SUBJECT:
Modification to improve crunch problems with 800 MHz MPA's

Modification required for MPA retry problems due to aging radios. This applies to 800 MHz radios which have begun to exhibit a retry problem. There is no need to make these modifications to radios which do not exhibit this problem.

To test for retry problems related to physical stress on radio:

Radios which exhibit the problem will show up in a 'Crunch" test (mechanically stressing) on the radio. On a RF communications test set or a modulation domain analyzer, key the radio with a TQ0609 Test box on a conventional channel. The output RF signal from the radio should contain a CG tone and no voice. Observe the demodulated output. This should be a clean sine wave. To produce the crunch simply lay the radio on its face and press on the back of the radio near the name plate. With a moderate amount of pressure the CG tone should not wander more than 1 kHz peak in transmit deviation. Another method of generating this crunch is by twisting and squeezing the radio. It should be noted that there is not an exact quantification to the amount of pressure that needs to be applied to produce the above affect. However, the amount of pressure applied need not be excessive in nature to see the crunch.

This modification is required for only MPA radios which exhibit a crunch problem. The A/L board should be 19D902081G1 rev L or 19D902081G3 rev G. 19D902081G1 & G3 which are older revision boards have a known retry problem which shows up in I-calls. Older revision boards can also be used which are up to rev letter modifications. RF boards have 4 variations or design stages. This modification applies to RF boards which have the covered eggcrate.

Variations on RF boards can be divided into 4 stages:

RF board 188D5111G1, rev 0: Present Production
- Covered eggcrate, no copper on VCO, Hitachi PA module

RF board 19D902395G5, rev A: Recent production
- Covered eggcrate, no copper on VCO, Mitsubishi PA module

RF board 19D902395G3, rev D : older production
- Covered eggcrate, copper wrapped VCO, Mitsubishi PA Module

RF board 19D902395G1: older production
- Open eggcrate, copper wrapped VCO, Mitsubishi PA module

All boards must be brought up to current rev letter state.

The following is a description of the modifications required for the present production 188D5111 boards and the older production 19D902395G5 boards. 19D902395G3 can have the same modification except a new style VCO (19C852149G1) must replace the copper wrapped VCO. The 19D902395G1 board can also be modified so that it has the new VCO and covered eggcrate. Shields must also be changed.

NOTE:

The VCO will be removed in this procedure. In the removal of the VCO via's or “through holes” are easy pulled out. This will cause significant performance degradation in the radio. If this occurs the entire RF board will need to be replaced.

1) Disassemble the two halves of the radio. Remove the RF board from rear assembly. The RF board must be separated from the eggcrate but do NOT lose the copper grounding springs. These copper springs are necessary in eliminating the crunch problem.

2) While disassembling, check the RF board for any unusual solder build up in any area which depends on a ground contact. Especially note the areas between the eggcrate and the RF board. If the board is viewed from the side, no gap should be seen between the board and eggcrate.

3) The VCO must be removed. The VCO should almost fall out once all of the solder is removed from the pins. A slight pull might be required to remove the VCO. If not all of the solder is removed from around the pin the via will be pulled out with the pin. Especially be careful of the ground pin as it is the trickiest pin to remove.

4) Once the VCO is removed check the pins and pin holes to ensure no vias or via parts have been pulled out.

5) The board needs to be cleaned of any solder or flux buildup in the vicinity of the missing VCO.

6) The two unsoldered corners need to be insulated from the Gnd pattern beneath the legs. This can be done with Teflon tape.

7) After ensuring that all via holes are cleaned out, the VCO can be put back into place. Note that the VCO must be a I9C852149G1 before placing back on the board. Put the VCO back on the board making sure that the unsoldered corners can no longer make contact with Gnd. It is very important to ensure that the corners cannot touch the ground plane or else the problem will reoccur (especially after several months of service in the field). Solder the VCO back into place.

8) An additional copper grounding spring must be soldered on the top of the VCO. See diagram for placement.

9) Check to ensure no solder buildup exists where the eggcrate makes contact to the board. Place the eggcrate back on the board with the PA bracket in place. Put all screws in place. NOTE: If PA screws are too tight the PA will fail.

10) Once the board has been secured to the eggcrate look at the edges to ensure no gaps are present between the board top and eggcrate edge.

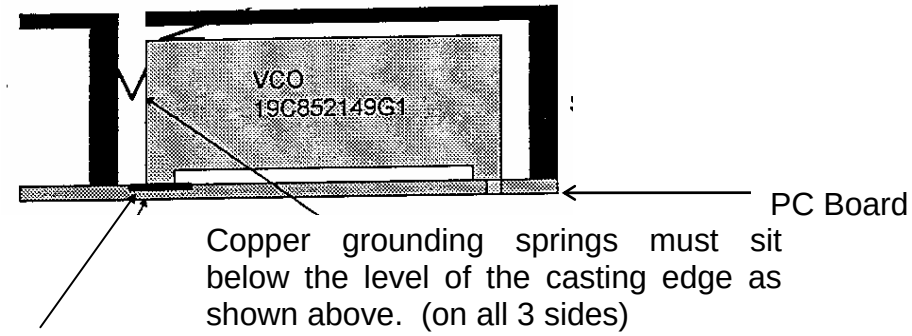
11) The copper grounding springs need to be put back in place. Push all 3 shields in around the VCO and verify that they drop below the edge of the eggcrate top surface. Also these shields should make contact between the sides of the VCO and the eggcrate.

12)The board can be placed back into the rear half and the radio can be reassembled. The crunch test can be performed to ensure the quality of the modification.

Copper ground spring Part Number 19B235901P1.

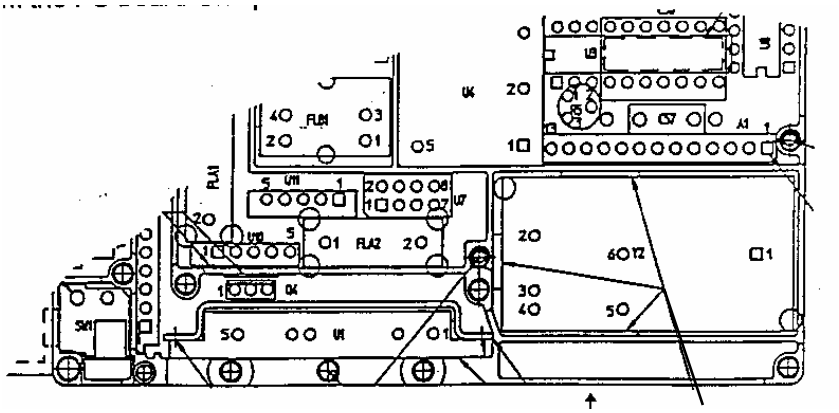
This spring is soldered to the upper edge of the VCO as shown. Do not use excessive solder. Spring must still compress after being soldered.

Casting Wall



Copper grounding springs must sit below the level of the casting edge as shown above. (on all 3 sides)

The two unsolder corners of the VCO must be insulated from the PC board Gnd plane.



Placement of 3 copper grounding springs.

Casting Viewed from top