



ICOM IC-M600

EXPANDED RF / LSB ACCESS

- 1- Remove power and antenna.
- 2- Open the radio.
- 3- Locate LOGIC unit board.
- 4- Locate and CUT diode D-8
- 5- Locate and remove diode D-15
- 6- Reassemble the radio.

LSB MODE

- 1- Press and hold [MODE] button and turn power ON.
- 2- Select LSB mode with mode button.
- 3- Press [RX] button.
- 4- Press [tx] button.
- 5- turn radio OFF.

From Paul KC2FXG

This modification come from ICOM

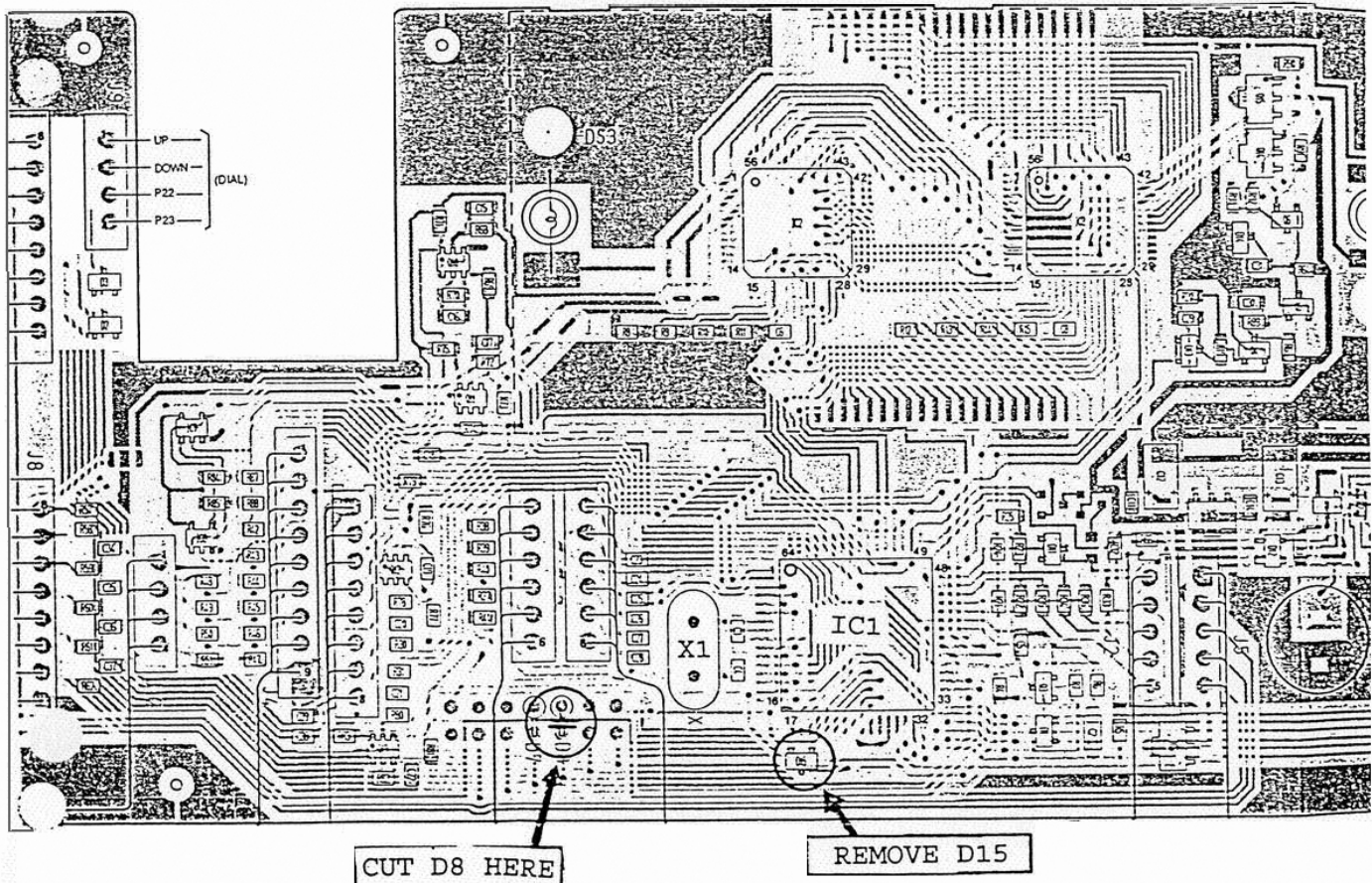
IC-M600 LSB AND TX/RX MODIFICATIONS LT 7/13/92

TO ACCESS THE LSB MODE:

1. Turn IC-M600 off by pushing BOTH power [POW] buttons.
2. Enter the "SET-UP-MODE" by pushing and holding the [MODE] and then pushing the [POW] button. Release the [MODE] and [POW] buttons after the LCD comes on.
 - NOTE- The IC-M600 should now display one of the three modes: "H3E", "R3E" or "J3E" located in the upper right hand corner of the LCD. Also, the letters "RCV" and a reverse displayed "TX" should be displayed in the upper left hand corner of the LCD. The rest of the LCD will be blank.
3. Use the [MODE] button to select "LSB".
4. Push [RX] to enable both "RCV" and the reverse displayed "TX" in the upper left hand corner of the LCD. (this step enables both receive and transmit)
5. Turn power off to memorize the LSB mode and to exit the "SET-UP-MODE" by holding both [POW] buttons.
6. Push [POW] power to turn IC-M600 back on.
7. Select "LSB" with [MODE] button.
8. Push [TUNE] button to tune radio.
9. The IC-M600 is now ready to receive and transmit LSB.

MASTER
 Do Not Remove
 From Tech Support Area

- TO ALLOW CONTINUOUS TRANSMIT COVERAGE FROM 2 TO 26.999 MHz. *(Logic Board)*
1. Remove D8 and D15 *(Behind Front Panel)* on the Logic unit. *HAWI*



IC-M600 PLL problem

It is a long time since I repaired the last M600 with this problem but it was the same on the 3 that I have done.

The symptoms are that there is either no AF or that the AF in RX mode fades out after a period of say 20 minutes. There is obviously no TX while the PLL circuit has gone unstable.

The reason is that the two halves of the PLL circuit measure against each other producing an offset, this voltage is applied to the osc, to lock the freq. Icom have poured wax into the entire PLL board. This wax has entered one or more of the inductors and needs to be removed.

Locate the PLL board from the top of the radio, it is in the middle chassis, the last one you can get to. The PLL circuit resides in an RF screened enclosure.

Desolder the lid of the enclosure and you will find two sets of identical circuits back to back. Invert the entire radio and play soldering iron or a flame at safe distance to melt wax out of the trimmers.

Test the radio (remember there will be no AF if the MIC is disconnected) and use an insulated tweaker to bring the pair stable by trimming either inductor. This last step is usually not required. The amount of wax coming out is usually about 1.5 cc.

Comments on the Icom M600, PLL fix, and how to add an Accessory Jack

(thanks to Dave Kerr for contributing this application note)

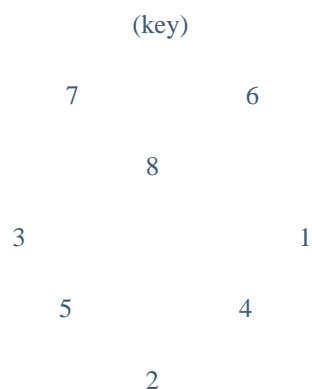
Here is some info on the M600 as a result of my perusal of the schematics plus extensive bench and ship testing:

- a. The ICOM M600 can be used at full power on SailMail. It has a thick diecast aluminum rear chassis with a good heatsink. Thermal switches on the output transistors control a fan on the heatsink. Make sure that the thin Aluminum cover over the heatsink/fan is not bent as even a small deformation can stop the fan blades from turning and the M600 could prematurely go into low power mode.
- b. The fan turns on once the output transistors reach 50deg Celsius. At 90deg Celsius, the fan goes to a higher speed and the ALC logic is invoked to reduce output power to 25 watts. Transmitting digital data (FSK) at close to full power, continuously for a little over 30minutes on a 30deg Celsius day will bring the output transistors to 90deg and drop the power output (90 is not a temperature that will cause damage to the transistors). SailMail sessions should definitely be shorter than 30minutes!
- c. In practice, 60 watts PEP is usually more than enough power and will save your batteries, except when HF conditions are really poor. For 2 years, I have used out M600 on full power for Seamaile and then SailMail, with the only problem being the PLL issue (see below). Once I took the action described, there were never any problems.
- d. The ICOM M600 has had very few reported problems in its lifetime. People have thought that it can overheat by being used at maximum output with digital data, however I believe this is actually a different but known problem whereby a trimmer capacitor (C238) in the PLL (Phase Locked Loop) is temperature sensitive. When the M600 gets hot, the trimmer drifts enough so that the PLL stops working and the radio will neither receive or transmit until it cools down. The ICOM America fix is to replace the trimmer with a ceramic one AND reduce the PLL voltage from the 2.6V in the service manual to 2.0 to give more margin for error. Changing the capacitor is actually difficult and precise work; a compromise is to leave the capacitor in situ and adjust the PLL voltage to 2.0V rather than 2.6, with the radio at about 80degF. I have found that the radio then performs flawlessly across a wide ambient temperature range and the transmitter can be heavily worked (causing the radio to get quite warm) with no PLL problems.

A competent radio technician should be able to add the appropriate Accessory-1 socket for an ICOM IC-M600 or you can do it yourself if you are experienced with electronics.

The M600 can be equipped with up to two accessory cables, ACC1 and ACC2. The holes are already on the rear diecast chassis of the unit, blanked off with blanking plugs. Only ACC1 is required for SailMail. In each case, a multicore, shielded cable is added with an appropriate in-line, female, standard DIN socket on the end of the cable (which should be about 8 inches long). ACC1 is an 8 pin DIN and ACC2 is a 7 pin DIN. Only ACC1 will be described here. Make sure you use a cable clamp with seal and anti-chafe protection when installing the cable. You may need to slightly grind the flats of a standard clamp to fit the recess in the chassis.

Pin connections, looking into the female DIN socket with the key upwards:



Pin #	Name	Description
1	SCAN	Scan control from ext equipment (not needed for PTC)
2	GND	Connected to chassis ground
3	SEND	Transmits when grounded
4	MOD	Modulation input from ext equipment
5	AF	Fixed AF output regardless of volume
6	SQLS	Squelch out. 0V when squelch open (not needed for PTC)
7	13.6V	13.6V output
8	ALC	Sets power output (not needed for PTC)

Take the cover off the radio by removing the dozen screws from the rear. Turn the radio over and remove the flat screening plate- this exposes the Main PCB. There is an 8 pin inline socket 2" in from the right hand side, middle of the board, color white. This was designed for the ACC1 cable. Ideally, obtain a connector to fit into this socket and wire the ACC1 cable wires to this plug per the following table. If you are desperate, you can carefully solder the wires to the underside of the board after removing the posts that hold the PCB in place. This will decrease the re-salability of your radio somewhat! It is far preferable to obtain a suitable plug. Connect the screen of the cable to the chassis ground, inside the rear of the M600. Do not extend the cable screen through to the Main PCB. Take the 8 wires through a suitably sized ferrite bead (for MF/HF frequencies) and connect them to the ACC1 plug as follows (Pin 1 of the ACC1 plug/socket is towards the front of the M600 Main board) and they go 1-8 towards the rear:

DIN pin ACC1 pin

1	5
2	6

3 4
 4 3
 5 1
 6 2
 7 8
 8 7

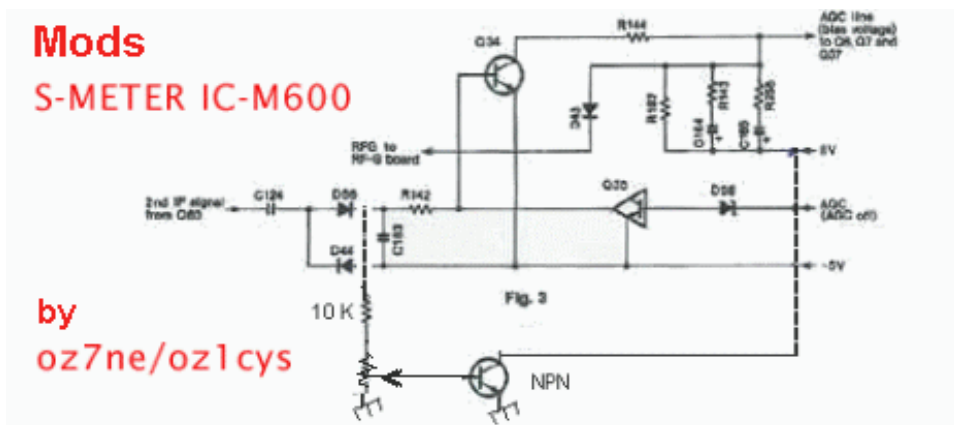
Note: People sometimes fit a voltage divider (2 small resistors) in the DIN at the radio end of the cable from the PTC to the radio (any ICOM) so that you can run the PTC at a higher output voltage and have a relatively low impedance close to the rear of the radio. Allegedly this improves the noise immunity. I use such a divider and have had no problems but probably would not have had any issues anyway as the PTC output impedance is low & the cabling relatively short. Input impedance of the MOD input is about 600ohms.

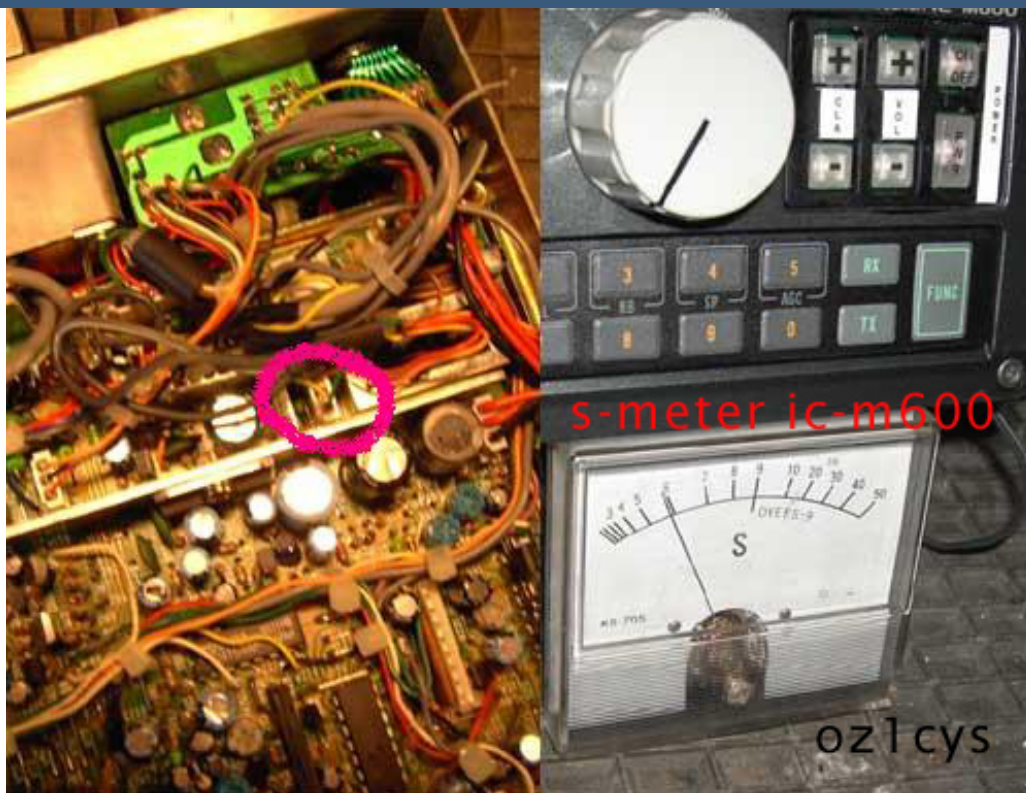
Dave Kerr

Feb 05 2002

S-Meter

The green lead from j13 + on s-meter. The minus on s-meter to ground on IC-M600.
 Use at potentiometer to adjust the s9.





For more information contact OZ7NE/OZ1CYS