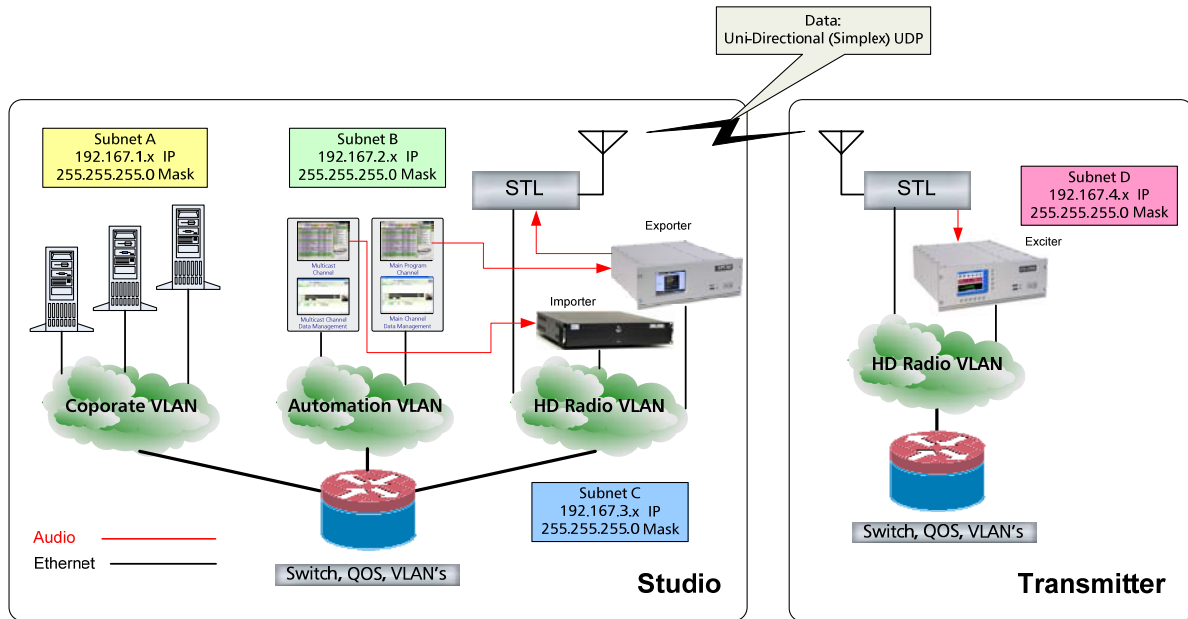


Figure 11 – Typical Networking Diagram (Exporter at Studio Site)

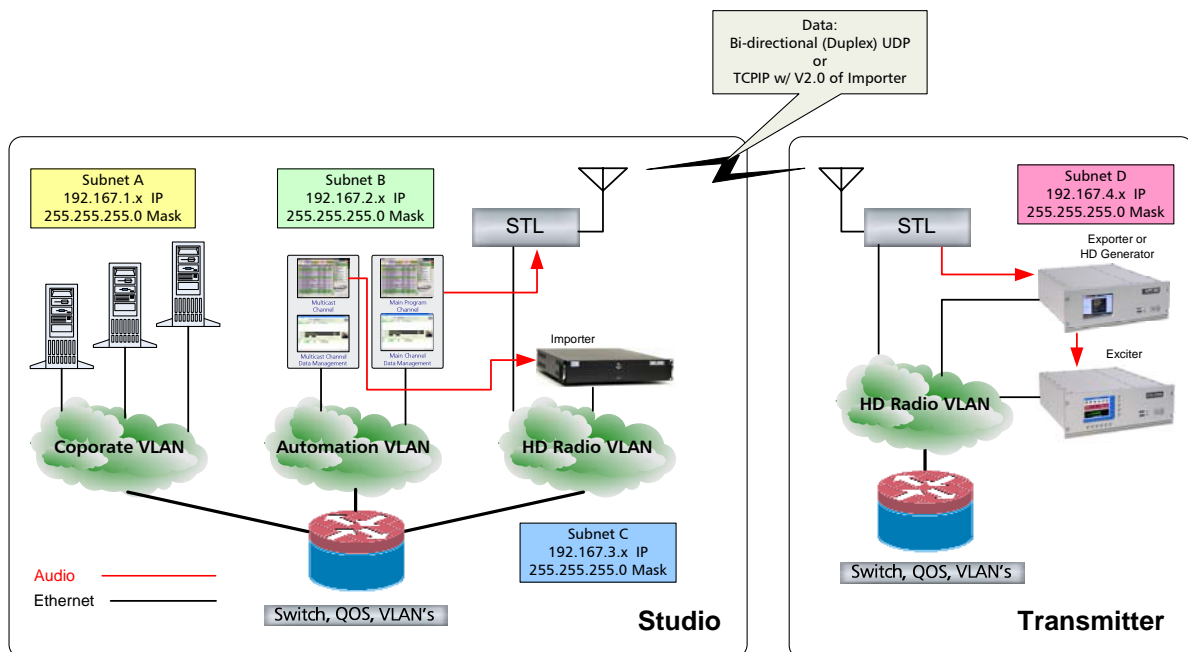


Figure 12 – Typical Networking Diagram (Exporter at Transmitter Site)

### 4.3. Power on the FXi 60/250 Exciter (w/Engine)

After the cable connections are complete, power ON the FXi using the switch on the rear panel.

### 4.4. Configure the I.P. Address of the FXi 60/250 Exciter (w/Engine)

**NOTE:** Both the FXi 60/250 Exciter (w/Engine) and the XPi 10 Exporter are configured at the factory to be in the same I.P. family. If it is desired to change from the original factory setting, the FXi and XPi must BOTH be changed to ensure communication. This section provides instruction on setting the I.P. Address of the FXi.

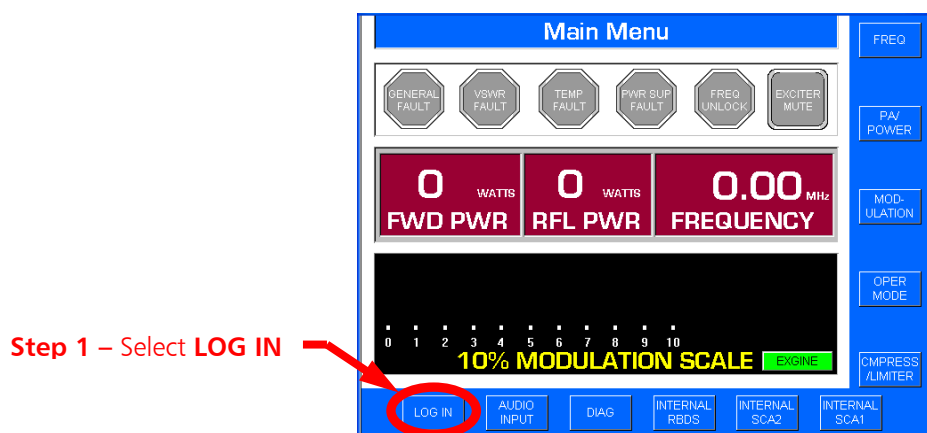


Figure 13 – Main Menu Before Login



**Step 2 – Using the numeric buttons, enter the password and then press ENTER (the default is 1 2 3 4 5 6)**

Figure 14 – Login Menu

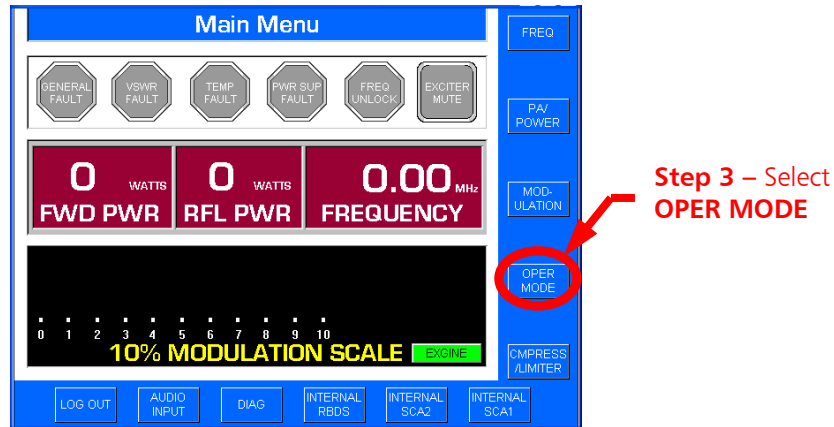


Figure 15 – Main Menu After Login

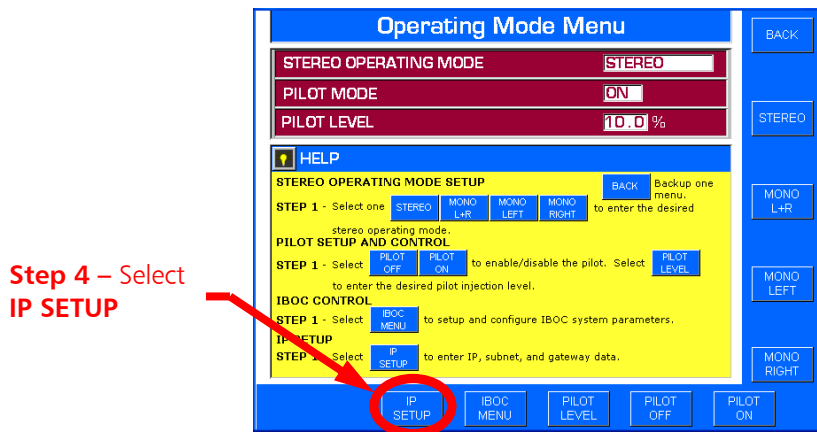


Figure 16 – Operating Mode Menu

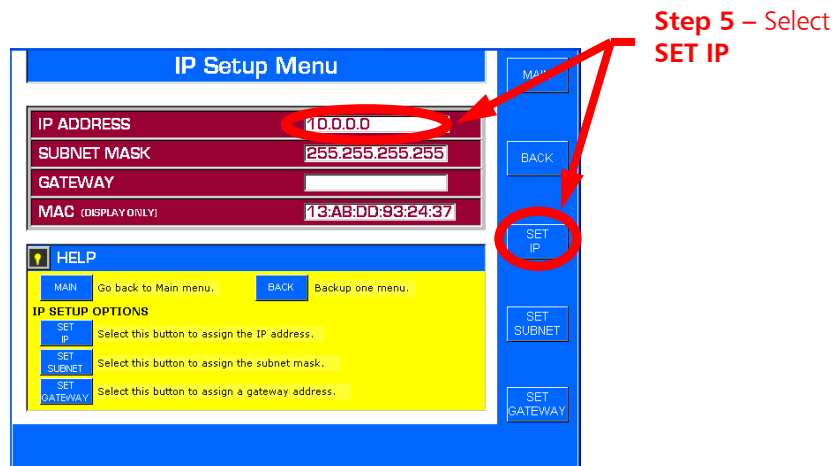


Figure 17 – I.P. Setup Menu

**Step 6** – Use the buttons provided to enter the I.P. address.  
(Use the <ENTER/.> button to advance to the next field).

Also, be sure to press <ENTER/.> when finished or the I.P. address will NOT be saved.

**NOTE:** The XPi 10 Exporter MUST be configured from the Main GUI Menu under PLATFORM-> LINK CONFIG-> with the I.P. Address of the FXi or communication between the XPi 10 Exporter and the FXi Exciter WILL NOT be able to be established.

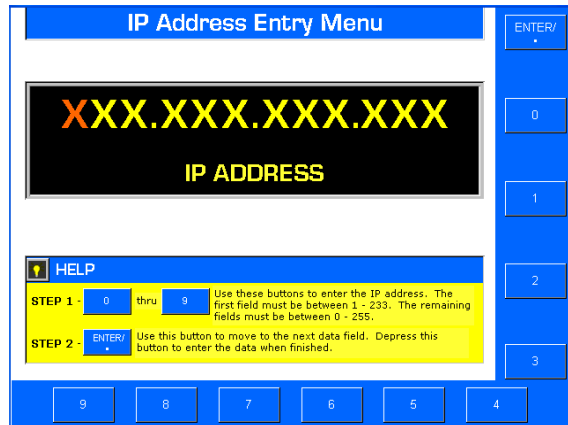


Figure 18 – I.P. Address Entry Menu

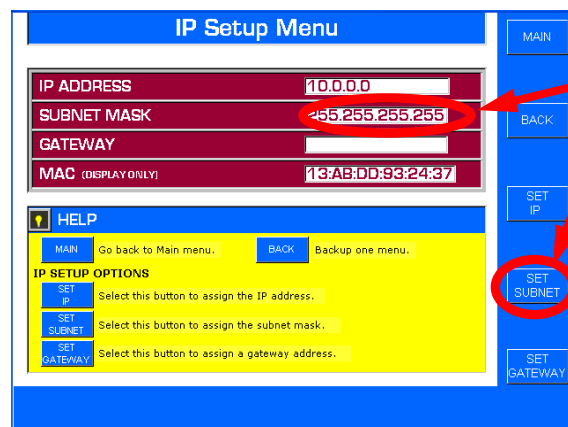


Figure 19 – I.P. Setup Menu

**NOTE:** The MAC address from the Exgine / NetBurner card will be automatically displayed here upon the initial power up.

**NOTE:** The XPi 10 Exporter MUST also be configured from the Main GUI Menu under PLATFORM-> LINK CONFIG-> with the MAC address of the Exgine or communication between the XPi 10 Exporter and the Exgine card in the FXi Exciter WILL NOT be able to be established.

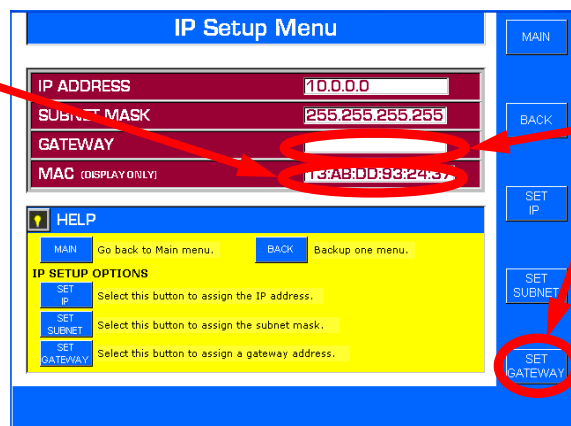


Figure 20 – I.P. Setup Menu

**STEP 9.** Cycle the AC power (operate the power switch OFF, then ON) to restart the operating system on the new settings.

**This completes the I.P. Address setup of the FXi Exciter.**



## 5. Install the XPi 10 Exporter

Install the XPi 10 Exporter at either the Studio or Transmitter Site (the Studio Site is the most common location for the XPi 10 Exporter along with the Audio Processing equipment). Ensure that all jumpers that were removed prior to shipment are installed as shown below (items 1, 3, 4, 7, and 15). Once the jumpers are installed, proceed with the remaining connections. Reference the HD Radio™ System Configuration Diagrams (Section 3 of this document) for additional connection and cabling information for your specific system.

### 5.1. XPi 10 Exporter Cable Connections

The following diagram shows all of the connections that should be made to the XPi 10 Exporter for proper operation. Refer to the HD Radio™ System Interconnect Diagrams for additional information regarding the type of system you are implementing as well cable identification.

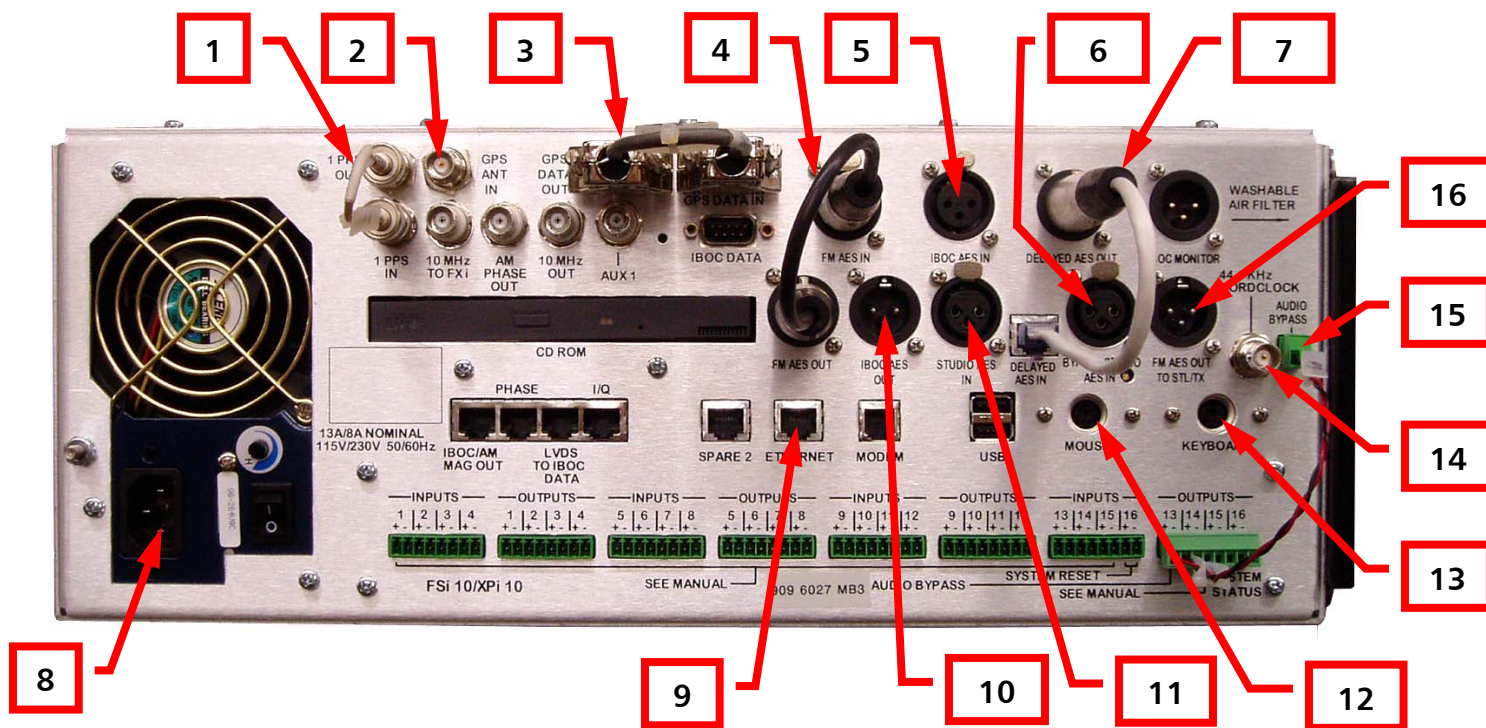


Figure 21 – XPi 10 Connections

1. **1PPS OUT to 1PPS IN** – Jumper Cable (949-0543) supplied in the XPi 10 Exporter Installation Kit (979-0544-100).
2. **GPS ANT IN** – Internal GPS Receiver Input from GPS Antenna (antenna and cable supplied by customer).
3. **GPS DATA OUT to GPS DATA IN** – Jumper Cable (949-0542) supplied in the XPi 10 Exporter Installation Kit (979-0544-100).





4. **FM AES OUT to FM AES IN** – Jumper Cable (949-0614) supplied in the XPi 10 Installation Kit (979-0544-100).
5. **IBOC AES IN** – Depending upon your System's Configuration, connect to one of the following (Reference the HD Radio™ System Configuration drawings for additional information):

Connect to the FM/HD Processor (OUT) using Cable (949-0544-102) supplied in the XPi 10 Exporter Installation Kit (979-0544-100).

- or -

Connect to the HD Processor (OUT) using Cable (949-0544-108) supplied in the XPi 10 Exporter Installation Kit (979-0544-100).

6. **BYPASS STUDIO AES IN** – Non-delayed input that will be applied to the FM AES OUT TO STL/TX upon bypass operation. This connection will normally be made to the Main Program audio source via an AES Splitter. Use Cable (949-0544-105) and AES Splitter (809-0830) supplied in the XPi 10 Exporter Installation Kit (979-0544-100). NOTE: In bypass mode of operation the delay supplied by the XPi 10 is not present. Reference the HD Radio™ System Configuration drawings for additional information.
7. **DELAYED AES OUT to DELAYED AES IN** – This jumper cable must be connected to route the delayed AES output to the FM AES OUT TO STL/TX connector under normal operation. Cable (949-0608) supplied in the XPi 10 Exporter Installation Kit (979-0544-100).
8. **AC POWER** – AC Line Cord (682-0001 or 682-0003) supplied in the XPi 10 Exporter Installation Kit (979-0544-100).
9. **ETHERNET** – From Data Importer (IDi 20) that includes all of the secondary program service audio and PAD. If using a switch or hub between units a straight through cable is used, if connecting straight from the Importer a crossover cable is required. (Reference the HD Radio™ System Configuration drawings for additional information).

NOTE: All Ethernet Cables, Switches and/or Hubs to be supplied by the customer. Use Category 6 cables and Gigabit Ethernet Switch or Hub for all Studio and Transmitter Site Ethernet/HDC Audio connections.

10. **IBOC AES OUT** – Depending upon your System's Configuration, connect to one of the following (Reference the HD Radio™ System Configuration drawings for additional information):

Connect to the FM/HD Processor (EXT SYNC IN) using Cable (949-0544-103) supplied in the XPi 10 Exporter Installation Kit (979-0544-100). The Audio Processor MUST be set-up for External Sync.

- or -

Connect to the HD Processor (IN) using Cable (949-0544-107) supplied in the XPi 10 Exporter Installation Kit (979-0544-100).

11. **STUDIO AES IN** – This connection will be made to the Main Program audio source via an AES Splitter. Use Cable (949-0544-104) and AES Splitter (809-0830) supplied in the XPi 10 Exporter Installation Kit (979-0544-100).
12. **Mouse** – (MUST be connected if the XPi 10 has an **ITOX brand motherboard** when upgrading software or changing the I.P. Address).
13. **Keyboard** – (MUST be connected if the XPi 10 has an **ITOX brand motherboard** when upgrading software or changing the I.P. Address).
14. **44.1kHz Word Clock Output** – This is used to drive the timing of your main audio source and would connect to the word clock input of this main audio source. This could be the word clock input on the sound card in an Audio Vault.
15. **AUDIO BYPASS to XPi 10 Status Output** – These connections go to the 2-pin connector on the XPi 10 Exporter for bypass operation. If a fault or power fails the BYPASS AUDIO IN is routed to the FM AES OUT to STL/TX Connector. Jumper Cable (949-0609) supplied in the XPi 10 Exporter Installation Kit (979-0544-100).
16. **FM AES OUT TO STL/TX** – This audio output is 44.1kHz. Depending upon your System's Configuration, connect to one of the following (Reference the HD Radio™ System Configuration drawings for additional information):

Connect to the STL using Cable (949-0544-106) supplied in the XPi 10 Exporter Installation Kit (979-0544-100).

- or -

Connect to the FM Processor (IN) using Cable (949-0544-110) supplied in the XPi 10 Exporter Installation Kit (979-0544-100).



## 5.2. Configuring Station Call Letters in the XPi 10 Exporter

Your stations call letters should have been configured in the XPi 10 Exporter at the factory prior to shipment. The following provides instructions on setting the call letters if needed. From the Main GUI, select **STATION** -> **Station Information**. Next, enter the station's call letters in the **Call Sign** field.



Figure 22 – XPi 10 Station Information

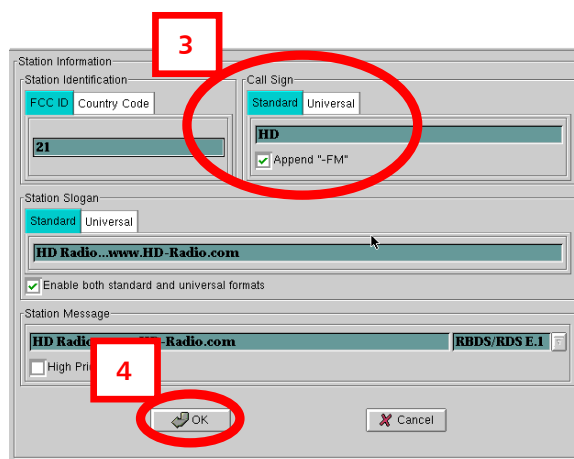


Figure 23 – XPi 10 Short Name Menu

### 5.3. Configure the I.P. Address of the XPi 10 Exporter

**NOTE:** Both the FXi 60/250 Exciter (w/Engine) and the XPi 10 Exporter are configured at the factory to be in the same I.P. family. If it is desired to change from the original factory setting, the FXi and XPi must BOTH be changed to ensure communication. This section provides instruction on setting the I.P. Address of the XPi.

**Step 1** - Select the **SYSTEM** button from the front menu.

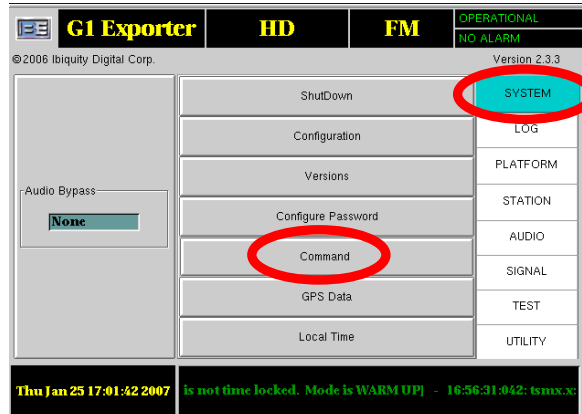


Figure 24 – XPi 10 Main GUI Menu

**Step 2** - Select **Command** from the SYSTEM menu and the following will appear asking for your password. Type in the password. The default is "password" (all lower case).

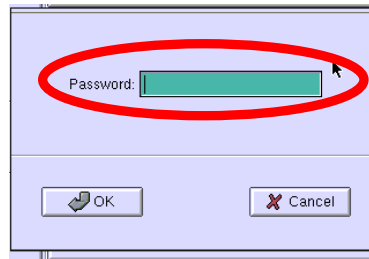


Figure 25 – XPi 10 Password Menu

**Step 3** - If using an external keyboard un-check Display virtual keyboard then click on linuxconf.

**Note:** If your XPi 10 has an ITOX brand motherboard, the external mouse and keyboard **MUST** both be connected for either to work.

**Note:** To view the IP address simply click on the ifconfig button to see the IP address, Subnet Mask, and MAC address if needed.

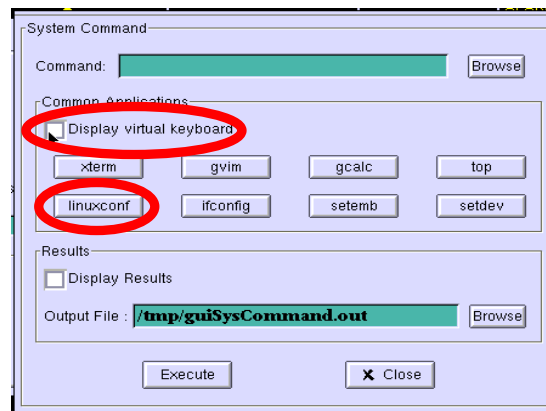


Figure 26 – XPi 10 System Command Menu

**Step 4 -** Highlight **Networking** and hit **<ENTER>**.

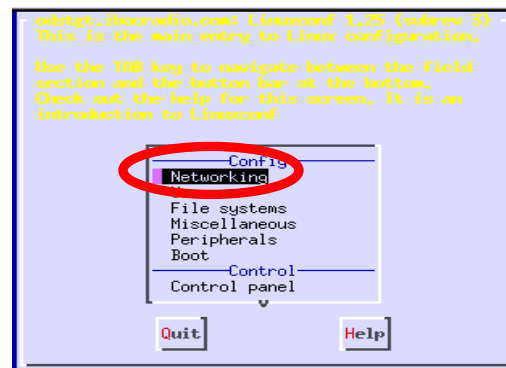


Figure 27 – XPi 10 Config / Control Menu

**Step 5 -** Highlight Host name and IP network devices and hit **<ENTER>**.

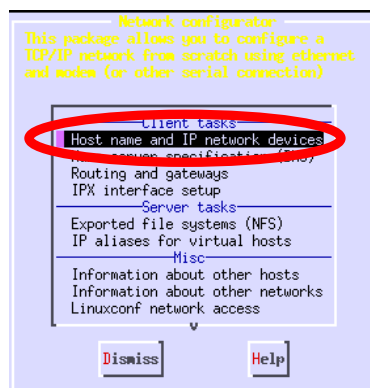
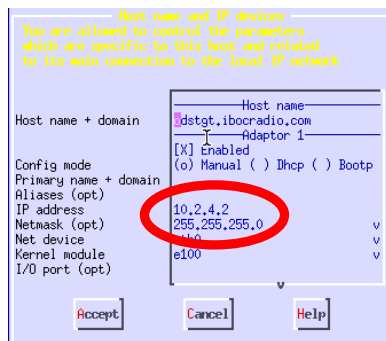


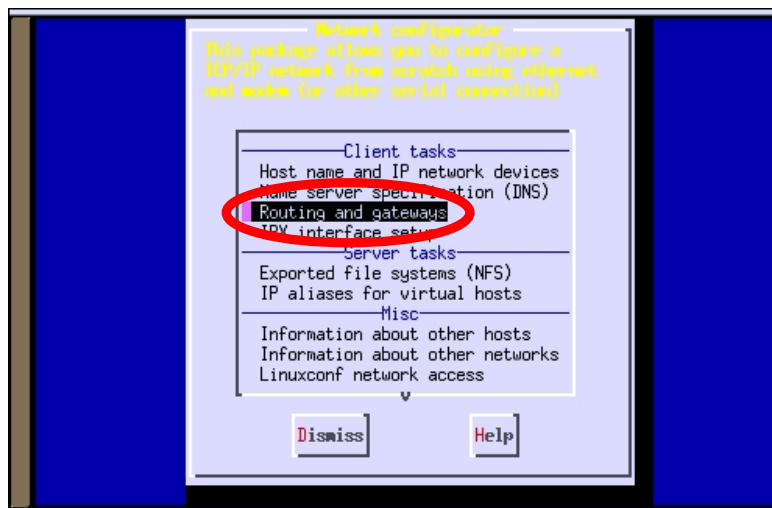
Figure 28 – XPi 10 Networking Menu

**Step 6** - Use arrows to go to IP address and Netmask and change to desired value.  
Hit **<TAB>** to accept, then press **<ENTER>** on the keyboard.



**Figure 29 – XPI 10 IP Address Menu**

**Step 7** - Next, the **Routing and Gateways** menu will appear.



**Figure 30 – XPI 10 Client , Server, and Misc Tasks Menu**

- Step 8** - Press **<TAB>** to Accept, then press **<Enter>** on the keyboard.  
**Step 9** - Press **<TAB>** to Dismiss, then press **<Enter>** on the keyboard.  
**Step 10** - Press **<TAB>** to Quit, then press **<Enter>** on the keyboard.  
**Step 11** - Press **<TAB>** twice to highlight **Do It**, then press **<Enter>** on the keyboard.  
**Step 12** - The Command window should now be displayed.  
**Step 13** - Cycle the AC power (operate the power switch OFF, then ON) to restart the operating system on the new settings.

**This completes the Network setup for the XPI 10 Exporter.**



## 5.4. Obtain the I.P. Address of the FXi Exciter (w/Exgine)

If you do not already know the I.P. Address of the FXi Exciter, follow the following steps to retrieve it.

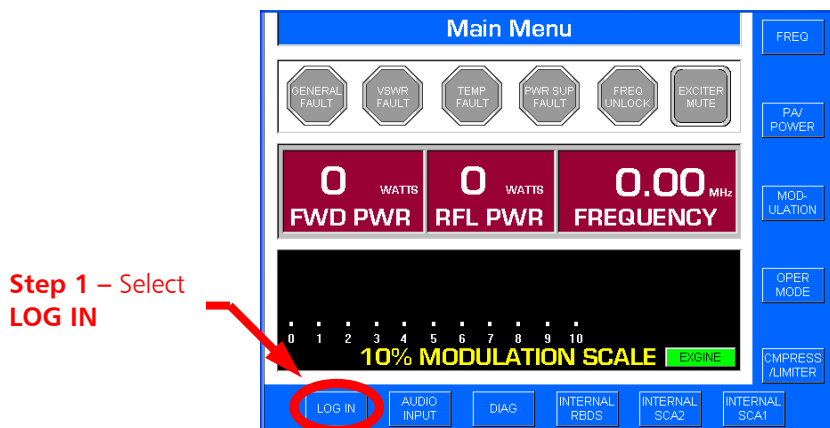
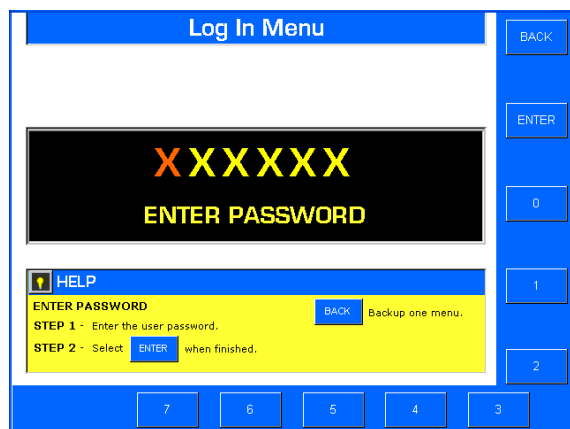


Figure 31 – FXi Exciter Main Menu Before Login



**Step 2 – Using the numeric buttons, enter the password and then press ENTER (the default is 1 2 3 4 5 6)**

Figure 32 – Login Menu

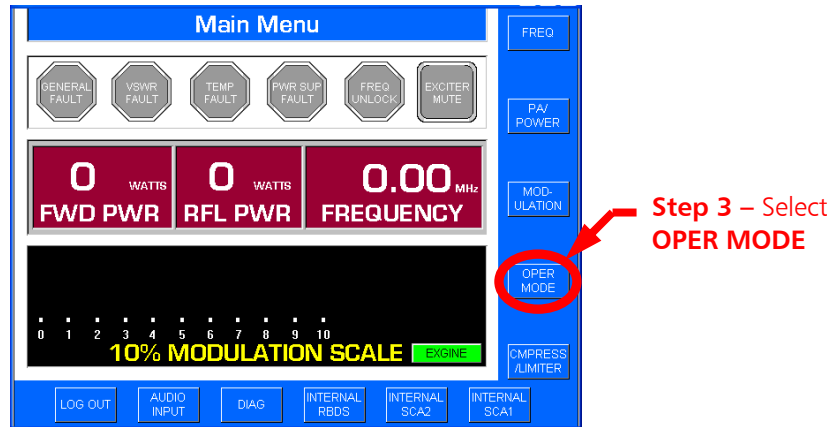


Figure 33 – Main Menu After Login

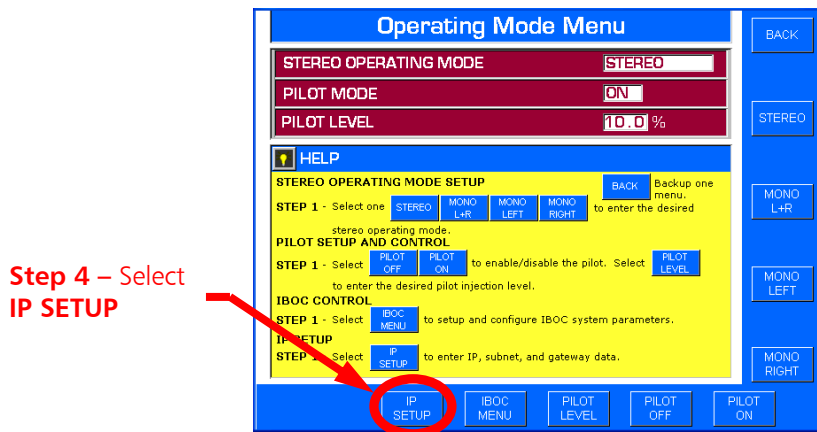


Figure 34 – Operating Mode Menu

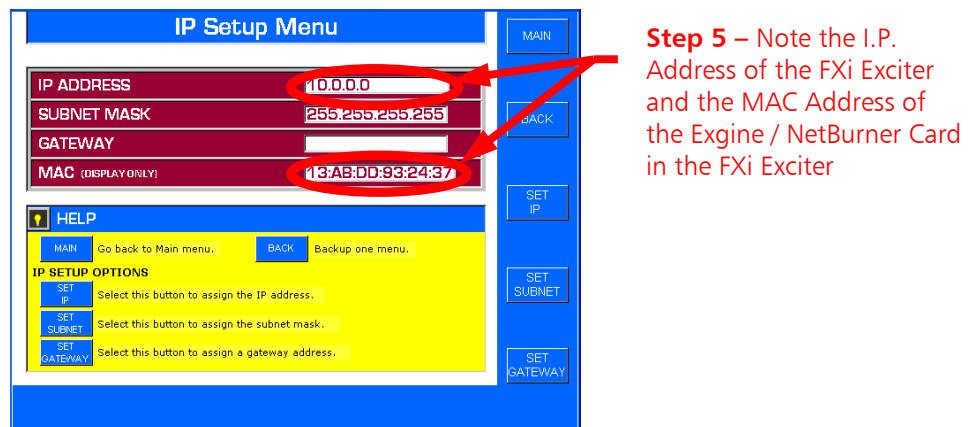


Figure 35 – I.P. Setup Menu



## 5.5. Pointing the XPi 10 Exporter to the Engine Card

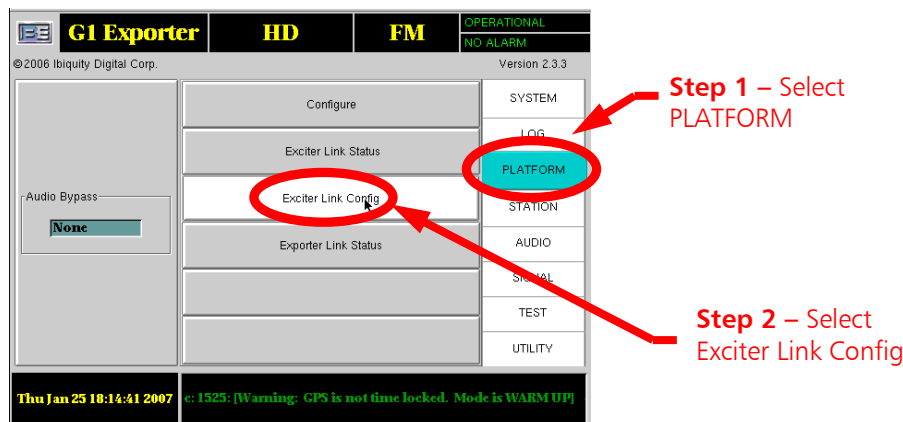


Figure 36 – XPi 10 Main Gui Menu

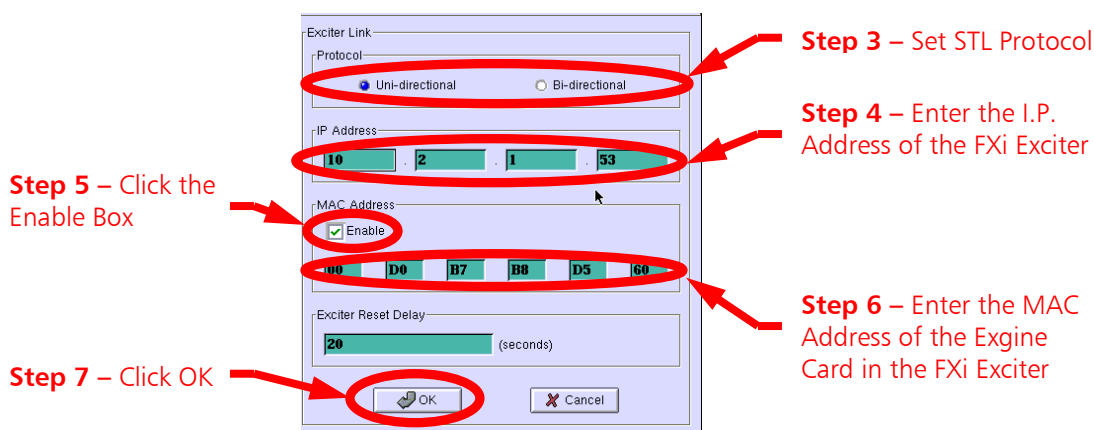


Figure 37 – XPi 10 Exciter Link Menu

**Step 8** – Restart the XPi 10 Exporter when prompted by cycling the AC power (operate the power switch OFF, then ON) to restart the operating system on the new settings.. Also, reset the FXi Exciter over the STL or network when prompted.

The communication setup for the XPi 10 Exporter to communicate with FXi 60/250 Exciter (with the Engine Card) is now complete.

## 6. Start the System

Once both the FXi 60/250 Exciter (w/Engine) and the XPi 10 Exporter have both been installed and setup for communication in your system's network, you are ready to start sending data. See the IDi 20 Data Importer manual (597-2010-004) for additional information.

## 7. Engine Card Status Indicators

To ensure that the system is operating properly, on the rear panel of the FXi Exciter check the Engine Card Status Indicator LEDs for normal operation as shown below. Additionally, on an HD Receiver tune to your channel(s) to confirm transmission.

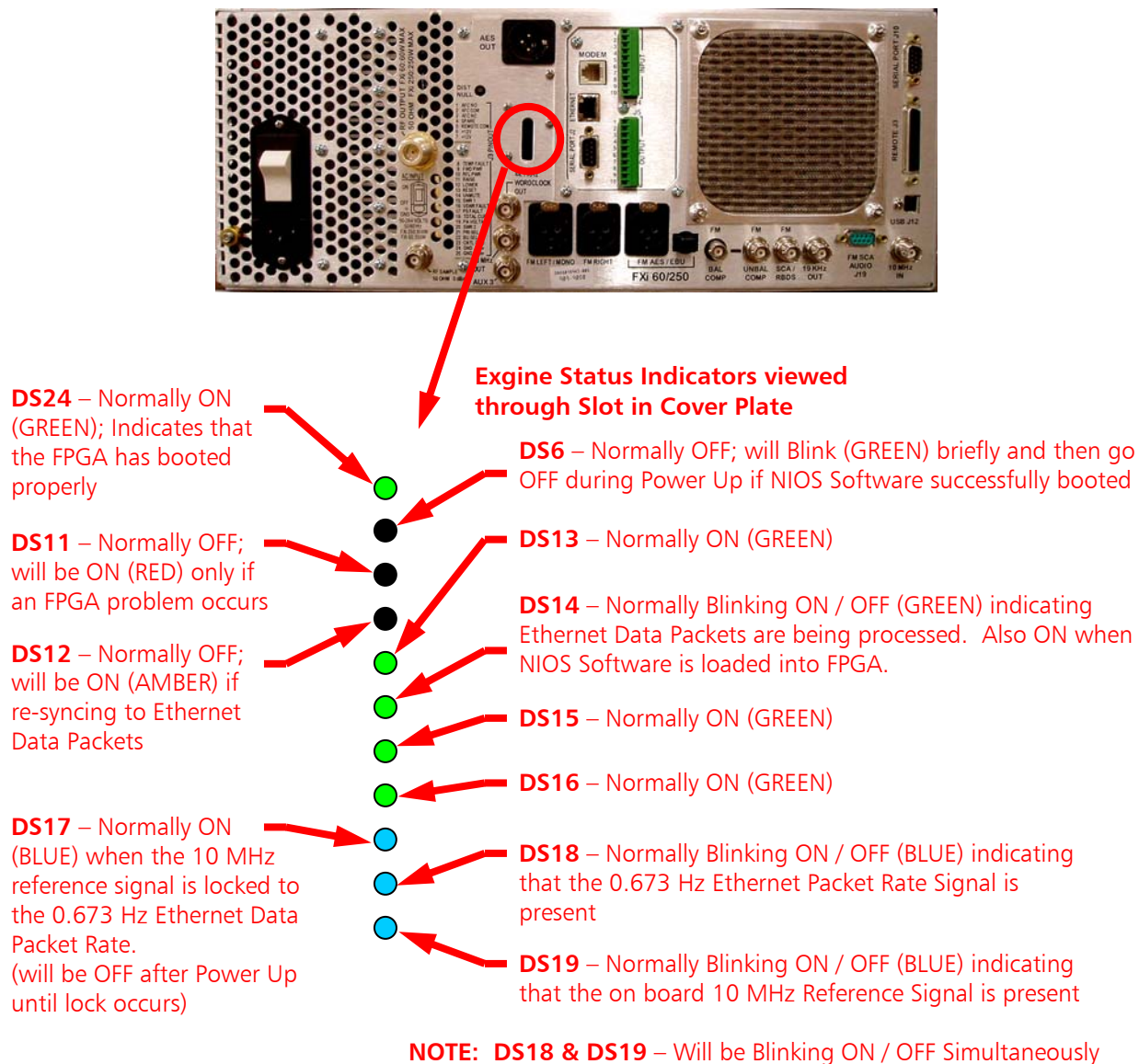


Figure 38 – Engine Status Indicator LEDs (Rear of FXi Exciter)

## 8. Software Upgrades

The latest versions of software for the **XPi 10 Exporter**, **FXi 60/250 Exciter Controller**, and **Exgine Card** are available from the Broadcast Electronics Customer Service website under the Registered User Login section here: <http://www.bdcast.com/support/index.php>

## 9. Software Upgrade Documentation

The latest **XPi 10 Exporter**, **FXi 60/250 Exciter Controller**, and **Exgine Card** software upgrade instructions are also available on the Broadcast Electronics Customer Service website at [www.bdcast.com](http://www.bdcast.com) under the "Support" tab, then "Application Guides."

### 9.1. Upgrading XPi 10 Exporter Software

Document **597-0542-005** provides detailed instructions for upgrading software in the **XPi 10 Exporter**.

### 9.2. Upgrading FXi 60/250 Exciter Controller Software

Document **597-0541-005** provides detailed instructions for upgrading **Controller Board** software in the **FXi 60/250 Exciter**.

### 9.3. Upgrading FXi 60/250 Exgine Card Software

Document **597-0541-006** provides detailed instructions for upgrading **Exgine Card** software in the **FXi 60/250 Exciter**.

## 10. RF Technical Service Contact Information

RF Technical Service -

Telephone: (217) 224-9617

E-Mail: [rfservice@bdcast.com](mailto:rfservice@bdcast.com)

Fax: (217) 224-9607

[www.bdcast.com](http://www.bdcast.com)

## 11. Terms and Definitions

AAS	Advanced Application Services
AES/EBU	Audio Engineers Society/European Broadcast Union
AM	Amplitude Modulation
EASU	Exciter Auxiliary Service Unit
EOC	Ensemble Operations Center
FM	Frequency modulation
IBOC	In-Band On-Channel
MF	Medium Frequency
MPA	Main Program Audio
MPS	Main Program Service
OFDM	Orthogonal Frequency-Division Multiplexing
PAD	Program Associated Data
QoS	Quality of Service
SIS	Station Information Service
SPS	Supplemental Program Service
VHF	Very High Frequency
WAN	Wide Area Network
LAN	Local Area Network
CM	Connection Manager
LP	Logistics Processor
IDi	Broadcast Electronics' brand name for an Importer
FSi	Broadcast Electronics' IBOC Signal Generator
FXi	Broadcast Electronics' Digital Exciter
XPi	Broadcast Electronics' Digital Exporter

Figure 39 - Terms and Definitions

