SR-400 AGC DISCUSSIONS

QUESTION. --->

Thanks again Walt.
This radio is getting to be very nice thanks to you.
A small problem still exists... the S meter is very generous; most strong signals are full scale and weaker ones are S7 to S9. This is after a one hour warm up with the meter zero and AGC set per the manual.
Could you point me in the right direction?

REPLY.

The agc circuit is a closed loop circuit and fault isolation can be a challenge.

The S-Meter is true only when the receiver RF GAIN control is at max. So, let us start there. With power on and no signal input (terminate the antenna in 50 ohms, dummy load works fine). Ground the tie-point of R2 and C12 (grid of V1 this blocks the AGC action). Measure the voltage at the junction of R3, 4A, R5 and R7 (cathode of V1). It should be between +0.1 and -0.1 volts dc. If it is not then R4A is probably at fault or there is a wiring error. That point needs to be as close to ground as possible with the pot at max gain.

The S-meter linearity depends on the receiver train gain, proper alignment and the linearity of V8A & B. Use the fault isolation chart below to determine if the receiver train gain is good. In all the steps in the chart the tie-point of R2 and C12 is grounded disabling the AGC.

2-4. RECEIVER FAULT ISOLATION CHART

	Injection point	Frequency	Signal injection level	Audio output	If good go to next step. If not check suggestions below.
1	V15 pin 7	1000 Hz	14 vpp 1:1 probe	½ wt.	Problem most likely V15 or associated circuitry. See section 4-2 for details.
2	V9B pin 2	1000 Hz	0.6 vpp 1:1 probe	½ wt.	Problem is most likely V9B or associated circuitry. See section 4-3 for details.
3	V9A Pin 7	1650 KHz	5000 uv	½ wt.	Problem is most likely V9A or associated circuitry. See section 4-4 for details.
4 *	V7A Pin 2	1650 KHz	425 uv	½ wt.	Problem is most likely V7A or associated circuitry. See section 4-5 for details.
5	Tie point C54/C59	1650 KHz	5000 uv 1:1 probe	½ wt.	Problem is most likely xtal filter or notch filter. See section 4-6 for details.
6	V6 pin 1	1650 KHz	35 uv	½ wt.	Problem is most likely V6 or associated circuitry. See section 4-7 for details.
7	V4A Pin 2	6.250 MHz	100 uv	½ wt.	Problem is most likely V4A or associated circuitry. See section 4-8 for details.
8 @	V3A Pin 2	6.250 MHz	15 uv	½ wt.	Problem is most likely V3 A or B or associated circuitry. See section 4-9 for details.
9 #	V2A Pin 9	7.250 MHz	8 uv	½ wt.	Problem is most likely V2A or associated circuitry. See section 4-10 for details.
10 ~	Junction C15&C20	7.250 MHz	6 uv	½ wt.	Problem is most likely 6.5 MHz traps, S1F, V18 grid or associated circuitry.
11	V1 pin 1	7.250 MHz	0.5 uv	½ wt.	Problem is most likely V1 or associated circuitry. See section 4-11 for details.
12 $	Tie point S1D wiper and 6.25 trap	7.250 MHz	0.5 uv	½ wt.	Problem is most likely S1D, S1C, or associated circuitry.
13 **	J1 direct from sig. generator	7.250 MHz	0.5 uv	½ wt.	Problem is most likely K1, 6.25 MHz trap, L17 or associated circuitry. **Upon successful completion to this point leave all equipment set as they are for AGC test in next section.**

* May require peaking of T3
\# may require peaking of T1
$ May require peaking of L3 and PRESELECTOR
** If the RX is working at this point perform the 6meg trap alignment. See section 8-12.
@ May require peaking of T2
~ May require peaking of L10 and PRESELECTOR

Next is V8 the AGC/S-meter amp. This tube needs to be hand selected for the best balance of agc and s-meter operation. This is a tedious process every time you swap out V8 you must reset the agc threshold and the meter zero.

Finally, the S-meter was never intended to be precision instrumentation. This is testified to by the considerable wide spec. "25uv to 100uv at the antenna shall produce a reading of S9". I can usually get most radios very close to actual scale. Some not so close. However all radios will meet the 25-100uv spec with time and diligence. The actual scale is as follows:
0.8uv = S3
3.2uv = S5
50uv = S9