mercuryAT

OPERATION MANUAL V 1.3

Features

- Operating Bands 160m – 6m
- 5-inch Color Touch Screen
- FWD/REF/SWR Meter
- Selection for 3 Antennas
- 1-30 MHz 1200 watts SSB
- 1-30 MHz 1000 watts CW
- 1-30 MHz 700 watts DIGI mode
- 50 MHz 300 watts
- Inductance 6.3 uH / Capacitance 1100 pF
- Matching Range 5:1
- Tuned 1.5:1
- Minimum Tuner Level 3 Watts
- W 8 x L 10 x H 5.5 / Weigh 7.5 pounds

Automatic Antenna Tuner
Designed and Manufactured in the USA

KM3KM HAM RADIO PARTS

SAFETY WARNING

Very high RF voltages, as well as large RF current flow, may be present in your mercuryAT. Like all antenna tuners meant for high power use, the mercuryAT handles a great deal of RF energy.

Your mercuryAT is designed to safely handle this RF energy within its specifications, with a reasonable margin of safety. There are amateur amplifiers capable of putting out excessive RF levels, sometimes far in excess of the specified maximums. Operating significantly above specifications will definitely damage or destroy your mercuryAT.

Operating above specifications may cause failure of internal components.

KM3KM Electronics LLC has always counted on our customers to help us improve not only our product but how we inform you. Please let us know if there are any errors in this Manual or if we missed any information that may be helpful to other operators; we will always review and consider any recommendations that will help us improve.

GOOD PRACTICE

Be sure to observe the mercuryAT specified power ranges.

If the tuner fails due to overload, it could also

damage your Transmitter or Amplifier.

An antenna tuner transforms the impedance at the power point from the line to the equipment, to a value suitable for the transmitter, typically 50 Ohms.

In order to work with higher power output, you'll first need a good antenna. Use a tuner only to correct some mismatch on narrow bandwidth antennas.

Remember that a tuner does not fix the antenna. To properly tune an antenna the following is necessary:

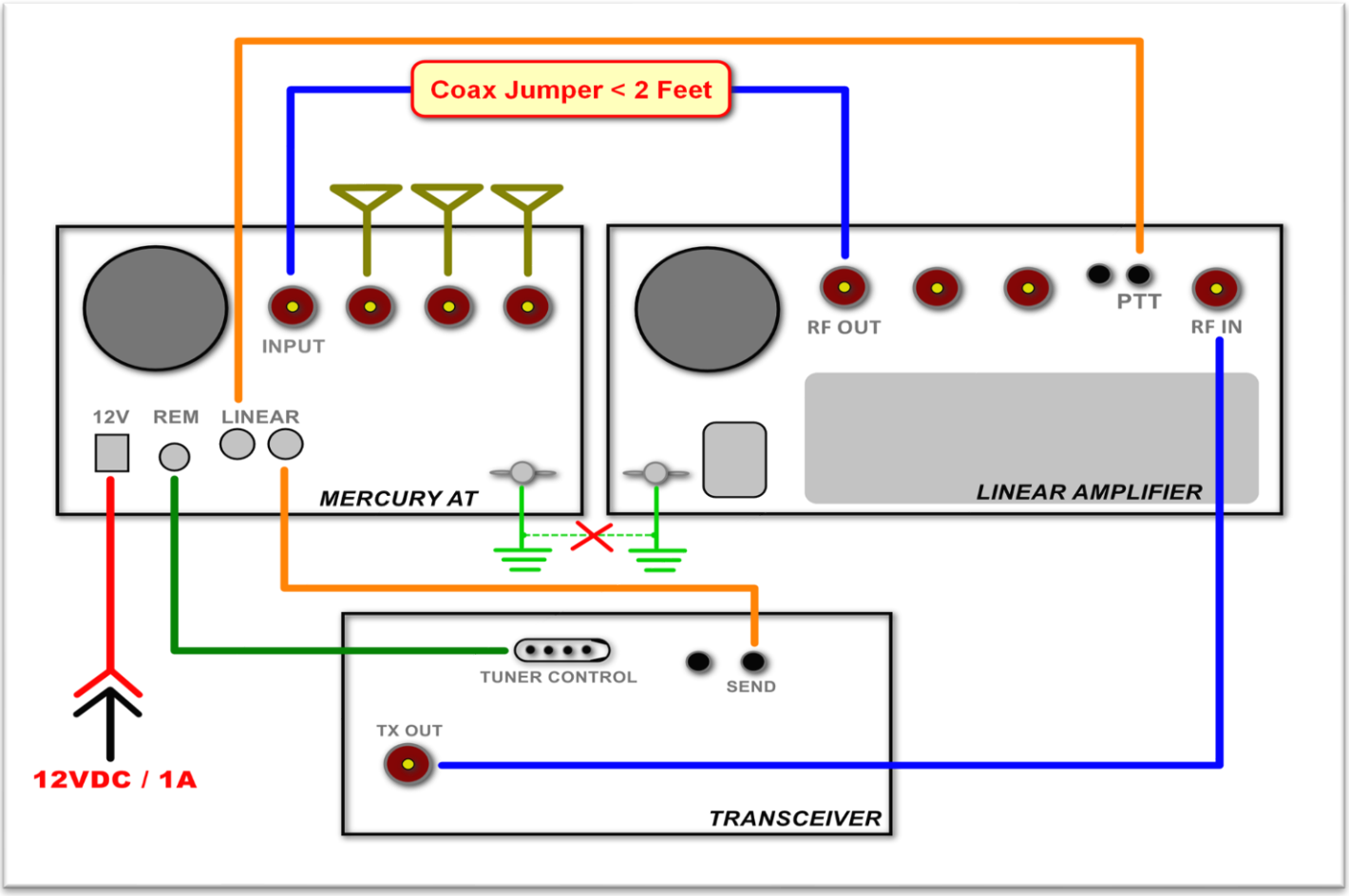
- **Lengthen or cut the antenna elements.**
- **Add or remove elements to the antenna.**
- **Change the height of the antenna above the ground.**

Your tuner does not reduce the portion of signal lost in the transmission line and it alone will not improve the radiation efficiency of your antenna.

Even though it may increase the power transferred from the transmitter to the transmission line (therefore increasing the power radiated from the antenna) it will not change the SWR on your transmission line.

If your antenna is compromised or poor, no tuner will correct this!
Keep in mind that if your transmission line has an impedance matcher or Balun it can get hot and will increase the SWR gradually.

CONNECTIONS DIAGRAM



PTT disconnect: The amplifier will be disconnected while the tuning is running.

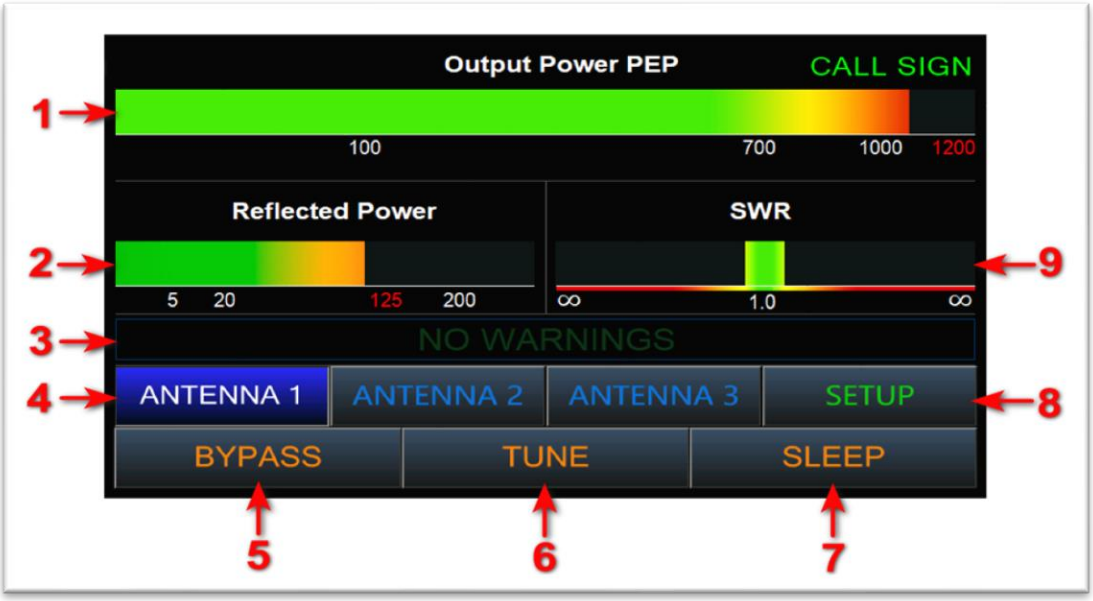
Radio control interface (Optional). 3.5 mm audio jack type to specific connecter of transceiver to enable transceiver "tune" button. See page 7.

Coax Jumper Cables: A Coax jumper of 2 feet or less from the amplifier to mercuryAT is recommended.

Power Cable: Connect the power cable to an external power supply up to 13.8VDC. Use Red for (+) and black for (-). Never power up your mercuryAT through the transceiver. Use the same power source with which the transceiver is powered since mercuryAT does not have a power switch. Minimum current required 1.5A. Connector Type 2.5mm ID, 5.5mm OD

Note: Single point ground ONLY… Do not connect ground loops.
Do not connect an open line antenna or Long Wire to this tuner.

MAIN SCREEN



1- Forward Power Indicator - Note that the FWD and REF Power indications will sometimes not match with other instruments. This is due to the matching point of the transmission line.

2- Reflected Power Indicator - Never operate mercuryAT at more than 125 watts of reflected power.

3- Banner Zone - This zone will display any mercuryAT error messages or required actions.

4- Antenna Output Selectors - Select the button for antenna 1, 2, or 3. Antenna 1 will be connected if mercuryAT is disconnected from 12 volts. The previous selection will remain in memory for the next power-up.

5- Bypass Button - Disconnects the tuner and directly connects the port (IN) to the selected antenna.

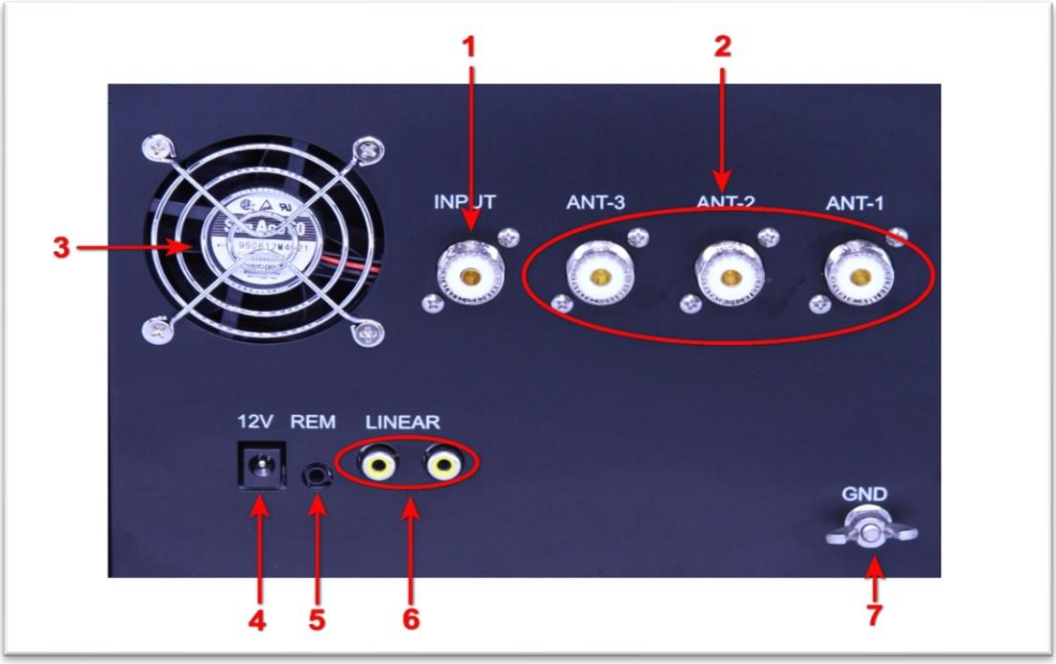
6- Tune Button - Press the TUNE Button to tune, the banner (TUNE CALL) will be displayed and mercuryAT will be ready to receive a continuous 10-watts carrier to start the auto adjustment.

7- SLEEP Button - mercuryAT will turn off the Display. The Antenna Relays and LC adjustment will remain energized, however. To turn on the Display, tap the screen again.

8- SETUP Button - Call Sign, Brightness and Beep sound can be configured.

9- SWR Indicator.

Rear View



1- SO239 Input Connector - Connects the signal coming from the transceiver or amplifier. Do not connect Ferrite Clamp or RF Choke on this line. A Coax jumper of 2 feet or less from the amplifier to mercuryAT is recommended.

2- SO239 Output Connectors - Connect only to external antennas or to a Dummy load. In case of antennas with high reflected power, it is recommended to connect a line RF Choke to avoid hot shack and interference to other electronic equipment. The line choke must be located at the end closest to the antenna. Do not connect an open line antenna or Long Wire to these ports.

3- Cabinet Fan - The exhaust fan makes a cooler environment inside the cabinet, prolonging the life of components and avoiding exposure to heat from the inductors. Do not block rear area and please leave either the left or right side of mercuryAT clear for proper airflow.

4- DC Power Connector - Connect the power cable to an external power supply up to 13.8VDC. Minimum current required 1.5A. Connector Type 2.5mm ID, 5.5mm OD.

5- Automatic Transceiver Control Port - 3.5mm female plug; connect control cable to transceiver if available but not required for mercuryAT operation.

6- Serial PTT Disconnect - RCA female plug. It is very important to connect the send/key cable to these ports if you are using an external amplifier. The ports are not directional so you can plug the transceiver and amplifier into either port.

7- Ground Screw - Connect directly to physical ground. Do not connect at other equipment or ground loops. Do not connect Ferrite Clamp or RF Choke on this line.

TUNING GUIDE

Semi Automatic Tuning (Transceiver Control Interface Disconnected)

1- Reduce the radio power to 10 watts.

2- Turn off or place the amplifier on STANDBY. If you are operating a mercury amp and the PTT Disconnect cable is installed, this is not necessary.

3- Make sure that the Bypass Button on the mercuryAT is turned off and press the TUNE Button for 2 seconds. You will see the Banner read "Tune CALL" on the screen.

4- Press PTT in any continuous carrier mode (CW, RTTY, FM, AM)

5- Do not release the PTT until the tuning has completed. *It is very Important not to release PTT as there may be a secondary tuning sequence if the initial tuning has not acquired an appropriate tune. One of the following Banners will appear on the screen:*

TUNED

Tuning not suitable for High Power !

mercuryAT will calculate the loss and indicate if the tuning is appropriate to handle high power.

Automatic Full Tuning (Transceiver Control Interface Connected)

1- Turn off or place the amplifier on STANDBY. If you are operating a mercury amp and the PTT Disconnect cable is installed, this is not necessary.

2- Make sure that the Bypass button in mercuryAT is turned off and press the TUNE button on mercuryAT; you will see the Banner (Tune CALL) on the screen and the tuning process will start automatically. Then one of the Banners described above will be displayed.

Important: ***If the input power level is too low the tuning will not run or will have an erroneous result. Never tune with more than 40 watts of input to mercuryAT.***
If you transmit a constant carrier with more than 700 watts for more than 5 seconds an alarm will sound -- if transmission is not halted, severe damaged can occur.

RADIO INTERFACE CONFIGURATION

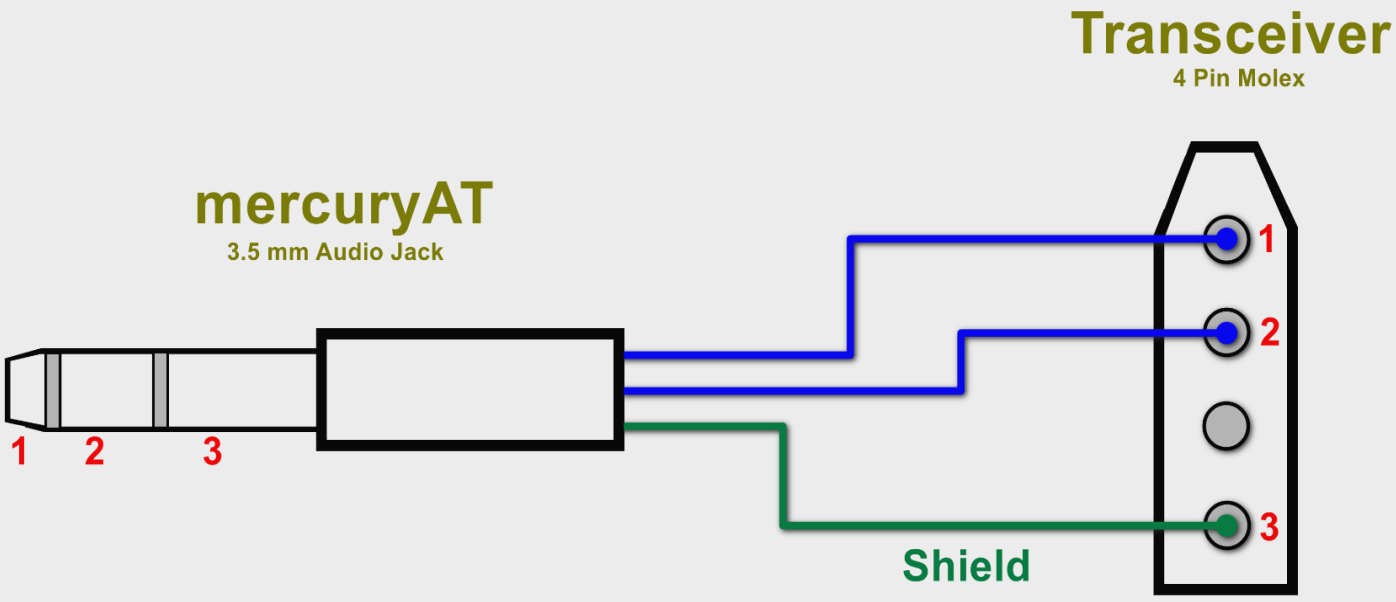
The control connection from mercuryAT to your transceiver allows for an automatic tuning process when the TUNE button on the tuner or transceiver is pressed. The mercuryAT sends a PTT signal (Active Low) into a tuner-dedicated port on the transceiver and the transceiver begins transmitting a low-level CW tone. The tuner detects this RF and completes the tuning process. Note that some transceivers do not automatically reduce output power or require additional configuration in the menu (see your manufacturer's manual). If you are using a mercury AMP the power setting is supposed to be 30-40 watts and you do not need to reduce power for the tuning process; note that some transceivers set the output power individually for CW modes.

Due to non-standardization of this tuner port and the many makes and models available, this fully automatic operation of mercuryAT may not be compatible with some transceiver ports. But you can operate in semi-automatic mode with any transceiver without a control cable. See the Guide on Page 6.

Note that the control cable is not included in the package (sold separately). Below are some diagrams and configuration of transceivers compatible with this control option in mercuryAT.

ICOM

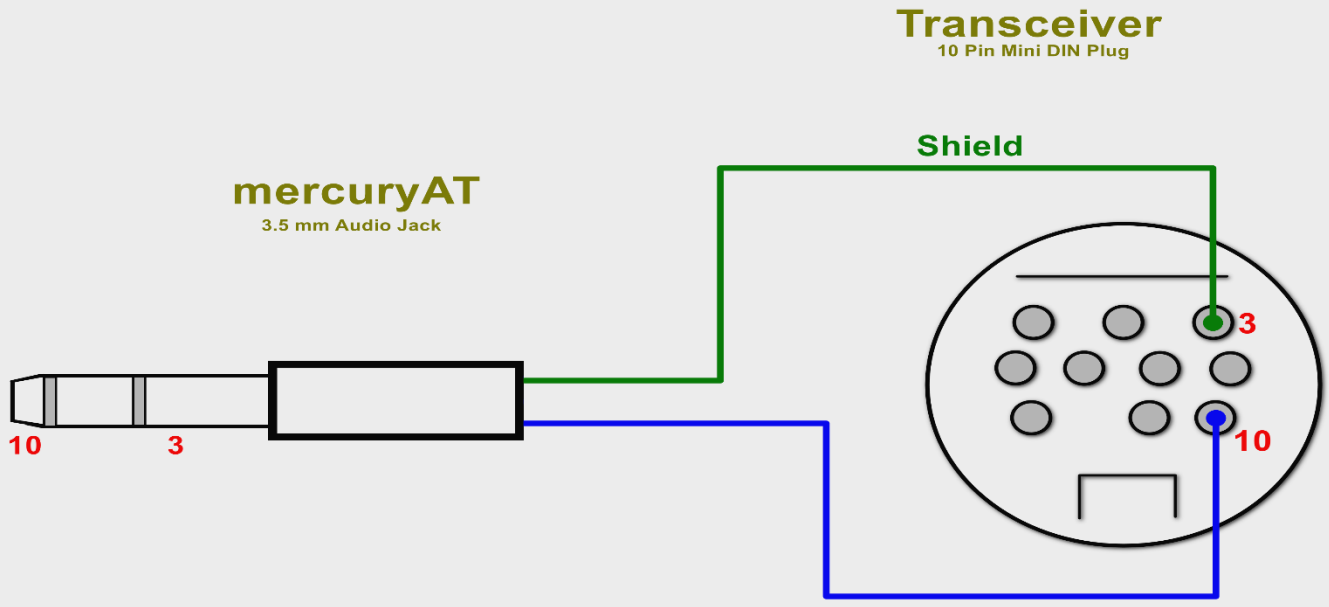
IC-7000. IC-7600. IC-7300. IC-7610. IC-7700. IC-7100. IC-7200. IC-706. IC-707. IC-718. IC-725. IC-728. IC-736. IC-738. IC-746. IC-756.



For ICOM RF power is lowered while mercuryAT is running. There is no need to change settings after or before tuning.

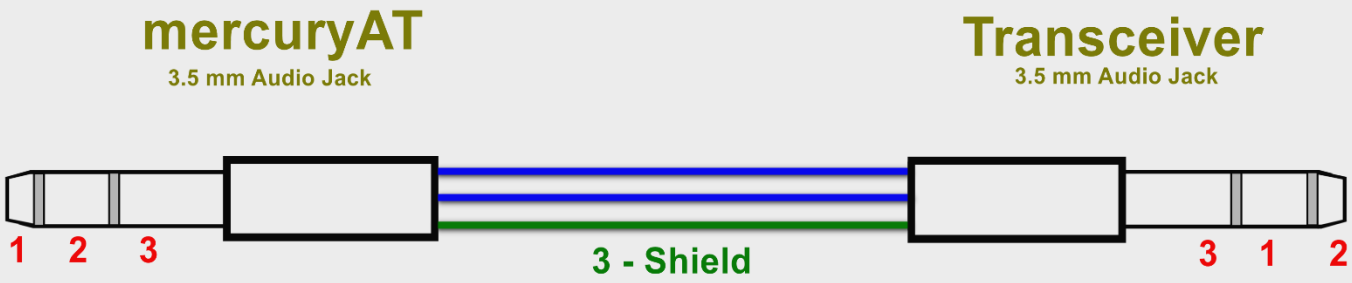
YAESU

FT-450D. FT-950. FT-DX1200. FT-DX10.



YAESU

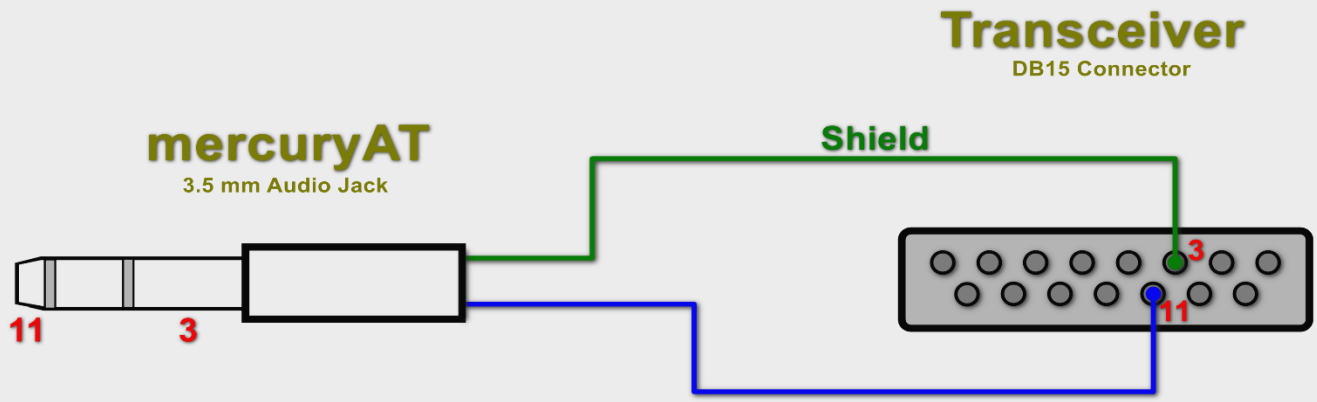
FT-891. FT-857D. FT-897D. FT-100. FT-100D. FT-991A



For FT-991(A), go to menu 143 and select LAMP. For the FT-891, go to menu 16-15 and select LAMP.

YAESU

FTDX-101D. FTDX-101MP. FTDX-3000



Warranty

COVERED: *Your mercuryAT is covered under normal use and service for a period of one (1) year including shipping. Date is calculated by the date of delivery to the first buyer.*

NOT COVERED: *Warranty does not extend if your mercuryAT has been subjected to damage from natural causes such as lightning, water, fire and other catastrophes. Warranty does not cover damage from improper installation or application not in accordance with the operating specifications.*

When sending in the mercuryAT for service, please pack it carefully, in the original box and packing materials. Please include a note with your name, address and e-mail or phone number, that clearly describes the problem. When the Tuner is returned to the factory and an examination of the mercuryAT discloses in KM3KM's judgement to have been defective during the Warranty Period, it will be repaired and shipped back at no cost to the costumer. However, if it is not due to failure in manufacturing, materials or workmanship, the customer will be charged for both return and original shipping.

Please note that we will not charge labor to any repair after the warranty expires. Customer will pay parts and shipping after warranty expires. This will also apply to secondhand mercryAT.

Return Policy: *You have 10 calendar days to return from the date you received your mercuryAT. To be eligible for a return, your item must be in the same condition that you received it. Your mercuryAT must be in the original packaging; you must have the receipt or proof of purchase.*

Refunds: *We will immediately notify you on the status of your refund after inspecting the mercuryAT, if found to be damaged it will be at the discretion of KM3KM what the refund amount will be. If your return is approved, we will initiate a refund to your credit card (or original method of payment). You will receive the credit within a certain amount of days, depending on your card issuer's policies.*

Shipping: *You will be responsible for paying for your own shipping costs for returning your item. Shipping costs are nonrefundable.*

Thank You For the collaboration
and help with this manual:
Dave Jensen (W7DGJ)
Steve Bennion (W7DJ)