Premium-Rx Archives

Jan 13, 2001 to June 15, 2001

Note: Audio and picture files removed …

premium-rx-digest Saturday, January 13 2001 Volume 01 : Number 101

Date: Wed, 3 Jan 2001 22:30:01 -0800
From: "Spencer Bahner" <spencer12345@email.msn.com>
Subject: Prem-Rx: Re: ACL VHF receiver

While the emphasis of this newserver has been on HF receivers, its such a great method of reaching collectors of VHF-UHF high end gear as well. So I'll steal a bit of bandwidth for the upper ranges and hope I don't offend anyone!

Among those who are on this list who collect older VHF-UHF surveillance receivers: Does anyone out there have any ACL SR-209/209 AFC IF boards (particularly in the narrower IF bandwidths like 10 KHz, 20 KHZ, 100 KHz) that are laying around unused? Or tuner modules? If so, would you mind dropping me an e-mail off-line?

Many thanks and please excuse the non-HF, semi-boatanchor surveillance receiver question!

Spencer Bahner N7UMO Seattle spencer12345@msn.com

Watkins Johnson 8617B Watkins Johnson 8618 Watkins Johnson 8615 D's Watkins Johnson 8615 P and on and on....

Plus a few HF receivers (Harris 505, 550, 590, 51-S1, 651S-1, WJ8718/MFPs).

Date: Sat, 6 Jan 2001 01:42:02 EST
From: Daiungoed@aol.com
Subject: Prem-Rx: deaf RA1795

Hi, I have a RACAL RA-1795 which I have used for a couple of years now, to monitor local stations. I have now decided to tune to more distant transmissions, and it appears to be very deaf. I have a few scanners, on all of them I can get airport towers etc when used with the outside discone, but the same stations do not even appear weakly on the 1795. Are there any common faults which affect these, I have the service manual, and have been all through the BITE sequences, nothing wrong here. Any ideas?? Dave

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Date: Sat, 06 Jan 2001 07:40:25 -0800
From: John Reed <jreed@ponca.net>
Subject: Re: Prem-Rx: deaf RA1795

Sounds like the DMOS FETs in the mixer module may have been shocked by static buildup at some time. These can be replaced if they are like other Racal mixer modules. They are Siliconix SD215DEs (four needed) and you have to unsolder the lid on the mixer can to get to them. I've replaced two sets of these now, on an RA6793A and an RA 6772E. Both these receivers suffered from low sensitivity and LO feedthrough and the new FETs fixed this.

John Reed

Date: Sun, 07 Jan 2001 21:27:20 -0500
From: Cornel van Ravenswaaij <cortec@club.tip.nl>
Subject: Prem-Rx: Info needed on Escom 500

Hi all,

Does anyone have any (more) info on the above mentioned receiver. I've discovered so far that only three units were built by the ESKA company. One unit is placed in a submarine, where it apparently broke down due to vibrations. One unit seems to be somewhere in Australia and one is somewhere in Europe. Frequency range is 10kHz to 470MHz, all modes available, 12 bandwidths selectable.

Anyone?

Regards,

Cornel

Date: Mon, 8 Jan 2001 13:03:52 -0600
From: "Davez" <davez2@netzero.net>
Subject: Prem-Rx: WJ-8711A For Sale

Watkins Johnson-BAE Systems WJ-8711A. Brand New, made in December 2000. Standard version. E-mail for full information.

Dave

Shop Safely Online Without a Credit Card http://www.rocketcash.com

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Date: Mon, 8 Jan 2001 20:41:56 -0600
From: "Joe Watson" <wwatson@mmcable.com>
Subject: Prem-Rx: Selling my Collins HF-2050

I have a nice Collins HF-2050 that I am planning to sell. Looks and = works great.

If interested, send me an e-mail.

Otherwise, off to eBay!

Joe = 20 W5WBR

Date: Mon, 08 Jan 2001 20:41:32 -0800
From: "Walter (Volodya) Salmaniw, MD" <salmaniw@home.com>
Subject: Re: Prem-Rx: Selling my Collins HF-2050

Joe, and the gang....Am I missing something somewhere. I, a devoted 2050 driver and owner of 3 of these things of beauty. Yet, I'm seeing more and more drivers opting out of this elite group of premium-rx owners, to try their hands with something different. Take away my JRC, my Kenwoods, my Racals, but don't touch my 2050! An explanation is needed for this "oak leafer" as Prof. Greg puts it! I feel like I'm on a sinking ship.

Walter R. Salmaniw, MD email: salmaniw@home.com Victoria, British Columbia DXING FROM CANADA'S WEST COAST, using CANADA premier radio receivers:

Rockwell/Collins HF-2050 (250) 592-1033 Collins R390A,ITT Mackay 3031A, Racal RA8772 and 6772, JRC NRD 535D, AOR 7030+, and Kenwood R5000. - --

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Date: Mon, 08 Jan 2001 21:49:34 -0800
From: "Walter (Volodya) Salmaniw, MD" <salmaniw@home.com>
Subject: Prem-Rx: TMC CU-5069/FRD-10A(V) Manual

Just to let everyone know that I printed up a bunch of the manuals on Saturday, and have begun to send them out to those who wanted them. I'll have a few extras, so if you still want one, and haven't told me, please let me know!.....Walt.

Date: Tue, 9 Jan 2001 00:19:39 -0700
From: Gerald Caouette <ve6nap@oanet.com>
Subject: RE: Prem-Rx: Selling my Collins HF-2050

Having had he pleasure of getting to try many " good " receivers over the years I have yet to find another receiver that comes even remotely close to the Canadian ROCKWELL COLLINS HF2050, for overall signal recovery - dynamic range - and audio quality in weak signal and high noise enviroments.

Oh well those decisions to sell lets some other lucky guys get their hands on a rare and excellent receiver that will only grow in value - as so few were made.

I consider this receiver to be the AVRO - ARROW of the Canadian Rockwell Collins recievers.

It shows what could be done when cost was not an object in the design of a receiver to bad the accountants got some say when it came to the power supply section

Regards Gerald Caouette 9116 - 79 Street Edmonton, Alberta T6C 2R4

de ve6nap@rac.ca

(6) Rockwell Collins HF2050 's (1) Cubic R3030 (1) I.T.T. Makay MSR 8050 (1) Watkins Johnson WJ8718-19 (1) C.E.I. R1279D/URR (1) C.E.I. R975 (1) Kenwood TS520 (1) Kenwood TS940SAT (1) Kenwood TS850S (1) Icom IC25A (1) Yeasu FT-2600M (1)True Time TF- 3 WWV reciever (1) Relistic Pro-2002 (1) Relistic Pro-2024

Date: Sat, 13 Jan 2001 09:18:02 -0600
From: John Bryant <bjohn@provalue.net>
Subject: Prem-Rx: Ten Tec 340

Don Nelson and I are owners of these beauties, now, him for a while, me since 3:00 PM yesterday.... REALLY a nice rig, but still without a full users manual.... that's coming in "about a month."

Are there any other Ten Tec 340 owners out there (there have been less than 90 sold so far)? If so, we might form a sub-group to figger out how to run these babies. For instance, didja know there are 200 memories rather than the 100 mentioned in all advertising and in the rough manual??? And you CAN dim the front panel display (Hold SETUP and use the edit knob in Memory/Scan). Both of these gems are courtesy of Mr. Nelson.

Any other RX-340s out there?

John B.

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premium-rx-digest Wednesday, January 17 2001 Volume 01 : Number 102

Date: Fri, 12 Jan 2001 15:46:45 -0500

From: "W. Charles Alexander" <charlie@swl-ute.com>
Subject: Prem-Rx: Ten Tec RX-340

I purchased a Ten Tec (Direct) and received it the first of November. So far I am very impressed, but I have been very busy at work and at home so I have not had many really good nights with it. I am working on a small review and soon will be finished with it. As soon as I am done I will post it to my web site. I have started a group of web pages about it, with the data sheet and the Review of Don Nelson. http://www.swl-ute.com/rx-340.htm

(Don I hope this is OK, I did not have youe E-Mail address, but your review said as long as full credit was given it is OK) I would also like to keep in touch with any other owners.

One thing most may already know that John did not mention is that, the tuning knob tension can be adjusted by holding the main part of the knob and turning the ring at the base. Mine was to 'stiff' for my liking, but it can be set more to my liking pretty free spining.

= 73 de charlie W. Charles Alexander KC8IKG E-Mail mail To:charlie@swl-ute.com Web Site http://www.swl-ute.com/shortwave Monitoring the World from Columbus, Ohio USA 39.951 N 83.124 W HF Ten Tec RX-340, AOR AR3030, Drake/Grundig Sat 800 VHF/UHF Alinco DJ-X10, BearCat BC 895 XLT, ICOM IC-Q7A Antennas: 33 Ft Off-Center Fed Dipoles, 45 Ft Longwires Slinky Dipole a Dressler ARA 60 Active Antenna and 2 Radio Shack Discones (All In Attic) And a 50 Foot Longwire Outside 12 ft high 1 end and 20 ft high the other.
= =

Date: Sat, 13 Jan 2001 12:57:28 -0800
From: "Don" <ulformat@teleport.com>
Subject: Re: Prem-Rx: Ten Tec RX-340

Fine with me. Looking forward to your comments as well!

Don Nelson Beaverton, OR ulformat@teleport.com

Date: Wed, 17 Jan 2001 18:43:02 EST
From: Daiungoed@aol.com
Subject: Prem-Rx: RAVEN RESEARCH MULTICOUPLER

Hi, Does anyone have any experience of receiver multicouplers made in England bu Raven Research? I have just got one, and am very pleased with it, but one or two things puzzle me. Anyone got any info?? Dave

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Date: Wed, 17 Jan 2001 20:22:17 -0600
From: John Bryant <bjohn@provalue.net>
Subject: Prem-Rx: Ten Tec 340 Pin Out for Line Level Audio, etc. + 5069 Manual

Hi,

I'm still busy falling in love with the Ten Tec 340....... a wonderful receiver and a pleasure of easy, intuitive operation. The factory manual has not yet gone to the printer (I suspect that they may be updating some firmware and are sitting on printing the final manual for a bit longer, but its justa suspicion.) The interim manual seems to cover almost all operations very very well, but there is no

schematic or block diagram and hence, no pin-outs on the blasted 15 pin D connector that offers up line level audio and other good things. The jack is J-8 and I'm attaching a fairly decent copy of the pinouts as a very small jpg file. In case you can't read the first few pins (this came from a fax) they are: 1 GND 2 MONO 3 LINE B- 4 B CT 5 LINE B+

When I was talking to the plant (very helpful as usual) I beat the drum for a 9 kHz tuning step to be added for those of us who DX European or Asian LW and MW broadcast stations. I told them that I also knew that there was interest in the 340 in the MW and SWBC DXing markets in Europe and that the 9 kHz. step would be helpful in that market should they ever choose to address it. He said that Ten Tec was trying to get European "CE" approval for the 340, so a 9 kHz step might be in the offing "someday." I sure hope that it is sooner than that.

Also, I've been assured by several Ten Tec folks that every 340 owner who sends in their registration card will get a copy of the full factory manual when such hits the street.

On another note, today I got the CU-5069 32 port Coupler manual from Walt Salmaniw up in beautiful BC. Great manual, Walt, THANKS! The surprise was the thing is actually a 75 ohm device, rather than 52. It provides a 2 dB gain to each port and lotsa isolation.

I'll try to get some general comments up on the list this weekend.

Now that our list's fearless leader is back from three glorious weeks in Kiwi-Land, I'll bet he is snowed under with back-work and getting the second semester started at SDSU. Greg, have you guys got generators to keep the cooling going to those wonderful buildings with fixed glass windows??? In San Diego's climate the people loads, lighting loads and equipment loads mean you need cooling all year round in the larger buildings. I'd suggest issuing push brooms to the faculty... they can ram the handles through the windows and then reverse the things and sweep up the mess! Shame that they can't do the same in "Sacamenta" with the whole mess.

John B.

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premium-rx-digest Saturday, January 27 2001 Volume 01 : Number 103

Date: Thu, 18 Jan 2001 02:36:00 -0800
From: "Greg W. Bailey" <gbailey@mail.sdsu.edu>
Subject: Prem-Rx: New Member- Bob Dockery

Gentlemen:

Bob Dockery has joined our list, he found us while searching for information on his WJ 1000a. Bob makes Murfreesboro, Tennessee his home town where, for the past 19 years, he has been a senior electrical engineer for Nissan North America. Specifically, he is responsible for all switches, engine control units, transmission control units, alternators, starters and airbag systems for vehicles built in this country.

His interest in electronics, like a lot of us, started at an early age and a crystal set. This developed into obtaining a ham license (not active at present) and collecting receivers for SWLing. Over the years he has taught vocational high school, did a term in the US navy, installed avionics for 5 years, and built CNC machines for a couple of years.

Presently Bob has the following receivers: Watkins Johnson HF-1000a, JRC NRD 545, ICOM R71A, ICOM R7000, and a Heathkit SB-104A. He casually adds, "For Heathkit fans, I have assembled 253 Heathkit in my time."

If you got a Heath question or a complaint about your Nissan, I would e-mail our newest member at: rddockery@home.com

Welcome to the group Bob, we look forward to your posts.

Date: Fri, 19 Jan 2001 16:44:34 EST
From: Daiungoed@aol.com
Subject: Prem-Rx: RA1792 PROBLEM

Hi, I wonder if anyone here can help me. I have just got a RA1792 , which has not got the optional 9942 freq.standard. I have a spare one, and the leads are there, but when wired up, the receiver does not work. I am certain that the problem lies with the L.O. now having two inputs instead of one. In my other set, which was presumably fitted with the 9942 at manufacture, there is no circuit board mounted TCXO. I do not really want to unsolder the TCXO, so I was wondering if there is a way of disabling it, or perhaps, as the connectors look the same, whether one could remove the co-ax lead from the 9942 to the circuit board and put it instead on the external L.O. input plug, so feeding the 9942 output into the external freq. standard connector on the circuit board, and then selecting the ext. option on the switch provided, so disabling the TCXO. Any ideas gratefully received, Dave

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Date: Fri, 19 Jan 2001 15:32:21 -0800
From: "Greg Bailey" <gbailey@mail.sdsu.edu>
Subject: Prem-Rx: New Member- Jon Iza

Gentlemen:

Jon Iza, a resident of Span, is our latest member. As most of you know, I ask each new member to supply me with some information about their background. From this I typically paraphrase a few lines and make the introduction of the new member. On a few occasions, I have literally copied the information submitted and forwarded it direct. This following bio is in fact one of the copied pieces.

My justification: As you read Jon's bio you will better understand the long technical road he has traveled. His experience is on the opposite end of the spectrum as compared to mine. Using myself as an example- I live in San Diego and enjoy a number of electronic "junkyards" and an excellent surplus store (aka Mike Murphy's). All my life I have been a few miles from all the parts and technical information I have ever needed. I take my hat off to people like Jon who have not had Acro Sales, Heathkit, TRW Swap Meets, Allied Radio, and a few dozen Radioshacks in their backyards. Many of you have communicated to me in your bio information similar to Jon's, specifically that the "road" to radio land has been long and up hill . . . . . .

New Member: Jon Iza-

(Taken direct) My name is Jon Iza and I teach Environmental Technology at the School of Engineering in Bilbao, Basque Country, Spain, as Associate Professor. I started on radio when I was 8 and was given by "The Three Wise Man" (the Spanish Santa) a "Phillips Electrical Engineer", an electronics erecto set. First thing built was the three transistor radio...

When I was 14 I became official SWL EA-4727-U and became proficient on listening with a receiver I built from partial kits. Using interior antennas I logged 130 countries and prepared myself for the ham ticket, that I got in 1978, as EA2SN. At that time, Generalisimo Franco recently dead, a ham ticket was not an easy task, and we had to go to the Police Station for questioning about our activities... the ETA group was in full force, so it was quite an experience.

Military folks didn't trust anyone, and it has continued this way until today. Mil Surplus has been/is inexistent (Ed. note, I think he mean non-existent) in Spain. The only time I was able to use military equipment was in 1982/83 when I "enjoyed" 15 months of compulsory military duty with the Air Force... I ended up being Weather Observer, Flight Desk dispatcher, and even ad-hoc air controller. I used then a Marconi CR150 for casual listening... Even Europe is very hard for Military Surplus, although Internet is opening a wide new market. As my main activity as "radioaficionado" (that's the

oficial -recognized- name in Spanish) is to build low power equipment (QRP) I don't have a huge budget to afford what the dealers ask for a Mil-Spec receiver. And all of you are aware the market is not that big.

I jump, though, on all good offers I see passing by. That way I got an AOR-3030, where I installed Collins filters, a R-5000, that I loaded with InRad filters, and recently a Hagenuk EE-334 which is the German name of a Drake MSR-2. It's in bad shape but I look forward to fix it soon. I'm waiting now for a Harris (sorry, Trans)ceiver, the RF3200, coming from England. (I also have some other transceivers, among them, the Elecraft K2 which works very well as a receiver).

Conditions here are horrible. I live in a medium size town (215000) and the HF spectrum is a horrible mix of everything. Also 3 cell phone companies are fitting lots of buildings with their stuff, so a good receiver is a real need. It's not as bad as in Central Europe, but getting closer.

I look forward to learn from the list. I read about 10 ham journals a month from all over the world - literally- and about 10 lists on Internet, keeping an eye on new developments. From the time I was getting weird looks when I was trying to buy a double gate MosFet in town until now, when I order stuff from antipodal countries, lots of things have changed in radio world. And I'm enjoying many of them!!

Be well,

jon, ea2sn

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Jon- thanks for sharing the above information with us. Jon's E-mail is: Jon Iza [iapizloj@bicc00.bi.ehu.es]

Date: Sat, 20 Jan 2001 12:54:32 -0600
From: Turkisher Dan-CSLC82 <Dan.Turkisher@motorola.com>
Subject: Prem-Rx: Hammarlund Speaker?

Sorry if this inquiry is a bit off topic...I've acquired a nice Hammarlund HQ180 receiver and am looking for the matching S200 (larger) speaker for it. Does anyone on the reflector have one or know anyone who'd like to sell one? Please email me directly. Thanks and regards, Dan cslc82@email.mot.com

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Date: Mon, 22 Jan 2001 08:11:15 -0500
From: "Carcia, Frank A. HS" <francis.carcia@hs.utc.com>
Subject: Prem-Rx: FW: RA6830

> Hi Everyone,
> I recently installed a linear power supply in my RA6830 and
> noticed the voltage regulator on the front panel was running
> very hot. I found the regulator input voltage was around 11.5
> volts. The switcher regulates this voltage at 8 volts
> while the linear is the unregulated rectifier filter cap. The
> power dissipation of the voltage regulator about doubles with the
> linear (with the same size heat sink). The switcher makes the
> regulator run warm so there is no problem. The advantage
> of the linear power supply is the elimination of switcher noise,
> The switcher is very quiet and I rarely hear it. The linear
> has landed in my hot rod model that is the test radio with
> modifications, so I wanted the best. My plan is to remove the
> regulator from the front panel and mount a TO220 case 5 volt

> regulator on chassis side wall behind the IF gain control.
> There is a pem nut pressed into the chassis to support the chassis
> side shield for the remote ribbon cable. The flat
> head screw can be replaced with a longer screw, then the regulator
> can be secured to the chassis without drilling
> any holes. If the pem nut isn't flush I will make a copper heat
> spreader with a hole to clear the pem nut so the spredder
> sits flat on the chassis wall. The wiring from the regulator will
> go directly to the mother board under the front panel
> ribbon connector. The unregulated and regulated voltages are at
> that point. I guess it wouldn't hurt to run a ground
> connection also. The regulator will have the normal decoupling
> caps to prevent oscillation since it will be far
> away from the old location. If a programmable regulator is used,
> two percision resistors will have to be added to set
> the feedback reference. A ground lug can also be installed on the
> mounting screw to terminate the caps.
> The surface area of the chassis side wall will provide ample heat
> sink for the logic regulator. This regulator powers
> A1, A2, A3 and A4 so you don't want it to ever fail in short
> circuit mode.
> My line voltage runs about 121 VAC and the voltages all reflect
> close to high line. fc

Date: Mon, 22 Jan 2001 11:52:14 -0800
From: jan@skirrow.org
Subject: Prem-Rx: Diode info needed

Hi all ...

Is there any way of estimating the PIV for a diode from bench measurement without destroying the diode?? I have some nice bridge rectifiers that are made up of strings of diodes. The construction of the whole unit suggests HV. But how H???

Suggestions gratefully received!

Jan Skirrow

... in rainy Maple Bay, BC, Canada

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http://skirrow.org/Boatanchors/ http://skirrow.org/Classic%20Technology/

Information, Parts, Pictures, Articles

Do you shop eBay? If so ... have a look at mine http://cgi2.ebay.com/aw-cgi/eBayISAPI.dll?ViewListedItems&userid=ba3
****

Date: Mon, 22 Jan 2001 16:34:54 -0500
From: Glenn Little <glittle@awod.com>
Subject: Re: Prem-Rx: Diode info needed

I have a curve tracer that does this. What they do is apply high voltage through a current limiting resistor. The resistor is chosen such that the current through the junction will not be high enough to

destroy the junction. The voltage is raised until the device breaks down. This is the never to exceed voltage. I would suggest that you consider this to be at least two times the device working voltage. The voltage is measured across the device with a scope. You will see the voltage rise as you increase the applied voltage until a point is reached where the voltage rise across the device is not smooth. This is about the breakdown voltage.

Hope that this helps.

73 Glenn WB4UIv

> **********

- -- Glenn Little Engineer HARK Systems, Inc. Voice (843) 764-1560 Fax (843) 764-3692

Date: Mon, 22 Jan 2001 13:50:44 -0800
From: jan@skirrow.org
Subject: Re: Prem-Rx: Diode info needed

Now that's action. Thanks to all who responded. I am honored that the big kahuna himself (Greg) was first off the mark.

Jan

... in beautiful British Columbia, Canada

*** http://skirrow.org/Boatanchors/ ***

Date: Tue, 27 Mar 2001 19:46:34 -0800
From: "Greg W. Bailey" <gbailey@mail.sdsu.edu>
Subject: Prem-Rx: New Member- John Midwood

Gentlemen:

John Midwood has joined our List from the small town of Basingstoke, UK. I am not sure if John is our youngest member or not, but I know at 25 he is up for the nomination. He confesses to taking apart radios in his (Ed. note: get this!) "youth" to see what made them work, but seldom was successful in getting them back together. He earned a BEng in Telecoms Engineering and has been working for an independent test house that does Type Approval of C-Phones. He has done test for Ericsson, Nokia, Panasonic, Xircom, RIM, TTPCom, as well as the American

PCS 1900 market. Test gear consists of: Rohde and Schwarz, HP and Racal, NoiseCom, Anite....

His receiver list consists of some vintage gear such as the Hallicrafters S20, SX24, S29, Murphy B40 and B41 (Naval receivers), RCA AR88LF, RA17L, plus SSB adapter, LF convertor, and P326 receiver. Each has been recapped and restored back to day one in operation. His top of the line receiver is the RA1792. John found our List by doing a search for the RA 1792 (6790) on the internet.

He has been known to generate a little RF under the sign of G7PTD. (50MHz and above).

You can drop him a few welcome words at: john.midwood@rfi-wireless.com,

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premium-rx-digest Monday, January 29 2001 Volume 01 : Number 104

Date: Tue, 27 Mar 2001 20:18:23 -0800
From: "Greg W. Bailey" <gbailey@mail.sdsu.edu>
Subject: Prem-Rx: New Member- Craig McCartney

Gentlemen-

Our second new member for the day is Craig McCartney, of Redwood City, California. His QTH is at the 550 foot level on a ridge somewhere between San Francisco and San Jose (Ed Note: darn near ground zero for the San Andreas fault line if my memory serves me right?). He has been a ham since high school (presently WA8DRZ) getting his license in the late 50's. At one time Craig was into RTTY, then AMTOR and in fact was part of the development team for APLink and WinLink.

Like many of us, Craig enjoys restoring 390A and presently has three connected in a diversity setup. There is also a Drake R-4245 and a Ten Tec RX-330 (non-front panel predecessor to the RX-340). Then there is a TR-7A/R-7A combo as well as an ICOM R71A and 7000 for catching any VHF/UHF signals.

With all the receiving hardware there is a need to find some RF and that is accomplished by "Alpha-Delta sloper, a 10 MHz dipole, an RF Systems MTA (passive) and an RF Systems DX-10 (active). These feed a set of four Hermes 1x4 multicouplers, two Stridsberg 1x4 multicouplers and a BNC patch panel with pads and splitter/combiners available as needed".

Craig is the VP of Quality Engineering for Globe Wireless, a maritime communication company. They "operate a worldwide network of 18 HF stations with over 150 active channels. Most use the Ten Tec RX-330 series receivers".

Our newest member's E-Mail address is: craigmc@pacbell.net

Date: Sun, 28 Jan 2001 08:13:33 -0800
From: Craig McCartney <craigmc@pacbell.net>
Subject: Prem-Rx: Hello, and RX-330 issue

Hello to all,

I thought I would send out an initial note after Greg's nice introduction.

My RX330 does not get as much use as it could, partially lacking good software to control it. Does anyone on the list have an RX-330 or 331 and use it regularly? If so, what software do you use? Are the commands the same as the RX-340?

I started off using Hyper Terminal and typing in the commands raw, a real pain. Recently, I obtained an 'alpha' version of a control program from Ten Tec. It is based upon the RX-320 software and is somewhat of an improvement over Hyper Terminal. However, it has bugs and does not control many of the 330 functions.

Any help or comments appreciated.

Craig

Date: Sun, 28 Jan 2001 18:25:58 -0800
From: Craig McCartney <craigmc@pacbell.net>
Subject: Prem-Rx: FW: Ten Tec RX-340

Well, here is the answer, for what it is worth.

Craig

- -----Original Message-----

From: DXtra Inc. [mail To:info@dxtra.com] Sent: Sunday, January 28, 2001 5:15 PM
To: Craig McCartney
Subject: Re: Ten Tec RX-340

Hi Craig:

We plan to support the RX-340 in early 2nd quarter of this year. On deck first is WorldStation(TM) for the Ten-Tec Pegasus / Jupiter. Since we expect to sell very few RX-340 copies of WorldStation(TM) , the cost of the program will reflect development costs. Retail price will be in the $199 range.

Thanks for your inquiry.

Dxtra Customer Support

Date: Mon, 29 Jan 2001 20:27:37 -0600
From: John Bryant <bjohn@provalue.net>
Subject: Prem-Rx: Fwd: Re: Software for the Ten Tec 340

For those of you interested in driving the TenTec RX-340 with software, here is an answer that I received recently from visualradio.com. I've not followed it up further

John Bryant

> From: "Colin Trass" <cgt@visualradios.com>
> To: "John Bryant" <bjohn@provalue.net>
> Subject: Re: Software for the Ten Tec 340
> Date: Fri, 12 Jan 2001 17:38:06 -0500
>
> Hello John:
> Thank you for you inquiry related to 340 software. Yes, I do have software
> that I wrote for 6790's -- additionally the Racal 6830 IEE488 interface --
> and the more modern TenTec 33X series.

> The software as it stands, supports a single receiver and a 100 memory
> database. The main activity at the moment is development of support for:
> Diversity, Multiple receivers and a full Microsoft Access Database.

> Over the next few weeks I will be posting the single user version for trial.
> The TenTec 33x version (same commands as the 6790 plus a few more) has been
> in the field for testing for 6 months with a happy customer.

> I will attach a JPG of the current version -(in 6790 mode -- the Ten Tec
> Knobs have been dulled)) - although the new version is undergoing major
> updates.

> Please let me know what your needs are so I can better respond. The basic
> version is $50. I plan to price the advanced version based on the
> application and quantity;

> Additionally, I am currently testing the software using wireless links so
> that the Antenna and Receiver can be placed in a quiet location -- and
> controlled remotely via remote 232c links.

> The 331 and 340 have identical circuitry -- the 330B is pretty good too --
> just a bit earlier.
> Hope this helps -- and please do not hesitate to email for additional info.

> Colin G Trass

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premium-rx-digest Thursday, February 8 2001 Volume 01 : Number 105

Date: Thu, 01 Feb 2001 11:38:51 -0800
From: jan@skirrow.org
Subject: Prem-Rx: Cooling the HF-2050

Hi All ...

I know there's been a lot of discussion in the past about the heat problems of this otherwise superb radio. I recently did a PSectomy on a friend's HF-2050 to remount the power supply externally. As usual I took some pix and wrote up a short piece on it.

The most direct URL is To:

http://skirrow.org/Boatanchors/articles.htm

Please don't bookmark anything other than my Boatanchors homepage though, as the sub-structure changes frequently!

You will need an Acrobat reader. If you don't have one there is a link on the above page to download one.

Jan Skirrow

... in beautiful British Columbia, Canada

*** http://skirrow.org/Boatanchors/ ***

Date: Sun, 04 Feb 2001 17:34:41 -0700
From: Rob &Terri Sherwood <rob@sherweng.com>
Subject: Prem-Rx: Need advise

I need a modest sized, solid-state, rack mount, NON-synthesized, general coverage receiver for phase noise testing. I can use my Sherwood Drake R-4C, but it is not general coverage. Possibly a Racal or WJ radio would be good, but I don't know what models to consider. SSB filter in the 2.1 to 3.2 kHz range would be OK. Dynamic range 90+ dB. Suggestions?

Date: Sun, 04 Feb 2001 20:32:23 -0500
From: Al Klase <skywaves@bw.webex.net>
Subject: Re: Prem-Rx: Need advise

Rob Sherwood wrote:
> I need a modest sized, solid-state, rack mount, NON-synthesized, general
> coverage receiver for phase noise testing.

Geez, it seem like there was just a fleeting moment in time, like the late sixties, when there were solid-state receivers that weren't synthesized. (A friend of mine maintains that if you remember the sixties, you weren't really there!) Anyway, the Racal RA6217 comes to mind. Kind of a solid-state RA.17 (Wadley loop) with product detector and decent filters. It occupies 3.5" of rack.

Regards, Al - -- Al Klase - N3FRQ skywaves@bw.webex.net Flemington, NJ 08822 Web Page: http://www.webex.net/~skywaves/home.htm

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Date: Sun, 04 Feb 2001 17:36:43 -0800
From: Craig McCartney <craigmc@pacbell.net>
Subject: RE: Prem-Rx: Need advise

Would a Drake R-7 or R-4245 meet your requirements? Of course, there is always an R-390A :)

Date: Mon, 5 Feb 2001 04:03:35 EST
From: CLeyson@aol.com
Subject: Prem-Rx: Phase noise testing

Hi Rob, I take it your'e measuring oscillator phase noise ? In which case I have two suggestions.

1. If the noise levels are high -130dBc/root Hz or worse then most spectrum analysers will do the trick, or

2. For low noise oscillators (-140dBc/root Hz or better) then almost any good receiver will do provided you use a crystal oscillator for the first LO. With a good crystal oscillator you should be able to achieve -150dBc/root Hz noise levels (Pierce for example)

Most "of the shelf" Collpits type oscillators (the ones with TTL/CMOS outputs) can only guarantee -125dBc/root Hz noise levels.

Date: Mon, 5 Feb 2001 04:54:35 EST
From: CLeyson@aol.com
Subject: Prem-Rx: Phase Noise again

I forgot to mention a few very important things !

1. The receiver used to measure phase noise must filter out the carrier. You won't have enough dynamic range to cope with the carrier and the noise, unless the noise is really bad.

A direct conversion approach is usually the easiest, with a D.C. block after the first mixer. This does mean that the receive L.O. is set to the same frequency as the signal you are trying to measure.

In an ideal world the L.O. should be phase locked to the signal you want to measure.

You could always try the old fashioned method of splitting the signal you want to measure and using that as the L.O. This does need a 1/4 wave line to get a 90 degree phase shift otherwise the carrier won't cancel in the mixer.

P.S. all the figures I quoted in the previous email were at 1kHz offset. Some manufactures quote for far out phase noise or worse still don't even give an offset from the carrier. Far-out (100kHz or so) is only worth considering if you are concerned with reciprocal mixing, close-in for in band signals.

Date: Mon, 05 Feb 2001 08:57:08 -0800
From: John Reed <jreed@ponca.net>
Subject: Re: Prem-Rx: Need advise

I have a couple of receivers here with these specs. The best would be a Sylvania R1414/URR. This is an analog tuned general coverage solid state with +91 dB dynamic range, has SSB capability and is very quiet. The problem is there are very few (if any) of them around for sale. The other would be the SAIT MR1411 receiver, also an analog tuned general coverage with 2.7 kHz SSB filters, however I think the dynamic range is around +80 dB. This one also would be hard to find.

The only W-J receiver that comes to mind is the 373A. The dynamic range on this one is really poor, around 50-60 dB, and it doesn't have SSB.

There aren't too many solid state analog tuned communications receivers, come to think of it.

John Reed

Date: Mon, 5 Feb 2001 16:53:40 +0100
From: Karl-Arne.A.Markstrom@telia.se
Subject: Re: Re: Prem-Rx: Need advise

Gentlemen,

This appears to be a knotty problem.

To accurately measure phase noise at 1 kHz spacing it takes a very low-noise mixing oscillator in the measurement setup.

One possible arrangement that comes to my mind would be to substitute the first LO in a synthesized receiver with a high-grade VHF signal generator.

I have used this technique in the past when measuring transmitter driver spectral purity, substituting the two-loop synthesizer in a Standard Radio CR302A with the HP8640B.

From published data on the HP8640B, it should be about 20 dB better than the best receiver or transmitter synthesizer that I know of, the DDS one in the Standard Radio CR91 (conservatively rated at -107 dBc/Hz at 1 kHz spacing).

The newer HP signal generators would be even better, and I doubt if any tunable HF receiver LO could outperform a state-of-the-art stabilized VHF signal generator.

Hope this helps and 73/

Karl-Arne Markstrom SM0AOM

= Senior Radio Engineer Maritime Networks Telia Mobile AB Nacka Strand Sweden Phone +46-8-6017171, Mobile phone +46-70-6636575 Fax +46-8-6017959

Date: Mon, 5 Feb 2001 11:26:38 -0500
From: "Carcia, Frank A. HS" <francis.carcia@hs.utc.com>
Subject: RE: Re: Prem-Rx: Need advise

Hi, I don't know of any generator cleaner than the HP8640B. This is a great idea for a quiet LO receiver source. The operator manual for this generator has some test setups for doing phase noise measurements. I don't remember the set up but it would be a good way to check a source. I think the generator and the source are put through a mixer and the result is the noise sidebands. Noise is measured with a low frequency spectrum analyzer. fc

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Date: Mon, 05 Feb 2001 16:17:50 -0500
From: Marvin Born <mborn@wbns.com>
Subject: Prem-Rx: Looking for Drake R4

Gentlemen,

As the subject line says, I am looking for a Drake R4. With filters and noise blanker would be great; however, empty slots is fine also. I just finished repairing a TR-7 and would like to get the matching R7

receiver. If anyone knows of one that is available please let me know. email is mborn@wbns.com and phone is 614 436 9000.

Marvin Born K8XU

Date: Tue, 6 Feb 2001 23:42:43 -0600
From: "mac mccullough" <w5hpm@airmail.net>
Subject: Prem-Rx: harris cabinets

I think I have shipped all the orders that I have received money for...With the exception of Mike T. am I missing anyone..thank you..mac/mc

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Date: Thu, 08 Feb 2001 16:55:34 -0800
From: jan@skirrow.org
Subject: Prem-Rx: Harris 590A preselector info needed

Hi gang!

Can anyone provide pinout info on the 590A preselectors?

Jan Skirrow, VE7DJX

... in beautiful British Columbia, Canada

*** http://skirrow.org/Boatanchors/ ***

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premium-rx-digest Thursday, March 1 2001 Volume 01 : Number 106

Date: Mon, 19 Feb 2001 22:45:56 -0800
From: "Walter (Volodya) Salmaniw, MD" <salmaniw@home.com>
Subject: Prem-Rx: Further HF-2050 heat reduction experiments or "The Skirrow modified HF-2050 receiver".

I think that Jan Skirrow has taken a quantum leap in addressing the question of heat suppression in the Rockwell/Collins HF-2050 receiver. I supplied the guinea pig receiver to Jan, so that he could outboard the existing power supply. Beyond this, the next step by someone in the group should be to totally replace the old supply with an equally quiet, but cool running power supply. Upto now, several of us have talked about it, but I've yet to see anyone take the plunge. In reading this report, please refer to Jan's article in pdf format at: http://www.skirrow.org/Boatanchors/Cooling%20the%20HF-2050.pdf

The major concern I had was the introduction of noise into the sensitive circuitry of the receiver. I'm happy to report this has not been the case at all. Granted, Jan purposely kept the wiring short to lessen this possibility. I also used a sensitive portable in the vicinity of the power supply and found no noise on the shortwave bands tested. Now for the heat results. I used my trusty 3 channel temperature probe. For simplicity sake, I used the degrees F scale. The first column represents internal receiver temperature in the vicinity of the CPU chip. The second temperature is ambient, while the third is on the externally mounted power supply. I tried various methods as shown. A simple small 12v muffin fan, surface mounted over the CPU on the top cover to draw warm air out was added after 2 hours.

In Out Power Supply

Start 66 66 1 hour 99 67 2 hours 108 69

Fan added at 12volts 30 seconds 100 1 minute 98 3 minutes 95 70 120 30 minues 91 70 122

Fan voltage reduced to barely audible (probably where I will want to use in actual use) 93 69 122 1 hour later 91 67 122 overnight 87 61 116

Fan disconnected for 30 minutes 102 61 116

Discussion: Several observations noted:

1/ No increase in receiver noise was noted 2/ A major decrease in internal receiver temperature noted. Recall that my initial experiments with this receiver showed internal temperatures easilly reaching over 150 to 160 deg F within 30 minutes of start up without cooling. 3/ Being paranoid, or at least very interested in cooling, a very simple cooling muffin fan reduced the internal temperature to negligible values. With anything like my "supercooled" units, with multiple fans mounted on top and bottom covers, I'm sure I could attain near ambient temperatures, but this would not really accomplish anything but increase ambient noise.

4/ The temperature of the power supply, now being external did not rise to the extent found when internally mounted. A win-win situation in my opinion.

As always, I'll be interested in hearing comments from the group over my experimentation above, as well as your own observations!

.....Walt.

Date: Tue, 20 Feb 2001 08:06:39 -0500
From: "Carcia, Frank A. HS" <francis.carcia@hs.utc.com>
Subject: RE: Prem-Rx: Further HF-2050 heat reduction experiments or "The S kirrow modified HF-2050 receiver".

Hi, I think someone said this radio uses a 80186 style processor. That part has the die bonded to the bottom of the case so a heat sink on top will not be very effective in reducing the temperature of the die. We built a system with this part some years ago and used a ground plane under the part with a heat transfer pad between them. fc

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Date: Tue, 20 Feb 2001 08:46:52 -0800
From: Paul Wende <pwende@aimtronics.com>
Subject: Prem-Rx: Further thoughts on 2050 heat reduction

Hi group,

I haven't played with the 2050 in a while but when I first bought it, I too, did some research into why there was so much heat coming from such a simple supply. I read all of the work being done with thermisters, fans, heatsinks and liquid nitrogen, and as interesting and well researched all of this was, it still didn't address the root cause of the heat. I did some voltage measurements and it looks like the supply was designed to work on quite a wide range of input AC voltage, maybe 85 - 130. I tried this with a variac and found it would work just fine on about 90VAC, and ran much cooler. I suppose that shipboard generators could fluctuate quite a bit and you wouldn't want your RX to die just because of a low voltage problem.

Anyway, there is way more voltage ahead of the regulators than need be for good regulation. If I remember correctly, somewhere in the order of 27VDC for the 15 volt supplies and maybe 13 volts for the 5 volt supply. Obviously, this is where the heat is generated and I discovered that the power xfmr has multiple primary taps, and that if one moves the tap to the highest voltage position, the overall secondary voltage drops significantly. Less voltage across the regs means less heat to dissipate and thus an easy step to make in the path to overall heat reduction. If the tap change doesn't bring the temp down into a comfortable range then perhaps a different xfmr could be installed with lower secondary voltages.

Food for thought anyway. Look forward to hearing from anyone else who also tries/tried this.

73 Paul VE7KHz

Date: Tue, 20 Feb 2001 12:15:10 -0500
From: "Carcia, Frank A. HS" <francis.carcia@hs.utc.com>
Subject: RE: Prem-Rx: Further thoughts on 2050 heat reduction

Now that is the real problem with an easy fix! I have the same problem with my linear supply in a RA6830.

Date: Thu, 22 Feb 2001 09:19:50 -0800
From: jan@skirrow.org
Subject: Re: Prem-Rx: Further thoughts on 2050 heat reduction

At 08:46 AM 2/20/01 -0800, Paul Wende wrote:
> wide range of input AC voltage, maybe 85 - 130. I tried this with a variac
> and found it would work just fine on about 90VAC, and ran much cooler. I
> suppose that shipboard generators could fluctuate quite a bit and you
> wouldn't want your RX to die just because of a low voltage problem.

Hi Paul ...

I don't recall what the milspec was on line voltage for the 2050, but I do recall it as quite wide, which presumably explains the excessive dissipation required across the pass transistors - altho I still think Collins just chose an off the shelf supply that more than met the requirements, and stuck it in w/o concern for the heat.

Your suggestion of changing the transformer tap is a good one, and simple compared to my PSectomy approach. I didn't do it, however, mostly because I have concerns that aging circuit boards and components need as much protection as possible from excess heat so that the PS had to be extracted. I don't have any concerns about the PS itself breaking down, as it is simple,the semis involved are readily available and the whole thing can be replaced if necessary. All the other approaches (variacs, fans etc.) leave the culprit in place.

The Collins construction generally seems to be of very good quality, but a recent experience with a Racal of similar vintage shows just how much damage can be done by moderate heat over a long period on pcbs and components. For the Racal, most of the problems were in the closed aluminum cases containing the RF/synthesizer components. I've not opened up any of the sealed boxes on the 2050, so who knows what problems lurk therein! So best to get the extraneous heat out to the degree possible. The thought of repairing the HF-2050 is daunting - so prevention is critical!

Anyway, I'd like to do an addendum to my article on the PSectomy posted to my website and would like to include your comments (edited somewhat). Ok???

Jan Skirrow

... in beautiful British Columbia, Canada

*** http://skirrow.org/Boatanchors/ ***

Date: Thu, 22 Feb 2001 18:27:37 -0500
From: jeffa@ix.netcom.com
Subject: Re: Prem-Rx: Further thoughts on 2050 heat reduction

After reading one of the prior posts regarding reduction of heat dissipation by adjusting the power supply taps , I took a look at my 2050 power supply. There are three primary taps, and unfortunatly mine was already connected to the maximum AC input tap, meaning that I can't adjust it any further to decrease output voltage.

With the unit out of the receiver I decided to make some measurements. The voltage across the +15 and -15 v series pass transistors was about 9 volts each, while the voltage across the 5.2 volt pass transistors wass 4.8 volts (with an AC input of 122 VAC). Power dissipation from these parts terefore totals about 40 watts.

By the way, if I could drop the AC input from 122 VAC to about 104 VAC, I would halve this dissipation and still maintain at least 3 volts headroom, minimum, across the transistors.

The power supply design seems to be similar to commercially available supplies. I measured the pass-transistor voltage drops across a similar commercially-available supply, and they were almost exactly equal to those measured in the Collins (when running at 122 VAC).

Interestingly, although my AC mains measured 122 VAC, at the power supply transformer's primary I measured 133 VAC, which had me scratching my head for a bit until I looked at the schematic. There's an L-C network in the AC input (not the standard input filter module, but instead consisting of those big metal blocks on the inner side of the right side of the chassis) that looks like it's some sort of series resonant network, and most likely the likely culprit.

While playing around with the receiver last night I experienced some flakey operation after the unit had been on for a bit (lockup, crazy lcd display). From prior posts it seems that failure of C5 in the 5.2v supply is often the cause of such problems.

Tonight I plan, time permitting, to change out cap C5. (I'm also borrowing the company's Fluke IR temperature probe to make some more extensive head-dissipation measurements.) I was a bit puzzled as to why it was this part, out of all of the parts in the power supply, that would fail, but I've come up with two theories that might explain it: First, C5 is quite close (too close, in my opinion) to the dual-diode block mounted on the side of the supply. This diode block probably dissipates in the region of 4 to 5 watts of power, and, due to the proximity of C5, this heat can't be good for the cap. My second theory is that there may be too much ripple current through the cap. Ripple currents cause heating within electrolytic caps (due to their ESR's), and for this reason such caps have max. ripple current ratings. This cap is filtering a half-wave rectifier (rather than full wave) which (I believe) has more ripple current than a full-wave rectifier. I'm hypothesising that ! ! the failure of C5, and C5 alone, is due to a combo of these two factors: heat from the diodes and ripple current through the cap.

I plan to mount C5 such that it sticks up a bit on its leads so that I can bend it away from the diodes (in a linear supply design such as this lead length ain't critical). I also plan to use a low-ESR (i.e. high-ripple current) cap, just in case.

By adding a diode I could change the half-wave rectifier to a full-wave, but I'm guessing that ripple current is a secondary phenomena compared to the heat radiated from the diodes. Maybe I'll borrow the company's current probe and make some measurements...

If anything interesting pops up, I'll let the group know.

- - Jeff Anderson, WA6AHL

By the way, if anyone knows how to calculate ripple current in half-wave vs. full-wave rectifier power supplies (given an unknown ESR), short of clamping on a current probe, please let me know!

Date: Sat, 24 Feb 2001 00:44:37 -0800
From: J Collins <jcollins@referencevideo.com>
Subject: Prem-Rx: premium demods to go w/premium rx's

Hi group,

I'm a bit off topic, perhaps, but I figured it worth a try-might any of you premium receiver owners happen to indulge in premium FSK demods as well? I just scored two: both Frederick Electronics, #1- model 1280 and #2- model 1632. Would anyone have a manual or be game to copy a manual for either or both? I can, o' course, pay for the goods.

please respond direct to me (off list).

Thanks for the bandwidth

John Collins

2 x Racal 6790/GM 2 x Cubic R3030 1 x Icom R9000

Date: Sat, 24 Feb 2001 05:41:13 -0700
From: "John Fallows" <john.fallows@home.com>
Subject: Prem-Rx: WJ8711

Just a note to say that ERGO now runst he 8711 as well as the HF1000. Thanks to Don Nelson for his help in the conversion.

ERGO Radio Software http://swldx.com SUPPORT * mail To:ergo@swldx.com * mailing list - http://ergoradio.listbot.com/ * MSN Messenger and NetMeeting via VE6MBA@hotmail.com when available

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Date: Sat, 24 Feb 2001 09:32:19 -0800
From: Craig McCartney <craigmc@pacbell.net>
Subject: RE: Prem-Rx: premium demods to go w/premium rx's

On the subject of premium FSK demods: I have two Electrocom Model 400 units that I used for diversity reception, currently in the rack but not connected (any day now...). I also have a Dovetron unit that commanded a premium price and offered mediocre performance (my old ST-6 was twice as good!).

Craig

Date: Mon, 26 Feb 2001 21:23:53 -0800
From: J Collins <jcollins@referencevideo.com>
Subject: Prem-Rx: THANKS!!! premium demods.....

Hi group,

I wanted to burn just a hair more bandwidth with this note of sincere thanks to each list member that responded with info re my inquiry on Frederick 1280(A) and 1632 fsk demods. Over the weekend I went from desparate and info-less to warm/secure and well informed. Responses ranged from immediate I/O and ops info to longer term sourcing for manuals.

I am quite impressed with the technical knowlege base and on line navigation skills resident on this list and hope that I, should the need arise, am able to return the favor.

Again, thanks to you all-I know any one of you would come forth when the question involves your expertise.

John Collins _____

Date: Fri, 2 Mar 2001 02:18:39 EST
From: Daiungoed@aol.com
Subject: Prem-Rx: HARRIS RF590A

Hi, Does anyone know if it is possible to decode the serial number and options numbers to produce the options fitted, and possibly the age of the set? Any replies received gratefully, Dave

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premium-rx-digest Saturday, March 10 2001 Volume 01 : Number 107

Date: Thu, 1 Mar 2001 23:59:32 -0600
From: "mac mccullough" <w5hpm@airmail.net>
Subject: Re: Prem-Rx: HARRIS RF590A

I did this several weeks ago...more like about 6 weeks ago...I will see if I can find my post...I still have the printed stuff...you should have a 13 digit CONFIGURATION code on the left side of the mid rail ...I was able to get a close mfg. time by the date codes on the band width filters...the 590 will only have a 10 digit code...mac/mc

your mileage will vary greatly, and be poor...

Date: Mon, 5 Mar 2001 11:08:51 -0500
From: "Carcia, Frank A. HS" <francis.carcia@hs.utc.com>
Subject: Prem-Rx: Racal RA6830 ; Taming the A9 IF

Hi, My RA6830 made weird sounds when the antenna was disconnected. I tracked it to the A9 IF module. The IF amplifier is on the verge of oscillation and has a noise level high enough to cause swishing noises in the audio. A9- J3 IF output was measured minus 40 to 50 dBM noise. I was able to reduce this noise by 10 dB with two simple changes. First, I soldered the U3 UA757 pins 5 and 9 ground pins on the top side of the board to the ground plane. When the board was produced solder didn't flow up the pin very well. I removed the two resistors that were beside the IC to gain better access. Next I found a piece of unterminated ground plane under the amplifier. I scraped the solder mask off it wide enough to solder a bus wire to it between pins 5 and 9. This terminates the ground pins of the IF amplifier to the piece of floating plane. The result was ambient noise dropping to minus 50 to 60 dBM. The speaker noise is now a steady hiss when the volume is turned up. My radio has been modified using the DF high dynamic range second mixer with a Mini Circuits PAS1 attenuator added for AGC. The performance has not been checked yet, but I can still hear a signal in noise at minus 135 dBM (HP8640B) fc

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Date: Sat, 10 Mar 2001 08:46:27 -0600
From: John Bryant <bjohn@provalue.net>
Subject: Prem-Rx: Selling Three Waves of Premium Gear

Hi folks,

I'm trying to pay for my new TenTec 340 (absolutely love it!) and some other new goodies, so I'm selling off a bunch of gear that might be of interest to many list members. The sale is happening in at least three, maybe four, waves generally ending a week apart on Sunday night after being posted Thursday evening, 10 days earlier. Each wave will have at least one premium receiver, starting this week with my R-Collins 2050. If you are interested, this URL should lead you to an ebay "Search by Seller" for my stuff... I'm "radpro" on ebay.

http://cgi6.ebay.com/aw-cgi/eBayISAPI.dll?MfcISAPICommand=ViewListedItems&userid=radpro&include=0&since=-1&sort=2&rows=25

Thanks, John Bryant

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premium-rx-digest Thursday, March 22 2001 Volume 01 : Number 108

Date: Wed, 14 Mar 2001 15:52:10 -0800
From: "Greg Bailey" <gbailey@mail.sdsu.edu>
Subject: Prem-Rx: New Member- Mikael Kostet

Gentlemen:

Caution- The participation of this new member SIGNIFICANTLY raises the technology bar of this List- READ ON

> From Sweden, in fact from Umea located 63 degrees 50.3 North, we find our newest member. Mikael Kostet, has been involved with the "wireless" business for the past 20 years. Since 1988 he has headed (and CEO) the R&D for Orexis Communications. He reports in the near future his company will have a new web page (www.orexis.se) just incase you want more details.

Mikael is active under the call sign of SM2KOT, but admits that time limitation and other distraction have attenuated his RF generating ability.

As I reviewed our newest member's bio I noted that Mikael neglected to draw my attention to one unique item. Seems one of Mikael's receivers can be remoted from the internet. That is right sport fans, this new member has connected an SRT CR-91 to the web so you can operate it from the warmth of your southern latitude homestead (See address below). Here is a partial list of Mikael's collection.

Collins 51-S1 Collins 651-S1 Collins 51J4 SRT CR-91 (One web controlled on http://194.165.225.6) SRT CR-304 Telefunken E-1501 Dannebrog elektronik MR6000 Icom IC-R71E Icom IC-R9000 Icom IC-R7100 Icom PCR-1000 Icom PCR-100 R&S ESM500 Racal RA1792 Racal RA117 Drake R7A JRC NRD-535D Plessey PR-155 Plessey PR-1553 Eddystone EC-958 Hammarlund SP-600 Plath SFP-5000 (Direction finder) Multi couplers R&S NV 14T Multi couplers Collins FSK analyser R&S GA082

Congratulations Mikael on your internet connection. Welcome to the List.

Greg

Date: Fri, 16 Mar 2001 11:04:00 -0800
From: jan@skirrow.org
Subject: Prem-Rx: TMC Info Request

Hi All ...

A pal has asked if I know anything about the likely market value of a TMC GPT-750 transmitter. He has a line on one and needs some idea of what it might be worth. This isn't bang on topic, but I figure this group may be able to help.

Jan Skirrow, VE7DJX

... in beautiful British Columbia, Canada

*** http://skirrow.org/Boatanchors/ ***

Date: Fri, 16 Mar 2001 21:19:36 -0500

From: "Tony Ward" <tonyward@home.com>
Subject: Re: Prem-Rx: New Member- Mikael Kostet

Hi Greg, and a warm southern (G) welcome to Mikael. As soon as I saw that mention of Umea in Greg's warm-up note Mikael I realized who you just had to be. I have enjoyed fiddling with your most excellent SRT CR-91 on many long winter nights from here, and have found it a most enjoyable way to tune in some of those more difficult Russian catches from here. Although not apparently on tonight I found it great fun to tune in Magadan 5940 remotely, and check stations such as Turkmen 5015, or Urumqi 5800 --- some of these are difficult occasional loggings from here. I also enjoyed tracking the Afghanistani as it drifted down from 7061 one night --- though on that occasion my direct reception (mostly on a JRC 535D or TenTec 320 with the Web going in one input, and the TenTec through another) was better. Sitting here right now listening to the late night show from the old RIAS (no more) on 6005.

Even more fun has been tuning through the European longwave bands. Anyway, you certainly have a nice set-up there and by far my favourite Java Radio!

Tony (VE3NO)ComputerViz, NYAA StarFest On-Line

tonyward@home.com tward@spanit.com http://www.nyaa-starfest.com

No sheep were harmed in the creation of this message ...

Date: Sun, 18 Mar 2001 15:26:04 -0500
From: "W.J. Ford Surplus Enterprises" <testequipment@falls.igs.net>
Subject: Prem-Rx: HF-2050

Greg,

I have just learned about your refector group for the HF-2050, and was wondering if we could join up. I probably don't have much to offer the group technically, but am interested in the discussions etc. as I did buy one of the sets for my personal use, and will be setting it up in the radio room (some day when we get time to play :).

Thanks & regards, Ron Ford

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*** Availability of all items is subject to prior sale
********** ***
W.J. Ford Surplus Enterprises / RF Science & Technology P.O. Box 606, 21 Market St. N., Smiths Falls, Ont. K7A 4T6 Canada www.falls.igs.net/~testequipment/ www.falls.igs.net/~rftech
testequipment@falls.igs.net rftech@falls.igs.net Phone: +1-613-283-5195 (9:00 am - 4:00 pm EST)
Fax: +1-613-283-0637 (24 hr/day)
********** **

Date: Mon, 19 Mar 2001 13:28:42 -0800 (PST)
From: Rodney Bunt <rodney_bunt@yahoo.com>
Subject: Prem-Rx: Getting on board.

I have been in contact with Walter (Volodya) Salmaniw, MD" <salmaniw@home.com> and he suggested that I contact you. I have recently purchased a Collins HF-2050 and am interested in "High End" Recievers.

My background is in Electronics and Communications and Digital Electronics, so I have quite some skills in this obsolete technology.

I have also had a 1 year stint in Antarctica with the Australian National Antarctic Expeditions, I was the HF Communications Radio Officer.

I live in Sydney Australia.

Any help would be appreciated, in getting on the Premium-RX List.

Regards,

Rodney Bunt rodney_bunt@yahoo.com

= = = = = Regards,

Rodney Bunt rodney_bunt@yahoo.com M:0414-437412 F:9899-9451

Date: Tue, 20 Mar 2001 06:39:39 -0800
From: "Greg Bailey" <gbailey@mail.sdsu.edu>
Subject: Prem-Rx: New Member- Rodney Bunt

Gentlemen;

Our newest member is Rodney Bunt, a citizen of the city of Sydney, Australia. Presently, Rodney is operating a Collins Rockwell 2050 and was recommended for membership by Walt Salmaniw.

Rodney's background includes a 1 year stint in Antarctica with the Australian National Antarctic Expeditions, where he was the HF Communications Radio Officer.

He technical background includes Electronics, Communications, and Digital Electronics.

Please give our newest member a welcome at; rodney_bunt@yahoo.com

Greg

Date: Wed, 21 Mar 2001 10:04:26 -0800
From: "Greg Bailey" <gbailey@mail.sdsu.edu>
Subject: Prem-Rx: List news-

Two Items of News-

1) I have been contacted off line by a non-List member (Jerry Lockett jlockett@onemain.com), who would like to purchase a "Premium-Rx". If you have a piece of equipment that you are interested in selling, you may want to contact him directly at the above address.

2) When the List was first started I wrote and posted a short summary every three months. It typically included the total number of members, new names to be added, topics, etc. WELL . . . . the "black hole of time" aka a new job at the university entered my life, and my quarterly reviews were abandoned. However, I cannot help but announce an anniversary the List recently celebrated,. . . . . It was just two years ago that the initial 25 members agreed upon the definition of a premium receiver and the criteria for membership to this List.

Since that time- two members have quit, one in anger and the other who moved out of country. The Rippel "kid" has been on and off the List a few times, I accidentally unsubscribed myself once, the server bit the dust one time (and with the CA rolling blackouts, it may happen again), Ben and I were in Murphy's once and heard some guy asking about a Harris 590 pre filter.... the owner of the voice was none-other than Herschel P. McCullough (aka as Mac), we just added our 140+ members - Ron Ford and Nolan Lee (bio to follow).

This anniversary celebration would not be complete without thanking Jim Pruitt (wa7duy@eburg.com), who continues to keep our Web Site up to date. Much thanks Sir James! And to all of you that post to the List, and to myself off line, my thanks for making this thing work!

Greg

P.S. For those who have asked- Bio for Bailey, Greg:

I got hooked on "smoke and mirrors", my nickname for electronics, when a youngster. Licensed in 1957 as K6QPV, I still generate some RF now and then but usually > 144 MHz. I started teaching at ASU in Electronic Technology 1968 then transferred to SDSU's college of engineering in 1982. I bought my first 390 in Germany while working for the Department of Defense in 67. The poor thing took up space in my university lab floor for almost 30 years until I bumped into the "Rippel" who motivated me to restore same. That progressed to bigger and better, and after receiving approval to obtain a premium-rx for the university's communication lab, I met Murphy for the first time. A change in direction took me to Cubic, who donated a radio to the SDSU. Still hooked, Rippel redirected me to a 2050 for my personal use, and because of the need to share information on the 2050's HEAT, I started the List (Chuck named it "Premium-Rx"). The new friends I have met through the List have made it a very rewarding experience!

I have two wonderful sons and the world's first class wife, that humors me by putting up with my wacko hobby. Nancy and I just bought a house which, at the 900 foot level, is ideal for UHF. I plan to retire next year and start my second vocation- PLAYING IN MY SHACK FULL TIME.

Date: Wed, 21 Mar 2001 11:53:54 -0800 (PST)
From: Rodney Bunt <rodney_bunt@yahoo.com>
Subject: Prem-Rx: HF-250 operation/conversion to 240v 50Hz Power & Controll Software ?

I am a new mwmber to the Premium Rx Group, my name is Rodney Bunt from Sydney Australia. I recently purchased a HF-2050 form Canada after looking at them on the WEB and eBay for some time. I have just taken delivery of this receiver in the USA asI am on a business trip. I haope I don't have trouble with Customs and Taxes when I return, there is not the enlightened attitude, that there is in the USA, regarding encouraging HAM radio activities, in AUSTRALIA.

Now to my enquiry, does anyone know if the HF-2050 Powersupply can be modified for 240v operation, I note that the Frequency range of the Power Supply is 43Hz to 65Hz so it should operate if I install a step down transformer from 240v to 110v, I also know that operating transformers on a lower frequency increases the Heat from them (a bad thing in the HF-2050 scheme of things). I sent an email to techsupport@deltroninc.com asking this question but as yet have not received a reply, so I thought I would ask the people who should know.

I am an Electronics Engineer for 24 years now, although there is no money to be made in this field in Australia these days, so I am in the Digital World of IT (a whole lot easier than electronics) don't know why think it is so hard, but that is another storey.

Point 2, is there any knowledge of controll software for th HF-2050, and is there a source of the large 'D' connector plugs that any of you know about ????

Regards,

Rodney Bunt rodney_bunt@yahoo.com VK2ZFC, VK2NNK.

= = = = = Regards,

Rodney Bunt rodney_bunt@yahoo.com M:0414-437412 F:9899-9451

Date: Wed, 21 Mar 2001 14:35:42 -0800 (PST)
From: Rodney Bunt <rodney_bunt@yahoo.com>
Subject: Prem-Rx: Modification to Power Supply HF-2050 - DELTRONIC 10890XA for 240v Operation

Well I got this reply from DELTRONICS. An interesting point is that the Powersupply is derated by 10% for 50Hz operation, I have yet to finout if this increases heat or decreases heat. I'll keep you posted...

Rodney Bunt

- --- Todd Reichenbach <toddr@deltroninc.com> wrote:
> From: "Todd Reichenbach" <toddr@deltroninc.com>
> Organization: Deltron
> To: Rodney Bunt <rodney_bunt@yahoo.com>
> Date: Wed, 21 Mar 2001 13:57:15 -0500
> Subject: Re: DELTRONIC 10890XA - Help from Australia
>To: techsupport@deltroninc.com
> Rodney:
> According to the notes I have found, Model 10890XA was built from
> a modified Model W303E. The power transformer should have 5
> solder terminals on the primary labeled from left to right 0, 1, 2, 3,
> 4. To operate with 240V, 50Hz, you must jumper 2 to 3. Your
> input terminals will be 1 & 4. For more information on W303E,
> please go to our web page www.deltroninc.com/W2001.htm.
> Regards,
> Todd Reichenbach
> Date sent: Tue, 20 Mar 2001 10:59:03 -0800 (PST)
> From: Rodney Bunt <rodney_bunt@yahoo.com
> Subject: DELTRONIC 10890XA - Help from Australia
> To: techsupport@deltroninc.com
> Date: Tue, 20 Mar 2001 07:28:04 -0800 (PST)
> From: Rodney Bunt <rodney_bunt@yahoo.com
> Subject: DELTRONIC 10890XA - Help from Australia
> To: techsupport@deltroninc.com
>
> I have a Collins HF-2050 Receiver. It has a DELTRONIC Power supply type 1089XA. I live in
> Australia, the Power here is 240v 50 Hz. Are there any modifications that I can make to the
> Powersupply to make it compatible with 240v 50Hz. I am an electronics technician of 25years
> experience. A circuit diagram sent to me would explain all.
> Can you send me the specifications for this Power supply, +/- 15v and +5v what are the output
> currents, what are the input voltage ranges ??
= = = = = Regards,

Rodney Bunt rodney_bunt@yahoo.com M:0414-437412 F:9899-9451

Date: Thu, 22 Mar 2001 07:58:22 -0500
From: "Carcia, Frank A. HS" <francis.carcia@hs.utc.com>
Subject: RE: Prem-Rx: Modification to Power Supply HF-2050 - DELTRONIC 108 90XA for 240v Operation

At 50 Hz the transformer is less efficient drawing greater magnetizing current. A 50 Hz transformer requires more turns of wire or more inductance (core size) to get the same efficiency as the 60 Hz type. fc

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premium-rx-digest Tuesday, April 3 2001 Volume 01 : Number 109

Date: Thu, 22 Mar 2001 14:11:19 +0100
From: "Franz N.Goenner" <fgoenner@dplanet.ch
Subject: Prem-Rx: Re:Modification to Power Supply HF-2050 - DELTRONIC 10890XA for 240v Operation

Hi Rodney and the group,

First and foremost: Please DO NOT JUMPER ANYTHING on that power transformer (!!!)

Owning two Hf-2050 and one extra power supply I found that _none_ of them is prepared for 220 (230, 240) Volts operation. The taps on the transformer primary are only to set input voltages in the 110 Volt neighbourhood.

I live in Switzerland, and the power grid is 230 Volts at 50 Hertz. A short summary of how I did it: I took a power transformer from discarded equipment and used the normal inputs to apply 230 Volts. Then I wired at the 110 volts input for an output to the HF-2050. (Neutral of both in and out connected together, 110 Volt tap as Hot to the 2050) Trial runs showed, that the RX was getting mighty hot for two reasons: - -At 50 Hertz the built in power supply generates more heat because of increased magnetic flux in the transformer core. - -And the power supply was anyhow designed in a way that it had (at nominal input voltage) much too high secondary voltages, that were heating up the pass transistors in the PS. = =So with connecting some of the low voltage windings on my extra transformer in series on the input side, I reached a lowered output voltage of just under 100 Volts to feed the 2050. (I have to re-measure the exact voltage and let you know) Now the RX is running much cooler than before and this scheme has been used for several months now. Points to note : (1) The 230 / 110 Volt transformer must be about a 100 Watt size. (2) I still run the RX only while I am present in the shack.

There are a few erroneous informations floating around about the HF-2050 RX, one of them ist 230 Volts operation, another is 100 memories and scanning. Feel free to ask more questions, I hope I helped you with my notes.

Regards: Franz, HB9ZEC .

Date: Thu, 22 Mar 2001 13:54:57 EST
From: MW1DUJ@aol.com
Subject: Prem-Rx: Watkins-Johnson HF1000

Hi, Do any of you have any opinions on the HF1000 receiver, I have been offered one, and whilst it looks great, I was hoping for a few experiences, good or bad. Any replies much appreciated, Dave

---

Date: Sat, 24 Mar 2001 09:50:40 EST
From: Daiungoed@aol.com
Subject: Prem-Rx: premium rx s

Hi, A friend of mine is looking to become a premium rx owner, does anyone know of anything premium like going in the UK ? Any replies gratefully received, Dave

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Date: Sat, 24 Mar 2001 10:50:55 -0700
From: Rob &Terri Sherwood <rob@sherweng.com
Subject: Prem-Rx: Collins 51S1

I have just tested a classic Collins 51S1 receiver. The data will be published on my web site as soon as I can get my web master to add it to the table. (www.sherweng.com).

Question: There is only one AGC speed, and by my ears it is rather fast for SSB. A reading of 40 on the signal meter is 50 uV, and it takes less than 1/4 second for the meter to drop from this level to zero. Making a guess, I would say the RC time constant is in the 10s of milliseconds. I would prefer it was 10 times slower. Any one else have this radio, and if so, is your AGC similarly fast? The manual does not mention the AGC as far as I can see.

Date: Sat, 24 Mar 2001 16:25:22 -0500
From: Al Klase <skywaves@bw.webex.net
Subject: Re: Prem-Rx: Collins 51S1

Rob Sherwood wrote:
> Question: There is only one AGC speed, and by my ears it is rather fast
> for SSB.....

While, unfortunately, I don't own the receiver, I do have the manual. A while back, I went digging in it looking for a good SSB AGC circuit to incorporate in my product-detector-equipped 51J-4. I was underwhelmed by the S1 circuit, at least on paper, and looked elswhere.

Looks to me like the release time constant is in the neighborhood of 100ms. That's 0.47uF x 220K. (R-73, C-192). Sounds short to me, and what about CW? Let us know what you find out.

Regards, Al - -- Al Klase - N3FRQ skywaves@bw.webex.net Flemington, NJ 08822 Web Page: http://www.webex.net/~skywaves/home.htm

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Date: Sun, 25 Mar 2001 11:51:03 +0900
From: Takashi Kuroda <tkuroda@tke.att.ne.jp
Subject: Prem-Rx: RE: WJ HF-1000

> Hi,
> Do any of you have any opinions on the HF1000 receiver, I have been
> offered one, and whilst it looks great, I was hoping for a few experiences,
> good or bad. Any replies much appreciated, Dave

Hi Dave,

I suggest you to check if it is A type or normal type. I do not know exact serial number but later version (HF1000A) is much better than earlier version. I used to have both type and am currently using A type which is better than the RX340 in some respects.

Takashi

Date: Sun, 25 Mar 2001 20:42:07 -0000
From: "W. Charles Alexander" <charlie@swl-ute.com
Subject: Prem-Rx: Collins 851-S1 info /tips?

Hello folks:

A friend of mine (In Hungary) is looking for any tips/tricks or other info on the Collins 851S1 (he has one). So if anyone has one or any information on them I/he would appreciate if very much.

Thank you in advance. Charlie

= 73 de charlie W. Charles Alexander KC8IKG E-Mail mail To:charlie@swl-ute.com Web Site http://www.swl-ute.com/shortwave Monitoring the World from Columbus, Ohio USA 39.951 N 83.124 W HF Ten Tec RX-340, AOR AR3030, Drake/Grundig Sat. 800 VHF/UHF Alinco DJ-X10, BearCat BC 895 XLT Antennas: 33 Ft Off-Center Fed Dipoles, 45 Ft Longwires Slinky Dipole a Dressler ARA 60 Active Antenna and 2 Radio Shack Discones (All In Attic) And a 50 Foot Longwire Outside 12 ft high 1 end and 28 ft high the other. =

Date: Mon, 26 Mar 2001 12:24:01 +0200
From: Karl-Arne.A.Markstrom@telia.se
Subject: Prem-Rx: Control protocol description for Harris RF-590A?

Gentlemen,

I'm looking for a source for the command syntax used for remote control of the Harris RF-590A receiver.

Currently I am in the process of writing software to integrate the RF-590A in the computer controlled setup at my station, and I am especially interested of the particulars used for reading back the current receiver settings, enabling a copying of its frequency and mode setting into an exciter for transceive operation.

73 and TIA,

Karl-Arne Markstrom SM0AOM

= Senior Radio Engineer Maritime Networks Telia Mobile AB Nacka Strand Sweden Phone +46-8-6017171, Mobile phone +46-70-6636575 Fax +46-8-6017959

Date: Mon, 26 Mar 2001 15:52:40 -0800
From: "Greg Bailey" <gbailey@mail.sdsu.edu
Subject: Prem-Rx: New Member George B. Hutchison

Gentlemen:

George B. Hutchison, aka W7KSJ and w7ksj@rtty.com, joins us from Auburn, Washington.

Our latest member operates an array of MacKays receivers because, as he says, "I . . . just like the things. They are incredibly stable, sensitive, and are, in my view, just nice rigs". He obtained his first through a trade, the second was purchased on the bay, and the third from a private party back east.

Unlike other members with their premium receivers being used for SWL and other technical aspects, he uses his receivers in a unique way, receiving RTTY. George's major area of interest is in RTTY. He justifies this based on the desire to keep these old teletype machine operating (the boat anchors of the Gutenberg world?). He has even gone so far as to obtain a Special Temporary Authority granted by the FCC, for 6994 and 13972 KHz, as an experiment to see if there is any interest in RTTY Broadcasts. This experiment has not been without QRM from other spectrum users, but George continues to work toward finding a home frequency for these lovable clattering machines. Need parts for your machine, he states, "I have one of the world's largest collections of new teletype parts. I give 'em away to people who really need 'em".

Never one to sit, George recently started working for Collins Avionics Service Center in Renton, WA. He now repairs the 180-R12 and 180-R17 series antenna couplers, and in fact, is one of the two people

in the US certified to tweak them. And if his dance card is not full enough, our newest member has a 20V-3 broadcast transmitter that he is working on.

As is the case with most members, it sounds like there is not enough time to start all the projects he wants, let alone time to finish them.

His parting comments, "My wife thinks I'm crazy.....Neener Neener Neener...."

Date: Mon, 26 Mar 2001 19:57:12 -0500
From: "Peter Gottlieb" <peter@newyorknerd.com
Subject: Re: Prem-Rx: Control protocol description for Harris RF-590A?

Depending on the ROM version, there are either 1 or 2 different protocols - ASCII and Harris Proprietary.

I have detailed info on each. The Harris protocol is preferred, but you must deal with checksums, CRC, and the like. If you want simple, you need a relatively late ROM and you can go with the ASCII protocol.

I had written a simple version ASCII control using VB and if you want this as a starting point we can talk as I could save you a lot of time.

Peter

Date: Tue, 3 Apr 2001 23:47:39 -0500
From: "herschel p mccullough" <w5hpm@airmail.net
Subject: Prem-Rx: Harris Help please....

I thought the person I am looking for was named Roy Morgan and worked for the Navy in the Wash area..and has a collection of Harris Equipment..But it seems I am no where close on who I want to talk with...if you are a Harris collector and have at least a RF-355 amplifier and other pieces of Harris eqpt. please contact me.I have several Harris relate questions...thank you mac/mc

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premium-rx-digest Friday, April 13 2001 Volume 01 : Number 110

Date: Thu, 5 Apr 2001 17:24:12 -0700
From: "Greg Bailey" <gbailey@mail.sdsu.edu
Subject: Prem-Rx: Steinbrecher Corp AND Spectrial Dynamics

Gentlemen:

Does anyone have a receiver produced by either of the above companies? Steinbrecher may have sold the company an presently known by the name of: Tellabs (?) . Don Steinbrecher was a prof at MIT some time back, produced "paramixers" at the time.

Greg

Date: Fri, 13 Apr 2001 15:48:27 -0700
From: J Collins <jcollins@referencevideo.com
Subject: Prem-Rx: Cubic R3030A serial control

Hi premies,

Uh, make that ladies & gentlemen...

I have a number of questions regarding Cubic R3030A dual VLF/HF Receivers...some of my questions could even involve my parting with dollars!!

1) Does anyone out there have a R-3030A or R-3090 (VLF version) that they'd like to part with? I'm looking for receivers in excellent condition, although light wear is ok. I prefer no modifications or tune-up fiddling...total hours shown on the meters is of no concern. I'd prefer receivers with no malfunctions in progress, although I am equipped to deal with most problems-please describe any malfunctions. Serial control using IEEE-488 (GPIB/HPIB) is preferred.

2) Having mentioned Serial Control, I'll try this question on the group: I have a Cubic R-3030A receiver in pristine condition...not a scratch and all module seals intact. Works like a charm. One "problem/challenge": the serial control system is RS449/RS422-A, which presents itself as follows:

a) two 37 pin connectors (one for each receiver section) on the rear panel remote plate

b) the serial control module is assembly #2140-1151, serial #3318652 - there's a second, similar module

c) program memory is 2143-3021B version 1.1

d) the crystal is 4.0960MHz (as opposed to the 5-ish MHz IEEE-488 system

e) there is a "64/128/256" jumper which I'm assuming sets a buffer or word length

Of course, all my documentation is for the IEEE-488 system. Overall, the module looks quite similar to the IEEE-488 diagram sets with subtle differences to the naked ey.

My question: Does anyone have documents for this serial control system or, failing that, familiarity with the jumper setup, connector pinouts, and protocol?

I am also in the market for bits & pieces-that is, modules, parts, etc.

Please reply direct off list

many thanks in advance

John Collins _____

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premium-rx-digest Monday, April 23 2001 Volume 01 : Number 111

Date: Sat, 14 Apr 2001 18:40:32 -0500
From: "Bob Nickels" <ranickel@mwci.net
Subject: Prem-Rx: General Precision Help Needed

Hi,

Looking for anyone with information or experience with a Model 100 Naval DF receiver made by General Precision Industries, Montreal Canada.

Thanks and 73, Bob W9RAN

Date: Sun, 15 Apr 2001 16:41:15 -0500
From: "Terry O'Laughlin" <terryo@wort-fm.terracom.net
Subject: Prem-Rx: Premium radios in Germany

I'll be in Frankfort and Berlin next week and I'm wondering if anyone knows of any interesting radio related museums or stores.

Thanks, Terry O'Laughlin

Date: Mon, 16 Apr 2001 09:10:52 -0700
From: "Greg Bailey" <gbailey@mail.sdsu.edu
Subject: Prem-Rx: Tracor 599 RXs

Gentlemen:

Dave Brown [tractorb@ihug.co.nz) writes from Christchurch, NZland and desires to locate information on a Tracor 599 Rx. Based on a thread published on the List some time ago, he thinks List member Allan Langer (ALanger394@aol.com) may have some information, but the e-mail address we have for Allan is bouncing incoming messages. Does anyone have a new address for Allan?

Also, I have moved my "junk" into a new QTH after months of endless planning and mountains of paper ("just sign here...."). The new "digs" is 890 feet above sea level, closer to Murphy's Surplus, and has less electrical noise than the last.

Greg

Date: Mon, 16 Apr 2001 12:28:19 -0500
From: "Mac McCullough" <w5hpm@airmail.net
Subject: Re: Prem-Rx: Tracor 599 RXs

well that's good all the way round..esp. for Murphy's now if he can just get that license to serve beer and alcohol on the premise's...mac/mc

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Date: Mon, 16 Apr 2001 14:50:16 -0500
From: "herschel p mccullough" <w5hpm@airmail.net
Subject: Prem-Rx: The Bigger question

Yah I guess Mike is right...The BIGGER question is .. Did we need a License ???? No one has ever mentioned this requirement before !!

Date: Tue, 24 Apr 2001 00:55:28 -0500
From: "herschel p mccullough" <w5hpm@airmail.net
Subject: Prem-Rx: FS HARRIS 590A

sell very good Harris 590a with cabinet and manual, $2,200.00 not including shipping...mac/mc

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premium-rx-digest Sunday, May 6 2001 Volume 01 : Number 112

Date: Sat, 28 Apr 2001 21:08:32 -0500
From: "Mac McCullough" <w5hpm@airmail.net
Subject: Prem-Rx: R-9000 and Sherwood

several days ago I received my Sherwood cooling kit for my r-9000 and finally got to install it last Wednesday...it works great, set runs very cool, and I have never dared in the past to just go away and let the set stay on continues for days on end..but have not turned it off since the kit was installed..put this in your for what it's worth dept..your mileage will vary...

Date: Sat, 05 May 2001 16:25:34 -0700
From: jan@skirrow.org
Subject: Prem-Rx: Harris Pre-selector info needed

I have several Harris preselector assemblies - Harris P/N 10215-6600. I need a schematic and/or pinouts for the connectors. I'd like to create some working units out of what I assume are now mostly non-working.

Thanks!

Jan Skirrow, VE7DJX

... in beautiful British Columbia, Canada

*** http://skirrow.org/Boatanchors/ ***

Date: Sun, 06 May 2001 08:16:40 -0700
From: "Greg W. Bailey" <gbailey@mail.sdsu.edu
Subject: Prem-Rx: New Member: Peter Patton

Gentlemen:

Our newest member is Peter Patton, who presently "drives" a Rockwell-Collins 2050. His interest in radios started in the early 50's when he restored ART-13s to earn pocket money and pay for his college days. He currently collects, restores, and operates HF-80 gear. Peter is a retired university professor (Aerospace Eng) and is currently Chief Technologist at Lawson Software.

In addition to the Rockwell, he enjoys the sounds of a Collins 8054, Plessey 2282A, 51J-4, and to hold down the workbench- a 390A (ed: that should make Rippel happy).

Peter has been searching for months for a Collins 851S-1 but hasen't scored as of this date. Perhaps you may want to contact him if you have an extra, or know the QTH of a spare?

Our newest member generates RF under the call sign of W0EWQ, since 1950, you can also contact him at Peter.Patton@lawson.com

Welcome to our group Mr. Pete

Greg

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premium-rx-digest Tuesday, May 8 2001 Volume 01 : Number 113

Date: Sun, 06 May 2001 22:20:09 -0700
From: "Greg W. Bailey" <gbailey@mail.sdsu.edu
Subject: Prem-Rx: New Member: John Wilson

Gentlemen:

John Wilson joins us from the UK. John certainly doesn't need an introduction bio-sketch, simply stated, he was one of the partners in Lowe Electronics in the UK and was responsible for the manufacture and introduction of the Lowe HF series of receivers. Presently he "owns and loves" a Collins RE 51S-1.

John is a regular contributor in the UK Short Wave magazine, which is read and commented on by readers throughout the world.

One item of interest that John admitted to in his note to me was that he is an acquaintance of "the Chuckster and John Bryant . . . " as well as other members of the List. I figure we shouldn't hold that against him? About this time of the year John is on the highway going north between the lower 48 and Orcas Island, Washington. As for the Rippel kid, he is probably under some rock with a tuning wand in one hand and a brew in the other, reading the mail and chasing DX.

John, it is a pleasure to have you join our List. We look forward to your downloads.

Greg

John Wilson, johnwilson@freezone.co.uk

Date: Sun, 06 May 2001 22:39:08 -0700
From: "Greg W. Bailey" <gbailey@mail.sdsu.edu
Subject: Prem-Rx: New Member: Robert Kelly

Gentlemen:

Robert Kelly is located in Portland, Oregon and learned about Premium-Rx while searching for information about battery replacement for his Racal RA6790/GM receiver. He has been an avid radio enthusiast since childhood thanks to his father K1CBO/SK receiving his Novice license in 1967, but recently "born again" as AC7KE.

Presently he works as a software developer, and is an advocate of the free software movement. His area of interest is signal processing algorithms, especially those pertaining to radio communications.

In addition to his RA6790/GM (which recently stopped working!), he dabbles with radios cobbled together from modules, subsystems, and test equipment. He claims that his HP3586C is also in fact a Premium-Rx (excellent especially for LF and VLF). Anyone want to argue this point..... try him at: Robert Kelley <pasha@kali.com

Welcome to the group- and by the way Bob, we happen to have a number of 6790 operaters on this List, perhaps they could help with that Racal.

Greg

Date: Mon, 7 May 2001 10:44:32 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: Prem-Rx: DSP and AGC

Good morning from a sunny (for a change) England. Reading the list on the subject of DSP makes me ask if anyone has addressed the odd AGC effects which some premium RXs show when subjected to repeatable tests. I devised and regularly use a system which applies a 200mS burst of RF to the RX antenna whilst monitoring the audio output from the RX using digital capture triggered by the RF burst. I find with the 95S-1 and W-J 8711/HF-1000 that they generate a loud audio "click" or "pop" at the beginning of an RF burst and investigation shows that there is up to 5mS of delay between the start of RF and the start of audio output. At the trailing edge the audio carries on for the same period after the end of the burst. All this is presumably due to finite processing time in the digitally derived AGC. The problem is that the RX is seriously overloaded during the 5mS interval and it is this which generates the "click" which is fairly unpleasant when listening to SSB utilities, particularly with headphones clamped to your ears. Convince me that I'm wrong, and that DSP is truly wonderful! I'm not yet converted from my premium analogue receivers.

- ---------- John Wilson Stone Hill Kings Nympton Umberleigh Devon EX37 9TR Tel: 01769 573047 Fax: 01769 574158

Date: Mon, 07 May 2001 06:58:08 -0400
From: "James C. Garland" <4cx250b@miavx1.acs.muohio.edu
Subject: Re: Prem-Rx: DSP and AGC

Hi John, I haven't used a 95S-1, but I know a longtime complaint about the HF-1000 has been its slow AGC attack time. I may be remembering incorrectly, but I think the original HF-1000 had an attack time of 15 msec, which was long enough to create significant thumping on CW and SSB signals. Later firmware versions shortened the time significantly, but not as short as desirable. My HF-1000 has the latest firmeware and is pretty good on SSB, although I can still hear minor thumping on extremely strong signals.

I don't believe the problem is necessarily an inevitable consequence of DSP. Some modern ham transceivers, such as the ICOM 756PRO and Yaesu MarkV/FT1000MP (and others) use DSP filtering and processing and have very satisfactory AGC operation. DSP seems to work best in combination with a high quality first IF xtal (roofing) filter. The aforementioned Yaesu ham transceiver was evaluated extensively by ARRL labs, and the receiver tested better in most key performance categories than any receiver or transceiver ever tested by the ARRL. The Yaesu is a quadruple conversion design with DSP used only at the 4th IF and for some of the detection modes.

Regards,

Jim Garland (W8ZR)

****

James C. Garland, President Miami University http://www.muohio.edu/president/
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Date: Mon, 7 May 2001 13:46:55 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: FW: Prem-Rx: DSP and AGC

- -----Original Message-----

From: John Wilson [mail To:johnwilson@freezone.co.uk] Sent: 07 May 2001 13:36
To: James C. Garland
Subject: RE: Prem-Rx: DSP and AGC

Good morning James, Thank you for the instant response to my first message to the group. The HF-1000 which I have been reviewing for the Short Wave Magazine was new (well, latest) production straight out of the box, so it should have the latest firmware. I don't think that it's DSP itself which causes the effect, but digitally derived agc, and certainly the amateur transceivers with DSP back ends still use (I think) analog agc systems. In fact the best agc performance I have measured is on my first sample Kenwood TS-900 (I was the UK Distributor for Kenwood Ham Radio) which I still have, and which has yet to be beaten for SSB/CW agc action. It's the fact that there is a measurable 5mS delay between RF appearing at the anten[John Wilson] n a and the agc (and audio) appearing at the other end of the DSP chain which is the problem. Gives us something to think about!

regards, John G3PCY/5N2AAC

Date: Mon, 07 May 2001 13:41:39 -0600
From: Rob & Terri Sherwood <rob@sherweng.com
Subject: Re: Prem-Rx: DSP and AGC

If you listen to the Ten-Tec 340, you will find that it does not have the agc attack distortion of the 8711/1000. I sold my 8711A just for that reason. It was very annoying on SSB. A lowly R-70 does 1000 times better in that respect. Unfortunately the 340 is lacking in close-in dynamic range.

John Wilson wrote:
> Good morning from a sunny (for a change) England. Reading the list on the
> subject of DSP makes me ask if anyone has addressed the odd AGC effects
> which some premium RXs show when subjected to repeatable tests. I devised

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Date: Mon, 7 May 2001 21:41:49 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: Prem-Rx: FW: Digital hash

- -----Original Message-----

From: John Wilson [mail To:johnwilson@freezone.co.uk] Sent: 07 May 2001 21:32
To: premium
Subject: Digital hash

OK, here's another one. I had the W-J HF-1000A and 8711A together on the bench and noticed that at higher frequencies, touching the tuning knob on the HF-1000 generated so much hash into its own antenna that it drowned out the signal. The 8711A was nowhere as bad. Looking behind the tuning knob reveals that the 8711A enscoder has a metal shaft in a metal bush, whereas the HF-1000A has a metal shaft inside a PLASTIC bush which has no connection to the front panel or the receiver ground. I hauled them both in to my EMC test lab and had a look in a fuly anechoic room which confirmed that with an antenna 4 metres from the front panel, the HF-1000A generates up to 60dBµV (S9 +20dB) at frequencies above 4MHz which makes the thing virtually 9no, totally) unusable above about 10MHz. I also checked the Racal RA-1792, my own vintage Collins 51S-1 and the AOR AR-7030, all of which were fine. Comments? John Wilson

- ---------- John Wilson Stone Hill Kings Nympton Umberleigh Devon EX37 9TR Tel: 01769 573047 Fax: 01769 574158

Date: Mon, 7 May 2001 17:29:05 -0400 (EDT)
From: Steve Stutman <steve@xenon.clickadeal.com
Subject: Re: Prem-Rx: FW: Digital hash

Radios with microprocessors have utility, but are impure.

Steve Stutman

Date: Mon, 7 May 2001 14:35:47 -0700
From: "John Miles" <jmiles@pop.net
Subject: Re: Prem-Rx: FW: Digital hash

It goes to show what I've always suspected: for normal HF listening, these receivers work about as much better than "normal" receivers as $600 toilet seats work better than "normal" toilet seats. :)

Let's face it. HF radio reception was a solved problem with the 51J-4. It hasn't really gotten any better, and won't in the future, regardless of what technologies are brought to bear. DSP is great, but when it comes to voice intelligibility, a few million years of evolution have given us one heck of a nice pair of subband filter banks in our own heads. Digital tuning is nice, too, but with it comes synthesizer noise and, as you've seen, radiated EMI from every piece of metal sticking out of the box. All- or mostly-digital receivers such as the 95S line are fascinating engineering exercises.... but as for me and

my house, give me an R7000 for UHF/VHF work and a good HF AM/CW/SSB receiver from any of several dozen manufacturers over the past twenty years.

The problems that Rockwell-Collins, Watkins-Johnson and other premium manufacturers are trying to solve are *not* the same as those faced by the average (or even high-end) monitoring/ham radio enthusiast. The manufacturers need To:

- - Compete for lucrative government/DOD contracts in the absence of commercial pressure on profit margins - - Meet various MIL standards that require robustness and field serviceability under difficult conditions - - Minimize manufacturing effort and lengthen/eliminate calibration cycles (take a look at a 95S board sometime: they could crank these out all day for $100 apiece if they wanted to!) - - Maintain the company's bottom line in an era of increasing public-sector budget scrutiny

Conspicuously absent from this list:

- - Continuously set and advance standards for technical performance and quality - - Maintain these standards set by the company in the distant past - - Build the absolute best radio possible, regardless of cost

The truth becomes obvious every few months on the list. Someone's HF-2050 power supply goes China Syndrome. Someone questions the AGC performance, or lack thereof, in the latest, greatest DSP-based rig. Someone notices that his premium-Rx's adjacent channel rejection doesn't quite measure up to the '39 Zenith chairside in his grandmother's living room. Someone pulls back the curtain and looks the wizard straight in the eye, and the wizard blinks first.

I think the important points are to have fun using your gear, enjoy and respect it for what it is, and don't be too quick to criticize when it doesn't live up to the technical and ergonomic standards of Receiver X. In many cases, the manufacturer had different criteria in mind (frequency agility, digital controllability, unattended / banked operation, particular contract requirements...) than what we're asking of it. If you can live with that, great... if you can't, it doesn't make sense to fool yourself into thinking the expensive box on your desk is something it isn't.

- -- john KE5FX (former owner HF-2050, 95S-1A)

Date: Mon, 7 May 2001 16:36:53 -0500
From: "Dave N9EWO" <n9ewo@netzero.net
Subject: Re: Prem-Rx: DSP and AGC

I will agree with Rob 100% on this, Using the WJ's to monitor SSB signals for any length of time is hard on the ears, and just as to was to Rob one of the reason's I did not keep my WJ's. The JRC NRD-545 sounds better on SSB signals to me.

Another problem with the WJ's was indeed the digital hash problem, in general and with the same gremlin John Wilson had covered with the tuning knob noise as you touched it. Drove me up the wall...

Dave Zantow

Date: Mon, 07 May 2001 18:37:03 -0700
From: Craig McCartney <craigmc@pacbell.net
Subject: RE: Prem-Rx: DSP and AGC

The problem described below is the main reason that, some years ago, we rejected the WJ DSP receivers (both the HF-1000 and its commercial cousin) and the competition from BR/TCI in favor of the RX-330 from Ten-Tec. The RX-330 was the only DSP receiver we found that got AGC correct for what we needed (both manual CW reception and auto SITOR/data reception). Ten Tec uses a

combination of good old analog AGC for a fast attack and DSP-derived AGC for exotic, programmable responses.

The Ten Tec did have the problem of detected audio out the back being many milliseconds behind an RF pulse in the front - that was almost a show-stopper for us (ARQ). Then they sent a set of EPROMS that had both the normal IF filter algorithms (brick wall, high delay), and special ones for our application (low delay with a little more slope).

Its not DSP that is the culprit, it is poor DSP implementation.

(No, I do not work for Ten Tec - we are just happy customers.)

Craig

Date: Mon, 07 May 2001 19:50:27 -0600
From: Rob & Terri Sherwood <rob@sherweng.com
Subject: Prem-Rx: Re: Digital AGC

One of my favorite radios for AM reception, the NRD-515 + an SE-3, also has AGC attack problems. I never could get rid of the ticks on SSB attack. What is disappointing in many solid-state radios is a lack of dynamic head room in the IF chain. The vintage Drake R-4C, which we significantly modify to fix specific problems, has about 20 dB of dynamic headroom. In other words, if you turn off the AGC, the IF transformer feeding the detector can output several volts peak to peak, though it normally runs at 600 mV peak to peak. This way, when on AGC attack, nothing clips before the AGC catches up. One also needs good dynamic headroom in the product detector. A good DBM for the PD did wonders for the R-4C, but did not help the aforementioned 515. The R-7 has slew-rate problems, and Drake resorted to some AGC detector tricks to try to speed up its response to a signal impulse, with only modest success. The NRD-345 strangely has a reasonable AGC attack on SSB, but was purposely slowed way down on AM, causing terrible AGC problems in that mode. If one disables all the extra circuitry in the AM mode, and uses the AGC circuitry for SSB all the time, the radio sounds much better. I have always been amazed at the apparent tin ears of design engineers. They don't seem to hear hum and buzz, TIM (transient intermodulation distortion), and at times seem to never bother to hook the radio to an antenna when more than one signal is on the band. The Yaesu VR-5000 was was virtually unlistenable due to IMD when attached to my 20 meter beam. The 20, 19, and 30 meter bands were full of IM hash that should not have been there, and certainly a 20 meter beam has no gain on 30 meters, yet the overload was terrible. The 20 dB input pad was a necessity. Mention has been made of the 32S1 (and its predecessor 51J4). The 32S1 I aligned has an AGC decay that is 10 to 100 times too fast for pleasant SSB reception. My 6790GM needs modification to its medium AGC speed to be listenable. The fatigue factor from extended listening to radio-induced distortions is rampant. Engineers who link filter bandwidth selection to mode are nuts, and apparently never use their own products. Of course filter bandwidth choices are often off the wall, as in my favorite R-9000. Who needs 12, 9 and 3 kHz as ones only AM choices? Of course I fixed that by adding a 6 and a 4 kHz to my R-9000, buy why should have that been necessary? Then there are the human interface abominations like the 7030, and even the R8. Who needs a $1000 to $2000 radio with a terrible display, no spin to the tuning knob, or filters that can only be selected in a rotary fashion. Enough! Enough!. I am often asked, "what is the best radio?" There is none. Well, maybe an R-390A with an SE-3, but can you keep it working for the next 30 years? Maybe with the help of a few R390A gurus. 73, Rob Sherwood, NC0B.

Date: Mon, 07 May 2001 19:56:58 -0600
From: Rob & Terri Sherwood <rob@sherweng.com
Subject: Prem-Rx: Oops

I said 32S1 when I meant 51S1. Sorry.

Date: Mon, 07 May 2001 22:24:08 -0400
From: Al Klase <skywaves@bw.webex.net
Subject: Re: Prem-Rx: Re: Digital AGC

Rob and the Group,

Some very interesting observations here. Thank you. I thought the best radio in the world was one of your hot-rod R4C's. As to the R-390's, we'll have a lot better chance keeping them on the air than the later synthesized rigs. In my experience radios like 6790's and 651S1's develope synthesizer problems that can not be fixed by mere mortals.

Regards, Al

- -- Al Klase - N3FRQ skywaves@bw.webex.net Flemington, NJ 08822 Web Page: http://www.webex.net/~skywaves/home.htm

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Date: Mon, 07 May 2001 19:39:30 -0700
From: Craig McCartney <craigmc@pacbell.net
Subject: RE: Prem-Rx: Re: Digital AGC

Hear hear! I agree, and so do others (at least Chuck), I suspect.

Craig

Date: Tue, 08 May 2001 01:39:57 -0400
From: Michael Brown <piggin@mindspring.com
Subject: Prem-Rx: DSP..

DSP still doesnt impress me as being ready for primetime.Nothing sounds as nice as a real analog rig..pick your flavor R-390, Hammarlund SP-600 ect. I use a Mackay Marine 3031A because to me,it has the attributes I always wanted.IE: Deadly accurate digital display(What Hash?)excellent selectivity, very good sensitivity, a tunable preselector, and most important....with a good set of phones I can utility DX for hours and hours and hours.I prize my ears highly...and Im sure you all know what I mean when I say that I am proud of their training.No processer I have used beats my grey matter.All I need is a rig that wont fatique me with vicious audio pops, spikes and harsh clipping.And of course,hash is totally unacceptable.The 3031A works fine.And it runs cool.

Date: Tue, 08 May 2001 10:09:42 -0400
From: jeffa@ix.netcom.com
Subject: Re: Prem-Rx: DSP & AGC

During the last several months I've been setting up a couple of racks of receivers in my shack, and by coincidence had been noting the various AGC problems I'd been having as I brought the various receivers on-line. Of the receivers I've listened to recently, here are my comments...

In my opinion, the best sounding radios for monitoring SSB are the Collins 651S-1, HF-2050, and the 51S-1. Set to a net frequency, they are all an absolute delight to listen to. Of course, there are other issues with the 651S-1 and HF-2050 (tuning tuning tuning!).

Interestingly, my 75A-4, 75S-3, and KWM-2A (w/AGC mods) all suffer when the RF gain is cranked to max. I'd spent quite a bit of time poking around them trying to improve their performance without

much success, and so I was pleasantly surprised by the performance of the 51S-1 when I finally put it on the bench for checkout. I was about ready to give up on Collins tube gear.

By the way, I'd rank my Drake 2B above the three aforementioned Collins tube receivers. It has a very natural sound (I listen to it with the matching Drake speaker). And, although I have an R4C with the Sherwood mods (all of them?), it has some problems that I still need to fix before I can adequately judge its performance.

My Mackay 3031A suffered from AGC attack problems (too long). If memory serves (my notebook is elsewhere) I shortened the attack time and it performs much better. Could use an LSB filter, but Mackay wants $600 for one so I'm content to shift the BFO frequency and use the stock filters. In general, though, it's not a receiver I'd recommend for SSB use.

Cubic 3030A has AGC problems (if I recall, also attack time). I can't recall if my Racal 6790A has any AGC problems (seems to me that it, too, "ticks" at the onset of the RF envelope (indicative of an AGC attack-time issue)), but the Racal 6830 seems better.

I have a couple of Watkins-Johnson receivers (WJ-8888 and another variant), and their problems are multiple. Poor AGC, lots of synth noise, IMD; the list goes on and on...

Of these receivers, only the HF-2050 is DSP based (to my knowledge), yet it performs surprisingly well compared to most of my other high-end receivers, many of which perform at a level less-than-desired.

- - Jeff Anderson, WA6AHL

Date: Tue, 8 May 2001 19:14:19 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: Prem-Rx: DSP, AGC and Hash

Wow! Isaiah Ch. 40, V3. I thought I was "The voice of him that crieth in the wilderness" when I first reported these effects with DSP and proposed (as I still do) that any single operator who wants to have the best receiver for his purposes had better look to the analog classics. Thanks to the very many folk who clearly know what "a good receiver" actually means and who have responded to my observations. I have been fortunate in having most of the well known premium receivers across my lab bench because of my writing for the UK Short Wave Magazine and since I have a lifetime spent in HF communications I think I can recognise a receiver which is comfortable on the ears, which usually means that it will measure out well using my own peculiar investigative tests.This will run and run, and I'm privileged to be among you all; the people who recognise the truth behind the glossy brochure hype. John Wilson

- ---------- John Wilson Stone Hill Kings Nympton Umberleigh Devon EX37 9TR Tel: 01769 573047 Fax: 01769 574158

Date: Thu, 13 Jan 2000 01:47:30 -0600
From: "Joe Watson" <wwatson@mmcable.com
Subject: Prem-Rx: Looking for cosmetic items for Racal RA6790/GM

I know this is a shot in the dark, but I am looking for a RACAL front = panel emblem and a couple of real or repro "RECEIVER RADIO = R-2174(P)/URR" nameplates for my RA6790/GM's #2 and #3. =20

Can anyone be of any help?

Thanks.

Joe Watson W5WBR

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premium-rx-digest Sunday, May 13 2001 Volume 01 : Number 114

Date: Wed, 09 May 2001 01:55:36 -0400
From: Michael Brown <piggin@mindspring.com
Subject: Prem-Rx: Mackay 3031A SSB

I have heard various comments about the 3031A ssb performance being poor...Evidently, subjectivity must apply.The attack is slow 10ms roughly.This does not cause much trouble here since the signal has to be massive to cause artifacting in the audio.In worst case scenarios I simply use the attenuator.I recommend the 3031A strongly for SSB.But dont take my word for it.The Voice of America used 3041As as SSB program link receivers for years.The 3041A has LSB and different am and cw filters than the 3041, otherwise its identical.Of course, if LSB is crucial to you the 3031A is a poor choice since the cw filters have the wrong offset.Indeed, the 3041A has 2 seperate if chains for each sideband position.The 3031A has only the USB chain installed.

Date: Thu, 10 May 2001 10:24:20 -0400
From: jeffa@ix.netcom.com
Subject: Re: Prem-Rx: Mackay 3031A SSB

I'm glad to see the relative merits of receivers being discussed. It's a great use of this list and I'd like to see more of it - it gives us all a chance to get an idea of how receivers we're thinking of buying actually perform. Of course, everyone has their own subjective yardstick against which they measure receiver performance, and what may sound good to one person may sound poor to another.

For me, my stock Mackay 3031A had several problems which made it a poor choice for SSB listening. It suffered terribly from pops at the onset of the incoming RF envelope (pops or ticks caused by inadequate AGC attack times are one of those things that bug the heck out of me as a listener). Performance improved if I switched in the attenuator, but that introduced a different problem which I'll describe later. And although performance was improved with the attenuator switched in, it irked me that I had to do this to get the receiver to sound acceptable. After all, I reasoned, with a well designed AGC I shouldn't have to muck about with RF gains or attenuators. I'll make allowances if there are IMD issues, but not if I have to switch in an attenuator to make the AGC operate correctly!

Performance was greatly improved by shortening the AGC attack time, which eliminated the vast majority of pops & ticks. Now the receiver is much more listenable. By the way, the ARRL handbook recommends an attack time of 1-2 ms. Mackay specs the 3031A at 10 ms.

As I mentioned earlier, if I switch in the attenuator, another problem occurs: there's an increase in broadband background noise. This isn't noise present at the antenna terminals, but noise introduced after the 5 MHz IF xtal filters. I find this type of noise annoying, and this is another reason why, for me, it was unacceptable to switch in the attenuator to improve AGC performance.

(By the way, one can usually identify this noise by the fact that it's wider than the IF passband and that its frequency response is independent of filter selection, both of which indicate that it's introduced after the filters.)

In the case of my Mackay 3031A, switching in the attenuator causes this background noise (which is always present to some degree) to increase to a level where it's quite noticable. The fact that it increases with input attenuation indicates that it's related to the AGC voltage, and the only AGC controlled stages after the IF filters are the two MC1350 IF amp IC's, which therefore must be the culprits. I'm not sure if this is a problem with my receiver alone, or if it's a design flaw (for which reason I would very much like to hear from other 3031A users). Whichever it is, the result is that I avoid using the attenuator switch.

It's been mentioned in other posts that the 3031A doesn't have an LSB filter. I had contacted Mackay regarding the purchase of one, but their price is $600, which quickly squelched that idea.

However, you can acheive quite good LSB performance by using the stock 2 KHz filter (which is actually rather broad) and shifting the BFO frequency to copy the other sideband.

The frequency range of my receiver's BFO did not extend far enough to allow me to copy LSB. Although it had quite a bit of span, it was shifted just far enough in frequency that I couldn't quite get to where I needed to be. I solved this problem by placing a 33 uH inductor in series with L3 on the "5MHz BFO" board, which allows me now to vary the BFO both above and below the IF frequency.

I've set the "CW Preset" pot (on the back panel) to a point where the 2 KHz filter is properly centered for LSB reception, and so to receive LSB I just switch modes to "CW preset" and switch in the 2KHz filter. Works surprisingly well. The only drawback is that the frequency readout is off by about 1.5 KHz or so in LSB mode, but this is minor compared to the ability to now copy LSB.

Just my opinions. Your milage may vary...

- - Jeff, WA6AHL

Date: Fri, 11 May 2001 09:05:11 +0200
From: Karl-Arne.A.Markstrom@telia.se
Subject: Prem-Rx: ARINC 533 and 559 HF/SSB documents

Gentlemen,

For an avionics history research project, I would be very interested in getting hold of copies of the old (1950's/-60's) ARINC Characteristics 533 and 559, covering the design and implementation of the first generation airline HF/SSB equipment.

If anybody in Prem-RX-cyberspace with tube-age avionics background would be able to help me, I would be happy to reimburse copying and postage costs.

73/

Karl-Arne Markstrom SM0AOM

= Senior Radio Engineer Maritime Networks Telia Mobile AB Nacka Strand Sweden Phone +46-8-6017171, Mobile phone +46-70-6636575 Fax +46-8-6017959

Date: Fri, 11 May 2001 12:16:51 -0700
From: J Collins <jcollins@referencevideo.com
Subject: Prem-Rx: AGC/Gain structure-related issues

Hi premium rx-ers,

I've been following the AGC attack-related thread with some interest. I have qty 3 dual Cubic R3030 dual HF receivers (one A model) on line at this time. While the receiver functions all work per factory docs, I'll be digging into them for major realignments to address several issues:

1) No two of the six receivers have the same gain sructure, wide open gain, or metering calibrations, even though factory cal stickers are still intact. I've heard comment this is typical, but tweakable-with proper instrumentation, which I have, there's no reason I can't have 6 virtually identically behaving receivers..

2) Receivers are built with "max 15 ms agc attack" (Cubic factory statement) on USB/LSB/CW...Cubic actually specs the exact resistor/capacitor setup that can be changed-the nominal factory R/C combo calculates to 13.86ms (15ms - ish).

3) All receivers, when connected to antenna with no active signal, settle into foot-to-the-floor gain such that the audio is just a roar of distortion-this completely swamps out idle band static and any weak signals. Receivers all work fine on signals strong enough to kick in the agc. Removal of the antenna leaves the radios with a dull roar-obviously from internal circuit noise. This over-gain issue is eliminated with man gain control and a backoff of 20-30db, but of course a stronger signal is a disaster because there's no agc in mgc mode.

I'm polling for experience here-I can easily modify the AGC attack setup into the 2-3ms (ARRL suggestion) area with a resistor change. Has anyone fiddled with receiver gain structure to address the issue I'm relating? My "standard" of performance, which interestingly is similar vintage, is my ICOM R-9000 of 1988 - ish age. In a no signal situation, the R-9000 settles into a very quiet state, disrupted proportianately by background static activity. No bang/burp/pop, etc when hit with a strong signal, and has dynamic range specs only a few db less than the Cubics.

I'd like the Cubics to behave similarly-I can afford to lose a few db of dynamic range, as I really don't listen to super-blasters-most of what I'm after is the stuff obliterated by the issue I'm describing.

Interestingly, Cubic R3030 receivers are built extremely modularly with each functional block in a separate EMP-proof module...the Cubic circuit theory very closely resembles the ARRL discussion of receiver gain structure & AGC systems with particular exception to the attack time constant (Cubic attack is way high). Basically, a few db of noise figure is sacrificed for better dynamic range, etc. Gains are kept quiet & low up front and large recovery gain is applied post 2nd IF filtering. Max receiver NF is spec'd at 13db, which I guess is ok.

I know from the R9000 that an alignment error can result in problem performance like I describe and I am hoping I find someone at the factory had a typo'd procedure or some such thing-if all this boils down to "lower the overall IF gain and retweak the agc threshold" that would be great-but then, life is never that simple.

Anyone got thoughts/experience/cure/want to come over and do this for me?

many thanks in advance & please watch for my other "dumb question" on filter select/deselect

John Collins

1 x R9000 2 x R3030 1 x R3030A

Date: Fri, 11 May 2001 20:48:04 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: Prem-Rx: FW: AGC and Cubic

Verrrry interesting, I have been checking a Cubic 3030 today for the dreaded tuning knob noise and noticed that even in a totally shielded anechoic chamber the receiver signal level indicator bounces along at about -100dBm and the audio noise is much to high. Sadly, I don't own the 3030 so I can't go digging inside it without permission, but I'm glad that I have stirred the muddy water and people are realising that just being a "premium" reveiver doesn't mean that you get a premium performance. My 51S-1 is deadly quiet in the absence of a signal, but then it isn't full of high speed digital stuff or switched mode power supplies which, in the case of the 3030, develop nicely spaced spurs around 1MHz all at 65kHz intervals, which of course is the switching frequency of the power supply. Let's keep talking.

73 John Wilson G3PCY/5N2AAC

- ---------- John Wilson Stone Hill Kings Nympton Umberleigh Devon EX37 9TR Tel: 01769 573047 Fax: 01769 574158

Date: Sat, 12 May 2001 17:19:55 +0200

From: "John Wilson" <johnwilson@freezone.co.uk
Subject: Prem-Rx: RE: Great prem-rx posts

Dear Michael, Thsnk you for your kind remarks on my postings. I simply though that this was the purpose of special interest groups i.e. to exchange information, both good and bad. As regards front end selectivity you will always find that a classic analog receiver with one or two tuned RF stages will beat the pants off a wide open front end, even with half octave filters fitted, and for a perfect example take a look at the front end of an AR-88. I reviewed this dear old giant a few months back for Short Wave Magazine and was staggered by the sharpness of the RF stages. It turned in a second order intercept point that the latest receivers can't come near. I should explain that I do my 2nd order measurements using signals at 6.5MHz and 7MHz, resolving the intermod product at 13.5MHz, because I decided that these frequencies represent real life situations, and that is what I'm trying to explain to readers and users. Your comment on the JRC (I presume NRD-545) receiver echo my own findings. There's such a simple test to check both phase noise and ultimate stop band attenuation, and that is to tune very slowly through a crystal oscillator signal from something like an elderly 100kHz calibrator, The NRD-545 (and most DSP receivers) have a rumbly, grumbly noise floor extending up to 20kHz either side of the wanted signal. with miscellaneous squeaks and whistles coming and going all the time. Try doing that with your SP-600 and I bet you can't hear a thing until you whoosh into the edge of the oscillator signal. Take a look at Ulrich Rohde's book on receiver design and check out the response characteristics of a DSP IF. There are spurious humps rising as high as -70dB relative to the filter passband, and since your ear and the effects of the receiver agc system raise these signals even higher, the result is noisy dissatisfaction for the listener. I'm sure there is a lot more to say. Hopefully everyone will join in. Regards John Wilson G3PCY/5N2AAC

Date: Sat, 12 May 2001 11:15:32 -0600
From: Rob & Terri Sherwood <rob@sherweng.com
Subject: Re: Prem-Rx: RE: Great prem-rx posts

A comment on the JRC 545. When it first came out, likely a pre-production unit that I tested for Passport, the garbage that one heard tuning around a clean test signal in the plus / minus 20 kHz range was staggering. There were hundreds of tweets and multiple hets, and an AGC that was going nuts. (By the way, the test generator was at that time an HP 8640A, a very clean cavity tuned oscillator divided by N to produce the HF test signal.) If the test signal was over 50 dB above the noise floor of the radio, the garbage from the DSP was so bad I wondered how JRC could contemplate shipping the product. After giving them a heads up, they modified something in the DSP to limit the stop-band signal so that its artifacts were different. I am not saying significantly better, but different. Instead of hundreds of tweets, the stopband garbage just became noise to a larger extent. To help this mess, we typically replace the DSP protection filter at 455 kHz with an 8 kHz filter instead of the 18 kHz filter that comes stock. Does this help plus/minus 4 kHz? No. But it does provide 40 dB additional rejection at plus / minus 5 kHz, and does help when having to cope with an adjacent-channel signal that is stronger than the desired signal by 50 dB or more.

Just a side note on the subject of testing radios in this synthesized world. Not only are all current production radios synthesized, but so are signal generators. It is very difficult to find modern test equipment clean enough to test good radios. The 8640s I used to own were clean, but I had to turn them on the night before a test run so they would be adequately stable; but at least they did not have phase-noise problems or close-in spurious signal limitations.

Early attempts to replace the non-synthesized generators with a pair of HP 3325As or 3336Cs was a total bust. The close-in phase noise is totally unacceptable with either of these, as was close-in spurious. An HP 3335 was only modestly better, as was an HP 3326A. Eventually I ended up with an HP 8662A and an HP 8663A, to my knowledge the two cleanest synthesized generators ever made. Luckily I did not have to purchase them new, as together they would have cost $110,000.00. One could

possibly get away with a pair of HP 8642As, but they are dramatically worse plus / minus 3 kHz compared to the 8662/8663s.

You don't get a feel for how bad 99% of the synthesized generators are unless you do the test Mr. Wilson describes with a good analog receiver. Whether it is an SP-600, R-390A, or a Sherwood modified R-4C for example, the sideband "junk" you hear off to the side of almost all synthesized generators is depressing. With an analog radio you can tell that the "junk" is from the signal generator. But when testing a synthesized radio, let alone a DSP IF synthesized radio, how are you going to know the source of all that garbage off to the side? Now we are just talking about single tone testing. Add to that what happens when you do dynamic range two tones testing, and the water really gets muddied. That is the subject for another day: how to keep IM products out of your test setup.

73, Rob Sherwood, NC0B.

Date: Sat, 12 May 2001 12:43:20 -0700
From: John Reed <jreed@ponca.net
Subject: Re: Prem-Rx: RE: Great prem-rx posts

To the group:

I thought I might add my comments on this. I owned an HF-1000 for a couple years, then traded it for Harris equipment (590 and 550). I like the Harris receivers much better than the W-J. It was really noisy as far as radiating signals, and I never thought the AGC was working right. I didn't like the sound of the digital filters. They seem to be so sharp that they add even more splatter from their long impulse response near a strong signal. Also the symmetrical impulse response sounds unnatural. In experiments with weak CW in noise the best filter turned out to be a passive analog Gaussian passband filter.

My all time favorite receiver is one nobody is familiar with, a Sylvania R1414/URR. It's all solid state with four tuned circuits before the first mixer. The mixer is a quad JFET ring and the oscillator is analog and very stable. Frequency readout if from a counter with nixies. I don't know what the receiver was designed to do but I ended up with two of them, one of which was demilled. I expect most were demilled. This receiver runs rings around my other premium receivers, Harris RF-590, RF-550, Racal RA6773E and RA 6793A.

John Reed

Date: Sat, 12 May 2001 15:02:08 -0600
From: Rob & Terri Sherwood <rob@sherweng.com
Subject: Prem-Rx: New published data

I have added several radios to my table on my web site. These have been tested over the past few years. I finally figured out how to edit the page without having to have my web master do it. Hi. Hi.

Web site: www.sherweng.com. Look on page 1 for Receiver Test Data. Click on that.

New additions:

Collins 51S1 Two more data points on Icom 781 transceiver, with and without the "pin diode" mod. Icom R-9000 Icom R-8500 AOR AR-5000 (This is 3 year old) Ten-Tec 340 (See comments below on the 340) NRD-545 stock (i.e. stock 18 kHz DSP protection filter) KWZ-30 (I think there were only a few manufactured.)

To my ears the 340 DSP has too much to do to provide IF filtering and sync detection. The synthesized 455 kHz IF output (like with the WJ) works well with the SE-3 detector. No lock problems and other anomalies from a sync standpoint when using the outboard detector. The strange thing is the

radio's close in DR is quite low, yet it did not seem as bad in the field as it tested in the lab. Anyone using this box have any input on its performance with strong adjacent channel QRM?

Date: Sat, 12 May 2001 15:05:32 -0700
From: "Don Nelson" <ulformat@teleport.com
Subject: Re: Prem-Rx: New published data

Rob

Amongst a variety of premium receivers (HF1000A, WJ8711A, WJ8712P, R590A, 3030A, 2050...) I happen to use a TT 340 quite frequently down at the coast for trans-PACIFIC MW DXing. In this case, extremely strong US stations are on 10kHz spacing, with TP MW on 9kHz spacing. The US MW stations are strong enough to be at over S9 even when on the backside of a long beverage with chokes on the coax.

The TT340 does very well bringing up the TP MW - for example, Majuro on 1098 often suffers from very strong 1100 USA stations. Even Tahiti on 738 has a lot of splatter from the US MW on 740, but the TT340 picks it out very well.

An alledged Program upgrade to the TT340 is forthcoming which will solve one of the major problems -- no 9kHz tuning stepsize (WJ have infinitely variable), as well as to enable the Noise Blanker. We'll see what else...

Don Nelson Oregon

PS The TT340 does do very well with your SE-3. I'd recommend it (I also use it on the 590A, 390, and WJ receivers to provide excellent listening).

Date: Sat, 12 May 2001 17:29:31 -0600
From: Rob & Terri Sherwood <rob@sherweng.com
Subject: Re: Prem-Rx: New published data

How about with 5 kHz spacing QRM? I wish I would have measured it with 10 kHz spacing, since that would have put one of the test tones outside the bandwidth of the DSP protection filter. Since the dynamic range was 93 at 20 kHz spacing with a 500 Hz CW bandwidth and 93 dB at 100 kHz with a 2.4 kHz BW, it is likely the 10 kHz dynamic range would be in the 70 dB range at 10 kHz spacing since the test signal 20 kHz away would be totally eliminated by the 18 kHz ceramic filter ahead of the DSP (plus / minus 9 kHz bandwidth of this filter would likely be rejecting the 10 kHz away test signal by 10 dB.) Thus we would be expecting the IM to be from the second mixer, which is typically 20 dB worse than the first mixer. The 5 kHz dynamic range was obviously blasting the DSP, and thus the low numbers this close in.

Date: Sat, 12 May 2001 20:12:46 -0500
From: "Bob Nickels" <ranickel@mwci.net
Subject: Re: Prem-Rx: Mackay 3031A SSB

I've noticed the same AGC attack time problem with my Mackay 3020 and 3021. Still, they are pretty decent receivers and next time I have one or the other out of the rack I'm tempted to shorten up the AGC as Jeff suggests.

The biggest problem I have with the 3021 is a tendency for the Khz synthesizer to come out of lock which results in a "warble" or FM-ing on SSB or CW signals. I've been unable to identify the cause of this intermittent problem, as most of the time it works fine. If anyone's spent more time under the hood of this receiver and has a suggestion, I'd appreciate hearing from you.

I've been under the impression that there are relatively minor differences between the 3020/3030/3040 (BCD tuned) and 3021/3031/3041 (knob tuned) series. Anyone know for sure?

73, Bob W9RAN

Date: Sun, 13 May 2001 00:37:58 -0400
From: "Howard L Ritter, Jr" <hlritter@mindspring.com
Subject: Re: Prem-Rx: RE: Great prem-rx posts

John Reed wrote:
> My all time favorite receiver is one nobody is familiar with, a Sylvania
> R1414/URR. It's all solid state with four tuned circuits before the
> first mixer. The mixer is a quad JFET ring and the oscillator is analog
> and very stable. Frequency readout if from a counter with nixies. I
> don't know what the receiver was designed to do but I ended up with two
> of them, one of which was demilled. I expect most were demilled. This
> receiver runs rings around my other premium receivers, Harris RF-590,
> RF-550, Racal RA6773E and RA 6793A.

> John Reed

This caught my interest because some years ago in a conversation with a premium-receiver enthusiast I was advised to keep my eye out for just this receiver, the Sylvania R1414/URR. I have never encountered one and of course it's not listed in Receivers Past and Present but I did find a reference or two to it (in addition to multiple John Reed postings!) in a Google search - -- one was an anecdote posted to a site devoted to the history of an Army installation in Germany that mentioned in passing the presence of a "high-tech" R1414 in addition to a number of R390s.
Does anyone have a photo or a lead on one of these beasts? John?

- --howard n7exn

Date: Sun, 13 May 2001 10:57:43 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: Prem-Rx: phase noise etc.

Dear Rob, Thanks for the notes on signal generators, and that's just the kind of information that needs telling and re-telling. I too have been shocked by the performance of high-priced signal generators and that's why I use my own custom built low noise crystal oscilators for intermod. and phase noise checking - as I think most of us involved in receiver measurements do. There is still little to beat the H-P 8640B for good phase noise performance, and I'm fairly sure you are aware of John Thorpe's simple modification to the 8640 levelling system to prevent inter-generator intermodulation. As for analog receivers, I will always try to keep something like a 51S-1 or SP-600 around just to convince myself that the sometimes awful results from high end receivers are really there and not due to my imagination. Obviously you and I have been presented with most of the newer receivers coming on to the market, and it's refreshing to know that we express more or less the same opinions. Next time you speak to Larry Magne, tell him I'm still around and making waves. 73 John Wilson

- ---------- John Wilson Stone Hill Kings Nympton Umberleigh Devon EX37 9TR Tel: 01769 573047 Fax: 01769 574158

Date: Sun, 13 May 2001 07:56:52 -0700
From: John Reed <jreed@ponca.net

Subject: Re: Prem-Rx: Sylvania R1414/URR et al

Fred Osterman wrote:

> John Reed mentioned that his "... favorite receiver is one nobody is familiar with,
> a Sylvania R1414/URR."
> I am indeed unfamiliar with it, and have also been trying (with little success) to
> learn about the Sylvania R-24 and Sylvania R-1452.
> If anyone has info on these models, would love to hear from them.

Hi Fred, I owned an R-1452/WLR-6 a couple years ago and can tell you a little about it. I can tell you a lot about the R-1414 since I "reverse engineered" many of its circuit boards to get it going. There seems to be no manual for it available. The R-1452 seems to be a scaled down version of the R-1414. The dynamic range is less, the front end isn't as elaborate and the filters aren't as good (mostly ceramic).

I really like your book on receivers and refer to it constantly. I'd like to see some of the Sylvania Electronic Systems equipment covered in a future edition. They seem to be really well engineered. The R-1414 is the first receiver with tracked front end of those I've checked using a spectrum analyzer in which the RF tracking follows the oscillator exactly. Not easily done.

> I would also like to take a moment to say I have enjoyed, learned much, and have
> had several personal prejudices confirmed by all the John Wilson inspired
> commentary!

Same here. I thought it was my imagination. How could a 30 year old design be better than a several kilobuck new digital wonder?

To those asking for pictures of the R1414 - Sorry but I'm still in the digital stone ages here. No digital camera, Windows 3.1 and I do all my programming in DOS with Fortran.

Fred, what do you need to know about the R-1414?

John Reed

Date: Sun, 13 May 2001 09:17:26 -0600
From: Rob & Terri Sherwood <rob@sherweng.com
Subject: Prem-Rx: Re: phase noise etc.

Comments inserted in the text.

John Wilson wrote:
> Dear Rob,
> Thanks for the notes on signal generators, and that's just the kind of
> information that needs telling and re-telling. I too have been shocked by
> the performance of high-priced signal generators and that's why I use my own
> custom built low noise crystal oscilators for intermod. and phase noise
> checking - as I think most of us involved in receiver measurements do.

REPLY: The custom oscillator is certainly an easier way to do the IMD testing and side stepping the inter-generator intermodulation problem. I suppose you had to end up making many of them, to test at different spacings. You cannot test an R-7, for instance, at exactly 100 kHz as there are other spurs that end up on top of the IM product. I also have found it is best to use odd ball frequencies in general, like 14.203 MHz and 14.223 MHz to minimize the change of other spurs landing on the IMD. Do you have a

little "rubber" pot on each oscillator? I always wobble both generators to see that the signal I am listening to is really third order IMD and not some other mixing spur.

> There
> is still little to beat the H-P 8640B for good phase noise performance, and
> I'm fairly sure you are aware of John Thorpe's simple modification to the
> 8640 levelling system to prevent inter-generator intermodulation.

REPLY: Yes, though I never implemented John's clever solution. By the time I would have done that, I had migrated to the 8662A and 8663A for stability and setability reasons. Then I found that their leveling circuits "talk to each other" worse than the 8640s. So I pulled my hair out to get 110 dB isolation between the leveling circuits by using two buffer amps, pads, low pass filters and the like to solve the problem.

> As for
> analog receivers, I will always try to keep something like a 51S-1 or SP-600
> around just to convince myself that the sometimes awful results from high
> end receivers are really there and not due to my imagination.

REPLY: Please compare your numbers on the 51S1 to mine, and I would love to see numbers on: SP-600, Racal 6217 & Racal 6778C. The 6217 has a 10/20/30 & 40 dB attenuator on the front panel. That always gives me pause.

> Obviously you
> and I have been presented with most of the newer receivers coming on to the
> market, and it's refreshing to know that we express more or less the same
> opinions. Next time you speak to Larry Magne, tell him I'm still around and
> making waves.

REPLY: I guess we will be classified as Drs. Gloom and Doom. It is challenging to test the new boxes, but it is a rare case when the radios really shine. Luckily most radios are not stressed very hard by most listeners, or there would be a lot more unhappy owners. I just tested the VR-5000. Let's just say third order performance is not its strong point.

> 73
> John Wilson

> ----------
> John Wilson
> Stone Hill
> Kings Nympton
> Umberleigh
> Devon
> EX37 9TR
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> Fax: 01769 574158

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premium-rx-digest Monday, May 14 2001 Volume 01 : Number 115

Date: Sun, 13 May 2001 21:29:39 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: Prem-Rx: RE: Receivers & Such

Hello Guy, Yes I remember our correspondence about the Radio Netherlands inability to recognise that the AR-7030 was such a good RF performer and their insistence that AOR were testing the intermod performance "incorrectly". If you take a look at the RN web site you will now read all sorts of justifications for testing receivers at input levels higher than the noise floor...what a turnaround. The gory details are contained in their review of the Kneisner & Doering KWZ-30, a receiver which takes absence of front panel controls to a new high (or should that be low?). If I'm listening to a difficult station and I want the notch filter, I want to push a button labelled "Notch" and not have to go through three layers of menu to find it. Nor do I want the weak DX to be drowned out by receiver generated hash. If you take the UK "Short Wave Magazine" you will shortly find my review of the W-J 8711/HF100, and it covers a lot of unpleasant findings about what happens when you put your hand on the tuning knob and drown out the signals you wanted to hear. It goes without saying that I also took a close look at the AR-7030 and the 51S-1 under the same conditions, and you might guess that they both came out smelling of roses. I note your comments on MilSpec receivers and I have to say that I'm perhaps being unkind in my criticisms pf phase noise and poor agc performance. The designers of these receivers do have to meet a lot of very demanding specification requirements which are all about rugged construction and high MTBF and so on, so perhaps it's difficult for them to remember that at the end of the day they are still supposed to be designing a receiver first, with mechanical ruggedness second. It's also true to say that the operators of these military receivers don't expect to go digging about in the tropical bands looking for weak Indonesian DX, but would probably use them on HF circuits where signal levels are quite high. You are wise to stay with the AR-7030 which was designed first and foremost with RF performance as the number one priority. The fact that it also has mechanical ruggedness is another bonus. I know it's a slightly odd-ball control setup, but I've grown accustomed to its menus and love it to bits as a DX machine. Now if only I could persuade John Thorpe to put some more knobs on the panel I could die happy. It's good to hear from you again, 73 John Wilson

- -----Original Message-----

From: Guy Atkins [mail To:dx@guyatkins.com] Sent: 13 May 2001 18:55
To: johnwilson@freezone.co.uk
Subject: Receivers & Such

Hello John,

It's good to see you on the Prem-RX List, and I've enjoyed your recent round of comments about AGC and limitations of the current DSP gear. A number of years ago (early 1996?) you and I corresponded briefly; I believe it was about the R. Nederland response vs. your SW Magazine review of the AR7030. (Looking back on it now, RN's defensiveness on the subject seems rather amusing.)

I'm on my second AR7030 now, and I'm as impressed as ever with the nearly "transparent" performance of JT's rig. I remember commenting on it's clarity and "open" sound in my own AR7030 review which the ODXA club carried in August 1996.

I'm blessed to live within a couple hours drive of the Pacific Ocean, in the Pacific Northwest region of the USA where we enjoy the fewest "thunderstorm days" per year of anywhere in the States. This means that during mid-winter the MW and tropical bands become quiet to an awesome degree, especially with a Beverage antenna at a coastal site around local dawn. Static and crackle from T-storms drop down into the natural band noise. The AR7030 allows me to really scrabble around on the noise floor as I seek out those few remaining Indonesian RPDs or juicy trans-Pacific mediumwave catches. Call it "readability" or "hearability" or "weak audio recovery"... whatever the correct term is, John Thorpe's creation doesn't get in the way of hearing the distant stations.

I notice that Rob Sherwood's rx comparison chart lists the AR7030 very high, just below a modified R-4C. How do you feel about the AR7030 currently, now that some years has passed since its introduction? I'm sure the numbers still speak for themselves; I'm not aware of any consumer-grade receiver that has surpassed the AR7030 in the key areas of performance. On DXpeditions with Don Nelson, John Bryant and others I've had the opportunity to use the HF-1000a, HF-2050, and RX-340

receivers... I can't say that the mil-spec rigs offered any consistent, large improvements, especially in the area of "close-in" split frequency DX on the mediumwave band.

Well, it's good to see that you're staying active with receiver testing, and I look forward to learning more about equipment through your astute comments via the Prem-RX list.

Cheers,

Guy Atkins DXing from Inlet Island, Lake Tapps, WA
http://terraserver.homeadvisor.msn.com/image.asp?S = 13&T = 1&X = 352&Y = 3267&Z = 10& W = 0
Bonney Lake, Washington, USA dx@guyatkins.com

Date: Sun, 13 May 2001 16:27:09 -0600
From: Rob & Terri Sherwood < rob@sherweng.com
Subject: Re: Prem-Rx: RE: Receivers & Such

A 7030 the size of an R-9000 with a nice LCD display (not like the R-9000L display), a good set of front end filters, and lots of single-function knobs would interest me. Seems like you could do that for an additional $500.00.

Date: Mon, 14 May 2001 19:12:45 + 0200
From: "John Wilson" < johnwilson@freezone.co.uk
Subject: Prem-Rx: HP 8640B mods.

Good evening all, I spoke to J-T today and his modification to the 8640B is a simple 1000 microfarad capacitor connected between TP1 on board A26A1 to ground. The board is the RF box mother board and John suggests that you can fit a toggle switch in the hole normally occupied by the "Counter Out" BNC connector so that you can switch the capacitor in and out as required. Why do you need to switch it out? 'cos if you leave it in place you will find you have no AM facility on the generator. The purpose of the capacitor is to remove any possibility that RF from the second signal generator used in two tone intermodulation measurements can get into the first generator and modulate the agc levelling, thus causing intermod products not related to the receiver you are testing. John and I have spent many hours (as has Rob Sherwood) in trying to determine just how many second and third order intermod measurements have been made incorrectly due to the intermod being generated by the test setup and not by the receiver under test. You would be amazed!!!

Thanks to everyone for their kind remarks about my contributions to the group. If it gets overpowering I'm sure someone will tell me to quiet down!

John Wilson

- ---------- John Wilson Stone Hill Kings Nympton Umberleigh Devon EX37 9TR Tel: 01769 573047 Fax: 01769 574158

Date: Mon, 14 May 2001 12:44:24 -0600 (MDT)
From: ve6jy@freenet.edmonton.ab.ca
Subject: Prem-Rx: Receiver Comments

Hi to all:

It was enjoyable to read the recent postings and look at the receiver specs at www.sherweng.com. Why some receivers do a good job of recovering audio from those poorly modulated, static crash laden tropical band signals has always been one of those great intangibles. Hard to measure, subjective to

rank and of great interest to DX'ers. Certainly a clean LO and transparent audio sections as well as enough dynamic range to prevent any locally produced artifacts from being heard are all part of it.

In a "blind" receiver test I quickly cobbled up here one night during one of our SWL Weekend gatherings out here, nothing too scientific but it was interesting to get others opinions on this aspect of receiver performance. The test consisted of several receivers whose audio is all feed to a multi channel mixer - the labels were covered up so nobody knew which slider controlled which radio. Heil Proset headphones were driven by the mixer. On the antenna side, the signal from the 4-30 mhz log periodic is split to many receivers thru the RCA CU-5069 multicoupler. In this "test" sensitivity and selectivity were not major issues. It was just your typical weaker but mainly just hard to understand AM signal on the tropical bands we were checking (60m).

Before I get onto this test, let me digress to another casual test - of multicouplers - I did between the 5069 and the Stridsberg active 8:1 unit (http://www.stridsberg.com/). Thanks to Joe Talbot for loaning me the Stridsberg. On the bench and in real life, there was little to choose between them. And also virtually no difference on weak signal detection with or without either m/c in the circuit. Both units overloaded on/near MW to a small but annoying degree (less with night pattern/power changes) when used with beverage antennas - more so than with the unit directly connected to the receiver. I am 75km from any locals but the signals are still very strong out here. On the higher SW bands the log periodic delivered several major SWBC relay site signals approaching S9 + 60db and these were enough to again cause slight overloading. Again, hooking directly to the receiver, eliminated the problem. My CU-5069 is modified in that only 16 (of 32) channels are used - this reduces heat buildup. It also has relays that will bypass the signal when turned off. Neither of these mods have more than a minimal effect on performance. The small size and the 12 volt DC capability of the Stridsberg is quite an advantage over the 5069.

The four receivers (or rx portions therof) used were the Yaesu FT-1000mp, ICOM 756PRO, Collins HF-2050 and ICOM R-8500. (unfortunately, Rob's fine site as above does not yet include data on the first 3). All of our "ears" yielded similar results to what conclusions I had reached before. Choosing AM or either side band didn't change the overall ranking. With the flexibility of the mixer, you can put any receiver in any ear or any percentage thereof so it is easy to compare in real time.. The R-8500 slider was discarded quickly by everyone, and the 1000mp came next. All took quite a while to reach any conclusion between the 756Pro and the 2050 - - and since it was such a hard choice, it implies there certainly wasn't much to choose between them. Both radios are full DSP implementations, altho the HF-2050 is over 15 years old. As far as new radios, right off the shelf, I certainly enjoy the 756Pro and the spectrum display is a huge benefit to me in the kind of listening I do. This is one feature I don't mind shelling out a few $ for - and indeed was the main reason I bought it. The excellent receiver was a pleasant surprise - I have not been impressed with other hobby level DSP implementations (not brand specific and I certainly haven't tried them all). While a few premium receivers have a panoramic display built in, they are not commonly available or affordable to the surplus crowd. And as has been the thread from many messages recently, a significant price tag does not ensure performance to match.

I'll be heading off to the Dayton Hamvention later this week, so if anyone on this list will have a vendor booth number where they will be, let me know so we can meet up. I'm just going as a spectator, so I'll have to find you.

73 Don Moman VE6JY

Date: Mon, 14 May 2001 15:59:40 EDT
From: CLeyson@aol.com
Subject: Prem-Rx: Prem-Rx Phase Noise and IMD

Gentlemen

It's good to see some healthy activity after a long silence.

I totally agree with comments on the poor spectral purity of many of todays synthesized signal generators. The HP8640, 8660 series are certainly very good sig-gens as are some of the offerings from Rohde and Schwarz, R-S SMDU for example. But are any of these any good for a receiver 1st local oscillator ?? If I had the choice I'd use a crystal oscillator every time !!

Theoretically the best general purpose synthesized generator should be one that uses direct frequency synthesis - the old double-mix divide or triple-mix divide principle. Unfortunately early generators from HP (HP5002 I think) were no better than todays PLL synthesized generators. Modern generators such as the PTS160 are a big improvement. A certain surplus emporium in Toronto has a few PTS160's for sale. Would make a good receiver 1st LO perhaps.

A quick note on two tone IMD measurements - 40 dB of generator to generator isolation can be achieved by using a 2:1 combiner. Wind a 1:1 transformer and connect it up so that it forms a center tapped widing. Connect a 100ohm resistor to the outer connections (not the ceter tap). Feed in signals from two generators at each end and take the output from the ceter tap. Don't forget that the signal generators internal attenuator will also provide extra isolation.

A note on phase noise - Just checked out an Analog Devices AD9850 DDS chip. Phase noise is about -110 to -120 dBc/Hz with Fclock = 50MHz and Fout between 2 and 10MHz. Performs better as the ratio Fclock/Fout is increased. Noise floor is fairly flat and is quite good close in to the carrier - the above measurements were done at a 100Hz offset. Ideal for a BFO oscillator.

Mixers - Have tried out the so called "H mode" mixer using mosfets and jfets. Can only achieve an IP3 of +40dBm. I think the problems are due to varactor effects in the silicon. Would be good to try this mixer configuration with tubes - perhaps a pair of dual triodes. Does anyone have any IP3 measurents for tube mixers ?

DSP - Please don't give DSP a bad name, it has a lot to offer. It's not digital signal processing that generates hash, but poor digital design. I have a home brewed DSP board here running at 100MHz and it generates a great deal less hash than the electronics stuffed into an RA1792 or RF590 for that matter.

Filtering and AGC is down to good algorithm design. Filters with steep slopes will always ring, whether they are analog or digital and they don't sound too good either. Spurs as low as -120dB aren't to difficult with DSP, trouble is there are not many A-D converters with this sort of dynamic range on the market yet.

Note: the the famous or infamous HF2050 only has a dynamic range of some 40dB as it uses a 7-bit A-D converter to digitize the 4MHz I.F. However out the three receivers I am lucky enough to own it does seem to be the better performer when it comes down to digging signals out of the noise ! Not bad for 7 bits.

73 Chris Leyson GW8RUL

Date: Mon, 14 May 2001 13:20:38 -0700
From: "Guy Atkins" <gatkins@nwlink.com
Subject: Prem-Rx: RE: Receivers & Such

David,

I'd like to jump in here briefly and comment that I've never had opportunity or chance to use the whip amplifier (middle position on rear slide switch) with anything but a 60-inch telescopic whip antenna. It works great for that purpose. However, I usually employ the "normal" +10db preamp via the front panel controls. The rear panel amp also engages a hi-to-low impedance matching transformer, so I never used it with coax fed aerials.

I have indeed used an external preamp at times when DXing at the WA State coast, when tuning the weakest of signals. The Kiwa Electronics preamp I previously owned gave better results than the stock AR7030 preamp (both have the same nominal +10dB gain). I look forward to getting one of the

Advanced Radio Research Co.'s preamps, such as Don Nelson uses. On paper, they are higher specs than the Kiwa units, smaller and much less expensive. Here's a link to the ARR product: http://www.advancedreceiver.com/page46.html

Guy Atkins DXing from Inlet Island, Lake Tapps, WA
http://terraserver.homeadvisor.msn.com/image.asp?S = 13&T = 1&X = 352&Y = 3267&Z = 10& W = 0
Bonney Lake, Washington, USA dx@guyatkins.com

Date: Mon, 14 May 2001 21:44:25 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: RE: Prem-Rx: Prem-Rx Phase Noise and IMD

Couldn't agree more with the comment on using a crystal for 1st LO in a receiver. Wasn't it clever of Art Collins to do it all those years ago, and hasn't the lesson been forgotten. Let's not confuse what I said about receiver hash. I didn't say or mean to imply that it was a result of DSP, that's a separate issue. What I was pointing out was my dismay that simple EMC precautions have been forgotten in the use of a non-grounded encoder shaft in the HF-1000 compared to the 8711, resulting in direct coupling of all the processor (not DSP) activity behind the front panel driving all the displays straight on to the metal tuning knob. As for phase noise and signal generators, I've had the oportunity to look at spectral purity on quite a lot of modern generators since I use them every day and I haven't found one that could better the dear old 8640B, unless it's an equally old Marconi 2017 which uses a divided down cavity tuned oscillator in much the same way as the 8640. And even then I revert to custom crystal oscillators for serious measurement. We're all mad you know!! 73 John Wilson

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Date: Mon, 14 May 2001 16:37:14 -0600
From: Rob & Terri Sherwood <rob@sherweng.com
Subject: Re: Prem-Rx: Prem-Rx Phase Noise and IMD

More comments on signal generator isolation and dynamic range testing.

On the subject of isolation between signal generators that have leveling circuits and thus can cause IMD on the exact frequencies you are trying to test, I believe you need 110 dB isolation between the leveling point in generator 1 and the leveling point in generator 2, if you want to measure a 100 dB dynamic range radio. Let us assume the leveling is right before the output attenuator.

I calculate my isolation as follows, assuming no additional reverse isolation from my buffer amps. (Hopefully there is some additional isolation, but who knows.) The generators can put out +13 dBm, and are typically running at -13 dBm output. This gives 26 dB isolation times two. (52 dB isolation here) The buffer amps are set to put out approximately +13.5 dBm, (12 dB below saturation) and the amps are followed by a 15 MHz low pass filter (for testing on 20 meters) and a 10 dB pad. This outputs approximately +3.5 dBm into the hybrid combiner. The generators are set so that actual combined output from the hybrid combiner is 0 dBm. The hybrid combiner is followed by some precision attentuators, double shielded coax, a 20 dB pad, and the appropriate adapter to connect to the radio. (I would not want to drive the combiner higher than this, but all seems well at +3.3 dBm into each port.)

The two 10 dB pads on the outputs of the buffer amps provide an additional 10 dB isolation each, for a total of 26 + 26 +10 + 10 = 72 dB. The combiner has been measured to provide 42 dB isolation if and only if it is seeing a 40 dB return loss. This is guaranteed by the 20 dB pad that feeds the radio. So now we have 26 + 26 + 10 + 10 + 42 = 114 dB isolation between the "nasty" generator leveling circuits.

Radios with dynamic range of approximately 100 dB at 20 to 100 kHz spacing have been measured with this setup. The IMD drops off properly as IM approaches the noise floor. The IMD should drop 3 dB per 1 dB drop in test signal level. It isn't quite 3 dB in practice, but very close. If the IM drops off close to 1 dB per 1 dB drop in test signal level, then you know you have test setup problems.

Would it be easier to test at a higher level then the noise floor? Yes. Why did RN suddenly change its testing method after strongly supporting this method that I believe was pioneered by the ARRL and Wes Hayward almost 25 years ago? The problem I see with testing at significantly higher levels is now the AGC is involved, and every radio will act differently depending on how the AGC is implemented throughout the IF chain.

Most AGCs are not doing much at 1 uV. Could we make testing easier if we all decided to test dynamic range referenced to a 1 uV IMD product? I think so, but how would we compare old data to new? What happens if you hand me a radio that really has a 20 kHz dynamic range of 110 dB, will the test setup be stressed to its limits? You bet.

Final comment. Radios that are failing to cope with incoming signals are not failing because their 20 kHz or greater dynamic range is only 95 dB, for example. They are failing because their close in dynamic range (at 2 to 5 kHz spacing) is more like 70 dB or worse. Most GOOD analog filtered radio will measure in the low 70 dB range for dynamic range. Some IF DSP radios have been measured in the 60s, and two in the 40s !!! Few manufacturers (if any) even quote the close-in two-tone dynamic range because the numbers are unimpressive. Most quote inflated wide-spaced numbers as high as 105 dB (on CW), and even those seem impossible to duplicate from my experience. Comments from others who test radios anxiously awaited.

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premium-rx-digest Monday, May 21 2001 Volume 01 : Number 116

Date: Mon, 14 May 2001 19:03:34 -0400
From: jeffa@ix.netcom.com
Subject: Re: Prem-Rx: Prem-Rx Phase Noise and IMD

Hi Rob,

Just a couple of questions regarding IMD measurement...

I understand the reasoning that's been presented of why it's undesireable to have the output of one generator modulate the leveling circuit of another - makes alot of sense to me. I'd like to know where the 110 dB isolation requirement number comes from. Years ago I read the ARRL test spec using two HP 8640 to measure IMD, but I don't recall any special measures taken to improve isolation beyond that provided by the hybrid combiner.

Also, your buffer amps may be providing you all the isolation you need. In other words, if you drive the output of your amplifier with an external signal source, how much of this signal appears at the amp's input? I'd guess not much (and something you could easily verify with a spectrum analyzer). (By the way, what kind of amps are you using?)

I'm not familiar with the RN technique of measuring IMD, but your explanation makes sense. But I was wondering, if AGC affects IMD measurements, shouldn't it be turned off? Are there receivers where this isn't possible?

Very interesting stuff. Am very much enjoying the discussion.

- - Jeff, WA6AHL

Date: Mon, 14 May 2001 19:14:18 -0400
From: jeffa@ix.netcom.com
Subject: Prem-Rx: HF-2050, Cubic 3030A, and AGC

Just a quick note...

Last week I mentioned that (from memory) I hadn't noticed any AGC issues with the HF-2050. I had a chance to play around with my various receivers this weekend (despite the poor band conditions) and I noticed that the HF-2050 has a noticable "tick" related to AGC attack. Don't know why I never noticed it before, but so it goes...

Also, the Cubic 3030A AGC drives me up the wall. It's a Hang-AGC system (rather than the more traditional leaky-peak detector). Because of this, background noise transitions, in my opinion, much too quickly from absent to (very very) present - something I find very annoying. I think my Racal receivers suffer from this a bit (I need to verify) but not nearly as bad as the Cubic - it's really annoying.

- - Jeff, WA6AHL

Date: Mon, 14 May 2001 17:12:36 -0700
From: Walter Salmaniw <salmaniw@home.com
Subject: Re: Prem-Rx: Receiver Comments

Good to hear your comments, Don! Keeps me believing totally in my HF-2050, despite what to me appears to be a certain amount of movement away from this fabulous receivers. I still own three, and have no intention to get rid of them! I do similar side by side comparisons at my QTH. I use the same 5069 multicoupler, and have a different array of receivers. I use the audio switching unit as published in several sources by John Bryant, so I'm able to quickly choose between the two, or feed each receiver to each left and right channel. I compare the 2050 to the following receivers: Collins R390A with SE-3, AOR 7030+, Kenwood R5000, JRC 535D, Mackay 3031A, and Racal 6772/8772. In virtually all cases, the READABILITY of the 2050 outperforms all the other receivers, with the exception occasionally of the 390A with SE-3. Very subjective, but isn't the bottom line what I as the listener can hear that counts?

.....Walt., Victoria, BC.

Date: Mon, 14 May 2001 21:16:36 -0700
From: "Don Nelson" <ulformat@teleport.com
Subject: Re: Prem-Rx: RE: Receivers & Such

If you are a MW DXer, they can build a "special" 0.5 to 30MHz instead of the 1.0 to 30MHz shown. Since I only have the 0.5-30, I have made no comparision to the 1.0-30 to see if there really was a difference or not....

Date: Wed, 16 May 2001 12:12:38 -0700
From: "Greg Bailey" <gbailey@mail.sdsu.edu
Subject: Prem-Rx: E-Mail addresses, & Misc.

Gentlemen:

Two items-

1) When a member changes his address and neglects to tell me, I get a "bounced" message from our Kahuna computer at SDSU. Typically, I do not get too excited about this because one or two of the servers being used by our 140+ members tend to be down at any one time. However, if a person moves and terminates his account without telling me, then his address gets bounced to me over and over again. Yesterday I purged the server of all the "bouncing" addresses (approx 10 in number). Lesson of the day, if you plan to move e-mail addresses, give me a heads up and I will redirect the server. It "ain't" no problem.

2) Approximately a week ago one of our members posted a rather negative worded memo stating that he was having a hard time "unsubscribing" from the list. Some of you have asked me about this situation and I would like to respond. The problem was that he had changed his address and was transmitting on the new address, and receiving the Premium-rx List on the old address. The two addresses were one or two letters different. Every time I unsubscribed his (new) address the server said he was not a member. When I finally realized what was happening, I pulled the plug on the old account and BINGO he digitally disappeared. We ain't perfect, but we are trying.

New Topic:

Congrats on all the list activity regarding receiver noise, agc, etc, I have been learning a great deal as I read the mail. My only comment parallels some of the thoughts of others, i.e. that my Cubic (any digital control/dsp receiver?) was designed to sit in a closet in some embassy far far away from the hands and ears of a SWL op. Then, via the magic of the internet or serial port, it can be operated remotely (as in Washington) . . . . . something my "valve equipped" 51-J CAN'T do.

And before someone reminds me that I am not in a foreign embassy, operating on a serial cable, or suggests I am a 'closet' case . . . . . let me end by saying I can't hear with a damn and most of the stations I try to copy don't broadcast in "living stereo". With tongue firmly planted in cheek-

Keep smiling. . . . and keep posting!

Greg

Date: Wed, 16 May 2001 17:33:34 -0400
From: Michael Brown <piggin@mindspring.com
Subject: Prem-Rx: dsp, agc, etc

I have enjoyed the recent flurry of activity here immensely.But something Mr Sherwood said struck me.It was his comment about he and Mr. Wilson being Drs. gloom and doom.Nothing could be further from the truth!I want MORE from my equipment!And I want every flaw and foible and ergonomic horror exposed.I think it telling that I spend serious cash on old equipment.Its simple...I wont buy a receiver unless it meets my needs, no matter how much it is hyped or how many wonder functions it has.Heres a case in point.AORs 7030.It has great rf performance.But it has truly evil ergonomics.And a mechanical encoder?This strikes me as bizarre.I will never own one.Call me inflexible if you will but the ergonomics are very important to me.We should continue to demand better performance and front panel layout or rigs will just get sillier and sillier.Thank God for military surplus!Judging by the latest commercial offerings today I did the olny thing I thought prudent...I purchased a second Mackay Marine 3031A.I love the one I have so I figured I better have a spare considering the current offerings.I will post how it performs compared to the one I already own since I have always wondered if the one I have is particularly good.I also have on the way factory specs for the frontend board and the 5mhz IF board for the purpose of properly setting AGC gain and level.The specs are a gift from the great guys at Mackay Radio.If any 3031A drivers out there need this info, drop me a line.I should have it by the end of this week.

Date: Thu, 17 May 2001 20:32:38 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: Prem-Rx: Mackay 3031A

Michael Brown and others have really given me an appetite to try out a Mackay 3031A, but where do I locate one in the UK, and more to the point, where would I find a brave owner who would let me review it for the UK Short Wave Magazine. Just finished looking at the Cubic 3030A and other comments about wight and heat certainly come to mind when you compare the 3030 with the lightweight HF-1000. First observation is that I don't like the hang agc when in the longest delay

setting, and reminds me of the Racal RA-1792 which has "normal" agc for the shorter decay settings but then sneakily changes to full hang on the long decay settings. After the hang time is up, the receiver restores to full gain without seemingly any analog decay time, and if you wear headphones it causes severe paind and sudden watering of the eyes. That perhaps answers the question from Jeff, WA6AHL. Boy, am I enjoying meeting all you folk out there, and thanks for all the good feedback. 73 John Wilson

- ---------- John Wilson Stone Hill Kings Nympton Umberleigh Devon EX37 9TR Tel: 01769 573047 Fax: 01769 574158

Date: Thu, 17 May 2001 16:48:23 -0700
From: "Greg Bailey" <gbailey@mail.sdsu.edu
Subject: Prem-Rx: New member- Dave Ross

Gentlemen-

David Ross, N7EPI, ross@hypertools.com, has joined our List. Dave claims home is a very quiet rural area (Ed: I can only assume he means RFI quiet) in southwest Washington state. In fact, it is about 15 miles inland and a couple of miles north of the Columbia River.

He has been interested in high-performance receivers since the mid-'70s and has held a license since the mid-'60s. Our newest member is self-employed in the areas of hardware & software design .

Current interests include SWLing, vintage RTTY, and repair of HF-80 gear..."lately out of necessity"... he admits. Dave has a Collins/Rockwell 1KW HF-80 setup including an HF-8054A and a GRiD PC control setup running Rockwell's ACMEXEC.EXE. There is also a Intermarine EN-R2 LF-MF-HF receiver and a Sunair RT-9000 transceiver.

If you are interested in contacting Dave . . . ross@hypertools.com

Welcome Dave-

Greg

Date: Sat, 19 May 2001 07:36:11 -0700
From: "Greg W. Bailey" <gbailey@mail.sdsu.edu
Subject: Prem-Rx: New Member- Kurt Holbrook

Gentlemen:

Checking in from the 'Valley of the Sun', Kurt Holbrook is our newest subscriber. For those who have not had the pleasure, 'the valley of the sun' is Phoenix, Arizona. Where today's temperature will be in the 100's +F (38 C)

Kurt has been involved with radios since he was fourteen. This passion was the motivation to become an Electrical Engineer and followed him into retirement where there is more time to pursue this activity. Professionally, Kurt was involved in Microwave Communication Circuit design for the military in Western Europe, Industrial Automation design for both private industry and the military and Robotics. His last position was at Kachina Communications as a Test and Quality Engineer. This provided a first hand look at DSP in communication receivers and what it can and can not do.

For the past nine years he has been collecting, restoring, using and evaluating just about all types of receivers. He has or had most of the "high end" consumer receivers made in the last ten or so years plus the usual R-390A, 51J-4 and 51S-1. Three of the more notable receivers that he has owned and used at length are: NRD 93, 851S-1 and WJ 8888.

Currently he is looking for a 6790/GM, RA 1792 and a RF 590/A.

Kurt can be reached at <radiouser@qwest.net

Welcome to our List Kurt- Greg

P.S. Do not think I was disrespectful to Kurt for living in the valley of the sun. I camped there for ten years, so I speak from experience. It is a great place to be from.

Date: Sat, 19 May 2001 08:19:40 -0500
From: "herschel p mccullough" <w5hpm@airmail.net
Subject: Re: Prem-Rx: New Member- Kurt Holbrook

Geezz oh Pete....you camped out there...Your bad ass The Marlboro man was not this tuff....but he's also dead, Hummm - ----- Original Message -----

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Date: Sat, 19 May 2001 10:41:19 -0700
From: "Kurt" <radiouser@uswest.net
Subject: Re: Prem-Rx: New Member- Kurt Holbrook

Thanks for the welcome Greg. I look forward to being part of the group. Greg is correct. This a Great place to be From. I'm counting the days until we can move out. Kurt Holbrook -

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Date: Sat, 19 May 2001 13:01:15 -0700
From: "Greg W. Bailey" <gbailey@mail.sdsu.edu
Subject: Prem-Rx: New Member- Rolf Folkesson

Gentlemen:

From Sweden, our newest member is Rolf Folkesson. Rolf operates under the call sign of SM0HP. He heard about the List via a friend. At present he is a Senior System Researcher in mobile communications.

He operates an ITT (SRT) CR-90 and CR-91. Both of these are microprocessor based receivers which (if I understand his message to me correctly) he personally designed or was a part of the design team. Both are listed in Fred Osterman's Shortwave Receiver book (Fred is a List member). Approximately 500 units were produced, the last being made in 1991.

Check out the the receivers in Fred's book, AND contact Rolf at rolf.folkesson@allgon.se

Greg

Date: Sat, 19 May 2001 13:01:25 -0700
From: "Greg W. Bailey" <gbailey@mail.sdsu.edu
Subject: Prem-Rx: New Member- Bob Geiste

Gentlemen:

Another receiver buff has joined our group. Bob Geiste (rjgeiste@email.msn.com) is a mechanical engineer that works in the R & D of surgical instruments. Home is in Milford, CT, a coastal town. Electronics, especially radio equipment are his interest, however, he has been know to enjoy art and photography.

When using his radio gear he typically can be found monitoring aircraft comms both military and commercial as well as Maritime activity.

Equipment includes: ITT Mackey Marine 3031A, Harris RF-550, Watkins Johnson 977-1 (30-300 mhz), and ACL made R-1368/GR (250-1000 mhz). Decoders: MFJ-1278, HAL2100, Universal M-7000,

Welcome aboard Bob.

Greg

Date: Sat, 19 May 2001 13:14:49 -0700
From: Walter Salmaniw <salmaniw@home.com
Subject: Prem-Rx: Re: Prem-Rx

At 01:01 PM 5/19/2001 -0700, Greg W. Bailey wrote:
> Gentlemen:

> From Sweden, our newest member is Rolf Folkesson. Rolf operates under
> the call sign of SM0HP. He heard about the List via a friend. At
> present he is a Senior System Researcher in mobile communications.

Greg's intro for Rolf got me thinking about exotic premium-rx, of which, to most of us, the CR series are. With a roster of premium-rx enthusiasts in the 100s, I for one would be interested in hearing from owners of the unusual, rarely seen receivers, with perhaps jpg"s of their equipment. For example, has anyone ever seen or used premium-rx from the former eastern block? If so, how well do they work, compared to better known western receivers? Check out page 450 of edition 3 of Fred's book. The ONIIP line made in Siberian Russia sound fascinating, and may still be current. Let's hear from the owner's of the weird, unusual and wonderful!!!.....Walt.

Date: Sat, 19 May 2001 16:22:42 -0400 (EDT)
From: Steve Stutman <steve@xenon.clickadeal.com
Subject: Re: Prem-Rx: Re: Prem-Rx

"Exotic Premium-RX"; sounds like a new list prof.

Steve

Date: Sun, 20 May 2001 21:17:08 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: Prem-Rx: Signal generators et al.

Rob, I have spent some time looking at the acquisition of an 8622A generator, but the going price for second user in UK is around $15,000. OUCH! The alternative is to stick with an 8640B, which is, for our purposes not far below the 8662A performance, but I have also been taking a good look at generator performance using my in-house spectrum analyser (Rohde & Schwarz FSA) which tells me that there is still nothing to beat a well designed crystal oscillator, and I can build a hell of a lot of crystal oscillators for $15,000. What I have decided to do is get a professional PCB layout done for my standard test oscillators, which up to now have been hand wired by me, and perhaps circulate the PCB info to anyone in the premium group who might want to use the same setup for quick but accurate checks on receiver performance. Like you, I test at the bottom end of twenty metres so that I can work on ham band and GC receievrs with the same setup, so even with custom made crystals it isn't that expensive to make a comprehensive system. OK, I won't ahve the ultimate frequency flexibility of a signal generator, but from my own measurements here, it's hard to beat a simple crystal, and it removes all that difficulty with the generator levelling intermodulation. Remember K.I.S.S., it really works (for me).

73

John - ---------- John Wilson Stone Hill Kings Nympton Umberleigh Devon EX37 9TR Tel: 01769 573047 Fax: 01769 574158

Date: Sun, 20 May 2001 21:20:07 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: Prem-Rx:

OOPS, Typing runs away with me. I'm referring to an H-P 8662A throughout my last posting, not an 8622A (whatever that may be). Sorry, John

- ---------- John Wilson Stone Hill Kings Nympton Umberleigh Devon EX37 9TR Tel: 01769 573047 Fax: 01769 574158

Date: Sun, 20 May 2001 21:23:31 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: Prem-Rx: How many Angels

As if that's not enough from me. I realise that the discussion about the finer points of signal generator performance may seem to many readers akin to the famous Vatican discussions as to how many Angels can stand on the head of a pin. The more one specialises, the more boring one gets. Do tell me to shut up if I'm getting that way!!!! 73 John Wilson

- ---------- John Wilson Stone Hill Kings Nympton Umberleigh Devon EX37 9TR Tel: 01769 573047 Fax: 01769 574158

Date: Sun, 20 May 2001 13:42:08 -0700
From: "John Miles" <jmiles@pop.net
Subject: Re: Prem-Rx: How many Angels

Not at all, John! I've drooled over more than one 8662A on ebay myself, but I don't think I've ever seen one meet its reserve.

It's occurred to me more than once that a modified Wadley-style mixing loop is really the way to get low phase noise. You multiply a high-quality crystal oscillator up with a comb generator, and use a steep filter and pair of mixers to "select" the desired comb tooth with a cheap, noisy, low-quality VCO. Between the comb-selection mixers, you mix in a high-quality VCO (or bank of VCXOs) whose total tuning range is only as wide as the comb spacing, and which determines the phase noise for the whole shebang.

There's at least one line of frequency-agile generators out there that uses a scheme similar to this. I've forgotten the name (Frequency Precision or something like that?) but they ought to have excellent PN performance, at least in theory.

The only thing that's stopped me from trying to homebrew something like this, is that I don't know how I could test it without ... you guessed it, buying an 8662A. :-P

- -- jm

Date: Mon, 21 May 2001 00:31:28 -0500
From: "herschel p mccullough" <w5hpm@airmail.net
Subject: Re: Prem-Rx: Signal generators et al.

In our ZEELL I use a 8660c that replaced an 8640b and the difference was day and night...the 8660s are very plentiful at 900.00-1,500.00 US$... - ----- Original Message -----

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Date: Mon, 21 May 2001 08:31:19 -0700
From: "Greg Bailey" <gbailey@mail.sdsu.edu
Subject: Prem-Rx: Cubic Communication

Gentlemen:

Being located in San Diego, the home of Cubic Communication, I have answered a number of List questions regarding getting in contact with Cubic's technical staff. The information below was recently sent to my attention by John Collins. Without his permission, I quote:

"Following up on my info gathering at Cubic: while I wasn't able to get free access to the innards of the company, Cubic did provide access to standard customer support and did sell me manuals (way more comprehensive than any I've found outside of Cubic) at a competitive price. I was pleasantly surprised when Cubic offered to accept my credit card and copied me on all internal communications relating to my inquiries. In short, Cubic is not a charity, but, unlike many manufacturers seems to appreciate the surplus market interest and is willing to provide info through channels."

I think the above is a fair statement. I have found individuals in the communication division, specifically receivers, to be very friendly. It is obvious they cannot spend hours on the phone jawing about some characteristic of their product, but they are communicative. Present sales and diversification of their product line leads me to think they will be here for many years. The president of the corporation is advanced in age and a MAJOR stock holder. If he sells, or the family sells, Cubic may be consumed by someone bigger, and thus slide to the untouchable side of the customer service ledger.

There was a thread regarding the switching noise in their receiver, I believe there is a fix or a modification that will correct this. I loaned my Cubic to Nick Hall-Patch (List member) and he discovered the "carrier" of the switcher on my receiver on the lower frequencies of his interest. Higher freqs we not a problem. After contacting Cubic, the problem was fixed. It would be interesting to find out how many members have such a problem.

Greg

Date: Mon, 21 May 2001 11:51:40 -0400
From: "Carcia, Frank A. HS" <francis.carcia@hs.utc.com
Subject: RE: Prem-Rx: Cubic Communication

Hi Greg, Last week I was on the West coast and managed a trip down South to visit Mike Murphy. Wow what a load of stuff, makes my basement look clean. fc

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Date: Mon, 21 May 2001 19:09:34 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: RE: Prem-Rx: Signal generators et al.

Thanks for the comment regarding the H-P 8660. I did take a look at the 8660 but whilst the unit is great for automated testing and very flexible with its selection of RF and modulation plug-ins, the close-in phase noise is not good enough for the kind of testing we are now involved in. At5kHz from the carrier the phase noise quoted from H-P is -105dBcHz whereas the 8662 is some 30dB lower. That's where you need to be if the measurements are to mean anything. I'm seeing a guy tomorrow who has helped me in the past with pcb layouts, and I'm hoping to "persuade" him that a crystal

oscillator/buffer/filter board layout is exactly what he wants to do! I'll keep you posted. 73 John Wilson
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Date: Mon, 21 May 2001 17:53:43 EDT
From: CLeyson@aol.com
Subject: Prem-Rx: Sig gens and Phase noise

Here is a little data on the PTS-160 from Programmed Test Sources Inc. (http://www.programmedtest.com). Synthesizer is a DDS type priced at $4500-$6000 depending in the options fitted. The spec speaks for itself.

Spurious (at full power output, + 13 dBm) Discrete: -75 dBc Harmonics: -35 dBc at full output (-40 dBc at lower level) Phase Noise: -63 dBc (0.5 Hz to 15 KHz) including effects of internal standard root(1Hz): 100 Hz/ -105 dBc, 1 KHz/ -115 dBc, 10 KHz/-123 dBc, 100 KHz/ - -127 dBc Noise Floor: -135 dBc/Hz

If you need low noise, build a crystal oscillator. I recently had to design a low noise 8MHz transmitter stage for an ultrasound probe. It used a 32MHz AT cut crystal (ESR 50 to 70ohm) in a Pierce oscillator divided down to get 8MHz. Output power 50mW into 50ohm. Measured noise less than -145dBc/root(Hz) at 1kHz offset. Incidentally, using a class A, AB, B or C PA stage after the oscillator only made the phase noise worse. Class C being the worst offender. Looks like non-linearities in the PA cause the PA transistor or FET 1/f noise to mix with the clean oscillator signal. I found that a switching PA stage worked best. Just a few 74HC04s parallel up did the trick.

It comes as no surprise really when you consider that switching mixers have the best noise figure. So the same could apply to amplifiers maybe ?

A quick note to Bill (W7AAZ). Re: the H-mode mixer. I seem to have dropped a clanger there. I forgot that there was 6dB of gain in front of the mixer, so I guess the IP3 should be around +46dBm. Mixer used J310 jfets and the load was 50ohm resistive. Generators and LO set to around 10MHz, IF at baseband. I've also found that reactive terminations degrade the IP3 performance. Tried mosfets of various sorts but they don't seem to be any better. Insertion loss is 6dB, don't have a noise figure yet. Front end amp, Class A push pull Norton amp with no sign of intermods. I would have another look but one of my sig gens recently emitted smoke from its power supply.

Chris Leyson

Date: Mon, 21 May 2001 17:16:01 -0600
From: Rob & Terri Sherwood <rob@sherweng.com
Subject: Re: Prem-Rx: How many Angels

A correction note that came up from all the fine feedback to the discussion on signal generator isolation. I said that the 8662A / 8663A generators had 26 dB of output isolation from their attenuators being set for -13 dBm output. That was incorrect. Some of the level setting occurs before the power amp, and up to 2 dB comes from setting the level with an electronic power adjustment of the PA. The real output attenuators after the PA are three 40 dB pads, one 20 dB pad, one 10 dB pad and one 5 dB pad. (No more than a maximum of 145 dB is ever switched in at one time.) At the level I am running them, it appears that I have 15 dB of pad isolation in each generator instead of 26 dB. (There is also one 8 dB pad, one 4 dB pad and one 2 dB pad before the PA). I talked extensively with Mini Circuits Labs about isolation from their ZHL-32As that I am using. They said that for this purpose the isolation is called Active Isolation. It is calculated by measuring the reverse gain (backwards loss) and subtracting the forward gain. This comes out about 10 dB in the case of the ZHL-32As. Thus while I lost 11 dB of isolation I thought I had per generator from not having as much pad after the PA, I did not count the unknown isolation from the amps, which came out to be about 10 dB each. So the end result was very close within 2 dB of the original estimate.

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premium-rx-digest Wednesday, May 23 2001 Volume 01 : Number 117

Date: Mon, 21 May 2001 18:45:42 -0600
From: Rob & Terri Sherwood <rob@sherweng.com
Subject: Re: Prem-Rx: Sig gens and Phase noise

Just an interesting comparison in specs for a generator that might be better known is the HP 3336C. HP specs it slightly differently, but I think it comes out about the same. The total phase noise is rated in a 30 kHz bandwidth less 1 Hz centered on the carrier. Its spec at 20 MHz is - 64 dBc. I have one of these, and for many uses it is a great little generator that can be purchased used for about $500.00. But it is useless for testing radios like we have been discussing for the past few weeks. Its cousin 3325A generator is even a few dB worse in the phase noise department, but it is nice for most audio work with harmonics down 60 to 70 dB.

Date: Mon, 21 May 2001 22:35:20 -0700
From: "Greg W. Bailey" <gbailey@mail.sdsu.edu
Subject: Prem-Rx: List Manager has its rewards-

I am sorry, but I got to share with you some of the 'off the wall' comments I get now and then from some of the List members. Almost without fail for every post to the List, I get a ping from one of the readers with a comment.

My recent comment about Cubic being located in San Diego generated this one from member Frank Carcia: "Hi Greg, Last week I was on the West coast and managed a trip down South to visit Mike Murphy (Ed: Mike Murphy, List member, owns Murphy's Surplus in San Diego area). Wow what a load of stuff, makes my basement look clean."

I know Mike reads all the mail and I can see him smiling as he reads this post. He sells many of the radios mentioned on the List. In fact, I think there is a Cubic in his "junk yard" at present. I agree with Frank, lots of goodies, and it is organized. Look at it this way Frank, I don't have a basement, I got Murphs!

Greg

Date: Mon, 21 May 2001 22:14:32 -0700 (PDT)
From: Daniel Robinson <darobin1@excite.com
Subject: Prem-Rx: FS: WJ8718A

An offer to Premium list members, before I turn to other venues.

It is a 8718A with BFO and SMO options installed. This was one of two sets obtained from the VOA relay site in Thailand in 1996 as they were in the process of acquiring replacement receivers (I believe they went for Harris).

As some list members I have corresponded with know, this 8718A needs a home with someone who can fix a Premium rig. It loses Phase Lock. Other than that, it is in excellent condition. It came straight out of the rack in Thailand. All LED's working, beautiful weighted tuning knob, black panel face.

I do not have the manual, but can supply copies of the original spec booklets for the BFO and SMO options.

In using the twin to this receiver, I have been impressed by the WJ's sensitivity and selectivity. I've run it against my R8, 525 and two SP600's and it is truly one amazing piece of equipment.

Reason for sale: need cash. The rx has been boxed up since last year and is ready to ship. I'll consider all reasonable offers and would much prefer to ship it to someone in the list community at this point rather than go to Ebay. I do need to make a minimum on this, but for anyone who is handy with minor repair work (and I have already heard from several members who apparently are) this should be fairly easy to deal with.

Any additional info I can supply please let me know.

Dan Robinson Rockville, MD

Date: Mon, 21 May 2001 22:58:13 -0700
From: Walter Salmaniw <salmaniw@home.com
Subject: Prem-Rx: HF-2050 highlights

Courtesy of Joe Talbot in Alberta, I received three absolutely perfect refinished panels for my three HF-2050s. This gave me the perfect opportunity to delve into my favourite receiver at close up. I wanted to share my experiences with other 2050 drivers, especially those, like myself who are not exactly electronically adept. First of all, a very big must. Download John Bryant's HF-2050 "manual" at http://bryant.ceat.okstate.edu/COLLINS2.HTM . In order to be brave enough to tackle the process of replacing the front panel, John has provided great instructions and tips.

What I did first was to remove the panel, with the attached board, which is a piece of cake. Be careful after removing the rack handles, as these provide most of the securing to the receiver. After this, it's just two little screws, in the front center and bottom. I stood close to the front face in case it decided to fall out, which it didn't, but it's a good idea just in case. Now carefully pull the panel straight out. Only two connectors. On the right is the power connector which comes off really easy. On the left is a ribbon connector. Darned, you need to remove the top panel before you can get at that connector. OK, just replace the panel, if you don't have a table wide enough to lay the front panel down, and secure it with a single screw front and bottom. Now that the top cover is off, remove the ribbon cable, and the front panel is free to come off.

What I then did was to work on the encoder. Piece of cake. About two minutes of work. The cover comes off with a bit of tugging. The first time I did it a few years ago, I used a screw driver to lever it off...Bad mistake. It came off, but not before damaging the cover. No big deal, but doesn't look so good. All you need to do is firmly grab it a gently rock it back and forth while applying upward pressure. It should pop off within a few seconds. Next, clean the spring and lube it (I used lithium grease), and replace. Voila, no more scratching. Now just replace the cover. It snaps back into place.

Next, I worked on the pushbuttons, which are easilly accessible. The actual pushbuttons come off with the same gentle traction. The cover under these buttons are removed the same way. Since they are fastened with two pins, pull up until the bottom pin clicks off, then apply force to release the opposite pin. I have to admit, I have some reservations about doing this too often, as this applies a fair bit of torque to the board. I can see a weak solder joint breaking after repeated cleanings. My advice is to do it once and forget about it, until a problem arises. On my three receivers, one was particularly bad with several numbers skipping repeatedly. No more problem. Total time to remove and clean the pushbuttons, about 20 minutes the first time, but with the second and third, I had it down to about five minutes! Heck, I should start an assembly line for refurbishing 2050s!!!

One experience which isn't documented to my knowledge, was replacing the switch body. Refer to John's picture of the switch exposed once the black square cover is removed. On one of my rigs, the white plastic switch had broken off due to mishandling. I had tried superglue, and later epoxy, but this was not satisfactory at all. Eventually the pushbutton fell off. Along came Don Moman to the rescue. He kindly sent out a couple of pushbutton bodies. I removed one of the white plastic switch parts....Not

that easy to do. Took me a great deal of force to yank it out. Careful here, there's a tiny spring under neath. Watch out, or, as happened to me, it will go flying once the white body is released. Place everything on a white sheet. This might prove useful finding it in case it does fly off. What I found worked the best was to take the spring and insert it on the nipple on the bottom of the white piece and then guide it into the corresponding nipple on the bottom of the switch body. The first time I did it, I tried the other way around. Didn't work right. When I opened it again, the spring had folded near the top at a right angle. No wonder it wasn't working properly.

For the first receiver, I used spray Deoxit. On the second, spray MCL lube, both Caig products. I wasn't very happy about the spray. Too little control for my liking. By far the best way is to use to liquid Deoxit, and apply with a stiff piece of wire. This was great....got a drop into each contact point. Beautiful, and oh so clean. I was impressed. Ask me in a few years if Deoxit or MCL works better. Don't know.

The hardest part was removing the board from the panel. Take your time here. I did well on the first two, but screwed up on the third. As John recommends, take notes, as the various studs have a variety of nuts, flat washers, locking washers, and grounding lugs. Pay close attention and write down what each stud has. I then carefully removed the nut using a 1/4" nut driver, washers, etc and placed them into an egg carton or the like, numbering the positions for later re-assembly. Now here's the most important part, and where I screwed up the third time. Listen carefully, now! Remove the board with the front panel facing down! Otherwise those spacers go flying all over, as they did with me, and darned if they aren't of various sizes! Wasted a lot of time trying to figure which spacer went with which stud. The big technical manual I didn't find particularly helpful either. Of course before you do this, you have to remove some things from the front panel. I used a VACO 90 1R handle with a 90-21 attachment. I assume this is a Bristol spline wrench. At least they look the same to me. Made one more stupid mistake the first time. Each knob is attached by two little screws. Make sure you loosen both, to prevent damage. I might have cause some big problems, as I started to pull at one of the knobs after loosening just one of the screws. Stupid me!

Once the knobs are all off (5 in total), the encoder and headphone jacks are still attached by 1/2" nuts. These, especially the headphone jack, I found to be pretty darned tight in all three receivers. Caution is required removing the headphone jack, as it has a tendency to rotate, potentially causing damage on the underside, so you have to hold the headphone jack body in place while torquing on the nut driver. Once these two 1/2" nuts are off, there is nothing holding the circuit board in place. Now, remember, place the front panel down, and gently lift the circuit board off. Check the board now, and remove any washers that might have been stuck, and replace them later on the studs. As John points out, in this manner, the spacers stay in place without any difficulty. The old front panel is then replaced. Don't forget to remove the speaker mesh from the old panel to the new one. Now it's just a matter of replacing the circuit board, and reversing the previous process, with the nuts and washers.

I flubbed one thing here on my first go. The center top and bottom screws are held in place by a couple of brackets, which will fall off when the circuit board is removed. Have a look at where exactly the bracket fits against the board. Otherwise it's easy to have it in the wrong spot when replacing the board, and the alignment with the top and/or bottom cover screw holes will be incorrect. That's how I found that I had the bracket in the wrong place the first time around.

While inside, with the covers off, I took the opportunity to spray some air to remove accumulated dust (there was hardly any), and to reset and Deoxit the connectors. I had had some trouble with audio cutting out on my main receiver. This was remedied by Deoxiting the rear ribbon connector, and resetting the cable.

Finally, make sure all the screws are in place, and tighten everything. I then took each receiver for a test run. No problems at all. I now own three basically brand new looking HF-2050 receivers (except for the cover scratches, though Joe Talbot has had these polished, and do they ever look great!). I don't know if Joe still has any of the front panels or not, but I wouldn't hesitate to recommend him very very highly! The panels were perfectly wrapped with kraft paper, then Bubble wrapped, and placed in a large box with styrofoam chips. Well done, Joe!

I do hope that this essay, used in conjuction with John Bryant's excellent resource guide will allow a few of you to jump into getting to know your HF-2050 a bit better. I know it sure helped me!

.....Walt Salmaniw, Victoria, BC.

Date: Tue, 22 May 2001 10:05:09 -0400
From: jeffa@ix.netcom.com
Subject: Re: Re: Prem-Rx: How many Angels

Could someone explain to me why, when calculating the isolation of one signal generator, connected through an amplifier, to an external, off-frequency signal source attached to that amplifier's output, we should care about the forward gain of that amplifier? I don't understand why MCL would claim that their "active isolation" number should be used in lieu of their "Isolation" (i.e. Reverse Gain) figure for calculating overall isolation in this system. This makes no sense to me. What am I missing?

Thanks!

- - Jeff, WA6AHL

Date: Tue, 22 May 2001 13:02:14 -0400
From: "Carcia, Frank A. HS" <francis.carcia@hs.utc.com
Subject: RE: Re: Prem-Rx: How many Angels

Hi All, I have tried many methods of measuring dynamic range but always come back to the poor boy approach. I connect my antenna through a step attenuator to one port of the combiner and the other input to the generator (8640B) through a pad. The output goes to the radio under test with a 6 dB pad to force a 50 ohm load on the combiner. next I find a nice signal and step the attenuator up to drop the level down near the noise floor. Then I crank up the generator and tune around to find the level that causes crud to come up from the noise floor on and around the signal I'm listening to. A bit of calibration is required but it works. It also eliminates the 2 generators modulating each other. It also tracks the other methods and gives me a real world feel for the dynamic range. Dynamic range is easy compared to synthesizer sideband trash. You R390A guys rejoice the lack of a PLL. My #2 generator is the old HP608 so ..... fc

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Date: Tue, 22 May 2001 18:32:52 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: Prem-Rx: RE: Signal generators et al.

Rob, It's clear that we are two of a kind. I would rather have top dollar test equipment than equipment on which to use it, and I remember Bill Lowe (the founder of Lowe Electronics) telling me why he always wore hand made shoes. "No one else will know they are hand made, but I know, and that's the pleasure". Same thing with signal sources. The FSA analyser is probably not too well known in the US because the market there has naturally belonged to HP, but to put the unit into price context, I bought one of these analysers for John Thorpe when he worked for me at Lowe and I think we paid around $70,000 for it (new). I was incredibly lucky to be offered the unit I now have because it was faulty, but that's no problem to me - fixing test equipment is my hobby. The main problem was sooooo simple, just a memory backup cell which had died and gone to heaven, so when I replaced it and fired up, the unit came back to life. A second problem with a power supply turned out to be dried up electrolytics, and after that it was easy. Frequency coverage is 100Hz to 2GHz (that really is 100Hz)with an on-screen dynamic range of 110dB and resolution down to 6Hz. You can imagine the suite of firmware functions which come along with this class of instrument, and it's all displayed on a full color tube. Having this on the bench means I can look at close in phase noise with meaningful results, and needless to say I have included close in spectrum sweeps of receiver local oscillators in my

reviews. Some of them do give cause for concern!! Self calibration is built-in and takes around 10 minutes to complete with a 0.5dB accuracy guaranteed at the end of the cal. Am I lucky?? For the real test equipment aficionado this is the best it can get. But I still can't afford an 8662A. We should meet and talk sometime, I'm sure we would both enjoy it. Maybe when you need someone in UK to handle your products you will call me. 73 John

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Date: Tue, 22 May 2001 14:38:29 -0400
From: "Carcia, Frank A. HS" <francis.carcia@hs.utc.com
Subject: RE: Prem-Rx: List Manager has its rewards-

Hi Greg, Bring your wife down there and have her imagine a path through the basement to the washing machine. (I keep that path clear so the wash gets done) I will show my wife a picture of Mike's and tell her how lucky she is with my limited stash. BTW, She does feel lucky to know where I play. "Egor come up, you need light"! fc

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Date: Tue, 22 May 2001 19:41:21 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: RE: Prem-Rx: Sig gens and Phase noise

Chris, Thanks for the interesting note about the PTS-160 but once again the close-in phase noise is not as good as an old 8640B, and the broad band noise levels out at least 5dB hgher than the 8640. As you say, and I have consistently argued, the best (and easiest) way to guarantee a low noise source is to build a crystal oscillator. I'm intrigued with the 8MHz source you measured at -145dBc/Hz and would like to have details of the measurement technique - perhaps you have access to some unbelievably high priced HP kit which I know will do these measurements but costs as much as my house. 73 John Wilson

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Date: Tue, 22 May 2001 20:37:04 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: Prem-Rx: Das Gerfingerpoken

Let's go down another road. I've handled most of the regularly encountered premium receivers in the last two years in my wrting for the Short Wave Magazine, and have loved some, liked some, and others I won't talk about, but there is that certain feeling which you all know when you settle in front of a receiver for the first time and think "This is really nice to handle". I'm talking about the ergonomics of the front panel, and I'd like to canvass views from the circle as to what receivers have given you "The Feeling". Personally, I like the HF-1000/8711 because I can see at a glance what the receiver is doing, and there's an instinctive feel to the control layout coupled with the displays. On the other hand, receivers like the 51 or 75 series from Collins take some beating with their comprehensive simplicity. What I don't like are triple decker menus, buttons which are too small to hit in the dark, and displays which I can't see (Collins HF-2050). Whaddya think?? John Wilson

- ---------- John Wilson Stone Hill Kings Nympton Umberleigh Devon EX37 9TR Tel: 01769 573047 Fax: 01769 574158

Date: Wed, 23 May 2001 13:39:42 -0400
From: Bob Milne <rmilne@cfl.rr.com
Subject: Re: Prem-Rx: Das Gerfingerpoken

Hi John,

To me, the all-time sexiest and greatest front panel design was found on the 51J-3 and 74A-4 receivers. They look like real precision radios that mean "business." As a kid, I got to twirl the dial of a working 75A-4 in a radio store--it was love at first sight. And my opinion hasn't changed over the years. The silky-smooth tuning mechanism is a pleasure when band scanning.

When Collins changed to the R390 series, I think it was a step backwards that resulted in an ugly-looking receiver (notwithstanding the fact that the R390A is one heck of a radio performance wise). And I hated the mechanical sound of the dial digits clicking into place when tuning real fast.

I used to live near the NJ Meadowlands and that horrendous RF environment humbled any receiver (professional or otherwise) that had a wide-band front end. Of course, the 51J-3, R390A, and HQ-180 beat the pants off any of them.

In fact, I couldn't even connect all my receivers with a multicoupler unless all of the solid-state rigs were turned on. If any one of them were turned off, the various diodes in the input sections rectified the whole RF spectrum and radiated an unbelievable amount of intermod (it took me awhile to figure that out, though). Now that I've moved to Florida (where there is only one local AM radio station) my Datong AD-270 active antenna handles the whole RF spectrum without generating any broadcast-band intermod in the VLF range!

....Bob

Date: Wed, 23 May 2001 14:23:10 -0400
From: "Carcia, Frank A. HS" <francis.carcia@hs.utc.com
Subject: RE: Prem-Rx: Das Gerfingerpoken

Hi Bob, They are very pretty radios but the audio sounded poor and not the greatest performer. The R390A is ugly but works great. I had a '72 one ton truck with a wood flat bed. My friends called it the jethro mobile but it would take a stock VET in a quarter mile. (not a stock drive train) Wasn't a girl magnet either but my wife to be tolerated it as long as a bathroom was near by. She called it the kidney killer. I think the drive train in the R390A a work of art. fc

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Date: Wed, 23 May 2001 14:25:27 -0400
From: "Spears, Ronald E" <SpearsRE@dot.state.sc.us
Subject: Prem-Rx: Barlow Wadley XCR-30

Hi John, First of all I want you to know that I really enjoy reading your receiver reviews in Short Wave Magazine. It's the main reason I buy the magazine every month. I get quite an education from the info you present. Although not a "Premium RX" by definition, the Barlow Wadley XCR-30 is one heck of a radio. I use mine for Dxing outdoors and with a good long wire it does a commendable job. Have you ever used one of these radios and if so how does it stack up against the R-390s and 2050s of the world? BTW: the HQ-180A gets my vote for best tube (err, I mean valve or whatever you non-English speaking people call them <grin
>) receiver.
Ron (diehard HF-225 fan from South Carolina) Spears

Date: Wed, 23 May 2001 14:37:30 EDT
From: Daiungoed@aol.com
Subject: Prem-Rx: receivers

Hi, Does anyone have any experience with either the CUBIC 3080, which seems to be half a 3030, or a WJ 8615. Any comments appreciated, Dave

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Date: Wed, 23 May 2001 15:05:51 -0400
From: "Ed Tanton" <n4xy@att.net
Subject: RE: Prem-Rx: Das Gerfingerpoken

WHAT 'tuning real fast' ??????????????????

The only way I can think of to tune my R-390-A "real fast" would be to remove the knob and fasten an electric drill to the shaft!!!

73 Ed Tanton N4XY <n4xy@arrl.net

Ed Tanton N4XY 189 Pioneer Trail Marietta, GA 30068-3466

website: http://www.n4xy.com

LM: ARRL QCWA AMSAT & INDEXA; SEDXC NCDXA GACW QRP-ARCI OK-QRP QRP-L #758 K2 (FT) #00057

R-390: Motorola SN: 374; R-390-A: Capehart SN: 2241 51S-1 WE SN: 4389 HRO-50; HRO-60; & HRO-500 SP600-VLF SP600-JX-17 SP-600-JX-21

///snip
> I hated the mechanical sound of the dial digits clicking into place
> when tuning real fast.
///snip

Date: Wed, 23 May 2001 20:42:15 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: RE: Prem-Rx: Das Gerfingerpoken

I always said that the way to recognise the owner of an R-390 was to measure the size of his right wrist. It would always be twice normal because of the exercise it received in getting from frequency to frequency with the '390. Mind you, the motor driven "channelised" version is even more frightening. John Wilson

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Date: Wed, 23 May 2001 20:42:17 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: RE: Prem-Rx: Barlow Wadley XCR-30

Good evening Ron, Yes, I do know the Barlow-Wadley well, and have one in my collection under the heading "Landmarks in the history of receiver design". I did a write-up on the XCR-30 some time ago, included in a general article on the various implementations of the Wadley drift cancelling loop, and told the story of an honourable Japanese company who had contracted with Peter Drake to produce a Wadley loop receiver "exclusively" for Drake under the model type SSR-1. No sooner was it in production than the same honourable company sold the same receiver to me at Lowe in a slightly different enclosure style and we marketed it as the Lowe SRX-30. Then, to mount a third Pearl Harbor they went and sold our "exclusive" receiver to a German company who marketed it under the title "Century 21". Happy Days. Having said all that, the Barlow-Wadley, made in South Africa, was as you say quite a receiver and works well as a portable "World Band" radio. I know that my old friend Larry Magne may not agree with me but the XCR-30 is remarkably free from unwanted spurious signals and mysterious wandering heterodynes, and once you have become accustomed to tuning with vertical thumb wheels it's a good thing to have along on portable excursions. You do have to have the digital sensitivity of an expert safe-cracker to get on frequency when receiving SSB, but at least it does it properly, and for a 1970s receiver it was indeed a landmark. But you are right; a premium receiver it ain't. 73 John

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premium-rx-digest Thursday, May 24 2001 Volume 01 : Number 118

Date: Wed, 23 May 2001 20:50:16 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: RE: Prem-Rx: Das Gerfingerpoken

Bob, you hit the nail on the head with the comments on the "classic" front panels of the 51J and 75A receivers. As my old granny used to say "A place for everything, and everything in its place". She was of course talking about household tidiness, but it struck me that it describes a good receiver panel layout pretty accurately. I have a 75A-1 sitting on my "Yet to be restored" shelf here, and I am looking forward to getting it back to its former glory. I like the band scales all in view rather better than the single band in view of the later receivers, and of course the 75A-1 will make a dream looking station with a 32V. So let's hear ot once again for Art Collins. 73 John

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Date: Wed, 23 May 2001 15:59:46 -0400
From: "Spears, Ronald E" <SpearsRE@dot.state.sc.us
Subject: RE: Prem-Rx: Barlow Wadley XCR-30

Thanks for this info John. I'll look forward to reading your postings to the group.

Ron

Date: Wed, 23 May 2001 14:27:46 -0700
From: "JerryL" <jlockett@onemain.com
Subject: Re: Prem-Rx: Das Gerfingerpoken

I once had a R390A that had a 'gear' on the shaft where the front knob used to be. It was chain driven by a little external motor that was remotely controlled. Military setup as I recall.

Jerry -n6jp-

Date: Wed, 23 May 2001 18:18:37 -0400
From: Michael Brown <piggin@mindspring.com
Subject: Prem-Rx: 3031A performance disparity

Today I received my second 3031A.Let me be blunt...Its a dog.Its SN 1496 only 4 units older than my SN 1500.There is NO comparison in performance.It acts exactly as some members here describe theirs.It has poor agc action(it overloads easily),the s-meter overreads by 30db+,and it otherwise is NOT a happy camper.I suspect it is behaving exactly like some of the other units out there.I suspect poor maintenence and adjustments to be the culprit.After seeing the factory method of adjustment, I can easily see why.It aint for the faint of heart or the less than really serious test bench.There is no way I can fix this unit...I will not even try.It will be a source of parts for my superb #1500.If you guys that own these 3031As are not happy with the AGC or overloading I suggest you try the factory procedure for adjustment.You would have to see these side by side to beleive the difference.I suspected mine was a good one.Now I am certain.

Date: Wed, 23 May 2001 18:31:08 -0400
From: Bob Milne <rmilne@cfl.rr.com

Subject: Re: Prem-Rx: Das Gerfingerpoken

Hi Frank,

I'm afraid I have to agree with you about the audio. No matter how much I dinked with it, I couldn't get it my liking. Eventually, I got rid of both my R-388's/51J-3. Now that I see what they're going for on eBay, I wish I had held on to one.

I'm a real stickler for good audio, and will even tolerate somewhat reduced performance in a receiver if it is comfortable to listen to. The worst-sounding receiver I ever owned was the NRD-525. And it wasn't something you could measure in terms of frequency response either. It even sounded awful with the bandwidth wide open. I had a number of (ahem) interesting discussions with Paul Lannier of Gilfer Shortwave (a staunch NRD supporter) when I praised the audio and virtues of my Drake R8. Of course, he was the real winner as I bought both radios from him!

Right now, I'm really happy with the audio from the R8, R7A, 51S-1, and my prized Mackay MSR 5050A. All of them sound warm and "tube-like" to my ears. I wish I could say the same for the Racal 6790GM.

....Bob

Date: Wed, 23 May 2001 18:36:32 -0400
From: Bob Milne <rmilne@cfl.rr.com
Subject: Re: Prem-Rx: Das Gerfingerpoken

Hi Ed,

You'd be surprised how fast you can tune an R-390A when you have the tuning shaft interfaced to the crank handle from a Model A Ford! <grin

....Bob

Date: Thu, 24 May 2001 01:14:46 EDT
From: DAVEINBHAM@aol.com
Subject: Prem-Rx: Was Das Gerfingerpoken, Now deaf RA6790/GM

In a message dated 5/23/01 4:32:11 PM Central Standard Time, rmilne@cfl.rr.com writes:

<< Right now, I'm really happy with the audio from the R8, R7A, 51S-1, and my prized Mackay MSR 5050A. All of them sound warm and "tube-like" to my ears. I wish I could say the same for the Racal 6790GM.

....Bob

****

Bob, My experience with the Racal RA6790/GM appears to be quite different than yours. My RA6790/GM has much better audio than any other sand state radio I have ever used. Much better than the R8, better than a truckload of Kenwoods that have lived here at one time or another, even slightly better than any of my R-390A's. Only my Hammarlund SP-600 has better audio than the RA6790/GM.

The only complaint I have with the RA6790/GM is that the sensitivy just plain sucks. I have not yet put a calibrated signal generator on it, but I would bet any of the R-390A's with 30db antennuator added at the antenna would hear stuff the RA6790/GM would not hear without the antennuator.

It is gonna be a week or so until I have time to work on it, in the meantime have any of you other RA6790/GM drivers had similar problems ? Suggested cures ?

If I can improve the sensitivy and ever get it to work at VLF, I will nominate the RA6790/GM for best radio ever. It has (with apologies to Bob) excellent audio, excellent ergonomics , and is the easiest radio to use I have ever encountered. But if I can't do something about the sensitivy it goes on the sales table next BirmingHamFest.

Regards, Dave

Date: Wed, 23 May 2001 17:28:24 -0500 (CDT)
From: parnass@marconi.ih.lucent.com (Robert S Parnass)
Subject: Re: Prem-Rx: 3031A performance disparity

Mike,

I wonder if a previous owner performed more than an alignment on your 3031A. Perhaps it has a modified product detector or somesuch.

Date: Thu, 24 May 2001 02:36:31 -0400
From: Bob Milne <rmilne@cfl.rr.com
Subject: Re: Prem-Rx: Was Das Gerfingerpoken, Now deaf RA6790/GM

Hi Dave,

No apologies needed as good audio is in the "ear" of the beholder. And the stability and 1-Hz tuning resolution of the 6790/GM are first rate. My unit also seems rather insensitive due to what appears to be excessive noise with no input signal. The receiver doesn't start to quiet down until some AGC action takes place. As I have no other 6790's to compare with, I don't know if that's normal for this radio, or mine has an internal gain adjustment set too high. Can any other 6790/GM owners comment on this? Right now it's getting cranky about passing the BITE when powered up, so I have it set aside. I seem to recall something from one of the longwave clubs where it was possible to "trick" a certain radio to tune below 500 kHz through a pushbutton sequence from the front panel--and I think it was the 6790/GM . Any other list members have a better memory than me?

....Bob

Date: Thu, 24 May 2001 14:22:48 -0500
From: "Terry O'Laughlin" <terryo@wort-fm.terracom.net
Subject: Prem-Rx: Re: Das Gerfingerpointen

> I'd like to canvass views from the circle as to what receivers have given you "The
> Feeling". -John Wilson

I'm disappointed that no one took up this red herring. I've seen enough wisecracks on lesser listservers about the tuning on an R-390 to run screaming from the room. I was hoping the discourse here would continue on a higher level.

I agree with John about sitting down to operate some receivers and getting "The Feeling." I thought he was aiming at a combination of performance and ergonomics that make a radio special. I'd love to see a discussion of what "feels" right in a premium radio. What do like about how a radio operates?

One operator's opinions:

My shack has settled on an R-388, RA-6217E, RA-6790, WJ-8718/MFP and a WJ-8671B(S1) w/LF option. (R-390s come and go). For various reasons I've owned and sold off many other radios but these feel right and have lingered.

The R-388 has the classic looks and that fabulous analog dial. It is a great radio for cruising around the dial. It is also relatively small and light for a tube radio. A definite keeper.

The RA-6217E is incredibly well built, as long as you have a selection of spare germanium transistors. It handles like an R-390 except the MHz dial is really easy to turn though misleading. It feels like it should have detents but it is not a switch even though the dial leads you to believe it is.

The RA-6790 has that amazing BITE. I made adapter boards and have a variety of hamfest Collins mech filters that it digested and lined up for operation (including 2.1kHz USB and LSB). I like the audio, especially using the long AGC on SSB which pushes the atmospheric noise down and holds it there. Tuning the BFO is a pain and the keypad entry for frequency is weird because you must remember to hit enter first and start with any leading zeroes. The display is decent but the illumination is uneven, especially in the middle of the left LCD.

The WJ-8718/MFP is my favorite. I like the operating system better than the Icoms and JRCs I've owned. The plain 8718 is boring, but the MFP option puts it all at your finger tips. The memory functions are intelligently laid out and easy to use. The tuning feels great, much better than the plastic bushing RA-6790 and the dampened feel of most Japanese radios (except JRCs). The yellow LEDs are great. Easy on the eyes and readable is just about any light. I wish the trailing digits would zero out when you increase the tuning step, or better yet, you could select between fixed smaller digits and zeroing them out. Nevertheless, it is an amazing radio especially when you consider that it was designed when the Icom R-70 was considered hot stuff.

The WJ-8617B(S1) is another favorite. It will not win any performance awards on HF because it has a broad 0.5-30 MHz filter after the antenna jack. What distinguishes this radio is the built-in spectrum display showing 4 MHz of the HF band. Great for scouting for utility stations on the high side of the MUF. The operating system is similar to the 8718/MFP but the keypad is an external option. It has red LEDs, which are not as nice as the 8718's yellow LEDs.

I remember reading that the Sony 2010 was designed with feedback from the SWL community. Maybe the premium receiver folks should seek feedback from us to design the user interfaces on their next box. There are enough ergonomic nightmares already on the market.

73 Terry O' WB9GVB

Date: Thu, 24 May 2001 16:06:56 -0400
From: Bob Milne <rmilne@cfl.rr.com
Subject: Re: Prem-Rx: Was Das Gerfingerpoken, Now deaf RA6790/GM

Hi Dan,

When my battery went sour, I removed the module, got a couple of AAA NiCads and a battery holder from Radio Shack and wired them in. Works just fine.

....Bob

Date: Thu, 24 May 2001 21:04:15 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: RE: Prem-Rx: Re: Das Gerfingerpointen

Terry, You hit the real spot about "The Feeling", and there really is something special about high quality equipment, whether it be receivers, test gear, ham radio rigs or cars that just "feels right". Ther is certainly enough experience on this list to get to the real meaning of "The Feeling" which I can still get from an AR-88. OK, it's not a premium receiver now, but it is so satisfying to use that you seem to forget that it is 60 years old. Come on guys, Terry and I can't be the only ones who have felt it. John Wilson

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Date: Thu, 24 May 2001 15:45:04 -0500
From: Peter.Patton@lawson.com
Subject: RE: Prem-Rx: Re: The Feeling

Great discussion. I have always liked the 51J-3 and -4 for their smooth operation and ease of bandswitching and tuning. The one I have now is smooth light gray rather than dark gray wrinkle, in the proper cabinet, so it presents aesthetic visual appeal as well. I have always been amazed at the accuracy and durability of the R-390 and R-390A but they simply lacked the Feel; they are just too "clunky." The Collins 451S-1 and its transceiver sister the KWM-380 are very nice Rx when equipped with both the keypad and the dial. My favorite Rx right now is the Plessey 2282A. It has keypad, memory, fast and slow tuning dial, BITE, auto filter selection, everyting I like except good audio. I have some Collins HF-80 Rx but I don't like the thumbwheel tuning for SWL. Again, too clunky. I am hoping that when I eventually find an 851S-1 it will marry the amazing HF-80 performance with the Feel. But, the Collins 2250 just doesn't do it for me. Pete Patton

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premium-rx-digest Friday, May 25 2001 Volume 01 : Number 119

Date: Thu, 24 May 2001 17:24:53 -0400
From: jeffa@ix.netcom.com
Subject: RE: Prem-Rx: Re: Das Gerfingerpointen

Now that I know what receivers Terry has kept, I'd love to know which ones he got rid of because they didn't have "The Feeling."

In terms of best-sounding receiver for AM reception, I gotta say that I love my SX-28A with the bass control turned up. It ain't high-end, but what a warm, mellow sound.

- - Jeff, WA6AHL

Date: Thu, 24 May 2001 18:43:09 -0500
From: Turkisher Dan-CSLC82 <Dan.Turkisher@motorola.com
Subject: RE: Prem-Rx: Was Das Gerfingerpoken, Now deaf RA6790/GM

Hi Bob...

Just happens thast since my post I ordered a pair of N-zie NICADS with accompanying holder!

It will be a pleasure to not endure a BITE test unless I ask for one!

Thanks and regards,

Dan

Date: Thu, 24 May 2001 16:50:14 -0700
From: Walter Salmaniw <salmaniw@home.com
Subject: RE: Prem-Rx: Re: Das Gerfingerpointen

At 09:04 PM 5/24/2001 +0200, John Wilson wrote:
> Terry,
> You hit the real spot about "The Feeling", and there really is something
> special about high quality equipment, whether it be receivers, test gear,

> ham radio rigs or cars that just "feels right". Ther is certainly enough
> experience on this list to get to the real meaning of "The Feeling" which I
> can still get from an AR-88. OK, it's not a premium receiver now, but it is
> so satisfying to use that you seem to forget that it is 60 years old. Come
> on guys, Terry and I can't be the only ones who have felt it.
> John Wilson

Over the years, I've owned many receivers, but in the premium class, only more recently. My favourite, and I think it's beautiful, is the R-390A, especially when coupled with the Sherwood Engineering SE-3, through to a high quality amp and speakers. Tune in a strong station, filter on wide, and sit back and relax. Can't beat the sound coming from that arrangement. I don't at all think of it as ugly, especially the mechanics of it all. A thing of beauty, in my opinion. The ergonomics are nice too. The closest solid state receiver for clean natural sound has to be my Collins HF-2050. Lovely audio, in my opinion. Much, much better than my Kenwoods and JRCs. For ergonomics, though, my favourite is a non-premium rx, the NRD 535D. I never have to use the manual using this baby. All controls make sense from the moment you look at the front panel. Another fine piece of radio art, is the Racal RA17/117, which I used to own. A lovely heavy tuning knob, and that 35mm tuning tape, but so much different from the Collins R-390 series. .....Walt Salmaniw, Victoria BC.

Date: Fri, 25 May 2001 12:19:32 +1200
From: "Helen and David Norrie" <norrieclan@clear.net.nz
Subject: Prem-Rx: Fw: Barlow Wadley XCR mark 2

I would agree with previous comments on the list. The BW is a great portable and it's sensitivity can compete well with modern paperback size portables although it's not great on AM. My 1970's BW adorns our kitchen and is in daily use. It gives out powerful audio which makes it ideal for the yard, BBQ's or a noisy kitchen full of utensils. It doesn't like the microwave!!The batteries last for ever (none of your digital hash or memories here) and it's great for hunting down sources of electrical noise since it generates none itself. But it's heavy and not a sleek beauty by any stretch of the imagination. The finish is workmanlike rather than sophisticated.

A premier receiver yes but not in the classic sense of a Collins or Harris.

best regards
David Norrie
Auckland
New Zealand
AOR 7030

Date: Thu, 24 May 2001 20:10:12 -0500
From: "Bob Nickels" <ranickel@mwci.net
Subject: Re: Prem-Rx: Fw: Barlow Wadley XCR mark 2

I too like the XCR-30, but mine's on the blink. I've got the manual and understand the Wadley loop (at least I did at one time!), but would appreciate hearing from anyone who's spent time under the hood of this receiver...

Thanks and 73, Bob W9RAN

Date: Thu, 24 May 2001 21:40:56 EDT
From: Llgpt@aol.com
Subject: Prem-Rx: "That Felling"

On the subject of receivers with that certain feeling, the Hammarlund SP-600 immediately comes to mind. There isn't much out there that can match the silky feel of the main tuning knob of the SP-600. It has to be the ultimate band cruiser.

Les Locklear

Date: Thu, 24 May 2001 20:39:48 -0500
From: "Bob Nickels" <ranickel@mwci.net
Subject: Prem-Rx: Re: RA6790/GM

I own far more "non-premium" receivers than premium ones, but took the plunge with an RA6790/GM last year. Based on my experience with my RA-17 and RA-6217 and the many recommendations, I had high expectations. Unfortunately, the 6790 hasn't lived up to them....

Sensitivity is poor, at least several dB down from other receivers that are fed from the same multicoupler. The difference is noticable by ear and on the S meter as well. Based on other owners experience with damaged DMOS FETs in the first mixer, I replaced them - but there was no improvement, indicating the originals were OK after all. After reading everything I could find about the high performance mixer, I developed a lot of respect for the design, but haven't been able to improve the sensitivity. Since most of the gain in this receiver comes in the IF as determined by the AGC there isn't a lot to twiddle and tweak as with a more conventional receiver ;-) I've adjusted the AGC per the sketchy information in the manual, but there isn't much else I can see to do.

So I'd like to know if other 6790 owners feel it measures up sensitivity-wise, or whether this is just the nature of the beast. And I would appreciate any suggestions for a Racal expert that I might get to take a look at this one if that's the thing to do.

Thanks and 73, Bob W9RAN

Date: Thu, 24 May 2001 20:08:31 -0600
From: Rob & Terri Sherwood <rob@sherweng.com
Subject: Re: Prem-Rx: Re: RA6790/GM

I think your observations on the 6790GM are pretty normal. My web site shows 0.7 uV for the one I have owned for many years. It is having problems these days in that it won't pass the byte test very often, which makes it difficult to get it to recognize all 7 filters I have installed in it recently. Many years ago I had a 3 dB hybrid spit between it and an R-9000. There were weak but readable signals on the Icom that I could not even hear on the Racal. Just noise; not a peep.

How does your RA-6217 do on overload? Anything that has a 30 and 40 dB attenuator on the front panel gives me pause. I think some recent post said the 6217 has germanium transistors. I, too, have fiddled with the modest number of IF adjustments on the 6790GM to little avail. I did slow down the AGC on the medium position so that it did not pop up with full gain between words so often. If I can ever get the byte to calibrate all 7 filters I want it to go back in the rack and hook it up with a PRE-4 (Drake R-7 preamp clone) after the front end filter. The input bandpass filter should protect the preamp from low band TV and FM signals that can overload the PRE-4.

I also have a second 6790GM that does pass the byte all the time when I plug in one of my filter / adapters, but it is really dead / noisy. Would like to fix it, but seem to never get around to it. I have always assumed it was the front end mixers like you did, but who knows. We need a Chuck Rippel equivalent for Racals.

Date: Thu, 24 May 2001 19:47:00 -0700 (PDT)
From: Robert Kelley <pasha@kali.com

Subject: Prem-Rx: Re: RA6790/GM

At least yours still works. My RA6790/GM stopped working several months ago and I've been really wanting to fix it. It just says "REMOTE" now when I turn it on. The LCD edgelighting is OK. No reaction from any of the keys. I guess that means a fault in A6A2? Anyone have any tips on where to go from here? Anyone have a spare A6A2? Any other suggestions? I suppose I should check power, clock, and reset on the CPU. Is there a particular common failure mode I should know about? Any tips on how to make component level troubleshooting easier on this receiver?

73 de AC7KE

Date: Thu, 24 May 2001 22:06:13 -0500
From: "Bob Nickels" <ranickel@mwci.net
Subject: Re: Prem-Rx: Re: RA6790/GM

> At least yours still works. My RA6790/GM stopped working several
> months ago

Hi Bob,

You might try replacing the CPU backup battery. I used a pair of nicads in a RS holder. The radio does weird things when this battery isn't up to par, and it still took several days of charging to get the darn thing to power up without going thru BITE everytime.

Good luck!

73,Bob W9RAN

Date: Fri, 25 May 2001 08:03:19 -0400
From: "Carcia, Frank A. HS" <francis.carcia@hs.utc.com
Subject: RE: Prem-Rx: Re: RA6790/GM

Hi, There is an RF amplifier module made for this radio that bolts on the back wall if you really want a low noise figure. You will pay with dynamic range. The noise figure is determined by the first IF which has to make up for the front end and loss through the 455 kHz IF filters. Contact Gary Wingerd if you want the real scoop. fc

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Date: Fri, 25 May 2001 08:35:57 -0400
From: "Carcia, Frank A. HS" <francis.carcia@hs.utc.com
Subject: RE: Prem-Rx: Re: RA6790/GM

Hi, BTW. Racal filters have a 10 KOhm input and output impedance. A lower impedance filter will hurt the noise figure. Gary Wingerd is the guy you want to talk to for Racal radios. He has a repair business and works for Racal. He really likes the 6790 and has parts. .7 microvolt sounds high for a noise figure. fc

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Date: Fri, 25 May 2001 08:39:01 -0700
From: John Reed <jreed@ponca.net
Subject: Prem-Rx: Racal RA6790 sensitivity

Rob & Terri Sherwood wrote:

> I think your observations on the 6790GM are pretty normal. My web site shows
> 0.7 uV for the one I have owned for many years. It is having problems these

> days in that it won't pass the byte test very often, which makes it difficult
> to get it to recognize all 7 filters I have installed in it recently. Many
> years ago I had a 3 dB hybrid spit between it and an R-9000. There were weak
> but readable signals on the Icom that I could not even hear on the Racal. Just
> noise; not a peep.

Here's something interesting I discovered the other day while experimenting on my RA6793A. There's a 100 Hz crystal filter installed in it and the S/N was really lousy. Noise figure was 46 dB. I noticed that the noise is not band limited, seeming to extend all over the audio range. I added a second 100 Hz filter connected to the 455 KHz IF output on the back panel and ran this into an SE-3 for detection. The noise figure dropped to 16 dB, about where I thought it should be. The filters sound very good now, better that an RF-590 with similar 100 Hz filter, and just as sensitive. Trying the same trick with the 1 KHz IF filter and adding a second 1 KHz filter the noise figure dropped from 20 dB to 16 dB. The Harris has a 12 dB noise figure with a 1 KHz filter. I think the lesson here is that Racal should have been more careful in the design of the IF stage. This problem is similar to the old NRD-525 hiss noise problem where ESKA fixed up a post IF filter board to fix it. The best way to fix the Racal 6790 series for narrow band reception would be to add another switched set of filters after the IF amp. Not too easy or cheap, however. I don't have a second 300 Hz filter but have one ordered. I'll report on the results for 300 Hz in the future.

John Reed

Date: Fri, 25 May 2001 10:11:33 -0400
From: "Mark S. Holden" <msholden@mail2.nai.net
Subject: RE: Prem-Rx: Racal RA6790 sensitivity

While we're on the subject of the 6790, does anyone know what bite code 99 means?

The symptom on my radio is it won't recognize filters wider than 3.2khz.

Unfortunately, my manual seems to be missing the dozen or so pages that presumably get into trouble shooting.

Mark

Date: Fri, 25 May 2001 17:49:46 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: RE: Prem-Rx: Racal RA6790 sensitivity

Absolutely right on the post-IF filter fitting. I did the same trick with the JRC NRD-505 for Angus McKenzie, G3OSS who was an audio reviewer and official BBC monitor. He couldn't stand the 455kHz IF hiss and the filter was a revelation.This was way back in the early 1970s. Kenwood also did the same trick with their TS-180S transceiver by providing a post-IF filter available as an extra cost option. Just like the phase noise of a crystal oscillator, there's little new under the sun' It's just that each successive generation seemingly has to re-learn the lessons, and that's why discussion groups like this are so valuable. 73 John Wilson

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Date: Fri, 25 May 2001 19:33:13 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: RE: Prem-Rx: Sig gens and Phase noise

Chris, Thank you for the details on the test setup for phase noise measurement. It prompted me to try and determine how professional phase noise figures are derived and I collected together all the

information I had, together with a detailed trawl of the Internet and manufacturer's catalogues. The stumbling block in my queries, and I may be displaying massive ignorance, is the Latin tag "Sed quis custodiet ipsos custodes"; Who shall guard the guards?. Each separate reference to phase noise measurements comes down to the question of comparison with a reference source which therefore has to be an order of magnitude better than the source you are trying to measure. H-P detail a technique which uses a mixer to compare a reference with the source under test with the resultant IF (dc) used to drag the source under test into phase lock with the reference, with a spectrum analyser used to measure the noise level at 20kHz. What I can't find is the way to measure a single source such as a crystal oscillator, so my question to myself is "How is this done?" Hewlett Packard application notes don't help since they are heavily biased towards getting you to spend huge amounts of money on their systems which still rely on the cleanliness of the reference source. Marconi Instruments tell you to measure phase noise against a crystal oscillator which is no help when you want to measure the crystal oscillator itself, so where do I go from here? The simple truth is that most users who are familiar with good receivers can tell how they are performing by using ears and brain coupled with experience. I certainly didn't need test instruments to tell me that the first sample of the JRC NRD 545 was absolutely unacceptable in demodulating broadcast AM, and I guess that the outstanding reputations of the great receivers reflects the ability of their owners to analyse the performance by just listening intelligently to the results. We must talk further.

John Wilson

Date: Fri, 25 May 2001 14:53:04 -0400
From: "Carcia, Frank A. HS" <francis.carcia@hs.utc.com
Subject: RE: Prem-Rx: Sig gens and Phase noise

Check out the operator manual for the HP8640B which describes the phase noise test you are referring to.

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premium-rx-digest Saturday, May 26 2001 Volume 01 : Number 120

Date: Fri, 25 May 2001 14:44:37 -0500
From: "Terry O'Laughlin" <terryo@wort-fm.terracom.net
Subject: Prem-Rx: Re: Das Rejectinlisten

At 05:24 PM 5/24/01 -0400, you wrote:
> Now that I know what receivers Terry has kept, I'd love to know which ones
> he got rid of because they didn't have "The Feeling."

Oh jeez. Where do I start?

I have owned many receivers but not a lot of premium receivers. I've slowed down because buying receivers has recently become a capital intensive hobby, probably due to eBay more than any other single cause. Ten years ago I could still afford many fixer-uppers, rebuild them, play with them and then get a reasonable chink of my investment back (but not covering my time). I remember buying three disheveled Collins 651S-1A receivers for $30, two dozen R-390 & 390As for $150 for the lot, and countless other receivers for well under $100. At those prices, one can play around and take chances.

The prices of receivers have risen to the point where finding one at a "play around with it" price is rare. When I am interested in a premium receiver now, I borrow or "test drive" them through the courtesy of my radio buddies. These include some of the radios discussed here like the Harris RF-590, Mackay 3021, NRD-535D and others not discussed like the WJ-8888B and the WJ-9040.

Test driven and rejected:

The Harris is a really neat radio. The performance is so... staid. They work great but it's kinda boring. Like trying to go for a joy ride in a UPS delivery truck. The front panel feels like I'm operating an old Univac computer. It also uses vacuum fluorescent displays, which tire my eyes. The display alone scratches it for me (along with most older Icoms).

The WJ-8888B is a great radio but a total pain to make large moves around the spectrum (the straight quad 8 and the A have serious circuit board manufacturing problems). The front panel layout feels clunky and the memory system is pure anachronism.

The Mackay's smallest steps are too big for me. The construction is really nice. It performs nicely but doesn't have many features. Boring.

The NRD-535D is gorgeous and operates very nicely. Easily one of the best overall operating systems I've come across. However, I've become biased toward radios I can fix myself. The JRC is loaded with special purpose chips and you don't want to know how much it costs to replace blown varactors in the front end.

Of the receivers I've owned and let go, I'll just give a few details on the highlights:

The 51H-3, 51J-3, R-389, R-390, R-390A, R-391, R-392. I've owned many of each.

The 51H-3 is the commercial aviation version of the R-105 and is clearly the place where the 51J series spawned. Very stable, but the tuning system is downright weird.

The R-389 is easily the most impressive mechanical design I have ever worked with. Too bad they didn't include the same motorized tuning in the R-390(). My WJ-340 receiver ran rings around it but stops at 900kHz. Not an HF radio but worthy of mention.

The R-390 is probably the greatest team effort between mechanical and electrical engineers. I love them but they are as common as dirt (well maybe, Iowa prairie soul which is better than dirt and eroding away). Lets face it these radios are not rare. If I see one under $100 I'll pick it up and rebuild it for kicks but I'm bored with them. I don't use my '76 Microbus for daily transportation and I'd rather use a newer receiver for daily listening.

The R-391 has nothing special going for it other than it is an odd variant. I had the matching autotune supply and the preselector in a rack with a CV-157. After a while you wonder what the hell you are doing. Heating the house? Anchoring the room? A lotta space for impressing a tiny circle of friends.

Same goes for the 392. A 390 variant in a lunch bucket. Nice radio but too weird. Vacuum tubes at 28 volts? A front panel uglier than an English Boxer (complete with drool). Like I say, weird.

Other radios that had the feel and were tough to part with:

Eddystone S-680X. Man-o-man. The Hammurlund SP-600 tuning is crude compared to this radio. The feel of the tuning is unbelievably good. The rest of the front panel is awkward to use. The bandswitch operates hard, the toggle switches operate in counterintuitive directions and the markings on the rotary controls are atrocious. Performance is excellent for an analog/crystal filter radio. Nice small package, but with enough heft to be more stable than an SP-600. If the prices had not gone astronomical and I had infinite bench space, I would never have sold this one.

Hammurlund SP-600. Too big, too heavy, too imprecise but drop dead gorgeous. Ray Loewy may have gotten big $$$ from Hallicrafter for the SX-42 but the unsung designer at Hammurlund outdid him with this one. I had to repair something in the coil turret on my last one - never again. Seems like every unit I have purchased has had failures in the AGC circuit. When I have the bench space, it's like having a pinup in the shack. Nice to look at, but tough to live with.

JRC NRD-525. I really liked this radio. I sold it at a weak moment, probably right after a friend told me about his bill for replacing the varactors on a dead band. Either that or the increasing bias I feel against consumer gear. Tiny wires and esoteric ICs are no longer inviting. The looks aren't as svelte as the 535 but the operating system is every bit as sweet.

The Collins 651S-1 was one of the toughest to part with. It was my first solid-state, premium receiver. I loved the stability, the sound, the way it handled, but the front panel, knobs, and conrols are cheesy as all get out. Internally, it was a nightmare. It looked like the mechanical engineers were sent home and the electrical guys scooped up the breadboarded design and stuffed it a box as best they could. Maybe when Collins realized that radios no longer had gears in them, they laid off the MEs. Nevertheless, I only parted with it because I was offered what I felt was ridiculous amounts of money for it.

A personal history of "feel".

When I was 13 and graduated from a bakelite Crosley with one marine band to a Heathkit GR-54, I thought I was in heaven. Talk about "feel". Now I know "feel" is a highly subjective term and it changes as we grow and learn.

In retrospect, the R-390A was the first radio I owned that truly had the "feel". I had radios before with mechanical and crystal filters, but my god, here were six bandwidths and they really worked. I tore the gear train down to the washers cleaned it and lubricated it with Phil Wood Waterproof Grease (designed for bicycles but works great in the R-390 - a vast improvement over Lubriplate and easier to use than Mobil 1). I think the tuning feel is wonderful. It's more Mercedes 300SL than Lexus 300. You gotta be a big boy to play with the big toys. I think that the comments on the feel of an R-390's tuning come from people with unreasonable expectations or who are too lazy to completely clean and relubricate their radio.

I sometimes wonder if any synthesized radio will ever outperform a tuned and tweaked 390, but that really doesn't matter to me anymore. I drive a Toyota Corolla and I don't miss tuning and tweaking the SUs on my Austin-Healey 3000 (or the damn side curtains). I am a casual SWL now. I want performance, but convenience matters. I'll trade down from ne plus ultra to merely superb for the ability to switch it on, push six buttons and hear what I am seeking. "Feel" is not a standard, it is a state of mind.

Final notes:

I'd love to try an HF-2050. I was all lined up to get one but they came in as demil units with smashed LCDs, smashed ICs and components torn out of the boards. A criminal act. I fail to see the rationale in doing a demil job on an HF rig. It must be done solely to enrich defense contractors by removing competition from the market. I'm sure all of us can imagine a hell for the idiots who sanction these heinous acts.

Now how do we combine everyone's opinions to design the optimal premium-rx to human interface.

73 Terry O' WB9GVB

Date: Fri, 25 May 2001 16:19:20 -0400
From: jeffa@ix.netcom.com
Subject: RE: Prem-Rx: Sig gens and Phase noise

It's been quite a bit of time since I read up on the techniques for verifying the phase noise performance of a reference source, but if I remember correctly there are a couple of ways of doing this.

The first one requires that you have another identical source, such as another 8640B or another xtal oscillator, depending upon which unit you want to test. If you want to measure the phase noise of an 8640B, for example, mix the two together as one would normally do for a phase-noise test. Assuming the two sources have identical noise performance, then the performance of a single source is 3dB (or is it 6? - I no longer recall) below the measured result.

I seem to faintly remember another technique where you shift the reference in phase to decorrelate the noise and then measure it against itself, but I no longer recall the details.

- - Jeff, WA6AHL

Date: Fri, 25 May 2001 21:17:47 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: RE: Prem-Rx: Re: Das Rejectinlisten

Bless you Terry, That's exactly the kind of response from the heart that I was hoping for, and I believe that "The Feeling" is straight from the emotions rather than the cold facts of a spec. sheet. When a group of receiver nuts get talking, we always at some point say "AAH, the SP-600 tuning dial", or in my case the AR-88, or in your case the Eddystone 680X. There just has to be some kind of tactile interface between the operator and the receiver, together with an aural interface between the received audio and the human ears/brain which defies explanation. I'm sitting here at the moment whilst my 20 year old son is being introduced to a re-mastered copy of the Basie orchestra from 1957 reproduced on classic British 60s/70s audio equipment, and believe it or not he almost has tears in his eyes at the sheer magic of it all, so it's not just old guys' nostalgia. However, I'm drifting away from the subject. From this side of the Atlantic I'll still nominate the Racal RA-1792 as the nearest thing to my perfect stand-alone radio. It gives me "The Feeling". I know and like the R-390, and it may surprise some of you to know that John Thorpe, the HF125/225/150 AR-7030 designer spent untold hours doing a complete strip and rebuild on his own R-390 which finished up (dare I say it) better than when it left the factory, so the 390 has friends in high places. My old bones just can't stand the stress of tuning it. Thanks Terry, 73 John Wilson

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Date: Fri, 25 May 2001 17:52:59 -0400 (EDT)
From: Steve Stutman <steve@xenon.clickadeal.com
Subject: Re: Prem-Rx: Re: Das Rejectinlisten

Hi,

Nice set of comments. I like this "feel" thread, but hope it doesn't degenerate into "oxygen free copper only from socialist Chilean mines above 12K feet" as happens in Stereotweak areas.

Seems to me that many premium RX and newer HF gear in general get things done performance-wise, but are awkward or less pleasant to use than say SP-600. As Terry commented, this is because there are fewer mechanical systems; less of the performance is derived from physical position of slugs or plates. Just not enough inertia and less need for big knobs.

Have been thinking about building some "control heads" with nice knob/encoder/flywheel, real knobs that turn, and a PIC or similar to output control codes. One head might serve a number of radios "with the right drivers". While the trend is obvioulsy toward "black box" for reasons given previously or otherwise clear; they just aren't fun for me. But, then again, driving games on Playstation controlled with pushbuttons aren't either.

Steve

Date: Fri, 25 May 2001 19:41:02 EDT
From: Llgpt@aol.com
Subject: Prem-Rx: 51S-1 vs. R-390A/URR

I recently read the article by John Wilson in the Shortwave magazine.

John, Have you ever considered an article on the R-390A vs. the 51S-1?

Having had 33 R-390A's pass through my hands over the years, and 1 R-390 (nonA) I believe that a 51S-1 cannot hold a candle to an R-390A.

I base this on many, many listening tests over the years between the two receivers. One time I included a Hammarlund SP-600. Other than on ssb reception, the SP-600 and R-390A bested the 51S-1. The 51S-1 came in last in sensitivity, audio and audio reproduction.

Having installed the Chambers/Lankford agc/ssb modification on several R-390A's, I can say that with this modification, the R-390A/URR will run circles around any 51S-1 I have ever listened to/operated on ssb.

I am not fortunate enough to own many of the laboratory grade instruments that many list on this list, but I listen with my ears, not oscilloscopes or signal generators.

I can say that I have used a refurbished a Military URM-25D for many years and have found it meets all of my needs.

When one considers the overblown prices that are being asked for 51S-1's, the R-390A has to be a bargain.

142-145 dbm noise floor on a receiver such as a well tuned operating R-390A has to be so much better than most of the noisy junk out there nowadays, that I believe that one is worth a test and an article in Shortwave Magazine.

Chuck Rippel and I believe that one cannot do much better these days on a receiver that is now approaching the mid century mark such as the R-390A/URR.

Les Locklear

Date: Fri, 25 May 2001 17:56:14 -0600
From: Rob & Terri Sherwood <rob@sherweng.com
Subject: Re: Prem-Rx: 51S-1 vs. R-390A/URR

I was hoping that someone would list test data on the following radios when I asked about them a few weeks ago. So far no data. Hi. I was not overwhelmed with my one and only look at the 51S-1, but testing only one sample of an old radio does not give you a high level of confidence in what is typical or even possible.

51S-1 R-390A SP-600 75S-3B or C RA-6217

Rob Sherwood Lets add 6790GM to the "data want list".

Date: Fri, 25 May 2001 20:11:34 EDT
From: Llgpt@aol.com
Subject: Re: Prem-Rx: 51S-1 vs. R-390A/URR

In a message dated 5/25/01 6:53:29 PM, rob@sherweng.com writes:

<< I was hoping that someone would list test data on the following radios when I asked about them a few weeks ago. So far no data. Hi. I was not overwhelmed with my one and only look at the 51S-1, but testing only one sample of an old radio does not give you a high level of confidence in what is typical or even possible.

51S-1 R-390A SP-600 75S-3B or C RA-6217

Hi Rob,

I can only report back what I have solid data on in that regard.

I have Chuck Rippel's R-390A Sensitivity Performance Summary on my particular R-390A, a 67 EAC sn/3314 (at least on the front panel nomenclature tag). That is a story by itself regarding the nomenclature tags on R-390XX series. But, onto business.

Band Frequency 10dbS/N + N Sensitivity 4 khz Filter AM

120M 2,2 mc 0.08

90M 3.3 mc 0.105

60M 4.8 mc 0.09

49M 6.0 mc 0.095

41M 7.1 mc 0.165

31M 9.6 mc 0.110

25M 11.8 mc 0.09

20M 14,2 mc 0.085

19M 15.2 mc 0.10

Receiver noise floor @ 2.2 kc -140db

Test equipment Used:

HP-8640-B HP-3400A

Receiver Conditions:

AGC "off" Filter: 4 kc Mode: AM

I can state with no hesitation, that my R-390A hears things that my R-8B, 6790GM, NRD-535(nonD), and John Leary SP-600 do not hear.

I no longer own a 75S-3B or the 51S-1, and don't miss them.

Les Locklear

Date: Sat, 26 May 2001 07:08:05 EDT
From: Radiomatt@aol.com
Subject: Re: Prem-Rx: 51S-1 vs. R-390A/URR

In a message dated 5/25/01 7:41:52 PM Eastern Daylight Time, Llgpt@aol.com writes:

< < Chuck Rippel and I believe that one cannot do much better these days on a receiver that is now approaching the mid century mark such as the R-390A/URR.

There was a news item that the AF is considering keeping the B-52 bomber flying until the 2030's (that would make it over 50-60 years, right?)

Both came from an era of American technical and manufacturing superiority, before we shipped those skills overseas, only to have them drop the ball and NOT improve on them. Interesting that the Icoms, Yaesus and Kenwoods that come back this way, may measure better, in some cases, but just not work as well as older stuff. There's a quality which is sensed but not definable.

In the audio field there's a parallel thing going on with 1960s tube equipment designed and built by (my late friend) Saul Marantz. (In the early 80s-90s I shared an office with him). He made a stereo preamp called the Model 7 (and 7-C) which now, forty years later, are available in exact KIT replicas in Japan...exact down to the last screw. THEY GO ON ebAY FOR 10 TO 30 TIMES THE ORIGINAL RETAIL LIST PRICE.

Is this lust for INHERENT quality silly? When the specs say there's no difference.

I dunno how we're ever going to win another war, if it happens. And we're sure as hell ill prepared for a terrorism-based war, and a technological (cyber) attack would easily succeed against us because our economy is so super dependent on labor-saving technology.

Date: Sat, 26 May 2001 13:41:14 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: RE: Prem-Rx: 51S-1 vs. R-390A/URR

Les, I believe you may well be right about a 390A out-performing a 51S-1, certainly from the ultimate "dig it out of the noise" ability which the 390A. One of the problems in writing articles on something like the 390A is that we in the UK are not blessed with the quantities of 390A receivers which are available to you in the US. That's why the Racal products are popular over here - because they are over here to begin with. My enthusiasm for the 51S-1 reflects my enthusiasm for Collins products as a whole, and what I try to do in the articles is remind newcomers that spending large amounts of cash on high end consumer products, littered with "features" does not necessarily mean that they are going to get a great receiver, and that the "classic" Collins designs are hard to beat. You and I and the members of the group already know that because we have been privileged to own and use most of the great designs. I'll try and persuade someone over here to loan me a 390A so that I can take a look at it and make the comparisons, but I already have an idea how it performs from talking to Chuck..... 73 John Wilson

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Date: Sat, 26 May 2001 15:08:18 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: Prem-Rx: Performance measurements

Rob, I read the mail from Les Locklear with some interest because it contained performance figures for the R-390A which I was then able to compare with my own measurements for other receivers. The information isn't completely helpful because the measurements were done in AM without stating the modulation depth, but for the sensitivity quoted I am assuming that 1kHz at 60% was used, otherwise I can't see how the 390A got down to -129dBm (.08µV). The other odd thing is the measurement of noise floor which is quoted at -140dB, but dB referenced to what? If the noise floor is -140dBm which kind of ties in with the sensitivity at -129dBm, then it beats anything I have ever seen, but since I also normally use an 8640B, with an 8657A for general hopping around with a keypad, but prefer to measure at 12dB Sinad using an HP 8903B I can get some correlation of results. I do have a 3400 true r.m.s. meter which I used prior to getting the 8903B so I can re-check some of my measurements with that and let you have up to date results for the 51S-1. The final anomaly is that I don't know whether the sensitivity figures quoted are e.m.f. or p.d. which of course makes a 6dB difference, and is why I prefer to measure in dBm. I should mention that the EMC test house which I run is attached to an accredited calibration lab so all my measurement gear is calibrated to National standards every year. 73 John Wilson - ---------- John Wilson Stone Hill Kings Nympton Umberleigh Devon EX37 9TR Tel: 01769 573047 Fax: 01769 574158

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premium-rx-digest Tuesday, May 29 2001 Volume 01 : Number 121

Date: Sat, 26 May 2001 17:32:20 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: Prem-Rx: RE: Performance measurements

Rob, No, I agree entirely with your methodology in testing, and indeed have looked to you as the teacher and me as the pupil when it comes to this field. For most of my measurements I use crystals at 14038kHz and 14058kHz, not because they are magic numbers but they happened to be two suitable stock crystals from a UK supplier which had 20kHz spacing and were not divisible by 10, for the same reason you use odd frequencies. If I had ordered my own frequency choice in single units the cost would have been about $30 per crystal, whereas from stock I got a real deal price. I also do all my measurements in SSB mode but use the standard SSB filter fitted to the receiver I'm testing, normally around 2.4kHz. I should I suppose correct for different bandwidths but it's only when you have a wide disparity like 2.4kHz compared to 500Hz that it's worth doing this. The difference in measured numbers between 2.4kHz and 2.7kHz is probably inside the measurement uncertainty window anyway. I'm looking forward to checking a real live 390A, and I'm hoping that John Thorpe still has his total rebuild unit. I hesitate to ask John to do the measurements for me because he is up to the armpits in paid work right now and there is a limit to friendship and favours which I might exceed. 73 John Wilson

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Date: Sat, 26 May 2001 12:13:53 -0700
From: John Reed <jreed@ponca.net
Subject: Re: Prem-Rx: Performance measurements

John Wilson wrote:

> Rob,
> I read the mail from Les Locklear with some interest because it contained
> performance figures for the R-390A which I was then able to compare with my

I was also wondering about the noise floor measurement. If this is converted to noise figure it comes out to be +.6 dB, only about 1/2 dB above thermal noise at room temperature. I don't think that's possible with front end filters and a tube RF amplifier. Usually at least a couple dBs are lost in filters, and tube amplifiers don't run a room temperature. The best receiver I've measured so far is the Sylvania R1414 which has a noise figure of 5 dB. It has special low noise front end filters and a solid state RF amp.

John Reed

Date: Sat, 26 May 2001 19:25:56 EDT
From: Llgpt@aol.com
Subject: Re: Prem-Rx: 51S-1 vs. R-390A/URR

John,

That would be great. Perhaps I could persuade a friend in England to help you in your search. Neil Clyne G8LIU has several of the R-390 and A receivers. I'll see what I can do regarding one to use for tests.

I'll say that one of my favorite receivers was a Racal RA.17C12. Very quiet, stable and selectivity was quite good. Unfortunately it has gone the way of many of my Boat Anchors over the years. A chronic bad back has forced me to look at the modern solid state receivers in a different light..... <grin

Les Locklear

Date: Sun, 27 May 2001 11:15:17 EDT
From: Llgpt@aol.com
Subject: Prem-Rx: Preformance measurements

I received this from Chuck Rippel today.

Les Locklear

= = = = = = = = = = = = =

Hi John with a copy to Les:

Maybe Les can post to this to the premie list for me. Seems sir Gregory has not signed me up yet.....

Since I measured Les' receiver with my calibrated HP-8640B and 3400A, let me clairfy the procedure just a bit. I use 30% modulation per the military procedure to arrive at a 10db S/N + N figure. The 4kc filter and AM detection, no BFO are used. Typically, R390A's I finish end up in the 0.1 - 0.2uv range. There have been many exceptions. I have 2 that are in the 0.07uv range and of course, you have heard about Les' receiver. The reigning "Champ" belongs to Ben Wallace out in San Diego. His radio, which I believe was a Stewart Warner build, came in at an astonishing 0.055uv for 10db S/N + N, as I recall. When the generator output gets that low, frankly, I start questioning my equipment, frankly. I start seeing intrusing through the 3' cable between the 8640B and receiver equipment during mesaurements under 0.1uv. Thus, I have to make sure the mesurements are taken on an otherwise quiet frequency. Cable leakage is enough of an issue with a sensitive R390A that 3 of the 4 IF alignments, which are made in the MW Band, are not possible unless they are made during daylight hours. WTAM in Cleveland, about 400 miles to the north, is a 50KW power house and their 1.100 khz channel falls on one of the aforementioned IF alignment frequencies. Noise floor is a difficult specification at which to arrive. Again, this is due to cable leakage. I usually measure it a 2.2mhz during the day by using the Line Out and adjusting Line Gain control to point where receiver noise measures -10db on the 3400A. I then turn the on RF ON switch and modulate the signal at 30% as per the spec while advancing the generator output until the meter goes upscale by 3db. The RF level of the 8640B at that point indicates the noise floor. The sensitivity numbers are achieved by working with the IF gain control and finding the optimum point of gain v/s noise. I know its hard to believe. However, the R390A handily bests my Harris RF590 (0.5uv with the preselector bypassed) and both the General Dynamics R1051H's I own. Frankly, the first time I measured the sensitivity of a completed R390A with credible test equipment, I was completely taken aback. I am going to be doing another of Robs R390A's in the near future. It would be interesting if he would measure the completed receiver to see if his numbers compare with mine.

Date: Sun, 27 May 2001 17:59:36 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: Prem-Rx: RE: R390A Performance

Hello Chuck, nice to hear from you again. Thanks for the details on the measurements which were missing from the posting from Les. I'm astonished at the AM performance and am now beginning to understand why the 390A is regarded as the best AM DX receiver on the market. Can't wait to get my hot little hands on one for a close inspection. Yes, I also have problems when checking intermod products around the bottom end of 20 metres and have taken to using RG-213 cable with silver plated N type connectors since I found that N to BNC adapters on the signal generators were not keeping out amateur CW signals. Are we reaching the limits of measurable performance here? I do have one magic bullet I can use because I have an anechoic chamber at the EMC test centre which has measured attenuation from inside to outside of around 130dB, so if I take all my measuring setup in to the office I can really get down to low levels without worrying about intruding unwanted signals. i can see this discussion running on from here, and thanks for the info. 73 John

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Date: Sun, 27 May 2001 22:21:48 EDT
From: CLeyson@aol.com
Subject: RE: Prem-Rx: Sig gens and Phase noise

Hi John,

Sorry for the late reply, I've been seriously overloaded with work lately.

I totally agree with your comments on reference noise. The reference does need to be much cleaner than the signal source under test. For most applications a VCXO is good enough. When it comes to measuring a single source such as a low noise crystal oscillator a different approach is usually taken.

The traditional method involves splitting the signal from the source under test and feeding half of it through a delay line to generate the required quadrature signal for the mixer LO port. I've never tried this method as I havn't had enough available output power from the test oscillator.

A second method uses two identical oscillators. The first oscillator drives the LO port, the second oscillator drives the RF port and is also phase locked to the first. Assuming that each oscillator contributes an equal amount of noise power, then simply subtract 3dB to get the double sideband noise power of one oscillator and another 3dB to get the single sideband power.

The best technique by far uses the cross-correlation method. This method requires two identical oscillators and phase detectors with associated low-pass filters and low noise amplifiers. The oscillator outputs are split to provide two pairs of input signals. These are fed into the LO and RF ports of the phase detectors and the output from one of the detectors is used to phase lock one oscillator to the other. The detector outputs are then fed into a cross-correlating FFT spectrum analyzer. Random noise from the mixers and amplifiers is uncorrelated and the correlated noise measured is that of the oscillators. A phase noise floor of some - -195dBc/Hz can be achieved using this method !

I wonder what sort of performance could be achieved with a few mixers and a soundcard ?

References: "Cross-Correlation Phase Noise Measurements" Warren F. Walls - Femtosecond Systems Inc. RF Design Test and Measurement Handbook pp.9-11 Cardiff Publishing Co. ISBN: 1-881289-01

Chris

Date: Sun, 27 May 2001 20:59:34 -0700
From: "John Miles" <jmiles@pop.net
Subject: Re: Prem-Rx: Sig gens and Phase noise

Here's a question along the same lines: what's the difference between "absolute phase noise" and "residual phase noise"?

I'm looking at the specs for the 8662A/8663A generators in the '98 HP catalog. One table shows "Front-Panel Absolute SSB Phase Noise (dBc/Hz)" and another, similar table shows "Residual SSB Phase Noise (dBc/Hz)." Both look like your standard phase-noise tables, showing specified and typical levels at various offsets from 1 Hz to 100 kHz. (The former table goes down to 1 Hz, the latter to 10.)

However, many of the closer-in values in the "residual" table are 5 to 15 dB better than those in the "absolute" table. At offsets of 10 kHz and beyond the figures are about the same, but the differences at 10 Hz and 100 Hz are substantial. The catalog doesn't elaborate on the differences between these two tables, or how their readings were obtained. Neither does the issue of the HP Journal I have that deals with the 8662A.

The listing for the 8640B in my '86 HP catalog shows only "Measured SSB noise (typical)", with the Y-axis labelled "SSB Phase Noise in 1 Hz BW, dB below carrier." Which does this graph show -- "absolute" or "residual" phase noise?

- -- jm

Date: Mon, 28 May 2001 00:51:39 -0400
From: Michael Brown <piggin@mindspring.com
Subject: Prem-Rx: Parts information

I am looking for parts for ITT Mackay Marine 3031A and 3041A Receivers.I am interested in obtaining the following:Front end Boards,IF/AGC boards,Information filter boards and filters.I need an 8kc filter and an LSB filter.I am also keenly interested in obtaining complete signal path modules.Signal path modules from Mackay 3030s and 3040s will work too.(the 3030s and 3040s are tuned by decadic switches)I beleive MSR-5050s use the same front end board as well.I am trying to get a full set of spares....I am sure this will prove very difficult.Thanks!

Date: Mon, 28 May 2001 01:18:11 EDT
From: CLeyson@aol.com
Subject: Re: Prem-Rx: Sig gens and Phase noise

Just downloaded the HP8662A data sheet. That's the first time I've seen two sets of phase noise figures for a sig gen. I don't know what the residual phase noise refers to. At small offsets how would you measure it anyway if it's 15dB below the phase noise at the front panel connector ?

Chris

Date: Mon, 28 May 2001 07:40:52 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: RE: Prem-Rx: Sig gens and Phase noise

Chris, That's a very informative posting and many thanks for taking the trouble to compile it. I did dig out an article from "RF Engineering" entitled "Phase noise measurement for $250" which described the use of the power divider/delay line/quadrature approach but used a coaxial cable for the delay line which meant that you had to tune the oscillator under test in order to get proper quadrature. This was OK in the context of the article since the author was working on VCOs and could tune them, but it's hopeless for a fixed frequency oscillator. The simplest approach for me would be to fit the same crystal to two of my test oscillators and assume that they are identical. I have enough MiniCircuits bits and pieces to do the rest. Once again thanks for the clear and simple explanation of a complex issue. Rob Sherwood and I are currently engaged in an off list discussion about the relative merits (or otherwise) of measuring receiver noise floor in AM mode. I'll never be at a loss for something to do. 73 John Wilson

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Date: Mon, 28 May 2001 08:09:30 -0600
From: "Joe Talbot" <n52w113@hotmail.com
Subject: Prem-Rx: HF-2050 Panels

Hello to all in the group! I have two newly restored HF 2050 panels and one pair of handles for sale. The handles are included with the panel. The panels were professionally restored, sandblasted, primed, painted and re-silk-screened. The handles sandblasted, primed and re-painted. At cost, the price is $178 Canadian, that would be approximately $87 US. If you are interested, contact me at: n52w113@hotmail.com

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Date: Mon, 28 May 2001 19:45:09 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: Prem-Rx: Signal to noise measurement

Rob, Being brought up in the Marconi Company, I should have realised what is wrong with these AM semsitivity measurements. We were always taught to measure AM signal to noise ratio as the difference between an unmodulated signal and that signal with modulation applied, which is a different technique to that used in sensitivity measurements in SSB and/or CW modes, where you switch the test signal on and off and calculate the difference betwen the resultant audio. The reason for this method takes some explaining in an e-mail posting but I'll put it all together and let you have the theory behind why you cannot measure AM signal to noise ratios at very low levels of input carrier, and why the sensitivities quoted for the 390A may be incorrect. You may gather from this that I am re-reading some dusty old notes dating back to my time at Marconi College in the early 1960s. It's a fascinating insight into forgotten techniques which will have to be re-learned by some folk (including me). 73 John

- ---------- John Wilson Stone Hill Kings Nympton Umberleigh Devon EX37 9TR Tel: 01769 573047 Fax: 01769 574158

Date: Mon, 28 May 2001 16:10:43 -0600
From: Rob & Terri Sherwood <rob@sherweng.com
Subject: Prem-Rx: Re: Signal to noise measurement

Sounds reasonable to me. I don't know the theory, but with a diode / envelope detector you hear a rushing sound when you tune in a weak unmodulated carrier. So certainly it only makes sense to use this noise as the base line reference, not the noise floor with no signal.

A similar error can be made when measuring dynamic range with a synthesized radio. If you miss the fact that the noise floor may have been significantly elevated from the phase noise, and you only look for a 3 dB peak form the IM product, then things look better than they really are. The first synthesized radio that I tested that could even be measured at 20 kHz was the NRD-515. Thus I started moving out whatever distance was necessary to sidestep the phase noise. Thus some radios are measured at 50 or 100 kHz. Sure it would be possible to use the 3585A with a very narrow bandwidth to listen through the noise, but that would be misleading. This I think the reader gets more data from seeing that a radio cannot be tested at 20 kHz, for instance.

If some published numbers need to be restated, that is OK. Isn't the purpose of this reflector to learn from the collective knowledge?

Date: Mon, 28 May 2001 20:50:14 -0600
From: Rob & Terri Sherwood <rob@sherweng.com
Subject: Prem-Rx: S-Line guru needed

I have just started getting used to my "new" 29 year old 75S-3C that was procured at Dayton. The first thing I did was slow down the AGC so it sounds like an R-4C. The noise floor and sensitivity were great, and will go on my web site as soon as I measure the dynamic range.

The only problem is too much distortion coming out of the product detector. My manual has one DC voltage (51 volts) listed at the plate of the detector V8A (6EA8) and yet another (75 volts) listed in the tube voltage table. Neither of these is what I measure, getting about 30 volts, depending on which tube is in the socket. The manual lists receiver RF voltage values throughout the chain, from antenna on through when feeding in an AGC threshold signal of 1.5 uV (terminated). Nothing looks out of whack.

I measured the AGC threshold on 20 meters and it comes out 1.3 uV with a 12 dB drop off from -30 dBm reference. So signals feeding into the product detector are about 10 dB higher than the values in the chart when signals are around 20 over S9.

The BFO injected into the cathode is 6 volts P-P. This seems reasonable though there is no listing on what this value should be. The IF feed into the grid of the PD is about 600 mV P-P, again at the S9 + 20 signal level. To get the down from about 10% to about 3% I had to drop the signal going into the PD grid by 6 dB. (I shunted C33, a 220 pF mica with another 220 pF). That made a big sonic difference, but I have to do that. I see no distortion spec in the manual, but 10% does not seem reasonable. The audio tubes after the PD are not causing the distortion. I am quoting 2nd harmonic numbers only, as measured on an HP 3585A.

Any insight will be greatly appreciated. 73, Rob, NC0B.

Date: Mon, 28 May 2001 21:46:04 -0600
From: Rob & Terri Sherwood <rob@sherweng.com
Subject: Re: Prem-Rx: S-Line guru needed

Sorry for the gibberish in the next to last paragraph. Bad proof reading. Try this one.

Rob & Terri Sherwood wrote:
> I have just started getting used to my "new" 29 year old 75S-3C that was
> procured at Dayton. The first thing I did was slow down the AGC so it
> sounds like an R-4C. The noise floor and sensitivity were great, and
> will go on my web site as soon as I measure the dynamic range.

> The only problem is too much distortion coming out of the product
> detector. My manual has one DC voltage (51 volts) listed at the plate
> of the detector V8A (6EA8) and yet another (75 volts) listed in the tube
> voltage table. Neither of these is what I measure, getting about 30
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> into the grid of the product detector is about 600 mV P-P, again at the S9
> + 20 signal level. To get the distortion down from about 10% to about 3%
> I had to drop the signal going into the PD grid by 6 dB. (I shunted C33,
> a 220 pF mica
> with another 220 pF). That made a big sonic difference, but I should not
> have to
> have done that. I see no distortion spec in the manual, but 10% does not
> seem
> reasonable. The audio tubes after the PD are not causing the
> distortion. I am quoting 2nd harmonic numbers only, as measured on an
> HP 3585A. It has been a long time since I have owned a radio with a tube
> product detector (Drake R-4), but I would expect 1% distortion or less,

> not 10% or even 3%. Most modern receivers are are measuring 0.3 % or less
> on SSB.

> Any insight will be greatly appreciated. 73, Rob, NC0B.

Date: Tue, 29 May 2001 10:10:17 -0400
From: "Carcia, Frank A. HS" <francis.carcia@hs.utc.com
Subject: RE: Prem-Rx: 51S-1 vs. R-390A/URR

Hi, When I find a 8640 cavity for my homebrew RX LO I will be ready to compete with a R390A. fc

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Date: Tue, 29 May 2001 10:14:05 -0400
From: "Carcia, Frank A. HS" <francis.carcia@hs.utc.com
Subject: RE: Prem-Rx: 51S-1 vs. R-390A/URR

I think this was pre MBA bean counter, when real talent was in charge.

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premium-rx-digest Wednesday, May 30 2001 Volume 01 : Number 122

Date: Tue, 29 May 2001 10:17:14 -0400
From: "Carcia, Frank A. HS" <francis.carcia@hs.utc.com
Subject: RE: Prem-Rx: Performance measurements

A screen room and super coax and with attenuators that don't leak are required for these signal levels. Fc

---

Date: Tue, 29 May 2001 17:59:09 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: RE: Prem-Rx: Re: Das Rejectinlisten

Hi Terry, The RA-1792 has a clean no-clutter panel, big LCD readout, a fine free-spinning weighted tuning knob and RF performance which is really hard to beat. It's the nicest feeling (mustn't talk about feeling) radio I have had through my hands, and betters some of the later Racal products. They are currently available here in top condition at the equivalent of $1400, down to half that for an early, well worn example, so they are cheaper than the JRC NRD-545 and beat the pants of that receiver even with all its digital signal processing. Racal used either top spec. xtal filters or Collins mechanical depending on which area of the world the receivers were shipped to. It's a real beauty. 73 John

---

Date: Tue, 29 May 2001 22:11:21 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: RE: Prem-Rx: Re: Das Rejectinlisten

Kurt, Thank you for your query about the Racal RA-1792. As you see, the situation with this receiver is that every premium enthusiast in UK has one because they have been easy to obtain, whereas in the US everyone can get a Collins 390A but over here they are hard to find. I know an enthusiast who visited Telford Electronics and reported to me that the units on offer were early production without LCD backlight and BITE test facilities. There is one other source called "John's Radio" (the John is not me) in Bradford, Yorkshire, who offers various RA-1792 and he can distinguish between early and late production so the price varies according to age, but I don't know if he ships out of the UK. Amazingly

these days he doesn't have an e-mail address but his telephone number is +44 1274 684007, and his fax +44 1274 651160. He is a strange guy to deal with, and in UK we would say he is a typical Yorkshireman, very blunt and no emotion, so be prepared if you call him. Always bear in mind that these premium receivers can be difficult to fix if there is a firmware problem, so first find out if there is anyone in the US who knows anything about Racal equipment. Don't let me try to put you off a very fine receiver, but keep all these things in mind. 73 John Wilson

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Date: Tue, 29 May 2001 14:30:42 -0700
From: "Greg Bailey" <gbailey@mail.sdsu.edu
Subject: Prem-Rx: New Member- Christoph Ratzer

Gentlemen:

May I introduce Christoph Ratzer, our first member from Salzburg, Austria. Chris operates a WJ HF1000 with Sherwood SE3 (Ed note: Robert Sherwood is a member of the Premium List) and an Icom R9000 and other (fine but not premium rx) like 51S-1, AOR7030, NRD 515. He is in the market for a 340 DSP Rx at the present time.

Chris is the founder of a mail reflector, the A-DX mailing list. It is a German speaking reflector specifically for BC-DX (tropical bands). The list has 420 members. You may want to take a look at the list (or practice your Deutsch) at: http://www.ratzer.at

I know we have a pot full of Tropical Band operators on the Premium-Rx List and I trust you will drop a note to Chris and welcome him to the list. christoph@ratzer.at

Chris also operates under the call sign; OE2CRM

Greg

Date: Tue, 29 May 2001 20:30:58 -0700
From: Walter Salmaniw <salmaniw@home.com
Subject: RE: Prem-Rx: Re: Das Rejectinlisten

At 10:11 PM 5/29/2001 +0200, John Wilson wrote:
> Kurt,
> Thank you for your query about the Racal RA-1792. As you see, the situation
> with this receiver is that every premium enthusiast in UK has one because
> they have been easy to obtain, whereas in the US everyone can get a Collins
> 390A but over here they are hard to find.

Folks, with the above statement over availability, is the statement in Shortwave Receivers, Past and Present incorrect. I.e., it states that the 1792 was built in the US, which doesn't make sense. I've seen these receivers at the RCI listening post near Ottawa, and recall the operator mention that they were his favourites, as opposed to the 6790.....Walt in Victoria, BC.

Date: Tue, 29 May 2001 20:41:23 -0700
From: Walter Salmaniw <salmaniw@home.com
Subject: Re: Prem-Rx: Re: Das Rejectinlisten

Terry, thanks for the great review of your radios from yesterday and today. I enjoyed reading it, in conjunction with Osterman's book. As for the 2050, I'm aware of many of these radios, and have seen quite a few. I'm not aware at all of any orders to demil them, however. The four I have owned were all surplused as is, and in pretty decent condition. I've heard of parts sets, as spares seem to be impossible

otherwise to obtain. Perhaps this is what you've seen. I'd be interested in hearing from other 2050 drivers re any reports of demiling of their receivers.....Walt.

Date: Tue, 29 May 2001 21:24:29 -0700
From: Martin Colby <mcolby@cts.com
Subject: RE: Prem-Rx: Re: Das Rejectinlisten

For my 2 cents worth, I think Walter is correct. I believe that the first digit in the Racal model nomenclature (i.e., '1' in '1792' indicates UK manufacture). A '6' (as in '6790') indicates USA manufacture.

Believe that Osterman is incorrect in this regard in his (otherwise invaluable) book, "Shortwave Receivers..."

As a 6790 owner (who also has noted sensitivity shortcomings, at least compared with my R-392), I must confess that I've eyed enviously the 1792 myself.

Any further info on being able to identify 'early' vs. 'late' 1792s (particularly those with LED lighting & BITE test capabilities) would be most appreciated on my end.

Thanks to you all for the lively discussions in this group of late. As a lowly SWL, some of the more advanced EE discussions are past my capabilites, but I find myself learning something in spite of myself <G> .

Cheers,

Martin Colby San Diego, CA

Date: Wed, 30 May 2001 00:10:59 -0500
From: Turkisher Dan-CSLC82 <Dan.Turkisher@motorola.com
Subject: RE: Prem-Rx: Re: Das Rejectinlisten...and RA1792, etc.

Well this could be controversial but I have a 6790 and a 1792. Both are wonderful and I enjoy them both, but if I had to subjectively pick between the two for S/N ratio and best audio quality, I would pick the 6790. I am kind of disappointed in this, as I like the 1792 ergonomics, keypad, and feature set (memory/scan) better, but the 6790 just "sounds better".

I have done no tecnho measurements, nor have I done much weak signal work with either one, but for a given signal strength and noise level I prefer how my 6790 sounds (AM or SSB).

I have not owned an R390 or similar, but based on the recent posts, it'd be fun to play with one.

As to other RX's which I've put up against the 6790, they include RA1792 (close 2nd to the 6790 IMHO) RA6217 (for an old dog this can sound quite good) Collins 651S1 (pretty good if you tweak it right, but a bit klunky) ITT Mackay 3020A and 3021A Drake R8A (does very well against its higher priced competitiors) Drake R7A Yaesu FT1000MP (does a credible job against the mil/comml fancy stuff)

As to the origin of the 1792 I believe the 1792 was built in the UK possibly as part of a US contract). I imported mine from the Telford in UK (great to do business with!), and called RACAL regarding import technicalities. RACAL had very little data on the unit but did say it was made in the UK, hence no FCC ID, hence US Customs paperwork did not require FCC Type Acceptance for single quantity experimenter/hobby import.

Cheers!

DT

Date: Tue, 29 May 2001 23:48:22 -0500
From: "herschel p mccullough" <w5hpm@airmail.net
Subject: Prem-Rx: more SERIOUS news...

AS most of you know this group will HOLD it's second annual elections this Saturday at the official CLUB HOUSE A.k.a. Murphy's on Johnson St. in San Diego CA...I of course will be the ONLY one seeking this much vaulted office, thus retaining my present title of "President for LIFE " following in the fine Uganda traditions..After the brief voting I will announce the ELECTION results and again confirm that I will retain the " President for LIFE " status..at that time the floor will be open for all new and surplus business matters..

this is or must be considered an informal announcement that I will be making my seemingly annual visit to Murphy's and as well supporting my daughter and her boyfriend's insane goal of completing the marathon course of the now famous San Diego ROCK and ROLL marathon this Sunday..

thank you for the BANDWIDTH

mac/mc : continually serving you thru my position as " President for LIFE "

any questions or comments can reach me thru n7ur@dancris.com until this Friday...

Date: Wed, 30 May 2001 02:30:34 EDT
From: Daiungoed@aol.com
Subject: Prem-Rx: RA1792

Hi, I saw a mention of Johns Radio in Leeds UK, last Christmas, I bought a RA1792 from there, great condition, backlit display, 1Hz readout, BITE, freq. standard, ISB, the list goes on, at the time he was either looking for a buyer for the business, or was going to retire, so you'd best be quick, if its not too late already. After about two months, it packed in, the dreaded leaky backup battery syndrome, I phoned to see if they had a spare board to sell me, and decided to take a trip up there, when they exchanged the whole receiver for another fine example, although the 30 day warranty was out, at no charge. The price was good too, £800 UKP, roughly U$ 1120, and from what I have been able to gather since owning three of these beasties, they were ALL made in UK. He is a little terse, typical Yorkshire man, but a good place to deal with. I have no connection with the place, except that of satisfied customer. As far as I can see, the only way to check for backlighting is power it up, and see if the display lights, then press and hold in the REM button, then press the 0 (zero) button twice. If it goes into BITE, you are away, sorry if this advice seems basic, but its the only sure way. By the way, sorry for sending this post to a group member by mistake. We all make mistakes, said the dalek climbing off the dustbin.... Dave MW1DUJ

Date: Wed, 30 May 2001 00:48:07 -0600
From: Rob & Terri Sherwood <rob@sherweng.com
Subject: Re: Prem-Rx: Re: Das Rejectinlisten...and RA1792, etc.

I am stunned that you like your 6790 so much, so obviously mine is "broke". It is on the way to Gary Wingert for some TLC, which seems a better choice than dropping it off a cliff. I was A/Bing the R-9000 and the 6790GM over the weekend. For unfatiguing listening, if you rate the Icom a 10, then the Racal gets a 1. So I am hopeful that something is blown in mine. The AGC pops and ticks and distorts to no end. I have diddled with the pots on the IF board to no avail. If I don't back off the IF gain 3 dB, the unit only quiets 3 dB at 1 uV and 4 dB at 100 uV. Hummm.

Date: Wed, 30 May 2001 03:13:13 -0400
From: "Ed Tanton" <n4xy@att.net

Subject: RE: Prem-Rx: Re: Das Rejectinlisten...and RA1792, etc.

Hello All... I have been avoiding this discussion since: a) I LIKE my RA6790/GM better than any receiver I own; and b) as you can see from the (partial) list below, I own some great BA receivers, but nothing else sufficiently sophisticated to compare a '6790 to (and stay within the BW of this reflector!). However, when I read the hiss & pop description(s?) I felt there had to be something wrong with the specific RA6790/GM receiver(s?) referred to. Mine is wonderful. You did the right thing to send it for repairs.

73 Ed Tanton N4XY <n4xy@arrl.net

Ed Tanton N4XY 189 Pioneer Trail Marietta, GA 30068-3466

website: http://www.n4xy.com

LM: ARRL QCWA AMSAT & INDEXA; SEDXC NCDXA GACW QRP-ARCI OK-QRP QRP-L #758 K2 (FT) #00057

51S-1 WE SN: 4389 Drake R4-B Galaxy (WRL) R-530 Hallicrafters: SX-28 SX-101A SX-115 ITT/Mackay-Marine 3031-A JRC NRD-515 National: HRO-50 HRO-60 HRO-500 Hammarlund: HQ-180-C HQ-180-A HQ-215 SP600-VLF SP600-JX-17 SP-600-JX-21 R-390: Motorola SN: 374; R-390-A: Capehart SN: 2241 RACAL RA17-C & RA6790/GM Scientific Atlanta GPD-111 (VLF) TMC GPR-90 GPR-90-RX GSB-1 CV-591A/URR MSR-4

Date: Wed, 30 May 2001 20:55:22 +1200
From: "Ted Minchin" <tedm@xtra.co.nz
Subject: Re: Prem-Rx: Re: Das Rejectinlisten...and RA1792, etc.

Hi rob, Well man you must have one sick 6790. I have 2 here which I use in dual diversity.... The are quiet, they hear everything that both my Harris 590 and Ten Tec 330 hear and at the same level, their RF performance is superb and their AGC DOESNT distort. I rate them as superb radios right up there with everything else I have. I also have a RA 1778 and a RA1772. I really dont have any favorites, they are all good. Take it to the doctor.... or get another one and keep that one for spares. 73 de Ted ZL1MT

Date: Wed, 30 May 2001 06:42:35 -0600
From: Rob & Terri Sherwood <rob@sherweng.com
Subject: Prem-Rx: Phase Noise

Here are two more tiny comments on the phase noise issue on the 8662A / 8663A. Sorry about the size of the Agilent app note. If something that large comes around again, I will just post that it is available for individuals who want it. Maybe this reflector filters out mb size attachments. I don't know. What are the rules on this issue? My apologies if I caused havoc.

Date: Wed, 30 May 2001 06:46:45 -0600
From: Rob & Terri Sherwood <rob@sherweng.com
Subject: Prem-Rx: [Fwd: Specs]

Interesting tutorial at: www.planetee.com/planetee/servlet/DisplayDocument?ArticleID=9351

...excerpt: ..."The measurement of 1/f slope (residual noise) and 1/f3 slope (absolute noise) tends to separate the noise-measurement method. This is also one of the several differences which tends to separate the component manufacturer and the oscillator designer."

Date: Wed, 30 May 2001 06:47:16 -0600
From: Rob & Terri Sherwood <rob@sherweng.com
Subject: Prem-Rx: [Fwd: Specs]

Well, in my quest to find the answer, so far I found a customer course that teaches the fundamentals, including both kinds of phase noise. It is at:
http://contact.tm.agilent.com/tmo/education/English/H7215Bopt302_IE.html

...Still looking...

Date: Wed, 30 May 2001 06:54:09 -0600
From: Rob & Terri Sherwood <rob@sherweng.com
Subject: Prem-Rx: Large attachment

It looks like the reflector filtered out the large attachment. I have a 50+ page Agilent app note on pulsed phase noise measurements that supposedly touches on the absolute and residual phase noise issue. If anyone wants it, send an email directly to me, and I will forward the 3 mb attachment back to you.

So I will know in the future, and all attachments stripped off by the reflector or just ones that are too large? Or does it just dump the email entirely?

Date: Wed, 30 May 2001 09:13:24 -0500
From: Turkisher Dan-CSLC82 <Dan.Turkisher@motorola.com
Subject: RE: Prem-Rx: Re: Das Rejectinlisten...and RA1792, etc.

Sure sounds like something is not right...and I wish you success with the repairs. Hope you are "stunned" positively when the unit comes back! Let us know how it goes.

73

Dan K0DAN

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premium-rx-digest Wednesday, May 30 2001 Volume 01 : Number 123

Date: Wed, 30 May 2001 10:30:51 -0400
From: "Carcia, Frank A. HS" <francis.carcia@hs.utc.com
Subject: RE: Prem-Rx: Re: Das Rejectinlisten...and RA1792, etc.

Hi, I diddled pots and made my RA6830 sound bad also. I now have the allignment procedure to avoid desperate actions. Gary will make it well again. fc

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Date: Wed, 30 May 2001 11:08:28 -0400
From: "Carcia, Frank A. HS" <francis.carcia@hs.utc.com
Subject: RE: Prem-Rx: Re: Das Rejectinlisten...and RA1792, etc.

Hi Dan, I own a RA6830 the newer brother to 6790 and half rack size. Gary W says they are the same performance. I really like the radio and on ten meters I hear the noise come up when the antenna is connected so noise figure is fine. The 6830 has many versions of software which changes the human interface and frequency range. I'm not sure if the 6790 has other software packages. They are more common so you would think others exist, Allignment makes all the difference in the world.

When everything is set up correctly bite passes every time. My radio only requires 42 watts to operate. fc

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Date: Wed, 30 May 2001 16:09:30 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: Prem-Rx: AM measurement at low signal levels

Michael, Until I prove to myself that some receivers can resolve AM with 30% modulation at less than 0.1 microvolt I shall remain in the same sceptical group as you. I am looking into this topic and have just checked out a Collins 51S-1, a W-J 8711, a Cubic 3030A, a Racal RA-1792 and an elderly Kenwood R-820 and none of them will give a 10dB S+N/N ratio with a 6kHz IF bandwidth into an HP 3400A meter at signals less than 0.5 microvolts (51S-1). The rest are all in the 1 microvolt region. A level of 0.08 microvolts for 10dB S+N/N implies a sensitivity some 20dB better than these figures, so something is wrong with our basic understanding of the measurement, but until I can check a 390A I don't have a definitive answer. I do have a very definite answer to the problem of measuring AM noise floor by looking for a 3dB signal increase and I will post this as soon as I can explain it in text without the help of diagrams. For the record I used an HP 8657A generator, checked against an HP 436A and 8481A power sensor, and an HP 3400A true rms meter.

Date: Wed, 30 May 2001 08:25:05 -0700
From: "Greg Bailey" <gbailey@mail.sdsu.edu
Subject: Prem-Rx: General Notice: Max File Size

Presently, the maximum file size is set at 400K. It can be increased if the membership desires?

Greg

Date: Wed, 30 May 2001 16:23:12 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: RE: Prem-Rx: RA1792

Glad to see an endorsement of "John's Radio" in Bradford, and confirmation that my description of a Yorkshireman is correct. Our friends in the US won't understand unless they have met a dour Yorkshireman at some time but at least they are straight to deal with normally, and in your case extremely flexible as to the warranty. When I go into those warehouses I have to keep a tight hold on my cheque book because there are some delightful items of RF test gear. By the way, I shall be in Llanelli later in June because I have to give a lecture at the College on basic EMC compliance testing and how to avoid paying huge amounts of money for overpriced EMC test gear by using things like the Icom PCR-1000 to do the pre-test investigations. 73 John Wilson G3PCY/5N2AAC

Date: Wed, 30 May 2001 11:26:59 -0400
From: "Carcia, Frank A. HS" <francis.carcia@hs.utc.com
Subject: RE: Prem-Rx: AM measurement at low signal levels

Hi John, I think most people own attenuators that leak. I bet most use RG58 as an interface cable. I agree with your findings. 30% modulation at a 6 KHz B.W. is a tall order to move the RMS meter 3 dB below 1 microvolt input. I use a HP8640B and a HP3400A. (Not to be confused with 400 Hz B.W.) fc

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Date: Wed, 30 May 2001 11:28:40 -0400

From: jeffa@ix.netcom.com
Subject: Re: Prem-Rx: AM measurement at low signal levels

John and the rest of the group,

If there is a set of agreed-to precedures for measuring receiver sensitivity vs. mode, let me know what they are (or where I can find them) and I'll be happy to run some measurements on my stable of receivers (which includes Racals 6790, 6793, 6830 (x2), Cubic 3030, Collins 651S-1, HF-2050, etc.).

Regards,

- - Jeff, WA6AHL

Date: Wed, 30 May 2001 12:23:16 -0500
From: Turkisher Dan-CSLC82 <Dan.Turkisher@motorola.com
Subject: RE: Prem-Rx: Re: Das Rejectinlisten...and RA1792, etc.

Hi Frank...

Not familiar with the 6830, but I looked it up in the Ostermann book, and recall somewhere I saw two of these in one rack unit. Cool receiver! Pretty rare, one would hope not to have to obtain proprietary parts or software!

I have heard there is a variety of software for the 6790, including a <500 khz version, but I have never searched it out.

I agree that an alignment makes all the difference in the world! To prove the point, just diddle all the slugs and see how bad things get!

Good luck and regards,

Dan

Date: Wed, 30 May 2001 12:24:22 -0700
From: John Reed <jreed@ponca.net
Subject: Re: Prem-Rx: AM measurement at low signal levels

John Wilson wrote:

> Michael,
> Until I prove to myself that some receivers can resolve AM with 30%
> modulation at less than 0.1 microvolt I shall remain in the same sceptical
> group as you. I am looking into this topic and have just checked out a
> Collins 51S-1, a W-J 8711, a Cubic 3030A, a Racal RA-1792 and an elderly
> Kenwood R-820 and none of them will give a 10dB S+N/N ratio with a 6kHz IF
> bandwidth into an HP 3400A meter at signals less than 0.5 microvolts
> (51S-1). The rest are all in the 1 microvolt region. A level of 0.08
> microvolts for 10dB S+N/N implies a sensitivity some 20dB better than these
> figures, so something is wrong with our basic understanding of the
> measurement, but until I can check a 390A I don't have a definitive answer.
> I do have a very definite answer to the problem of measuring AM noise floor
> by looking for a 3dB signal increase and I will post this as soon as I can
> explain it in text without the help of diagrams. For the record I used an HP
> 8657A generator, checked against an HP 436A and 8481A power sensor, and an
> HP 3400A true rms meter.

Just to add some more "noise" to this discussion, here are the results I got from trying the AM noise floor test (3 dB S/(S + N) increase, 30% modulation):

Sylvania R1414/URR (very sensitive) .09 uV (-134 dBm) Listening to the audio output indicated there was very little of the AM modulation present, mostly noise.

Harris RF-590 .28 uV, (-124 dBm) No AM modulation present. Turning the modulation ON/OFF on the generator made no difference in the audio output.

Racal RA6793A 1.41 uV, (-110 dBm) Contrary to the two other receivers, modulation was clearly heard on the Racal despite the poorer measurement.

What am I to make of these measurements? I don't think that a receiver that gives a lower level of noise as the output should be preferred over one that gives the modulation clearly. As far as I can see this measurement is not useful for comparing receivers or for determining how well a receiver performs.

On a CW noise floor measuremennt, the standard for comparison, the CW note is always heard and is what's measured.

John Reed

Date: Wed, 30 May 2001 12:32:59 -0700
From: John Miles <jmiles@pop.net
Subject: RE: Prem-Rx: Large attachment

Looks like some excellent references, I'll have to spend some time at the links you found. The attachment didn't make it through the list server, but you can send it directly to me at jmiles@pop.net. If my mail account rejects it, I imagine the only recourse will be to put it up on an FTP site or free web page somewhere?

Thanks!

- -- jm

Date: Wed, 30 May 2001 20:43:38 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: Prem-Rx: AM signal to noise measurements

The basic rule for measuring signal to noise ratio in an AM receiver was laid down years ago and taught to all budding radio engineers by companies such as the Marconi Company. I re-read my own lecture notes on the subject and the bottom line is this:- The measurement is taken for any given modulated RF signal by measuring the ratio between the audio output with an unmodulated carrier and the audio output with the modulation applied. You do NOT turn the whole input signal on and off to make the measurement as you would do for SSB or CW S/N ratio measurement. The reason for this approach is that if you assume a diode (or diode type) detector having a non-linear region at the lower part of its V/I curve, and the detector is operating under no-signal conditions, the generated noise within the receiver will appear symmetrically disposed about the V (Y) axis of the detector characteristic. The detector sees the noise as a signal having 100% modulation by random noise and demodulates it by effectively using half wave detection. This means that the baseband audio coming out of the detector has a peak value of half the incoming noise (half wave rectification). If you now add a low level RF signal into the receiver, this moves the signal arriving at the detector along the X axis, and appears to the detector as a small signal still 100% modulated by random noise. If you plot the output from the detector under these conditions you will see that the baseband which was half the p-p value of the noise with no added signal will now reach a p-p value of twice the no-signal condition, because all of the noise component is now demodulated. Proof of this is to measure the no-signal audio output with a true rms meter (like the HP 3400A) and then introduce an RF unmodulated carrier at a low level. As

this is increased you will see the audio output rise to - guess what? 3dB more than the no-signal output. Everyone on this list knows that when you tune in to a low level carrier in AM mode, the receiver noise increases, and that's what you are hearing. Now, if you add 30% modulation to the low level carrier when the noise output is at the 3dB point, you will not, in most normal circumstances, see or hear any increase in the audio output because the 30% modulation is much smaller than the 100% noise modulation. If you listen to the receiver at the same time, a practice which should always be observed, you may hear the faintest whisper of the modulation, but often you won't hear it at all. The result of all this is that employing the same technique to measure noise floor as we commonly and correctly do in an SSB receiver, i.e. by switching the incoming signal on and off to determine when the RF produces the same audio level as the internal noise of the receiver, the measured 3dB increase in the AM receiver is actually the internal noise being fully demodulated and has nothing whatever to do with the modulation on the incoming signal. Why doesn't the SSB receiver behave the same as the AM receiver? Because the SSB receiver uses a product detector of some sort which is linear and not non-linear as in the case of the AM detector. Points to ponder. If you demodulate AM using a synchronous detector, or a homodyne detector where the incoming carrier is replaced by one generated in the receiver - as in the case of an SSB product detector, the detector is operating in a linear mode. The use of a synchronous detector therefore should allow you to measure the true AM noise floor of the receiver. I checked this using the synchronous detector in the AR-7030 and it seems to be true. When it comes to measuring an AM signal to noise ratio of, say, 10dB then the technique is the same. You leave the unmodulated carrier on all the time and switch the modulation on and off until you get the 10dB ratio in audio output. What you have to be careful about is the agc action of the receiver you are testing, because if the agc has a low threshold, you may well be into agc at the point you are measuring the 10dB ratio, and this can lead to erroneous results. In this respect, as Chuck has already said, you must (if you can) switch off the agc in order to ensure that the measurement is correct. I checked a Collins 51S-1, Kenwood R-820, and a Cubic 3030A, since all these receivers have diode or diode-like detectors. I then checked a W-J 8711 and RA 1792 because one uses DSP demodulation and the other a homodyne detector. The results are quite unambiguous. Measured using the signal on/off method to determine the 3dB increase in output from an unmodulated signal, the 51S-1 came up at -126dBm, the R-820 at -130dBm and the 3030A at -128dBm. Adding 30% modulation to the input signal at these levels did not increase the audio output, and the modulation was virtually inaudible. Now I measured the same receivers for a 3dB increase in audio output by the "Marconi" method, leaving the carrier on all the time and looking for a 3dB increase in output between modulation on and modulation off. The results were now: 51S-1 -115dBm, R-820 -117dBm and the Cubic 3030A -117dBm. THIS IS THE TRUE 3dB MEASUREMENT and shows a difference of about 11dB from the carrier on/off method.

The results for the non-diode detectors with an unmodulated carrier on/off showed 3dB noise output increase at -116dBm for the RA-1792 and at -115dBm for the 8711. Repeat tests using the carrier on continuously and looking for a 3dB increase with modulation on/off gave -118dBm for the RA-1792 and -112dBm for the 8711. In other words, for receivers using DSP or homodyne/reinserted carrier type AM detectors, there is virtually no difference in results between the two measurement methods - which is what I expected if the "Marconi" explanation for the diode-like detectors was correct.

Summary so far. If a receiver under test uses a diode or diode-like detector then attempting to measure noise floor using the carrier on/off method could overstate the noise floor level by some 11dB, whereas the linear type of AM detectors will give the correct result. The way to remove any doubt in these measurements is to use the "Marconi" methods and leave the unmodulated carrier on all the time, and measure the signal/noise ratio at the noise floor by looking at the difference between modulation on and modulation off - always remembering to disable the agc system if this is possible.

So far, so good. Now let me address the measurement of signal to noise ratios at the 10dB level. Put fairly simply, when I got to a 10dB ratio there was no significant difference in results between switching the modulation on and off and switching the entire modulated signal on and off, but this may only be true for the particular receivers I tested. The common sense approach must be to employ the modulation on/off with constant carrier method which I have described as "Marconi" simply because that is my background, but may be confirmed by anyone having a copy of Ulrich Rohde's book

"Communications receivers, Principles & Design" who cares to take a look at section 2.3, pp65 and 66 where he re-states the method of AM signal to noise ratio measurement, and I for one am not going to argue with Ulrich Rohde on this matter. Happy reading John Wilson

- ----------

John Wilson Stone Hill Kings Nympton Umberleigh Devon EX37 9TR Tel: 01769 573047 Fax: 01769 574158

Date: Wed, 30 May 2001 16:04:18 -0400
From: "Carcia, Frank A. HS" <francis.carcia@hs.utc.com
Subject: RE: Prem-Rx: AM signal to noise measurements

Looks like a good bible to me. I measure about -115 dBM on the RA6830. All you guys with RF amplifiers will be 10 to 15 dB better at the expense of dynamic range. The R390A with a tuned RF amplifier may now flex its arm and get a little of both. fc

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premium-rx-digest Wednesday, May 30 2001 Volume 01 : Number 124

Date: Wed, 30 May 2001 14:13:19 -0600
From: Rob & Terri Sherwood <rob@sherweng.com
Subject: Re: Prem-Rx: AM signal to noise measurements

If all is designed correctly, would not the 10 dB preamp guys only have a 10 dB lower IP3? When I tested the R-7 years ago, the DR only dropped 1 dB with the 10 to 11 dB preamp turned on. Of course the IP3 went down by the same 10 or 1l dB.

Date: Wed, 30 May 2001 14:17:40 -0600
From: Rob & Terri Sherwood <rob@sherweng.com
Subject: Prem-Rx: Many of us are in trouble.

I have concluded that too many of us (including me first) are e-mail junkies. We seem to be able to carry on near real-time conversations through this reflector. That means we must be wired full time to the Internet. What does that say? Do we even have our radios on? Do we sleep at night? Do we have to take our laptops with us on vacation? We may be in the Dilbert Zone.

Date: Wed, 30 May 2001 16:30:40 -0400
From: "Carcia, Frank A. HS" <francis.carcia@hs.utc.com
Subject: RE: Prem-Rx: AM signal to noise measurements

Sorry, I confused dynamic range and IP3.

Date: Wed, 30 May 2001 22:04:18 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: RE: Prem-Rx: Many of us are in trouble.

Rob, Where else but on a truly world-wide net would we be able to talk through subjects with like minded people and still be able to live and work in a location or country of our choice. That's why I'm a self confessed junkie - 'cos I love you all. 73 John

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Date: Wed, 30 May 2001 22:56:24 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: Prem-Rx: RE: Jolly Good Show

Rob,

Each answer creates a question!! The 60% modulation depth for AM sensitivity measurements came about because of the increasing use of heavy audio processing by AM broadcasters in order to make their stations sound "LOUDER" to the guy with a transistor radio glued to his ear, or to people listening to AM radio in cars. The system most often found over here in Europe is called "Optimod" and deliberately processes (and of course distorts) the audio feeds to transmitters to such an extent that if you take a spectrum plot of a station using Optimod, you find wall to wall sidebands extending to the very edge of the station's allocated frequency space, in Europe MW that means +/- 4.5kHz. Another "feature" of Optimod for AM broadcasters is that negative going audio peaks are compressed whilst positive going peaks are expanded. This allows the modulation depth to be greater than 100%, usually 110% on postive audio swings, but at the same time prevents the negative going swing from going to carrier zero. So- you have what to all intents and purposes is permanent 100% modulation. Prior to Optimod, the average level of modulation on an AM broadcast signal was empirically set at 30%, so that no peak of audio would overmodulate the then linear AM systems, and that is where the 30% test level originated. I don't know who can claim to have first suggested a test level of 60% to more accurately represent real life but certainly we at Lowe and Radio Netherlands began using 60% many years ago. I'm sure that Optimod is not confined to Europe but I don't have definitive information on its use in the US.

SINAD (Signal Including Noise And Distortion) has been long used in the communications field to provide a more repeatable method of measuring receiver sensitivity for all comms modes including wide and narrow band FM, AM and SSB/CW. The technique involves feeding receiver audio into an agc controlled amplifier so that the same level is always applied to the rest of the measuring system, then knocking out the modulation fundamental (usually 1kHz) and accurately measuring what is left. It's the same technique that you would find in a harmonic distorion analyser, except for the fact that the measured signal includes noise components as well. 12dB SINAD equates more or less to traditional 10dB S+N/N ratio, but the beauty of the SINAD technique is that the measurement can be made by a single connection to the audio output of a receiver and you can crank the modulated RF source up and down until you have 12dB SINAD. Removing the 1kHz modulation in an AM measurement is the same as switching the modulation off. The second great advantage from a service engineer's point of view is that you can align a receiver for best SINAD performance by just watching a single meter and tweaking everything for best SINAD. This is I suppose only true for narrow band communications systems and wouldn't help at all in aligning critically flat band pass filters, but for comms work it's great. All modern audio test equipment (such as the 8903) includes SINAD measurement, and I can find noise floor on SSB by simply dropping the signal generator level down until I have 3dB SINAD. It's that easy. I first started using SINAD when I discovered an American company called Helper Instruments who make a little low cost instrument called "The Sinadder". This is a small box, mains powered, with a large meter on the front and one BNC input jack. You just connect the jack to audio from the receiver and there you go. No tweaking, no range changing, no thinking "Damn it's gone over the scale and I need to change ranges and remember where I started (3400A). What did I start?? John the Junkie -

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Date: Wed, 30 May 2001 18:34:45 -0400
From: Bob Milne <rmilne@cfl.rr.com
Subject: Re: Prem-Rx: AM signal to noise measurements

Hi John,

Right On! Congratulations for bringing us all back to a sense of practicality and reality. Very interesting that now there's only a 3-dB difference between the 51S-1 and the RA-1792.

But just to muddy the waters a little, I'd like to submit that just because your ears (which are a natural CW filter) can pick up a 400-Hz modulated tone from a signal generator at very low levels, doesn't mean you can understand voice modulation (pick out a station ID) at that level. Could that be why AM sensitivity always used to be specified with at least a 10-dB S/N ratio? Then you might have a fighting chance to hear something intelligible. I think the bottom line is that what's called for is a "practical" sensitivity spec, which is meaningful in terms of understanding a voice-modulated carrier. From some of the stuff I've read, it seems some DSP receivers may have a slight edge in this area.

And remember, some of those old boat-anchor designers really knew what they were doing. Remember those radios with "delayed AGC?" The AGC wouldn't start operating until the input reached some predetermined level (which was not near the noise floor)!

Regards.... ....Bob

Date: Wed, 30 May 2001 18:40:45 -0400
From: Bob Milne <rmilne@cfl.rr.com
Subject: Re: Prem-Rx: Many of us are in trouble.

Hi Rob,

I don't know about you, but I often have my receiver going on in the backround while I'm on the Internet. Something not too distracting like some foreign music, or some hams rag-chewing in the wee hours. Does that mean I'm a "double junkie?" Or, maybe I'm a "triple junkie" because I have this burning desire to own (or at least try out) all the good receivers that were ever built.

Regards.... ....Bob

Date: Wed, 30 May 2001 15:58:29 -0700
From: "Jerry Gardner" <jerr@nortelnetworks.com
Subject: Prem-Rx: Philosophical Question

Sorry for the non-technical nature of this question, but it's one I've often pondered and wanted to get the list's views.

For those of you who are hams, do you feel that merely listening to shortwave broadcasts, utilities, etc., is in some way inferior to 2-way operations on the ham bands?

I'm both a ham and an SWL and my ham buddies often are amazed that someone would "just listen" when they could be transmitting as well. They seem to regard SWLing as the minor leagues suitable only to those who haven't graduated to the majors yet.

- -- Jerry Gardner, W6UV email: jerr@nortelnetworks.com

Date: Wed, 30 May 2001 18:24:18 -0600
From: "John Fallows" <john.fallows@home.com
Subject: FW: Prem-Rx: Philosophical Question

Philosophical Question These are two distinct hobbies / avocations. Both are equal and interesting. I have had my ham license since 1967 but have recently found SWL much more compelling, though. It's

interesting that, in 1980 when the kids started coming along, I sold all my ham gear but I kept my RA-17 for another 20 years! I finally sold it cause I could not locate the RS232 port! :)

Your average ham, unfortunately, would not understand the issues being discussed in the last 100 postings in this group. My technical interests began to blossom when I started getting into receiver design (premium or otherwise). Most ham conversations rarely get past QTH and weather (and, increasingly, a detailed enumeration of medical problems). We, at least, can listen to the BBC! And we keep that interesting by listening to the BBC relay in southern Africa coming in long path, rather than Delano (or, shudder, streaming audio!) The conversations in this group are as "on the edge" as comparable technical conversations you would have in the ham community - the key is having a focused interest.

Your average SWL, I believe, has a greater appreciation of HF propagation, and has a far greater knowledge of the uses, limitations and ambiguities of the lower radio spectrum. Probably also has a greater understanding of the perilous state of the use of this spectrum, e.g., emerging proposals for Power Line Communication (PLC) which would see the electric utilities making "last mile" and "last inch" internet connectivity over their distribution system using the 2-30 MHz spectrum using orgothonal modulation.

Most hams I discuss my SWL hobby with are actually quite interested in what SWL does and especially the use of computer control, etc. Another area of common interest is antenna design and construction, as we are all facing the same kind of urban limitation in antenna erection.

Now that you have me going on this, I think I will suggest to the Calgary ham group that they start an SWL special interest group. After all, nearly all of them have general coverage receiver capabilities, and SWL would help them get their money's worth! Oh, yeah, lots of hams love doing things "on the cheap", and many still believe 640K is enough in their PC's!

73 John Fallows VE6MBA ERGO Radio Software http://swldx.com

Sorry for the non-technical nature of this question, but it's one I've often pondered and wanted to get the list's views.

For those of you who are hams, do you feel that merely listening to shortwave broadcasts, utilities, etc., is in some way inferior to 2-way operations on the ham bands?

I'm both a ham and an SWL and my ham buddies often are amazed that someone would "just listen" when they could be transmitting as well. They seem to regard SWLing as the minor leagues suitable only to those who haven't graduated to the majors yet.

- -- Jerry Gardner, W6UV email: jerr@nortelnetworks.com

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premium-rx-digest Thursday, May 31 2001 Volume 01 : Number 125

Date: Wed, 30 May 2001 20:30:51 -0400
From: Michael Brown <piggin@mindspring.com
Subject: Prem-Rx: The Dilbert Zone

I dont have my computer on all the time but I will say this.Thank God I finally found a group of people who share my PASSION....I cant explain easily how great a thing this is.To me, this kind of activity is what the internet is all about...high-speed knowledge dissemination and conversations ,that while entertaining actually arrive at truth and higher learning.To me, expanding my knowledge of Truth and Beauty is a lifelong commitment.I learn more every day...this IS a good thing.(can you tell I hold a Philosophy Degree?)Thank goodness we can have conversations like this....without being perseceuted.As it is, there is already more than enough anti-intellectual bent in my society.

Date: Wed, 30 May 2001 18:52:22 -0600
From: Rob & Terri Sherwood <rob@sherweng.com
Subject: Re: Prem-Rx: Philosophical Question

I don't think so. My enjoyment over 30 years as a ham has shifted to less operating and more to building things. I built a single 3-500Z amp that went through 20 years of continual modifications, took my Drake twins (yes a separate receiver and transmitter) mobile with a home-brew mobile antenna that I later marketed, and found my R-4C did not work very well stock and developed a cottage business devoted to fixing it. I have an SWL client who does 1000 times more listening that I, and more power to him. If I am leaning something I am having fun, whether or not I have a transmitter turned on.

Date: Wed, 30 May 2001 23:28:08 -0400
From: Michael Brown <piggin@mindspring.com
Subject: Prem-Rx: building

As a SWL I have built much equipment over the years.My first project was to design and build a 4 band preselector with 10db gain.It works very well.I had to build it so I could use my dreadfully performing Bearcat DX-1000 on my longwire antenna.I also built a very nice series tuner for 100kc to 500 kc for chasing beacons.Over the years , I have taken a system approach to performance.My first order of buisness is to get a really good ground both in terms of RF performance and lightning saftey.My Dream antenna would be a field filled with curtain Rhombics.As it is, I ended up using as long a piece of wire as high up as I can get, worked against the good ground.Wherever I am, I do those 2 things first.Then I see what kind of accessories I need to build.I have made many, many antennas over the years...small and big loops,yagis,quads, etc.I once copied B-52s on bombing runs over iraq useing a hairpin loop 2 feet long tacked to the wall.It was tuned via a 365mmf cap into an MPF-102.Not bad. I currently have the best compromise antenna I can use on this property.130 or so ft long and 60+ feet up.The hours of testing new antennas and their placement is great fun.Then, the task becomes keeping them in the air!I suspect those who build their own equipment are a vanishing breed.This is too bad.I have used in the past some great antennas.The one from my 4th floor dorm room to the roof of an adjacent building was great(only 125ft but 80 feet up) It was pretty quiet in southern indiana in the winter.A nice listening post. As you can tell, I like big antennas.I hated living in an apartment.But maximising your post where your at is what seperates the men from the boys.

Date: Wed, 30 May 2001 23:27:47 EDT
From: DAVEINBHAM@aol.com
Subject: Prem-Rx: (no subject)

In a message dated 5/30/01 11:24:25 AM Central Standard Time, Dan.Turkisher@motorola.com writes:

<< I have heard there is a variety of software for the 6790, including a <500 khz version, but I have never searched it out. >

****

Dan, Perhaps I can shed a little light on that. As best I can figure it out, Racal came out about August 1983 with an option for the RA6790/GM that would allow it to receive signals down to 50kHz. This option consisted of differently programmed chips which allowed the radio to tune down to 00.000000 mHz and a different "mixer box". The new mixer was, according to someone I recently met who claims to have been working at Racal at the time, incorated in all RA6790/GM's as a running change known as "series 6".If the buyer of the radio did not spring for the VLF option he still got the new mixer but not the reprogrammed chips. Now, if you obtain a set of the VLF chips and plug 'em in your RA6790/GM you may or may not be able to recieve VLF. It depends. If your radio is a "series 6 " or later you are in luck. If your radio is earlier you are outa luck. Been there, done that. I got a set of

the VLF chips and copied them and plugged 'em in my radio. The readout now goes to 00.000000 mHz but the radio is deader than a mackerel below 400 kHz. I got the old mixer in mine. I talked to Mr. Wingerd about this. He can supply the board with the VLF mixer, but the price is much more than I paid for the radio, so I will just keep on using my upconverter until a more reasonable (cheaper) solution can be found. You might want to find out whether your radio has the VLF mixer before you invest in the VLF chipset. A good way to do this is to fool the synthizer into tuning down there. To do that, pick a station below 500 kHz, better yet below 400 kHz. I will use 200 kHz to make the math simple, but you can make the synthizer tune any VLF frequency this way. Punch in "enter 10.200000". Then you are tuned to 10.2 mHz. Then punch in " enter 00" and your radio is now tuned to 200 kHz. As soon as you touch the tuning dial the synthizer pops back inside it's program and you are at 500 kHz. Maybe some of you smart people on this list can come up with a modification to the old mixer or a Mini-Circuits replacement which will allow the RA6790/GM to tune down to VLF.

Regards, Dave Holder Birmingham, Alabama

PS. Last time I mentioned this on the net, I got covered up with requests for the VLF chips. I think I may still have a set or two left out in the barn. If you want a set it will cost you $20 post included. E-mail me off list if you want a set.

Date: Wed, 30 May 2001 22:04:44 -0600
From: Rob & Terri Sherwood <rob@sherweng.com
Subject: Re: Prem-Rx: (no subject)

I installed the VLF roms just to get the different tuning rate steps. 1 Hz, 10 Hz and 100 Hz.

Date: Thu, 31 May 2001 00:34:12 -0500
From: Turkisher Dan-CSLC82 <Dan.Turkisher@motorola.com
Subject: RE: Prem-Rx: Philosophical Question

Hi Jerry...

Interesting question...given the nature of this reflector I'll bet the concensus will be that listening is better than talking. And, listening to some of the bozos and drivel on the ham freqs, there are some who should have far less access to their PTT switch....people who are stuck in transmit mode are not good communicators.

While I do like to get on the air and chat with buddies and work DX, I also find utility and foreign broadcast listening very enjoyable. If working in the shack I'll set up a few RX's on military or Coast Guard freqs, sometimes ham nets, etc., and just listen while I putter. Also, there are times when the band conditions on ham freqs are just not so good....but you can always find some part of the HF spectrum that has good signals or interesting signals. I suspect the guys who pooh pooh that have simply not tried it.

BTW, there's a great public domain program which decodes ALE (the name escapes me right now), which is another SWL to-do I plan to pursue if I ever get some time to devote to the radio room!

Good luck and 73

Dan K0DAN

Date: Thu, 31 May 2001 08:14:13 -0400
From: "Carcia, Frank A. HS" <francis.carcia@hs.utc.com
Subject: RE: Prem-Rx: (no subject)

Hi, Take a Mini Circuits mixer and reverse the RF input and the IF ports and you will work down to DC. I have done this with the SRA1-H but any mixer with a DC to 50 MHz IF port will work fine. fc

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Date: Thu, 31 May 2001 08:15:58 -0400
From: "Carcia, Frank A. HS" <francis.carcia@hs.utc.com
Subject: RE: Prem-Rx: Philosophical Question

That's why God gave us 2 ears and one mouth!

Date: Thu, 31 May 2001 08:04:24 -0400
From: "Carcia, Frank A. HS" <francis.carcia@hs.utc.com
Subject: RE: Prem-Rx: Philosophical Question

Hi Jerry, Some of us Hams still home brew and listen most of the time with a couple radios on different bands. Also the computer is near by just in case one needs to snipe out a comment. Sometimes you just have to go outside and pull weeks in the garden though. fc

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Date: Thu, 31 May 2001 09:03:41 -0400
From: "Carcia, Frank A. HS" <francis.carcia@hs.utc.com
Subject: RE: Prem-Rx: Philosophical Question

Hi, As a Ham, I wish the members of this groupe were also Hams so we could have more interesting people to talk to on the air. Many hams barely know where to send their rigs when they break. I wish I could modify my Ranger for better audio gang not much better. fc

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Date: Thu, 31 May 2001 11:33:21 -0400
From: jeffa@ix.netcom.com
Subject: Re: Prem-Rx: AM measurement at low signal levels

After reading John Wilson's post on AM signal to noise measurements, I made some measurements on my receivers last night. The group may be interested in the results

Test Equipment Used:

HP 8640B Sig Gen (not recently cal'd so mileage may vary) HP 3400A True RMS meter

Test Setup:

Set HP 8640B To: 13.9515 MHz AM Modulation, 1KHz Int., 30 % modulation

Attach 8640B to antenna input of receiver-under-test

Connect 3400A to speaker output

Receiver-Under-Test setup: Tune to test frequency AGC: OFF (if possible) Mode: AM Filter: AM filter (usually 6 - 8 KHz)

Test Procedure:

While turning modulation Off and On (carrier always present), adjust the generator's output level while regarding the reading on the 3400A until the difference between the audio level with modulation and the audio level without modulation is 3 dB.

Results (listed in order of S+N/N):

1. TenTec SP-325 -115 dBm BW = 6 KHz. 2. Collins 651S-1 -114 dBm BW = 6 KHz. 3. Cubic 3030A (left) -114 dBm BW = 6.0 KHz 4. Mackay 3031A -112 dBm BW = 8 KHz 5. Collins 51S1 -111 dBm BW = AM mode. AGC ON 6. Watkins-Johnson WJ-8880 -111 dBm BW = 8 KHz 7. Racal 6793 -110 dBm BW = 6.9 KHz 8. Racal 6830JD (rcvr 1) -110 dBm BW = 6.8 KHz 9. Racal 6830JD (rcvr 2) -110 dBm BW = 6.0 KHz 10. Racal 6790/GM -109 dBm BW = 9.2 KHz 11. Watkins-Johnson WJ-8888 -109 dBm BW = 8 KHz 12. Collins HF-2050 -107 dBm BW = 6.0 KHz 13. Cubic 3030A (right rcvr) -105 dBm BW = 6.0 KHz (Broke?) 14. BR RSS-5 Spectrum Monitor -100 dBm BW unknown

(I would have liked to test my R-390A, 51J-3 and 51J-4, but they're awaiting alignment and aren't hooked up at the moment).

I monitored the receiver outputs while performing these tests, and I was quite suprised by the range of audio quality exhibited by the various receivers - some sounded much better than others. I wish I had made some notes while I was doing it. Perhaps I'll repeat the test, this time noting audio quality, too.

- - Jeff, WA6AHL

Date: Thu, 31 May 2001 12:56:56 -0400
From: Al Klase <skywaves@bw.webex.net
Subject: Re: Prem-Rx: (no subject)

Not all VLF ROM's have the "decade" tuning rates. I think we should figure out which ROM versions are what, and perhaps dump them to Intel hex files. Maybe we have a real hacker among us who could dissasemble the code and make changes. I'm also looking for some control software that doesn't cost a hundred bucks.

Rob & Terri Sherwood wrote:

Date: Thu, 31 May 2001 13:07:09 -0400
From: jeffa@ix.netcom.com
Subject: Re: Re: Prem-Rx: (no subject)

A couple of years ago someone was selling two different sets of VLF proms for the 6790 and they might still be available. One of the differences was the tuning rate. I believe his name was Colin Trass (or something similar), but unfortunately, I don't have his email address with me.

- - Jeff, WA6AHL

Date: Thu, 31 May 2001 12:07:08 -0700
From: John Reed <jreed@ponca.net
Subject: Prem-Rx: Re: Racal LF Option

DAVEINBHAM@aol.com wrote:

> In a message dated 5/30/01 11:24:25 AM Central Standard Time,
> Dan.Turkisher@motorola.com writes:
>
<< I have heard there is a variety of software for the 6790, including a <500
> khz version, but I have never searched it out.

I have an RA6793A with the LF option, good to 10 KHz. I also have the original sales invoice on this receiver from Racal. The LF option adds $2764 to the base price of the receiver. There's obviously a lot more than different eproms and a mixer in this option. One thing that you can do that will help is to re-align the high pass filter in the first LO input to the mixer. You'll need a spectrum analyzer and tracking generator to do this. This filter is set to attenuate the LO signal starting at about 500 KHz on a standard receiver. It's an elliptic filter that attenuates quite sharply.

John Reed

Date: Thu, 31 May 2001 18:20:42 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: RE: Prem-Rx: AM measurement at low signal levels

Jeff,

thanks for expending effort in doing the AM sensitivity checks on your (very impressive) raneg of receivers. The results seem to tie in well with my own measurements and those of Frank Carcia, so we're all getting somewhere in establishing a common procedure. It seems likely that all members of the list are carrying the same test equipment inventory, and that in itself is a tribute to the genius of Hewlett and Packard (at least when they were involved in the company). Let's hope that we get more data to cover the whole range of premium receivers, and CERTAINLY a few measurements on the 75S, 51S and 390 series of Collins. I'm inspired to get my 618T transceiver up and running just to see how Collins Avionics performed. The problems are two-fold; 1) 400Hz ac for the blowers, and 2) 28Vdc at 50 amps!! 73 John Wilson

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premium-rx-digest Friday, June 1 2001 Volume 01 : Number 126

Date: Thu, 31 May 2001 14:08:52 -0400
From: "Wm. L. Townsend" <wlt@tesnet.com
Subject: Re: Prem-Rx: (no subject)

Al Klase wrote:

> Not all VLF ROM's have the "decade" tuning rates. I think
> we should figure out which ROM versions are what, and
> perhaps dump them to Intel hex files. Maybe we have a real
> hacker among us who could dissasemble the code and make
> changes. I'm also looking for some control software that
> doesn't cost a hundred bucks.

Al,

How about control software for free? What are you looking for in a control program? If all you want is something to operate the radio remotely (no scan stuff or memory) I've got a fairly nice program I wrote in LabView5.1 that runs my 6790 in the office. It displays an S meter and allows entry of frequency, bandwidth, mode, etc. Scanning and memory would be easy enough to add, but I've never bothered to do that.

I use it regularly to run the receiver from my desk in the office. Audio comes back in another pair in the serial cable and goes to a sound card. Unfortunately, I can only compile it for Linux. It would run on other platforms like windows, but I only have the Linux version of LV.

If you have a Linux system (all it needs is a serial port and X) I'll send it to you if you're interested. If not, maybe someone else out there has the LV AppBuilder for windows and could make you a windows version if that's what you need.

I looked at trying to disassemble the ra6790/gm proms some time ago and couldn't find any documentation on the F8 cpu it uses. I thought there was a manual around here somewhere for the Mostek version of the F8 but so far have had no luck finding it.

larry/wa8ulo - -- - ---------- Wm. L. Townsend TES, Inc. Cincinnati, OH USA (513)661-3200 fax:(513)661-3732 - ----------

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Date: Thu, 31 May 2001 13:38:20 -0500
From: "Terry O'Laughlin" <terryo@wort-fm.terracom.net
Subject: Prem-Rx: RA-6790 LF performance

> Now, if you obtain a set of the VLF chips and plug 'em in your RA6790/GM you
> may or may not be able to recieve VLF. It depends. If your radio is a "series
> 6 " or later you are in luck.

My 6790 has a tag on the front panel "This receiver contains non-standard prom". The proms are marked "LF". It apparently tunes down to DC but it is not very usable below about 300 kHz. It has internally generated noise all over the place, even with a shorted antenna jack. Loran and WWVB are completely buried. I don't bother using the radio down there even though I love to check on beacons in the winter. I've never used another LF capable 6790 so I don't know if this is normal.

By the way, this 6790 tunes in 1, 10, and 100 Hz steps rather than the 1, 30, 1000 Hz steps. Is this standard for the LF eprom set?

Terry O'

Date: Thu, 31 May 2001 15:42:01 EDT
From: Daiungoed@aol.com
Subject: Re: Prem-Rx: RA-6790 LF performance

Hi, On my 6790/GM, R2174/P/RR, SER.4526, all this from little panel below rh keypad. One EPROM is labelled with a blank number, one LF EXTENSION, one VLF extension. The set tunes down to 00000000 and receives well down to 50KHz, where broadcast band breakthrough spoils the show. It receives RUGBY at 60KHz easily, and another time signal at 50KHz. If I disconnect the multicoupler feeding my sets, I can get so-called whistlers below 10KHz, and a few RTTY signals around 22-24KHz. Incidentally, anyone know where I could pick up a set of LCDs for it, mine are showing their age now, also, does anyone know the EPROM type number, so that I can see if my programmer does them?

Date: Thu, 31 May 2001 15:57:32 -0400
From: "Carcia, Frank A. HS" <francis.carcia@hs.utc.com
Subject: RE: Prem-Rx: RA-6790 LF performance

Gary Weingerd is considering a contract with the people who produced the displays. I'm sure there will be a minimum quantity buy. He told me they are getting very rare. I bet he would be willing to do this if there was enough demand to make it worth the investment. Contact him and inquire. fc

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Date: Thu, 31 May 2001 16:10:39 -0400
From: jeffa@ix.netcom.com

Subject: Re: Re: Prem-Rx: RA-6790 LF performance

In the past I've purchased LCDs and other spare 6790 parts from Alan Bond of Max-Gain systems, in Georgia. His URL is: http://www.mgs4u.com/president2.htm

- - Jeff, WA6AHL

Date: Thu, 31 May 2001 16:13:21 -0400
From: jeffa@ix.netcom.com
Subject: Re: Prem-Rx: (no subject)

Thanks to others who have the data at their fingertips, I can report that Colin Trass, who supplies these PROMS, can be reached at:

cgt@visualradios.com c.trass@att.net

- - Jeff, WA6AHL

Date: Thu, 31 May 2001 13:32:15 -0700
From: "Greg Bailey" <gbailey@mail.sdsu.edu
Subject: Prem-Rx: New Member- Gary Martek, antenna design

Gentlemen:

Gary Martek in Redmond, WA has become our latest member. Gary is a Engineer for a wireless OEM and designs "wireless smart antenna systems". He presently holds 20 patents on antenna design including point to point microwave, RF, IF, and base band processing systems.

Gary is another one of those individuals interested in diversity reception using spatial and cross polarized antenna systems in the HF spectrum.

His call letters are WIDOW, email at Gary.Martek@metawave.com

We have SWL types, digital geeks, amplifier designers, and whatever. . . but unless my professor brain has failed, I think this is our first skyhook designer

Welcome aboard Gary-

Hi Greg, Thanks for the response, I'm not too sure if my 3020s qualify me or not, since the question of a microprocessor controlled receiver and digital display? Since I think its all state logic and thumb-wheel digital. I hope it is close enough for now since I've only started last week in the procurement of such equipment. I'm interested in these receivers running off a common local oscillator and the design of a rack mounted frequency control system of these receivers. I'd like to share such information with technically qualified persons interested in such information and the investigation of diversity reception. I'd suspect this time next year I'll own more than enough such receivers for your qualification standards.

Information

I work as a Technical Staff Engineer for a wireless OEM in Redmond, WA. for the design of advanced wireless smart antenna systems. I have advanced degrees in physics and EE and hold over twenty antenna system patents in the US and other countries. I have designed point to point microwave, RF, IF, and base band processing systems related to radio systems. My hobby interests are specialized amateur radio for the investigation of diversity reception using spatial and cross polarized antenna systems in the HF spectrum. My call sign is W7DO and have been licensed since the late sixties. I own and have access to high end RF test equipment for the purpose of trouble shooting, repair, prototyping, alignment, and testing of any RX/TX equipment made.

I have just started a week ago into the procurement of "Premium-RX" equipment for the purpose of my diversity work and would appreciate those of similar.

Date: Thu, 31 May 2001 13:52:49 -0700
From: "Greg Bailey" <gbailey@mail.sdsu.edu
Subject: Prem-Rx: Ooooops I goofed

In a recent introduction of Gary Martek I accidentally included the bio information that Gary sent to me. I apologize for the double dose of information. That is the second time I included portions of the original bio info (Karl - Arne of Sweden was the first).

For this professor, the semester is over, grades are in, and I am euphoric, ... how is that for rationalization.

Greg

Date: Thu, 31 May 2001 14:05:05 -0700
From: "Greg Bailey" <gbailey@mail.sdsu.edu
Subject: Prem-Rx: New Member- John hoopes, LOWFER

Gentlemen-

John Hoopes form Bonaire, Georgia (near Macon) has joined our List. After retiring from the Air Force, John became a test program developer for a company that builds testers based around the VXI chassis. The company also manufacture a RF tester that provides stimulus and measurement up to 18GHZ.

John received his first license a few years back and presently operates AB4MS. One of his real passions is Dxing in the VLF/LF portion of the radio spectrum. He also transmits a signal on 184.5kHz with the call "JDH". Thus his nickname: LOWFER. Michael Brown (List member) has copied his beacon from his QTH in North Carolina.

John presently operates a pair of RA-6790, R1401 A/G VLF/LF, and a Sunair GSR 920

For you LOWFERS out there, John can be reached at jdhatti@hom.net

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Date: Thu, 31 May 2001 15:55:07 -0600
From: Rob & Terri Sherwood <rob@sherweng.com
Subject: Prem-Rx: Absolute vs residual phase noise

Here is the answer from Agilent in the short form.

The long form is an out of print HP app note (All HP app notes are now out of print because they say HP instead of Agilent.) A guru #2 in California scanned the HP app note and sent it to the Denver guru who tried to email it to me. It is over 10 mb in PDF format, and won't pass anyone's ISP. I guess the Agilent Intranet passes larger files.

Residual phase noise is the phase noise of the system less the reference oscillator. Absolute phase noise is the total phase noise from the entire system.

If you had a perfect noiseless crystal reference oscillator, the absolute would equal the residual. If you look at the typical absolute and residual phase noise at 100 Hz spacing or beyond, the max difference is 1 dB until you get to 100 kHz where it is 2 dB. The larger differences are at 10 Hz spacing, or if you are looking at the true spec and not the typical performance. So apparently what noise the 10811 does put out is really close in, as one might expect. It would be interesting to know if the

10811 was designed while they were working on the 8662A. I understand it took HP 7 years to design the box.

The 8662A or 8663A uses the HP 10811 SC cut oscillator. It has very low noise sidebands and a quick warm up. It replaced the older 10544 oscillator which was less reliable, more noisy and took much longer to stabilize from a cold start.

So now my question is, why do we care what the residual phase noise is? The synthesizer has to have a reference oscillator to work. I have been told that if you drive an 8662A with a cesium standard you will degrade the phase noise. I have not tried driving my synthesizers with my rubidium oscillator since I was not happy with an HP 5087A distribution amp. At this point I am assuming that anything except the 10811 will make things worse. An Astron 1295C eBay purchase is on the way, so if it works better I will try to drive the synthesizers with the rubidium.

Date: Thu, 31 May 2001 16:51:34 -0600
From: Rob & Terri Sherwood <rob@sherweng.com
Subject: Prem-Rx: 75S-3C noise floor

Here is data on a 75S-3C on 7.1 MHz using the new and improved AM testing method where the modulation is turned on and off, leaving the carrier on all the time.

0.16 uV (-122.5 dBm) 3 dB S+N/N AGC ON 0.15 uV (-123 dBm) 3 dB S+N/N AGC OFF

0.4 uV 10 dB S+N/N AGC ON. This is what I would call AM sensitivity.

- -114.5 dBm 10 dB S+N/N AGC ON - -115 dBm 10 dB S+N/N AGC OFF

If you use the old way, I get a reading of 0.035 uV, but there is no recovered audio and it makes no difference whether the modulation is on or off. These tests were done with the stock AM double-transformer 6 kHz filter. I don't yet have a mechanical filter in this radio for the AM mode.

Test were done with an 8663A, until I tried to go low enough to do the old method. The 8663A doesn't go that low without an external attenuator, so I switched over to the the 8662A for that reading.

On 7.1 MHz the AGC threshold of this radio is 1.3 uV with a 12 dB drop in audio references -30 dBm. -30 dBm reads S9 + 50 dB. S9 is about 15 uV on this specific radio.

Date: Thu, 31 May 2001 17:15:00 -0600
From: Rob & Terri Sherwood <rob@sherweng.com
Subject: Re: Prem-Rx: AM measurement at low signal levels

Were these numbers for 10 dB S+N/N or 3 dB S+N/N? I just put my 75S-3C on the reflector, and if the numbers are for 10 dB, then everything looks normal. If they are 3 dB numbers, then things are out of whack. By the way, I did not say so, but my meter was an HP 3400A with linear dB scale. I also used 400 Hz modulation.

Date: Thu, 31 May 2001 17:24:39 -0600
From: Rob & Terri Sherwood <rob@sherweng.com
Subject: Prem-Rx: S+N/N

I just read Jeff's (WA6AHL) email more carefully, and I see his numbers are for a 3 dB audio peak, modulation on/off. With his best radio at - -115 dBm and my 75S-3C at -123 dBm, I am puzzled. What is the "new" standard, 400 Hz modulation or 1000 Hz?

Date: Thu, 31 May 2001 16:43:43 -0700
From: "Greg Bailey" <gbailey@mail.sdsu.edu
Subject: Prem-Rx: New-Old Member: Chuck Rippel

Gentlemen:

Chuck Rippel runs hot and cold.

When in the hot mode he reads the List, in the cold mode he un-subscribes and retreats under his rock. It is obvious that his ears have been burning with all the recent posts regarding generators and receiver sensitivity numbers. Thus, he has surfaced again.

Most of you know that Chuck is a boatanchor "benchmark". Rippel, is one of the many List members that have made this hobby possible. Chuck motivated me to crank up the kahuna server with our account, and in fact provided the name: Premium-Rx. He was the List's number 2 member (Tony Ward was number uno).

So, without further introduction (see archives for old intro), the "Rippel kid" has joined again.

Greg

Date: Thu, 31 May 2001 17:58:15 -0700
From: John Miles <jmiles@pop.net
Subject: RE: Prem-Rx: Absolute vs residual phase noise

- -----Original Message-----

From: Rob & Terri Sherwood [SMTP:rob@sherweng.com] Sent: Thursday, May 31, 2001 2:55 PM
To: Premium, RX
Subject: Prem-Rx: Absolute vs residual phase noise

<<The long form is an out of print HP app note (All HP app notes are now out of print because they say HP instead of Agilent.) A guru #2 in California scanned the HP app note and sent it to the Denver guru who tried to email it to me. It is over 10 mb in PDF format, and won't pass anyone's ISP. I guess the Agilent Intranet passes larger files.

That's a shame. There are several HP app notes I'd like to find, particularly concerning the 8662A/8663A and its applications... guess I'll have to keep watching eBay. I am slowly getting all my Tek 49x literature scanned into .PDF form and would like to do the same for the HP notes at some point.

Generally, files larger than a couple MB have to be posted on a web server or FTP site if you want to disseminate them. I'm a little surprised your pulsed-source phase noise app note made it OK via email, myself.

<<Residual phase noise is the phase noise of the system less the reference oscillator. Absolute phase noise is the total phase noise from the entire system.

Great, that makes perfect sense.

<<If you had a perfect noiseless crystal reference oscillator, the absolute would equal the residual. If you look at the typical absolute and residual phase noise at 100 Hz spacing or beyond, the max difference is 1 dB until you get to 100 kHz where it is 2 dB. The larger differences are at 10 Hz spacing, or if you are looking at the true spec and not the typical performance. So apparently what noise the 10811 does put out is really close in, as one might expect. It would be interesting to know if the 10811 was designed while they were working on the 8662A. I understand it took HP 7 years to design the box.

I've got an issue of the HP Journal with a collection of articles by the 8662A design team; makes for great reading. It'll eventually get turned into a .PDF, too, and if anyone wants a copy I'll be glad to send a link.

< <So now my question is, why do we care what the residual phase noise is? The synthesizer has to have a reference oscillator to work. I have been told that if you drive an 8662A with a cesium standard you will degrade the phase noise. I have not tried driving my synthesizers with my rubidium oscillator since I was not happy with an HP 5087A distribution amp. At this point I am assuming that anything except the 10811 will make things worse. An Astron 1295C eBay purchase is on the way, so if it works better I will try to drive the synthesizers with the rubidium.

A couple of web references suggest that hydrogen masers are capable of decent performance (http://www.stdtime.gov.tw/english/d-2.htm: -165 dBc at 100 kHz offset from a 5 Mhz source).

These guys (http://www.boulder.nist.gov/timefreq/ion/freqstd/spie1/spie1.pdf) are using an 8662A to multiply the output of a 5 MHz hydrogen maser source to 1 GHz, where it's used as a LO in a hybrid system for extremely precise light frequency measurements. The lasers they're working with apparently have even better phase-noise characteristics than the RF gear, but I don't know if they're using the maser for its very-short-term (PN) stability, longer-term stability, or both.

- -- jm

Date: Thu, 31 May 2001 19:18:59 -0600
From: Gerald Caouette <ve6nap@telusplanet.net
Subject: RE: Prem-Rx: RA-6790 LF performance

I seem to remember toronto surplus and having some displays at one time try mike he may be able to help

their web address http://www.torontosurplus.com

Regards Gerald Caouette 9116 - 79 street Edmonton, Alberta Canada T6C 2R4

ve6nap@ve6nap.com

http://www.ve6nap.com

Date: Fri, 1 Jun 2001 00:01:46 -0700 (PDT)
From: Rodney Bunt <rodney_bunt@yahoo.com
Subject: Prem-Rx: Collins HF-2050 Remote Control program ?

I have recently aquired an RS232 to RS422 converter, so I can now "talk" to the Collins HF-2050.

Does any one have software to do this ?

I know that I can use a "dumb" terminal, and I thought a remote control program would overcome the terrible tuning rates from the dial, for making "band cruising" more of a pleasure.

Rodney Bunt VK2KTZ

Date: Fri, 1 Jun 2001 02:29:47 -0700
From: "refmon" <monitor@referencevideo.com
Subject: Prem-Rx: continuing saga: Cubic R3030 mods, etc.

Hi premium group,

By way of the recent AGC characteristics thread, I became fixated on the = AGC system and birdie situation with my Cubic R3030 receivers. I set = about "fixing" the AGC and gain structure of the receivers and analyzing = and coming up with a remedy for the self-generated interference. = Following are my findings, cures, dead ends and finally, an inquiry of = the group for ideas &/or advice:

Receiver: Cubic R3030 SN-509, manufactured April 1, 1986 For = experiments, I'm using a sacrificial detector module procured on ebay = for $11.00-working!! Once I understand all the mods, receiver will be = returned to stock to collect benchmark measurements and plots from the = SA. Then the real mods may be installed.

Issues:

1) AGC clicks heavily at start of SSB and/or CW transmission. Cure: = Detector module R89 (470 ohms working with with 33uf cap) change to 100 = ohms...this reduces attack time to just inside ARRL recommendations-huge = improvement, although a small click sometimes ocurrs if conditions are = quiet enough-still tracking cause.

2) Hang AGC release is abrupt and distracting, causing severe audio = pumping. Not a cure, but huge improvement by increasing the hang = release time constant. Detector module R92 (22K) change to 47K-this = significantly softens the release transition and is way easier on the = ears. The dump command, issued when scanning/sweeping or changing AGC = settings remains as factory installed.

3) Receiver at rest (no signal) is annoyingly noisy with AGC ON...a = manual gain setting of about 36-40 db reduction results in nice, quiet, = Icom R9000-like reception, although, of course there's no AGC and this = is a big pain. Antenna disconnect confirms the noise is via = antenna...that is, the roar is just over-amplified atmospheric noise. = Conclude that for SWL band searching, the receiver gain structure has to = be modified. This is not an alleged design fault-I am using the = receivers outside their original design requirements.

Observations: Overall receiver gain can be set with a one-turn pot = (need more resolution-maybe a 5 or 10 turn pot), but this still leaves = one MC1350 IF amp running at fixed full gain of about 50db complete with = the attendant "rush" of a wide open amp. One option is to plumb AGC = control to this amp stage.

Resetting receiver gain & realigning AGC threshold goes some distance = toward solving the issues, but also causes other issues like S-meter cal = points out of range and a slight loss in dynamic range...several = resistors can be chaged in the meter-zero and meter-gain circuit to = re-establish very accurate cal...the S meter actually tracks the signal = generator level from "0"dbm down to -80dbm...gets a little sloppy at = - -100dbm and below. Once the meter is recal'd, AGC threshold can be = retweaked to kick in just above the idling noise level.

Loose ends: still need to confirm apparant success with = instrumentation, but need to solve/reduce the hash/birdie problems = first- see below. Final noise figure, noise floor, and dynamic range = measurements will need to be made.

4) Receiver is fairly clear of birdies up to about 15MHz, then lots of = hash & birdies above 15MHz-can totally mask all but the strongest = signals. Again, I'm outside the original design requirements...I'm in = an unshielded house with antennas right outside the wall...while coax = fed, and about 25 feet away from the radio, the antenna itself picks up = radiated crud. Current physical constraints do not allow for further = remoting of antennas.

Near field measurements using H & E field probes, HP8568B spectrum = analyzer, and the #1 side of the SN-509 receiver reveal the following:

With only the power connected, the receiver is virtually free of crud up = to 30MHz-there are a few birdies, but the wideband, throbbing digital = stuff is not there.

Near field probing shows essentially no leakage from rear panel = connectors including the antenna-there is a low level lump around 5MHz = when the probe is poked into the GPIB connector, but

nothing present = beyond 2 inches. The case and front panel are free from leakage at = chassis seams, etc, HOWEVER, wideband noise as high as +45db above SA = noise floor is pouring out of the front panel cutouts for the digital = displays and the keyboard. Sealing over the displays and keyboard with = chassis-grounded aluminum achieves a virtually silent receiver-entire = chassis looks RF tight, but is inoperable because the display & keyboard = are covered.

So, it appears I have to dissect the front panel and panel circuit = boards to find if there is any factory-installed shielding and, if so, = why it isn't working. I suspect there is no specific shielding and I'll = need to do something clever & cunning. The keyboard is fairly easy, = because I don't have to see through the shielding...there's plenty of = room behind the front panel to accomodate additional internal depth so a = shield can be inserted between the circuit board and the keyboard-near = field probing shows two specific IC's are the originating points for = most of the keyboard area crud-the keyboard itself seems to just pass = stuff.

The displays are tougies-the crud is fairly strong and the shielding has = to be visually transparent (or maybe translucent is ok). I've played = with several ideas:

A) adapt pieces of "radiation treated" computer monitor glare = filters-total failure-in some cases, the grounded test piece actually = increased the crud level.

B) very fine metallic mesh-way finer than window screen (which by the = way, works fairly well, except you'll go blind looking through the = coarse mesh)-no material located yet. Anyone know of a metal screen = mesh the consistency of a nylon stocking? If the displays are = immediately behind such a material, they'll be clearly visible.

C) Aluminized mylar!! There's actually data available on this on the = web! Aluminized Mylar can act as an RFI/EMI shield and you can see = through it when what you're looking at is a light in contact with the = rear side of the mylar...I can even get sufficient quantities of this = material from a nearby electronics factory...Static Suppression bags! = Inital tests with a small bag look like there's going to be an inverse = relationship between shielding & visbility...the more heavily aluminized = the mylar is (good shield), the harder it is to see through (counter = productive around displays).

Here's that question I alluded to in the beginning of this post:

Has anyone out there dabbled in the use of aluminized mylar as outlined? = I expect the magnetic field noise will be relatively untouched by the = alum'd mylar, while the electric field noise will be significantly = attenuated/redirected back into the chassis. Is that basic expectation = accurate? Is there some-other-ized mylar available that would attack = the magnetic field as well? Maybe steelized mylar...?

PS...another handy mod may be to replace the volume pots with true log = taper audio pots-a little spread on the dial would be nice.

Anyway, it's late and I'm going blind and deaf here...any ideas or = advice (other than seek counseling/sell the receivers) will be much = appreciated.

with many thanks in advance & a "keep up the fascinating threads"

John Collins USA

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premium-rx-digest Friday, June 1 2001 Volume 01 : Number 127

Date: Fri, 01 Jun 2001 10:10:24 -0400
From: jeffa@ix.netcom.com
Subject: Re: Prem-Rx: S+N/N

Hi Rob,

In my test setup the generator's AM modulation is set to Internal 1 KHz, 30% modulation.

Test gear is an 8640B generator plus 3400A Meter (with log dB, rather than linear dB, scale though). Rob, could you give me a bit more info on your 3400A with the linear dB scale? Is there an option (-H or -J) number on it, or some other difference in part-number? Sounds like a useful beast and I'd like to keep my eyes open for one.

I'm puzzled too by the 8 dBm difference between your 75S-3C and my best receiver. One possible explanation is that different receivers may have frequency-dependent sensitivities (and noise performance) and unless we all agree upon a common test frequency, our results may not correlate. I tested all my receivers at 13.915 MHz, and always with the appropriate AM bandwidth filter.

Does anyone have a test frequency they recommend we use? It should be either in or near one of the ham bands so that we can also compare ham-band only receivers, too.

Of course, another explanation may be that one or both of us is out of calibration. I can't vouch for my gear at the moment, but I can easily check if it's in the ballpark this weekend.

- - Jeff

Date: Fri, 1 Jun 2001 12:39:47 -0400
From: "Carcia, Frank A. HS" <francis.carcia@hs.utc.com
Subject: RE: Prem-Rx: S+N/N

Hi All, You may want to put a pad at the radio just to force 50 Ohms.

Last night I looked at my RA6830. I used HP8640B, 4 Ft RG142B/U and A HP3400A. At 6 KHz BW I measured -109 dBM for modulation on/off at 30 %, 1 KHz. Also measured -120 dBM modulation and carrier on/off. (Increased audio RMS = 3 dB)

Next I switched to 3 KHz BW. Modulation on/off same number but with carrier and modulation on/off I measured -123 dBM.

The 455 KHz IF has a nice spot between two cans in the output circuit where a small tail end filter could go. I may try this to reduce the noise.

I think my results match Jeff's for the RA6830. I did not have Racal preselector in line for this test. It has about 4 dB gain. I performed everything at 3.885 MHz (75 meter AM window) fc

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Date: Fri, 1 Jun 2001 12:47:17 -0400
From: "john hoopes" <jdhatti@hom.net
Subject: Prem-Rx: RA6790 mixer question

Greetings fellow listers. First of all, I would just like to say hello and I'm glad to be on the premium receiver list. I can see that there is a great deal of information to be had here. Isn't e-mail a wonderful thing!

I have a question for any owners of the Racal RA6790 receiver and that is...has anyone deciphered the type of DMOS transistors that are used in the 1st mixer. I took a chance when mine went out and replaced them with Temic SD210DE and the receiver has maintained it's excellent performance (except for the high noise level) but I was curious if maybe there is another device out there that would work as well, or better than the stock transistors.

Thanks in advance.

John

Date: Fri, 1 Jun 2001 18:41:41 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: RE: Prem-Rx: 75S-3C noise floor

Rob, I think that results coming in via many postings including your own seem to suggest that most agree on the figures for AM sensitivity using the "Marconi" method. However, your 75S-3C seems to have an unusually low 3dB noise floor even though the 10dB S+N/N ratio is in line with other results. It's the anomalies which make it all interesting. The S9 setting at 15 microvolts is way adrift from the usual 50 (pd) microvolts for S9, and I note that Collins quote 100 microvolts (presumably emf) for S9 in the 75S-3 manual, but ther's no s-meter sensitivity adjustment of the kind you find on the 51S-1 so I don't understand that?? Incidentally, if we used -73dBm for S9 we wouldn't have the 50/100 microvolt business!!! I'm enjoying come home knowing that there will be something interesting waiting on the list. 73 John -

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Date: Fri, 1 Jun 2001 18:41:44 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: RE: Prem-Rx: continuing saga: Cubic R3030 mods, etc.

Hello John, A most interesting posting, particularly the findings on the digital hash coming out of the front panel of the Cubic 3030A.I wish I could a) find a 3030A in UK, and 2) afford to use "sacrificial" sub assemblies. 73 John Wilson

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Date: Fri, 1 Jun 2001 14:43:23 -0400
From: "Carcia, Frank A. HS" <francis.carcia@hs.utc.com
Subject: RE: Prem-Rx: S+N/N

I measured the same number with either modulation frequency

Date: Fri, 01 Jun 2001 13:03:25 -0600
From: Rob & Terri Sherwood <rob@sherweng.com
Subject: Re: Prem-Rx: 75S-3C noise floor

Yes you are correct. The manual says S9 is approximately 50 uV so I have no idea why mine is more like my Drake R-4C or my Icom R-9000. There is an S meter zero pot and the IF gain pot to set the AGC threshold. No adjustment to make the S meter more or less scotch. Some of the most sensitive radios on my site are S-Lines. The 9000 and the S-3C both sound wonderful on the air. The AGC is a bit stiffer on the Icom, and this shows up when the signals are in the S-1 range. No AGC pops / overload on AGC attach on either one. Is the 1/2 dB difference in readings of AM noise floor with the AGC off vs on about what you would expect. Assuming a radio does not have a nutty AGC threshold in the 0.3 uV range like a Rhode & Schwartz I once tested, it would seem that the AGC on/off numbers should be very close.

Date: Fri, 1 Jun 2001 15:39:15 -0400
From: "Carcia, Frank A. HS" <francis.carcia@hs.utc.com
Subject: RE: Prem-Rx: New Member- Gary Martek, antenna design

I hope he shares some minature antenna designs with us. It is too hard to drag my 30 foot lpda on vacation.

Date: Fri, 01 Jun 2001 16:00:10 -0400

From: jeffa@ix.netcom.com
Subject: Re: Prem-Rx: 75S-3C noise floor

I wonder how different the AGC circuit in the 75S-3C is from its earlier variants?

The AGC performance in both my 75S-3 and my KWM-2A (with the Collins Service-Bulletin AGC mods) leaves alot to be desired. Although I don't recall hearing pops on attack, there is a noticable (and quite distracting) amount of distortion when the AGC is operating. When the RF gain is cranked back far enough to disable the AGC, the signals sound noticably better.

I initially thought the 75S-3 problems were a result of something wrong in my receiver and I spent many hours trying to track down the cause, without success. Finally, a friend brought by his 75S-3 and I did a comparison - it sounded the same! That's when I decided it was a design flaw, rather than a bad unit.

Interstingly, my 51S-1 sounds MUCH better. And I love the sound of my 651S-1.

- - Jeff, WA6AHL

Date: Fri, 1 Jun 2001 22:09:25 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: Prem-Rx: RE: R-390A for tests

Les, Thank you so much for your efforts to get me a receiver to test. I'm sure that one will appear here before too long and it will only take a few hours to run it through my normal test routines, including the infamous AGC response tests. At least I know that an R-390 won't be radiating hash from its front panel. I think you might find the area of England which you knew is rather more built up than when you were here, but I'm lucky to have semi-retired to the Southwest, and the horizon from my house is between 12 to 15 miles away to the North and I'm looking across a river valley with no immediate neighbours. This sounds like it might be a quiet electrical area, but my wife has her hobby of breeding and showing pedigree sheep so she has, in effect, surrounded me with electric fences which are exactly like Beverage antennas connected to high voltage spark generators. It's great for testing noise blankers, but when I really need to get quiet I have to go out into the farm and turn the damned things off. 73 John

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Date: Fri, 1 Jun 2001 22:09:27 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: RE: Prem-Rx: 75S-3C noise floor

Rob, I think that the half dB change in 10dB S/N ratio could be either measusrement uncertainty or that you are around the agc threshold. I never worry too much when the readings are that close. The agc sounds like classic ham radio agc in tube receivers which may overload but does it gracefully. The 51S-1 shows a slight audio burst at the beginning of an RF input step but it's rounde like half a sine wave so your ears don't really notice it. Why is it that valve equipment just seeme more electrically genteel than the harshness of some digital gear. My favourite recording of Barney Kessel on guitar still sounds better from my original beat-up vinyl than a CD re-master that I bought recently, even with the vinyl hiss. 73 John

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premium-rx-digest Saturday, June 2 2001 Volume 01 : Number 128

Date: Fri, 1 Jun 2001 22:18:03 +0200
From: "John Wilson" <johnwilson@freezone.co.uk

Subject: Prem-Rx: 8640B

Rob, Forgot to mention that I received my 8640B yesterday and sent it back for replacement today. Everything seemed ok and I checked the cavity end to end as I looked at it on a spectrum analyser and there were no rough spots, and the levelling was perfect. Checked the FM deviation using Bessel Zero method - all fine, checked AM modulation depth - all fine, and then I took a listen at the signal at 450MHz using one of my Rohde & Schwarz EMI test receivers and found that when the generator was phase locked it had a "wobble" on it at a rate of about 5Hz and a deviation of up to 1kHz, a kind of whoop, whoop, whoop. So back it has gone with a promise of a replacement. I was fortunately able to take the telephone to the test receiver and let the dealer have a listen to the noise so he couldn' deny it existed. I await developments. Damn. 73 John

- --------------------- John Wilson Stone Hill Kings Nympton Umberleigh Devon EX37 9TR Tel: 01769 573047 Fax: 01769 574158

Date: Fri, 1 Jun 2001 17:37:43 -0400
From: "Chuck Rippel" <avsl@erols.com
Subject: Prem-Rx: RE: Noise Floor and useable sensitivity

> Here is data on a 75S-3C on 7.1 MHz using the new and improved AM
> testing method where the modulation is turned on and off, leaving the
> carrier on all the time.

First, thanks to Greg for his version of my............. "reintroduction" to the group. I have been on DX'peditions with this fellow and may start an interesting thread about having to live in close quarters and accommodate his... habits.

Back to biz. My method on the R390A is to determine the noise floor after manipulating the IF gain control looking for the "sweet spot" for optimum sensitivity. There, the prevailing issue is not one of gain, rather its noise. The location of the IF gain control in an R390A is in the 3rd IF amplifier (out of 4). Too much gain and the noise in the previous stages are amplified causing a degredation of the s/n ratio. Lower the IF gain too far and signal recovery can suffer.

The R390A I finished last night spec'd out at 0.09 uv for 10db S/N + N using the 4kc filter, no BFO, 30% modulation per the manual. The receiver also has excellent audio recovery with the coupling capacitors after the filters having been replaced with type 716P Orangedrops. This receiver will also have one of the new Dave Curry 6 kc filters installed in place of the basically useless 16 kc filter.

The receiver was a 1967 build EAC off the DAABxxxx order number.

The usefulness of that sort of sensitivity number is controversial. I can honestly say that I personally used an R390A with sensitivity numbers to advantage twice. Once was during the last transmission of the PT station in Hong Kong which transmitted the weather reports during the Yacht Races Hong Kong to Austrailia(?) a few years ago.

The second opportunity was during a DX'pedition morning at Cape Hatteras. An absolutely dead quiet band allowed me to use a Sherwood SE-3 equipped R390A to hear RRI Dili on 3306.8 long (30 minutes) before the R8A's and 2 WJ HF-1000's.

There is some utility for that kind of performance .5 - 30 mhz but granted, the opportunities are somewhat limited.

= =

Chuck Rippel Cornland, VA (VA/NC State line 30KM Inland from coast) SWBC DX'er since 1971

Reply To: wa4hhg@amsat.org WJ HF-1000A, R390A/Sherwood SE-3, Harris RF-590, Collins HF-2050 www site: http://www.avslvb.com/R390A/index.html
= =

Date: Fri, 1 Jun 2001 14:44:13 -0700
From: John Miles <jmiles@pop.net
Subject: RE: Prem-Rx: 8640B

Actually, they all do that. Your generator was working properly.

The 8640B does not do true phase-locking when the "Lock" button is pressed. It's a frequency-locking scheme: they latch the value of the counter LSD when you hit Lock, and from that point on, any output frequency deviation that would result in LSD drift is corrected. So you will definitely see FM sidebands with deviation related to your current counter resolution. You can hit the 'X10' or 'X100' buttons to raise the LSD resolution and reduce the FM in lock mode, but it'll never go away entirely.

- -- jm

Date: Fri, 01 Jun 2001 15:54:47 -0600
From: Rob & Terri Sherwood <rob@sherweng.com
Subject: Re: Prem-Rx: 8640B

Some 8640Bs are worse than others. It is absolutely correct that the lock button is more of a drift canceling button. If it was a real phase locked loop, it would put phase noise on the signal like a lot of other mediocre synthesizers. I had two 8640As and one 8640B. My B had very little of the wobble you are seeing, but my HP metrology friend has two of the Bs and both of his have much the same problem you mentioned. I will forward this email to him to give his thoughts on how typical this is, and what if anything there is to do about it.

Date: Fri, 1 Jun 2001 15:15:32 -0700
From: John Miles <jmiles@pop.net
Subject: RE: Prem-Rx: 8640B

Hmm... barring power-supply drift which is easy to check for, all 8640s are going to drift, and the FLL circuit is going to correct it, and you're going to get FM as a result. The amount of FM you get would depend on:

- What band you're on. For a given counter resolution, the HF bands exhibit less drift and won't need as much correction; 450 MHz would have a LOT.

- How long the 8640 has been running. They settle down a LOT after 10 to 30 minutes; don't even think about using one for critical measurements unless it's been on for at least 30 minutes.

- What counter resolution is selected. X10 or X100 will give you less deviation but a 10X or 100X higher correction rate.

- Any temperature gradients, mechanical noise, etc. going on at the time of the measurement

- Drift in the cavity supply, or a bad cavity oscillator transistor

If you observe a difference between the FM characteristics of two different, "locked" 8640s, it's much more likely to be one of the first four factors than the latter one.

- -- jm

Date: Fri, 1 Jun 2001 21:07:04 -0500
From: "Bob Nickels" <ranickel@mwci.net
Subject: Re: Prem-Rx: RA6790 mixer question

> ...has anyone deciphered the type of DMOS transistors that are used in the
> 1st mixer. I took a chance when mine went out and replaced them with Temic
> SD210DE

Mine originally had Phillips BSV81s which proved impossible to find, so I used Siliconix SD215E DMOS FETs when I replaced them. Unfortunately this did not cure the low sensitivity problem which I've since learned is something of a case history problem with the 6790 and not indicative of a defective first mixer.

I did some web-mining and found an article in the Feb. 1993 issue of QST that covers the commutative DMOS FET mixer, and also gives a reference to a Siliconix Si8901 (discontinued) that has been replaced by a Calogic SD8901that is shown here: http://www.calogic.com/pdf/SD8901.PDF This would seem to be a suitable replacement for the entire PCB in the Racal mixer.

In my research, I found references that pointed to the AOR AR7030 as a modern receiver that uses the same high performance mixer as the RA6790:

"The AR7030 is a combined project between AOR and internationally acclaimed designer 'John Thorpe'. This new design provides exceptional strong signal performance coupled with enhanced microprocessor features and facilities. Where good strong signal handling, high performance and transportability are of great importance, the AR7030 is the solution offering an IP 3 greater than +30dBm (typical +35dBm reduced by 10dB with the preamp on). Intermodulation free dynamic range with the 2.2kHz filter is typically 105dB @ 100/200kHz spacing, 104dB @ 20/40kHz and still better than 90dB @ 5kHz. This fantastic strong signal handling is aided by the innovative configuration of a lateral DMOS FET QUAD first mixer running at 15V, relay switching in the front end (not diodes) and the use of shielded inductors throughout the signal path. Enhanced features include pass band tuning 4.2kHz, variable audio pitch tune on CW & data modes and a new 'variable bandwidth synchronous detector' for AM listening to eliminate the effects of transmitter / receiver drift as well as reducing distortion from selective fading. The pass band tuning may be used in synchronous AM mode to select synchronous USB, LSB, DSB or anything in between."

Sounds like an interesting receiver - the above quote is taken from http://aorja.com/ar7030e.html I'm betting John Thorpe once worked at Racal - does anyone know for sure?

73, Bob W9RAN

Date: Sat, 2 Jun 2001 04:50:46 -0600
From: "gbus" <gbus@qwest.net
Subject: Re: Prem-Rx: 8640B

Hi Everyone,

I am Rob's friend (the one owning two 8640B generators). I can confirm that the FM wobble in the "Lock" mode is normal. As Rob mentioned, some boxes, such as the one he used to own, wound up having a little less wobble than typical for the 8640B population. JM makes good points regarding the effect as a function of band, counter resolution, warm-up time, etc.

It's worth mentioning that A3R2, which is a 1k ohm pot coupled to the tuning gears of the cavity oscillator, compensates the FM Amplifier gain as a function of carrier frequency. In some cases A3R2 has become intermittent, causing FM deviation to be erratic at some "spots on the dial." The fix: replace the bad pot.

Regarding the wobble's FM deviation at 450 MHz, 1 kHz deviation sounds pretty high to me. For comparison I'll warm-up both my 8640B generators, measure the wobble, and report back to you.

73, Greg

Date: Sat, 2 Jun 2001 11:53:30 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: RE: Prem-Rx: 75S-3C noise floor

Rob, I'm pleased to see the posting from Chuck Rippel who seems to have confirmed the innate excellence of the R-390A on weak AM signals. Now that we have clarified the measurement technique which had not previously been well defined, we are all singing from the same hymn sheet and the results are properly comparable. If you want to hear the best AM audio I have ever encountered then try and locate a Rohde & Schwarz EK-07D which I know will be somewhat rare in the US, 'cos it's damned rare in the UK and we're a lot closer to Germany than you are. I took a lot of measurements on the beast (it weighs in at around 150 pounds)and I'm copying here the relevant text from my review: "Having completed my regular measurements I sat down to actually use the EK-07, and it was whilst tuning around the medium wave to do my 900/909/918kHz checks, which of course the EK-07 passed with laughable ease, that I began to notice the quality of the AM audio. When a receiver needs an external loudspeaker, I always use a single Wharfedale Programme 20 because if the audio is any good, this speaker will show it up. I simply couldn't believe how amazingly good the recovered audio from strong AM stations could be, and some of the French broadcasts were outstandingly impressive. This is where the "zero-beat" button came in useful in ensuring that the incoming signal was properly centred in the 12kHz IF passband of the receiver, because the filter response was so flat that the signal strength meter couldn't help. Using the rear panel sockets on the receiver I was able to check the response of the audio section and was surprised to find it flat between 3dB points of 30Hz and 12kHz. Pursuing this further. I set up my HP 8657A generator and used the external AM input to produce a signal at 800kHz modulated from 20Hz to 12kHz. Now the specification for the 8657A only claims distortion figures of 1.5%, so anything approaching this after the signal had passed through the entire receiver from antenna input to loudspeaker output would be really good performance. The darned thing produced LF recovered audio down to 30Hz, with the HF end being limited only by the constraints of the IF bandwidth. I can honestly say that I have never, never heard AM of this quality, and certainly not from a monitoring receiver. I spent an entire evening just listening to medium wave AM and enjoying the revelation. A glance at the circuit and the inside of the receiver tells a lot. The output valve is a classic EL84 running in Class A with an output transformer the size of a half brick, and negative feedback around the stage using a separate cathode winding on the transformer. Aficionados of Quad II valve amplifiers will recognise the circuit configuration instantly." Now that the doctors have repaired the hernia I got from lifting it, I'm more in favour of the W-J 8711, but the audio was magnificent. 73 John

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Date: Sat, 2 Jun 2001 11:53:35 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: Prem-Rx: RE: JT2000 (2001?)

Dear Guy, I think you hit on an interesting topic with the rumoured JT-2000 receiver. John is a perfectionist and it's difficult to stop him designing for perfection and get the **** thing into production. We're all waiting in anticipation but the last time I spoke to JT about two weeks ago he confessed that he had taken on rather too much design work for the allocated 24 hours in a day and was beginning to feel under pressure. I just hope, and hope, and hope that he puts a front panel on it, but I suspect we might see a black box approach with control from a computer - but that is my own fear and not based on any actual information. As for Washington State - well I guess that you can't have green grass and heakthy trees without some irrigation, and I'd rather live there than in Nevada!! 73 John Wilson

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Date: Sat, 2 Jun 2001 11:54:32 +0200
From: "John Wilson" <johnwilson@freezone.co.uk

Subject: RE: Prem-Rx: RA6790 mixer question

Hi Bob, Glad you like the sound of the AR-7030 designed by John Thorpe who worked for ME after I sponsored him through his engineering degree at Cambridge (England). He worked for me at Lowe Electronics until the company was sold to new owners who simply did not understand the qualities of the man and (like me) left Lowe to become an independent designer. That's when AOR who we had been representing in the UK approached John and asked him to design a receiver for them - which was of course the AR-7030. John is a multi-premium receiver pwner, having re-built a 390A from total strip down to finished product and it is this 390 that I would like to test, for if John has anything to do with it, it's perfect. He has never worked for anyone but Lowe, and AOR on his own account, but is also deeply involved in very high-end audio, at which he is equeally excellent. 73 John Wilson G3PCY/5N2AAC

Date: Sat, 2 Jun 2001 11:54:34 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: RE: Prem-Rx: 8640B

Hi to all who commented on my 8640B "problem". Thank you all for providing in-depth knowledge on the 8640B frequency wobble. I must be extremely lucky to already have an 8640B which does not exhibit anything like the amount of FM that the second sample demonstrated, but knowing that this is inherent, all I can hope for is an 8640 which matches my first one!! I did check out the generator over a period of several hours, and took close-in spectrum plots using the Rohde & Schwarz test receivers which gave me print-outs of the results, and it seems that the problem became gradually worse after about four hours. I appreciate that the FM is divided down as you come down from the basic cavity tuned range, but even dividing down to 14MHz, the original +/- 1kHz wobble leaves a lot on the signal at 14MHz. I will keep you posted about what happens, but thanks to you all again for the asistance. Shared information is really valuable. 73 John Wilson

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Date: Sat, 2 Jun 2001 12:00:17 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: RE: Prem-Rx: 8640B

Greg, Thanks a million for offering to check your own generators for me (us). O sent a spectrum plot of the wobble back to the dealer who sold me the generator, and I thought that a clear 1kHz deviation was too high. If I don't get anywhere with a second sample, the tip on the A3R2 pot will be the next thing to try. Grateful for your help, John Wilson

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premium-rx-digest Sunday, June 3 2001 Volume 01 : Number 129

Date: Sat, 02 Jun 2001 07:52:01 -0700
From: John Reed <jreed@ponca.net
Subject: Prem-Rx: R-390A Noise Figure

Maybe the R-390A S/(s+N) data is now understood, but there's one thing that I still don't understand. In the original posting that started all this the R-390A noise floor measurement (AM, 4000 Hz filter, 3 dB increase in signal) was given as -140 dBm. In Rohde et al the formula relating noise figure (NF) and MDS (-140 dBm) is given as:

MDS = -174 + 10Log(bandwidth(Hz)) + NF

Plugging in the numbers for MDS and bandwidth, I get a noise figure of - -2 dB. That means the receiver is 2 dB BETTER than a perfect, noiseless amplifier at room temperature.

Can anybody offer some insight into what's going on here? Having worked in physics I always like to see the theory and experimental results agree.

John Reed

Date: Sat, 02 Jun 2001 09:32:46 -0700
From: John Hoopes <jdhatti@hom.net
Subject: Re: Prem-Rx: RA6790 mixer question

Bob wrote:
> Mine originally had Phillips BSV81s which proved impossible to find, so I
> used Siliconix SD215E DMOS FETs when I replaced them. Unfortunately this
> did not cure the low sensitivity problem which I've since learned is
> something of a case history problem with the 6790 and not indicative of a
> defective first mixer.

I replaced mine out of necessity after a near-by storm decided to have them for lunch. That is when I discovered the mixer was a sealed unit and no longer available from Racal. Out of desperation, I tried a matched quad of 1n914 diodes. Seat of the pants performance was not that bad and the receiver actually passed bite. There was noticeable intermod though but nothing that an outboard antenna tuner couldn't take care of. Later on I discovered that I could replace the blown fets with the Siliconix brand of DMOS fets so that is what I did. Thankfully they were a direct drop in (pin for pin) and seemed to perform well. I haven't noticed any intermod but that characteristic "hiss" is still there when at maximum gain. One of the list members mentioned a thread that ran a while ago about an amplifier mod after the first mixer which addresses that problem. When I get a chance I'll have to rummage through the archives.
Regards John

Date: Sat, 02 Jun 2001 10:30:00 -0700
From: John Hoopes <jdhatti@hom.net
Subject: Re: Prem-Rx: RA6790 mixer question
> My front blew too, but I think it is different.
> Where did you get FETs?
> Gary Wingerd quoted me $2oo to fix, a little high for my budget.
> 73
> Matt

Matt:
Newark Electronics carries the Vishay Sliconix line of fets. When I go to work on Monday I can find out more. There might be some smaller distributors out there that carry their product line but I wasn't able to turn up anything on a search. Let me know if you're interested in obtaining some because I need to replace my stock as well.

Regards, John

Date: Sat, 2 Jun 2001 16:56:44 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: RE: Prem-Rx: RE: Noise Floor and useable sensitivity

Chuck,

Found your posting on the R-390A really interesting and it shows what can be done by someone who knows every tweak in the book on a piece of equipment. I can't put myself in that league because I never had the opportunity to get to grips with any one receiver. I see premium receivers passing across my test bench at a rate of one a month and I can only do the routine set of tests before it passes away to be replaced by another. So, I get the breadth but you have the depth, and the tip about the IF gain setup is the kind of knowledge that takes a long time to acquire. The Collins sweat shirts are still admired!!! 73 John Wilson

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Date: Sat, 2 Jun 2001 10:48:05 -0700
From: "John Miles" <jmiles@pop.net
Subject: Re: Prem-Rx: 8640B

> Regarding the wobble's FM deviation at 450 MHz, 1 kHz deviation sounds
> pretty high to me. For comparison I'll warm-up both my 8640B generators,
> measure the wobble, and report back to you.

If your counter is set to 1 kHz resolution at the LSD, that's precisely how much deviation you're going to get. :-) Think about it...

- -- jm

Date: Sat, 2 Jun 2001 19:54:12 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: RE: Prem-Rx: 8640B

I've thought about it - I must be dim. Some of my best friends say the same thing. The service manual suggests that residual FM should be at most 15Hz and surely the PLL filter should take care of this. What have I missed?? I don't mind being made to look like an idiot if there is something to learn. John Wilson

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Date: Sat, 2 Jun 2001 13:26:07 -0700
From: "John Miles" <jmiles@pop.net
Subject: Re: Prem-Rx: 8640B

Sorry for muddling the issue so much... my thinking is, if you're frequency-locking a source to the counter LSD, and the counter LSD resolution is 1 kHz, then you're going to get corrections (in the form of FM sweeps) when the cavity drifts +/- 1 kHz. Assuming the magnitude of the correction is calculated maximize the time before another correction is likely to be necessary, then they're probably dragging the oscillator backwards or forwards an amount equal to the counter resolution, in order to put it back as close as possible to the original locked frequency.

Keep in mind that there is *no* PLL filter, since there's no PLL. There will be some sort of integrator (I don't have my manual handy) between the digital up/down correction signal and the cavity's FM port, but the trouble is that the loop is only effectively "closed" when the signal drifts away from the LSD, so it can't act as a cleanup mechanism.

I could believe that residual FM is <= 15 Hz without the lock feature -- these things are pretty darned quiet. But if you watch the output on a spectrum analyzer at < 1 kHz RBW, you'll see all kinds of sidebands popping up when you hit the lock button.

Of course, maybe MY 8640B is the one with the noisy/drifty cavity that requires excessive lock correction... that's always a possibility. :-)

- -- jm

Date: Sat, 2 Jun 2001 19:38:30 -0400 (EDT)
From: Steve Stutman <steve@xenon.clickadeal.com
Subject: Prem-Rx: R&S EK 07 RX

Hi,

Thinking about bringing over a number of Rohde and Schwarz EK 07 towards end of summer or early fall. If there is enough interest it might be possible to freight them in a container which is cheaper than the usual.

Are there many list members who might be interested? With all deference to author Osterman, whose book I thoroughly enjoyed and which has cost me more than its cover price insofar as I've gotten RXs I didn't previously know about; price for a good example would be less than $1K.

73,

Steve Stutman

Date: Sat, 2 Jun 2001 18:06:52 -0600
From: "gbus" <gbus@qwest.net
Subject: Re: Prem-Rx: 8640B

Hi John,

As promised, I measured the residual FM on my 8640B in its "lock" mode. What I actually measured is: [noise induced by my modulation analyzer] + [8640B noise] + [8640B wobble]. I made the measurement in a 5 Hz to 3 kHz BW.

So, at 450 MHz, in the lock mode with counter resolution of 1 kHz (X10 setting), after 18 hours warm-up, the composite residual FM deviation in a 5 Hz to 3 kHz BW measures 46 Hz peak. Of course some of that is coming from the two contributors other than wobble. So we may assume the wobble contribution is a little less than 46 Hz.

The human ear is very sensitive to wow and flutter; so when using your receiver (at 450 MHz) with BFO / product detector resulting in, say a 1 kHz audio beat, you're hearing 4.6 % wow (46 Hz / 1000 Hz = 4.6 %). That's a pretty heavy duty amount of wow to the human ear. (Audiophiles become unhappy with the sound of pianos and guitars, for example, if wow/flutter exceeds, say 0.08 %.)

Hope that helps a little. Cheers, Greg

Date: Sat, 2 Jun 2001 22:01:11 -0600
From: "gbus" <gbus@qwest.net
Subject: Re: Prem-Rx: 8640B

Hi again John,

I just now measured my second 8640B, with surprising results: At 450 MHz, its composite residual FM deviation in a 5 Hz to 3 kHz BW measures only 12 Hz peak in the "locked" mode -- which is actually less residual than it measures in its "unlocked" mode.

Therefore its wobble peak deviation is certainly no more than 12 Hz, but might be significantly less.

At the least you can see that my second unit (which, surprisingly, is actually the older of the two, with the older style counter assembly) has less wobble for some reason.

BTW, when their "lock" buttons are first depressed, both generators temporarily put out a lot of wobble (as much as 200 Hz peak deviation for a couple seconds. ...Then, after a few more seconds, they settle down to the numbers I gave you.

73, Greg

Date: Sun, 03 Jun 2001 01:15:20 -0400
From: Michael Brown <piggin@mindspring.com
Subject: Prem-Rx: collins advice

I know this is a bit off topic but since the membership is so experienced in this area here goes...I want to add a collins 390A to my arsenal.I see fair radio sales has them at 550 or so.What can I expect?Will I have to do a lot of restoration?I would rather listen than play MR.Alignment since I have a dearth of test equipment.I hope for some quidance as some list members are verified 390A fans.I have always wanted a collins but 2050s are too dear.....And at the risk of causing a riot I suspect the 390s are more on the eternal side of reliable.Also, are 390As any good for SSB? Or will I need to use another rx at the IF out?Thanks gentlemen.

Date: Sun, 3 Jun 2001 01:46:27 -0700
From: "refmon" <monitor@referencevideo.com
Subject: Prem-Rx: EMI/RFI saga-related info sites of interest

Hi,

I've recently posted several notes regarding my Cubic R3030 shielding = and tweaking adventures. Some of you have experienced similar problems = (digital crud) on a variety of receivers. In my travels on the web, I = found some interesting info. The company, Tecknit, manufactures all = kinds of EMI/RFI shield materials AND provides a series of documents:

"Electromagnetic Compatibility Design Guide": what it is, = troubleshooting flow charts, enclosure and shield design, and a ton of = glossary and reference stuff.

Also see their sub-category sorted stuff on air vents, enclosures, = gaskets, etc.

Go to www.tecknit.com

there are a number of useful sources of info under search keywords "emi = shield", "shield window" (as in digital display windows), etc.

also see http://astimage.daps.dla.mil/quicksearch/ for US gov military = standard documents-search under "grounding", "shielding", "bonding" for = all kinds of detailed info relating to station grounding, signal cable = grounding, chassis bonding, EMI/RFI avoidance, etc. =20

best regards to all

John Collins _____

Date: Sun, 3 Jun 2001 09:55:30 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: RE: Prem-Rx: 8640B

Greg, That's just perfect information for my needs, and it convinces me that the wobble I was hearing (and measuring) was more than I should expect. Thanks again for all the trouble you took to help my

query. Your results fall more in line with what I might have expected from taking a look at the service manual. Your second posting was even more interesting because it mirrors my own experience that one of my generators is better than the other!!! 73 John Wilson

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Date: Sun, 3 Jun 2001 09:55:27 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: RE: Prem-Rx: R&S EK 07 RX

Oh Steve, Warn everyone that these beasts are BIG and HEAVY, but a classic receiver nevertheless. There are four carrying handles, two on each side and that tells you that you need a two man duty roster to get the thing up on to a bench. I fell into the trap of sliding the EK-07 out of its box with the front panel facing me and reached that awful point when I realised that I couldn't hold the weight - big decision time. 73 John Wilson

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Date: Sun, 3 Jun 2001 09:55:34 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: Prem-Rx: RE: RA1792

Dear France, I have to say right away that I am not a super-expert on the RA 1792, simply someone who has the opportunity to carry out reviews on a range of high end receivers on behalf of the readers of Short Wave Magazine. Of course I am also a crazy collector!!! The RA-1792 is the best all round HF receiver I have tested or encountered during my working life BUT I have not had my hands on a 6790. From comments we have both seen in the permium-rx list, it would appear that there are serious reservations about the 6790 sensitivity and high noise levels, and from the number of list postings I can only assume that the apparent problems are real and not imaginary. According to the manual which I have for the RA-1792 there is no on-board provision for fitting a post-IF filter, but since the last IF is at 455kHz it shouldn't be too difficult to fit one. You would have to be aware of the effects of fitting a narrow filter after the IF on the performance of the FM demodulator which also provides the gain limited carrier for the synchronous AM detector. One thing you could try is to use the 455kHz buffered IF output from the rear panel and feed that into either a spectrum analyser or another receiver tuned to 455kHz to measure the IF noise, then fit a filter between the IF out socket and the analyaer/receiver to check whether or not it's worth modifying the 1792. As for suppliers, there are two currently offering RA-1792s, the first being Telford Electronics, but I understand from friends who have visited Telford that the receivers are early units without display backlighting and without the BITE system. The other supplier has been mentioned in a recent posting from Daiungoed@aol.com and is located in Bradford, Yorkshire. He supplied the list member with a very good late production RA-1792 and although a bit lacking in humour, the dealer has a good reputation for supplying quality gear. He does not have e-mail, but his company is called "John's Radio" and the phone number is +44 1274 684007; fax +44 1274 651160. Tanks for the comment on the ALA1530 active loop antenna. I use one all the time now, since it allows me to listen at tropical band frequencies without having to shut down my computer and printer. The near field noise rejection is excellent, and the manufacturer has since made for me a completely E-field screened loop to use in my EMC work when measuring radiated emissions between 50kHz and 30MHz. It's fantastically quiet when used inside an anechoic chamber and equally good as a receiving antenna when I use it outside. I'm a total convert to this antenna for use it typical noisy situations but of course it won't compare to a half mile long Beverage!! If I can be of further help, just yell. 73 John Wilson

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premium-rx-digest Monday, June 4 2001 Volume 01 : Number 130

Date: Sun, 03 Jun 2001 07:57:55 -0400

From: "James C. Garland" <4cx250b@miavx1.acs.muohio.edu
Subject: Re: Prem-Rx: collins advice

Hi Mike, Here's my two cents worth, re the Rair Radio R390As. If you want an R390A that you won't have to work on, you might be better buying a known one from a private owner. If you posted a "want" on the Collins email reflector, you'd probably find someone willing to sell one. Fair Radio occasionally gets a pallet of these radios and their condition is quite variable. Most have the meters removed, the front panels damaged, and water damage. The technician at FRS will take the better-looking radios, put in replacement meters (which may or may not be the correct ones) and do a very cursory electrical check. I don't think you can count on finding one that won't need quite a bit of maintenance, UNLESS you can go to Lima, look through the pile, and find one that seems in good condition.

In my experience, the prices on the R390A have gone up quite a bit in the past few years. I think $500 would be an excellent price for a known, working radio with original meters and in reasonably good cosmetic condition. However, I've seen the radios sell for $1500 or more, with the high end of the price range being for fully renovated radios in excellent condition. You'll pay at least that for a fully restored radio with cabinet. Top and bottom covers are often missing on rack-mounted radios, though aftermarket ones are available, as are meters. There are excellent service documents and VCR tapes available for the radio, but even so, it's pretty daunting for inexperienced owners to do extensive servicing on one. The gear train and cams that adjust the slug-tuned coils have to be seen to be believed. On the plus side, spare parts are readily available, and module-swapping is very easy.

With respect to SSB performance, an unmodified R390A works about as well as can be expected for a radio without a product detector. I use mine on SSB and CW all the time, though the radio really shines on AM. There are some simple AGC and IF mods that will enhance the performance, but to my mind the biggest deficiency of the radio is the audio output. The R390A wasn't really intended to drive a speaker, and while it will do so, the audio is weak and constricted. Bill Klernomous (sp?) designed an excellent high-fidelity modification of the audio output stage which completely solves this problem. I made the modification for my R390A and in my opinion it completely transformed the radio. I use the Kleronomous stage to drive a bookshelf speaker, and I also use the line-out audio to drive a JPS NIR12 DSP unit, when noise is a problem.

Before you grab for the soldering iron, however, Bill's modification involves a complete rebuild of the audio module, with some metalwork required. Bill's design appears in back issues of Electric Radio (sorry, don't have the reference). People have also designed outboard AF circuits and product detectors, though I haven't used them.

The R390 and R390A have something of a cult following, of which I would include myself as a member. The R390A may be one of the world's ugliest radios, but they really grow on you, and they're wonderful for AM. I have a number of radios I use on AM (51S1, HF1000, R8A, HRO500, some Hammarlund, National, and Hallicrafters boatanchors, etc), but somehow I keep gravitating to the R390A. It doesn't have memories and glitzy features, but it just sounds good! Of course, with all the front-end tuned circuits its strong signal-handling performance is excellent.

Regards, Jim Garland W8ZR

Date: Sun, 3 Jun 2001 13:18:22 -0400 (EDT)
From: Steve Stutman <steve@xenon.clickadeal.com
Subject: RE: Prem-Rx: R&S EK 07 RX

Hi John,

Agreed. They make a '390 look almost like a portable.

Steve

Date: Sun, 3 Jun 2001 15:04:24 -0400
From: "Howard L Ritter, Jr" <hlritter@mindspring.com
Subject: Re: Prem-Rx: RE: RA1792

Telford's website (www.telford-electronics.com) advertises a special on = the RA-1792 for 550 pounds, something in the neighborhood of $800 I = believe, but doesn't specify the vintage. I have emailed them with = queries and will post the reply.

- --howard n7exn ----- Original Message -----=20

Date: Sun, 3 Jun 2001 19:10:07 -0500
From: "Bob Nickels" <ranickel@mwci.net
Subject: Re: Prem-Rx: collins advice

Just to echo Jim W8ZR's comments, two R-390As were sold at the Princeton = IL hamfest this weekend by friends of mine. One was asking $300 for his = receiver which worked but needed cosmetic and electrical overhauling. = The other was in better shape and included the Klernomous audio = modification and sold for $400. As with all hamfest purchases, you = should be prepared to invest a fair amount of time and money into = refurbishing an R-390A to your personal standards. Of course the = advantage is you get to look it over closely and you'll learn a lot by = doing the work yourself.

As for audio, I put the Klernomous push-pull audio stage in one of my = 390As and as Jim says, it turns into a different radio. But an equally = satisfactory solution is to feed the diode load output into a decent = audio amplifier and speaker. My personal favorite is a Jensen 12" = bass-reflex driven by a Macintosh amp....now THAT's audio ;-)

73, Bob W9RAN

Date: Sun, 3 Jun 2001 19:36:25 -0500
From: "Bob Nickels" <ranickel@mwci.net
Subject: Re: Prem-Rx: RA6790 mixer question

> Newark Electronics carries the Vishay Sliconix line of fets.

Future Electronics also carries Siliconix SD215DE and was very accomodating to a small order through their online site at http://www1.future-active.com/

73, Bob W9RAN

Date: Sun, 03 Jun 2001 10:43:21 -0700
From: Nick Hall-Patch <nhp@ieee.org
Subject: RE: Prem-Rx: 75S-3C noise floor

At 11:53 AM 6/2/01 +0200, you wrote:
> enjoying the revelation. A glance at the circuit and the inside of the
> receiver tells a lot. The output valve is a classic EL84 running in Class A
> with an output transformer the size of a half brick, and negative feedback
> around the stage using a separate cathode winding on the transformer.
> Aficionados of Quad II valve amplifiers will recognise the circuit
> configuration instantly."

John,

Your posting set off something far back into my memory banks. Some years ago I was helping a lady set up a simple shortwave antenna at her house, as she had a Quad tuner which covered shortwave and wanted to listen to the BBC. The audio quality (on shortwave broadcast yet, and using a cheapo audio amplifier rather than her stereo system) from that tuner was quite extraordinary. Whatever was being used for demodulation certainly seemed of "Prem-RX" quality, and I put in a request that "if she ever wanted to sell..." which she unfortunately ignored. I'll have to see if I recorded its part number in my files.

best wishes,

Nick

****

Nick Hall-Patch Victoria, B.C. Canada

e-mail: Nick_Hall-Patch@telus.net (mail forwarded via nhp@ieee.org)

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Date: Mon, 4 Jun 2001 08:10:03 -0400
From: "Carcia, Frank A. HS" <francis.carcia@hs.utc.com
Subject: RE: Prem-Rx: RE: RA1792

Hi All, Remember Racal made a RF amplifier for the 6790. All you guys who want a hotter radio should install it. It bolts on the inside back wall of the radio. fc

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Date: Mon, 4 Jun 2001 10:56:30 -0400
From: "Carcia, Frank A. HS" <francis.carcia@hs.utc.com
Subject: RE: Prem-Rx: RA6790 mixer question

hi, The SD8901 is a very nice mixer if you can still get one. They like a large gate voltage swing to produce a good IP3. The RA6830 uses a SD5000 in the mixer which is a quad matched set of 4 FETs. Any of these will work. A Mini Circuits VAY1 connected with the IF as the input will also work fine (but about $80). Anything with matched devices will be a little better. I have built mixers with 16 diodes and a half of a watt of LO that also work. I find the second mixer the weak link in the chain though. fc

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Date: Mon, 4 Jun 2001 09:25:12 -0700
From: "Guy Atkins" <dx@guyatkins.com
Subject: Prem-Rx: Vishay-Siliconix SD5400

If anyone on the list is interested, I have a small quantity (twelve) of the Vishay-Siliconix SD5400CY Quad Lateral DMOS mixer ICs available. They are the "narrow body gull-wing" SO-14 package style.

You may contact me at: dx@guyatkins.com

Guy Atkins Bonney Lake, WA USA

Date: Mon, 4 Jun 2001 12:44:52 -0400
From: "Chuck Rippel" <avsl@erols.com
Subject: Re: Prem-Rx: 75S-3C noise floor

I am not suprised at you comments. The AGC action in the Collins "S-Line" vintage of receivers is brutal at best. The transition from AGC attack and subsequent clamping is not at all smooth. Also notice on the 75Sxx series that there is very little difference between "Slow" and "Fast" AGC. Both are fast which result in SSB reception having a fatiguing "edge" to the audio.

My KWM-2 and 75S-3B both exibit the same characteristics. The 75A-4 is much slower and there is a more discernable difference between "Slow" and "Fast" AGC.

There is a partial fix on the 75S-3B to decrease the AGC release time. A capacitor on the back of the AGC switch is replaced with a higher value. I am at work and can't quote exact component values but if there is an interest, I'll check on it. The results are not that significant but it does tame things down a bit.

As far as I know, that change is only applicable to the 75S-3B and 75S-3C.

Date: Mon, 4 Jun 2001 13:40:19 EDT
From: Daiungoed@aol.com
Subject: Re: Prem-Rx: RE: RA1792

Hi, list, and Francis in particular, the RF amp for the 6790 is mentioned in the manual, but no-one I know of has ever seen one, I think it is the same as the RA1792 one, but where does it get its power from? Any ideas?? Dave

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Date: Mon, 04 Jun 2001 18:23:27 -0600
From: Rob & Terri Sherwood <rob@sherweng.com
Subject: Re: Prem-Rx: 75S-3C noise floor

In my 75S-3C I put a 0.47 cap across C50, an 0.1 that is in the AGC circuit all the time, fast or slow. I also shunted R88 (680k) with a 100k resistor. This slows down the early part of the discharge cycle. One of the published articles suggests that the C does not charge up correctly with such a large R, so as backwards as it seems, reducing R88 helps significantly. I could have removed the original components, but I have not done so at this time. The results are quite nice, and the AGC sounds more like a Drake, and is much less fatiguing.

The distortion coming out of my product detector is another story. It has not been resolved yet, other than to cut the IF signal down going into it by 6 dB which dropped the distortion for 10% to 3%. I will investigate this further, and if a significant improvement cannot be obtained with the existing tube circuit, I will adapt our R-4C PD-4 product detector upgrade to the S-Line. I would like to see distortion down in the 1% range.

Date: Mon, 4 Jun 2001 17:57:28 -0700
From: John Miles <jmiles@pop.net
Subject: RE: Prem-Rx: 75S-3C noise floor

Last week I mentioned that I was planning to scan in the February '81 issue of the HP Journal. This issue is devoted to technical articles by various members of the 8662A team. Here she is, for those interested:

http://209.95.122.40/jm/8662hpj.pdf

This is a 12MB file with 32 pages, fully-searchable (except for the fine-print specs page) via OCR. If you have a reasonably-recent version of Acrobat Reader (free from http://www.adobe.com), you should

be able to hit the disk icon to save it to a local drive once it loads. It's very slow to render and I don't recommend trying to read it online; you're better off sending it straight to a laser printer if possible.

- -- jm

Date: Mon, 4 Jun 2001 18:04:07 -0700
From: John Miles <jmiles@pop.net
Subject: Prem-Rx: HP Journal, 8662 issue

Sorry, I hit 'reply' on an existing thread to mail the list and forgot to change the title!

- -- jm

Date: Mon, 4 Jun 2001 22:58:09 -0700
From: John Miles <jmiles@pop.net
Subject: Prem-Rx: More 86xx lore from HP gurus

Just ran across this thread while surfing Google:

http://groups.google.com/groups?hl=en&lr=&safe=off&ic=1&th=91f8d5eff1ada4e7,7&seekm=380E113B.3D3D8CAC%40lsid.hp.com#p

Tom Bruhns and Rick Karlquist are both HP engineers with unusually-high Usenet credibility indexes. (Meaning I wouldn't argue with either of them lightly. :-) Tom seems to be fairly confident that the Lock function is, in fact, a genuine PLL that provides full-time closed-loop correction.

All I can say is that if it's a PLL, it's either the cruddiest one I've ever seen, or my example has a serious loop-stability problem.

- -- jm

Date: Tue, 5 Jun 2001 07:31:15 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: RE: Prem-Rx: More 86xx lore from HP gurus

John, Just when I had decided that the 8640B was NOT a "proper" PLL you go and find an HP man who says it is!!! My reasoning behind the "NOT" view is that the RF from the cavity is not directly sampled and applied to a phase detector but is isolated from the PD by a counter chain, and the PD compares any time difference between the edges of the LSD of the counter with the reference clock, the output from the PD then being a variable width rectangular pulse which is then stretched and filtered to provide the correction. I suggested to Rob that there may well be phase anomalies between the true cavity signal and the output from the counter chain dependant on the presence or absence of any hysteresis in the front end of the counter where the sine wave from the cavity is first converted to a square wave. Funny how a simple question starts a long running story

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premium-rx-digest Friday, June 8 2001 Volume 01 : Number 131

Date: Tue, 5 Jun 2001 07:56:20 -0400
From: "Carcia, Frank A. HS" <francis.carcia@hs.utc.com
Subject: RE: Prem-Rx: More 86xx lore from HP gurus

A long Divide by "N" and low reference frequency must be to blame.

Date: Tue, 05 Jun 2001 09:46:44 -0600
From: Rob & Terri Sherwood <rob@sherweng.com
Subject: Re: Prem-Rx: More 86xx lore from HP gurus

Part of the confusion is HP refers to it as a PLL in some parts of the manual and as a synchronizer in others. I no longer own one, but the following test would help if someone has one. The reference oscillator is 5 MHz in this box. Set the 8640B up on 5 MHz and lock it. Run the time base out to the external trigger in on your scope. Take the 5 MHz out of the normal output of the generator and run it to the normal input of the scope. If it is not really phase locked, the sine wave will drift around a lot. If it is phase locked, you will get a stable display over time.

Date: Tue, 5 Jun 2001 12:01:44 -0400
From: "Carcia, Frank A. HS" <francis.carcia@hs.utc.com
Subject: RE: Prem-Rx: More 86xx lore from HP gurus

Hi, I suspect the 5 MHz is divided down to the gate frequency of the counter where it becomes the pll (fll) reference. The cavity must drift a little between samples causing the FM modulation. The loop filter, power supply noise, and cavity will be different in every unit. Your test method will tell the user what his unit is doing. Another test will be to listen to the 8640 on an FM receiver. One of my RA6830s has a VNB FM demodulator that I will have to try on the generator. That radio also has a 50 hz filter position. Thanks for finding a use for the module. Fc

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Date: Tue, 5 Jun 2001 11:08:54 -0700
From: "JerryL" <jlockett@onemain.com
Subject: Fw: Fw: Prem-Rx: More 86xx lore from HP gurus

Interesting comments from a friend of mine concerning the 8640B. I've been forwarding some of the comments made about the 8640B to him..

Jerry -n6jp-

Date: Tue, 05 Jun 2001 13:52:05 -0400
From: Al Klase <skywaves@bw.webex.net
Subject: Prem-Rx: RA6790/GM Preamp

The recent discussions of the preamp prompted me to resurrect my 6790/GM-13. (It's synth board was in a friends 6793, but that's a long story.) Anyway, shade tree SSB sensitivity measurements, come out to 0.15uV versus 0.8uV for the plain 6790/GM. (That was 10.1MHz from URM-25, USB, 1KHz tone, The GM-13 has a narrower filter 1.8 vs. 2.7KHz. - YMMV)

I've posted pictures and schematics in the communications-receiver section of my webpage.

73, Al - -- Al Klase - N3FRQ skywaves@bw.webex.net Flemington, NJ 08822 Web Page: http://www.webex.net/~skywaves/home.htm

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Date: Tue, 05 Jun 2001 12:56:12 -0700
From: jan@skirrow.org
Subject: Re: Prem-Rx: More 86xx lore from HP gurus

At 09:46 AM 6/5/01 -0600, Rob & Terri Sherwood wrote:
> Part of the confusion is HP refers to it as a PLL in some parts of the
> manual and as a synchronizer in others. I no longer own one, but the
> following test would help if someone has one. The reference oscillator is
> 5 MHz in this box. Set the 8640B up on 5 MHz and lock it. Run the time
> base out to the external trigger in on your scope. Take the 5 MHz out of
> the normal output of the generator and run it to the normal input of the
> scope. If it is not really phase locked, the sine wave will drift around
> a lot. If it is phase locked, you will get a stable display over time.

Had a quick look at this - setup as suggested, after 30 minutes or so the "sine" wave varied within about +/- 0.15usec limits. It tended to float slowly and then jump a bit, but within these limits.

Jan Skirrow

... in beautiful British Columbia, Canada

*** http://skirrow.org/Boatanchors/ ***

Date: Tue, 5 Jun 2001 20:54:26 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: RE: Fw: Prem-Rx: More 86xx lore from HP gurus

Jerry, Thanks for the 8640 posting. As your colleague says, whatever it is, PLL or not PLL, it shouldn't be bouncing around, so the low pass filtering has to be a prime suspect. I guess that after 20+ years, the capacitors in the loop filter, which look like they may be electrolytics may well have dried out and gone to HP Heaven. This doesn't mean I'm willing to attempt a repair on an 8640B just delivered from a dealer to whom I paid real money, so we'll wait and see what he says. The problem is that I suspect the members of this list know more about the 8640 than the dealer!!! Apologies to anyone who might think that this thread has gone way off list, but the understanding of PLL operation is surely fundamental to anyone interested in premium receivers, since most of the receivers we own are heavily dependant on correct PLL operation, and the 8640 could equally be a receiver conversion oscillator. 73 John Wilson

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Date: Wed, 6 Jun 2001 08:15:57 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: RE: Prem-Rx: 75S-3C noise floor

Nick, Thanks for your posting about the Quad AM tuner. I've also been looking for one of those for some time because of the reputation it had. The original design was a product of the Quad company when Peter Walker was still alive, and he was the audio equivalent of Art Collins in his absolute determination to do everything by the best possible means, and the results are still outstanding. I recently picked up a Quad 405 current dumping amplifier for restoration, although apart from replacing the huge power supply capacitors the restoration is cosmetic. I'm looking forward to firing it up and finding out if it was as good as its reputation suggests. I'm interested in far too many things!!! John Wilson

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Date: Wed, 6 Jun 2001 08:15:59 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: Prem-Rx: RE: S/N measurement

Chris, Thanks for the posting on the TS-900 performance. Now that I've cleared the Cubic off the bench I was able to address your query. The front end of the TS-900 is conventional for its time, using a 3SK35 dual gate RF amplifier ahead of a single 3SK35 mixer. The first conversion down to a tunable IF was crystal controlled, henc the quiet receiver, and the mixer was followed by an electronically track tuned variable IF tied to the VFO which tuned a single range. Very much Collins derived. AGC was interesting in that there were two loops, one from the back end of the IF which operated at an antenna threshold of aabout 1 microvolt, but a second loop driven from the output of the tunable IF prior to the second mixer operated on out of band (IF filter passband) signals and hacked back the gain of the RF amplifier when signal levels reached the point where excessive intermod might occur. Operation of this second agc loop also flashed a lamp on the front panel display to let you know that you should perhaps reduce RF gain manually, and that was a good idea in that the RF gain control was actually a stepped RF attenuator so you backed it off until the RF agc lamp stopped flashing and you were back in a low intermod operating condition. I haven't the faintest idea of the gain distribution through from the antenna to the output of the first mixer, but it seems to have been carefully thought out. I'm prepared to believe the 4dB overall noise figure, but await your comments on alternative measurements for this. I can't find any record of my measuring the intermod performance of the TS-900 so I'll make it a moderate priority, although I imagine that it's going to be mediocre, looking at the mixer config. 73 John Wilson -

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Date: Wed, 6 Jun 2001 11:07:26 -0700
From: "JerryL" <jlockett@onemain.com
Subject: Fw: Fw: Prem-Rx: RE: S/N measurement

Interesting comments from Bill Carver about 'ringing'..Bill and a group of well know amateurs have been designing and building a high end (very high end!) receiver for several years. Check out the description of a 'home-made' 20 pole filter he designed and built and is testing.

Jerry -n6jp-

Date: Wed, 6 Jun 2001 19:42:18 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: RE: Fw: Prem-Rx: RE: S/N measurement

Jery, Take the description of "ringing" as inaccurate which is why I call it "ponging" 'cos it sounds like the noise you hear when you listen at the end of a long length of plumbing pipe - well knwon effect of an audio reonance, and I agree that filter "ringing" is not technically correct but pretty close to the effect. The TS-900 was quite remarkable, and received very little recognition in its day, although the designers (some of whom I knew personally) were determined to make tha TS-900 the very best that could be achieved in its day. I think it deserves a "premium" rating. 73 John Wilson

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Date: Wed, 06 Jun 2001 21:32:39 -0700
From: matt parkinson <mparkinson1@socal.rr.com
Subject: Prem-Rx: RF-590 list

Mr. Greg Bailey I would like to be added to this list for RF-590 receivers. I realize this is a list for premium receivers. I just purchased one and will be getting it in a couple of days. thanks Matt Parkinson.

Date: Thu, 7 Jun 2001 19:04:53 +0200
From: "John Wilson" <johnwilson@freezone.co.uk

Subject: Prem-Rx: 8640B

Rob, I got my replacement 8640B today and all is well. It doesn't have the wobble of the original and is more like the 8640s to which I have been accustomed. I did your suggested comparison between the generator output at 5MHz and the internal 5MHz reference but used an X-Y display to get a Lissajous figure which is much easier to interpret than looking at a jiggling sine wave. Sure enough the Lissajous shows "twitchy" phase shifts all the time, so I set the 8640 to 10MHz to get a 2:1 trace and then to 15MHz to get a 3:1 Lissajous. The "twitch" is there all the time, so I am now down firmly on the "not a PLL" side of the fence and am right in line with your interpretation of the system as a synchroniser rather than a true PLL. Well done!! 73 John Wilson

- ---------- John Wilson Stone Hill Kings Nympton Umberleigh Devon EX37 9TR Tel: 01769 573047 Fax: 01769 574158

Date: Thu, 7 Jun 2001 15:46:03 -0700
From: "Greg Bailey" <gbailey@mail.sdsu.edu
Subject: Prem-Rx: New Member Allan Jones

Gentlemen:

Allan Jones joins us from Huddersfield, West Yorkshire, UK.

Al has been into SWLing for the past 33 years. His first SWL receiver was a RA17L. Recently he purchased a RA 6790/GM which he will soon be taking delivery.

Our newest member appreciates well engineered/designed equipment, and when given leisure time, enjoys investigating circuits and systems. Being able to ask a question, and maybe later exchanging information with like minded people, is one of the reasons he is joining the List.

You can contact Al at: al.jones5@ntlworld.com or by listening for G4UGA (his amateur call).

Welcome to the group---

Greg

P.S. FYI, Al found the Premium-Rx List when he pinged google.com looking for receivers. In fact, our List came up as the second hit on the search engine's findings.

Date: Thu, 7 Jun 2001 18:28:08 -0500
From: "Joe Watson" <wwatson@mmcable.com
Subject: Prem-Rx: Racal RA6790/GM Repair Guru?

Who would you recommend for RA6790/GM repair? I doubt that I am going to have the time to invest in it and may want to get help. I have two for repairs. Thanks.

Joe Watson -

Date: Thu, 07 Jun 2001 22:24:03 -0400
From: "Howard L Ritter, Jr" <hlritter@mindspring.com
Subject: Prem-Rx: FW: Website and Racal

From: "Marc Christian - Telford Electronics" <telfordelectronics@btinternet.com
Date: Thu, 7 Jun 2001 11:16:06 +0100
To: "Howard L Ritter, Jr" <hlritter@mindspring.com

Subject: Re: Website and Racal

Dear Sir, =20 Further to your e-mail, the RA1792's we are advertising are standard units. However we do have the units with Bite & Backlit fitted, these are =A3750.00 (GBP + VAT) All units are fully checked and come with a 30 day warranty & user manual. =20 If you require any further information, please do not hesitate to ask =20 PLEASE NOTE OUR NEW E-MAIL ADDRESS: telfordelectronics@btinternet.com Telford Electronics Old Officers Mess Hoo Farm Humbers Lane Horton. Telford. TF6 6DJ Shropshire UK Phone: +44 (0) 1952 605451 Fax: +44 (0) 1952 677978 e-mail: annie.007@btinternet.com web: www.telford-electronics.com <http://www.telford-electronics.com

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Date: Fri, 08 Jun 2001 14:47:29 -0600
From: Rob & Terri Sherwood <rob@sherweng.com
Subject: Prem-Rx: R-390A

What is the vertical height of an R-390A in inches. i.e., how much rack space does it take up?

Date: Fri, 08 Jun 2001 17:35:30 -0400
From: "Wm. L. Townsend" <wlt@tesnet.com
Subject: Prem-Rx: R-390A rack space

The panel is 10.5" high. The chassis is about 9.75, centered vertically, so there's about .375 clear above and below the chassis in a 10.5" space. I use a 1.75" blank panel above and below and to help with airflow.

It's 17.75 wide which makes it about .25 too wide for chassis tracks (at least any I've been able to find). Some pieces of angle stock for it to slide on would be a big help when taking one in or out of the rack, without that you almost have to have a second person to manage it because they're so heavy.

The receiver is 14.5 deep, from the back of the panel. You really need about 16.5 clear space, or more, for the cabling.

It's been said that you shouldn't hang a 390a by the panel without supporting the back - supposed to cause things to bind in the gear train. I've had three of them mounted without support at the back for a couple of years and had no problems. Maybe I've been lucky...

larry/wa8ulo

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premium-rx-digest Sunday, June 17 2001 Volume 01 : Number 132

Date: Sun, 10 Jun 2001 16:21:42 EDT
From: Daiungoed@aol.com
Subject: Prem-Rx: MARCONI H2550 HF RECEIVER

Hi, I have today acquired a really great looking and very promising receiver, a MARCONI H2550. Fred Ostermans excellent Short wave receivers, past and present has a brief description of it on page 273, it appears to use DSP, although I have no idea at which stage of the proceedings, modular construction, made from 1995 to now, it has fitted to it a pre/post selector, which I see is an extra, now the crunch, does anyone know anything about these sets? has anyone got a manual I can hire at whatever cost, even if it means a large postal bill, or does anyone know someone I can try? This is such a complex looking unit, I feel that a manual is needed to drive the thing with any degree of success. Any help would be MUCH appreciated, Dave

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Date: Sun, 10 Jun 2001 21:15:34 EDT
From: CLeyson@aol.com
Subject: Prem-Rx: Marconi H2550

Hi Dave

The only info I have on the Marconi H2550 is from an old copy of Radcom (Vol 70 No 10 October 1994 p.62-63) The H2550 was described in a paper by R.J. Eassom in IEE Conference Publication No.392 Sixth international conference on HF radio systems and techniques (ISBN 0 85296 616 4, 1994) - Sorry don't have the page numbers.

The H2550 was designed for naval use - hence the need for a pre-selector. The RF front end uses conventional analog circuitry and is double conversion. 1st IF 62.5MHz, 2nd IF 2.5MHz. 1st and 2nd mixers have an IP3 of +40dBm. First IF filter is a two cavity helical resonator for good linearity, similarly, an LC design is used for the 2nd IF filter although there is a option to fit a crystal filter.

2.5MHz IF is digitized using a bandpass sigma-delta A-D converter and then down converted to baseband using an ASIC. Baseband quadrature signals are then processed by no fewer than three Motorola DSP56002 DSP chips !

Hope this helps Chris

Date: Mon, 11 Jun 2001 18:35:42 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: RE: Prem-Rx: MARCONI H2550 HF RECEIVER

Dave, Judging by the reply from Chris you seem to have found quite a receiver. Let's know how you get on with it. Hope that Kevin Nice has been in contact about the 6790; I'm certainly looking forward to seeing it in due course, and thanks in advance for the opportunity. 73 John Wilson

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Date: Tue, 12 Jun 2001 03:48:31 EDT
From: Daiungoed@aol.com
Subject: Prem-Rx: MARCONI H2550 RECEIVER???

Hi, Further to my last posting about the Marconi receiver, I am now not sure that what I have acquired is a receiver, or if maybe it is a transciever or a transmitter drive unit. I will obviously be disappointed if I cannot receive with it, but as it cost next to nothing, I will not be too worried. Also, I was not sold it as a receiver, I simply asked how much it was, staggered about in disbelief at the LOW price, knocked the seller down a few more pounds, and bought it. There is nothing written on the front of the front panel, besides the function of the buttons, but on the rear of the front panel, it has a legend FRONT PANEL MODULE H-210-2550, and is exactly the same as shown in Fred Ostermann's Short wave receivers past and present book. The modules contained inside are as follows, the trouble is, that so many of them could be either for a transmitter or receiver. A 10MHz frequency standard 1. Pre-post selector unit H-220-2550 2. RF UNIT H-120-1550 3. SYNTHESIZER H-130-2550 4. DAC H-140-1550 5. DSP H-150-1550 6. NO MODULE FITTED, AND NO LEGEND ON THE BACK PANEL 7. AUDIO H-180-1550 8. CONTROL H-190-2550

The problems started to dawn on me after getting it home, I had powered it up before buying it, as I take my UPS from my PC for just this kind of thing. Firstly, it is an amazing thing, large fluorescent dot matrix display of just about everything going on inside, frequency, filter widths, mode (the modes are just about every one you can think of, ISB, FSK USB, ISB, FSK,.....BUT NO AM) There is a tiny monitor speaker behind the front panel, but I cannot get any sound from it whatever I do, including setting it as active from the front panel menu. The thing that really worries me is that in Fred's book,

the picture of the display shows the word RECEIVER in the top left corner, mine says H1550 DRIVE, it is possible that it is both driver and receiver, but to get into the really meaty SETUP operationd, it asks you for a password, which is not known to me. I am tempted to try and buy a manual from MARCONI, but if its just a transmitter driver, I will keep it as an ornament. Incidentally, the interconnecting plugs at the rear of the various modules seem to be connected as a receiver would, pre/post selector, rf, lo1 if lo2 freq.ref dsp, etc, would anyone like to comment on the mystery, even if the sad truth has to be told, and my so-called receiver is just an ornament. All the best, Dave

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Date: Tue, 12 Jun 2001 12:13:40 -0400
From: Bob Milne <rmilne@cfl.rr.com
Subject: Re: Prem-Rx: MARCONI H2550 RECEIVER???

Hi Dave,

Sounds like what you have is part of an overall communications system. This is just speculation, but since the word "Receiver" is part of the menu display, the unit might be currently configured in the mode to control an H1550 (which could be a transmitter). That would explain the lack of an AM function and no sound from the loudspeaker. You may very well have a complete receiver there. But without the password, it doesn't sound like you get into it to turn it into receive mode. I tried a web search on Canadian Marconi products, but didn't turn up anything related to your unit. Maybe somebody on the list with a Jane's Military Communications book can shed some light on this?

Regards.... ....Bob

Date: Tue, 12 Jun 2001 14:13:46 -0400
From: Fred Osterman <osterman@dxing.com
Subject: Prem-Rx: (no subject)

Dave, It does indeed sound like a drive unit. I do have an original GEC-Marconi spec sheet for the H2550 receiver. It does not mention a matching drive unit. However, the H2540 receiver did have a matching drive unit, so it is quite logical that the H2550 receiver would as well.

The H2550 receiver does include AM as a standard reception mode.

Although you may not have a receiver, I think you have a very interesting and rare piece of equipment. - -Fred Osterman N8EKU-

- -- Fred Osterman E-Mail: osterman@DXing.com Universal Radio Research Web site: www.DXing.com Universal Radio Inc. Web site: www.universal-radio.com 6830 Americana Pkwy. Phone: 614 866-4267 Reynoldsburg, OH 43068 Fax Line: 614 866-2339

Date: Tue, 12 Jun 2001 14:32:32 -0400 (EDT)
From: Steve Stutman <steve@xenon.clickadeal.com
Subject: Re: Prem-Rx: (no subject)

Hi,

Have no specific knowledge of this set of gear, but perhaps it requires "only" a module or two and some firmware to become RX?

73,

Steve Stutman

Date: Tue, 12 Jun 2001 11:45:49 -0700
From: "Greg Bailey" <gbailey@mail.sdsu.edu
Subject: Prem-Rx: New Member: Matt Parkinson

Gentlemen:

Our newest member is a Californian by the name of Matt Parkinson. He is employed by JVC Service of America, specifically . . on professional broadcast equipment.

Matt has recently taken delivery of a Harris RF 590. In addition he has a R-5000, RS EK-07, and a National FRR-59a (plus others) in his collection of receivers. In the past he has owned a Racal 6790GM as well as a Harris 550. While it is not a List topic, it is interesting to note that Matt has been known to restore a few 390a. Presently he has a few dozen in the wings a waiting his magic touch.

Welcome aboard Matt

Date: Tue, 12 Jun 2001 19:44:25 +0200
From: "John Wilson" <johnwilson@freezone.co.uk
Subject: RE: Prem-Rx: MARCONI H2550 RECEIVER???

Dave, I think the suggestion about finding it in "Jane's" has to be the best route to finding out what you have purchased. I agree with Fred that whatever it is you are lucky to have it, and if it is part of an overall system you may well find that some, if not all of the units will be common to transmitter and receiver, so hang on to what you have. 73 John Wilson

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Date: Wed, 13 Jun 2001 10:33:45 -0400
From: "Walt Novinger" <wnovinger@nc.rr.com
Subject: Prem-Rx: WTD: Manuals for Siemens E-311-b1b and E-311-E2

I have recently acquired these receivers and would like to find copies of the respective manuals in English. I have a full manual copy in German for the E2, and schematics for the b1b in German/English. Any help in finding the English-language manuals will be greatly appreciated!

If a German speaker could translate at least the alignment instructions from my manual, I will be happy to scan and email or post to a web site the appropriate pages.

Walt - ---------- Walt Novinger Raleigh, NC wnovinger@nc.rr.com

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Date: Fri, 15 Jun 2001 09:17:48 -0600
From: Rob & Terri Sherwood <rob@sherweng.com
Subject: Prem-Rx: S-Line product detector distortion

I have solved my 75S-3C product detector distortion problem by adding three components to the detector circuit. A very pleasant discussion with Pat Brothers indicated I should not have be experiencing the level of distortion I was seeing. Yet some others e-mailed me some weeks ago saying they, too, were having too much distortion for their S-Line or KWM/2. So now with the AGC slowed down, and the product detector cleaned up, I am quite happy with the sound of my new "toy".

If anyone else wants to pursue this issue with their radio, please contact me. A one sample "fix" is not enough information to know how general the problem may be, and whether what fixed mine is even applicable to other radios. Mr. Brothers certainly said radios did not ship from the factory with distortion of even 3%, let alone approaching 10%. (We are discussing steady state distortion, not AGC issues, which is another subject.)

I am also interested in hearing from anyone who has modified their radio to replace the 6BF5 output tube with either a 6AQ5 or even a 6BQ5.

73, Rob, NC0B

Date: Fri, 15 Jun 2001 16:05:46 -0600
From: Rob & Terri Sherwood <rob@sherweng.com
Subject: Prem-Rx: 75S-3C data

I posted my 75S-3C data on my web site. www.sherweng.com As always, the table is sorted by the right most column. The Dynamic ranges varies from 90 dB at 100 kHz to 72 dB at 2 kHz. I listed the average noise floor on several bands. My best band was 40 meters at -144 dBm. The radio has not been aligned. Just as it came from Dayton Hamvention.

Date: Fri, 15 Jun 2001 21:28:26 -0600
From: Rob & Terri Sherwood <rob@sherweng.com
Subject: Prem-Rx: 75S-3C Info

I got so many requests for info on the AGC mod I put in my 75S-3C and the product detector mod that reduced the distortion to less than 1%, I have decided to post the info to all. Please be advised that at this time, the product detector mod fixed one radio that certainly had a serious distortion problem. I cannot generalize on the mod's general effectiveness. If anyone else has a radio with similar problems, but is either reluctant to dig into it, or has no test equipment to evaluate the results (other than ears), I would be interested in servicing additional radios to gather more data.

In the coming weeks, to evaluate whether the triode product detector can be made to work as well as a modern solid-state Gilbert cell product detector, I will bring out the 455 kHz IF, and listen to and do distortion tests on the same radio with an outboard SE-3 detector running in SSB mode. This will bypass the entire detector and audio chain of the S-Line. It will then be easy to do A / B comparisons to see how much additional improvement is possible.

The following has nothing to do with the product detector issue: I just ran some 20 meter dynamic range numbers on my 75S-3C:

Dynamic range, 100 kHz spacing: 90 dB DR 20 kHz spacing: 85 dB DR 5 kHz spacing: 74 dB DR 2 kHz spacing: 72 dB

Product Distortion Modification:

I was able to correct the high product detector distortion, though I don't know the real cause of the problem. My basic approach was to add negative feedback in the cathode circuit. I also reduced the drive level to the detector by 6 dB, though this is optional. The improvement of the reduced level at S9 + 20 dB was an additional 5 dB reduction in 2nd harmonic distortion.

A previous 6 dB starve of the product detector input had dropped the 2nd harmonic distortion down from a totally unacceptable -22 to -25 dB range (about 8%), to near 30 dB down (3%), livable but not good. The

plate voltage was too low, under 28 volts, or at best 31 volts with select tubes, and trying to increase the -2.5 volt bias did not work, as

the bias supply is anything but stiff with all those high valued resistors. So I initially lifted the ground end of the 100 uH cathode choke, and inserted 220 ohms. That brought the distortion down to -33 dB, and added -0.3 volts at the cathode, bringing the plate up to 42 volts. I upped the resistor to 330 ohms, and that brought the plate up to 53 volts and the distortion down to -35 dB. Then I started playing with bypasses of the 330 ohms, and that helped, improving it to -38 dB with anywhere from 470

pF to 1000 pF. The 1000 pF was about 1/2 dB better than 470 pF, so I went with that value. Then I put the 6 dB starve back

in by shunting C33 (220 pF) with another 220 pF. This dropped the distortion to -43 dB, with the expected 6 dB drop in audio level. Now I

was getting 2nd harmonic at about 0.8%, and THD likely right at 1%. Now the radio sounds much better. Still plenty of audio gain, as you can clip the 6BF5 with the audio gain pot at about 3 o'clock on the calibrator signal.

Because the Collins AGC is not stiff by design, the stronger a signal gets, the stronger the product detector is driven. Thus if a given radio starts to sound edgy at S9, it is going to sound even worse at S9 + 20 dB, let alone S9 + 40 dB.

The BFO wave form looks more sinusoidal with the modified cathode circuit, though the 2nd and third harmonics of the BFO are not much lower. I am told that the 75S-1 has a 3300 ohm cathode resistor, no grid bias, and no choke in the cathode, so this approach will have no application to earlier models.

I think the degeneration is more significant than raising the plate voltage, since I tried shunting a 100K and 68K resistor across the existing plate resistor. That raised the plate voltage, but did NOT change the distortion at all.

The change in cathode load impedance has pulled the variable BFO slightly off frequency, something I assume can be easily adjusted. I calculate the 100 uH coil has a reactance of around 285 ohms at 455 kHz, or just under the the resistor value I inserted in the cathode. The 100 uH and the 1000 pF are series resonant just above 500 kHz. The distortion went up dramatically if I put 1500 pF or more across the resistor. I think any value between 470 pF and 1000 pF across the 330 ohm resistor will be satisfactory. Since series resonance at 455 kHz or below caused the distortion to increase significantly, one might easily argue for a value of 620 or 820 pF as a better choice.

What is not known at this time is whether there are radios out there with high distortion in the detector that have a plate voltage near the nominal 51 volts DC. If that is the case, I suggest trying resistor values between 100 and 220 ohms instead of 330 ohms.

73, Rob, NC0B
