

AUGUST 2001

THE MONTHLY NEWSLETTER of the SANTA CRUZ COUNTY AMATEUR RADIO CLUB

SHORT SKIP



What Makes a Good HF Receiver?

The short answer is a combination of many technical and human factors!

The significant learning experience for me coming from field day this year focused my thoughts on how well receivers perform under bands crowded with extremely strong signals. These conditions are quite different from my normal challenge of trying to pick out very weak CW signals buried in a combination of atmospheric and man made noise.

The dynamic range (DR) of a receiver determines how well it will perform in the presence of strong adjacent signals. The three most significant measures in common use to express dynamic range are Blocking-DR, Inter Modulation Distortion -DR and Third Order IMD Intercept Point (IP3)

Blocking DR.

The output level of a receiver increases linearly with increased input level up to a point where critical front-end components become non-linear. When the increase in output becomes less than the increase in input, the receiver gain becomes compressed. Blocking DR is defined as the difference in dB between the point where 1 dB of gain compression occurs and a certain output signal level chosen as a reference. The reference may be the noise floor of the receiver itself or the combination of the receiver noise and external noise. In some receivers strong signals mix with unwanted components of local oscillators and in so doing increase the noise floor, in-effect also desensitizing the receiver.

Except at very quiet locations on earth, external noise at HF is primarily atmospheric or man-made. For example a low atmospheric noise level on 20 meters is about 25 dB above thermal noise. When external noise is excluded from the DR reference we are determining the minimum discernable signal of the receiver alone and when external noise is included we are

referring to the minimum discernable signal of the receiver and antenna as an operational system. A point to be stressed is that different reference points, differing measurement techniques and the bandwidth of measurement mean that caution must be exercised in comparing specifications from differing sources. In this article the results from standard measurement techniques used by the ARRL labs will be quoted to permit a side by side comparison of several popular receivers. In all cases the bigger the Blocking DR numbers the better.

IMD-DR

When devices such as diodes, transistors and magnetics become non-linear, signals begin to appear in the output which are the inter-modulation products that result from mixing two or more input signals. These unwanted signals impair the ability to receive wanted signals. Measurement techniques are similar to those used for blocking DR. The ARRL lab measures the strength of two equal test signals that produce third-order products 3dB above the receiver noise floor. As IMD products begin to appear well before a receiver becomes de-sensitized the IMD-DR measurement is most valuable in understanding receiver strong signal performance. The bigger the IMD-DR numbers the better.

Third order Intercept Point (IP3)

The third method of expressing dynamic range is to determine where a graph of the desired output of a receiver would intersect with the output due to third order intermod products if both wanted and unwanted outputs were assumed to extend beyond the linear range. IP3 can not be measured directly and is calculated in at least two ways. ARRL handbooks from 1999 on contain a description of this concept but the formula given does not exactly correspond to

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Chaminade?

Ron, W6W0, has been working on reserving a room at Chaminade again for our traditional Holiday Brunch. Last year's brunch at Chaminade was wonderful, but there was a little matter of it costing more per head than the Board at first realized. We opted to subsidize the extra cost from the club treasury rather than raise the price to the club members. This year we are proposing the club will pay for the room rental plus a small per head contribution which would make the cost per head to club members \$20.00



I would like to get some member feedback on this as to whether or not you feel this price tag would be prohibitive. So, the question is: Would you most likely attend, or not attend, the brunch if it were held at Chaminade again and the cost was \$20. per head. (Note that this would be \$40. per couple.)

Please respond to KQ6DV with your comments.

SPEAKER FOR AUGUST

Jamie Finch will be the featured guest speaker for the August SCCARC meeting.

Jamie will talk about the Red Cross, disaster communications and amateur radio.

CLUB MEETING FRIDAY AUGUST 17, 7:30P.M.



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LOGBOOK OF THE WORLD™ SOFTWARE DESIGN UNDER WAY

Fast on the heels of approval of the "Logbook of the World" by the ARRL Board of Directors, software design to support the electronic contact-verification program is moving full speed ahead. ARRL Membership Services Manager and LOTW Project Manager Wayne Mills, N7NG, said the ARRL hopes to make LOTW software modules available soon to vendors for incorporation into their logging programs.

"We have been in touch with 15 or so developers of popular logging software," Mills said. "We're also looking at providing a basic, do-it-yourself program to get contact data to ARRL."

The logging software modules are being developed as part of the Trusted QSL open-source project headed by Darryl Wagoner, WA1GON.

At the heart of the Logbook of the World concept is a huge repository of log data provided by operators--from individual DXers and contesters to major DXpeditions--and maintained by ARRL. Mills says the system will benefit big and little guns alike by providing quick QSO credit for awards offered by ARRL, and, it's hoped, for awards offered by other organizations as well.

Once it becomes available--which could be as early as the middle of next year--Logbook of the World will accept authenticated data directly from computerized logs via the Internet. "This is an e-mail based system

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Prez Sez

As many of you know my time has been consumed by teaching and writing over the last six months, resulting in some neglect of my presidential duties to SCCARC. I want to issue a big thank you to Vice President Richard, KG6AXD, and the Board for filling in whenever I was AWOL. We had a great Field Day this year and I will be showing an edited version of Roy's, KF6KVD, video from Field Day at our August meeting. (This was meant to be done at our July meeting but I was so busy with teaching I didn't get around to editing Roy's tape, plus I "spaced out" and forgot our meeting night!)

Despite my absence the club seems to be doing well. It is very gratifying to feel the "good vibrations" going around. Many people I've talked to have commented about their perception of an elevated energy level amongst the club membership this year. It seems like people are helping each other, enjoying the hobby, and having fun: which is what it's all about. Upcoming opportunities for camaraderie will be a Potluck BBQ hosted once again by Jim, KF6YRD, and Norma Welty. Last year we had a GREAT time at their place, and I thank them both for their gracious hospitality. Stay tuned for the date: we will try and set it at our next Board Meeting. Also at our August Board Meeting we will be deciding on whether or not to have our Holiday Brunch in December at Chaminade again this year. If so cost will be \$20. a head for a fabulous meal in an elegant setting. So far response to my "feeler" email has been overwhelmingly in favor of the Chaminade brunch.

Ron, W6WO, Jeff, AC6KW, and myself, KQ6DV, worked the "Flight of the Bumblebees" QRP sprint on Sunday, July 29 from New Brighton Beach State Park. Ron and I transported our entire HF station to New Brighton by bicycle. Jeff surprised us by showing up at the last minute in his truck and setting up his station in record time. He was soon making QSO's with his tabletop antenna while Ron and I were still wrestling with stringing my dipole in the trees. Despite marginal propagation conditions we had a good time and made contacts ranging from Alaska to the East Coast.

—73, KQ6DV

Receiver Performance Cont.

that currently in use by their lab. Once again the bigger the value derived by either calculation the better.

What follows are the Blocking-DR, IMD-DR and IP3 values for some popular receivers that were established by the ARRL lab. These figures are for 20 meters with 5kHz adjacent test tones. ARRL also publishes figures at 20 kHz spacing but 5kHz is more realistic under FD conditions. The figures below are without preamps, some preamps increase DR but most lower it.

conditions. Field day environments really put receiver dynamic range performance on trial. This year I was using my Icom 706 MkII, and the little beast was complaining so much it was necessary to have the RF attenuator in place and RF gain almost at zero at all times. The K2 is a hard to beat radio and for 6 year old technology my trusty Ten-Tec Omni is in pretty good shape technically and operationally.

The best of professional receivers and some expert home brew receivers well exceed the performance of those mentioned above so

	Blocking-DR dB	IMD-DR dB	IP3 dBm S 5 method
Icom 706 MkII G 500Hz filter	86	74	-1.3
Ten-Tec Omni VI Pro 500Hz filter	119	86	+12
Elecrafft K2 700 Hz filter	126	88	+21.6

ARRL expanded test results include swept measurements of dynamic range that provide a great deal more information. Graphs for many popular radios can be viewed on the ARRL member site.

Conclusions: There are several other metrics associated with dynamic range and spurious response but the three mentioned above provide a very good indication of performance of HF receivers under crowded

there is room for much improvement in commercial ham products. I hope that the next generation of receivers will increase both weak signal recovery and dynamic range performance substantially. The article "Performance Specifications for Amateur Receivers of the Future" QEX May/June 1999 is highly recommended for those who wish to probe further.

—Ron W6WO



By Art Lee WF6P

CHATTER

I was pleasantly surprised to see our Gabrielle (K6CAT) and Ken (K6KZA) Adelman, both electrical engineers, taking on PG&E in a power struggle. Their solar panel array would have furnished additional power to then, power-starved California. My sister-in-law would have loved to have had some power for her Fresno apartment last summer. Her "rolling" blackout period lasted through a couple of 100 plus degree days. The photos of the Adelman's very impressive solar panels were shown in the July 30th issue of the San Jose Mercury. A special connection fee of nearly \$600,000 was more than Ken and Gabrielle felt was justified. They are working with the State and PUC to resolve the problem. We wish them every success.

Pirates! Did you know they still roamed the seven seas? There was a case last year where cruising hams were attacked in South American waters. The couple and their son were on a round-the-world cruise when their son was shot. The case was well publicized as hams ashore relayed emergency medical traffic for the distressed sailors. Large vessels have been boarded by pirates operating high speed and heavily armed boats. These attacks have occurred mostly in the Straits of Malacca south of the Philippine islands. When my brother was sailing on Military Sealift tankers through that area he had to undergo refresher courses in small arms use. To repel boarders they were issued M-14 rifles, but no pikes or cutlasses. I just received a letter from Ralph Eschborn, N6ADJ, on this subject. A cruising sailor in Dusseldorf, Germany, Klaus Hynpendahl, needs stories of yacht piracy for a book he is writing. His e-mail address is Khynpendahl@compuserve.com. If you know of any piracy incidents, he will be glad to hear from you.

Famous hams: on the ARRL web site there was a nice picture of Patty Loveless, KD4WUJ. Patty is a popular singer whose image can be seen at

<http://www.arrl.org/FandES/ead/graphics/>

photo5.jpg. I know that our daughter Joyce, KN6RR, would love to work her. Joyce is presently singing with a band in Sacramento.

Ham club meetings. You are missing out if you don't attend. Our club officers have been getting some very good speakers from within our membership. At our last meeting we were given a presentation by Bruce Hawkins, AC6DN. Bruce discussed a wide variety of mobile whip antennas he has used to various degrees of success. He gave us a thorough briefing on the importance of grounding various portions of your vehicle, mufflers, fenders, hoods, etc., to eliminate signal interference. Bruce is an excellent speaker, using great amounts of humor to spice up his material. How can you nod off when you are laughing?

I will soon be making another trip down to Ventura with Terry Parks, N6NUN. He has ham gear in his vehicle and on his boat. It is nice to have a schedule with Donna, AB6XJ, while on the road and when relaxing over a glass of wine in the main salon of Terry's Hatteras 53. Terry and I will take a week to visit the offshore islands. (Please, no pirates!)

One of our Short Skip readers, Candace Fazio, e-mailed me to inquire if the port wine Donna and I consumed aboard Rich and Lee Hanset's boat last month was ... well, here is what she asked. "Is port wine the kind you drink on the left side of the ship? Or the proper wine for consumption while a boat is at anchor in the harbor? Or is it just necessary to hold the glass with the left hand?" Candace is a fantastic piano player who owns a piano studio in Gilroy. She specializes in teaching children so if you have kids who are musically inclined, send them there. She doesn't have her ham license yet, however.

Software cont.

that uses easy-to-obtain digital signatures for authentication," Mills said. "Once you get your digital certificate, a few keystrokes will do the trick."

Mills said the program envisions user access to the LOTW "confirmed database" so an operator can see what "matches" turn up--such as confirmation of new DXCC entities, states or grid squares. "We'll also publish a list of logs that have been submitted," he said, adding that operators may access the LOTW database once they've uploaded their own log data.

Member(s) Profile

MARS



It has been said that Hams generally fall into two groups, those who are social but not highly technical and those who are technical but are lacking in sociability. Incompatibility however is seldom an issue as you will soon see by joining the Mac Donalds Amateur Radio Service. This diverse and well-balanced group meets almost every morning at 10:00 AM at the MARS branch next to Longs Drugs on 41st Ave.

In this picture we have Vivian who is responsible for moderating good behavior, Gene W6ENE, Del KD6KXD, Myron K6RRU and Bob W6REB.

Topics of conversation range far and wide and often reflect the vast experiences of those present, in life as well as Ham Radio.

Members who are often present include KG6EE Hank, K6TAM George, AA6GD Dan, KN60 Joe, K6GHA Dave, KD6LCO Cliff, KD6MTE Sam, WB6MVK Larry, W6PAD Bill, K6BDK Frank, WA6EWT Warren, N6GKK Bob, KD6DRY Monty, W6WO Ron, KC6VJL Allan, KD6DSB Gene. As you can tell from these calls you can be sure of a warm welcome, empathy and technical know-how. Now if only McD would sell Sue Ann's coffee!

Heading up software development is ARRL Electronic Publications Manager Jon Bloom, KE3Z, along with Web Applications Developer Mark Simcik, WA1VVB. Software specifications already have been established. In addition to Wagoner, those assisting the project include Dick Green, WC1M, Ted Demopoulos, KR1G, and ARRL staffer and well-known contester and DXer Dave Patton, NT1N.

Mills said that he hopes to be able to announce a specific inauguration date for Logbook of the World within a few months.

—ARRL Newsletter

SCCARC Officers - 2001

President	Tom Johnson	KQ6DV	464-3120
Vice President	Richard Trebbien	KG6AXD	426-0169
Secretary	Cap Pennell	KE6AFE	429-1290
Treasurer	Elaine Pennell	KE6FRA	429-1290
Board	Bruce Hawkins	AC6DN	
	Bill Walters	W6PAD	688-0557
	Allen Fugelseth	WB6RWU	475-8846
	Mike Doern	KF6UXB	477-1161
	Ron Skelton	W6WO	477-1021
	Royce Krilanovich	AC6Z	475-4798
K6BJ Trustee			

MONTEREY BAY ACTIVITY

K6BJ / K16EH (Linked) • SCCARC Net Monday 7:30 PM 146.79- /147.945- 146.79- /147.945-

K6BJ / UHF • SCCARC Net Monday 8:30 PM 440.925 (PL 123)
 • SC ARES Net Monday 8:30 PM 146.835-(PL 94.8)
 • Watsonville ARES Net Thursday 8:30 PM 147.945-

K6LY (Monterey) • Monterey ARES Net Wednesday 7:30 PM
 146.97- (PL 94.8) • NPSARC Net Wednesday 8:00 PM
 444.700+ (PL 123) • Monterey Bay Traffic Net Nightly 9:00 PM
 (Linked) • Monterey Bay Swap Net Wednesday 8:15 PM
 • Newsline (Ham News) Broadcast Wednesday 8:30 PM
 N6IYA (Felton) • SLVRC Net Thursday 7:30 PM
 146.745- (PL 94.8) • SLV ARES Net Monday 7:30 PM
 • Newsline (Ham News) Broadcast Sunday 9:00 PM

6 Meter Local Net 52.8 MHz (PL-114.8) Sunday 8:00 PM
 SCCARC 10 Meter Net 28.308 MHz USB Monday 7:00 PM
 Mont. Bay Chapter 191 QCWA :Tuesday, 7:30PM, AA6T repeater, 146.700-(NO PL).

SCCARC Calendar of Events

SCCARC Board Meeting 6:30	Friday	Aug 17
SCCARC Meeting	Friday	Aug 17
SHORT SKIP deadline	Monday	Sep 10
Santa Cruz ARES	Tuesday	Sep 11
SCCARC Meeting	Friday	Sep 21

MONTHLY MEETINGS

The SCCARC Meets at 7:30 PM, on the THIRD FRIDAY of the each month (except December). Meeting are at Dominican Hospital, 1515 Soquel Drive, Santa Cruz.

Visit the SCCARC Website at -

www.k6bj.org

CLUB E-MAIL: yourcall@k6bj.org

NET CONTROL SCHEDULE

(Subject to Change)

8/13	Ron W6WO
8/20	Dave W6TUW
8/27	Jeff KF6BKG
9/3	Tom K6TG
9/10	Allen WB6RWU
9/17	Phil KE6UWH



SANTA CRUZ COUNTY AMATEUR RADIO CLUB
 P.O. BOX 238
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TRADE or SELL TABLE at AUGUST MEETING

Bring your surplus radio gear to sell or trade. The table will be set up before the club meeting. Put a price on your goodie and have fun trading or selling: mics, connectors, handhelds and related equipment, receivers, transmitters, etc. Let's have fun!

—Dan AA6GD

First Class