

STXLP TRANSMITTERS

STX LP – 1 kW, 2 kW, 3 kW, 5 kW FM Transmitters

Quick Installation Guide

STX LP – 1 kW, 2 kW, 3 kW, 5 kW FM Transmitters

Quick Installation Guide

©2012 Broadcast Electronics. All rights reserved.

The information in this publication is subject to improvement and change without notice. Although every effort is made to ensure the accuracy of the information in this manual, Broadcast Electronics accepts no responsibility for any errors or omissions. Broadcast Electronics reserves the right to modify and improve the design and specifications of the equipment in this manual without notice. Any modifications shall not adversely affect performance of the equipment so modified.

Proprietary Notice

This document contains proprietary data of Broadcast Electronics. No part of this publication may be reproduced, transmitted, transcribed, stored in a retrieval system, translated into any other language in any form or by any means, electronic or mechanical, including photocopying or recording, for any purpose, without the express written permission of Broadcast Electronics.

Trademarks

Broadcast Electronics and the BE logo are registered trademarks of Broadcast Electronics.

All other trademarks are property of their respective owners.

Table of Contents

1. Quick Install Guide Purpose	3 -
2. Overview	3 -
3. Installation Preparation	9 -
3.1. Verify Contents of Shipment.....	9 -
1 kW Models -	9 -
2 kW Models -	9 -
3 kW Models -	9 -
5 kW Models -	9 -
3.2. Tools / Items Needed For Installation (not supplied)	10 -
3.3. Mounting Considerations	10 -
3.4. Estimated Time for Installation / Setup.....	10 -
4. STXLP-1kW Assembly Rear Panel Connections / Features	10 -
5. STXLP-1kW Assembly Front Panel Features	15 -
6. STXLP-2kW, STXLP-3kW, And STXLP-5kW PA Assembly Front Panel Features -	17 -
7. STXLP-2kW, STXLP-3kW, And STXLP-5kW Combiner Assembly Front Panel Features	18 -
8. Installation	19 -
8.1. Install Into Equipment Rack	19 -
1 kW Models -	19 -
2 kW Models -	19 -
3 kW Models -	19 -
5 kW Models -	19 -
8.2. RFI/EMI Protection - Ferrite Ring Installation	20 -
8.3. AES Connections – Requires Optional Stereo Generator PCB.....	20 -
8.4. ANALOG L/R Connections – Requires Optional Stereo Generator PCB.....	20 -
8.5. Composite Connections.....	22 -
8.6. SCA1 Connections	22 -
8.7. SCA2 Connections	22 -
8.8. RDS Connections	22 -
8.9. 19 kHz Out Connections.....	22 -
8.10. Exciter - Using Only The Internal Exciter	22 -
8.11. Exciter - Using Only The External Exciter	22 -
8.12. Exciter - Using Both the Internal And External Exciter	23 -
8.13. Ethernet Connections.....	23 -
8.14. Remote Control Unit Connections	23 -
8.15. Failsafe Connection	23 -
8.16. RF Sample Connection	24 -
8.17. HD System Connections	24 -
8.18. RF Out Connection.....	24 -
8.19. RF/Control Connections – 2 kW Models.....	24 -
8.20. RF/Control Connections – 3 kW Models.....	24 -
8.21. RF/Control Connections – 5 kW Models.....	24 -
8.22. Ground Connection	25 -
8.23. AC Input Connection	25 -



1 kW Models -	- 25 -
2 kW Models –	- 26 -
3 kW Models –	- 26 -
5 kW Models –	- 26 -
9. Initial Turn On and Setup.....	- 27 -
9.1. Overview	- 27 -
9.2. Initial AC On.....	- 27 -
9.3. Set The Power Output	- 27 -
9.4. Select The Audio Input.	- 29 -
9.5. Calibrate the Audio/SCA/RDS Inputs.....	- 30 -
9.6. Audio Input Level Menu	- 34 -
9.7. SCA/RDS Level Menu	- 35 -
9.8. Set the Clock.....	- 36 -
9.9. Turn On	- 40 -
9.10. HD Operation With FXI 60/250 Exciter.....	- 41 -
10. RF Technical Services Contact Information.....	- 43 -



1. Quick Install Guide Purpose

This guide provides installation and operation information for STXLP transmitters setup at the factory. Only basic installation and operating procedures are presented here. Detailed information is presented in the STXLP Transmitter manual. The following items have been preset at the factory. These include settings if the unit is equipped with the optional stereo generator circuit board.

- Frequency – Customer requested Frequency
- Power Level – 1 kW Model - 1000 W, 2 kW Model - 2000 W, 3 kW Model - 3000 W, 5 kW Model - 5000 W
- 100% Modulation – Customer requested Deviation (75 kHz, 125 kHz, 200 kHz)
- Preemphasis – 75 uS
- Pilot Level – 10%
- Mono/Stereo Mode - Stereo
- Internal/External Exciter – Internal
- Audio Input – Composite
- Modulation Level – 100%
- Emergency Pwr – 1 kW Model - 250 W, 2 kW Model - 500 W, 3 kW Model - 750W, 5 kW Model – 1250 W
- SCA1 Injection = 10%
- SCA2 Injection = 10%
- RDS Injection = 10%
- Ethernet –
 - I.P. – 10.2.4.110
 - Subnet Mask – 255.255.0.0
 - Gateway – 10.2.4.1
- Passwords -
 - Optional RGUI Password - 222222
 - Chief – 123456
 - Operator - 111111

2. Overview

The STXLP FM transmitter series is designed to provide a low power cost effective solution for the FM broadcast market. The STXLP is available in 4 models providing power levels from 250 W to 5 kW. The following text presents the steps required for a quick installation:

- Install the transmitter components in a rack.
- If the internal exciter is to be used, connect a composite source to the unit. If the unit is equipped with the stereo generator board, AES or analog L/R may be connected to the unit. If an external exciter is to be used, an external relay and attenuator will be required for the connection.
- Connect any SCA or RDS equipment if used.
- Connect a network patch cable if I.P. control is desired.
- Connect the failsafe.
- Connect the antenna.
- Connect the AC input.
- Set the transmitter output power.
- Select the audio input.
- Calibrate the audio input level



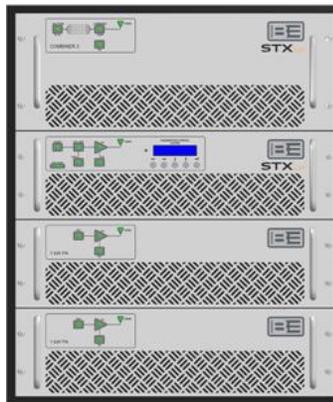
- Calibrate the SCA1/SC2/RDS levels.
- Select internal or external exciter.
- Turn the unit on.



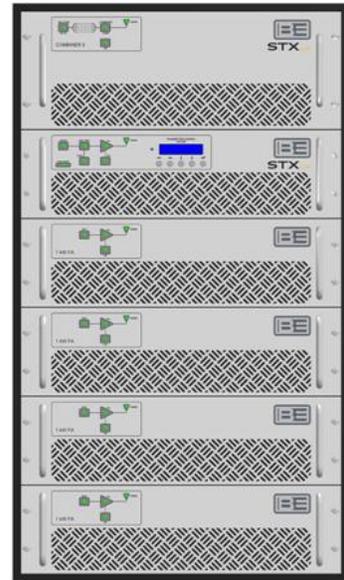
STXLP – 1 kW



STXLP – 2 kW



STXLP – 3 kW



STXLP – 5 kW

Figure 1 - STXLP – TRANSMITTER MODELS



The following text presents the STXLP specifications.

Table 1 – Specifications

Parameter	Specification
Physical	
1 kW Model -	
Height	3RU (5.25", 13.4 cm)
Width	19" (48.3 cm) EIA Rack Mountable.
Depth	26" (66.1 cm) deep including connectors.
Weight	40lbs (18.2 kg) unpacked.
Outlet Size	75 in ² (493 cm ²), rear of unit
2 kW Model -	
Height	17.5", (44.5 cm)
Width	19" (48.3 cm) EIA Rack Mountable.
Depth	26" (66.1 cm) deep including connectors.
Weight	130lbs (59.0 kg) unpacked.
Outlet Size	165 in ² (1065 cm ²), rear of unit
3 kW Model -	
Height	22.75" (57.8 cm)
Width	19" (48.3 cm) EIA Rack Mountable.
Depth	26" (66.1 cm) deep including connectors.
Weight	170lbs (77.1 kg) unpacked.
Outlet Size	220 in ² (1419 cm ²), rear of unit
5 kW Model -	
Height	33.25" (84.5 cm)
Width	19" (48.3 cm) EIA Rack Mountable.
Depth	26" (66.1 cm) deep including connectors.
Weight	250lbs (113.4 kg) unpacked.
Outlet Size	330 in ² (2129 cm ²), rear of unit
Environmental	
Temperature	-10°C to +50°C.
Altitude	10,000ft (3048M).
Humidity	95% max., non-condensing.
1 kW Model	
Cooling Air Requirements	200 CFM (5.7 m ³ /Min)
Heat Dissipation	750 W at 1 kW RF Output into a 50 Ohm load, FM Only Mode.
BTU	2560 BTU/H at 1 kW RF Output into a 50 Ohm load.
2 kW Model	
Cooling Air Requirements	600 CFM (17.0 m ³ /Min)
Heat Dissipation	1550 W at 2 kW RF Output into a 50 Ohm load, FM Only Mode.
BTU	5295 BTU/H at 2 kW RF Output into a 50 Ohm load.
3 kW Model	
Cooling Air Requirements	800 CFM (22.7 m ³ /Min)
Heat Dissipation	2300 W at 3 kW RF Output into a 50 Ohm load, FM Only Mode.
BTU	7850 BTU/H at 3 kW RF Output into a 50 Ohm load.
5 kW Model	
Cooling Air Requirements	1200 CFM (34.0 m ³ /Min)
Heat Dissipation	3800 W at 5 kW RF Output into a 50 Ohm load, FM Only Mode.
BTU	13000 BTU/H at 5 kW RF Output into a 50 Ohm load.



AC Input	
Frequency	47-63 Hz.
Power Factor	≥ 0.98 .
Surge Protection	Surge protection required.
1 kW Model	
Voltage	180 to 260 VAC, Single Phase.
Power	Requires 20 Amps Max.
Power Consumption	1.75 kW (calculated) at 1 kW.
Current Draw	16 Amps Max.
2 kW Model	
Power Consumption	3.5 kW (calculated) at 2 kW.
Single Phase -	
Voltage	180 to 260 VAC
Power	Disconnect Size 40 Amps.
Current Draw	32 Amps Max.
3 kW Model	
Power Consumption	5.3 kW (calculated) at 3 kW.
Single Phase -	
Voltage	180 to 260 VAC
Power	Disconnect Size 60 Amps.
Current Draw	48 Amps Max.
Three Phase -	
Voltage	180 to 260VAC Delta or 311 to 449VAC Wye
Power	Disconnect Size 30 Amps
Current Draw	28 Amps Max.
5 kW Model	
Power Consumption	8.8 kW (calculated) at 5 kW.
Single Phase -	
Voltage	180 to 260 VAC
Power	Disconnect Size 100 Amps.
Current Draw	80 Amps Max.
Three Phase -	
Voltage	180 to 260VAC Delta or 311 to 449VAC Wye
Power	Disconnect Size 60 Amps.
Current Draw	47 Amps Max.



RF Output	
Accuracy	+/-5%.
Impedance	50 Ohms nominal.
VSWR	Rated Power into 1.5:1 VSWR.
1 kW Model	
FM Only	250-1100W.
FM+HD (-20 dB)*	175-770W.
FM+HD (-10 dB)*	110-495W.
HD Only*	75-330W.
Resolution	1W.
Efficiency	65% or greater.
RF Output Connector	Type N, Female.
2 kW Model	
FM Only	500-2000W.
FM+HD (-20 dB)*	350-1280W.
FM+HD (-10 dB)*	220-820W.
HD Only*	150-600W.
Resolution	2W.
Efficiency	57% or greater.
RF Output Connector	1 5/8 " Hard Line Coax, 50 Ohm.
3 kW Model	
FM Only	750-3000W.
FM+HD (-20 dB)*	525-1920W.
FM+HD (-10 dB)*	330-1230W.
HD Only*	225-900W.
Resolution	3W.
Efficiency	57% or greater.
RF Output Connector	1 5/8 " Hard Line Coax, 50 Ohm.
5 kW Model	
FM Only	1250-5000W.
FM+HD (-20 dB)*	875-3200W.
FM+HD (-10 dB)*	550-2050W.
HD Only*	375-1500W.
Resolution	5W.
Efficiency	57% or greater.
RF Output Connector	1 5/8 " Hard Line Coax, 50 Ohm.
Frequency	
Range	87.5MHz to 108MHz; 10kHz increments.
Stability	Internal Osc: +/-150 Hz, -10°C to +50°C.



Modulation	
Type	Direct-to-Channel; FM (HD or FM + HD only with external exciter.
Capability	300 kHz
RF Harmonics Suppression	Meets all FCC/DOC requirements and CCIR recommendations.
Composite Input	
Connector	BNC, un-balanced
Impedance	10k ohms
Level	3.5V p-p for 75 kHz modulation
Amplitude Response	+/-0.03 dB 20Hz to 53 kHz; +/-0.25 dB 53 kHz to 100 kHz
SNR	-80dB; below 100% modulation @ 400 Hz
THD + Noise	0.1%; 20 Hz to 53 kHz; 0.15% 53 kHz to 100 kHz
Stereo Separation	55dB; (typical 60 dB)
IMD	0.13%, SMPTE (60.7000 Hz, 1:1 ratio)
Asynchronous AM S/N Ratio	Better than -65 dB (typical -70dB) below referenced to 100% peak AM modulation.
Synchronous AM S/N Ratio	Better than -53 dB (typical -60dB) below referenced to 100% peak AM modulation. 75uSec de-emphasis with 75 kHz deviation @ 400 Hz sine wave.
SCA1 & 2 Inputs	
Connectors(2)	BNC, un-balanced
Impedance	10k ohms
Level	3.5V p-p for 10% injection level.
Response	+/-0.5dB; 53 kHz to 100 kHz.
RDS Input	
Connector	BNC, un-balanced.
Impedance	10k ohms.
Level	3.5V p-p for 10% injection level.
Response	+/-0.5 dB; 53 kHz to 100 kHz.
Pilot Stability	+/-0.3 Hz, 0°C to +50°C.
AES Input **	
Connector	XLR Female.
Impedance	110 Ohms, balanced.
Level	-2 dBFS for 100% modulation.
Amplitude Response	+/-0.25 dB; 20 Hz to 15 kHz.
SNR	75 dB below 100% modulation @ 400 Hz
IMD	0.1% or better.
THD + Noise	0.1% or better.
Stereo Separation	55dB (typical 60dB); 20 Hz to 15 kHz
Pre-emphasis	None, 50 uSec, 75 uSec selectable
Modes	Mono L, Mono R, Mono L+R, Stereo



Analog L/R **	
Connectors	XLR Female
Impedance	600 Ohms or 10K Ohms, selectable, balanced.
Level	+10 dBm for 100% modulation into 600 Ohms.
Amplitude Response	+/-0.25dB; 20Hz to 15 kHz
SNR	75 dB below 100% modulation @ 400 Hz
IMD	0.1% or greater.
THD + Noise	0.1% or greater.
Stereo Separation	55 dB (typical 60 dB); 20 Hz to 1 5kHz
Pre-emphasis	None, 50 usec, 75 usec selectable
Modes	Mono L, Mono R, Mono L+R, Stereo
19kHz Output **	
Connector	BNC un-balanced
Impedance	4.7 k Ohm minimum load
Level	1V p-p
Regulatory	
FCC/DOC/CE/IEC 215 Safety	Meets or exceeds FCC/DOC/CE and IEC 215 Safety requirements
* External HD Exciter Required	
** Optional Stereo Generator Circuit Board Required	

3. Installation Preparation

3.1. Verify Contents of Shipment

1 kW Models -

- 909-4101, STXLP-1kW FM Transmitter
- 979-4110, STXLP-1kW Installation Kit
- 979-4111, STXLP Instruction Manual Kit

2 kW Models -

- 909-4201, STXLP-2kW FM Transmitter
- 979-4210, STXLP-2kW Installation Kit
- 979-4111, STXLP 1kW Instruction Manual Kit

3 kW Models -

- 909-4301, STXLP-3kW FM Transmitter
- 979-4310, STXLP-3kW Installation Kit
- 979-4111, STXLP 1kW Instruction Manual Kit

5 kW Models -

- 909-4501, STXLP-5kW FM Transmitter
- 979-4510, STXLP-5kW Installation Kit
- 979-4111, STXLP Instruction Manual Kit



3.2. Tools / Items Needed For Installation (not supplied)

- Small Flat Blade Screwdriver
- Regular Flat Blade Screwdriver
- Wire Strippers
- Solder and Soldering Iron
- Cable for 37 Pin Connector
- Heat Shrink
- Appropriate Tool for Rack Hardware
- Standard Ethernet Cable to connect from the transmitter to the network.

3.3. Mounting Considerations

The STXLP-1kW unit is designed to mount in a standard 19" E.I.A. rack or cabinet and is 3 rack units in height. The STXLP – 2kW unit consists of: 1) one STXLP – 1kW transmitter assembly which is 3 rack units in height, 2) one amplifier assembly which is 3 rack units in height, and 3) a combiner assembly which is 4 rack units in height. The STXLP – 3kW unit consists of: 1) one STXLP – 1kW transmitter assembly which is 3 rack units in height, 2) 2 amplifier assemblies which are each 3 rack units in height, and 3) a combiner assembly which is 4 rack units in height. The STXLP – 5kW unit consists of: 1) one STXLP – 1kW transmitter assembly which is 3 rack units in height, 2) 4 amplifier assemblies which are each 3 rack units in height, and 3) a combiner assembly which is 4 rack units in height.

3.4. Estimated Time for Installation / Setup

Providing that you have the proper materials and tools listed above, the installation and setup of the STXLP transmitter will take approximately 1 hour.

4. STXLP-1kW Assembly Rear Panel Connections / Features

For STXLP 1kW models, the STXLP 1kW assembly is used as a standalone transmitter. In STXLP 2kW, 3kW, and STXLP 5kW models, the STXLP 1kW assembly is used as the main control and audio interface center. The following text presents the STXLP 1kW assembly rear panel connections and features.



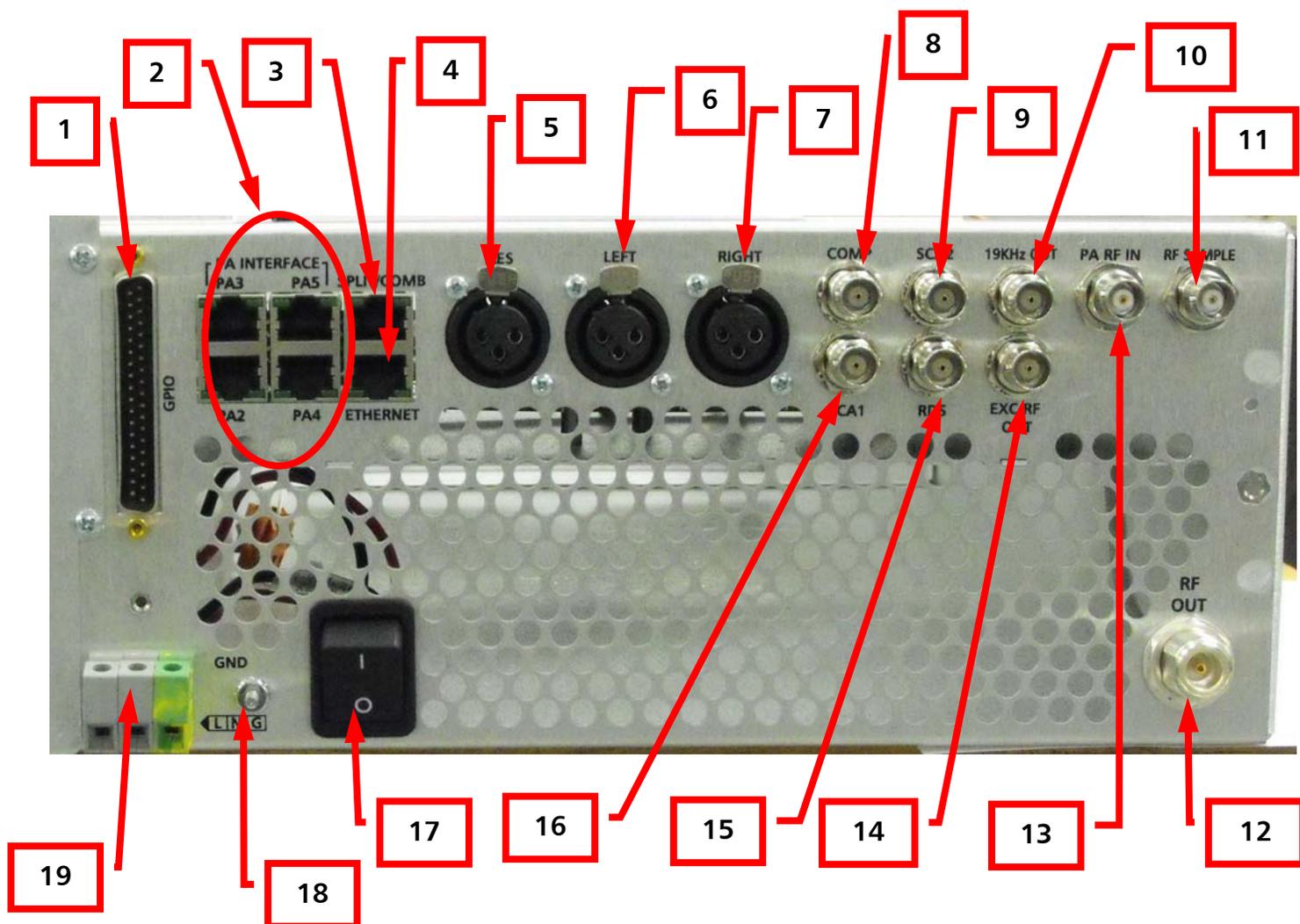


Figure 2 – STXLP – 1kW Rear Panel Connections / Features

- 1) **GPIO** – General purpose input/output connector. This connector is used to interface remote control units to the transmitter. The following text presents the pin descriptions.



Table 1 – GPIO Inputs

Pin No.	Name	Description
1	Fault Reset	Resets all the transmitter faults when active. Requires a momentary low (0 V) to activate.
2	Failsafe	Transmitter failsafe input. Requires a sustained low to close.
3	Transmitter On	Turns the transmitter on when active. Requires a momentary low (0 V) to activate.
4	Transmitter Off	Turns the transmitter off when active. Requires a momentary low (0 V) to activate.
5	Mute	Transmitter is muted while the input is low (0 V).
6	Lower Transmitter Power	Lowers the transmitter power while input is low (0 V).
7	Raise Transmitter Power	Raises the transmitter power while the input is low (0 V).
8	Internal/External Exciter Control	Toggles between internal and external exciter when active. Requires a momentary low (0 V) to activate.
9	Controller Reset	Resets the controller when active. Requires a momentary low (0 V) to activate.
10	External Exciter Fault Input	This input requires the connection of external exciter fault output. On the external exciter, select a status output which will be active when any exciter fault occurs. Requires a sustained low (0 V) to activate.
11	FM Only Mode Input Select	FM Only mode is selected while the input is low (0 V). Active only if in external exciter mode.
12	Ground	Ground to be used for remote input connections.
13	FM+HD Mode Input Select	FM + HD mode is selected while the input is low (0 V). Active only if in external exciter mode.
14	HD Only Mode Input Select	HD Only mode is selected while the input is low (0 V). Active only if in external exciter mode.
18	PA Module Meter Select Input	For STXLP 2 kW, 3 kW, and 5 kW models, toggles between the PA modules for status readings. Requires a momentary low (0 V) to activate. Not required for 1 kW models.
19	Ground	Ground to be used for remote input connections.

Table 2 – GPIO Outputs

Pin No.	Name	Description
15	Reflected Power	This output is a dc voltage (0 to 5 V) for remote reflected power monitoring of the system. 5V = 100 W – 1kW Models, 200 W – 2kW Models, 300 W – 3kW Models, 500 W – 5kW Models.
16	PA1 Thru PA5 Total Current	For 1 kW models, outputs a dc voltage (0 to 5 V) for remote PA1 total current monitoring. For STXLP 2 kW, 3 kW, and 5 kW models, outputs a dc voltage (0 to 5V) for a specific PA total current as determined by the PA Module Meter Select Input.
17	PA1 Thru PA5 Temperature	For 1 kW models, outputs a dc voltage (0 to 5 V) for remote PA1 temperature monitoring. For STXLP 2kW, 3 kW, and 5 kW models, outputs a dc voltage (0 to 5V) for a specific PA temperature as determined by the PA Module Meter Select Input.



Pin No.	Name	Description
20	General Fault Status	General fault status. This output goes low (0 V) when any transmitter fault occurs.
21	VSWR Status	VSWR fault status. This output goes low (0 V) when VSWR of greater than 1.5:1 is detected.
22	Transmitter On Status	Transmitter on status. This output goes low (0 V) when the transmitter is on.
23	Transmitter Off Status	Transmitter off status. This output goes low (0 V) when the transmitter is off.
24	Mute Status	Mute status. This output goes low (0 V) when the transmitter is muted.
25	AFC Lock Status	AFC Lock status. This output goes low (0 V) when the internal exciter is locked to the assigned frequency.
26	Power Supply Fault Status	Power Supply fault status. This output goes low (0 V) when a power supply fault is detected.
27	Internal/External Exciter Status	Internal/External exciter status. This output goes high (+5V) when the internal exciter is selected. This output goes low (0 V) when the external exciter is selected.
28	PA Fault	PA Fault status. This output goes low (0 V) when any PA fault is detected.
29	PA1 Thru PA5 Forward Power	For 1 kW models, outputs a dc voltage (0 to 5 V) for remote PA1 forward power monitoring. For STXLP 2 kW, 3 kW, and 5 kW models, outputs a dc voltage (0 to 5V) for a specific PA forward power as determined by the PA Module Meter Select Input.
30	PA1 Thru PA5 Reflected Power	For 1 kW models, outputs a dc voltage (0 to 5 V) for remote PA1 reflected power monitoring. For STXLP 2 kW, 3 kW, and 5 kW models, outputs a dc voltage (0 to 5V) for a specific PA reflected power as determined by the PA Module Meter Select Input.
31	Not Used	
32	+5V Out	+5V used for remote status connections.
33	Forward Power	This output is a dc voltage (0 to 5 V) for remote forward power monitoring. 5V = 1100 W – 1kW Models, 2000 W – 2kW Models, 3000 W – 3kW Models, 5000 W – 5kW Models.
34	PA Voltage	This output is a dc voltage (0 to 5 V) for remote PA voltage monitoring. 5V = 50 V PA Power Supply.
35	HD Power Control	This output is used only when the transmitter is configured in an HD system. When used in an HD system, the output is a dc voltage (0 to 5 V) used to control power.
36	External Exciter Relay Control	This output goes low (0 V) when the external exciter is selected.
37	Ground	Ground to be used for remote output connections.

- 2) **PA2/PA3/PA4/PA5** – For STXLP 2kW, 3 kW, and 5 kW models, the PA2 through PA5 ports are used to send control data to and receive data from an individual PA module. Not used for STXLP 1 kW models.
- 3) **SPLIT/COMB** – For STXLP 2 kW, 3 kW, and 5 kW models, the SPLIT/COMB port is used to send control data to and receive data from the splitter/combiner. Not used for STXLP 1 kW models.
- 4) **ETHERNET** – The ETHERNET port is used to interface the transmitter with a local network or the Internet.



- 5) **AES** – The AES XLR connector is used to interface AES audio to the transmitter. Not used if the transmitter is not equipped with the optional stereo generator circuit board.
- 6) **LEFT** – The LEFT XLR connector is used to interface analog left channel audio to the transmitter. Not used if the transmitter is not equipped with the optional stereo generator circuit board.
- 7) **RIGHT** – The RIGHT XLR connector is used to interface analog right channel audio to the transmitter. Not used if the transmitter is not equipped with the optional stereo generator circuit board.
- 8) **COMP** – The COMP BNC connector is used to interface a composite signal such as from a composite link to the transmitter.
- 9) **SCA2** – The SCA2 BNC connector is used to interface a subcarrier generator signal to the transmitter SCA2 input.
- 10) **19 kHz OUT** – The 19 kHz OUT BNC connector is used to output the pilot signal for external equipment requiring a pilot signal for synchronization. Not used if the transmitter is not equipped with the optional stereo generator circuit board.
- 11) **RF SAMPLE** – For STXLP – 1kW models, the RF SAMPLE BNC connector is an RF sample which can be used for monitoring of the RF signal. Typical connections include a modulation monitor or spectrum analyzer. The output level is 2V RMS at 1 kW. For 2kW, 3kW, and 5 kW models, the RF sample port is located on the combiner.
- 12) **RF OUT** – The RF OUT Type N female connector is the transmitter RF output.
- 13) **PA RF IN** – The PA RF IN BNC connector is used to interface: 1) the output of an external exciter to the transmitter if used or 2) the internal exciter to the PA (output from the EXC RF OUT connector).
- 14) **EXC RF OUT** – For STXLP 1 kW models, the EXC RF OUT BNC connector is used to interface the exciter output to the PA. For STXLP 2 kW, 3 kW and 5 kW models, the EXC RF OUT BNC connector is used to interface the exciter output to the splitter/combiner.
- 15) **RDS** – The RDS BNC connector is used to interface an RDS signal to the transmitter RDS input.
- 16) **SCA1** – The SCA1 BNC connector is used to interface a subcarrier generator signal to the transmitter SCA1 input.
- 17) **ON/OFF SWITCH** – Transmitter AC ON/OFF switch.
- 18) **GND** – The GND terminal provides a connection for a chassis ground strap or wire.
- 19) **AC INPUT TERMINAL BLOCK** – The AC input block is used for the AC input connection.



5. STXLP-1kW Assembly Front Panel Features

For STXLP 1kW models, the STXLP 1kW assembly is used as a standalone transmitter. In STXLP 2kW, 3kW, and STXLP 5kW models, the STXLP 1kW assembly is used as the main control and audio interface center. The following text presents the STXLP 1kW assembly front panel connections and features.

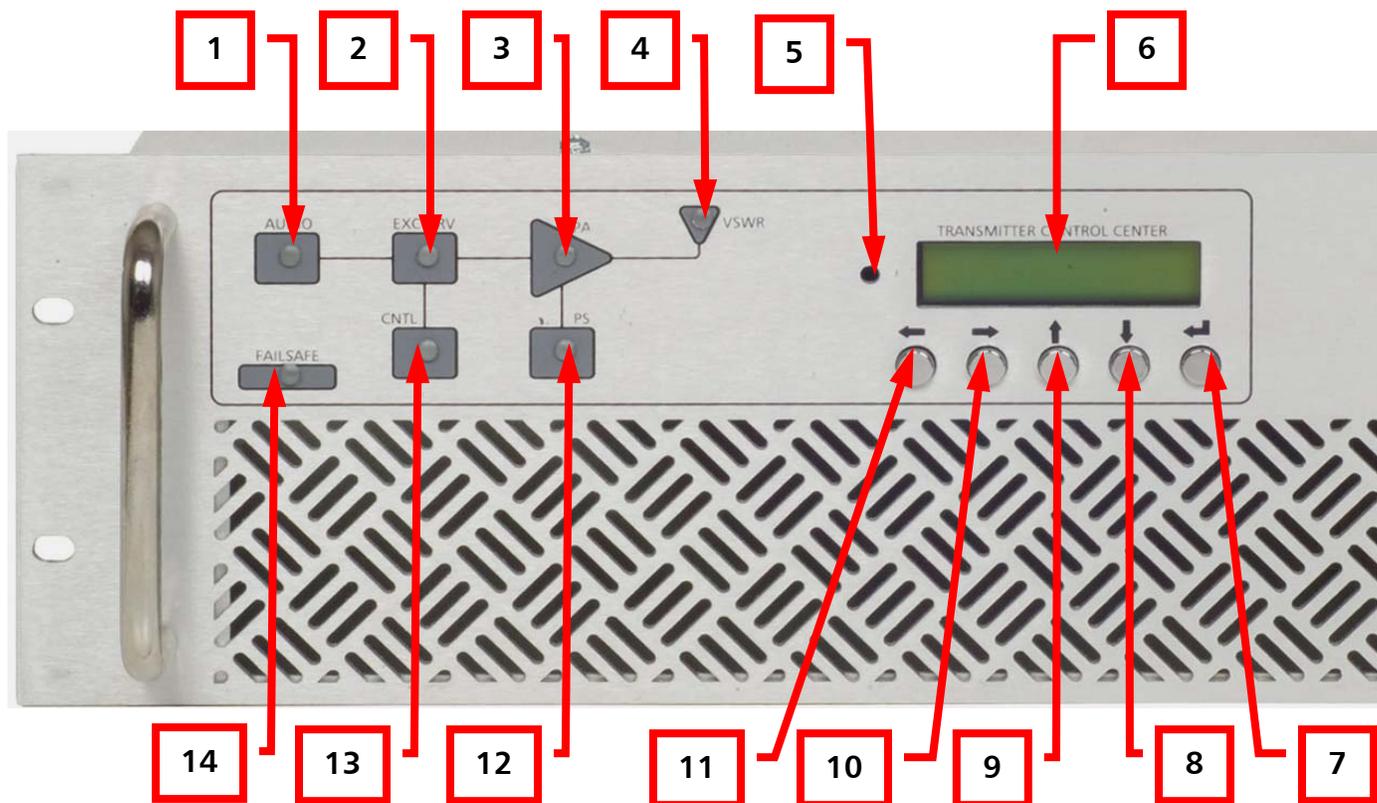


Figure 3 – STXLP Front Panel Features

- 1) **AUDIO INDICATOR** – The audio indicator illuminates red if no modulation is detected in the selected audio input source. The indicator illuminates green during normal operation.
- 2) **EXCITER INDICATOR** – The exciter indicator illuminates red if the internal exciter: 1) AFC (Automatic Frequency Control) becomes unlocked or 2) a communication fault occurs. The indicator illuminates green during normal operation.

- 3) **PA INDICATOR** – For 1 kW models, the PA indicator illuminates red if a fault is detected in the PA module. For 2 kW, 3 kW, and 5 kW models, the PA indicator illuminates red if a fault is detected in any PA module. The indicator illuminates green during normal operation.
- 4) **VSWR INDICATOR** – The VSWR indicator illuminates red when a greater than 1.5:1 VSWR condition is detected. The indicator illuminates green during normal operation.
- 5) **LCD CONTRAST CONTROL** – The LCD contrast control is used to adjust the backlight on the LCD display.
- 6) **TRANSMITTER CONTROL CENTER** – The LCD display is used to present transmitter information to the user.
- 7) **↵ RETURN BUTTON** – The return button is used to select a menu for editing, saves data changes made by the user, and returns the user to selected top level menu.
- 8) **↓ DOWN ARROW BUTTON** – The down button allows the user to move down the menu tree, decreases the selected value, or changes an option state.
- 9) **↑ UP ARROW BUTTON** – The up arrow button allows the user to move up the menu tree, increases the selected value, or changes an option state.
- 10) **→ RIGHT ARROW BUTTON** – The right arrow button allows the user to move the cursor to the right on the LCD display. In menus with no cursor, goes back to the sub menu such as Metering (refer to the STXLP Menu Tree at the end of this manual for specific menus).
- 11) **← LEFT ARROW BUTTON** – The left arrow button allows the user to move the cursor to the left on the LCD display. In menus with no cursor, goes back to the main menu (refer to the STXLP Menu Tree at the end of this manual for specific menus).
- 12) **PS INDICATOR** – For 1 kW models, the PS indicator illuminates red if a fault is detected in the PA power supply module. For 2 kW, 3 kW, and 5 kW models, the PS indicator illuminates red if a fault is detected in any PA power supply module. The indicator illuminates green during normal operation.
- 13) **CNTL INDICATOR** – The CNTL indicator flashes red to indicate when the unit has switched to the backup controller due to a fault in the main controller.
- 14) **FAILSAFE INDICATOR** – The FAILSAFE indicator illuminates red when the failsafe is opened. The indicator illuminates green when the failsafe is closed.



6. STXLP-2kW, STXLP-3kW, And STXLP-5kW PA Assembly Front Panel Features

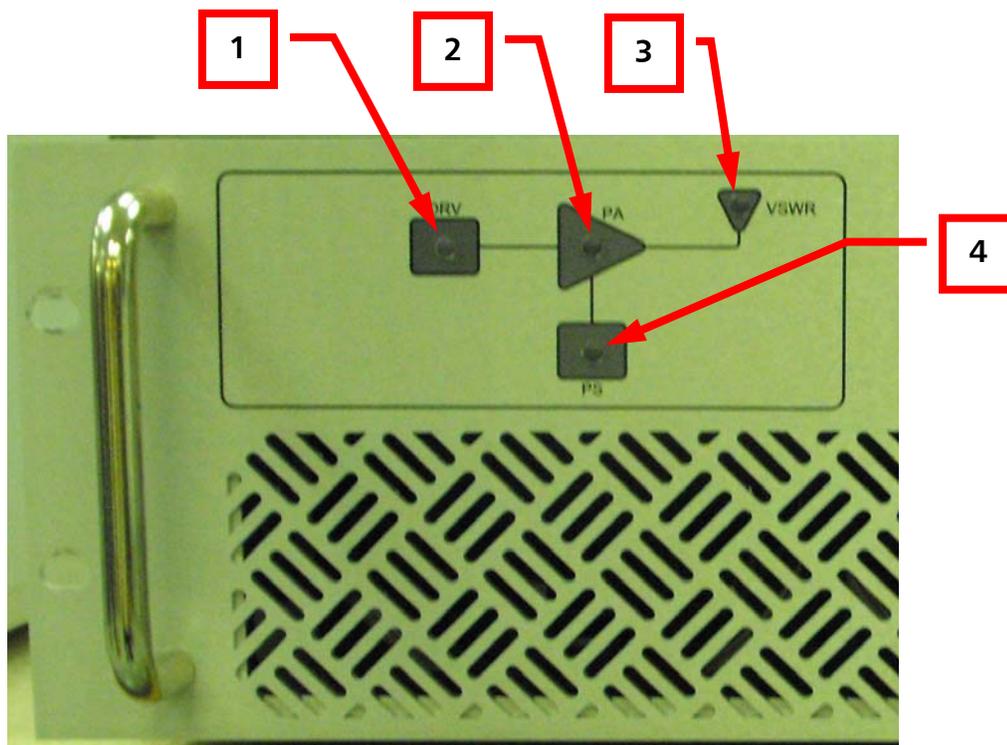


Figure 3 – STXLP PA Assembly Front Panel Features

- 1) **DRV INDICATOR** – The drive indicator illuminates red if no RF is present at the input. The indicator illuminates green during normal operation. The indicator is red when the transmitter RF is off.
- 2) **PA INDICATOR** –The PA indicator illuminates red if a fault is detected in the PA module. The indicator illuminates green during normal operation.
- 3) **VSWR INDICATOR** – The VSWR indicator illuminates red when a greater than 1.5:1 VSWR condition is detected. The indicator illuminates green during normal operation.
- 4) **PS INDICATOR** –The PS indicator illuminates red if a fault is detected in the PA power supply module. The indicator illuminates green during normal operation.

7. STXLP-2kW, STXLP-3kW, And STXLP-5kW Combiner Assembly Front Panel Features

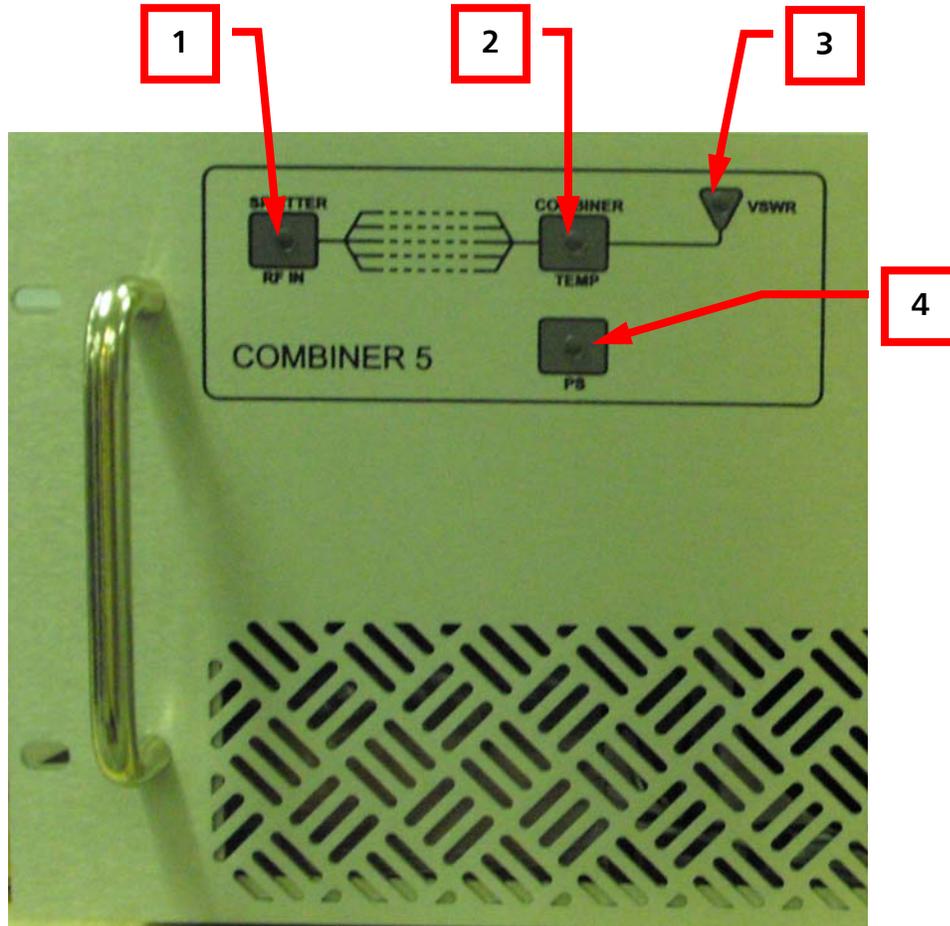


Figure 3 – STXLP Combiner Assembly Front Panel Features

- 1) **SPLITTER RF IN INDICATOR** – The splitter RF in indicator illuminates red if the RF input level is too low or high. The indicator illuminates green during normal operation. The indicator is red when the transmitter RF is off.
- 2) **COMBINER TEMP INDICATOR** – The combiner temp indicator illuminates red if the combiner temperature is above 91 C. The indicator illuminates green during normal operation.
- 3) **VSWR INDICATOR** – The VSWR indicator illuminates red when a greater than 1.5:1 VSWR condition is detected. The indicator illuminates green during normal operation.
- 4) **PS INDICATOR** – The PS indicator illuminates red if a fault is detected in the combiner +12V power supply module. The indicator illuminates green during normal operation.

8. Installation

8.1. Install Into Equipment Rack



CAUTION: EACH UNIT MUST HAVE REAR MOUNTING SUPPORT TO PREVENT DAMAGE.

1 kW Models -

The STXLP – 1kW assembly requires 3 rack units of space in a standard 19 inch E.I.A. rack. Overall installation information is presented in the installation drawing at the end of this guide. To install the unit proceed as follows:

1. Determine the location for the unit in the rack.
2. Refer to Figure 4 and install the unit in the rack using the mounting hardware located in the installation kit.
3. Refer to Figure 4 and install the rear mounting plates as shown. If the rack is not equipped with rear rails, modify the rack to provide rear support.

2 kW Models -

The STXLP – 2kW unit consists of: 1) one STXLP – 1kW transmitter assembly which is 3 rack units in height, 2) one amplifier assembly which is 3 rack units in height, and 3) a combiner assembly which is 4 rack units in height. Overall installation information is presented in the installation drawing at the end of this guide. To install the unit proceed as follows:

1. Determine the location for the unit in the rack.
2. Refer to Figure 4 and install the unit in the rack using the mounting hardware located in the installation kit.
3. Refer to Figure 4 and install the rear mounting plates as shown. If the rack is not equipped with rear rails, modify the rack to provide rear support.

3 kW Models -

The STXLP – 3kW unit consists of: 1) one STXLP – 1kW transmitter assembly which is 3 rack units in height, 2) 2 amplifier assemblies which are each 3 rack units in height, and 3) a combiner assembly which is 4 rack units in height. Overall installation information is presented in the installation drawing at the end of this guide. To install the unit proceed as follows:

1. Determine the location for the unit in the rack.
2. Refer to Figure 4 and install the unit in the rack using the mounting hardware located in the installation kit.
3. Refer to Figure 4 and install the rear mounting plates as shown. If the rack is not equipped with rear rails, modify the rack to provide rear support.

5 kW Models -

The STXLP – 5kW unit consists of: 1) one STXLP – 1kW transmitter assembly which is 3 rack units in height, 2) 4 amplifier assemblies which are each 3 rack units in height, and 3) a combiner assembly which is 4 rack units in height. Overall installation information is presented in the installation drawing at the end of this guide. To install the unit proceed as follows:

1. Determine the location for the unit in the rack.
2. Refer to Figure 4 and install the unit in the rack using the mounting hardware located in the installation kit.



3. Refer to Figure 4 and install the rear mounting plates as shown. If the rack is not equipped with rear rails, modify the rack to provide rear support.

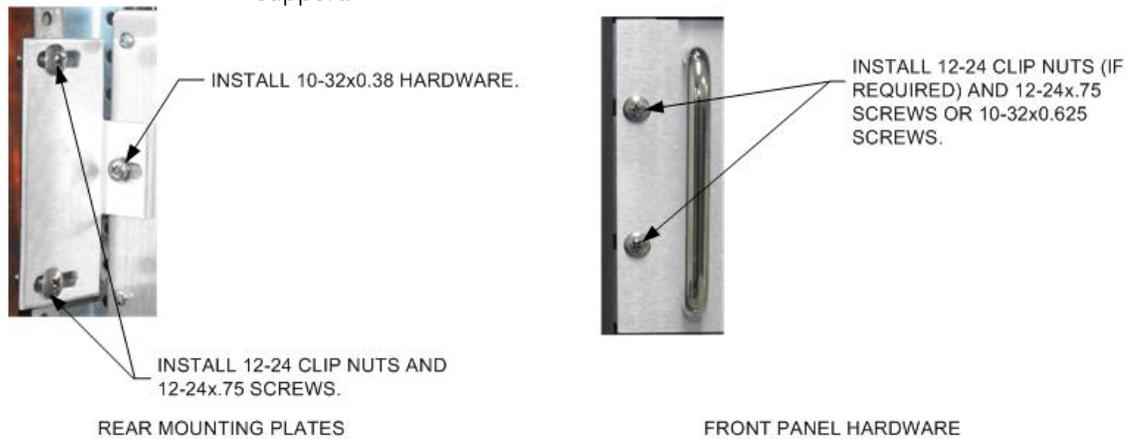


FIGURE 4. RACK INSTALLATION

8.2. RFI/EMI Protection - Ferrite Ring Installation



CAUTION: IT IS STRONGLY RECOMMENDED ALL TRANSMITTER INPUT/OUTPUT CABLES BE INSTALLED WITH FERRITE RINGS FOR RFI/EMI PROTECTION.

The following text presents the procedures to connect audio, Ethernet, input/output, sample, and interconnect (for STXLP 2kW, 3kW, and STXLP-5kW models) cables to the transmitter. It is strongly recommended the cables be installed with Ferrite rings for RFI/EMI protection (refer to Figure 5). Ensure Ferrite rings are used with the cable installations.

8.3. AES Connections – Requires Optional Stereo Generator PCB

If the transmitter is equipped with the optional stereo generator circuit board, an AES source can be used for the audio input. Input level range is from -20 dbFS to 0 dbFS. -2 dbFS nominal. If AES audio is to be used –

1. Locate an XLR mating connector.
2. Attach the wires as follows –
 - Pin 1 – Ground
 - Pin 2 – Signal +
 - Pin 3 – Signal –
3. Refer to Figure 5 and connect the cable to the AES connector.

8.4. ANALOG L/R Connections – Requires Optional Stereo Generator PCB

If the transmitter is equipped with the optional stereo generator circuit board, an analog L/R source can be used for the audio input. Input level range is from -15 dBm to +15 dBm. +10 dbm nominal. If analog L/R audio is to be used –

1. Locate 2 XLR mating connectors.
2. Attach the left channel wires as follows –
 - Pin 1 – Ground
 - Pin 2 – Signal +
 - Pin 3 – Signal –
3. Refer to Figure 5 and connect the cable to the LEFT connector.

4. Repeat the procedure for the right channel.

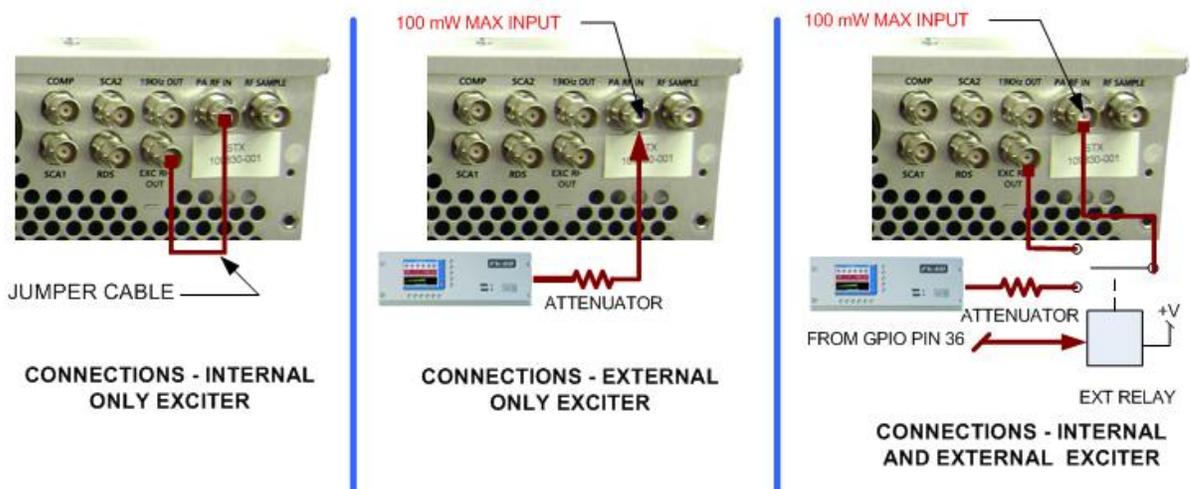
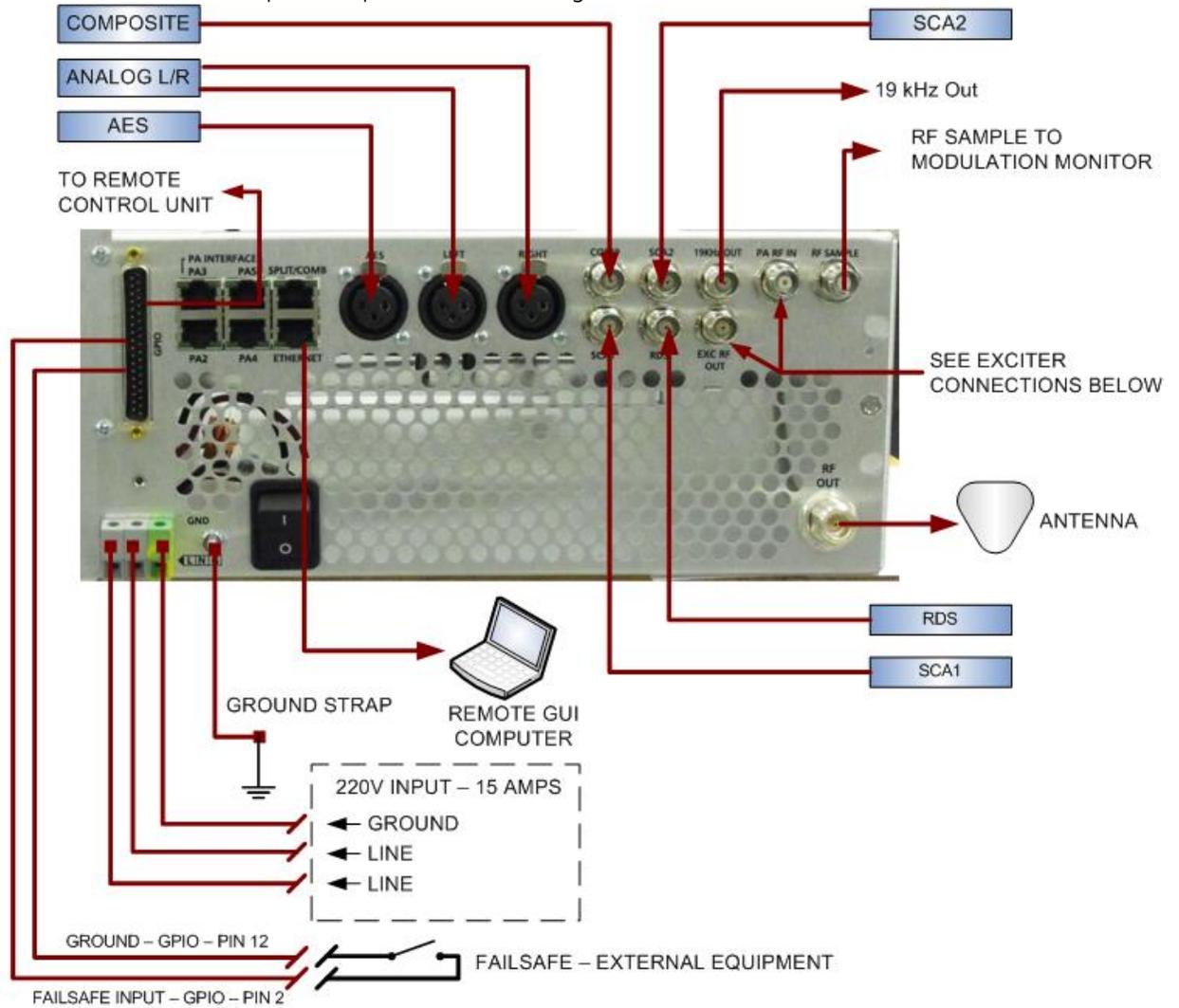
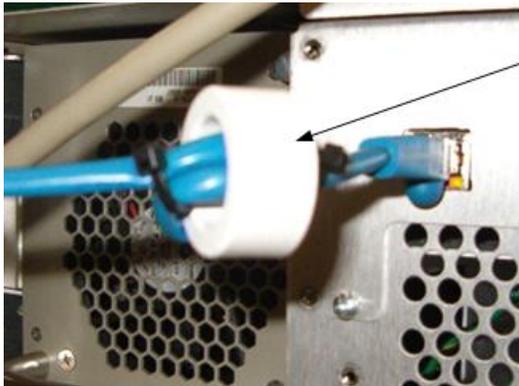


Figure 5 – STXLP Connections (Sheet 1 of 2)





Ferrite Ring 375-0009. Min 2 Wraps.

NOTES –

It is strongly recommended all interface cabling be installed with Ferrite Rings such as BEI P/N 375-0009. Minimum of 2 wraps. Install the Ferrite rings for the following cables –

1. General Purpose Input/Output (GPIO).
2. Ethernet.
2. Audio (Composite, AES, and Analog).
3. SCA1.
4. SCA2.
5. RDS.
6. 19 kHz Out.
7. RF Sample.
8. For STXLP-3kW/STXLP-5kW Models - Interconnecting Ethernet cables between the main control unit/ PA Only units/combiner (if not provided by the factory).

Figure 5 – STXLP Connections (Sheet 2 of 2)

8.5. Composite Connections

If a composite audio source is to be used, refer to Figure 5 and connect a BNC cable from the source to the COMP connector. Input level range is from -15 dBm to +15 dBm. 3.5 Vpp nominal.

8.6. SCA1 Connections

If an SCA is to be used, refer to Figure 5 and connect a BNC cable from the source to the SCA1 connector. Input level range is from -20 dBm to +15 dBm. 3.5 Vpp nominal.

8.7. SCA2 Connections

If a second SCA is to be used, refer to Figure 5 and connect a BNC cable from the source to the SCA2 connector. Input level range is from -20 dBm to +15 dBm. 3.5 Vpp nominal.

8.8. RDS Connections

If an RDS generator is to be used, refer to Figure 5 and connect a BNC cable from the source to the RDS connector. Input level range is from -20 dBm to +15 dBm. 3.5 Vpp nominal.

8.9. 19 kHz Out Connections

If the unit is equipped with the optional stereo generator board and a 19 kHz pilot signal is required, refer to Figure 5 and connect a BNC cable from 19 kHz OUT connector and the source equipment. Output level is 1 Vpp.

8.10. Exciter - Using Only The Internal Exciter

If only the internal exciter is to be used, refer to Figure 5 and ensure the jumper cable is connected between the EXC RF OUT and the PA RF IN connectors.

8.11. Exciter - Using Only The External Exciter



CAUTION: TO PREVENT DAMAGE TO THE PA, DO NOT OVERDRIVE THE INPUT.

If only an external exciter is to be used, refer to Figure 5 and perform the following procedure. If the external exciter is an FXI-60 /FXI-250, refer to the FXI-60/FXI-250 connection diagram at the end of this manual for additional connection information.

1. Remove the cable between the EXC RF OUT and PA RF IN connectors.

2. If the exciter RF output power can not be lowered to 100 mW or below, connect an attenuator to the exciter RF output.
3. Connect the external exciter to the PA RF IN connector. The maximum PA RF input level is 100 mW.

ATTENUATOR	POWER RATIO
-3 dB	.5
-6 dB	.25
-10 dB	.1
-20 dB	.01

8.12. Exciter - Using Both the Internal And External Exciter



CAUTION: TO PREVENT DAMAGE TO THE PA, DO NOT OVERDRIVE THE INPUT.

If both the internal exciter and an external exciter are to be used, an external relay must be used. Refer to Figure 5 and perform the following procedure. If the external exciter is an FXI-60/FXI-250, refer to the FXI-60/FXI-250 connection diagram at the end of this manual for additional connection information.

1. Remove the cable between the EXC RF OUT and PA RF IN connectors.
2. If the exciter RF output power can not be lowered to 100 mW or below, connect an attenuator to the exciter RF output.
3. Connect a BNC cable between the EXC RF OUT connector and one of the relay terminals.
4. Connect a cable between the external exciter RF output connector (attenuator if required) and the other relay terminal.
5. Connect a cable between the common relay terminal and the PA RF IN connector.

8.13. Ethernet Connections

The STXLP transmitter is equipped with an Ethernet port. This port allows the transmitter to be monitored and controlled by the built in web interface or by the optional STXLP RGUI (Remote Graphical User Interface) remote control system. The port requires a standard RJ45 patch cable. If Ethernet control of the transmitter is desired, refer to Figure 5 and connect a standard RJ45 patch cable between the ETHERNET connector and a computer or hub.

8.14. Remote Control Unit Connections

The GPIO connector provides the interface of control and status signals to a remote control unit (refer to Figure 2). If remote control unit interfacing is desired, refer to Figure 2 and proceed as follows:

1. Refer to Tables 1 and 2 to determine the desired remote control/status signals to be connected.
2. Solder the wires in the cable to the mating connector located in the installation kit.
3. Connect the cable the GPIO connector.

8.15. Failsafe Connection

The failsafe input is located at GPIO pin 2. The input requires a ground (0 V) to close the failsafe connection. Refer to Figure 5 and proceed as follows:

1. Locate a ground pin such as pin 12 or 19.
2. Route the ground through external equipment such as a remote control system, external switch, or test load.



3. Connect the ground from the failsafe equipment to failsafe input GPIO pin 2.

8.16. RF Sample Connection

For STXLP – 1kW models, the BNC RF SAMPLE connector is for the connection of equipment such as a modulation monitor. The level is 2V RMS at 1kW. Refer to Figure 5 and connect the desired equipment. For 2 kW, 3 kW, and 5 kW models, the RF sample port is located on the combiner (refer to the installation diagram at the end of the manual). The level is 2V RMS at 2 kW for 2kW models, 3 kW for 3 kW models, and 5 kW for 5 kW models.

8.17. HD System Connections

The STXLP transmitter can be used with an external HD exciter to provide HD broadcast operation. Figure 6 presents the HD system connections. Refer to Figure 6 and connect the exciter to the transmitter as shown. If the HD exciter is an FXI-60/FXI-250, refer to the FXI-60/FXI-250 connection diagram at the end of this manual for additional connection information.

8.18. RF Out Connection

For STXLP - 1kW models, the TYPE N RF OUT connector is for the connection of the antenna or dummy load. Refer to Figure 5 and connect the RF OUT connector to the antenna or dummy load. For STXLP 2kW, 3kW, and 5kW models, a 1 5/8 connector is for the connection of the antenna or dummy load. Refer to the connection diagram at the end of this manual and connect the RF OUT connector to the antenna or dummy load.



WARNING: USE THE RF CABLES SUPPLIED IN THE INSTALLATION KIT. IF THE CABLES ARE NOT USED, THE COMBINER COMPONENTS WILL BE DAMAGED.

8.19. RF/Control Connections – 2 kW Models

The STXLP – 2kW models require RF and control connections. Refer to the STX 2kW connection diagram at the end of this manual and connect the RF and control cables as shown. Ensure the splitter and combiner cables in the installation kit are used to connect the STXLP – 2kW components.



WARNING: USE THE RF CABLES SUPPLIED IN THE INSTALLATION KIT. IF THE CABLES ARE NOT USED, THE COMBINER COMPONENTS WILL BE DAMAGED.

8.20. RF/Control Connections – 3 kW Models

The STXLP – 3kW models require RF and control connections. Refer to the STX 3kW connection diagram at the end of this manual and connect the RF and control cables as shown. Ensure the splitter and combiner cables in the installation kit are used to connect the STXLP – 3kW components.



WARNING: USE THE RF CABLES SUPPLIED IN THE INSTALLATION KIT. IF THE CABLES ARE NOT USED, THE COMBINER COMPONENTS WILL BE DAMAGED.

8.21. RF/Control Connections – 5 kW Models

The STXLP – 5kW models require RF and control connections. Refer to the STX 5kW connection diagram at the end of this manual the RF and control cables as shown. Ensure the splitter and combiner cables in the installation kit are used to connect the STXLP – 5kW components.



8.22. Ground Connection

WARNING: ENSURE AN EARTH GROUND CONDUCTOR IS SECURELY CONNECTED TO THE CHASSIS GROUND TERMINAL.

Each STXLP transmitter model requires ground connections. For STXLP 1kW models, refer to Figure 5 and connect an earth ground to the GND terminal. For STXLP 2kW, 3kW, and 5kW models, each component chassis is equipped with a ground terminal. Refer to the installation drawings at the end of this manual and connect an earth ground to each component.

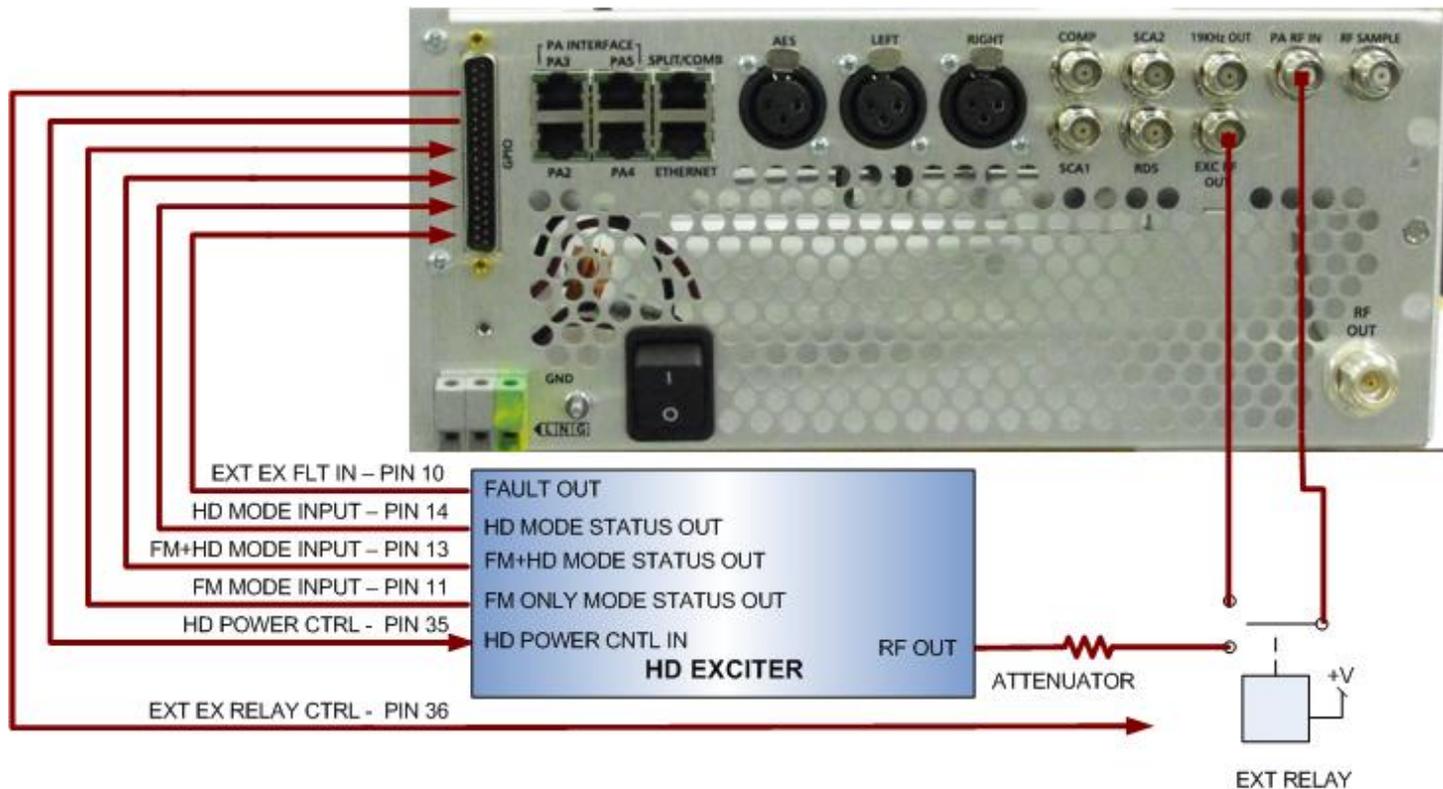


FIGURE 6. HD SYSTEM CONNECTIONS

WARNING: ENSURE ALL PRIMARY POWER IS DISCONNECTED BEFORE PROCEEDING

8.23. AC Input Connection

The STXLP 1kW and 2kW units will operate from a 180V to 260V AC 47 to 63 Hz single phase power source. The STXLP 3kW and 5kW units will operate from a 180V to 260V AC 47 to 63 Hz single phase power source or 311V to 449V AC 47 to 63 three phase power source. To connect AC to the unit, and proceed as follows:

1 kW Models -

1. Operate the ON/OFF switch to OFF.
2. Locate an AC cable of the appropriate current capacity for the AC input to be used.
3. Remove the ac guard.

4. Refer to Figure 5 and connect the cable to the STXLP rear panel AC input terminals.
5. Replace the ac guard.

2 kW Models –

1. Main AC input information is presented in the installation diagram at the end of this manual.
2. On the combiner chassis, operate the ON/OFF switch to OFF.
3. Locate an AC cable of the appropriate current capacity for the AC input to be used.
4. Remove the ac guard.
5. Refer to the installation diagram at the end of this manual and connect the cable to the STXLP rear panel AC input terminals.
6. Connect the wiring to an ac breaker as shown.
7. Replace the ac guard.
8. Repeat the procedure for the 1 kW main control unit and the PA unit.

3 kW Models –

1. Main AC input information is presented in the installation diagram at the end of this manual. If the unit is to be operated from a three phase power source, acceptable three phase power information is presented in the three phase power source diagram at the end of this manual. Refer to these diagrams for main AC input information.
2. On the combiner chassis, operate the ON/OFF switch to OFF.
3. Locate an AC cable of the appropriate current capacity for the AC input to be used.
4. Remove the ac guard.
5. Refer to the installation diagram at the end of this manual and connect the cable to the STXLP rear panel AC input terminals.
6. Connect the wiring to an ac breaker as shown.
7. Replace the ac guard.
8. Repeat the procedure for the 1 kW main control unit and the 2 PA units.

5 kW Models –

1. Main AC input information is presented in the installation diagram at the end of this manual. If the unit is to be operated from a three phase power source, acceptable three phase power information is presented in the three phase power source diagram at the end of this manual. Refer to these diagrams for main AC input information.
2. On the combiner chassis, operate the ON/OFF switch to OFF.
3. Locate an AC cable of the appropriate current capacity for the AC input to be used.
4. Remove the ac guard.
5. Refer to the installation diagram at the end of this manual and connect the cable to the STXLP rear panel AC input terminals.
6. Connect the wiring to an ac breaker as shown.
7. Replace the ac guard.
8. Repeat the procedure for the 1 kW main control unit and the 4 PA units.



9. Initial Turn On and Setup

9.1. Overview

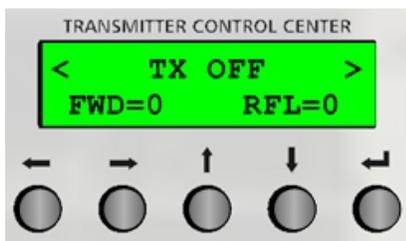
The following section will present the procedures to initially turn on and setup the transmitter. Information on the STXLP operating menus is presented in a menu tree at the end of this manual.

9.2. Initial AC On

NOTE: FOR ALL MODELS, ENSURE ALL TRANSMITTER INDIVIDUAL UNIT CIRCUIT BREAKERS AND ON/OFF SWITCHES ARE OPERATED TO ON.

1. For STX-1kW models, operate the circuit breaker to ON and operate the ON/OFF switch to ON. For STX-2kW, STX-3kW, and STX-5kW models, operate all individual unit circuit breakers to ON and operate all individual unit ON/OFF switches to ON.

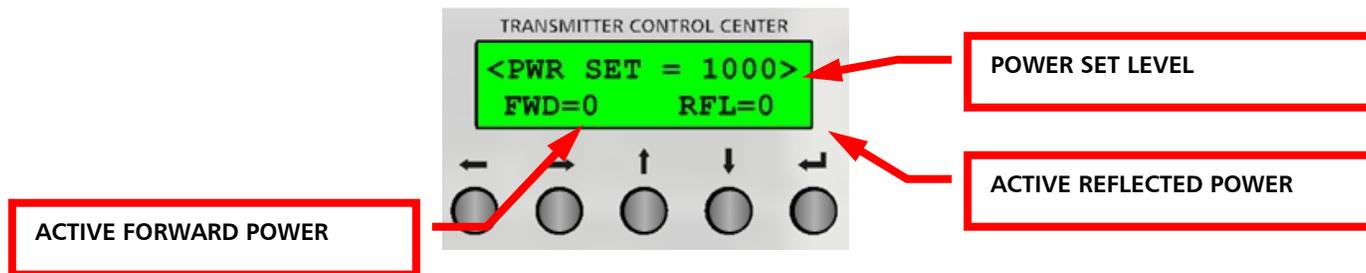
The front panel LCD will illuminate.



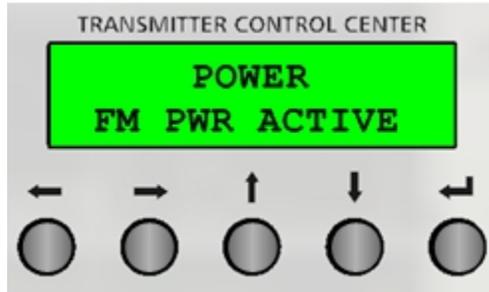
9.3. Set The Power Output

1. Depress the ↓ Button to display the Power Set menu. Power is adjusted by:
 - 1) selecting the desired power mode, 2) accessing the digit using the →← buttons, 3) using the ↓ ↑ buttons to change the value. The power ranges are shown below.

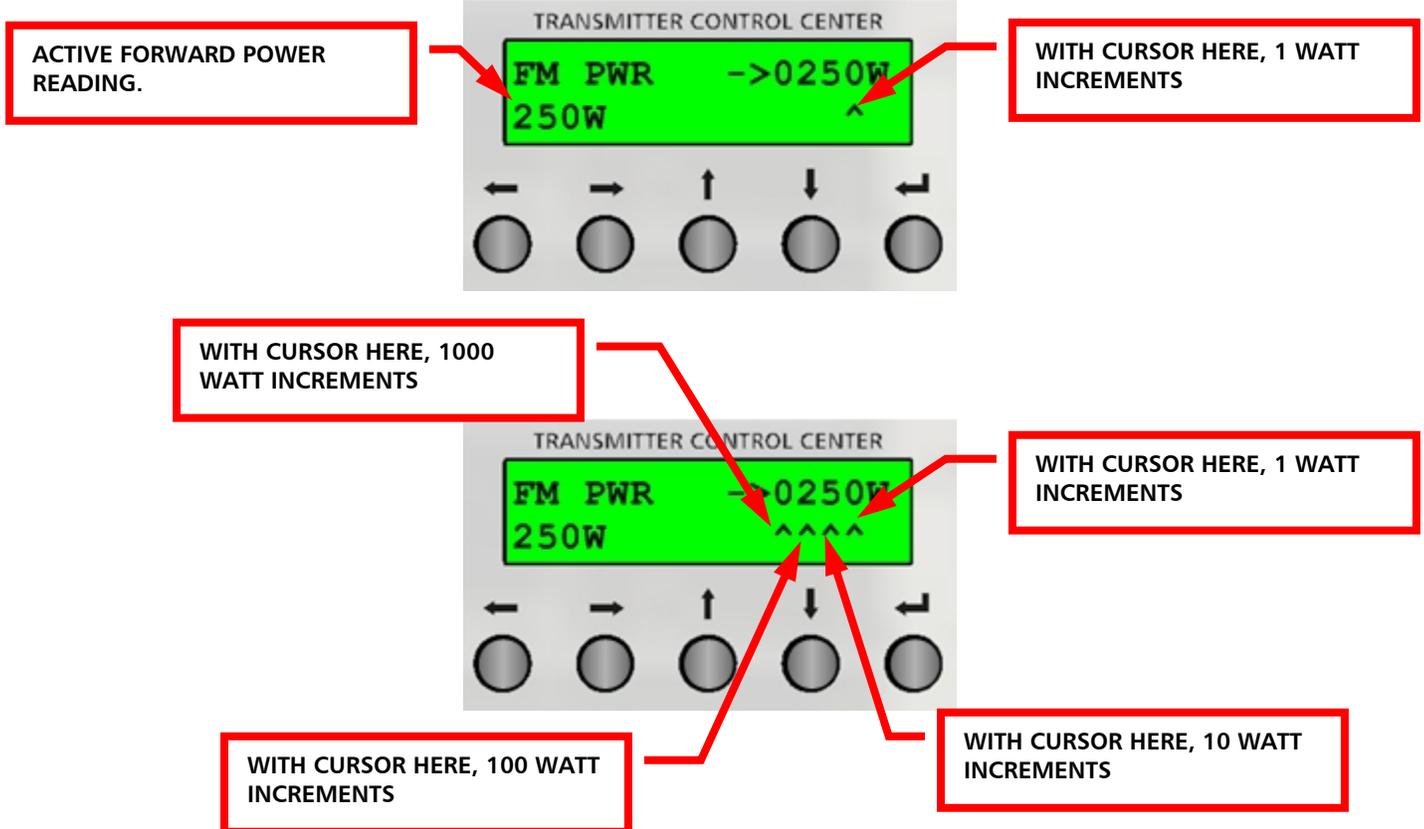
MODEL	FM ONLY - WATTS	FM+HD - WATTS	HD ONLY - WATTS
STXLP -1kW	250 to 1100	175 to 770	75 to 330
STXLP -2kW	500 to 2000	350 to 1280	150 to 600
STXLP -3kW	750 to 3000	525 to 1920	225 to 900
STXLP -5kW	1250 to 5000	875 to 3200	375 to 1500



2. Depress ←. *The Power Set select menu will appear.*



3. Select the mode of operation for the power setting using the $\downarrow\uparrow$ buttons. The modes are FM ONLY PWR, HD ONLY PWR, and FM+HD PWR.
4. Depress \leftarrow .
The Power menu will change to the power set mode.



5. With the cursor in the 1 Watt position, use $\downarrow\uparrow$ to change the power in 1 Watt increments. The number will not change if an upper/lower power limit is reached.
6. Depress \leftarrow .
The cursor moves to the 10 Watt position.
7. Use $\downarrow\uparrow$ to change the power in 10 Watt increments. The number will not change if an upper/lower power limit is reached.



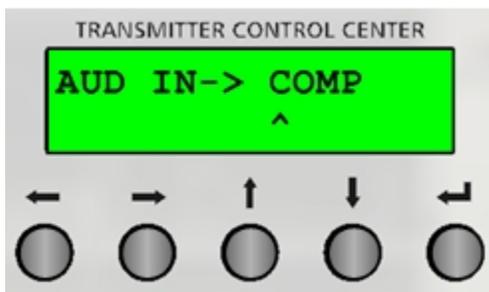
8. Depress ← .
The cursor moves to the 100 Watt position.
9. Use ↓ ↑ to change the power in 100 Watt increments. The number will not change if an upper/lower power limit is reached.
10. Depress ← .
The cursor moves to the 1000 Watt position. The number will not change if an upper/lower power limit is reached.
11. Use ↓ ↑ to change the power in 1000 Watt increments. The number will not change if an upper/lower power limit is reached.
12. Depress ↵ .
The Power setting will be saved.
13. If required, repeat the procedure for the HD ONLY and FM+HD modes of operation.

9.4. Select The Audio Input.

1. Depress ↓ to display the Audio Input menu.
The Audio menu will appear.



2. Depress ↵ .
The Audio Input menu will change to the audio input select mode.



3. Use ↓ ↑ to select the audio input. If the unit is not equipped with the optional stereo generator board, the transmitter is equipped with only a composite input. If the unit is equipped with the board, select between COMPOSITE, AES, or ANALOG.
4. Depress ↵ .
The audio input will be saved.

9.5. Calibrate the Audio/SCA/RDS Inputs

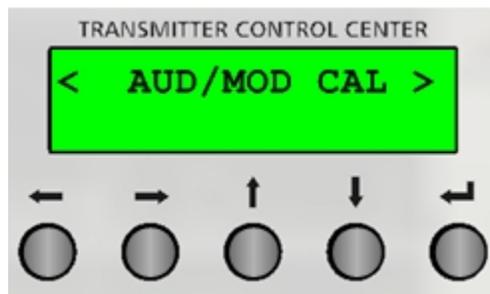
Once the input is selected, the inputs must be calibrated. The following procedure presents the calibration of the external composite input. The AES input calibration is identical to the external composite. The Analog input will require one additional input level calibration. If the optional stereo board is not present, some of the menus will present N/A (not applicable).

The procedures turn off all inputs with the exception of the source to be calibrated. Therefore, the unit must be removed from on-air operation. If SCA/RDS signals are used, the user must reduce the main channel audio level manually to prevent over modulation. The steps required to calibrate inputs are:

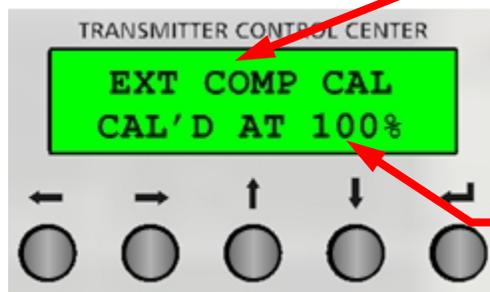
- Calibrate the main channel audio (example composite). If the analog input is selected, an additional input level calibration is required.
- Perform the deviation calibration if required.
- Calibrate the SCA/RDS inputs.

1 - CALIBRATE THE AUDIO INPUT -

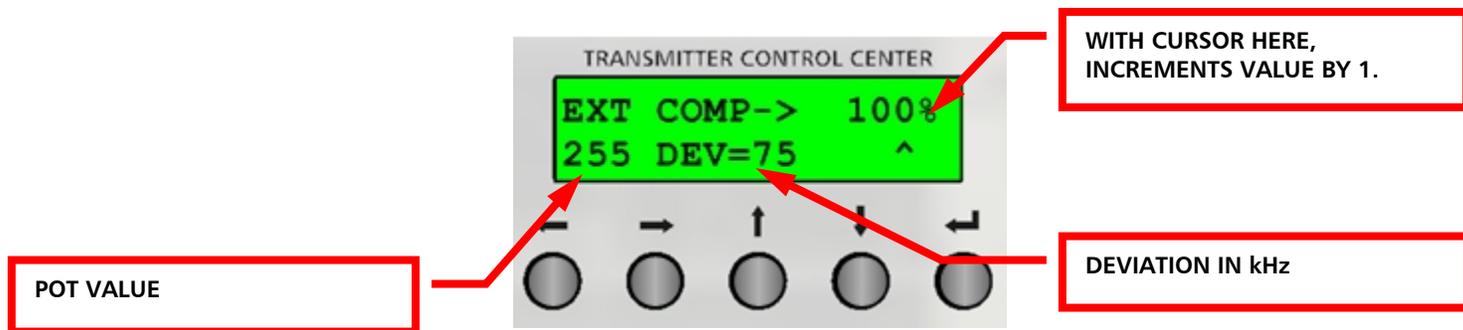
1. Apply the nominal signal to the selected input. Ensure no SCA/RDS signals are applied.
2. Depress ↓ to display the audio cal menu.
The audio calibration menu will appear.



3. Depress ↵.
A calibration menu will appear.
4. Use ↓ ↑ to select ext composite cal.



5. Depress ↵.
The edit calibration menu will appear

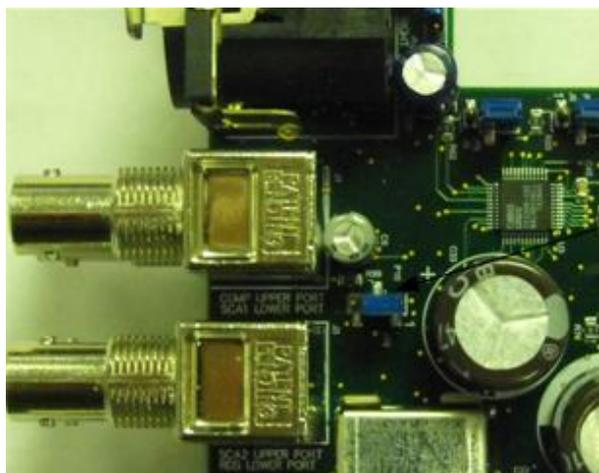


6. With the cursor in the 1's position, use ↓ ↑ to set the desired value. The number will not change if an upper/lower level limit is reached. If SCA/RDS and pilot signals are to be used, ensure the audio level is lower than 100% to allow the total deviation to be 100% when the SCA/RDS/pilot signals are added.
7. Depress ↵.
The calibration will be saved and the calibration menu will appear.

2 – DEVIATION CALIBRATION –

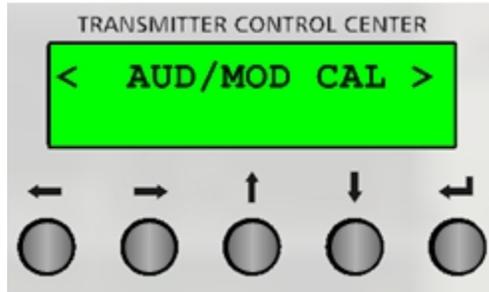
The deviation calibration is performed at the factory for the desired deviation. The deviation must be re-calibrated if:

- The deviation changes to a value not calibrated at the factory.
 - The frequency changes.
1. Connect an external modulation meter to the RF SAMPLE connector.
 2. Set the deviation jumper to the correct position for the desired deviation.

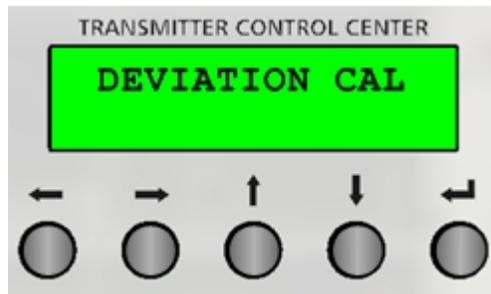


EXCITER PCB DEVIATION
 JUMPER J10 –
 POS 1-2 = 75 kHz
 POS 2-3 = 125 kHz
 POS Removed – 200 kHz

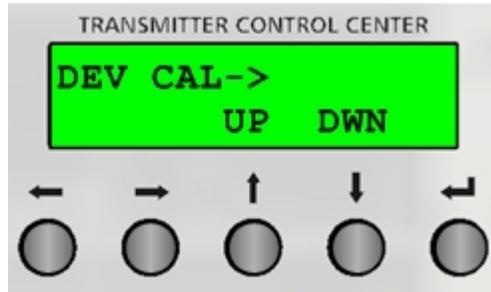
3. Connect an external composite source to the unit at a level of 3.5V p-p. If an external composite source is not available, use an AES or analog source.
4. Ensure the audio source to be used is selected as the input (refer to Select The Audio Input above if required).
5. Depress ↓ to display the audio cal menu.
The audio calibration menu will appear.



6. Depress ↙.
A calibration menu will appear.
7. Use ↓ ↑ to select the deviation cal menu.



8. Depress ↙.
The deviation edit menu will appear .

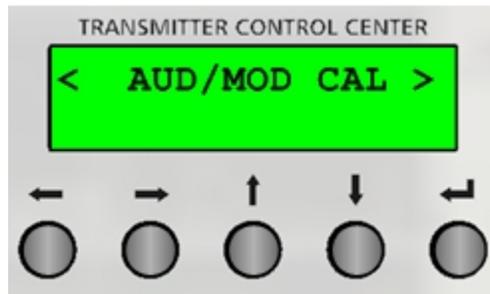


9. Use ↓ ↑ to adjust the level for the selected deviation on the external meter.
10. Depress ↙.
The calibration will be saved.

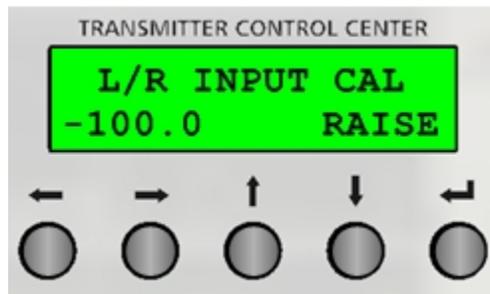
3 - REPEAT FOR AES AND ANALOG L/R -

If the optional stereo generator board is installed, repeat the above procedure for the AES input. If the analog input is to be calibrated, the analog input level must be calibrated. To calibrate the input level, proceed as follows:

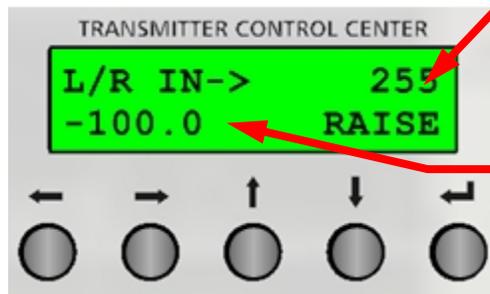
1. Apply the highest peak level audio to the analog input. Ensure no other signals are applied.
2. Depress ↓ to display the audio cal menu.
The audio calibration menu will appear.



3. Depress ↙.
A calibration menu will appear.
4. Use ↓ ↑ to select left/right input cal.



5. Depress ↙.
The edit left/right input calibration menu will appear.



POT LEVEL.

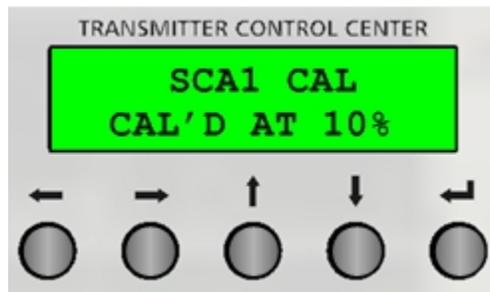
USE THE ↓ ↑ BUTTONS TO INCREASE OR DECREASE LEVEL, TO MINIMIZE THE CALIBRATION VALUE SHOWN .

6. Check the left/right input level indication. The indication will present: 1) lower level or 2) raise level. Use ↓ ↑ to increase/decrease the pot level to minimize the calibration value shown. The value should be near 0.
7. Depress ↙.
The calibration will be saved.
8. Once the left/right input cal is finished, repeat the CALIBRATE THE AUDIO INPUT procedure for the left/right input.

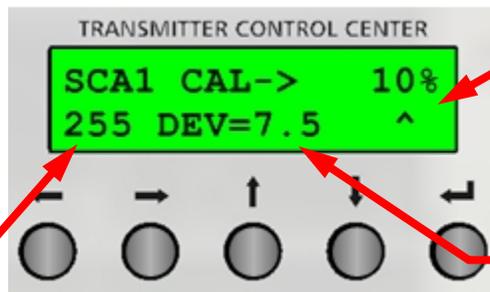


4 - IF SCA/RDS SYSTEMS ARE USED -

1. If SCA systems are to be used, remove the audio input signal and apply the SCA1 signal. Only the SCA1 signal must be present.
2. Depress ↓ ↑ to display the audio calibration menu.
3. Depress ↵.
4. Depress ↓ to display the SCA1 calibration menu.
The SCA1 calibration menu will appear.



5. Depress ↵.
The SCA1 edit calibration menu will appear.



6. With the cursor in the 1's position, use ↓ ↑ to set the desired value. The number will not change if an upper/lower level limit is reached.
7. Depress ↵.
The calibration will be saved.
8. Remove the SCA1 signal. Repeat the procedure if SCA2 and RDS systems are to be used. Use ↓ ↑ to select the desired SCA/RDS input.

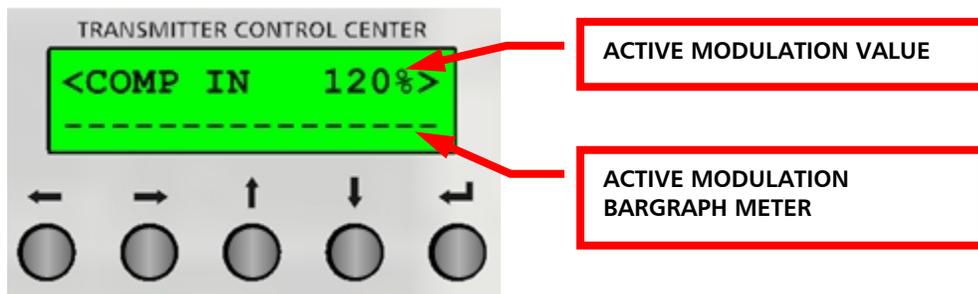
9.6. Audio Input Level Menu

Once each audio input level has been calibrated, the Audio Input level menu allows each individual input to be adjusted. For units without the optional stereo generator board, the only input is COMPOSITE. For units with the stereo generator board, the input options are: 1) COMPOSITE, 2) AES, or 3) ANALOG L/R.

The following procedure sets the COMPOSITE input. The input level directly changes the modulation level. The input level is adjusted by: 1) accessing the digit using the →← buttons and 2) using the ↓↑ buttons to change the value. Therefore, the number entered is in percent of modulation.

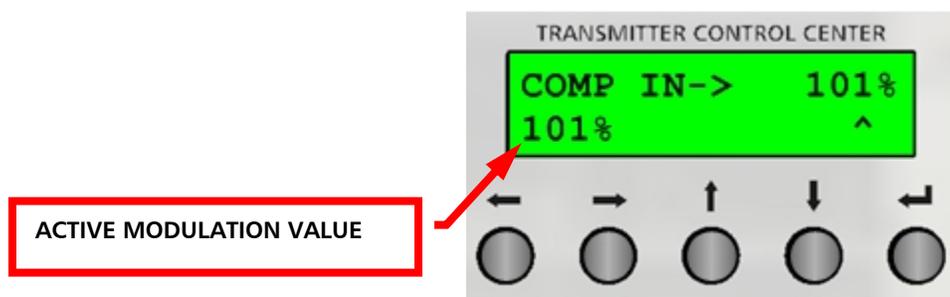
1. Depress ↓ to display the Audio Input Level menu (audio source with a bargraph).

The Audio input level menu will appear.



2. Depress ←.

The Audio Input Level menu will change to the audio input level set mode.



3. Use ↓↑ to set the desired input level. The number will not change if an upper/lower level limit is reached.

4. Depress ←.

The composite input level will be saved.

5. Repeat the procedure for the AES and ANALOG L/R inputs.

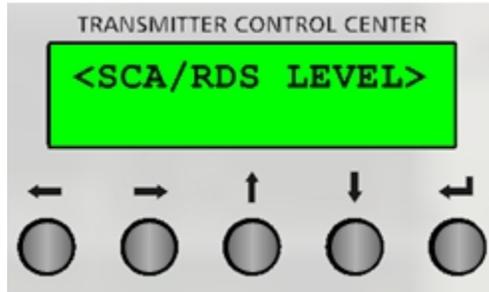
The Audio Input menu will change to the audio input select mode.

9.7. SCA/RDS Level Menu

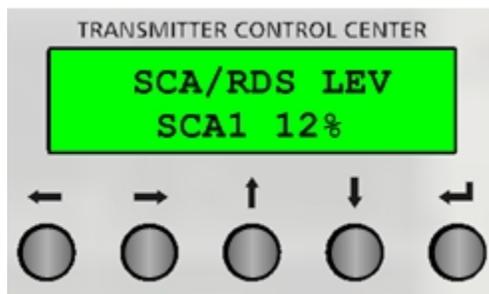
Once each SCA/RDS input level has been calibrated, the SCA/RDS Level menu allows the SCA1, SCA2, and RDS inputs to be adjusted. The input level is adjusted using the ↓↑ buttons to change the value.

1. Depress ↓ to display the SCA/RDS LEVEL menu.

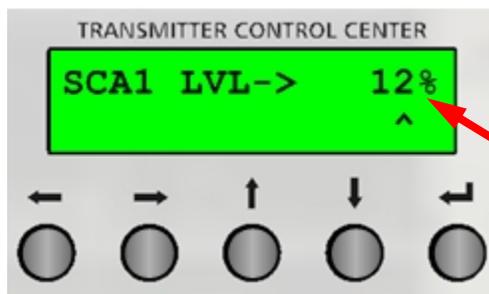
The SCA/RDS Level menu will appear.



2. Depress ↙.
The SCA/RDS Level select menu will appear.



3. Depress ↙.
The SCA1 level edit menu will appear.

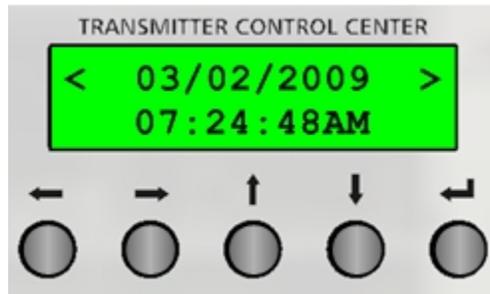


4. Use ↓ ↑ to set the input. The number will not change if an upper/lower level limit is reached.
5. Depress ↙.
The SCA1 Level will be saved.
6. Repeat the procedure for the SCA2 and RDS inputs. Use the ↓ ↑ buttons to select the SCA2 or the RDS input.

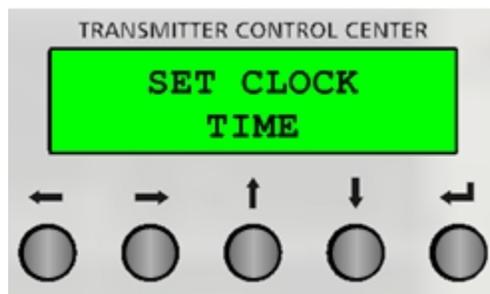
9.8. Set the Clock

The clock menu allows the user to set the internal clock. The clock is used only for a future feature. Do not use the clock at this time. The clock time and date are adjusted by: 1) accessing the digit using the → ← buttons and 2) using the ↓ ↑ buttons to change the value.

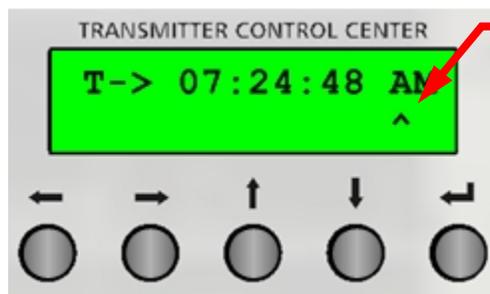
1. Depress ↓ to display the Set Clock menu.
The Set Clock menu will appear.



2. Depress ↵.
The time selection menu will appear.



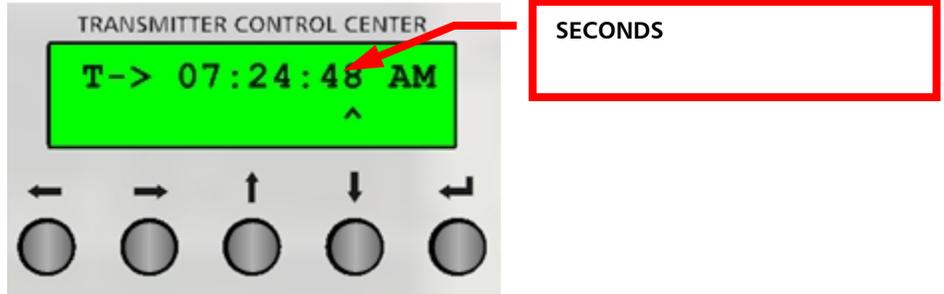
3. Depress ↓↑ to select TIME.
4. Depress ↵.
The set clock time menu will appear.



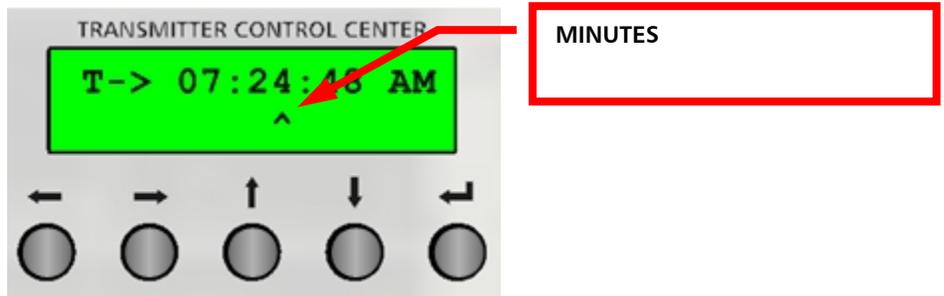
WITH CURSOR HERE, TOGGLES BETWEEN AM/PM

5. With the cursor in this position, use ↓↑ to toggle between AM or PM.
6. Depress ← .
The cursor moves to the left.

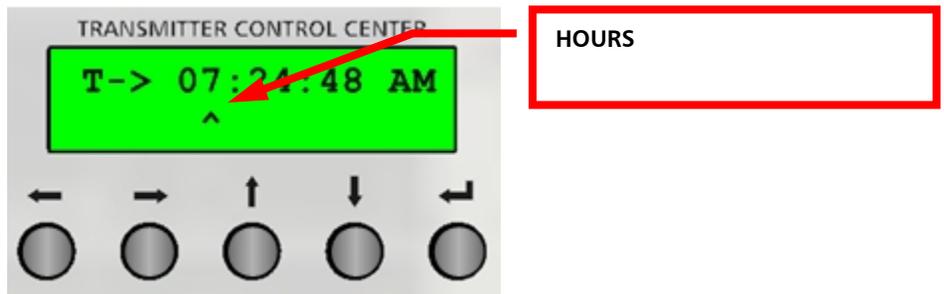




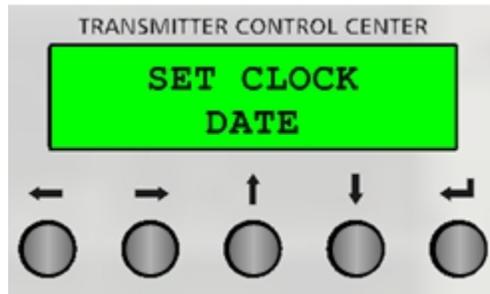
7. With the cursor in this position, use ↓ ↑ to set the seconds.
8. Depress ← .
The cursor moves to the left.



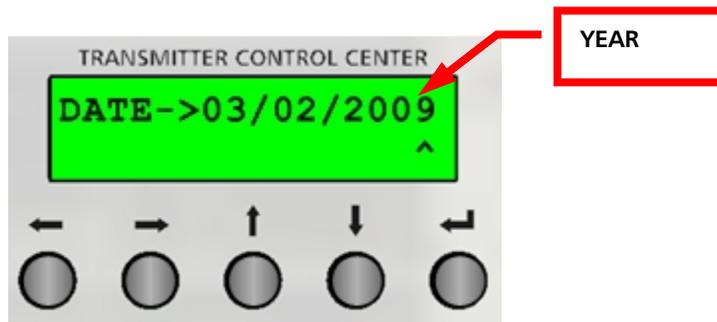
9. With the cursor in this position, use ↓ ↑ to set the minutes.
10. Depress ← .
The cursor moves to the left.



11. With the cursor in this position, use ↓ ↑ to set the hours.
12. Depress ↵ .
The time will be saved.
13. Depress ↵ .
The time select menu will appear.
14. Use ↓ ↑ to select Date.
The set date menu will appear.



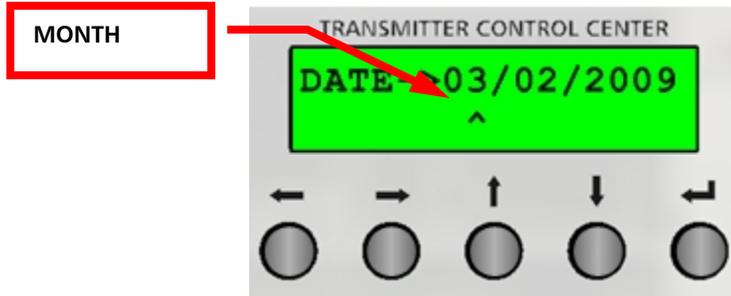
15. Depress ↵.
The set date menu will appear.



16. With the cursor in this position, use ↓ ↑ to set the year.
17. Depress ← .
The cursor moves to the left.



18. With the cursor in this position, use ↓ ↑ to set the day.
19. Depress ← .
The cursor moves to the left.



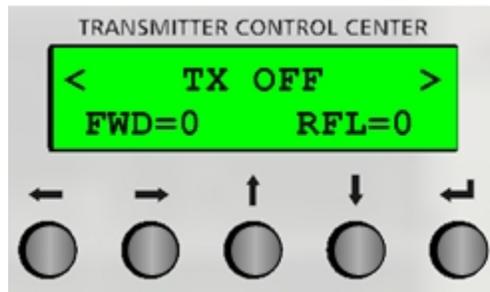
20. With the cursor in this position, use ↓ ↑ to set the month.

21. Depress ↵.
The date will be saved.

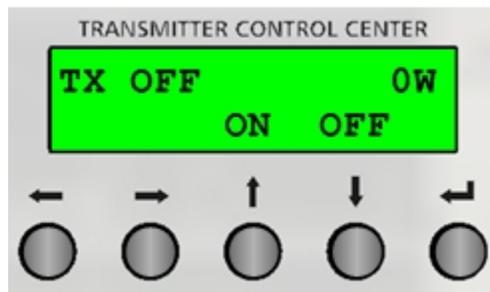
9.9. Turn On

NOTE: FOR ALL MODELS, ENSURE ALL TRANSMITTER INDIVIDUAL UNIT CIRCUIT BREAKERS AND ON/OFF SWITCHES ARE OPERATED TO ON.

1. Use ↓ ↑ to select the transmitter ON/OFF menu.
The ON/OFF menu will appear.



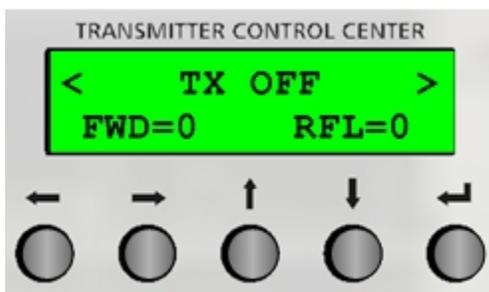
2. Depress ↵.
The transmitter on/off select menu will appear.



3. To turn the transmitter on, depress ↑.
The menu will display the following.



4. To turn the transmitter off, depress ↓ .
The menu will display the following.



9.10. HD Operation With FXI 60/250 Exciter

The STX can operate with an FXI-60/250 exciter in an HD transmission system. The FXI exciter can operate in the following modes: 1) FM Only, 2) FM+HD, and 3) HD Only. Operating in a specific mode and switching between modes must be performed in a specific manner to prevent damage to the equipment. The system is configured and calibrated at the factory specifically for the type of HD operation requested in the order.

FXI Setup For The STX

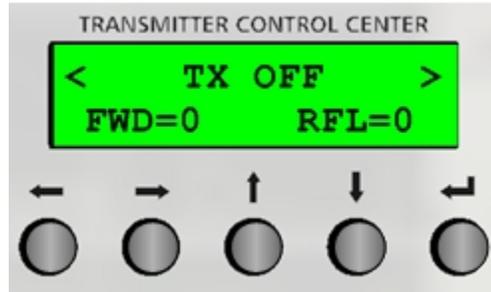
On the FXI exciter, access the PA/POWER menu. Ensure FMi 31 to 402 is selected for transmitter type.

FM Only Operation.

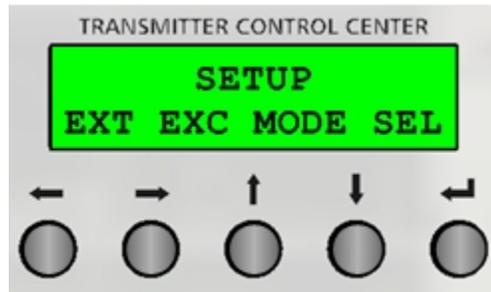


CAUTION: TO PREVENT DAMAGE TO THE TRANSMITTER, ENSURE THE FXI EXCITER AND THE STX TRANSMITTER ARE CONFIGURED FOR THE SAME MODE OF OPERATION (EXAMPLE – FM ONLY).

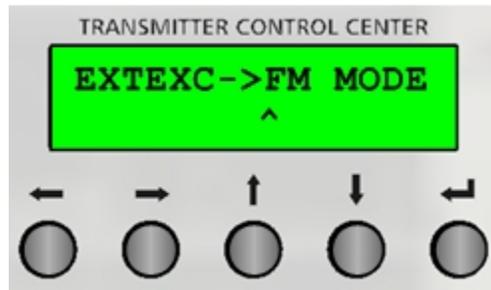
1. Operate the transmitter to Off using the ON/OFF Menu.



2. On the FXI exciter, access OPER MODE → IBOC MENU and select FM ONLY.
3. On the STX transmitter, set the exciter modes as follows:
 - A. Use ↓ ↑ to access the SETUP menu.
 - B. Depress ↵.
 - C. Use ↓ ↑ to access the Internal/External exciter menu.
 - D. Depress ↵.
 - E. Use ↓ ↑ to select EXTERNAL.
 - F. Depress ↵.
 - G. Depress ↵ again to re-enter the setup menu.
 - H. Use ↓ ↑ to access the External Exciter Mode menu.



- I. Depress ↵.
The External Exciter Mode Select menu will appear.



- J. Use ↓ ↑ to select FM MODE. Ensure the transmitter is configured for the same mode of operation as the exciter.

- K. Depress .
The mode will be saved.
- L. Operate the transmitter to On using the ON/OFF Menu.

FM+HD Operation.



CAUTION: TO PREVENT DAMAGE TO THE TRANSMITTER, ENSURE THE FXI EXCITER AND THE STX TRANSMITTER ARE CONFIGURED FOR THE SAME MODE OF OPERATION (EXAMPLE – FM+HD ONLY).

Repeat the FM Only Operation procedure above for FM+HD operation. Select the FM&IBOC mode for the FXI exciter and HYB MODE on the STX transmitter. Ensure the transmitter is configured for the same mode of operation as the exciter.

HD Only Operation.



CAUTION: TO PREVENT DAMAGE TO THE TRANSMITTER, ENSURE THE FXI EXCITER AND THE STX TRANSMITTER ARE CONFIGURED FOR THE SAME MODE OF OPERATION (EXAMPLE – HD ONLY).

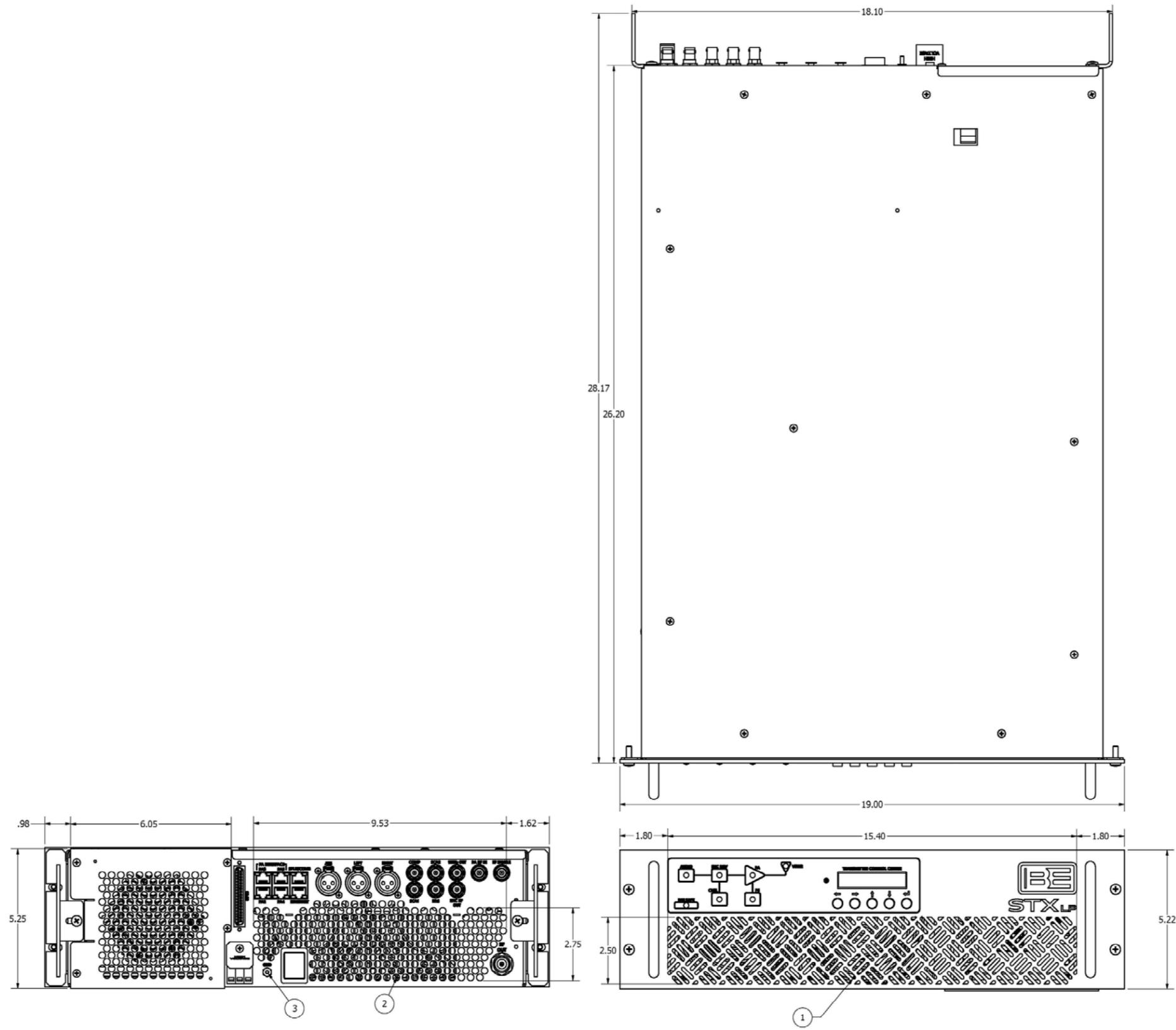
Repeat the FM Only Operation procedure above for HD Only operation. Select the IBOC ONLY mode for the FXI exciter and HD MODE on the STX transmitter. Ensure the transmitter is configured for the same mode of operation as the exciter.

10. RF Technical Services Contact Information

RF Technical Service -

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

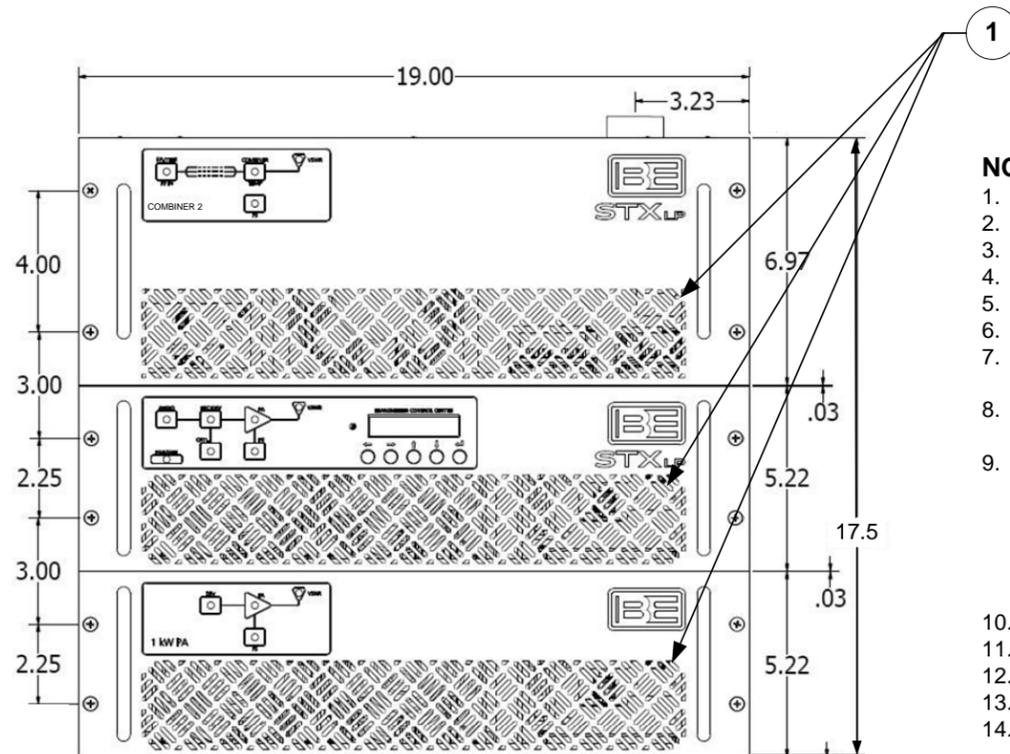
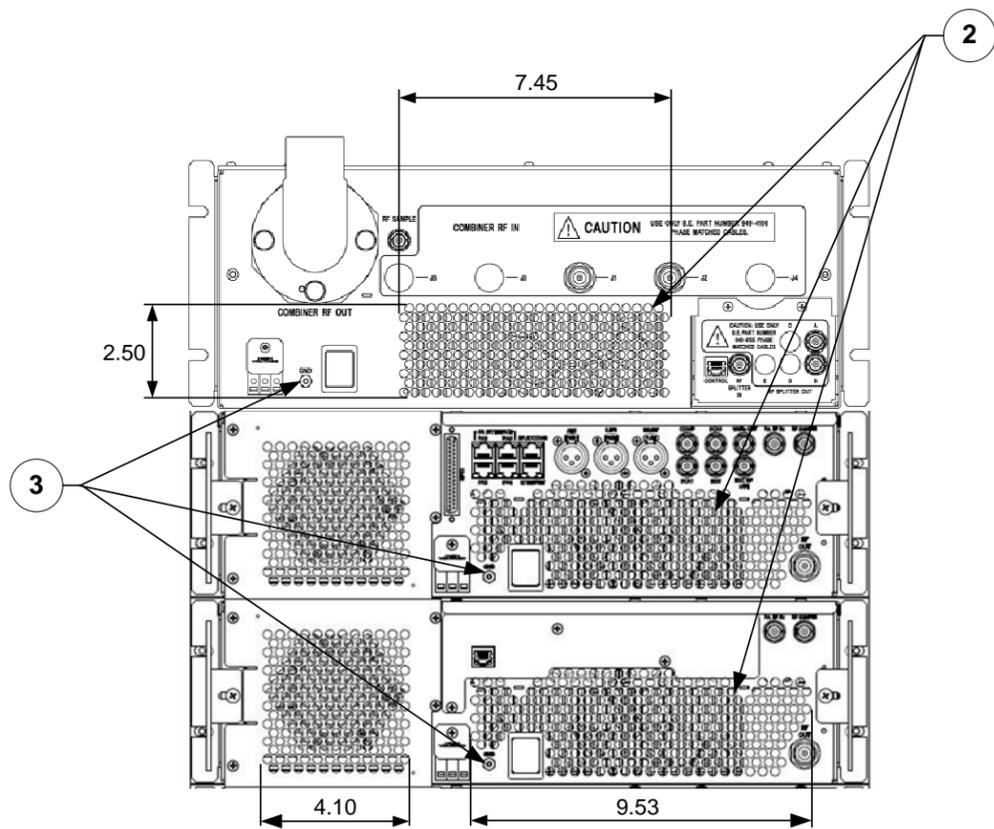
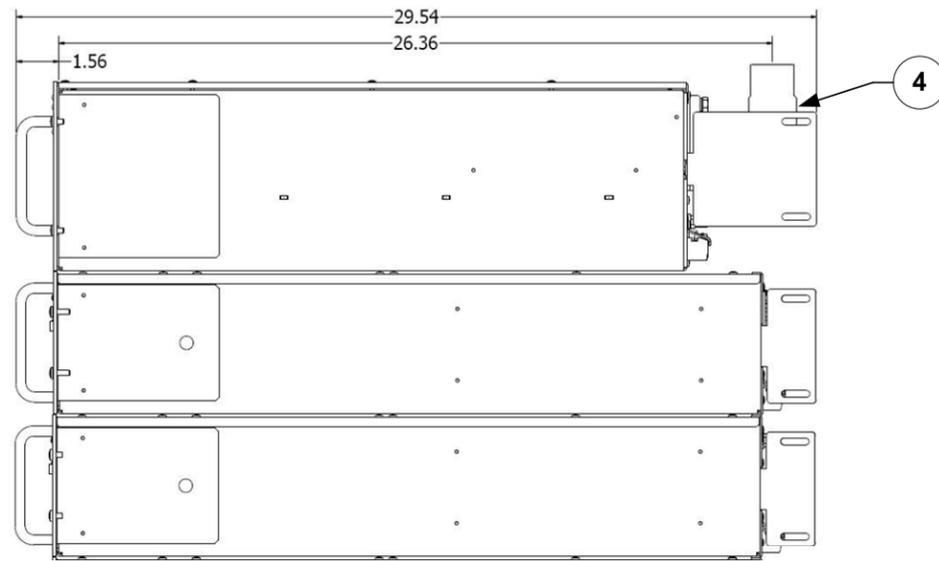




NOTES

1. AIR INLET AT FRONT OF TRANSMITTER.
2. AIR OUTLET AT REAR OF TRANSMITTER.
3. GROUND LUG.
4. OUTPUT RF CONNECTION – TYPE 'N'.
5. WEIGHT – 40 LBS (18.2 kg).
6. UNPACKED CUBAGE – 1.5 FT³ (0.04 m³).
7. AC POWER INPUT – 180V TO 260V AC 47 TO 63 Hz.
8. AC LINE CURRENT – 20 Amps MAX.
9. PRIMARY AC DISCONNECT – FUSE/CIRCUIT BREAKER – 20 Amps. WIRE SIZE – 12 AWG TYPE THHN.
10. POWER CONSUMPTION – 1.75 kW (CALCULATED).
11. COOLING REQUIREMENTS – 200 CFM (5.6 m³/min).
12. HEAT DISSIPATION – 750W AT 1 kW RF OUTPUT INTO A 50 OHM LOAD.
13. BTU – 2560 BTU/H AT 1 kW RF OUTPUT INTO A 50 OHM LOAD.
14. POWER FACTOR – GREATER THAN 0.98.

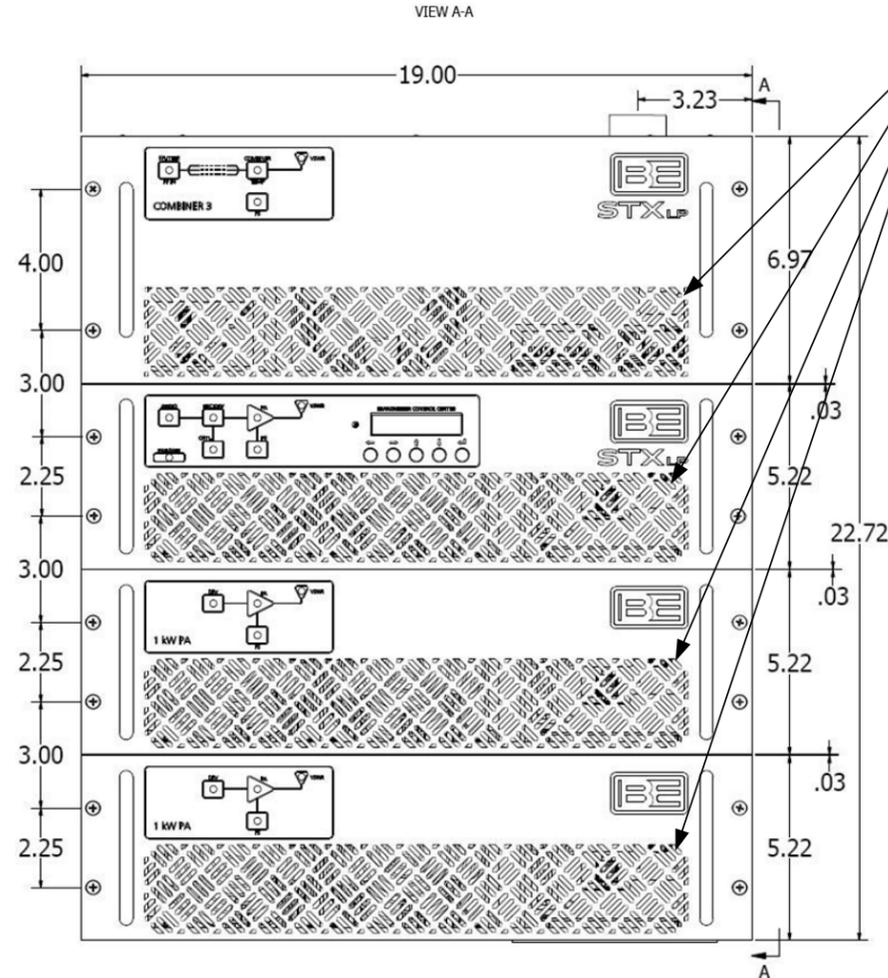
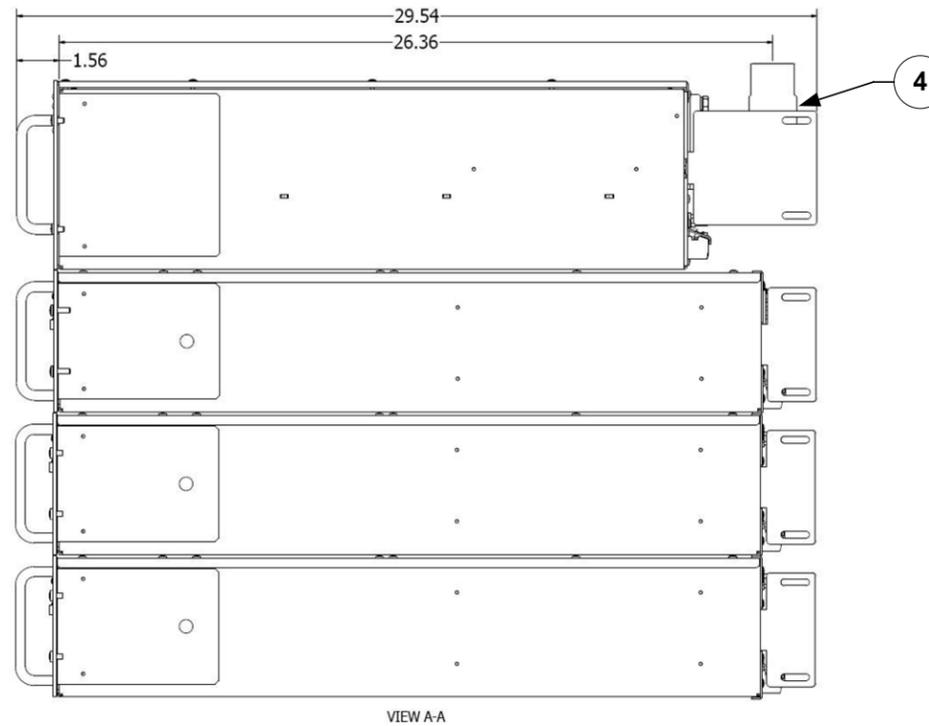
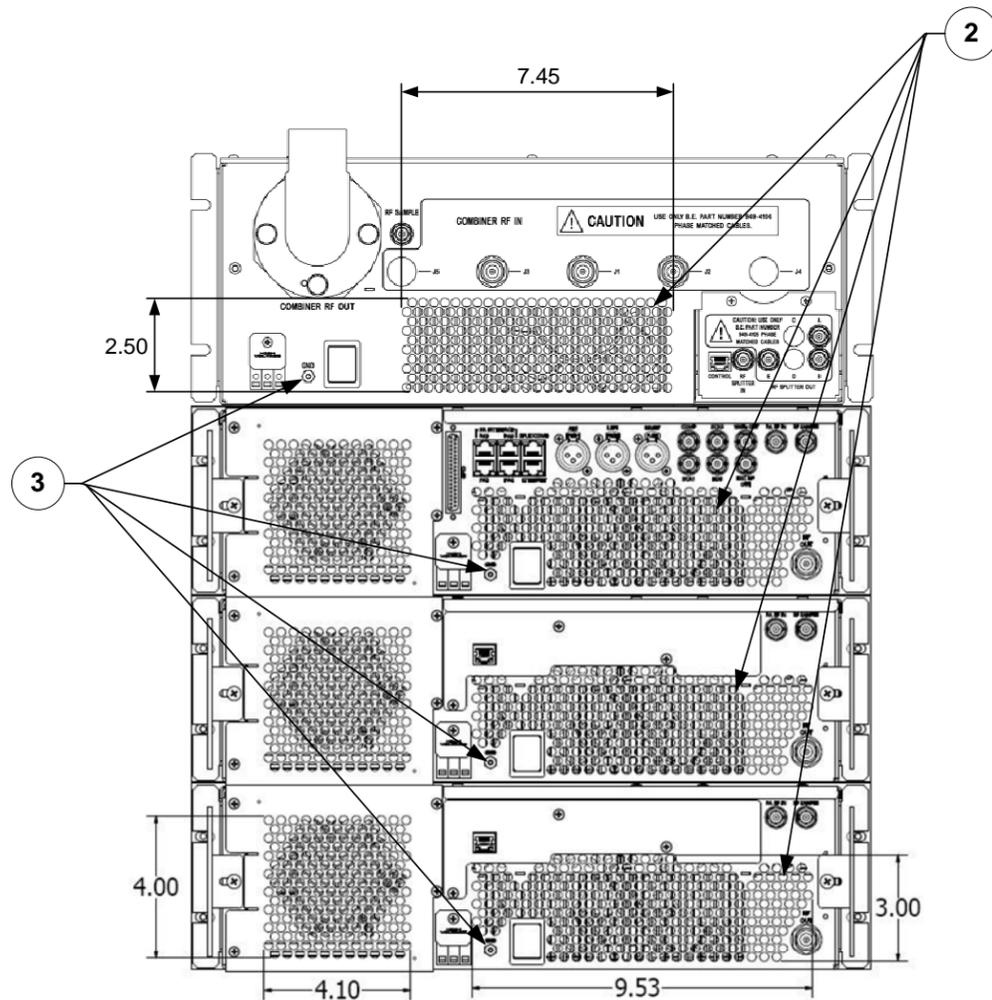
STXLP 1 kW INSTALLATION DIAGRAM – 597-4102-4



NOTES

1. AIR INLET AT FRONT OF TRANSMITTER.
2. AIR OUTLET AT REAR OF TRANSMITTER.
3. GROUND LUG.
4. OUTPUT RF CONNECTION – 1 5/8" Hard Line Coax
5. WEIGHT – 130 LBS (59.0 kg).
6. UNPACKED CUBAGE – 5.7 FT³ (0.16 m³).
7. AC POWER INPUT -
180V TO 260V AC 47 TO 63 Hz SINGLE PHASE.
8. AC LINE CURRENT –
32 Amps MAX SINGLE PHASE.
9. PRIMARY AC DISCONNECT -
SINGLE PHASE–
FUSE/CIRCUIT BREAKER – 40 Amps.
WIRE SIZE – #8 AWG TYPE THHN.
- FOR PROPER FUSE/CIRCUIT BREAKER SIZE, REFER TO NATIONAL ELECTRIC CODES AND LOCAL CODES.
10. POWER CONSUMPTION – 3.5 kW (CALCULATED).
11. COOLING REQUIREMENTS – 600 CFM (17.0 m³/min).
12. HEAT DISSIPATION – 1550W AT 2 kW RF OUTPUT INTO A 50 OHM LOAD.
13. BTU – 5295 BTU/H AT 2 kW RF OUTPUT INTO A 50 OHM LOAD.
14. POWER FACTOR – GREATER THAN 0.98.

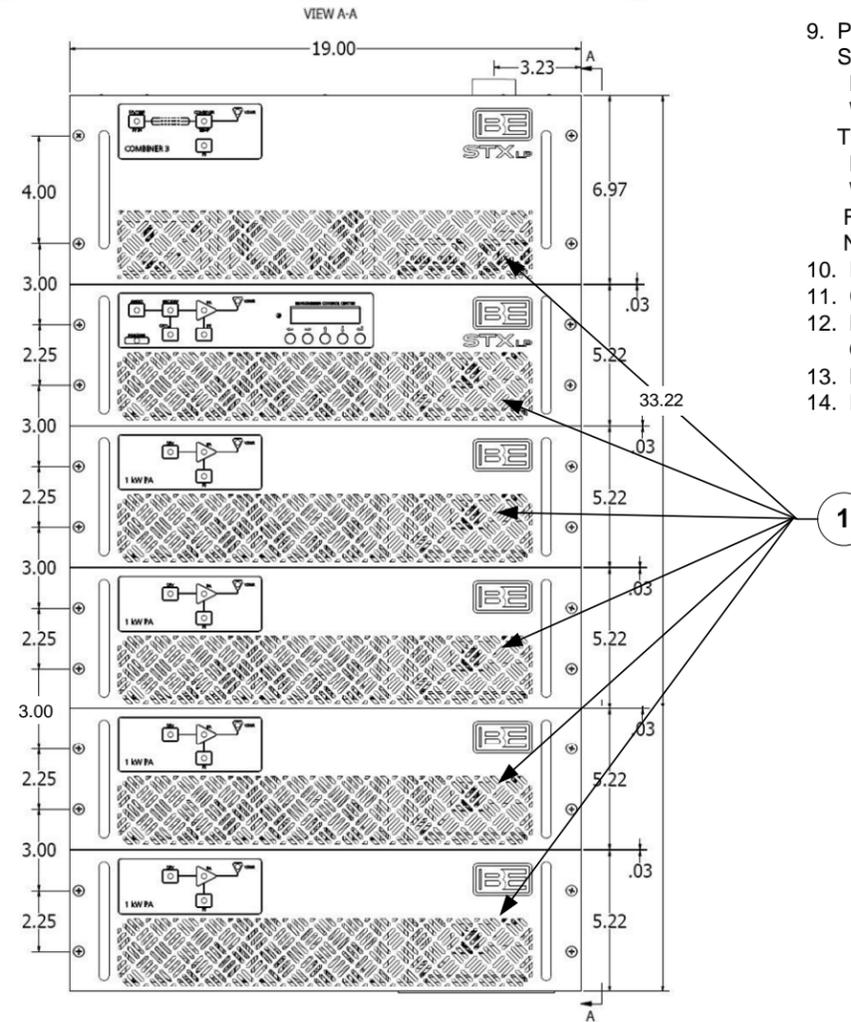
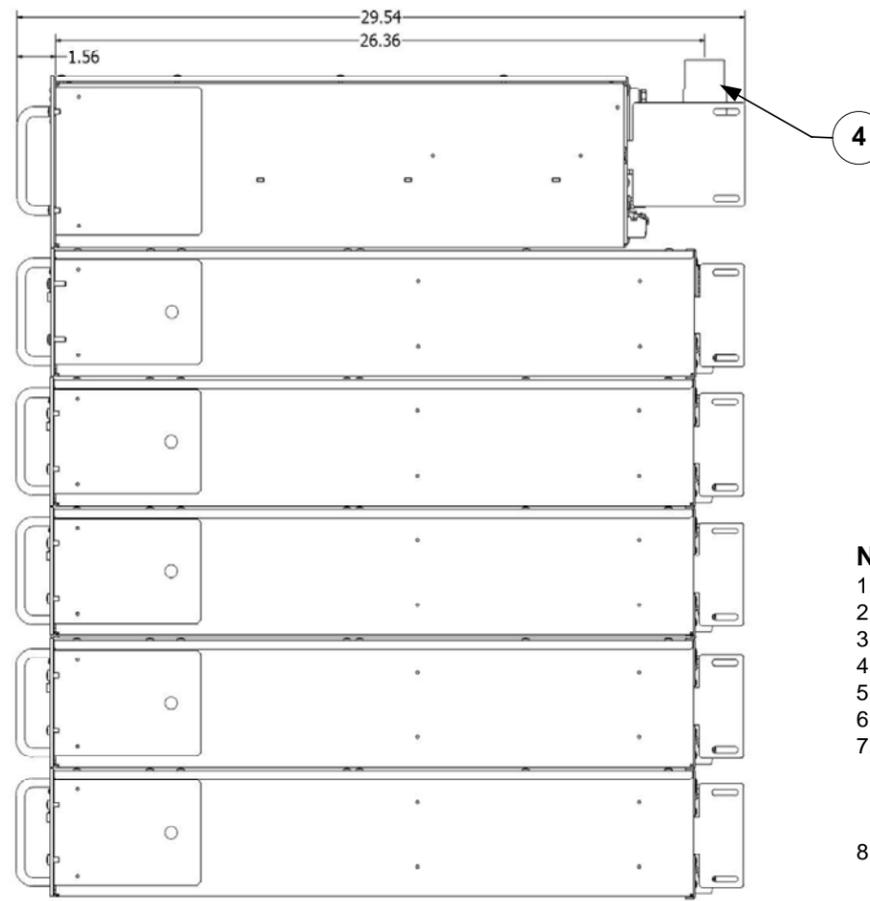
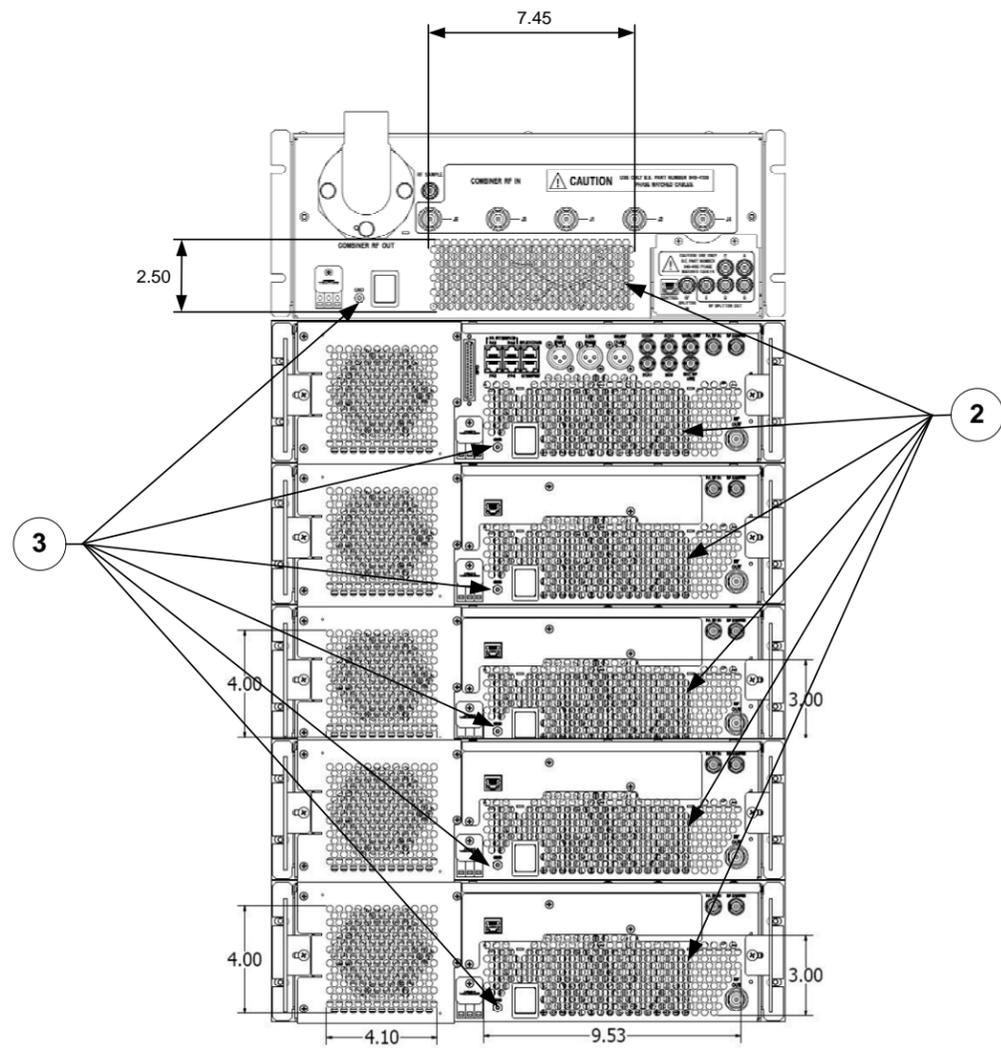
**STXLP 2 kW INSTALLATION DIAGRAM –
597-4102-37**



NOTES

1. AIR INLET AT FRONT OF TRANSMITTER.
2. AIR OUTLET AT REAR OF TRANSMITTER.
3. GROUND LUG.
4. OUTPUT RF CONNECTION – 1 5/8" Hard Line Coax
5. WEIGHT – 170 LBS (77.1 kg).
6. UNPACKED CUBAGE – 7.4 FT³ (0.21 m³).
7. AC POWER INPUT -
180V TO 260V AC 47 TO 63 Hz SINGLE PHASE.
180V TO 260V AC DELTA OR 311V TO 449V AC WYE
47 TO 63 Hz THREE PHASE
8. AC LINE CURRENT –
48 Amps MAX SINGLE PHASE.
28 Amps MAX THREE PHASE.
9. PRIMARY AC DISCONNECT -
SINGLE PHASE –
FUSE/CIRCUIT BREAKER – 60 Amps.
WIRE SIZE – #4 AWG TYPE THHN.
THREE PHASE –
FUSE/CIRCUIT BREAKER – 30 Amps.
WIRE SIZE – #10 AWG TYPE THHN.
FOR PROPER FUSE/CIRCUIT BREAKER SIZE, REFER TO
NATIONAL ELECTRIC CODES AND LOCAL CODES.
10. POWER CONSUMPTION – 5.3 kW (CALCULATED).
11. COOLING REQUIREMENTS – 800 CFM (22.7 m³/min).
12. HEAT DISSIPATION – 2300W AT 3 kW RF OUTPUT INTO A 50 OHM LOAD.
13. BTU – 7850 BTU/H AT 3 kW RF OUTPUT INTO A 50 OHM LOAD.
14. POWER FACTOR – GREATER THAN 0.98.

**STXLP 3 kW INSTALLATION DIAGRAM –
597-4102-7**



NOTES

1. AIR INLET AT FRONT OF TRANSMITTER.
2. AIR OUTLET AT REAR OF TRANSMITTER.
3. GROUND LUG.
4. OUTPUT RF CONNECTION – 1 5/8" Hard Line Coax
5. WEIGHT – 250 LBS (113.4 kg).
6. UNPACKED CUBAGE – 10.8 FT³ (0.31 m³).
7. AC POWER INPUT –
180V TO 260V AC 47 TO 63 Hz SINGLE PHASE.
180V TO 260V AC DELTA OR 311V TO 449V AC WYE
47 TO 63 Hz THREE PHASE
8. AC LINE CURRENT –
80 Amps MAX SINGLE PHASE.
47 Amps MAX THREE PHASE.
9. PRIMARY AC DISCONNECT -
SINGLE PHASE –
FUSE/CIRCUIT BREAKER – 100 Amps.
WIRE SIZE – #2 AWG TYPE THHN.
THREE PHASE –
FUSE/CIRCUIT BREAKER – 60 Amps.
WIRE SIZE – #4 AWG TYPE THHN.
FOR PROPER FUSE/CIRCUIT BREAKER SIZE, REFER TO
NATIONAL ELECTRIC CODES AND LOCAL CODES.
10. POWER CONSUMPTION – 8.8 kW (CALCULATED).
11. COOLING REQUIREMENTS – 1200 CFM (34.0 m³/min).
12. HEAT DISSIPATION – 3800W AT 5 kW RF OUTPUT INTO A 50 OHM LOAD.
13. BTU – 13000 BTU/H AT 5 kW RF OUTPUT INTO A 50 OHM LOAD.
14. POWER FACTOR – GREATER THAN 0.98.

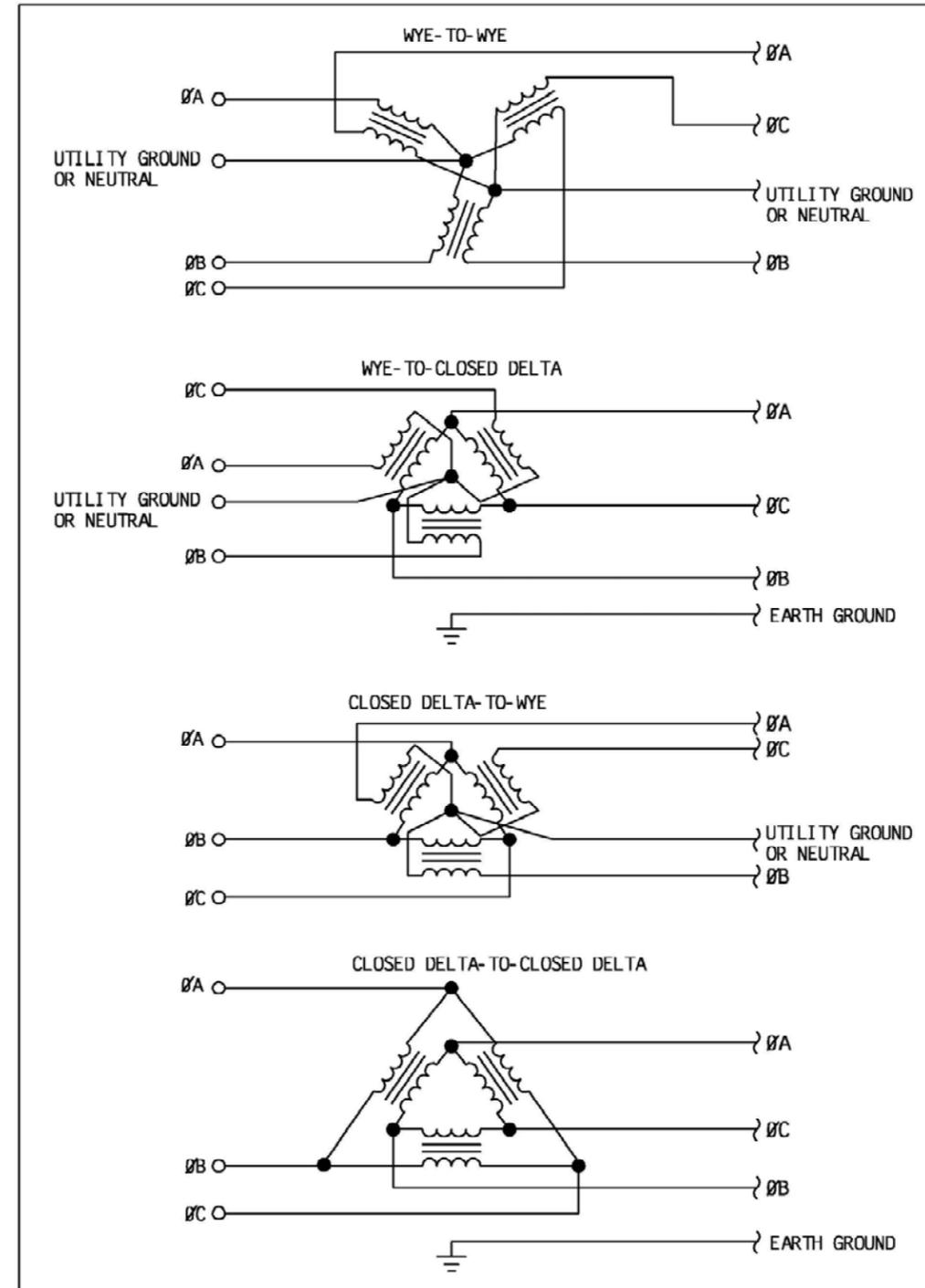
**STXLP 5 kW INSTALLATION DIAGRAM –
597-4102-15**

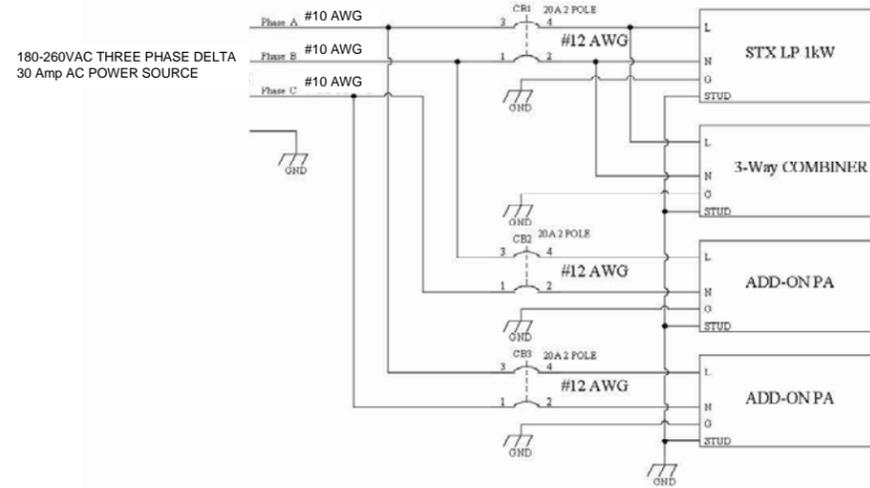
ACCEPTABLE THREE PHASE AC INPUT CONFIGURATIONS.

The STXLP 3kW and 5kW transmitters can be operated from a three-phase power supply if desired. If the transmitter is to be operated from a three phase power supply, the transmitter must be connected to a closed-delta or wye connected three-phase power source. Operation from an unsatisfactory power source will void the warranty on the transmitter as any resultant damage is beyond the control of the manufacturer. Before attempting installation of the transmitter, assure that the proper power source is installed.

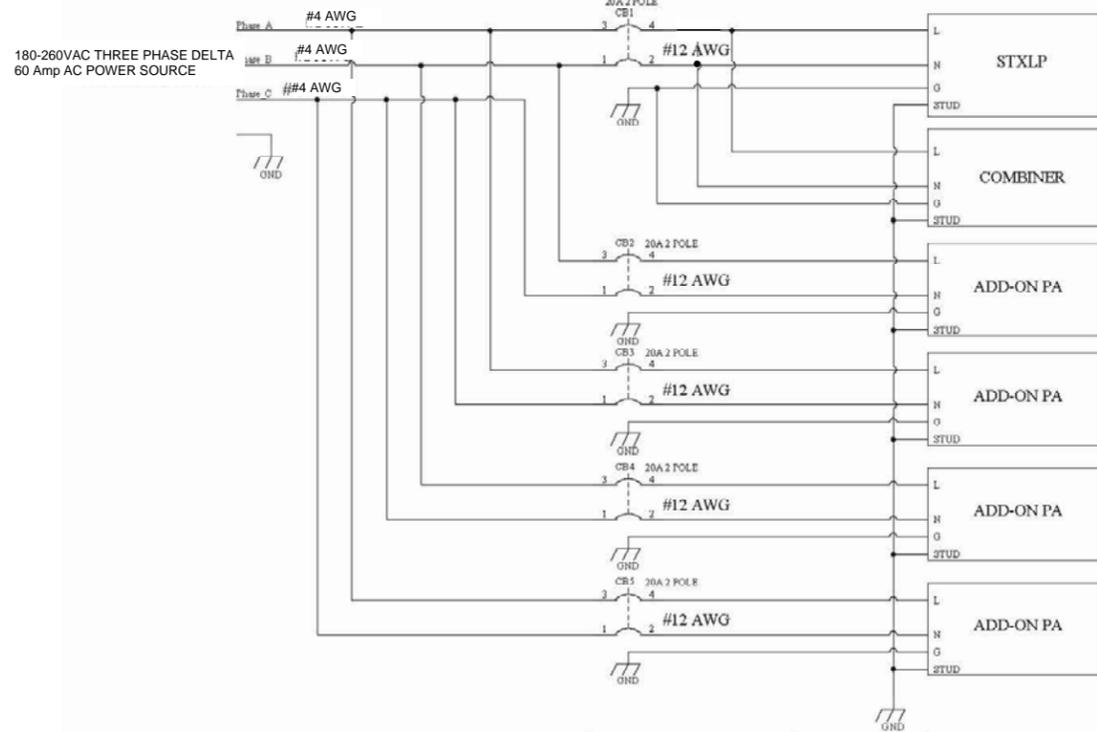
An open-delta, V to V, T to T, T to L, or Scott connected power source will provide unsatisfactory transmitter performance as transients and unstable power can damage components of the transmitter and provide degraded specifications. Any of these systems will develop a considerable imbalance between phases in voltage, phase angle, or both voltage and phase angle. These problems can result in premature failure of power supply and RF circuit components.

It is important that the local electric utility be consulted to ensure that the correct service is provided before connection of the transmitter to a primary power source. The proper power source can be readily identified by the use of three transformers with one winding each or one transformer with three windings instead of the use of two transformers as required for the unacceptable configurations.

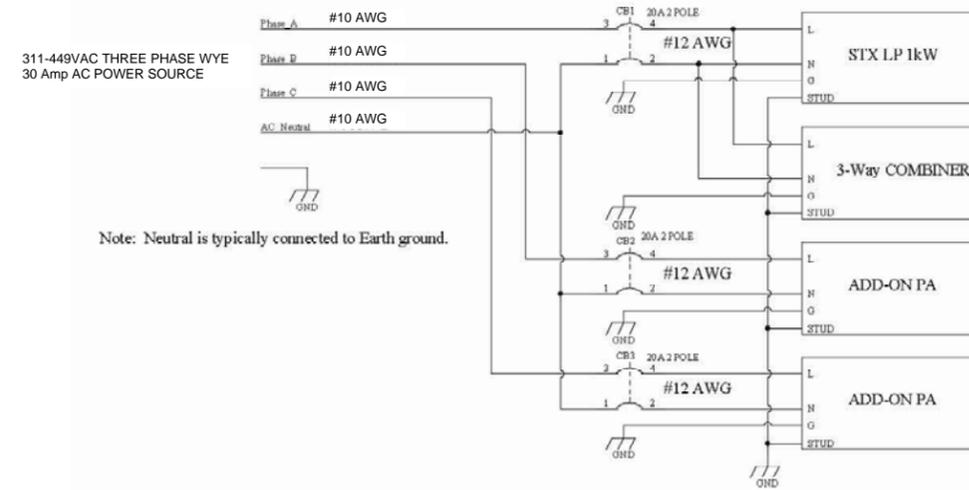




STXLP 3KW THREE PHASE DELTA

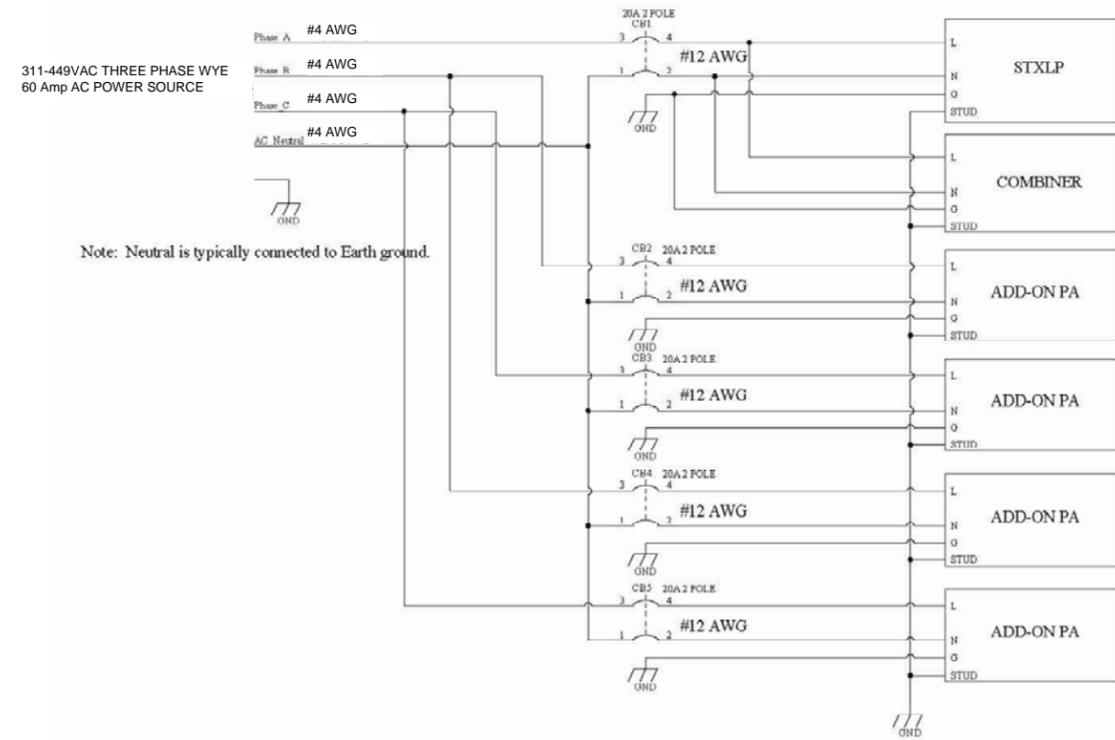


STXLP 5KW THREE PHASE DELTA



Note: Neutral is typically connected to Earth ground.

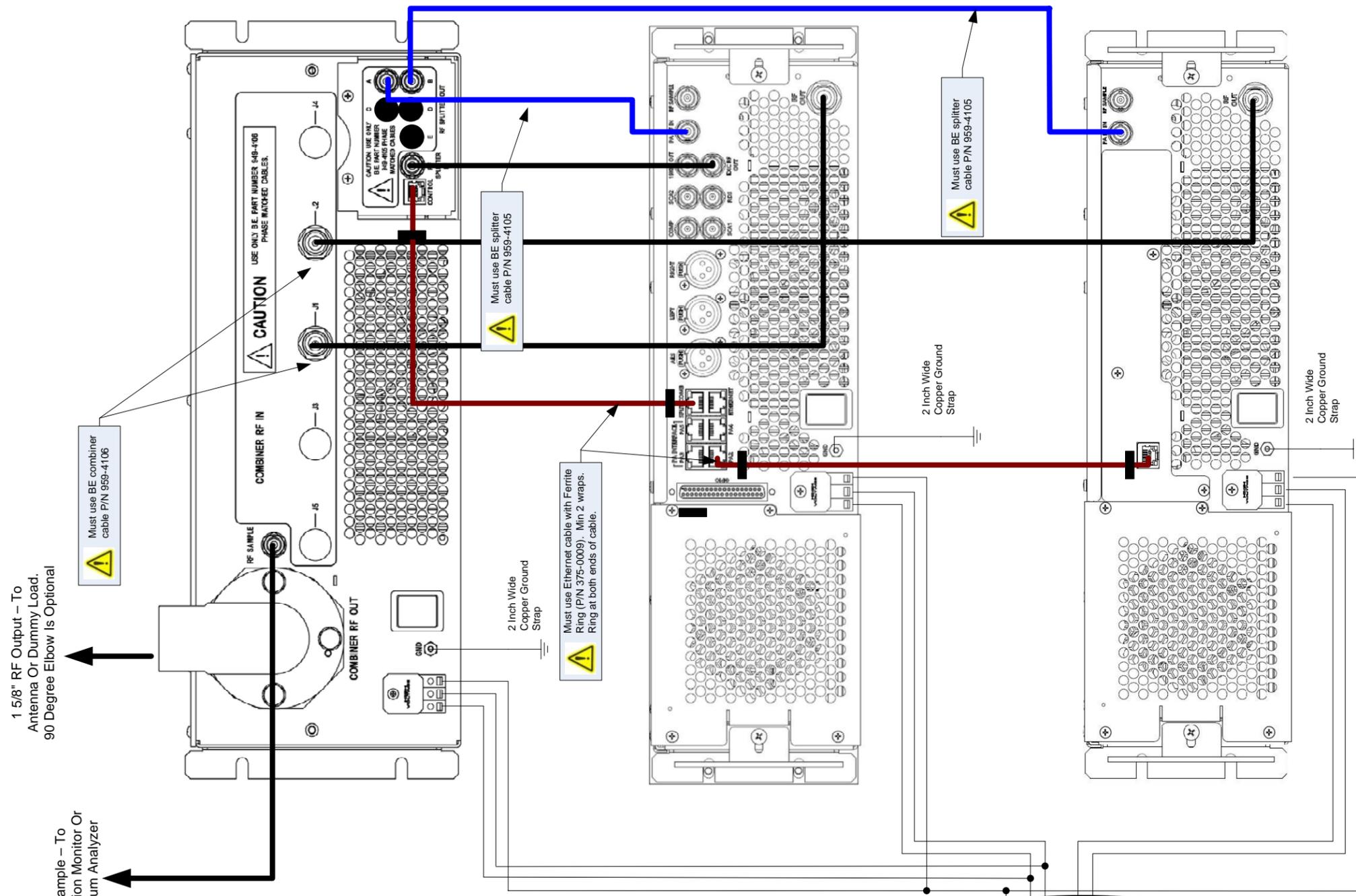
STXLP 3KW THREE PHASE WYE



Note: Neutral is typically connected to Earth ground.

STXLP 5KW THREE PHASE WYE

NOTES –
FOR PROPER FUSE/CIRCUIT BREAKER SIZE, REFER TO
NATIONAL ELECTRIC CODES AND LOCAL CODES.



1 5/8" RF Output – To Antenna Or Dummy Load. 90 Degree Elbow Is Optional

RF Sample – To Modulation Monitor Or Spectrum Analyzer

Must use BE combiner cable P/N 959-4106

Must use BE splitter cable P/N 959-4105

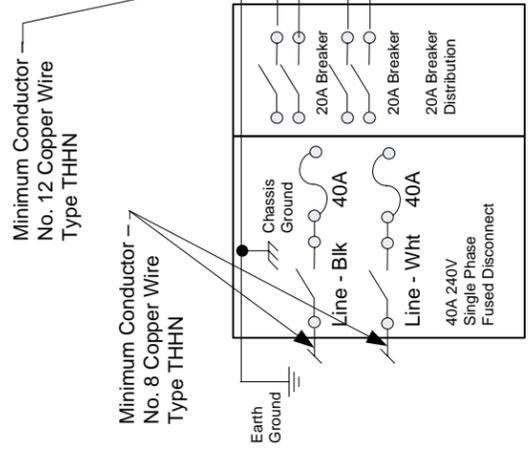
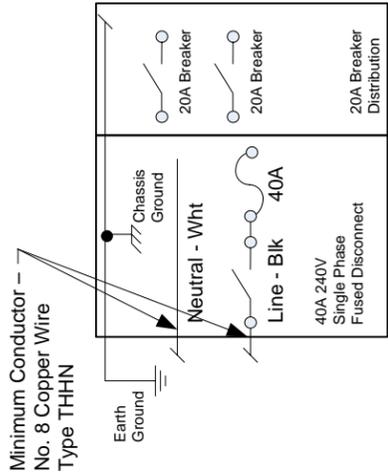
Must use BE splitter cable P/N 959-4105

Must use Ethernet cable with Ferrite Ring (P/N 375-0009). Min 2 wraps. Ring at both ends of cable.

2 Inch Wide Copper Ground Strap

2 Inch Wide Copper Ground Strap

2 Inch Wide Copper Ground Strap



STXLP 2 kW CONNECTION DIAGRAM 597-4102-35

1 5/8" RF Output - To
Antenna Or Dummy Load.
90 Degree Elbow Is Optional

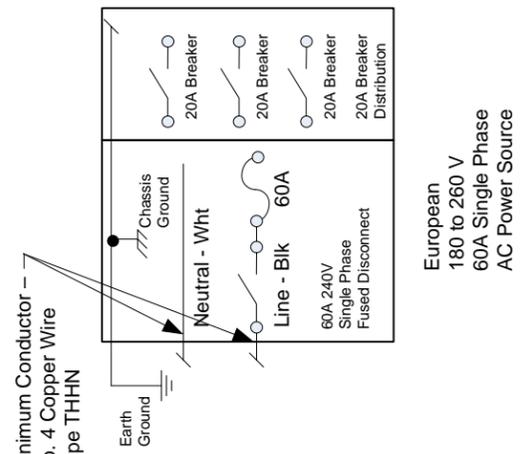
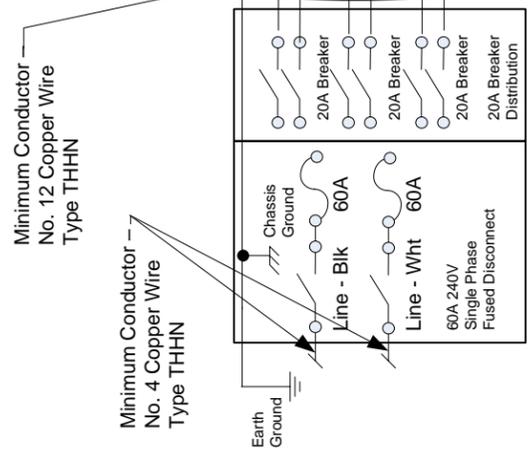
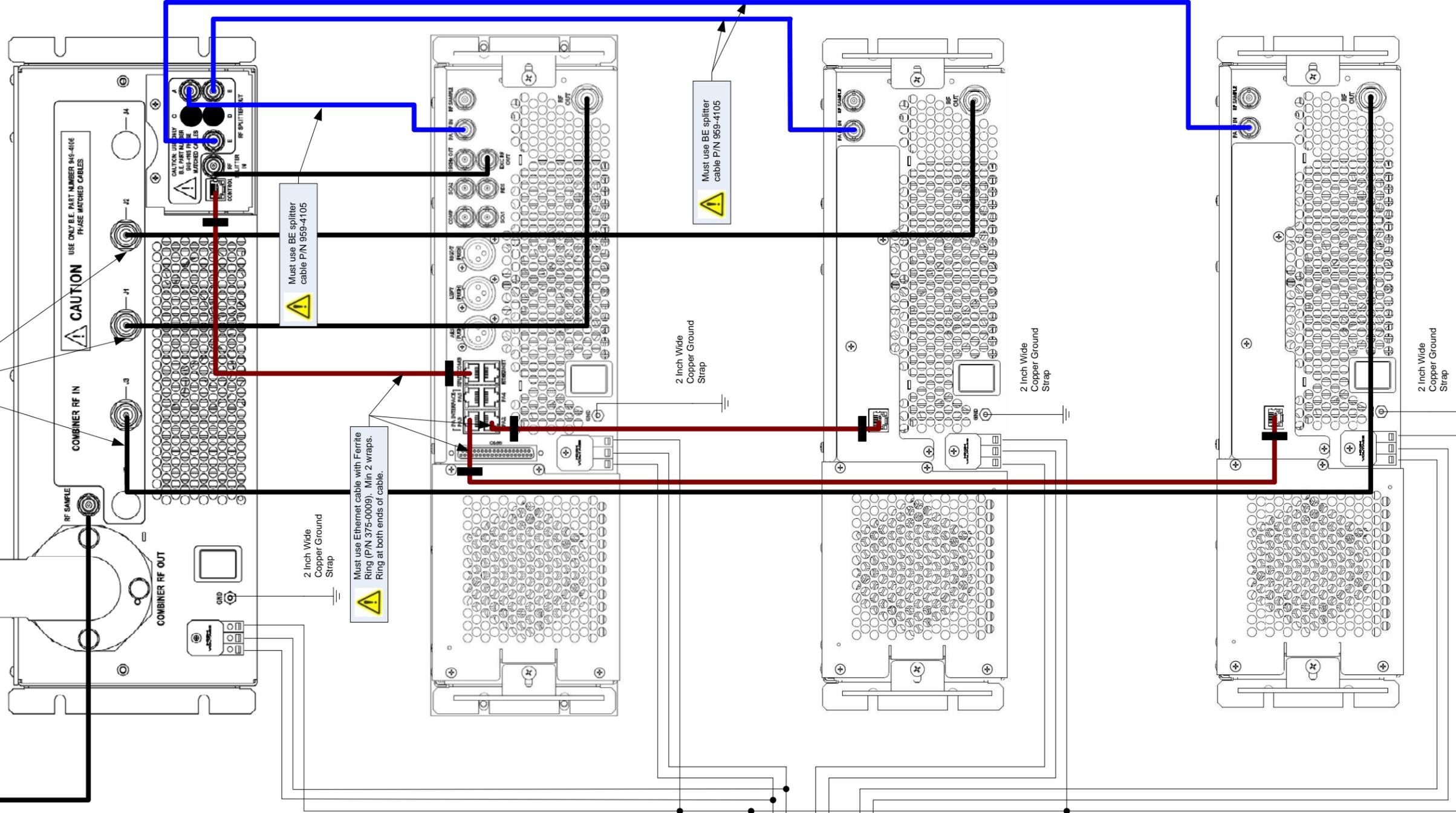
RF Sample - To
Modulation Monitor Or
Spectrum Analyzer

Must use BE combiner
cable P/N 959-4106

Must use BE splitter
cable P/N 959-4105

Must use Ethernet cable with Ferrite
Ring (P/N 375-0009). Min 2 wraps.

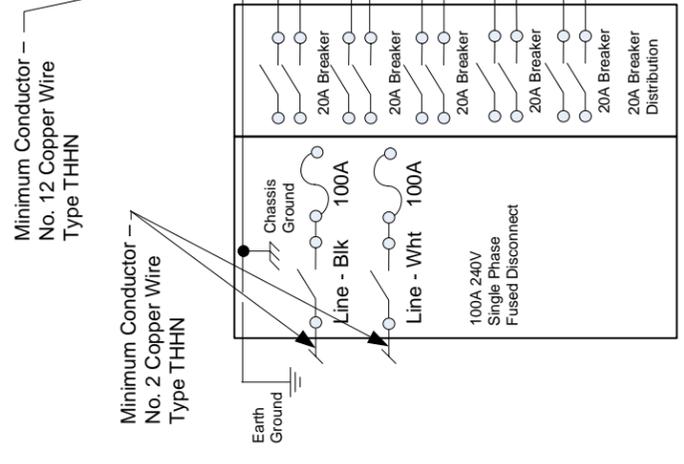
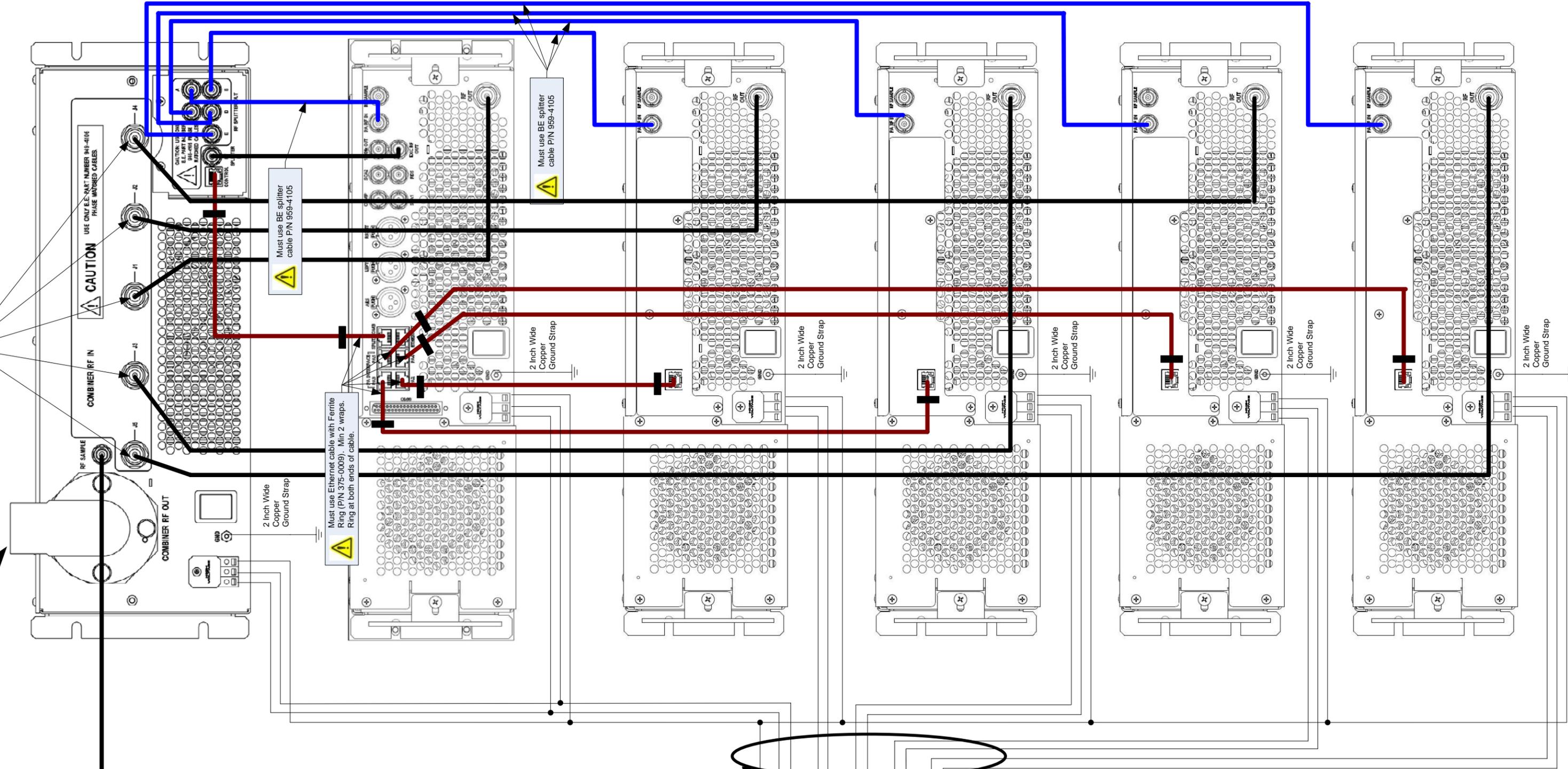
Must use BE splitter
cable P/N 959-4105



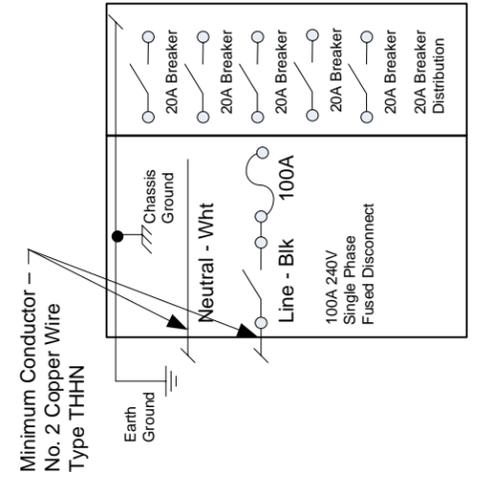
**STXLP 3 kW CONNECTION
DIAGRAM 597-4102-5**

RF Sample - To Modulation Monitor Or Spectrum Analyzer

1 5/8" RF Output - To Antenna Or Dummy Load. 90 Degree Elbow Is Optional.

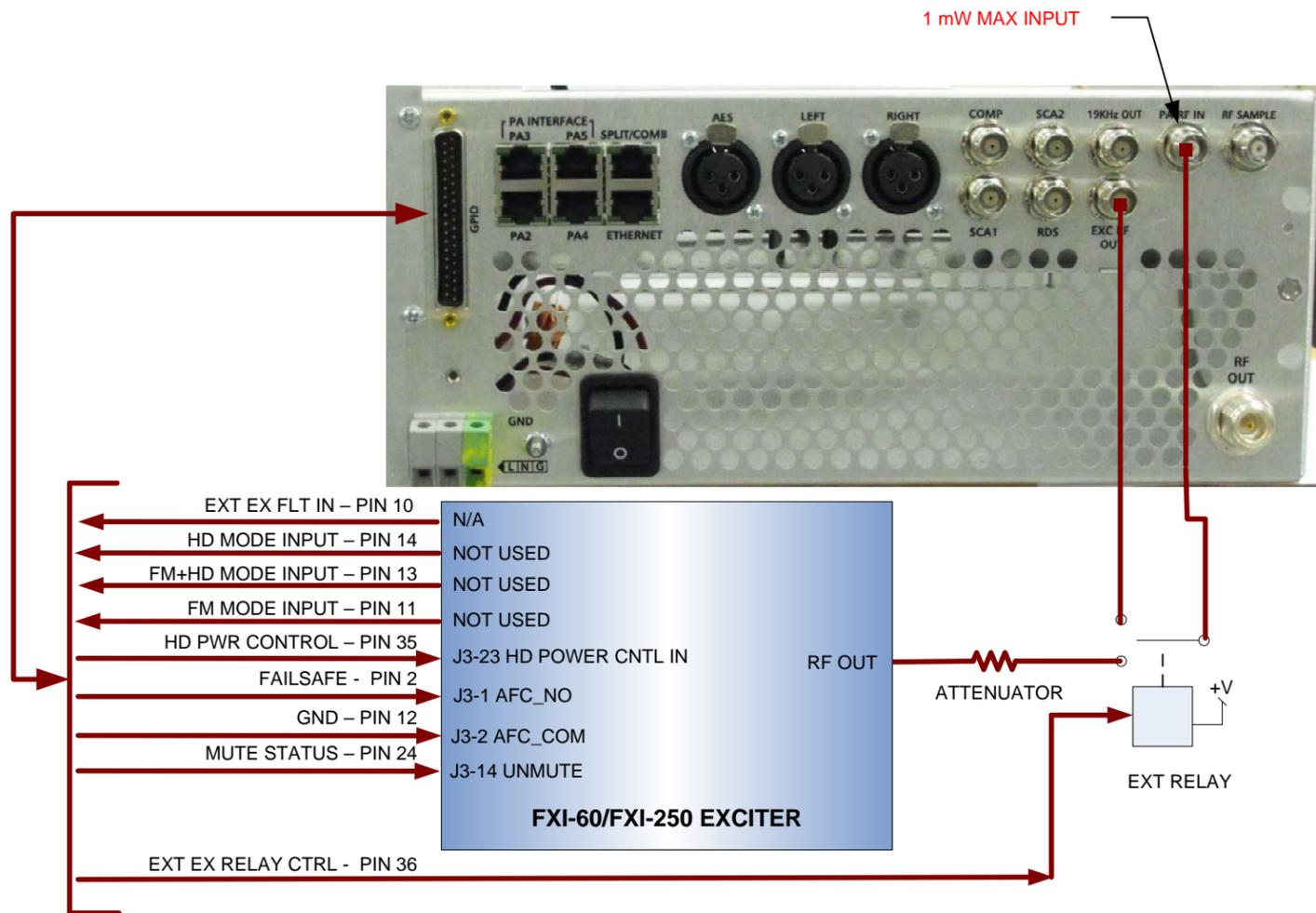


North American
180 to 260 V
100A Single Phase
AC Power Source

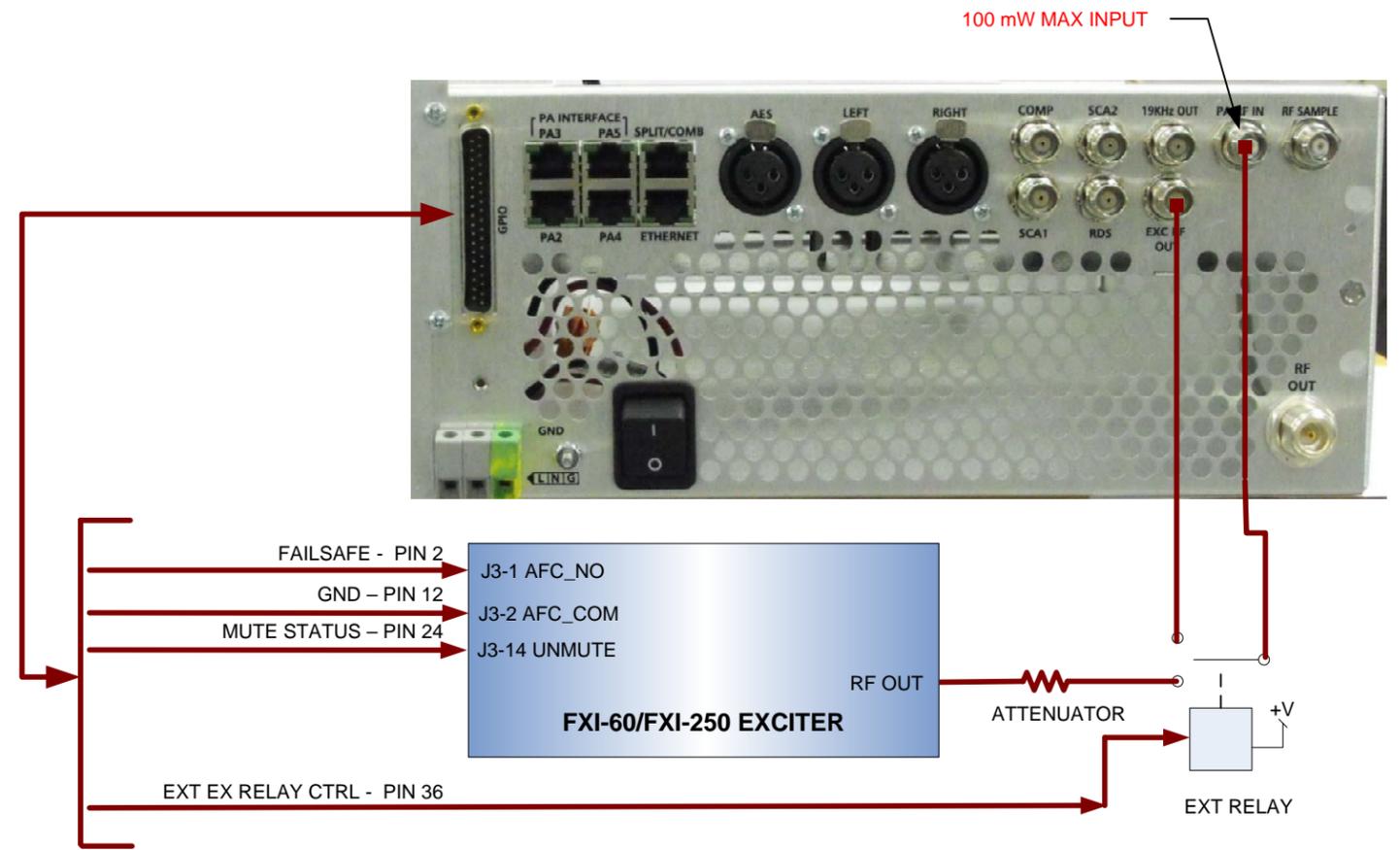


European
180 to 260 V
100A Single Phase
AC Power Source

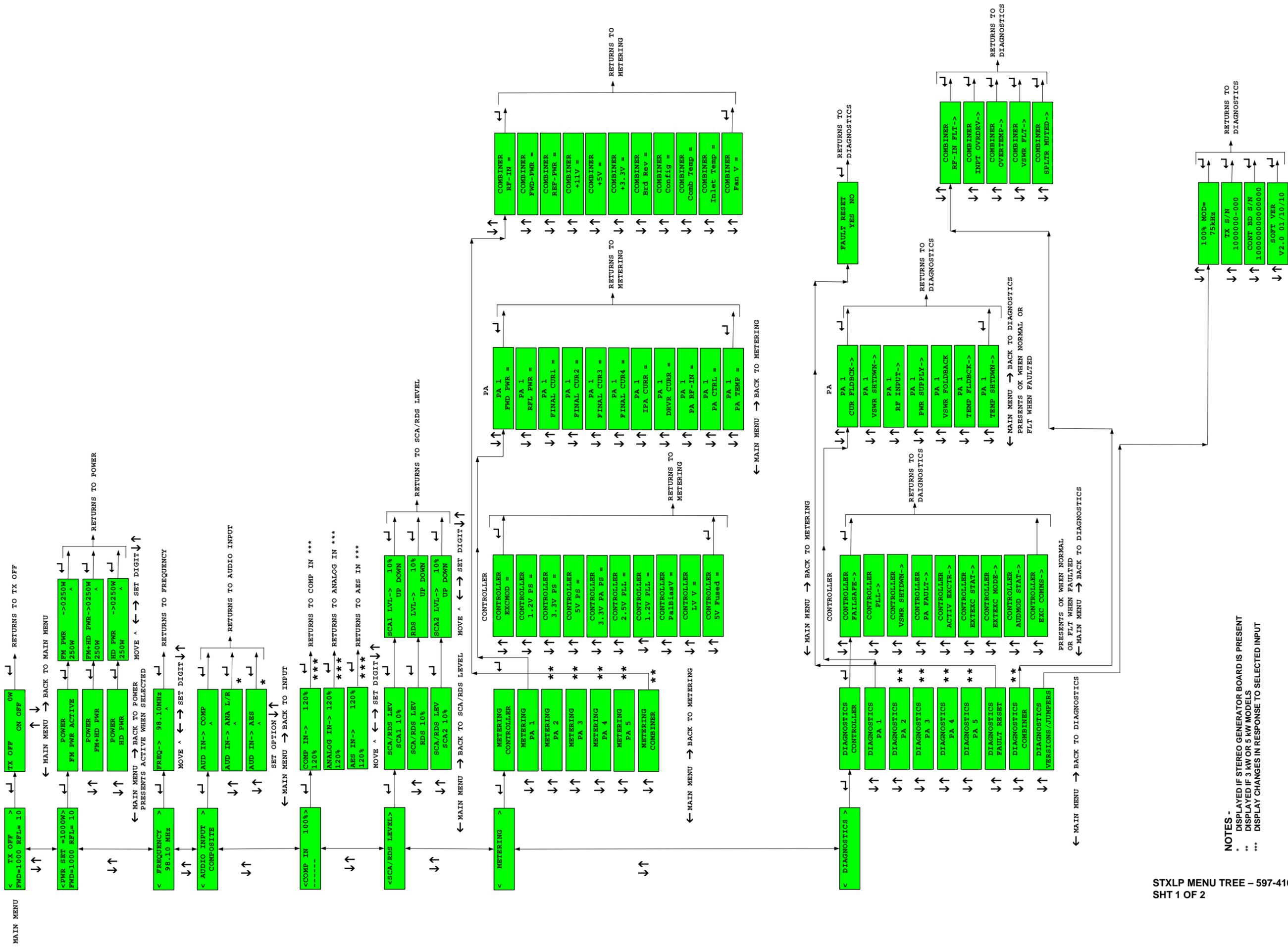
**STXLP 5 kW CONNECTION
DIAGRAM 597-4102-6**



HD CONNECTIONS



FM ONLY CONNECTIONS



NOTES -
 * DISPLAYED IF STEREO GENERATOR BOARD IS PRESENT
 ** DISPLAYED IF 3 kW OR 5 kW MODELS
 *** DISPLAY CHANGES IN RESPONSE TO SELECTED INPUT

