



MERCURY ATS

OPERATION MANUAL V 1.0

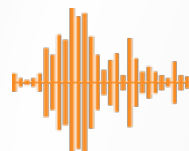
Features

- Operating Bands 160m – 6m
- 5-inch Color Touch Screen
- FWD/REF/SWR Meter
- Selection for 3 Antennas
- 1-30 MHz 1500 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 10 Watts
- W 8 x L 10 x H 5.5 / Weigh 7.5 pounds

Automatic Antenna Tuner

Designed and Manufactured in the USA

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KM3KM HAM RADIO PARTS

SAFETY WARNING

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

Your MERCURY ATS 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 ATS.

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 MERCURY ATS 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:

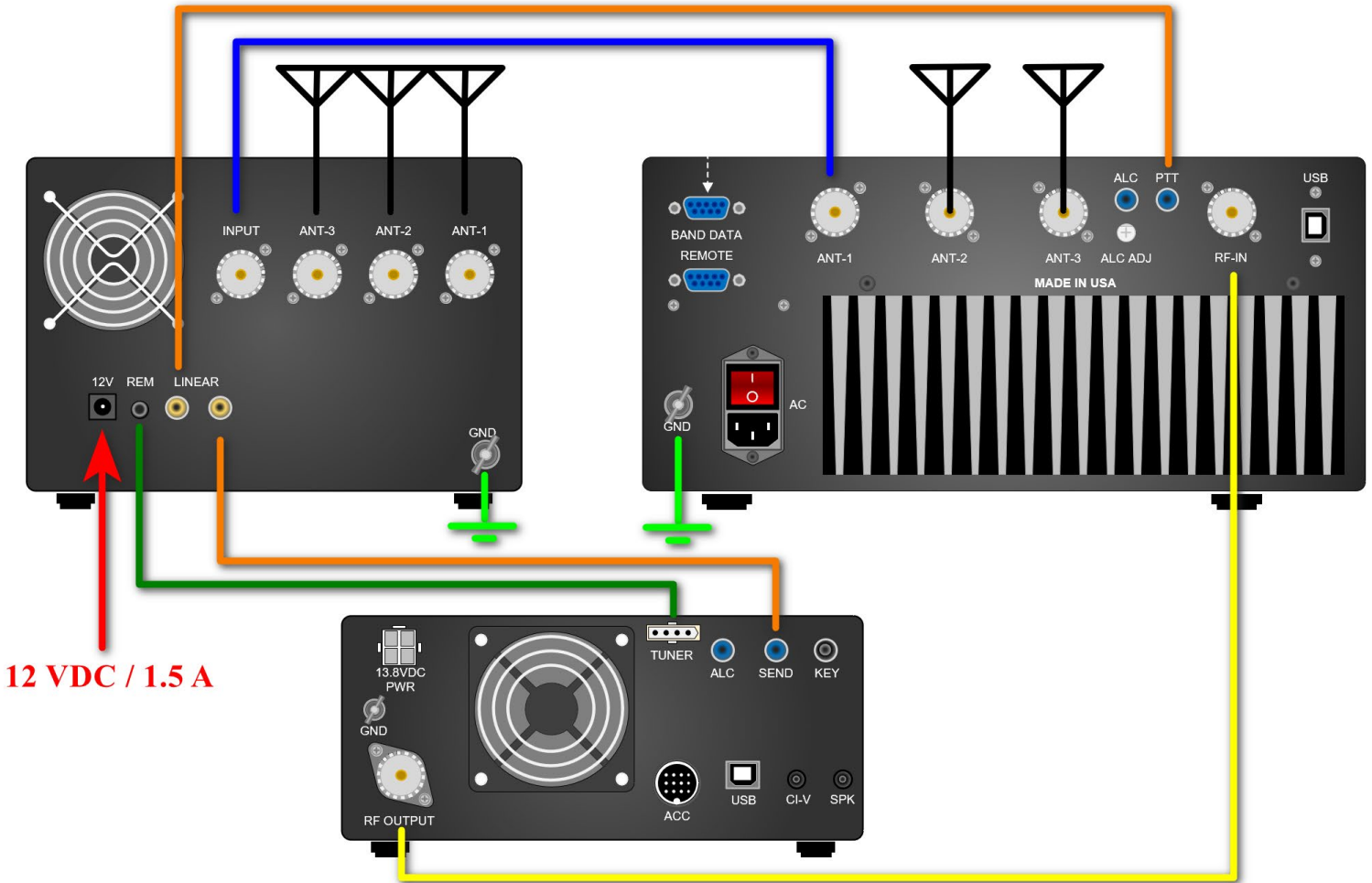
- *Lengthen or cut the antenna elements.*
- *Add or remove elements to the antenna.*
- *Change the height of the antenna above the ground.*

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



12 VDC / 1.5 A

PTT disconnect - The amplifier PTT will be interrupted while tuning.

Radio control interface (Optional) - 3.5 mm audio jack type to specific connector 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 MERCURY ATS 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 ATS through the transceiver. Use the same power source with which the transceiver is powered, MERCURY ATS does not need a power switch placing it in SLEEP mode turns it OFF. 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 ATS at more than 125 watts of reflected power.

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

4 Bypass Button - Disconnects the tuner and directly connects the port (IN) to the selected antenna. Bypass mode will memorize each selected antenna.

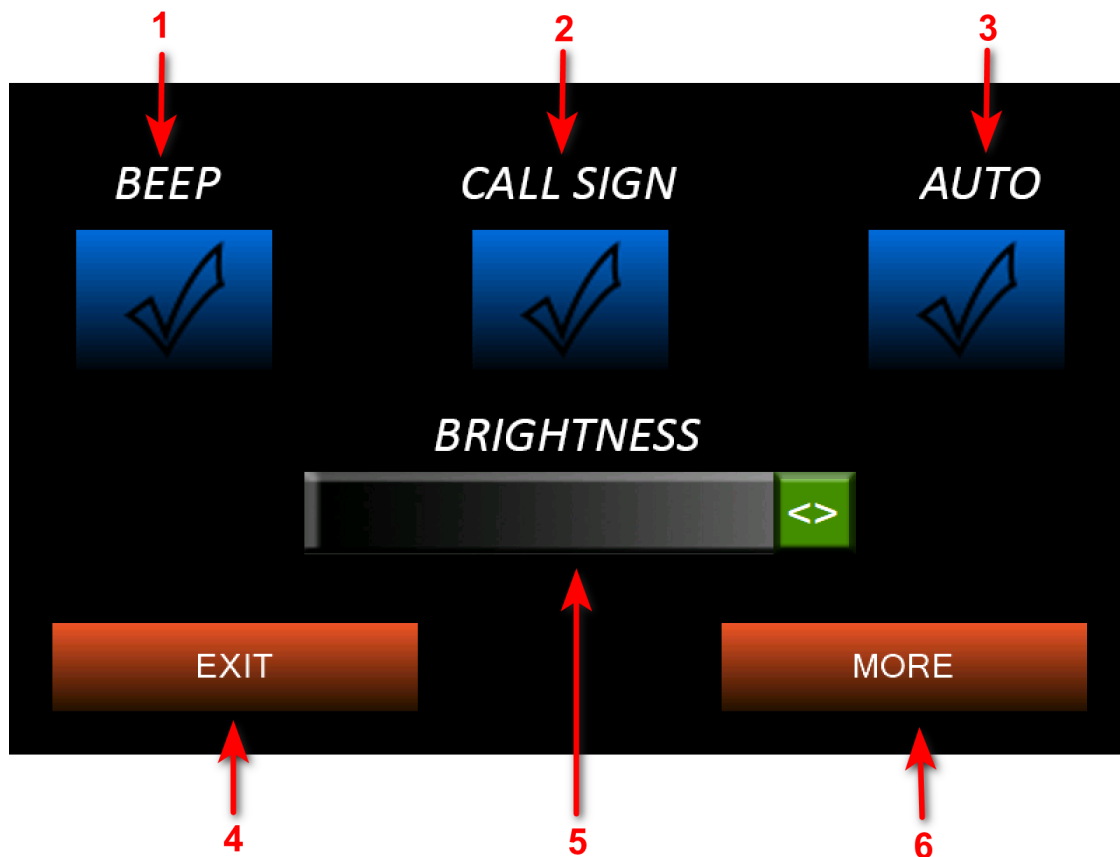
5 Tune Button - Press the TUNE Button to tune, the banner (TUNE CALL) will be displayed, and ATS will be ready to receive a continuous 10-watts carrier to start the auto adjustment. Bypass will be disabled.

6 SLEEP Button - MERCURY ATS will turn OFF. The Antenna Relays and LC adjustment will remain energized. To turn on, tap the screen again.

7 SETUP Button - Call Sign, AUTO mode, Brightness and Beep sound can be configured.

8 SWR Indicator.

Setup Screen



1. **Beep** - Disable the sound of buttons and confirmations.

2. **Call Sign** - Enter your Cal Sign to display on the main screen, up to 8 characters.

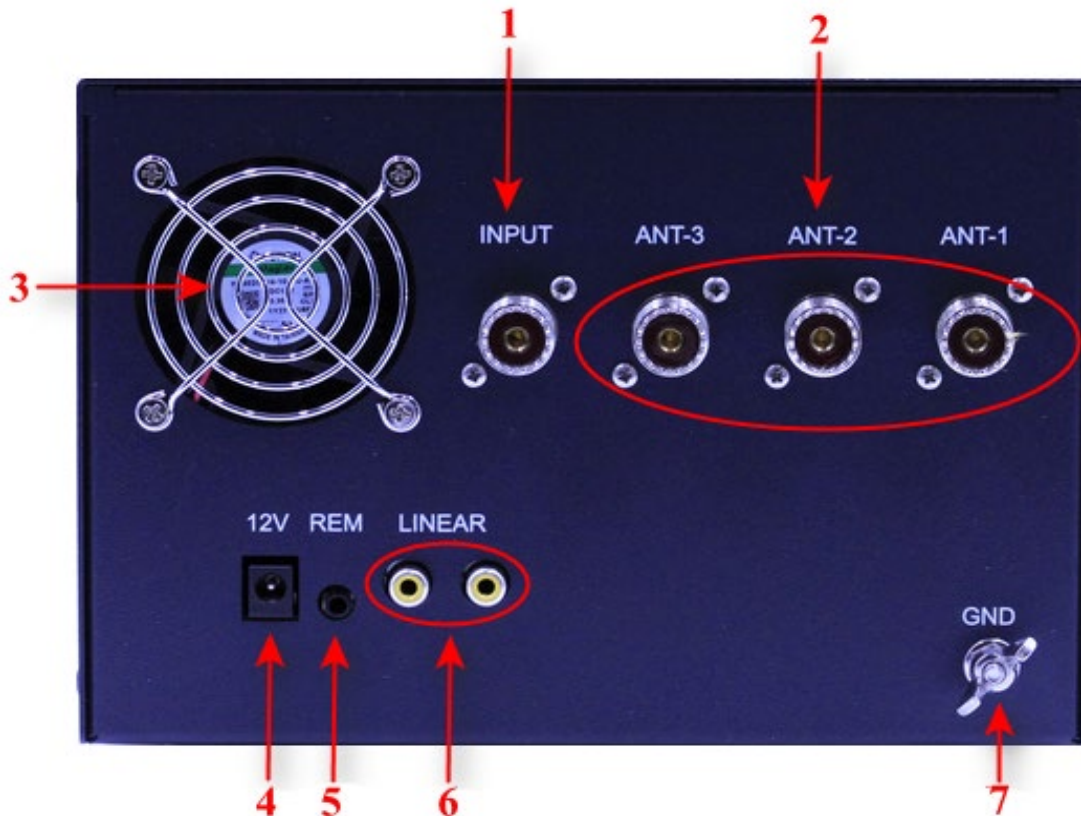
3. **Auto** - Enable and disable the Auto Tuner option. When SWR is above 1.8 the ATS will start the tuning process when RF is detected. **WARNING: NEVER USE THIS OPTION IF YOU ARE USING A POWER AMPLIFIER AS DAMAGE MAY OCCUR TO BOTH THE AMPLIFIER AND TUNER.**

4. **Exit** - Return to main screen and changes will be saved.

5. **Brightness** - Slide the green tab to adjust screen brightness.

6. **More** - Show guides and ATS information.

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 AT 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 turns ON automatically if the power output is more than 500 watts. Do not block rear area and side areas of ATS, maintain 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 ATS 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, 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 10-20 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- 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:*

SUCCESSFUL TUNE

UNSUCCESSFUL TUNING

The MERCURY ATS will calculate the loss and indicate if the tuning is appropriate to handle high power.

Full Automatic 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- Press the TUNE button on ATS; 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.

WARNING: NEVER OPERATE AN AMPLIFIER IF AUTO IS CHECKED IN THE SETUP SCREEN!!!...see page 6.

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 ATS.***
- ***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 MERCURY ATS to your transceiver allows for an automatic tuning process when the TUNE button on the tuner or transceiver is pressed. The ATS 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 on your transceiver 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 of transceivers available, this fully automatic operation of ATS 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.***

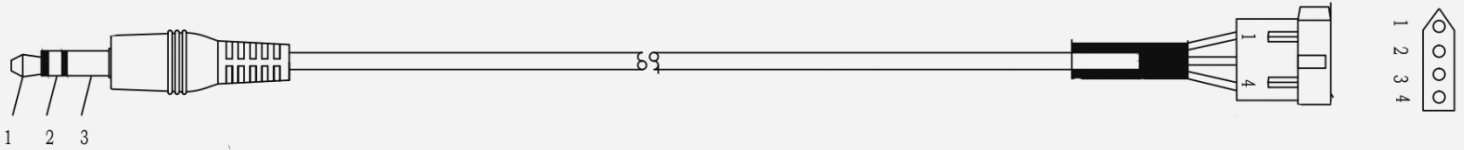
Note that the control cable is not included in the package (sold separately). Below are some diagrams and configuration of transceivers compatible with this control option in ATS.

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.

P1

P2



PIN CONNECTION	
P1	P2
1	1
2	2
3	4

With most ICOM radios, RF power is lowered while MERCURY ATS is tuning. There is no need to change settings after or before tuning.

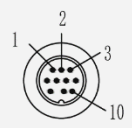
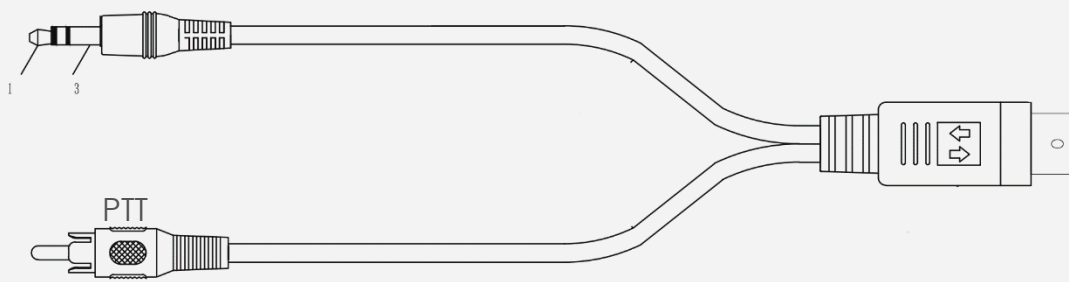
YAESU

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

P1

P3

P2



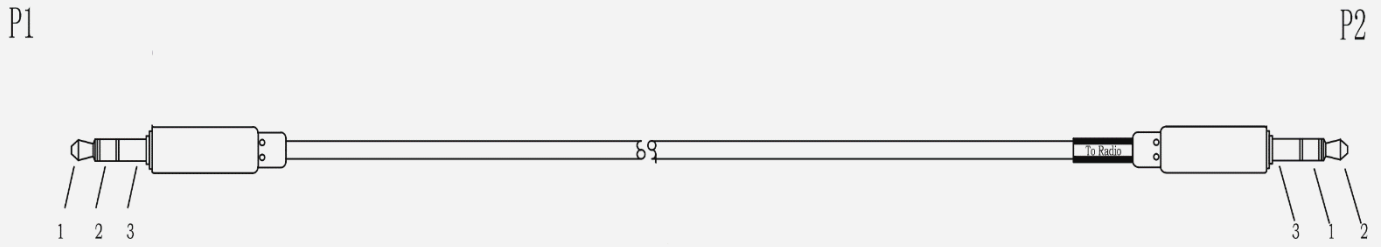
Rear view

PIN CONNECTION	
P1	P3
1	10
3	3

PIN CONNECTION	
P2	P3
1	2
2	3

YAESU

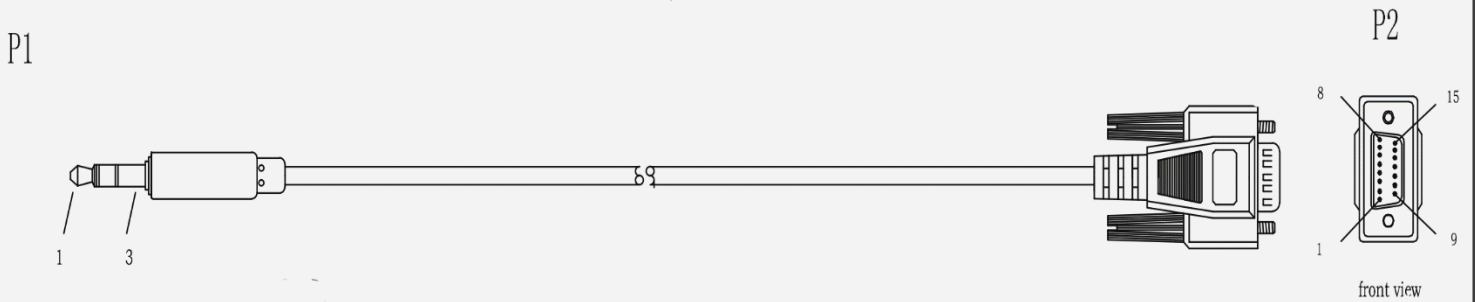
FT-891. FT-857D. FT-897D. FT-100. FT-100D. FT-991A



With 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



PIN CONNECTION	
P1	P2
1	11
3	3