

## The Service Line

**Edited**

**by**

**Bill Carns - N7OTQ**

*This issue we will start inclusion of this column "The Service Line" on an a periodic basis.*

*Some of these service oriented short articles will be written by the Column Editor - N7OTQ. Others, hopefully many, will be contributed by readers to help spread the word on newsworthy service issues on Collins Radio amateur equipment.*

*Articles contributed by others will be so noted and a brief description of the author will be included as an introduction.*

*In addition, after discussion with the advisory board, some of the more serious issues (related to either error correction or severe aging failure prevention) will result in the publishing of Collins Collectors Association Service Bulletins. These will be published in the original Collins style and numbered in sequence with the original equipment bulletins.*

*These service bulletins will be available from N7OTQ - by sending a SASE and the cost of publishing. This will usually be \$2-3.00, depending on the estimated printed quantity.*

*Bulletins issued will be individually approved by the advisory board and will not be issued for "modifications or improvements" but just when absolutely necessary.*

*It is hoped that, through all of our efforts, we can document and correct any ongoing or newly discovered service problems.*

*The following article on the 75A-4 was written by the column editor. Let us know how you like the column and feel free to share your feedback and experience.*

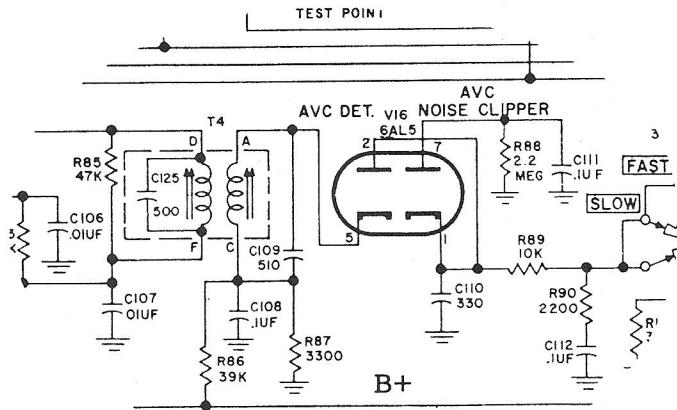
### **IS YOUR 75A-4 SMOKING MORE AND ENJOYING IT LESS ?**

Well, as hard as it is to believe, Collins goofed.

The error, while not appearing to be very severe on the surface, is aggravated by time and the mode in which the receiver is used. Ultimately the receiver's AVC and S-meter performance is degraded severely, many times leading to a desensitized radio.

#### **PROBLEM**

The culprit is a "smoking" R86, the 39K ohm 1/2 watt resistor used with R87 as a voltage divider from the B+ line to ground to develop the cathode bias level of 13-14 volts for the 6AL5 AVC rectifier V16. This positive bias of 13-14 volts on the cathode provides noise immunity for the AVC IF/detector chain and is very critical in providing stable and proper AVC and S-meter operation.



**Figure 1. Schematic of AVC detector section showing cathode bias voltage divider R86 & R87.**

Referring to Figure 1, and using a conservative normal B+ level of 155V for the receiver running on a 110V line ("operate" position), the dissipation in R86, the 39K resistor, is calculated to be:

$$(155-14)^2 / 39 \times 10^3$$

or almost exactly 1/2 watt.

With 5% high line and R86 at -5% low tolerance, R86 dissipates over 1/2 watt.

Now, even that does not seem so bad...enter time and mode of operation.

Since the 50's when the venerable 75A-4 was designed, the nominal line voltage has changed from 110V to 120 or 125V, and on long lines or with high line tolerance, it can get even worse. With a line voltage of 120V, the B+ level will typically be 170 volts in the "operate" position, but note that it rises to 190 volts when the radio is in "standby" and there is less load on the power supply.

With the B+ voltage at 190 volts and R86 at its tolerance limit, R86 can be dissipating over .8 watt.

The condition of your particular radio will depend upon how many hours it has operated at today's higher line voltage and particularly what percentage of the time it has been left on in the "standby" mode.

The symptoms of the resulting failure of R86, and sometimes R87 (if R86 goes low in value), are:

1. dramatically changed AVC threshold and action, and
2. inappropriate or unstable S-meter reading.

Note that the failure of these components can produce either increased or decreased AVC and S-meter action.

In other words, if you can no longer set your S-meter to S9 for a 100 uV input to the ANT or if the 3.0 uV AVC threshold has shifted or can no longer be set, check R86 and R87.

## SOLUTION

It is recommended that, regardless of condition, R86 be replaced with a 39K +/- 5%, 1 watt minimum, carbon resistor. A 2 watt is preferred as it is more conservative.

At the same time, check R87 to make sure it is within tolerance (3.3K +/- 5%). The 1/2 watt rating here is more than adequate. If R87 is out of spec, replace it also. The resulting voltage on the cathode of the 6AL5 (V16) should be approximately 14 volts with the correct value R86/R87 and the radio in the "operate" position.

The new R86 can be placed, as it was originally, under and behind C109 and allowing enough lead length to clear the alignment tool access on T4.

Making this change will prevent future failure, if the process has not already started, and greatly improve AGC and S-meter stability with time.

Your 75A-4 should be ready for another 40 years. Enjoy! It's a great receiver.

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A Collins Collectors Association Service Bulletin will be issued for the above problem.

For a copy of 75A-4 Service Bulletin #4, send \$2.50 and a SASE to:

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## **Dayton Hamvention Room and Dinner Update**

There are still a few rooms left for the 1994 Hamvention at the Radisson Hotel. This year George, AC4FQ, is taking the reservations for the rooms. Give him a call **NOW** if you are interested in going, his number in the evening is 305-434-0722.

April 29, 1994 will be the 3rd annual **Collins Dinner** also at the Radisson Hotel. This annual event has always been a lot of fun! Call Jay, KBØATQ, at 605-348-3346 evenings for more information and reservations.

The 1994 Hamvention will see the return of the **Collins Hospitality Suite** at the Radisson!