Productions Modifications, Field Changes, and Optional Modifications for the R-390A

This is a consolidation of modifications from the Production Modifications as listed in the Y2K Manual, various Navy Field Changes, Hollow State News, and various other sources.

RF Deck

Production Mod 2: Pin 7, V201, connected to ground instead of pin 2.

Production Mod 2: C275 changed from 5000 pF to 3300 pF. C275 is between S208 rear, pin 7 and ground. Note: The consensus of opinion is that C275 should be 0.033 uF. This value was consistently used in manufacturing contracts during the 1960's.

Production Mod 3: Series network of C256, 0.1 uF, and R235, 47 ohms, inserted between terminal 1 of HR202 and ground.

Production Mod 4: C257, 47pF, added in parallel with C227. C227 is located betweenV201, pin 2 and ground.

Field Change 7: R210 changed from 56K to 220K. R210 is connected to pin 6 of V207. Finger stock added to shield RF chassis if available. Documented in Navsea 0967-LP-063-2120. (I do not add this one)

PTO

Field Change 7: R702 changed from 56K to 220K. R702 is connected to pin 6 of V701. Documented in Navsea 0967-LP-063-2120. (I do not add this one)

AF Deck

Production Mod 1: C612, 68 pF, added in parallel with R601. R601 is 680K connected to pin 2 of V601.

WA4HHG (Chuck Rippel) Easy Audio Mod: Replace C601, C604, and C605 with a 0.022 uF 400V orange drop capacitor, and replace R614 with a 560 ohm 2 watt resistor. Documented here and in HSN issue 46, page 6 (adding the C601 capacitor in the HSN version). Note that some prefer even larger values, up to 0.047 uF. Replacement capacitors which are too thick can be mounted either off the edge or under the circuit board.

Kleronomos Real Audio Mod: This is a major (non-reversible) mod that is documented in Electric Radio issue 42. It converts the AF deck to deliver 5 watts of push-pull audio into an 8-ohm speaker.

IF Deck

Production Mod 2: C507 and C517 changed from selected value to 51 pF. C508 through C510 and C513 through C515 changed from selected values to 82pF. Trimmer capacitors C564 through C571 added. See schematic and a modified IF deck for details and correct layout.

Production Mod 2: R504 changed from 1000 to 560 ohms. R504 is connected to pin 7 of V501 SSB Mod: (optional, highly recommended) Uses two 1N4148 diodes and one 47pF ceramic disk (or silver mica) capacitor.

-one diode in parallel with R547, cathode as follows
-----|<-------pin 2 V506A

-one diode in parallel with R546, cathode as follows
----->|-------pin 1 V509A

-one 47 pF cap in parallel with C535

Mods very similar to this one are described be Lankford and Cornelius in issues of Hollow State News.

3TF7 Substitution Mod: (optional, recommended) Add jumpers on RT510 between pin 7 and pin 5, and between pin 2 and pin 4. This allows you to later substitute a 12BH7A tube in place of your 3TF7 if (when) it ever fails. (HSN issue 10, pages 1&2 or HSN reprints, page 1)

Chassis

Inrush Current Limiter: (optional, highly recommended) Keystone CL80 (or CL90 if you never run the ovens) added between 120 VAC fuse and line filter. This mod limits AC voltage to the radio over a brief few seconds. It also reduces the incoming AC voltage by a couple of volts. Documented on Jan Skirrow's website at http://www.skirrow.org/Boatanchors/ and in HSN issue 48, page 3.

B+ Fuses: (these can be added if not present) Fuse F102 is located in the B+ line between pin 5 of plug P111 and pin 5 of plug P119. Fuse F103 is located in the B+ line leading from pin 2 of plug P119. Chassis wiring has to be unlaced, rerouted, and relaced to complete this installation. See the wiring schematic in the Y2K Manual on pages 6-83 and 6-84 to determine which changes are necessary.

Ground-fault protection capability: (optional) Insulate the line filter from the chassis using insulating sheet, insulated feed-throughs, two soldering lugs, and 0.01 uF 1000 VDC poly capacitor. For details see HSN issue 43, pages 7 & 8. (I do not add this mod to mine)

Power Supply

Solid State: (optional, only if 26Z5W tubes not available) Cover tube socket with labels regarding solid state mod. Use 3A, 1KV rectifier diodes. One diode between pins 1 and 3 of socket XV801, connecting the cathode lead to pin 3. Another diode is installed across the same pins on XV802. This change is documented INCORRECTLY in Navships 0967-063-2110, where it describes using pins 1 and 4.

Many suggest adding a 220 ohm dropping resistor to lower the B+ voltage to 240 VDC. (Also see HSN reprints, page 5) Some versions add the dropping resistor to the Power Supply Chassis with the 220 ohm 10 watt resistor between T801-6 and ground (http://www.qsl.net/wb4tur/milt/index2.htm website and in HSN issue 48, pages 5 & 6). Some add the 220 ohm resistor to the AF deck (Navy EIB 895 and HSN issue 2, page 5 or HSN reprints, page 5). I prefer to add it to the power supply deck so

that I can freely swap power supplies between tube and solid state type and the mod travels with it.

3-prong Power Cord: (optional, recommended if not already installed) Change any two-prong power cords to 3-prong. Insert ground lug from green wire underneath one of the AC terminal cover screws.

Other

Tube shields: Tube shields are needed on V201, V206, V505, and V701 (HSN issue 5, page 3 or HSN reprints, page 3). Others are often removed if shiny, but should be kept in place if black (inside and outside). IERC shields are the most highly regarded, with WPM coming in second.

Potential Low-Noise Tube Substitutions:

I don't do the following unless I run out of tubes. I tried all of these in my Collins R-390A for several months, but could not really tell any difference. AGC action may have been a bit worse, and sensitivity measurements didn't really change. Resting noise level did decrease with no signal injected, but it was compensated by less gain when signals were applied. Net result: no measurable change in sensitivity. If I had an abundance of the following tubes that would allow me to "tweak" the performance a bit, I might have had better results. Regardless, here are some easy substitutions for you to try.

6BZ6 instead of 6DC6 in V201 and 6AH6 instead of 5749/6BA6W in V508 (National Radio Club reprint R-57)

6JH6 instead of 5749/6BA6W in V501, V502, and V503 (Electric Radio issue 26, pages 22+)

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