

Regenerative Receiver Contest - General Rules

Place: Black Hills ARC Annual Auction
Canyon Lake Senior Citizens' Center
Rapid City, SD

Date: 19 February 2005

Objective:

To stimulate personal interest and knowledge in the art of wireless by offering awards to the designer / constructor / demonstrator of the best wireless receiver apparatus using a Regenerative architecture.

Who May Enter: All who claim to be practitioners of the wireless art.

Entry Fee: None

Website: Check our website at <http://www.w0blk.org>, "Contest" link, for the most recent contest information.

General Rules:

- 1) There shall be 2 entry classes:
 - Homebrew Class
 - Commercial Class
- 2) Five (5) awards shall be presented:
 - Homebrew Class - Best Electrical Performance Incorporating a Single Active Device
 - Homebrew Class - Best Mechanical / Construction
 - Homebrew Class - Most Innovative
 - Homebrew Class - Best Electrical Performance Incorporating Multiple Active Devices
 - Commercial Class, Best of Class
- 3) An individual or team may enter more than one receiver in either class, and may enter both classes.
- 4) An entry in the Homebrew Class shall be eligible to win all awards in that class, except that a design with multiple active devices shall not be eligible to win the single active device award. A design incorporating a single active device shall be eligible to win the multiple active device award.

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- 5) Three Judges shall be appointed by the BHARC Board of Directors. Judges may enter designs in the contest, but are not eligible to win any of the awards. The decision of the Judges is final. Judges may determine that an apparatus may be disqualified as non-compliant with the rules.
- 6) Electrical performance measurements will not be made on apparatus entered in the Commercial class.
- 7) Rules are subject to change until January 15, 2005. Changes of a clarification nature only are anticipated.

Regenerative Receiver Contest - Detailed Technical Rules
Homebrew Class - Best Electrical Performance
(Single and Multiple Active Devices)

- 1) Each apparatus shall be measured at the same randomly chosen frequency within the phone portion of the 80 meter amateur band (3750 - 4000 KHz).
- 2) The receiver architecture shall of the regenerative type.
- 3) Multiple active devices may be used in the apparatus (BJTs, FETs, vacuum valves, etc).
- 4) Each apparatus shall contain its own power conversion source. Standard wall-outlet power shall be provided to each entrant. The apparatus may be powered by batteries (supplied by the entrant).
- 5) The input to the apparatus shall be via the following 50 ohm antenna simulator circuit. Each apparatus shall contain provisions to allow easy connection to the antenna simulator. The entrant shall attach the simulator outputs (antenna and ground) to the apparatus.

Simulator schematic TBD

(the antenna and ground connections shall be made to the apparatus by alligator clips which are part of the antenna simulator circuit)

- 6) A modulated carrier signal level at the input of the apparatus, at the test frequency, shall be set by the Judges to a level of approximately 5 - 10 microvolts (peak). This signal shall be 50% amplitude modulated with a random audio frequency (sinusoidal) between 200 and 2000 Hz.
- 7) Measurements of the audio output of the apparatus shall be made via the following measurement interface circuit. The apparatus shall contain provisions allowing easy connection to the measurement interface. The load impedance seen by the apparatus shall be approximately 2000 ohms to simulate a high impedance headphone. The Judges shall determine whether the audio output contains excessive distortion levels which would influence the audio level measurement unfairly. If excessive distortion exists, the entrant shall be advised of this fact and will have the opportunity to re-adjust the apparatus to reduce the distortion. The entrant shall attach the measurement interface to the apparatus.

Measurement Interface Circuit TBD

(the audio and ground connections to the apparatus shall be by alligator clips which are part of the measurement interface)

- 8) The tuning shall be set to the test frequency, and the regeneration level shall be adjusted to a desired level by the entrant. The entrant shall be given 20 seconds to complete this procedure.

Regenerative Receiver Contest - Detailed Technical Rules
Homebrew Class - Best Electrical Performance
(Single and Multiple Active Devices)

9) Measurements shall be made by the Judges as follows:

- a) Sensitivity: The input and output shall be connected as described in rules 1 through 7 above. The apparatus shall be tuned to the test frequency by the entrant as described in rule 8 above. The audio output voltage across the 2000 ohm measurement interface, at the audio test frequency, shall be measured, and the ratio of the apparatus audio output voltage to the apparatus antenna input voltage (audio modulating signal component of carrier) shall be recorded in dB.
- b) Selectivity: Following the sensitivity measurement as described in 9a) above, and with no further adjustment of the apparatus, the rf signal generator frequency shall be varied by 10 KHz plus or minus, at the Judges discretion, from the original frequency and the sensitivity measurement will be re-recorded. The selectivity will be calculated as follows:

TBD

10) The following equation shall be used for the competitive scoring:

TBD

(desirable score = f(high sensitivity - measurement taken in 9a = large,
high selectivity - measurement taken in 9b = small))

11) An outdoor antenna will be provided by the Judges for entrants to use for live demonstrations of their apparatus. This is for "showing" purposes only, and is in no way connected with the official scoring.

12) Tie-breaking will be done by re-measurement, in order of the following:

- a) A newly chosen random frequency as stated in rule 6) above.
- b) A newly chosen random frequency as stated in rule 6) above, and the selectivity measurement in 9b) above shall be made by varying rf signal generator frequency by 5 KHz.
- c) A newly chosen random frequency as stated in rule 6) above, and the selectivity measurement in 9b) above shall be made by varying rf signal generator frequency by 2 KHz.

Regenerative Receiver Contest - Detailed Technical Rules Homebrew Class - Best Mechanical / Construction

- 1) No electrical measurements shall be made to apparatus entered in this class, but the apparatus shall be operational. Operation shall be verified by attaching the apparatus to an external antenna or modulated rf signal source provided by the Judges.
- 2) The Judges shall make a subjective evaluation of each apparatus entered in this class based on internal and external neatness, "professional appearance", etc.
- 3) The winning apparatus shall be selected based on criteria in 2) above.

Regenerative Receiver Contest - Detailed Technical Rules

Homebrew Class - Most Innovative

- 1) If the entrant feels that electrical performance is pertinent to the innovation being demonstrated, sensitivity and selectivity measurements of the apparatus may be requested by the entrant and will be made by the Judges. Otherwise, electrical measurements will not be made.
- 2) The apparatus shall be operational. Operation shall be verified by attaching the apparatus to an external antenna or modulated rf signal source provided by the Judges.
- 3) Charts, drawings, schematics, a short description, etc may be provided by the entrant if the entrant feels that they are pertinent to the innovation being demonstrated.
- 4) The Judges shall select the winner in this class by subjective means relating to entrant's claims of innovation. |

Regenerative Receiver Contest - Detailed Technical Rules Commercial Class

- 1) Apparatus entered in this class shall have been commercially manufactured or commercially sold as a kit.
- 2) No electrical measurements shall be made to apparatus entered in this class, but the apparatus shall be operational. Operation shall be verified by attaching the apparatus to an external antenna or modulated rf signal source provided by the Judges.
- 3) Modification of the apparatus is allowed.
- 4) The Judges shall select the winner in this class by subjective means.

Revision History

Revision	Revision Date	Revision Description
A	Winter '03	Initial draft for review
B	04-02-18	Initial release
C	04-09-05	Added multiple device award criteria
		Added comment re: measured audio distortion
		Clarified input signal description
D	04-09-07	typo page 1, typo page 6