

ACOM 1010 TUBE REPLACEMENT INSTRUCTION

This step-by-step instruction is about the tube replacement and idling current re-adjustment of ACOM1010 power amplifier. Please follow all details closely since the work is difficult, with many details to keep track about, and it might be dangerous too. Do not hesitate to contact your local dealer or nearest ACOM's service for any advice.

Please don't attempt tube replacement by yourself, if you don't feel comfortable with amplifier repairs!

1. Safe proofing and opening the amplifier.

WARNING HIGH VOLTAGE!

The amplifier works with voltages up to 3000 V dc, which are potentially LETHAL! You must unplug the amplifier from the line (mains) wall outlet and **WAIT AT LEAST 30 minutes** before removing the cover of the amplifier. Do not touch any part inside before you safe proof the amplifier as described below because some residual voltages may still be present. **If you don't feel comfortable with amplifier repairs or you are not sure about your safety, we recommend that you entrust the following operations to your dealer.**

a) Unplug the amplifier from the line (mains) wall outlet. Disconnect the mains cord from amplifier rear panel. Disconnect all cables from the amplifier (grounding last).

b) Wait at least 30 minutes before to continue.

2. Removing the top cover.

Using a Philips-2 screwdriver, unscrew 11 pcs of flange-button head screws - three on the rear edge and 2x4 pcs on both sides - fig.1:



Fig.1 Cover Screws

a) Lift the rear cover edge and rotate the cover to about 30-45 degrees to release it from the front panel chute. Then pull the cover backwards and upwards while shaking it slightly in order to remove it - fig.2:



Fig.2 Top Cover Removal

b) Check whether the High Voltage Crowbar (located on the middle chassis wall) does reliably short-circuit its center screw to the chassis when the top cover is removed. It must keep the HV circuit connected to the chassis ground during all your operations - fig.3:

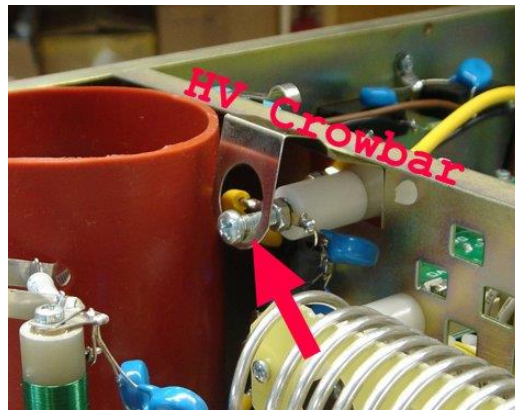


Fig.3 High Voltage Crowbar

3. OLD TUBE REMOVAL

W A R N I N G H I G H V O L T A G E !

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Prior to continue you must be absolutely sure that there are no residual voltages in the amplifier - see (1) and (2) above!

Be careful - the tube may be VERY HOT!

Prior to remove the tube, you have to uninstall the 5mm (0.2") wide copper strip with UHF anti-parasitic suppressor, that is installed between the tube plate and the plate choke. Using a Philips-1 screwdriver, unscrew an M3-screw from the plate choke. This way, the entire copper strip, along with the UHF anti-parasitic suppressor is released and can be easily removed from the tube.

Unclip the anode spring clip from tube cap, while pressing the tube to the bottom with a finger. Now unthread the chimney out of the anode heat sink, together with the anti-parasitic suppressor and copper strip inside.

At last, pull the tube out of its socket, using force directed to TOP ONLY, since any bending or tilting it may destroy the tube socket.

4. INSTALLING A NEW TUBE

C A U T I O N

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Examine new tube pins before inserting it in the socket. They must be straight and not inclined in respect to the ceramic base, otherwise any bent pin could damage the socket's spring contacts, thus the socket and/or the tube may become unusable.

a) Put carefully the new tube ON the socket, without neither pressing nor inserting the pins for now. Keep track about the pins orientation. There is a larger gap between two pins (a pin is vacant) and it must coincide with the corresponding socket's gap. Be extremely careful about the tube screen-grid ring, not to bend any of the socket's spring contacts. If needed, slide the tube carefully up and down in small steps while you align these contacts. After that, count the ring contacts: there must be 16 of them, closely fitting OUTSIDE the tube screen-grid ring. This ensures that no spring contact can be damaged during installation.

b) Align tubes pins so that EACH one would lie precisely in the gap, and at the width center, of the socket's spring contacts. Use very small rotation movements during this alignment to check the proper position. Do not lift the tube during this operation in order not to disorder screen-grid ring contacts (you should repeat the previous step (a) otherwise).

c) Using a force of NO MORE THAN 50...60N (about 5...6kg or 12...15Lbs.), in VERTICAL DIRECTION ONLY, push carefully the tube (holding it for the plate heat sink) in order to insert the tube in the socket. If you meet a strong mechanical resistance, do not force anymore and go back to recheck steps (a) and (b) above.

The tube must fully seat in the socket.

C A U T I O N

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After inserting the tube, please recheck all 16 contacts of the tube screen ring.

d) Orient the silicon rubber chimney (together with the anti-parasitic suppressor inside) so that the connection to the plate choke could be installed to its original place.

Now thread, by small steps in parallel, the chimney over the tube plate heat sink. Clip the anti-parasitic-suppressor spring contact to the tube plate and precisely orient the connection lug to the plate choke nut. Align carefully the rubber chimney, so that it firmly contact the tube deck at the base (a part of airflow would be exhausted uselessly and the tube might over-heat otherwise).

At last, install and tighten the screw to the plate choke, using the original screw and lock washer (should have been saved at previous steps).

e) Ensure that after the tube replacement all the wiring is restored to its former condition.

5. IDLING CURRENT ADJUSTMENT.

After each tube replacement, the BIAS voltage needs to be re-adjusted in order to align the new tube regime.

First switch off the amplifier and follow safety instructions in p.1 and p.2 above.

Remove the shorting jumper "JMP" on MAINS PCB - see fig.4.

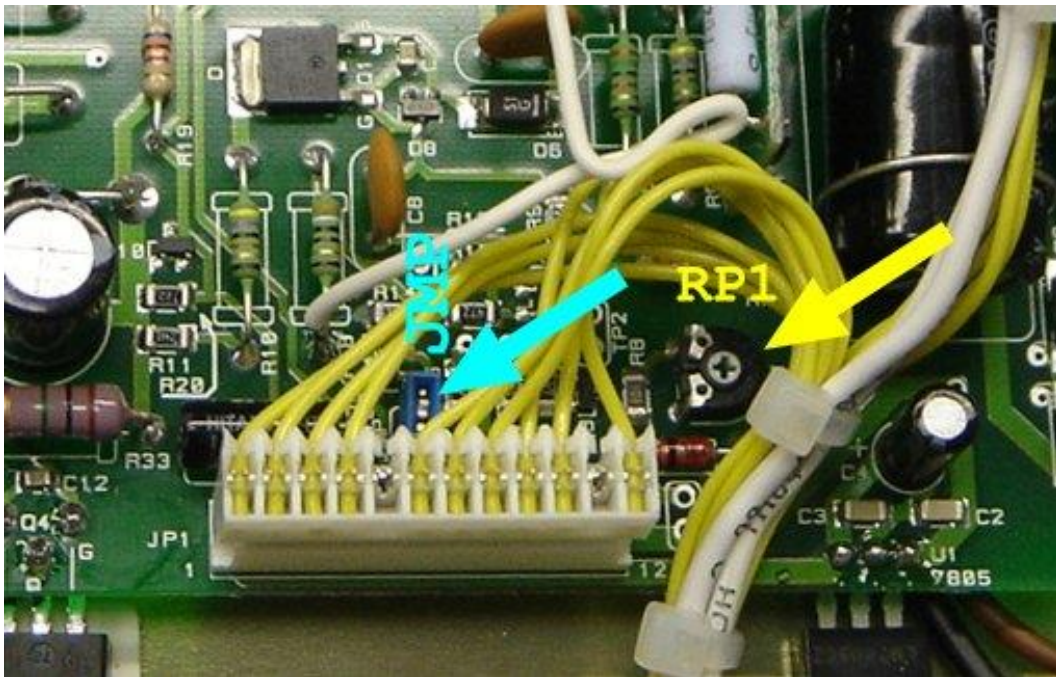


Fig.4 Mains PCB - Shorting jumper JMP and idling-current adjustment trimmer potentiometer RP1

Connect a load to the antenna output, preferably ANT1. Connect a switch to the KEY IN relay-control input.

Put the top cover 50% displaced towards the rear panel so that it covers the HV wiring in the rear part of the amplifier and reveals JMP and RP1 as shown in fig.5 below. Install the cover in this position with two screws at the chassis center.



Fig.5 Top cover in service position

W A R N I N G H I G H V O L T A G E !

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The mains voltage will be accessible during the next operations - do not touch any part inside the amplifier!

Now turn on the amplifier and wait for the warmup period (150s). Before to adjust the idling current wait five more minutes in order to let the tube to stabilize.

Switch the upper LED bar-graph to the service mode **IP** by pressing OPER and RTTY buttons simultaneously three times. The measurement resolution is 50mA per LED.

Select RTTY mode and go to OPER (if not done automatically). Close the KEY IN input to the chassis. Plate current presence should be indicated on the top LED bar-graph (FWD).

Use a flat-tip screwdriver (1.75x0.4mm / 0.07x016") to rotate the trimmer potentiometer RP1 (look at fig.4), while following the plate current indication on the top LED bar-graph (FWD). Adjust RP1 just below 200mA so that the "200" LED should be blinking and not constantly lit. The three first LEDs must light constantly in this position. Do not let the fourth LED to light constantly!

Release the KEY IN control input after the adjustment. Switch OFF the amplifier and get safety measures as described in p.1 and p.2 above. Wait for 30 minutes.

Remove the top cover and install the shorting jumper "JMP" on MAINS PCB. Install the top cover as described below.

6. Top Cover installation.

a) Put the cover on the chassis while holding its rear edge lifted to 15-20cm (the cover inclined to 30-45 degrees - look at fig.2). Align the horizontal cover edge to the respective front-panel chute.

Push the cover forwards and downwards while shaking it gently, in order to insert the cover edge into the front-panel's chute. Use similar motion like when you were removing the cover but in reverse sequence.

Take care that the bottom corners of the cover do not steal inside the chassis while you are closing the cover by pushing it downwards.

b) Use a Philips-2 screwdriver. Screw in loosely all 11 pcs of flange-button head screws - look at fig.1 again.

c) While pressing the cover continuously forwards and downwards, tighten all 11 screws properly.

- End -