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## **FM 10S / 20S Transmitter**

### **Standby Exciter Installation Application Guide**

**(For Use With an FX50, FXi 60, or FXi 250 Exciter)**

597-1012-008, Revision A  
6/04/07

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### **Standby Exciter Installation Application Guide**

**(For Use With an FX50, FXi 60, or FXi 250 Exciter)**

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## 1 Purpose of this Document

This document provides detailed instructions for the installation, connection, and setup of an FX50, FXi 60, or FXi 250 Standby Exciter for use with an FM 10S or FM 20S Transmitter.

## 2 Tools / Items Needed

- No. 1 Phillips Screw Driver
- 5/16 Nut driver
- PC with Serial Port and Windows HyperTerminal
- 9 Pin Null Modem Cable
- 969-1011 Kit, Standby Exciter, FX50  
- or -
- 969-1011-001 Kit, Standby Exciter, FXi 60  
- or -
- 969-1011-002 Kit, Standby Exciter, FXi 250

## 3 Estimated Time for Upgrade

Providing that you have the tools / items listed above, it will take approximately 30 minutes to install and setup an FX50, FXi 60, or FXi 250 Standby Exciter.

## 4 Turn the Transmitter's RF Output Power to OFF

## 5 Disconnect AC Power from the Existing Exciter

## 6 Turn the Transmitter's AC Breaker to OFF

## 7 Disconnect and Remove the Existing Exciter From Tx



## 8 Assemble Coaxial Switch and Bracket

**Step 1** - Locate the Coaxial Switch (340-0202-001), Mounting Plate (471-5437), and Qty (2) 4-40 X 3/8 Long Screws (500-211).

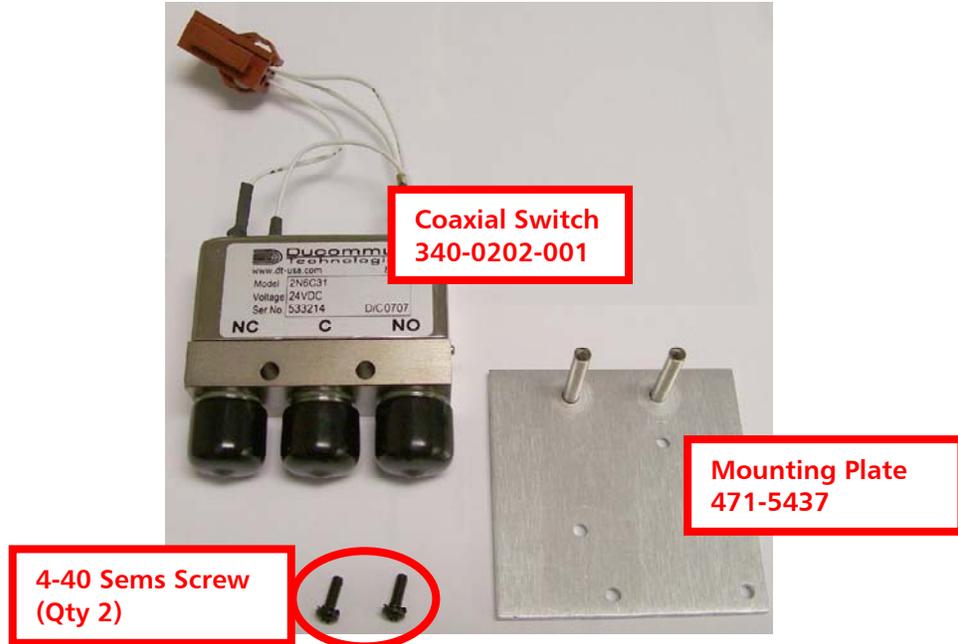


Figure 1 – Coaxial Switch and Bracket

**Step 2** – Install the Coaxial Switch onto the Mounting Plate as shown. Using a No. 1 Phillips Screw Driver, install the mounting screws.



Figure 2 – Coaxial Switch and Bracket

## 9 Attach Cables to Coaxial Switch

Remove port covers and install Coax Cables from the kit as indicated.

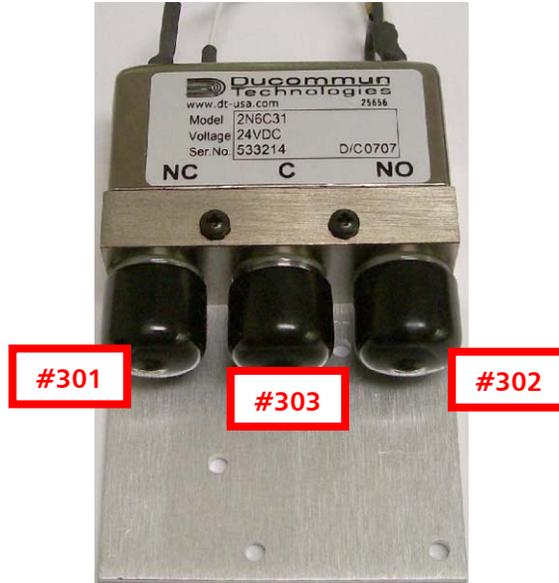


Figure 3 – Attach Coax Cables From Kit

## 10 Install Coaxial Switch / Cabling Into Transmitter

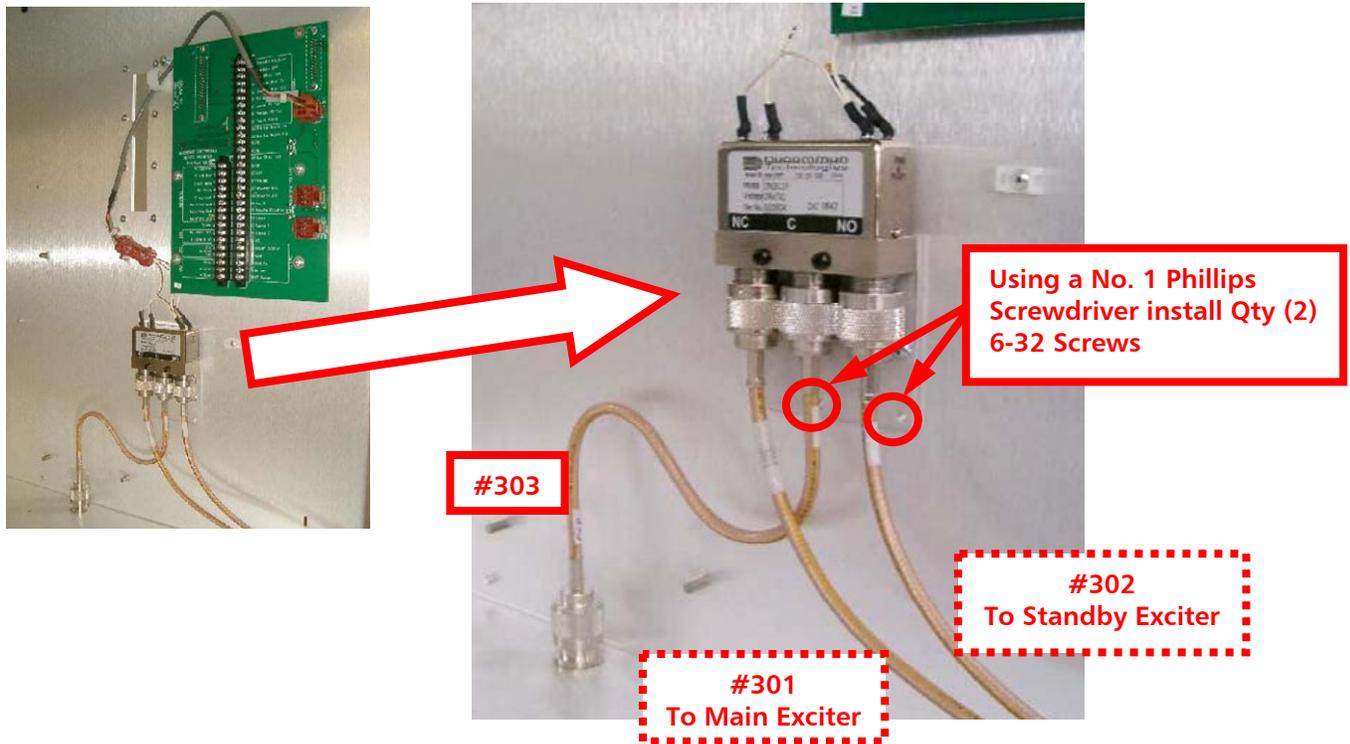


Figure 4 – Coaxial Switch Installation

## 11 Install Interface Cabling

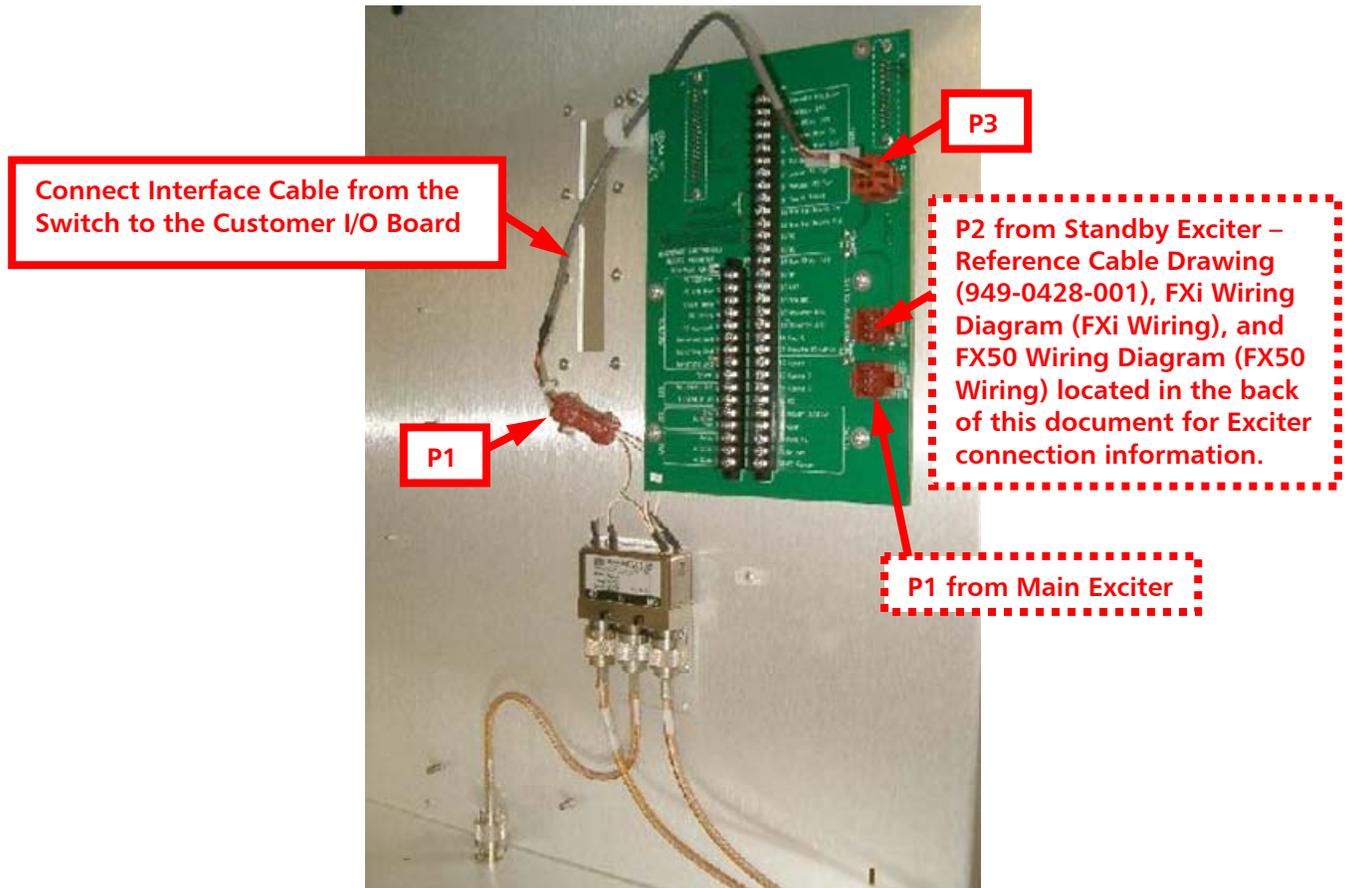


Figure 5 – Interface Cable Installation

## 12 Install the Main Exciter

Install the Main Exciter back into the transmitter in its original position.

## 13 Install 1 RU Panel

Install the 1 RU Panel above the Main Exciter.

## 14 Install the Standby Exciter

Install the Standby Exciter above the 1 RU Panel.

## 15 Complete Exciter RF and I/O Board Connections

After installing both the Main and Standby Exciters into the transmitter, complete the connections from the Coaxial Switch and Customer I/O Board to both of the exciters as noted by the “**dashed boxes**” in **Figure 4** and **Figure 5**.

## 16 Connect AC Power to Both of the Exciters

## 17 Connect Program Audio to Both Exciters

## 18 Turn the Transmitter’s AC Breaker to ON

## 19 Apply AC Power to Both of the Exciters

## 20 Verify the Frequency of the Standby Exciter (if FXi 60/250)

See Section 21 for verification and setting the frequency of an FX50 Exciter.

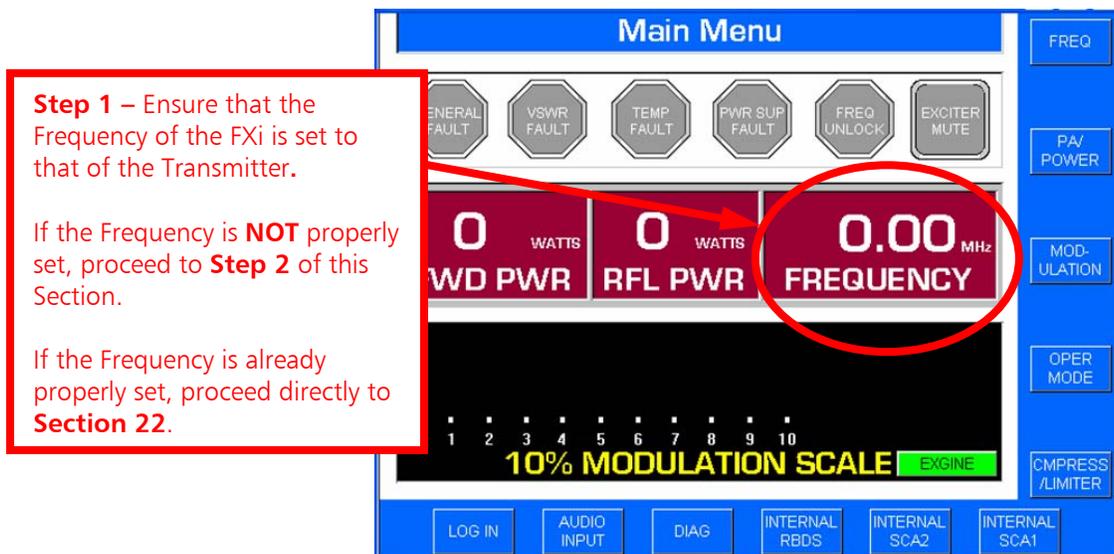


Figure 6 – FXi 60/250 Main Menu

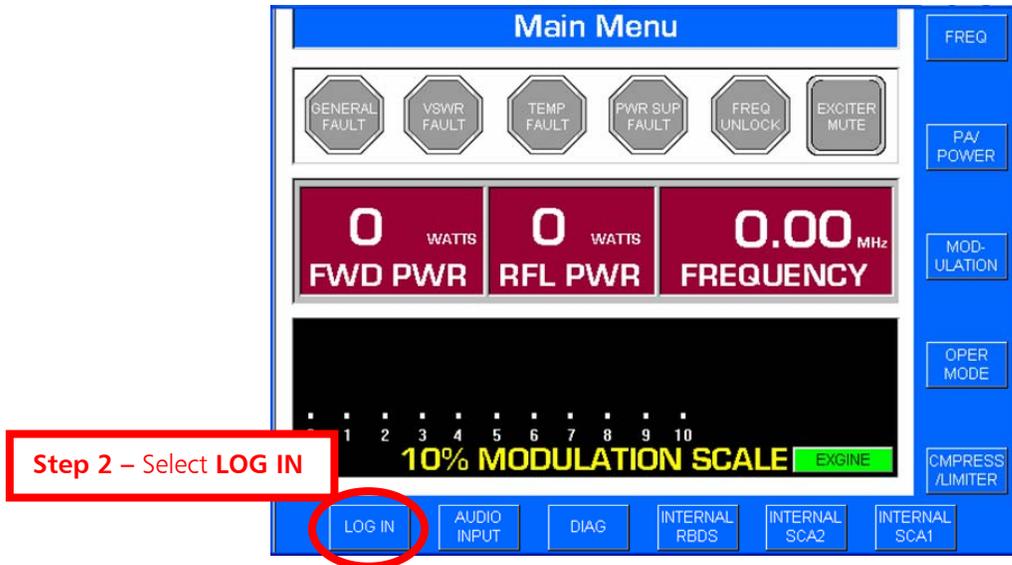


Figure 7 – FXi 60/250 Main Menu



Figure 8 – FXi 60/250 Login Menu

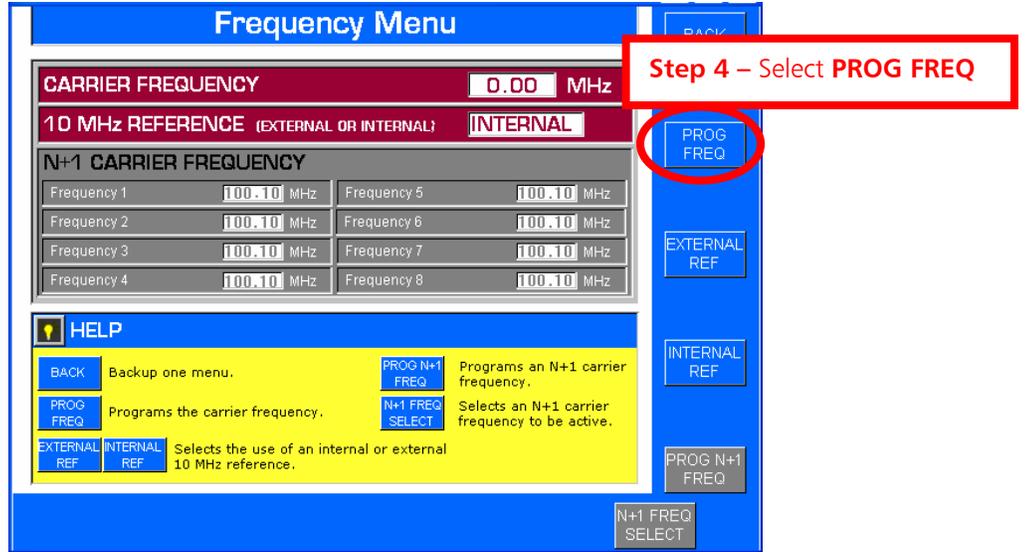


Figure 9 – FXi 60/250 Frequency Menu

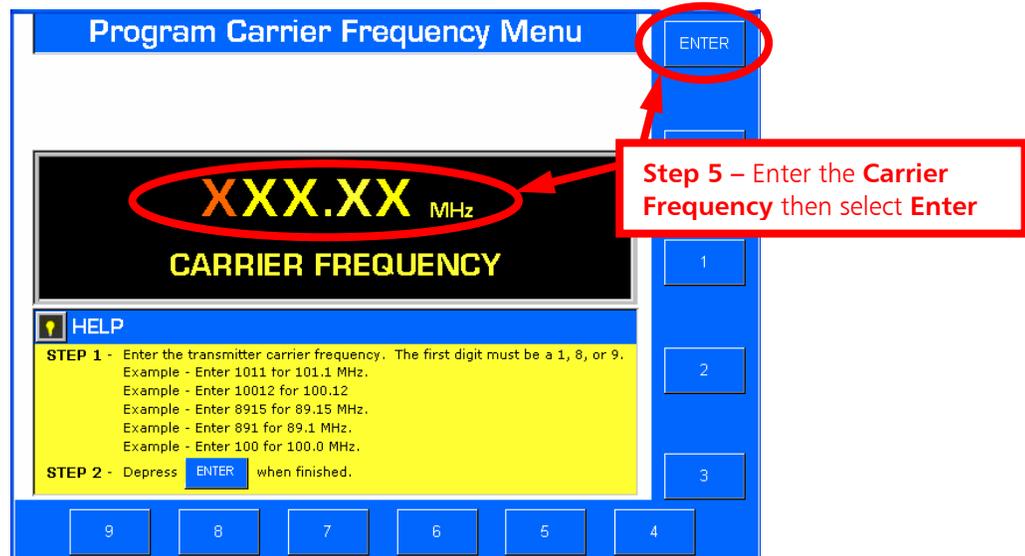


Figure 10 – FXi 60/250 Program Carrier Frequency Menu



## 21 Verify the Frequency of the Standby Exciter (if FX50)

Verify the operating frequency of the FX50 is that of the transmitter. If it is already set correctly proceed to Section 22. If it is NOT set correctly remove the cover from the FX50 and use the dip switches on the AFC / PLL Assembly (919-104) to change the frequency.

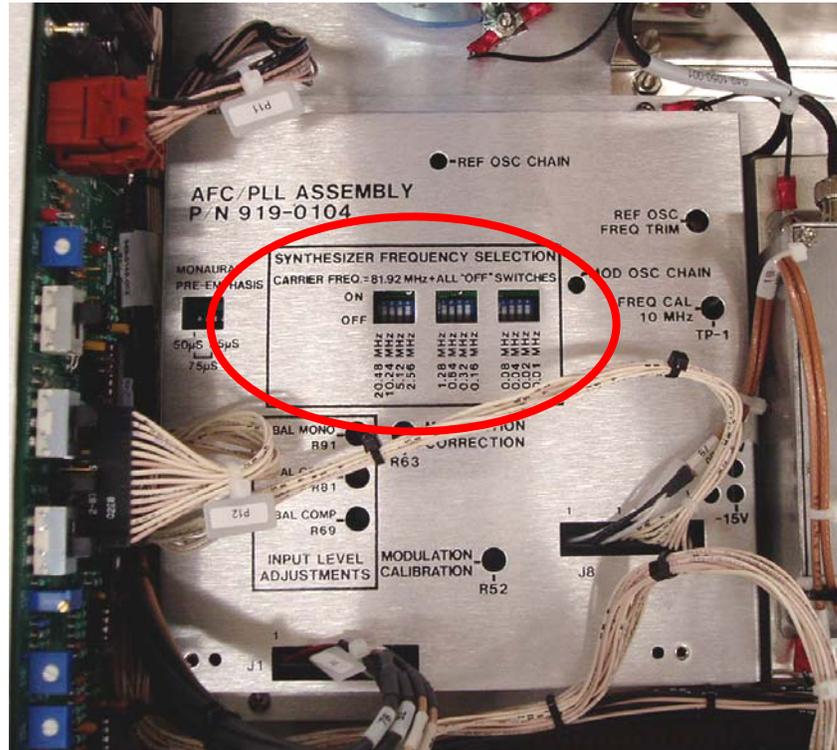


Figure 11 – FX50 Frequency Dip Switches

## 22 Establish Communication with the Transmitter

**Step 1** – Ensure that the Transmitter's AC Power is ON.

**Step 2** – Connect a Null Modem Serial Cable (not supplied) from the COM port of the PC to the RTDS port on the front of the Transmitter.

**Step 3** – To enable HyperTerminal communication with Transmitters that are running older software, simultaneously depress the **FWD POWER** and **PA CURRENT** buttons on the transmitter's front panel as shown.

This is **ONLY** necessary if the transmitter you are trying to communicate with is an:

**FM10S Transmitter running Smartcore Software v1.0.30 (or older)**

– or an –

**FM20S Transmitter running Smartcore Software v2.1.9 (or older).**



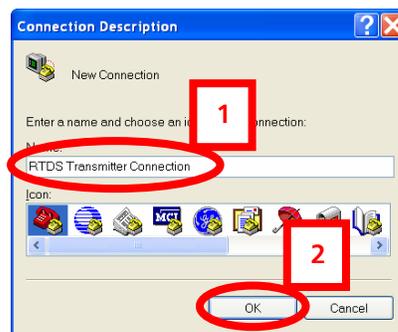
**Only Applies to the following:**

**FM10S Transmitter running Smartcore Software v1.0.30 (or older)**

**FM20S Transmitter running Smartcore Software v2.1.9 (or older)**

**Figure 12 – Enabling HyperTerminal Communication**

**Step 4** – Launch Windows HyperTerminal by going to **START -> ALL PROGRAMS -> ACCESSORIES -> COMMUNICATIONS -> HYPERTERMINAL**. Name the connection and then select **OK**.



**Figure 13 – HyperTerminal Connection Description Menu**

**Step 5** – The default telnet question box may appear. Select **Yes** if you want HyperTerminal to be your default telnet program. Select **No** if you do not want it to be.



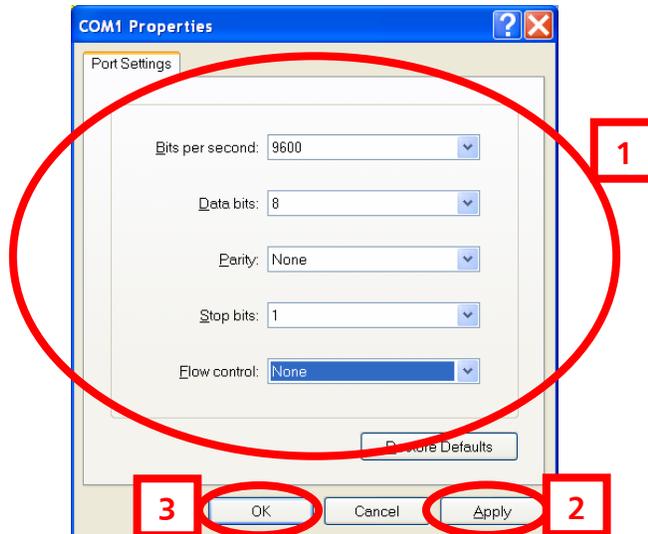
**Figure 14 – Default Telnet Program Menu**

**Step 6** – Select the appropriate connection port (**COM1** is the most common) from the pull down, then select **OK**.



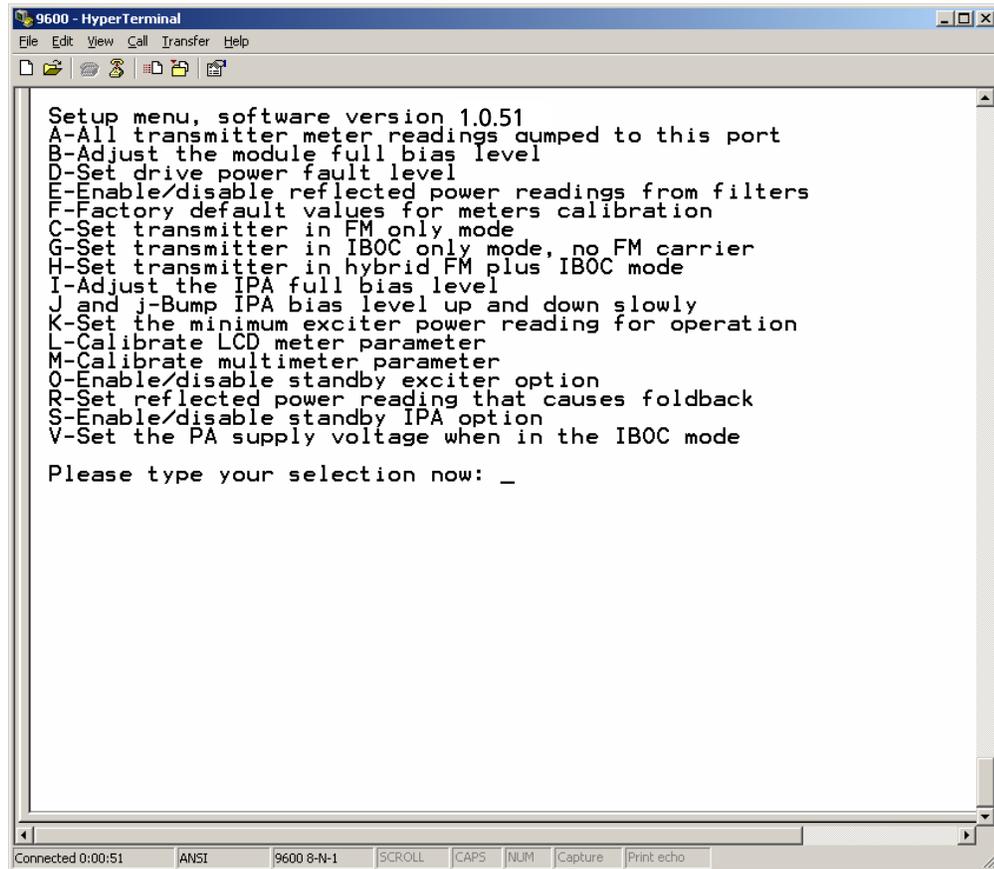
**Figure 15 – HyperTerminal Connect To Menu**

**Step 7** – Configure the **Port Settings** as shown below, select **Apply** then **OK**.



**Figure 16 – Port Settings Menu**

**Step 8** – Next, the HyperTerminal command window should appear. Type <Enter> to display the command prompt.



```
9600 - HyperTerminal
File Edit View Call Transfer Help
[Icons]
Setup menu, software version 1.0.51
A-All transmitter meter readings gumped to this port
B-Adjust the module full bias level
D-Set drive power fault level
E-Enable/disable reflected power readings from filters
F-Factory default values for meters calibration
C-Set transmitter in FM only mode
G-Set transmitter in IBOC only mode, no FM carrier
H-Set transmitter in hybrid FM plus IBOC mode
I-Adjust the IPA full bias level
J and j-Bump IPA bias level up and down slowly
K-Set the minimum exciter power reading for operation
L-Calibrate LCD meter parameter
M-Calibrate multimeter parameter
O-Enable/disable standby exciter option
R-Set reflected power reading that causes foldback
S-Enable/disable standby IPA option
V-Set the PA supply voltage when in the IBOC mode

Please type your selection now: _

Connected 0:00:51  ANSI  9600 8-N-1  SCROLL  CAPS  NUM  Capture  Print echo
```

**Figure 17 – HyperTerminal Command Window**

## 23 Enable Standby Exciter Option

Type "0" then <Enter> to enable the standby exciter option.

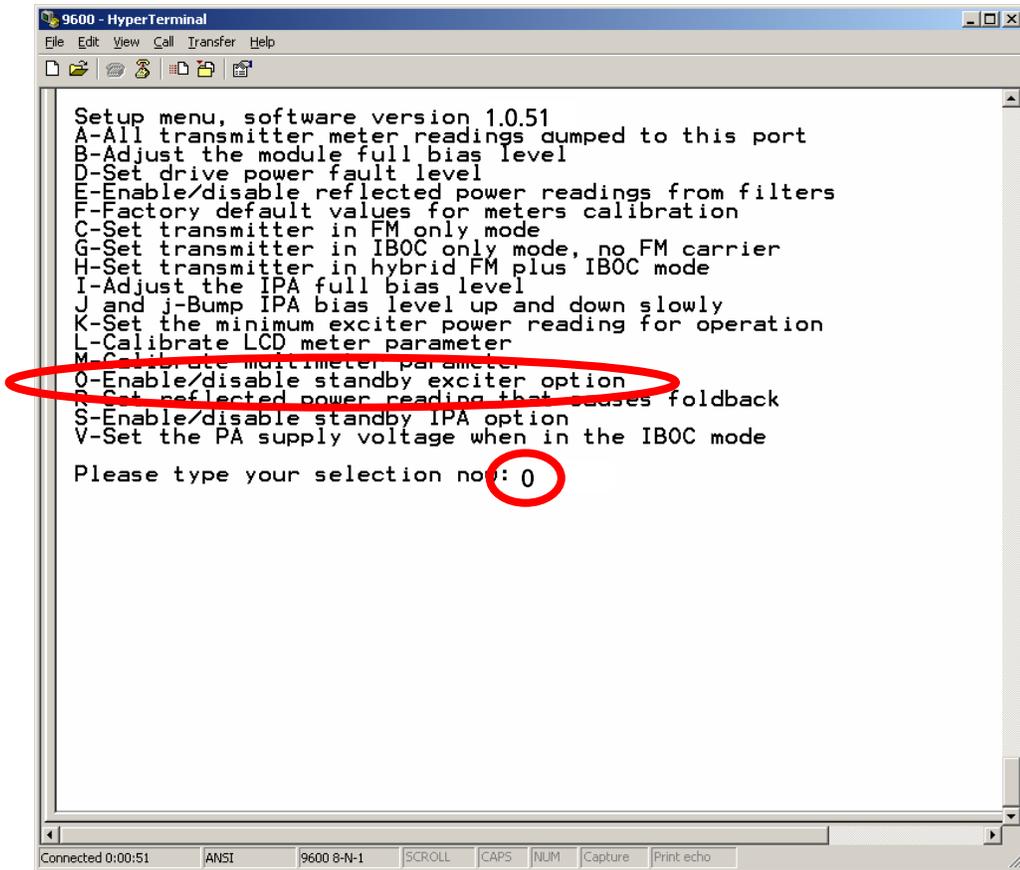


Figure 18 – Enable Standby Exciter Option

## 24 Verify Standby Exciter Operation

Verify that the relay switches and the control circuit is operational by depressing the "Standby Exciter" button on the Transmitter's front panel. The button should illuminate and an audible relay closure should be heard. Return to the Main Exciter by pressing the button again.



Figure 19 – Standby Exciter Switch

## 25 Turn the Transmitter's RF Output to ON

Next, press the **ON** button to turn the transmitter's **RF Output** to **ON** (un-mute).



Figure 20 – Turn Transmitter's RF Output ON

## 26 Transmitter Front Panel Multimeter Calibration

**NOTE:** This section discusses the necessary steps to calibrate the transmitter's front panel multimeter Exciter FWD PWR.

**Step 1** – Using the Multimeter selector knob, go to **Exciter Fwd Pwr**.

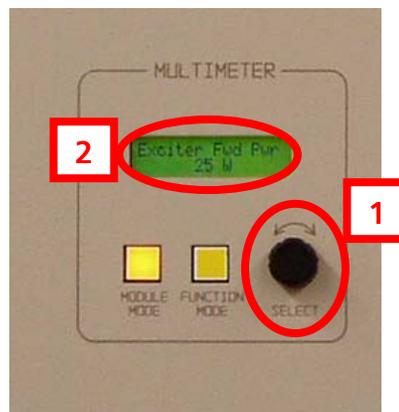
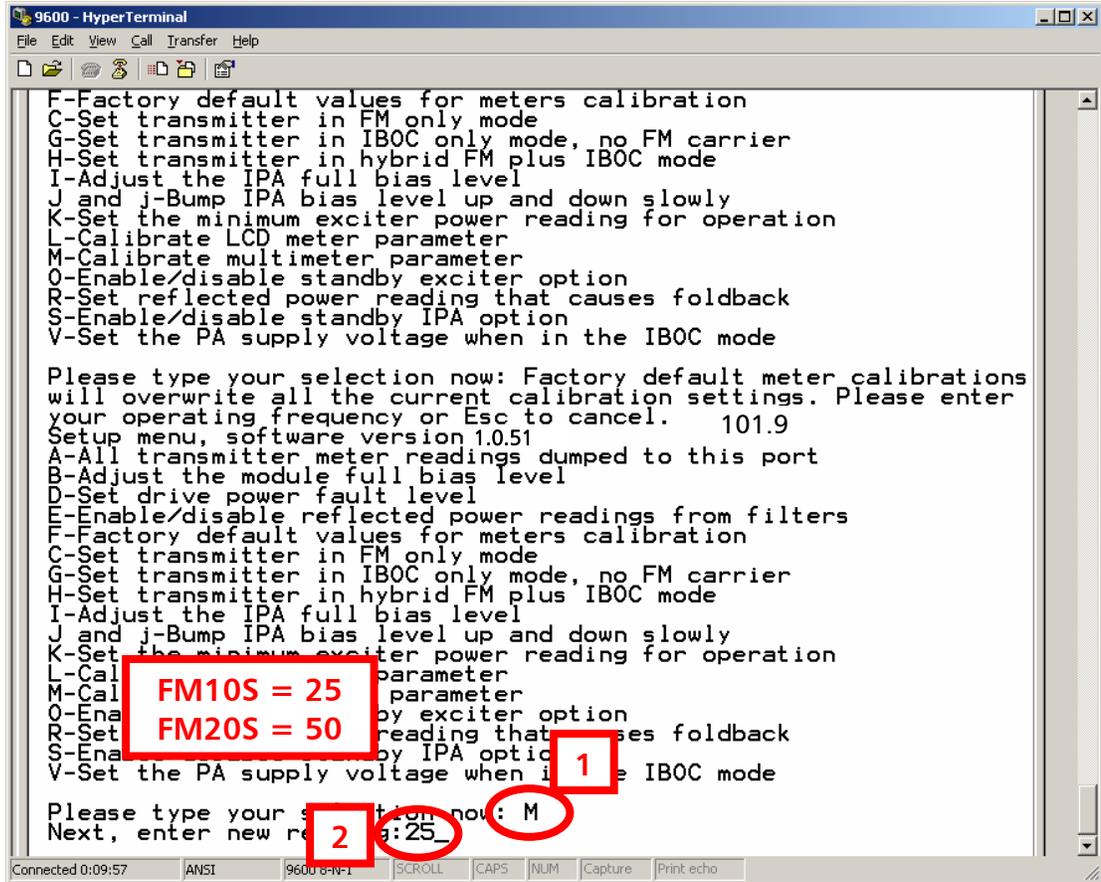


Figure 21 – Multimeter Exciter Fwd Pwr

**Step 2** – To calibrate the transmitter’s **Exciter Fwd Pwr** meter, type “M”, then type either **25** (for a **FM10S**) or **50** (for a **FM20S**) and press **<Enter>**. This value is the Exciter’s Output Power Level. Ensure that the Exciter is set at the proper level for your specific transmitter!



**Figure 22 – Transmitter Meter Calibration**

**Step 3** – Steps 3 - 6 are ONLY required if you have an:

- FM10S Transmitter running Smartcore Software v1.0.18 (or later)**
- or an -**
- FM20S Transmitter running Smartcore Software v2.1.5 (or later)**

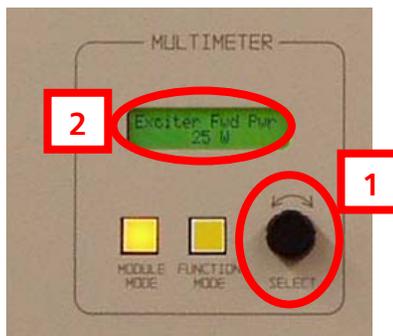
If either of the above is the case, press the “Standby Exciter” button on the Transmitter’s front panel.



**Figure 23 – Standby Exciter Switch**

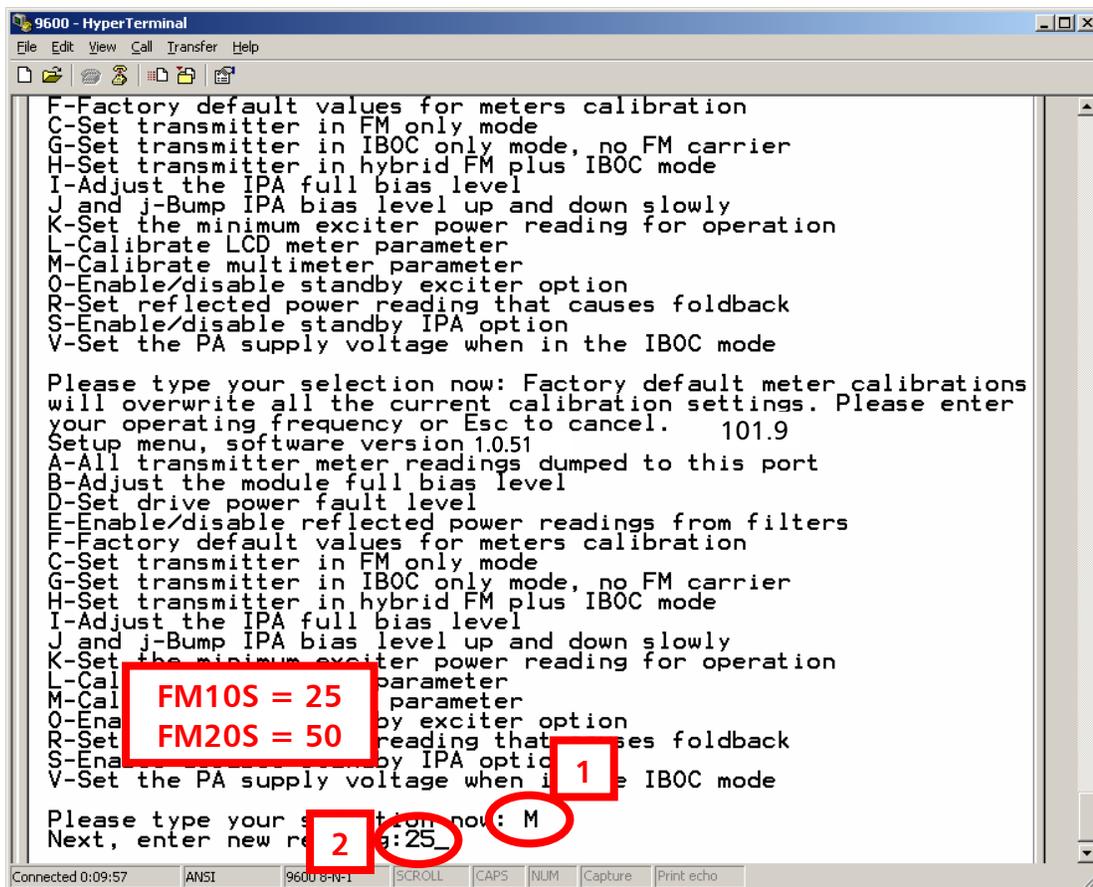


**Step 4** – Using the Multimeter selector knob, go to **Exciter Fwd Pwr**.



**Figure 24 – Multimeter Exciter Fwd Pwr**

**Step 5** – To calibrate the transmitter’s **Exciter Fwd Pwr** meter, type “M”, then type either **25** (for a **FM10S**) or **50** (for a **FM20S**) and press <Enter>. This value is the Exciter’s Output Power Level. Ensure that the Exciter is set at the proper level for your specific transmitter!



**Figure 25 – Transmitter Meter Calibration**

**Step 6** – Press the “Standby Exciter” button to return to the Main Exciter.



## 27 Auto Switch Test

**Step 1** – Ensure that the Main Exciter is selected and the Transmitter is operational.

**Step 2** – Remove AC Power from the Main Exciter.

**Step 3** – Verify that the Transmitter automatically switches to the Standby Exciter and the Transmitter is operational.

**Step 4** – Restore AC Power to the Main Exciter.

**Step 5** – Remove AC Power from the Standby Exciter.

**Step 6** – Verify that the Transmitter automatically switches to the Main Exciter and the Transmitter is operational.

**Step 7** – Restore AC Power to the Standby Exciter.

## 28 RF Customer Service Contact Information

RF Customer Service -

Telephone: (217) 224-9617

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

Fax: (217) 224-6258

## 29 Schematics / Drawings

**29.1 Assy, Cable, Standby Exciter (949-0428-001)**

**29.2 Diagram, FXi Wiring (FXi Wiring)**

**29.3 Diagram, FX50 Wiring (FX50 Wiring)**



STANDBY EXC. KIT CABLE ASSY. FX-50

JUMPER CHART FOR 949-0428-001

WIRE NO.	WIRE PART NO.	LENGTH	ENDTYPE	ENDTYPE
302	621-0001	38	73A	71
303	621-0001	10	71	71

REVISIONS					
REV	DATE	DESCRIPTION	DRAFTER	APPROVED	ECN
1	5-27-99	PROTOTYPE RELEASE	JTD		
2	4-10-00	MODEL RELEASE	MSE		
3	5-10-00	MODEL RELEASE	MSE		
A	10-2-00	Engineering Release	MSE		
B	10-18-00	Added 7 in of 610-0019-363	MSE		10376
C	3-19-01	Del 621-0001, add 622-8444, add cut off gny and shld notes	MSE		10431
D	1-21-02	Del 622-8444, add 621-0001, update P1 & P3 charts del #239	MSE		10619
E	8-12-02	Del 682-0004 line cord	MSE		10753
F	2-04-03	KEEP BLU IN 608-0002	MSE		10881

WIRING OF P3  
418-0670

PIN NO.	WIRE NO.
1	BLK
2	RED
3	GRN
4	
5	
6	

CUT OFF WHT



WIRING OF P1  
418-0240

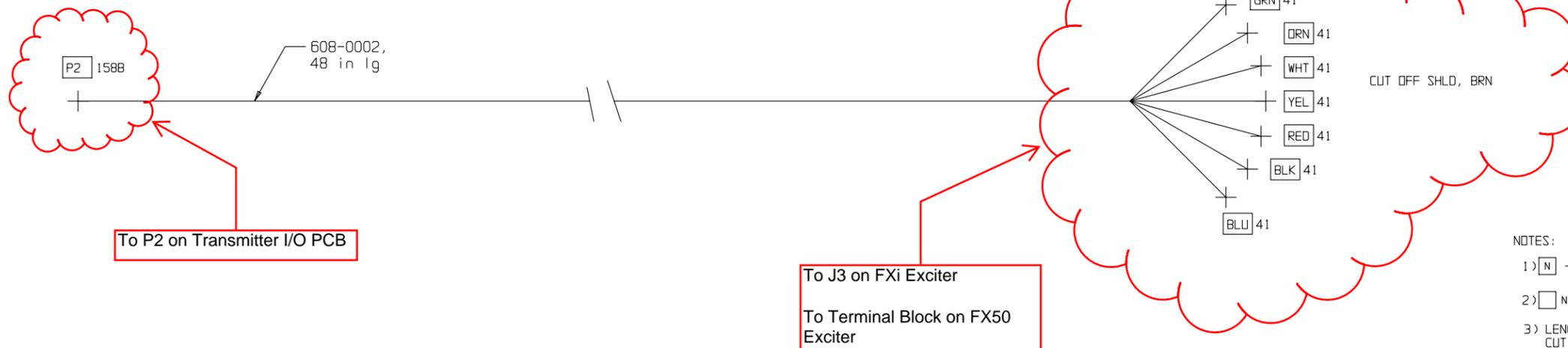
PIN NO.	WIRE NO.
1	BLK
2	RED
3	OPEN
4	GRN

CUT OFF WHT

WIRING OF P2  
417-0059

PIN NO.	WIRE NO.
1	GRN
2	DRN
3	WHT
4	YEL
5	RED
6	BLK
7	BLU
8	
9	

CUT OFF SHLD, BRN



NOTES:

- 1) [N] - WIRE NO.
- 2) [N] - WIRE END TYPE
- 3) LENGTHS ARE IN INCHES  
CUT CABLES TO LENGTH SHOWN  
THEN ADD CONNECTORS
- 4) LABEL ALL CONNECTORS W/402-0051

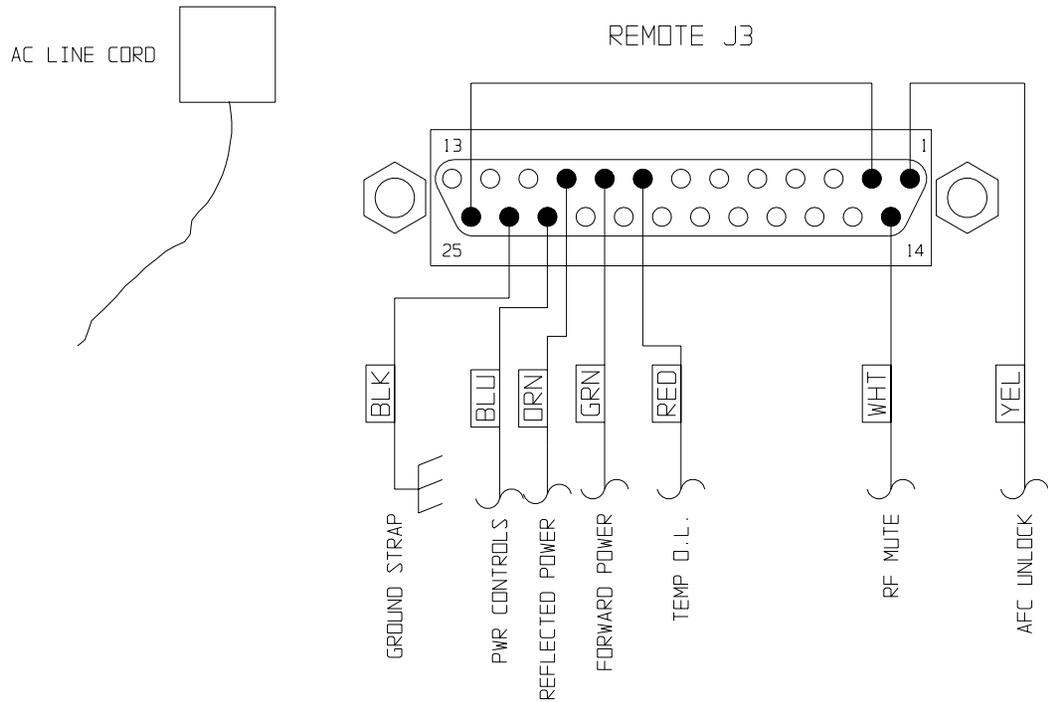
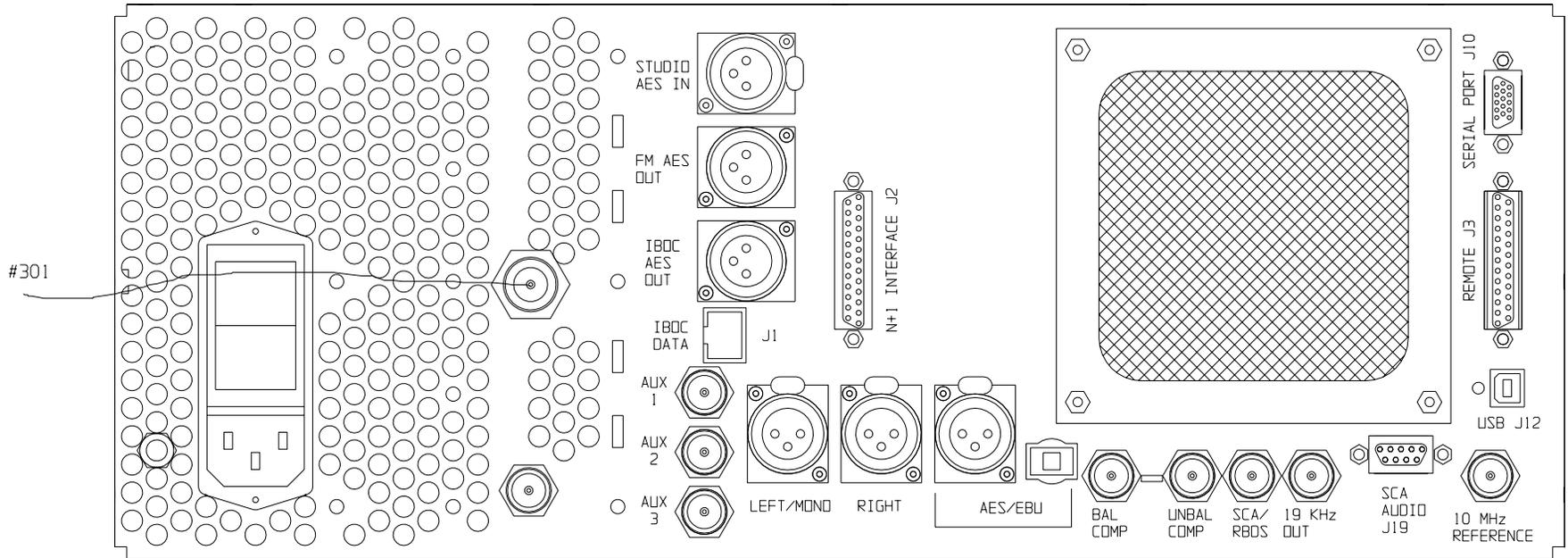
ENDTYPE = BE PART#  
71 = 418-0031  
73A = 417-0095

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	DESIGNER(S)	FINISH		TITLE ASSY, STANDBY EXC KIT CABLE ASSY, FX-50, FM10S
	PRJ. LEADER	SEE DWG RA592-0000	TYPE A SIZE D DWG. NO. 949-0428-001	REV F
	MFG.	NEXT ASSY.	MODEL FM10S	SCALE 1/1 SHEET 1 OF 1

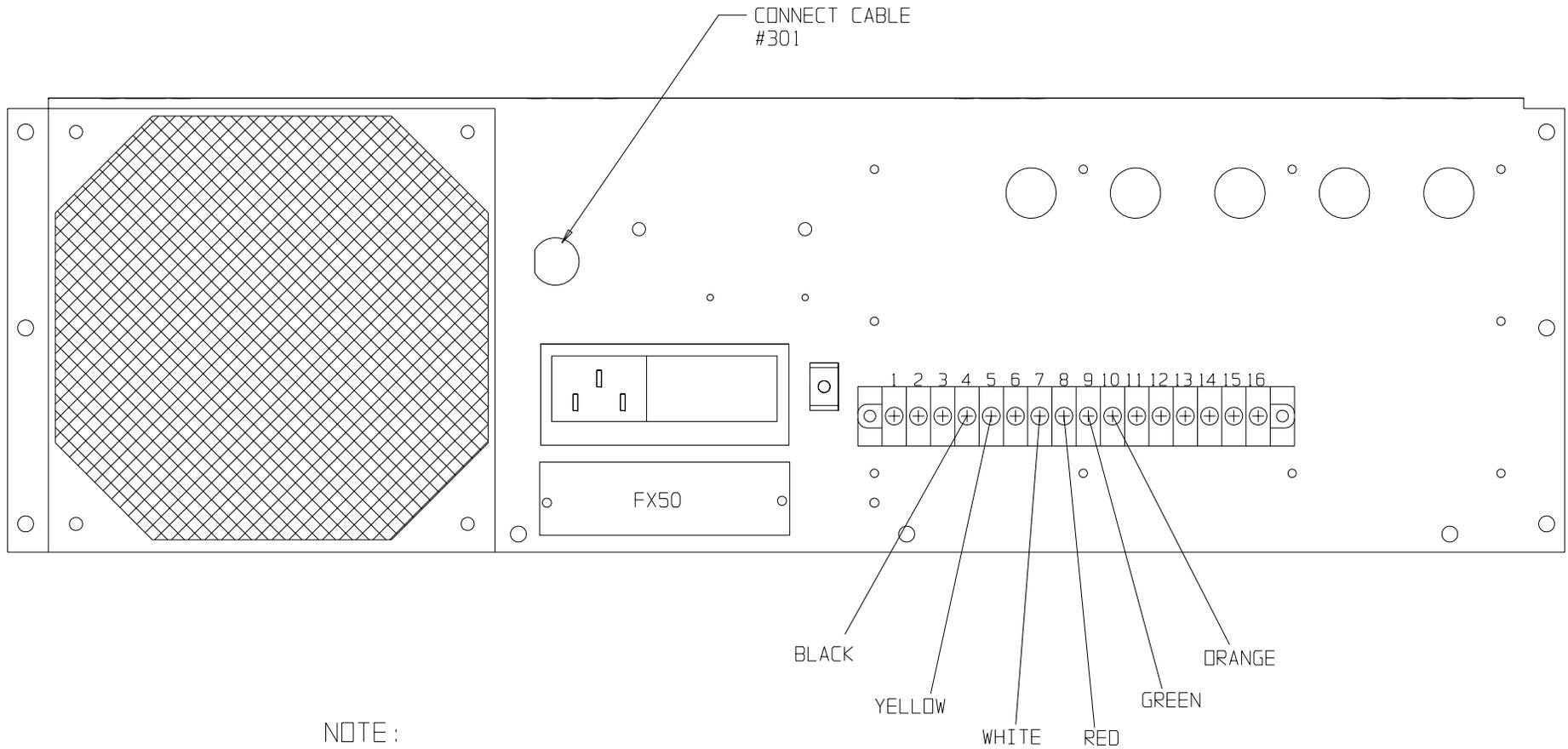
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# FXI WIRING



FXI EXCITER P3 WIRING.  
 SOLDER THE WIRES INTO THE 'D' CONNECTOR  
 FROM ACCESSORY KIT 979-0540. WIRES ARE FROM  
 P1 IN WIRE HARNESS 949-0427.  
 PIN-WIRE  
 1- YEL  
 8- RED  
 9 - GRN  
 10 - DRN  
 14 - WHT  
 23 - BLU  
 24 - BLK  
 JUMPER 22 GA. WIRE

# REAR PANEL VIEW OF FX-50



NOTE:  
 BLUE WIRE IN FOR IBOC ONLY.  
 HEATSHRINK BACK WHEN NOT  
 USED. FXI - FSI

THESE WIRES ARE FROM  
 CABLE #111