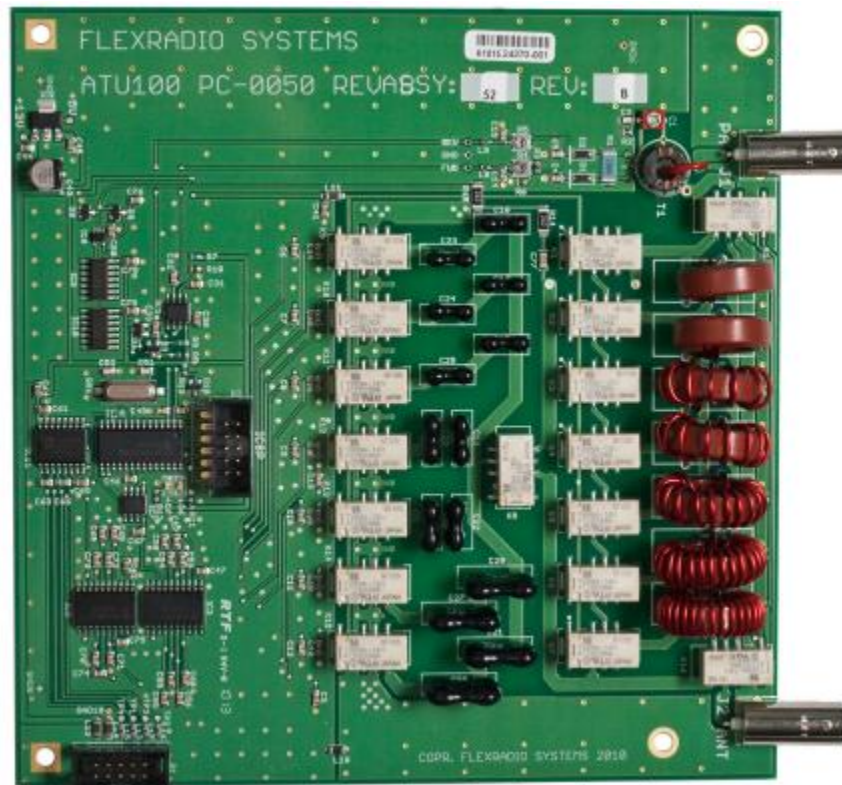


# FLEX-5000A ANTENNA TUNING UNIT (ATU) INSTALLATION INSTRUCTIONS

ATU Board Revision 52B and above

Version August 15, 2011



## ATU Installation Guide

Congratulations on your purchase of an Antenna Tuning Unit (ATU) the FLEX-5000.

You will need the following materials to complete the installation:

- One (1) FLEX-5000 ATU (Assembly 52, Rev. B or higher)
- One (1) metal RF shield
- One (1) ATU Control ribbon cable with connectors
- One (1) mini coax jumper with BNC connectors
- Four (4) 1" (2.54 cm) threaded spacers with post
- Four (4) 1/4" (6.35 mm) threaded spacers with post
- Four (4) 1/4" Hex nuts
- Eight (8) flat washers
- Eight (8) internal tooth lock washers

### Required Software

The most current version of PowerSDR v2.x.x

### Prerequisites for Installing the ATU

The ATU is designated as a user or field installable upgrade only if the FLEX-VU5K (V/U module) is NOT previously installed. If a FLEX-VU5K is installed in your FLEX-5000, then you must return it to an authorized FlexRadio Systems Service Center for installation. Installation charges are applicable.

Before starting, remember to observe proper ESD (electrostatic discharge) procedures before attempting the installation of the FLEX-5000 ATU in order to prevent damage that may occur from static charges that can build up on your body or work surfaces. This is especially a concern during the winter months or in climates where the relative humidity can be very low.

### Preparing the FLEX-5000 for ATU installation

#### Remove the FLEX-5000 from the Operating Position

- a. Turn off the Power to the FLEX-5000 and remove the power connector and all other connecting cables.
- b. Place the FLEX-5000 on a flat, well lit working surface.

Remove the Side Panels.

In addition to the instructions below, you may refer to the KB article, [How to Remove and Install the FLEX-5000A Top and Side Panels](http://kc.flex-radio.com/KnowledgebaseArticle50382.aspx) as a supplementary resource for removing the covers of the FLEX-5000A. (<http://kc.flex-radio.com/KnowledgebaseArticle50382.aspx>)

a. If you look closely at the side rails you'll notice little indentations in them. This is to allow you to remove the side panels.



Figure 1

b. Using a flat blade screwdriver GENTLY pry the side panels off the radio.

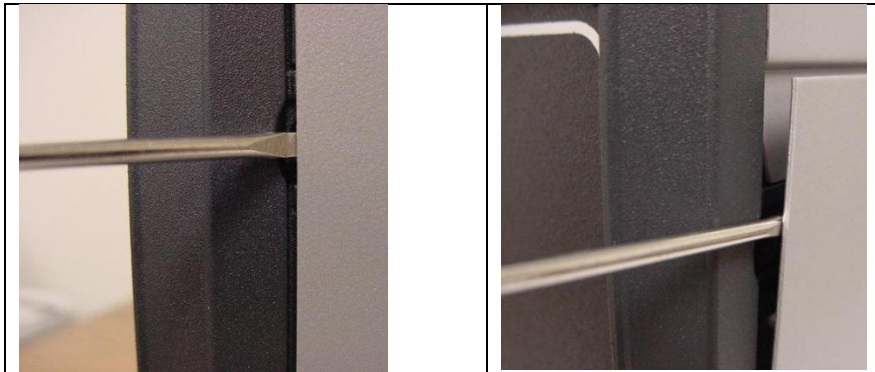


Figure 2a

Figure 2b

c. Set them aside for later reinstallation.

## Remove the Top Panel

- a. Using the T-20 Torx driver, remove the four (4) screws fastening the top cover to the chassis.



Figure 3

- b. Using your hands, place your thumbs on the dark grey side support pieces and using your fingers grip the lip of the panel and flex it out slightly, while lifting up. You may need to push down with your thumbs for added assistance. Once it 'pops' loose, do the same to the other side.



Figure 4a



Figure 4b

## Installing the ATU inside the FLEX-5000

- a. Remove the four (4) nuts that are holding down the PA board, but leave the flat washers in place.  
**Do not discard the hex nuts.**
- b. Install one (1) of the four (4) 1" (2.54 cm) spacers in place of the four (4) nuts that were just removed. Take care not to over-tighten the spacers, so that you do not strip the threads. (See Figure 5)

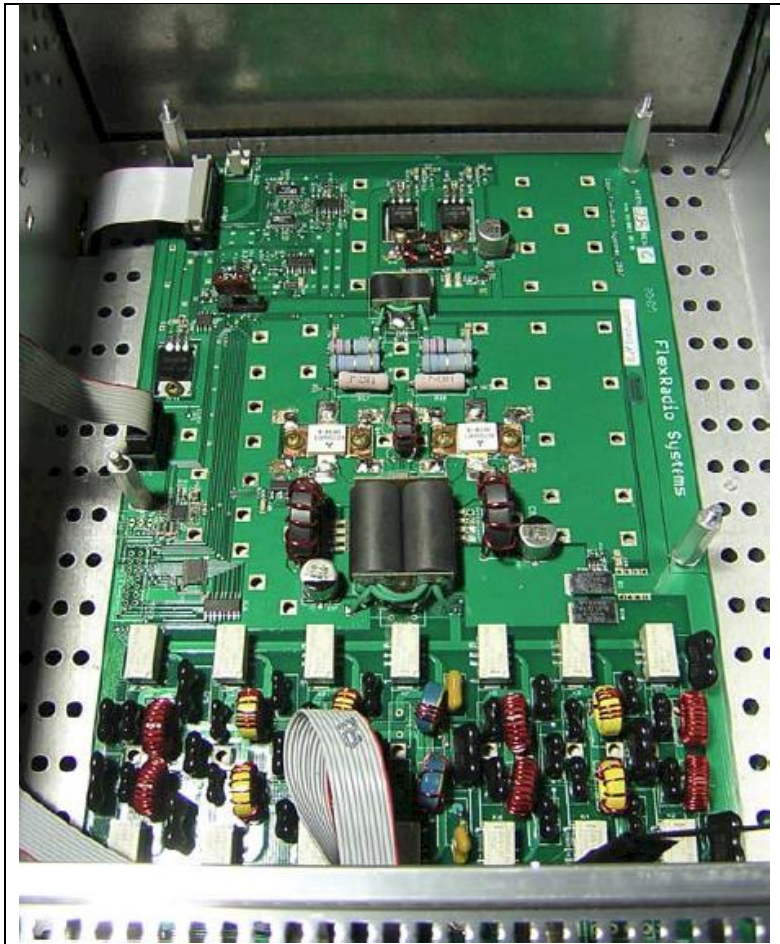


Figure 5 – PA with 1" spacers installed

- c. Plug one end of the ATU control ribbon cable into the keyed connector marked "SV2" on the edge of the PA unit. The red strip of the cable is oriented towards the front of the FLEX-5000. You can see the ribbon cable plugged into SV2 on the left side of Figure 5 above, just behind the 1" (2.54 cm) spacer. Lay the cable over the side of the FLEX-5000 chassis as shown in Figure 5.

d. Locate the metal RF shield, and observing the orientation of the mounting holes, place the shield on top of the 1" (2.54 cm) spacers with the spacer threads protruding from the tops of the metal RF shield. (See Figure 6)



Figure 6 - Placement of RF shield on top of 1" spacers

e. Install one (1) flat washer and one (1) internal tooth lock washer over each of the four (4) screws protruding through the metal RF shield as shown in Figure 7.



Figure 7 - Flat washer and internal tooth lock washers on top of RF shield

f. Install one (1) 1/4" (6.35 mm) spacer over each of the four (4) screws protruding through the RF shield, but take care not to over tighten these soft aluminum spacers. (See Figure 8)



Figure 8 - Installation of four 1/4" spacers on top of shield

g. Carefully position the ATU over the 1/4" (6.35 mm) spacers with the BNC connectors facing the rear of the FLEX-5000. (See Figure 9)

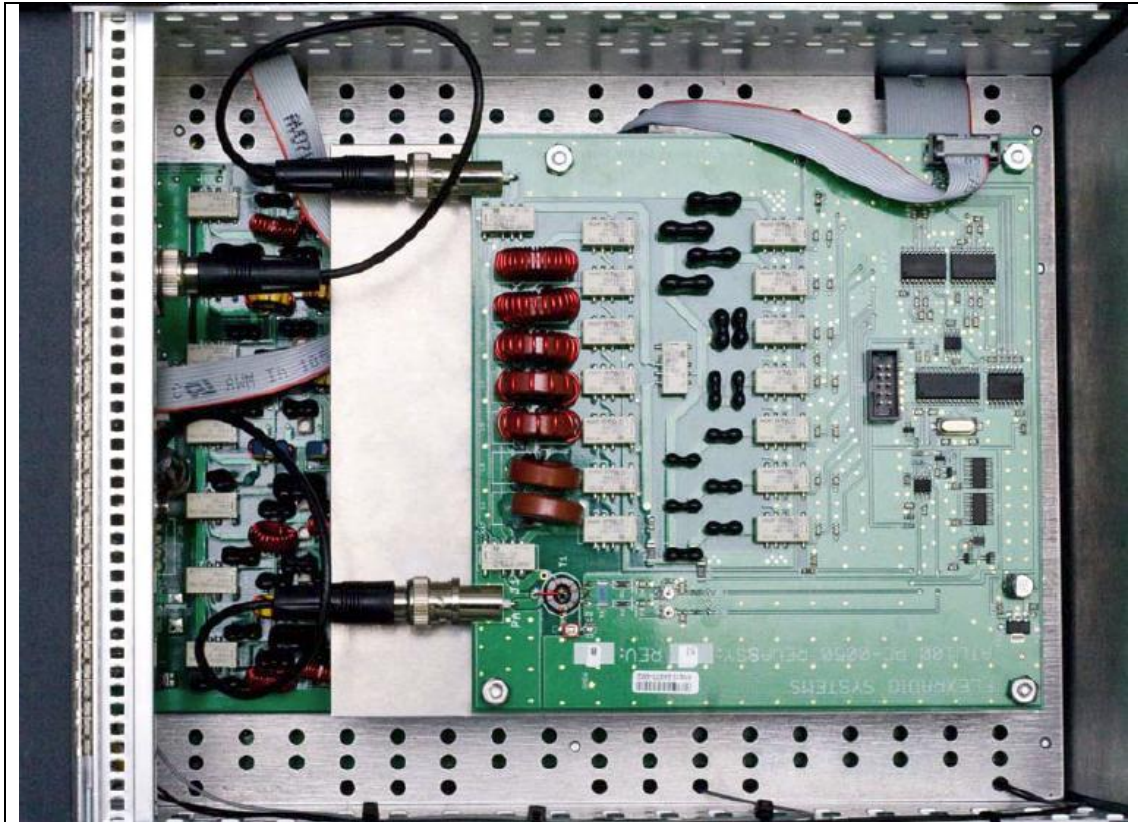


Figure 9 - Placement of ATU onto spacers above shield

h. Install one (1) flat washer, one (1) internal tooth lock washer, and one (1) hex nut over each of the four (4) screws upon which the ATU is mounted. Hand tighten the nuts, but be careful not to strip the threads. (See Figure 10)

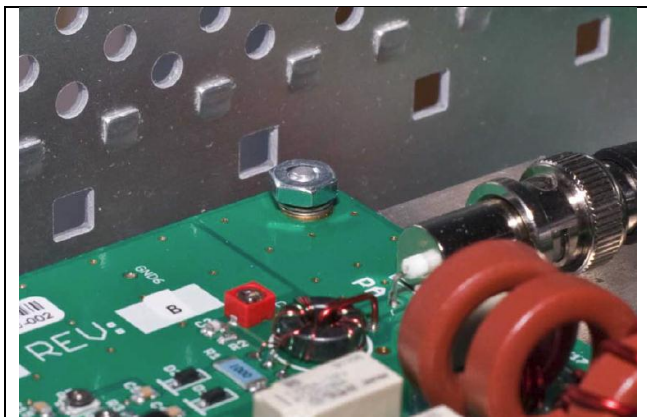


Figure 10 - Flat washer, internal tooth lock washer, and hex nut securing the ATU



- i. Connect the other end of the ATU control ribbon cable to connector labeled “P1” on the side of the ATU board located towards the front of the FLEX-5000. The red strip (pin 1) on the cable is oriented towards the front of the FLEX-5000. Do NOT connect the ATU control cable to the ICSP connector in the middle of the ATU board. (See Figure 9)
- j. Locate the short mini coax cable connection between the BNC connector labeled “PA Out” on the PA board and the BNC connector labeled “J4 PA/ATU” on the RFIO board mounted on the rear panel of the radio.
- k. Remove the mini coax cable from the RFIO BNC connector referenced in step 14 and connect it to the BNC connector on the ATU board labeled “PA J1”. (See Figure 11)
- i. Connect one end of the supplied BNC mini coax cable to the BNC connector on the ATU labeled “J2 ANT” and the other end to the BNC connector labeled “J4 PA/ATU” on the RFIO board mounted on the rear panel of the radio. (See Figure 11)

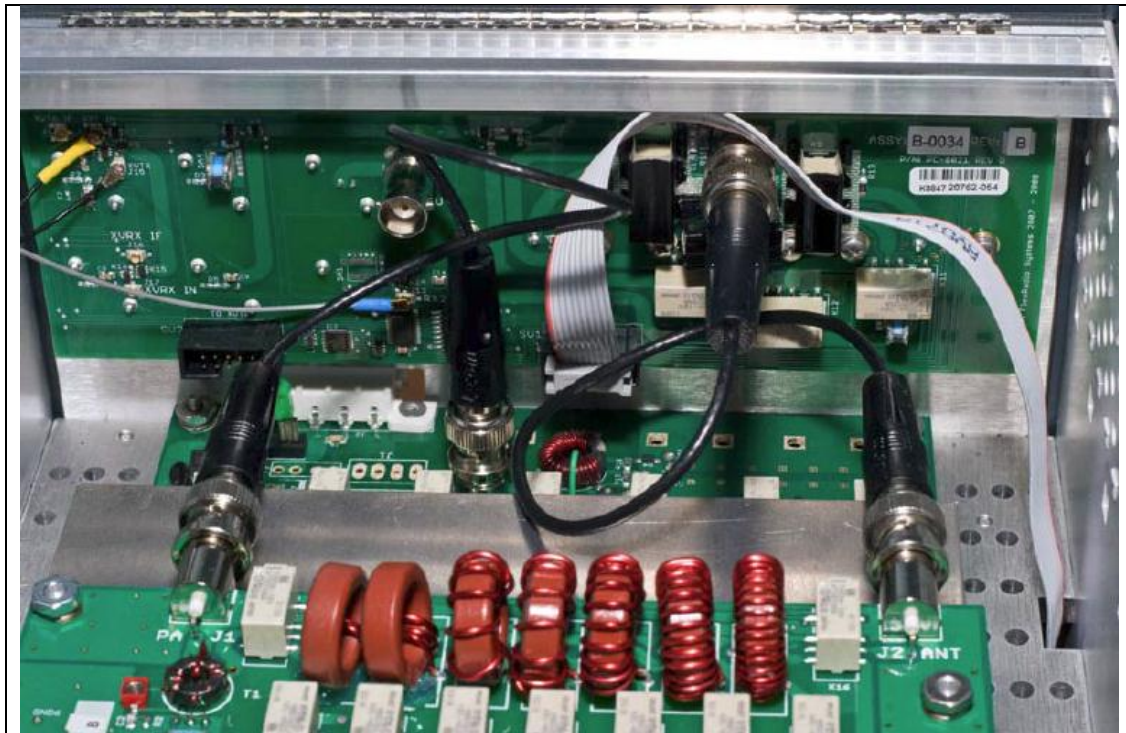


Figure 11 - Routing of BNC cables between PA, ATU, and I/O panel

- j. Confirm that your connections between the BNC connectors on the PA, ATU, and RFIO panel are routed as shown in Figure 11.

## Replace the Top and Side Covers

- a. Install the top cover. The top cover has the vent holes facing backwards towards the rear of the FLEX-5000. Gently press them on and screw them down.
- b. Install the side panels by gently pressing them into place.

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## Return the FLEX-5000 to the Operating Position

- a. Return the FLEX-5000 to its operating position
- b. Install the power connector and all other connecting cables.

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## Install the latest version of PowerSDR

- a. Download PowerSDR (v2.0.22 minimum) from the FlexRadio Systems web site ([www.flexradio.com](http://www.flexradio.com))
- b. Run the PowerSDR Integrated Installer to ensure that the latest Firewire drivers and firmware are installed to your PC

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## Install latest Firmware and Register the ATU with the FLEX-5000 EEPROM

- a. Start PowerSDR.
- b. If a firmware update is needed, PowerSDR will install it automatically.
- c. Once PowerSDR is running, use keyboard sequence **CTRL+SHIFT+D** to start the FLEX-5000 Debug form.
- d. Now execute keyboard sequence **CTRL+ALT+A** from the FLEX-5000 Debug form to access the ATU Upgrade form.
- e. **Left click** on the **Update EEPROM** button. This will write the ATU serial number and assembly number information to the FLEX-5000's EEPROM and registers the ATU.
- f. Close the ATU Upgrade form
- g. Close the FLEX-5000 Debug form
- h. Close PowerSDR

## Verify that PowerSDR Recognizes the Newly Installed ATU

- a. Start PowerSDR.
- b. Select the “Setup” tab in the upper left of the PowerSDR screen.
- c. Select the “General” tab.
- d. In the “FLEX-5000 Config” section, make sure ‘ATU’ is present and shows the proper serial number and revision 52B (or higher) in parentheses. If not displayed, then contact FlexRadio Support ([support@flexradio.com](mailto:support@flexradio.com)) for assistance before using your radio to transmit. An improperly installed ATU can damage your radio which will not be covered under warranty repair.

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## Operation of the FLEX-5000 ATU

- a. Refer to the FLEX-5000 User’s Manual for instructions on the operation of the ATU using PowerSDR.