R-390 Reflector August ‘04 Edited

From ham at cq.nu Sun Aug 1 11:29:58 2004
Subject: [Racal] RE: [R-390] Source for axial caps

Hi

Some of the places that the good old BBOD's show up in are a bit surprising based on series resonance effects. The missing element in the analysis usually is that the impedances on a tube circuit are so high that you can get away with operating well past series resonance without any real harm. Without data on the old paper parts it would be a bit tough to know just how much we are shifting things around with the newer capacitors. There certainly aren't many posts indicating any trouble in this area though.I would attribute the popularity of the Orange drops to two things:

1) The epoxy coating on the cap is fairly forgiving when you bump it with a soldering iron.

2) Good marketing by Sprague over the years combined with a distinctive look to the parts.

There aren't a lot of variables in a plastic capacitor. The dielectric material pretty much determines the leakage regardless of who made the part. Dielectric also is a big factor in the loss versus frequency curves provided you compare parts with similar construction. Even self resonance characteristics are fairly similar for parts of the same construction and same physical size.

There are a fairly small number of people making the film for capacitors so that's not as much a variable these days as it may have been in the past. There are a few interesting dual layer films today that didn't exist a couple of decades back but i don't think they do much for boat anchors. The availability of some of the good high frequency dielectrics has dried up in the past few years.

Fortunately we don't seem to need good Q at IF frequencies in our parts. The tuned circuits in an R390 all seem to be set up with ceramic and silver mica caps.

Construction wise you have two ways to do the plates, metal foil and vapor deposited film. The film gives you higher ESR and smaller volume. Most of what we look at are wound parts rather than stacked foil so usually that is not a variable.

I like the Illinois Capacitor parts. They seem to work perfectly well to replace the old paper and foil parts. I tend to go for two voltage ratings. Something low for tight spaces and the 630 V's for the rest of the stuff. One side advantage of the higher voltage parts is that they generally have a bit lower leakage. Of course the best paper cap in the world leaks more than the worst plastic cap I have ever seen ....

Provided the voltage ratings are adequate and you don't get parts that are only rated to 85C (like polystyrene) just about any modern plastic part will do a lot better than the paper parts it's replacing. I certainly would not pay a premium price for any special capacitors. It's probably a good idea to avoid the ones that the audio guys are after because they will drive up the prices ...

Take Care! Bob Camp KB8TQ

From barry at hausernet.com Sun Aug 1 11:44:38 2004
Subject: [Racal] RE: [R-390] Source for axial caps

Ooops?!

wrote: > Provided the voltage ratings are adequate and you don't get parts that r are only rated to 85C (like polystyrene) just about any modern plastic r> part will do a lot better than the paper parts it's replacing.
I've stocked up on some yellow poly's here and there -- don't remember whether they're polystyrene or polyethylene polypropylene or what. What are the typical temp ratings of the various yellow axials? Barry

From ham at cq.nu Sun Aug 1 15:52:15 2004
Subject: [R-390] Source for axial caps

Hi, Most of the polystyrene parts I have seen have been in clear cases. They tend to be low value parts. I don't think I have ever seen a 0.1 uf polystyrene part. Polystyrene is what your good old model airplane kits were made out of. The stuff has a pretty low melting point.

The two common plastics in use for capacitor dielectrics these days are polyester and polypropylene. Polycarbonate used to be an option but then the last guy making the film went out of business. Teflon is another option that is out there but it's so expensive you should not consider it for the kind of stuff we do. Mylar is a trade name for polyester so it does not count as a separate material.

Polyester is usually a 105 to 125C rated material. Polypropylene is commonly rated from 85 to 105C. Packaging can make a bit of a difference as can the size they are trying to achieve on the part. The guys that go super compact on the parts seem to rate them a bit lower in temperature . The temperature is often a "rated" temperature rather than a "failure" temperature. As long as you are not putting a lot of AC current through the parts (and we don't) *and* you de-rate the voltage by a bit you can use both polyester and polypropylene up to the 125 or 105C temperatures.

A quick check on all this is at **http://www.illcap.com/Film.**asp . The page applies to Illinois parts specifically, but most of their competitors rate parts the same way.

Orange drop capacitors are available in both dielectric materials. The 715 series that most of the audio guys like has the polypropylene dielectric.

The polypropylene material usually results in a capacitor that is larger than the equivalent polyester part. The polypropylene part will normally have a lot less loss for a given size part (0.05% versus 1%) . The only advantage to the polyester part is that it's smaller size will normally give you a lower inductance. What ever gain you get from lower inductance normally is wiped out by the higher loss of the polyester material.

In a bypass application the fact that the polyester part has an impedance 1% higher than the polypropylene part hardly matters at all. There is no reason to pull out parts you already have installed. If you have a choice *and* they will fit then use the polypropylene parts. How important is all of this? Well I for one don't pay any attention to it at all. I pretty much use the two types of capacitors interchangeably in R390 rebuilds. Epoxy coating is nice, but keeping the soldering iron away from capacitors isn't all that tough. I often can succeed at it three times out of four. Take Care! Bob Camp KB8TG

From roy.morgan at nist.gov Tue Aug 3 13:10:23 2004
Subject: [Racal] RE: [R-390] Source for axial caps

wrote: >Ooops?! >Bob wrote: Provided the voltage ratings are adequate and you don't get parts that

Barry,

PolySTYRENE caps are usually clear, you can see the foil inside through the stuff. See the (poor) picture at: <http://www.industrialnewsroom.com/fullstory/8253> The common polystyrene cap is the right most one. (It may be that the other ones shown are also styrene.) Note: polystyrene caps are normally rated at 100 volts or less but one outfit seems to have stocks up to 630 volts: see: <www.seacorinc.com> or: <http://www.seacorinc.com/products/capacitors/tables/precision.asp> Where you will note that the styrene caps have one tenth the dissipation factor and three times the leakage resistance of the polypropylene units in the same table.

This link is a nice comparison chart showing many common dielectrics and their significant characteristics: <http://www.seacorinc.com/products/capacitors/tables/dielectrics.asp> I see from this data the styrene caps have a negative temp coefficient. This may give us a way to determine if a cap is styrene or not.

The caps that are usually yellow are poly-something-else. If your caps are recently made, you can check manufacturers specs for the particular ones you have for details. I think you have nothing to worry about. Roy

From cgalbrai at umich.edu Tue Aug 3 18:18:33 2004
Subject: [R-390] CY-979 and CY-979A differences + shock mount question

Hello gang,

Are there any differences between the CY-979 and the CY-979A cabinets? I am guessing the non-"A" was made during R-390 production and the "A" during R-390A production. All photos I've seen show the two models as otherwise identical.

Also, anyone have, or know of a source, for shock mounts for these guys? I have a CY-979 to use with my R-390A, and would like to find the shock mounts. I'd also be interested in trading for a CY-979A if someone needs a CY-979 to be more "correct" for an R-390. Thanks! 73, Chris KA8WFC

From eldim at worldnet.att.net Tue Aug 3 20:03:04 2004
Subject: [R-390] CY-979 and CY-979A differences + shock mount question +

Hello Chris & 390 Fans,

Does anyone have the LORD Part Number, or Federal Stock Number for the individual shocks for the R-390 Cabinets? I have a bin loaded with different shocks, and would be happy to search or research them if I have some info to go on. Some look identical in physical shape and size but have different load ratings. I don't have time to research my R-390 manuals as I'm way behind the power curve. Also, you lucky folks who own one may be able to take a peek at your mounts and let us know the part number or what info is on them. They may also be listed in the T-368 Transmitter Manual. On the subject of T-368's. Does anyone have a empty or partial transmitter Cabinet FOR SALE or TRADE. Was there a manual ever published on the Cabinets themselves? 73, Glen Galati, KA7BOJ Tacoma, WA eldim@att.net

From r390a at bellsouth.net Tue Aug 3 20:48:31 2004
Subject: [R-390] Re: CY-979 + shock mount answer

Glen --

The Lord p/n on the one I have on the shocks on my cabinet is HT2-35. These are Lord BTR series mounts. Data for that type of mount is here -- literature.lord.com/root/other/btr_mounts.pdf Trivia, once knew a guy many years ago that worked for the Lord plant in Bowling Green Kentucky. Whenever folks asked where he worked he told them. A good portion went away assuming he worked for a company that made Bibles. Tom NU4G

Date: Tue Aug 3 21:04:49 2004
Subject: [R-390] Differences in Slug Carriers

On the metal carriers that hold the coil slugs, in some radios you see a rod running from front to back. At each end of the rod ar small cylindrical bearings that ride on the cams. In the S&W radio I have, the slug carriers have this rod in them front to back. In my Collins 390a, there is no rod. Only a metal tab at each end that holds the cylindrical bearings. Did Collins never use slug carriers with this rod? The rod seems to offer more mechanical rigidity or stability than the "tab" type. I would have thought Collins would go for the more substantial design.

From redmenaced at yahoo.com Tue Aug 3 21:22:10 2004
Subject: [R-390] CY-979 and CY-979A differences + shock mount question + T-368 WTB

The T-368 Cabinets were covered in the manuals for each version of the series because there were some small differences in the cabinets, mostly the antenna relay used different voltages, some were 120 VAC some were 24 VDC. There were also differences in the wiring harnesses which have to be accounted for if you ever have to mix and match modules. http://groups.yahoo.com/group/T-368_BC-610/ 73 Joe

From dpharr53 at swbell.net Tue Aug 3 21:29:48 2004
Subject: [R-390] R390A Newbie - Need Meters & Filters

All:, I've wanted to own a R390A receiver for a long time. I've perused hamfests and swapmeets for the entire summer thinking I would be able to find one in reasonable condition and reasonably priced - but without success. Since I could wait no longer, I contacted Fair Radio today and ordered one "Used Reparable". While speaking with Gary Clements @ Fair Radio (very nice guy, by the way), I was informed that he would do his best to provide a unit, put together out of the pile they have left, that at least would power up and be in some semblance of operating condition. However, the best he can do is a receiver without meters (I'm well aware of the meter issue - all pulled out due to radiation fears before auctioning by the government) and most likely the 4kc filter will be bad. So, I'm looking for the following:
1. Source, or multiple sources, for replacement meters
2. Source, or multiple sources, for IF strip or individual filters

Neither one of the above items are currently available from Fair Radio. If anyone has any information or can point to an earlier post regarding the above items, I would appreciate it. Thanks & 73 WD5JWY

From redmenaced at yahoo.com Tue Aug 3 21:40:24 2004
Subject: [R-390] Differences in Slug Carriers

I've got one of those decks without the rod, too! I was wondering who made them. Are you sure it was Collins? The RF deck in my EAC has the bearings but I believe they are assembled incorrectly as the roller that rides in the slot is narrower than the roller that rides on the cam, I'd think it should be t'other way round, it would fit better. Joe

From jmiller1706 at cfl.rr.com Tue Aug 3 22:39:06 2004
Subject: [R-390] Differences in Slug Carriers

The RF deck has the Collins name stamped on the side, so unless someone swapped out the slug carriers some time in the past, then Collins used the ones with out the rods. But on the other hand it looks like someone has taken a heavy file to the slug rack slides, so I can't be sure. Anyway,, as I said someone in the past took a file or grinder to the inside edges of the slug rack slides on the front of the deck, so I bought a junker EAC RF deck from Fair with the idea of changing out the front plate of the RF deck. I am hoping the holes and all are the same dimensions and spacing. While looking at it this question ahout the rods came to mind. The junker EAC deck has the rods, as does my Stewart Warner, but the Collins deck does not. Just wondering if that's normal...

From dpharr53 at swbell.net Wed Aug 4 11:28:39 2004
Subject: [R-390] R390A Field and Depot Maintenance Manual

Does anyone have a source on the Internet where this manual may be downloaded (TM 11-5820-358-34P 'Direct Support and General Support Maintenance Repair Parts and Special Tools Lists, Radio Receiver R-390A/URR'). I was actually able to find and download TM 11-5820-358-35 ('Field and Depot Maintenance Manual, Radio Receiver R-390A/URR') from the LOGSA site (https://www.logsa.army.mil/), but when you try to download TM 11-5820-358-34P, the site prompts you for a login. Thanks 73 Dennis WD5JWY

From ka4prf at us-it.net Sat Aug 7 06:10:50 2004
Subject: [R-390] not yet

Hi all,

I had hoped my R-390A would have been setting here in front of me by now, but I guess there will be more time elapse before that happens? I ordered a Rebuild R-390A which was scheduled to be shipped within four weeks. That was over 4 weeks ago. I am wondering if the vendor might have run out of spare parts?
I already got a spot cleared where it will set when the R-390A arrives. I have been wondering about the antenna connections. Will I be able to hook up ordinary connectors or does the R-390A require something different? Tnx Chuck

From mikea at mikea.ath.cx Sat Aug 7 10:58:31 2004
Subject: [R-390] not yet

wrote: > Hi all, > I had hoped my R-390A would have been setting here in front

Saw that post. Brave man, but also an enterprising one. Do you have the set of R-390A TMs yet, and the Y2K R-390A manual?

If you need the R-390A TMs, you can go to LOGSA, or you can do the easy thing and get them off my site: <http://mikea.ath.cx/R-390A>. It's case-sensitive until I get in and set up some lowercase links.

> I already got a spot cleared where it will set when the > R-390A arrives. I have been wondering about the antenna > connections. Will I be able to hook up ordinary connectors > or does the R-390A require something different?

Different.

The unbalanced connector is a "C", which is like a BNC on too much steroids. The balanced connector is fairly common and easily procured, since IBM uses it on S/400 minicomputers. -- Mike Andrews

From ham at cq.nu Sat Aug 7 11:04:00 2004
Subject: [R-390] not yet

Hi, Sometimes the process of coming up with a radio takes a while. This is especially true around the opening days of deer season or when it gets real hot in the shop in the middle of summer ....

If the radio is coming from Fair then they very definitely run a pull one and check it routine. The first check is to see if they can at least hear something on some band at each of the filter settings. Next is a quick check of the BFO and maybe the noise limiter. If it makes it past that they then try to get a radio with both the AM broadcast band and a couple of the HF bands working. Last time they explained it to me it sounded like the tech had a certain amount of discretion about what did and did not constitute a working radio. The good news is that if they mess up you can get them to make it right without much hassle at all.
There are different opinions on what to do about the RF connectors on the R-390. As it came stock from the factory the BNC antenna connector goes to the whip antenna input on the RF deck. The balanced antenna connector (an IBM LAN connector) goes to the main antenna input on the RF deck.

Things that have been known to work:

1) simply stuff a piece of wire into one side the twin lead connector and ground the other side of the connector.
2) modify the cables from the back panel to the RF deck so the BNC goes to the main antenna. This is a Navy mod if I remember right.
3) The LAN connectors are < $2, so buy the right connector and wire it up to the right cable (twin conductor coax - weird ...).
4) Get an adapter from the LAN connector to a SO-239. This is certainly the best looking solution.
5) Make a 50 ohm to 120 ohm balun, put it in a box, mount it on the back of the radio, cable it with the right connectors .... ugg...
6) Just use the whip antenna input (not as good for RF overload)

There are probably other things that also work, but you get the general idea. On a radio fresh out of the box I would just use option one above and get playing with the new toy. Take Care! Bob Camp KB8T

From ham at cq.nu Sat Aug 7 16:16:56 2004
Subject: [R-390] not yet

Hi

There is a error in the previous post. The BNC connector you swap the cables over to is the one that is normally the IF output jack on the back of the radio. The whip antenna goes in through a C connector. The Navy mod moves the balanced input over to the C connector rather than the BNC. Sorry about that! Bob Camp KB8TQ

From chacuff at cableone.net Sat Aug 7 17:14:24 2004
Subject: [R-390] Ovens and Synchronization

Hey guys,

Lets talk about the crystal ovens in the 390A. I seem to remember it is common practice to not use them anymore for the sake of longevity.

My R-1051 experience is that one can't do without the oven in the Frequency Standard because without the oven the stability the 1051 is known for goes down the toilet. The crystal in the oven was designed to work at a specific temp to be stabile. There is a nice flat spot in the curve up around 85C

Is this not the same with the crystal deck, calibrator xtals and maybe to a lesser degree the PTO in the 390A?

Looking in the Y2K manual it seems recommended to fire them up a few hours before an alignment but then go back to the practice of turning them off for our day to day ops....seems that would negate the alignment. Wouldn't one be better off doing the alignments in the state one would normally operate the radio?

I am at the point in my R-390A ownership that I am starting to get technical with the 390A now that time presents that opportunity. As a result I guess I'll be asking some of the typical beginner questions.

Coming to a post near you: How does one go about putting a radio back together where everything is totally out of mechanical and electrical sync!

I pulled the whole IF deck apart for complete cleaning....4 years ago. No problem on getting everything back together just need some starting point for getting everything re-synchronized. It was a nasty blue striper...won't know it once it's complete....it cleaned up very nicely. The gear train is separated from the IF deck chassis and all that is separated from the xtal deck.

Gear train works like a swiss watch....love that Mobil 1 Thanks in advance! Cecil Acuff

From ham at cq.nu Sat Aug 7 17:14:59 2004
Subject: [R-390] Russian HF Radios

Hi, Well obviously we need to get something going. How about did the Russians build a better all tube HF receiver than the R-390A? From what I hear the answer may be yes .... That's the way to see if

anybody's listening. Enjoy! Bob Camp KB8TQ

From chacuff at cableone.net Sat Aug 7 17:34:31 2004
Subject: [R-390] R-390/URR Heads Up!

Greetings group.

I wanted to let the group know that in the near future there will be a very nice R-390/URR up for sale. (you know the man's radio). I'll fill in the details at a later date but I will tell you that it has been through a recent restoration...

The front panel has had a very nice refinishing as has the knobs. It is fairly clean on the inside.

I will be doing a clean up on the entire radio and touching up the alignment to be sure it's up to spec after a full tube testing and replacement as necessary. I will also be checking for any work that has been done as part of the restoration and doing any that looks like it needs to be done. (any suggestions would be appreciated)

It will be right before it goes to it's new owner! I will have pictures available and an idea of an asking price at a later date. The radio will be shipped with a three prong grounded cord and proper power connector, and a copy of the manual on CD.

It will be a nice addition to your collection of vintage anchors..so start thinking about whether ownership of a real man's radio is in your future. (just a list joke folks no flames please!) Sale will be cash..not interested in trades at this point. (got way too many now.arrrg.) Thanks. Cecil Acuff WB5VCE

From chacuff at cableone.net Sat Aug 7 17:37:31 2004
Subject: [R-390] Re: Russian HF Radios

I'd be curious what the model number of that would be.... I know many like the German shot at it...the EK-07. I wouldn't mind having one of those some day....when sell off some of this other stuff. (where you at Hank) Cecil....

From Commtekman at aol.com Sat Aug 7 17:42:27 2004
Subject: [R-390] Halloween Set

Hey Guys- In one of my 'senior moments', I bought an R-390 off of Eplace, finally received it, powered it up without turning it on, all the tube filaments came on while it was still in the 'off' position, and the dial light started flashing like a haunted house on halloween night. I suspect without going further that this has something to do with the standby or break-in being held up and not releasing. Ideas? Tnx Bob K6OSM Mccall, Idaho

From femyers01 at bellsouth.net Sat Aug 7 17:59:00 2004
Subject: [R-390] Russian HF Radios

Well, If the Russians copied an r-390 non A they may have made a better all tube hf radio than the r390-a, hee hee. Forrest Myers AG4ND

From ham at cq.nu Sat Aug 7 18:20:08 2004
Subject: [R-390] Ovens and Synchronization

Hi, The crystal ovens in the R-390 and the R1051 are different beasts. The 1051 oven standard is designed like a modern OCXO. The crystal inside it is cut so it is very stable at the oven operating point. The oven in the 1051 is designed so it is very temperature stable.

Unfortunately none of this is true of the crystal oven in the R390 series of radios. From talking to the guy who did the design of that part of the radio it was known to be a stop gap solution at the time. The main reason for it's inclusion was a requirement for modest stability at temperatures well below freezing.
The crystal oven in the R390 swings in temperature over something like a 10 degree C range in normal operation. A fairly normal room should be stable within a degree or two for quite a while. Since the oven cycle time is in tens of minutes the oven is definitely a poor choice for basic temperature stability.

The crystals in the R390 are not specifically cut for oven operation. This is a good thing since we don't turn the ovens on. In order to optimize them for an oven environment you cut the crystal so it's upper turn temperature is approximately at the oven temperature. Since there is a tolerance on the cutting process it is hard to do anything more than get them close to the oven temperature. When you cut the crystals this way a side effect is to make their performance at room temperature worse than a normal crystal.
The oven on the PTO is kind of the same thing. It does not cycle over quite as wide a range as the crystal oven, but it does cycle further than your room probably does. The issue with the PTO is coil form shrink. The hotter you run the PTO the faster the master coil shrinks. Eventually the coil shrinks enough that you can no longer get the PTO on frequency with the correction adjustment. There is an article in Electric Radio back a few years that goes into all this stuff. Strange but true I worked for the guy who is quoted in the article. At the time I worked for him he would just barely admit working on the PTO's ....

Finally, when you turn on the ovens on the R-390 you almost double the power in the radio. The oven in the R1051 is not as big a power hog as the ovens in the R390. When the heat in the radio goes up by that much the whole radio will get hotter. Unless you run some kind of fans to cool everything the result will be parts that run hot and wear out faster. Of course the fans would cool off the ovens which draws more power which heats up stuff more ... nasty cycle.

One note - The ovens we are talking about are the ones on the crystal oscillator deck and inside the PTO. The plug in oven that has the calibrator crystal in it does not get turned off by the "oven on/off" switch. The plug in oven does do a good job, it does not pull a lot of power and it should be left running.

One of the neat things you can do with a bunch of R390's (like say you just picked up a dozen of them ...) is to sort the crystals in the crystal oscillator deck. The closer you get to a matched set of crystals the less you will have to adjust the radio each time you change bands. I still think they should have put tuning caps on the crystals. The reason they didn't : " Well we didn't do it because it wasn't in the spec". Darn Ft. Monmouth. Take Care! Bob Camp KB8TQ

From ham at cq.nu Sat Aug 7 18:33:31 2004
Subject: [R-390] Halloween Set

Hi, Main power to the radio is controlled by a microswitch ganged to the function switch shaft. It is fairly common for this little item to weld it's self in the on position. Last time I had a problem with one

of these I got the parts from somebody on the list. It was either David Medley or Hank. The fix is not to hard except you have to unmount the front panel to get at the switch. It's a little time consuming is all. When you mount the new one you want to make sure it's snug on the mount so it goes full on / full off. If it gets loose it may weld again.

The flashing is a bit odd. Other than the heater thermostat in the crystal oven I can't think of anything in the pilot light circuit that would cycle. You may have a bad wire from the power transformer to the filaments. It's P111 / J111 in the Y2K manual. You might also make sure the "ovens" switch on the back of the radio is set to off.

Everything about these radios is fixable. I do not know of any parts that are in the "can't get or replace them" category. Dive on in and see what's wrong. They were designed to be repaired. Enjoy! Bob Camp KB8TQ

From ham at cq.nu Sat Aug 7 19:25:17 2004
Subject: [R-390] Russian HF Radios

Hi, Well I seem to remember they made a receiver called the R320 that was intended as a dedicated intercept radio. I have been able to find very little information on the radio and have never seen one. What little I was able to find claims it was a bit large (a couple hundred pounds) but worked quite well. Enjoy! Bob Camp KB8TQ

From wf2u at starband.net Sat Aug 7 22:01:12 2004
Subject: [R-390] Russian HF Radios

The Russians indeed built a receiver in the same class and purpose as the R-390 and R-390A. The frequency display was not the Veeder-Root mechanical-digital counter as in the R-390* series, but an analog system comprised of a coarse dial displaying each 2 MHz band in 100 KHz increments and a "fine" frequency dial which was projected from the rear, displaying increments of 1 KHz, above the coarse dial. The receiver has a dual conversion system based on a tunable first IF of 1.5 to 3.5 MHz, mixed down to the 215 KHz fixed IF. The rest of the bands are converted with a crystal oscillator/mixer to the variable IF, a la Collins. The difference is that the bands are 2 MHz wide instead of the 1 MHz in the Collins system, and the tuning is not a permeability tuning arrangement with slugs moving in and out of the coils, but a multi-section main tuning capacitor and a drum bandswitch system. The selectivity is infinitely adjustable (by variable coupling of the 215 KHz IF stages, between 1 KHz and 14 KHz, and an audio bandpass filter is provided as well, selectable between 8, 5, 2.5 and 0.3 KHz.

The receiver contains a thermostat-controlled ovenized crystal calibrator, the BFO is tuned with a reduction drive, with a dial displaying -5 KHz - 0 - +5 KHz frequency in 100 Hz increments. AGC time constants available are 1, 0.1 and 0.05 seconds or AGC OFF.

The RF input is selectable with a front panel switch between a 60 to 400 ohm (nominal), balanced and unbalanced dipole, whip/long wire or ground, antenna trimmer control on the front panel. There are jacks for AGC in/out for diversity, 1st and 2nd IF out, and 600 ohm audio line out (besides the headphone jacks).

The construction is modular: the RF/first IF/crystal oscillator/mixer is in the bottom drawer in the cabinet, the top drawer contains the second IF, BFO, AGC, detector and audio circuits, as well as the metering circuit - the receiver has a built-in emission tester and each tube can be selected for test while

the receiver is in operation, or the meter can be switched by the selector to monitor the audio line output or the received signal strength. The power supply is external, and interestingly the input is selectable between 220 and 120 VAC...

The first version of this receiver was put in service with the (former) Soviet Armed Forces in 1948 with the military nomenclature of R-250 ("Whale"), and the improved version, the R-250M was issued in the early 1950's. Both these models used standard metal octal tube types, which are equivalent to the US types. In the early 60's the receiver was modernized and standard miniature tubes were used together with some circuit improvements. The self testing arrangement got an additional feature, a built-in noise generator, so besides emission testing of the tubes, a sensitivity check could be performed without external test equipment (like: "Hey, Sergey, I can't copy headquarters!" "Check the receiver with the noise generator, Ivan!" "click, click, click as the meter switch is turned to check each tube, and the input with the noise generator"- "There is nothing wrong with the receiver" "S**t! The ice broke the antenna again!") This version was the R-250M2 and was in production until 1981.

Incidentally, in all these receivers the B+ is 160 VDC, giving the tubes a real long and cool life, with a total current draw of 120 mA! The filaments are series-parallel connected (all 6.3 V tubes) for 12.6 V at 6 A.

I own a pristine R-250M model. Its performance is simply incredible, considering an early 50's design with all octal tubes (19 of them). It outperforms many receivers 10 years more advanced. The spec on the sensitivity is 0.6 uV for S/N ratio of 10 dB at 3 KHz IF and 2.5 KHz AF bandwidth, with a 100 ohm antenna. Audio output is 0.5 W into 600 ohms at 4% (AF output tube is a Russian 6P6, which is the exact equivalent of the 6V6). Frequency stability is specified as maximum 200 Hz drift after a warm-up of 2 hours!

The tube complement in US equivalent designations is 10 x 6SK7, 3 x 6AC7, 3 x 6SA7, 2 x 6H6, 1 x 6V6, + a voltage regulator tube (I have to find the US equivalent) and the power supply has a 5Z4 rectifier. The detector/BFO injection is good enough for good SSB reception, even with the AGC on, as well as CW is just great to copy on it with all the selectivity options.

It's no slouch in AM quality, although .5 W is really not enough to drive a big speaker without an outboard amp.

All this in a real "boatanchor" package of 26" wide, 18" deep and 21" tall (with the shock mounts), weighing 209 pounds, without the power supply, which weighs about 35 pounds.

Options available were RTTY demodulator, high precision AFC (Automatic Frequency Control) system, which provides tuning with a servo motor and a diversity control interface. There was also a vibrator power supply option, for 12 VDC input.

Construction is really excellent quality and it looks like good US mil-spec work. The wiring and soldering are also first-class, the components look high quality. The transformers are potted, cased and painted, just like the US mil. stuff. Incidentally, I got a couple of sets of NOS spare tubes, with 1972 manufacturing date. Pretty late for still making metal octal military tubes!

There are photos of the various versions at a Russian web site **http://www.cqham.ru/trx/r_250.html .**

Well, I hope this wasn't boring, but there is not too much traffic here tonight anyway... 73, Meir WF2U Gowensville, SC

From mikea at mikea.ath.cx Sat Aug 7 23:09:18 2004
Subject: [R-390] Russian HF Radios

, WF2U wrote about the Soviet R-250 : [snip description of _really_ interesting receiver]

> I own a pristine R-250M model. Its performance is simply incredible, > considering an early 50's design with all octal tubes (19 of them). It [snip]

Thanks _very_ much; that's a neat RX, and there's a lot more on that site that I'd never heard of. If you'd care to put some larger pix of your R-250, internal and external, on your website or to mail them to me so that I can put them on my website, I'd be very pleased. -- Mike Andrews mikea@mikea.ath.cx

From pulsarxp at earthlink.net Sat Aug 7 23:42:15 2004
Subject: [R-390] Obituary

It's quit, so here is something about Ole! Lee, w0vt

Subject: Fw: Obituary

A Northern Minnesota newspaper reported the Sad News that Ole was SHOT. He was up by the Canadian border on his 4-wheeler cutting some trees, when some rangers looking for terrorists spotted him. According to the news reports, using a loudspeaker, they shouted to him "Who are you and what are you doing?" Ole shouted back, "OLE.....BIN LOGGIN'!"

Ole is survived by his wife Lena and Lena's good friend Lars.

From vk2abn at batemansbay.com Sun Aug 8 01:14:12 2004
Subject: [R-390] Re: R-390 Digest, Vol 4, Issue 6

Talking about better radios than the 390a ,Afew years ago I aquired a WRR2 by national ,Now there is what I think is the penultimate Valve reciever ,Sorry for you guys in the US ,TUBE reciever I would say that it was a product of the early sixties and synthasized in 500 hz steps and in 2 boxes that are both heavier than a 390a and also 2 channel ISB capability also -, The biggest Radio reciever I have -owned was made by the technical material corp and weighed in at more than 500pounds and also had a crystal controlled synthasizer and the radio was capable of 4 channel ISB it completly filled a 7Ft rack and the house lights used to dim when I turned it on. regards to everyone on the site -

From lester.veenstra at lmco.com Mon Aug 9 08:30:14 2004
Subject: [R-390] Re: R-390 Digest, Vol 4, Issue 6

Now that is a real receiver; Have one also, the FRR-59. Same "synthesis" as the R-1230 as both are one of the last gasps of National Radio. Les K1YCM/3 [former CTM1]

From roy.morgan at nist.gov Mon Aug 9 11:02:42 2004
Subject: [R-390] Ovens and Synchronization

wrote: >Hey guys, Lets talk about the crystal ovens in the 390A.

Ok, let's do.

> I seem to remember >it is common practice to not use them anymore for the sake of longevity.

Yes, a number of people turn the ovens switch off. I seem to remember the ovens being described in the manual(s) as provided for *very* difficult temperature environments (like unheated places in the arctic.)

>My R-1051 experience ... without the oven the stability the 1051 is known >for goes down the toilet.

But, but... do you NEED 10 cycles dial accuracy??

> The crystal in the oven was designed to work at a specific >temp to be stabile. There is a nice flat spot in the curve up around 85C

The crystals may well be quite stable at whatever temperature they are at, but not as accurate as at the rated temparature. If the crystal temperature wanders up and down (with ovens off), the frequency may drift enough to cause trouble in *SOME* modes of operation: for instance mulitplexed RTTY reception with very narrow shifts. Do you do that with your receiver?

>Is this not the same with the crystal deck, calibrator xtals and maybe to a >lesser degree the PTO in the 390A?

Yes, it is likely the same.

>Looking in the Y2K manual it seems recommended to fire them up a few hours before an alignment but then go back to the practice of turning them off for our day to day ops....seems that would negate the alignment.

I presume you mean run the ovens for a few hours before an alignment. I would suggest you turn them off, leave them off, and do the alignment after a warmup with the ovens off.

It might change the frequency alignment of the PTO a bit. But I would expect any such change to be well within the adjustment range of the zero set mechanism. If the end point spread changes too much, that is another story.

> Wouldn't one be better off doing the alignments in the state one would normally operate the radio?

Yes, I agree with this.

>I pulled the whole IF deck apart for complete cleaning....

I think you mean the *R*F deck.

>Gear train works like a swiss watch....love that Mobil 1

'Sounds like you are well on the way to having a better-than-new radio.. keep going! Roy

From Llgpt at aol.com Mon Aug 9 11:16:47 2004

Subject: [R-390] Ovens and Synchronization

My 3 cents (inflation ya know) I don't use the ovens period! I have seen many stick in the on position and ruin a good pto. Wally Chambers K5OP suggested many years ago to clip the wires and tape them to avoid the switch being "acidentally" turned on by a well intentioned individual. Les Locklear

From LairdThomasN at JohnDeere.com Mon Aug 9 11:26:29 2004
Subject: [R-390] RE: Ovens

>From all that I have read over the years, I agree; don't use the oven. For the semi-purest. You can buy crystals for HR202 from mhelectronics that are designed for room temp. Although, the consensus is "why spend the extra money"..... Tom Laird WC9M Moline, IL.

From brookbank at triad.rr.com Mon Aug 9 18:08:18 2004
Subject: [R-390] R-390 Crystals

Looking for a 13000 KH and a 12500 KH crystal. If anyone has them for sale, please contact me directly. Thanks and regards, Pat

From ham at cq.nu Mon Aug 9 20:54:54 2004
Subject: [R-390] RE: Ovens

Hi, The calibrator crystal would be a bit tough to do as a "stable at room temperature part". The 200 KHz frequency is low enough that you can not do it as an AT cut in that holder. The HR202 oven is actually a pretty good little unit. It will hold a couple degrees during fairly major external changes. Since it's a plug in it's easy to replace if it runs away. It's not all that different than the units you wold see in the older two way radio sets.

One interesting thing you could do would be to replace the first LO crystal with a room temperature unit and then replace the calibrator crystal with a cell phone TCXO and a digital divider. You would have a more accurate calibrator. What ever you did would fall into the category of easily reversible modification if it was all in a replacement oven plugin. Next step up would be to phase lock the first LO to the TCXO..... As you pointed out "why spend the extra money". Take Care! Bob Camp KB8TQ

From mjmurphy45 at comcast.net Mon Aug 9 21:54:35 2004
Subject: [R-390] RE: Ovens

I think the calibrator in the ART-13 uses an old FT-243 pin spaced 200 kHz crystal. No oven there! Plus they definitely are aged. My guess is that Fair Radio should have some. That ought to get you within a couple of kc after zero beating WWV!

Bob was starting to talk about SL-cut crystals which are normally required to hit frequencies much below 1 MHz and are somewhat less stable than AT-cuts, hence the requirement for ovens etc.. Mike Murphy WB2UID

From ham at cq.nu Mon Aug 9 22:08:49 2004

Subject: [R-390] RE: Ovens

Hi

Well if we are going to get into the "pick one up while they are still available" thread .....

Back when I was in school surplus stuff was a lot more common than it is today. This was just after the invention of dirt. R-390's sold for $150 to maybe $200. Any way ...

I wandered into a surplus house in Indianapolis Indiana of all places and here in front of me is a General Radio frequency standard. The thing was based on a double oven enclosure around a bar (not a piece a bar) of quartz. The chunk probably weighed half a pound. The whole thing fit nicely into a relay rack and had more than a couple of tubes. I suspect it was an orphan from the Crane Navy Depot.

Talk about the perfect item to calibrate your R-390 with. Great big X cut bar standard. Here's the standard that was the standard for most of the 1940's and early 1950's. I wish I had picked the darn thing up. As it was I bought a model 15 teletype and checked it as luggage on the filght back home. It came out ok ... Take Care! Bob Camp KB8TQ

From woodrat at citynet.net Tue Aug 10 08:39:22 2004
Subject: [R-390] Line Level Meter

Yesterday was an unlucky day.....found a dead line level meter on a long inactive 390A. Hoping today will be a lucky one and some lister will have a meter they are willing to part with. I do expect that it wont be cheap. If anyone can help, please reply off list. Thanks, Larry

From ham at cq.nu Tue Aug 10 18:21:58 2004
Subject: [R-390] Line Level Meter

Hi

Obviously if the poor meter got in the way of a fast moving object that's a problem. If it is physically intact I would bet that it can be fixed. The R-390 meters are a bit harder to pop open than the plastic face meters you see in a lot of commercial gear, but the guts of the beast is the same. More or less you have the mechanical meter movement and some wires. In some cases you have a resistor or two in there.

The meter movement is easy to check. If it wiggles when you rock the meter back and forth in your hand then the bearings and springs are ok. If it is pegged hard one way or the other you may have a problem with a spring. If it is sitting mid scale and not moving then it's come off of a bearing.

If the movement is mechanically ok then the problem often is a broken wire or a failed series resistor. Usually these problems are the most common and the easiest to fix. I suppose there are audio meters with diodes in them as well. Again that should be an easy fix.

The one you worry about is the meter armature winding burning up. If that happens then you have a bit of a problem. Other than stuff that has been really nuked (as in 10 amps does not go well through a 10 micro amp meter ... trust me on this one) the armature rarely is the point of failure.

If you do open up the meter you may be overcome by an impulse to eat some of the glow in the dark

paint. Be sure to open the meter in the presence of another adult incase this happens to you. Multiple reported incidences of this behavior are the most likely driver in the military's long standing policy of removing meters from equipment destined for disposal. Again, you have been warned ..... Take Care! Bob Camp KB8TQ

From jmiller1706 at cfl.rr.com Tue Aug 10 19:47:50 2004
Subject: [R-390] Line Level Meter

Have you checked to be sure it's not something besides the meter, such as the meter sswitch or a connector? A radio sitting unused for long periods can develop corrosion in switches and connectors. Just a thought...

From roy.morgan at nist.gov Wed Aug 11 11:28:15 2004
Subject: [R-390] Line Level Meter

wrote: >... More or less you have the mechanical meter movement and some wires. In >some cases you have a resistor or two in there.

In the case of the line level meter, there is a rectifier, too.

>The meter movement is easy to check. If it wiggles when you rock the meter

Exactly, there could be a failed rectifier. Replacement with non-selenium diodes will likely cause increased deflection with the correct ac voltage for 0 VU. An external resistor will cure this, unless you want to change any you find inside the meter.

Notes:

1) The R-390 line level meters are AC meters. They indicate 0 VU for line level output at the rear terminals of the radio.

2) The pictures of line level meters I have at hand do not show a zero on the dial markings.. only a "VU" at the place where 0 should be which is at the "100" of the 0-100 dial markings.

3) The meter movement is a DC mechanism. The meter case contains a rectifier (and presumably a resistor or two to set the correct calibration.) The meter has an impedance of 3900 ohms. (That is *not* the dc resistance of either the meter movement or the complete meter with rectifier.)

4) If your meter has luminescent markings, DO NOT OPEN IT UP AND EAT THE INSIDES. Roy

From sdaitch at ibb.gov Wed Aug 11 13:14:38 2004
Subject: [R-390] Line Level Meter

I can't speak for the R-390 meters, but most honest VU meters use a bridge rectifier, not a single diode, for rectification. In the Simpson and Weston meters, at least the larger ones, like on audio consoles, the diodes are similar to copper oxide disks, in a four pack stack, and the diode case can be opened, allowing the diodes to be replaced individually. What normally happens is that the meter will read 1-2 dB below full scale with the proper input.

We were replacing meters like this on our console at Greenville VOA, and ran out of meters. I found some old ones, with the same problem, too low a meter reading, and pulled one apart for investigation. I think I wound up fixing 3-4 meters out of about 6-8 "dead" ones.

The smaller R-390 meters are much too small for the larger diode bridge, and since I have never worked on one of these meters, I really can't talk about their specifics. Sheldon

From dsmaples at comcast.net Thu Aug 12 19:18:53 2004
Subject: [R-390] O.T. 618S

all: I had an ARC-38A a while back. Went through the agony of building a 400 Hz PS for it (anyone need a 100 watt PA amplifier with a 400 Hz oscillator stuck in it?), large DC supplies, etc., Never had the mounting chassis which contains a peculiar phase-shift network for the 400 Hz so the closed-loop electromechanical synthesizer would work, so mine didn't ever quite lock up.

I think I'll pass on the 618-S.

Side note: I'm nosing around for a sideband converter for my 390A. I ran into an Eldico SBA-1 a while back. Is that useful as a converter? Any other suggestions besides the two-diode mod (which works pretty well but still leaves a little to be desired, IMHO, but is definitely the right price!). Thanks, Dave WB4FUR

From ham at cq.nu Thu Aug 12 20:32:14 2004
Subject: [R-390] O.T. 618S

Hi, Do you really think this single sideband stuff is here to stay? There are more different outboard SSB adapters out there than you can easily list in a day. Since you have a 455 KHz IF about 90% of them will work with the R-390. One of the better modern ones is made by Sherwood. The military adapters all have a certain look that goes well with a R-390 so they also are a good choice.

If you want to build something then I would do it as an outboard box that hooks into the IF output. There are a number of good ways to do it that don't cost a lot of money. Take Care! Bob Camp KB8TQ

From vk2abn at batemansbay.com Fri Aug 13 20:01:57 2004
Date: Fri Aug 13 20:02:44 2004

A few years ago I got very much into ARC58 /TRC75 and after using all sorts of aircraft alternators that sound like a 747 on full boost ,I found that there is a product desighned for running motors at variable speed I contacted the company and recovered 2 systems from their rubbish bin and made a good system , briefly it consisted of a ring counter driving some large transistors and was single phase input and 3 phase out put at at 4kva, it generated a multi stepped square wave that after filtering was compatable with the gear and was permanently set to 400Hz, it ran here for many years with no problems , preceding this I was using a PP2352 unit that ran on 28v dc and was one of the most unreliable pieces of electronics that I have owned, it used to generate internal spikes and was always blowing the big germanium power transistors which were individually fused and would gradually die , the motor controller was a great improvment, I am sure they have them in the states HI

From r390a at bellsouth.net Sat Aug 14 01:12:32 2004
Subject: [R-390] 400hz converters

The show up on Ebay every now and again pretty cheaply too. most can be adjusted to 400 hz easily. Tom

From terryo at wort-fm.terracom.net Sat Aug 14 09:31:24 2004
Subject: [R-390] Commercial 400hz converters

At my college, we have a Kepco power supply donated by a local company. Takes in 220 VAC single phase 60 Hz and puts out 0-220 VAC @ 20-1000 Hz, controlled by keypad and microprocessor. We primarily use it for testing at 50 Hz (Japanese electronics) but you could even power old blimp radios at 800 Hz. Very slick unit. I can get the model number on Monday if you'd like to know more. Best, Terry O'

From mjmurphy45 at comcast.net Sun Aug 15 19:38:58 2004
Subject: [R-390] Commercial 400hz converters

Terry, I obtained a laboratory AC power source this year and have not fired it up yet. It is a Kepco model 200 which is a rack mount unit. It has an oscillator module which is directly adjustable to 400 Hz. It can generate a 120 VAC sine wave at 30 to 1000 Hz at several hundred Watts with essentially zero noise. Unfortunately it is a single phase unit. These types of units can be had cheaply surplus from test equipment houses and they sometimes show up at ham flea markets.

At work we rent gear sometimes. We may pay $1000 - 3000 a month rental for a special piece of microwave or cellular gear, but when we needed one of these for 220 VAC 50 Hz testing, it only cost us $100 per month to rent.

Other AC power supply companies are California Instruments and Elgar. Here is an example: http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&item=3833622791&category=50968 Mike WB2UID

From vk2abn at batemansbay.com Sun Aug 15 21:30:58 2004
Subject: [R-390] Power supplies

Calafornia Instruments also made these supplies I have repaired quiete a few of them over the years

From stevehobensack at hotmail.com Mon Aug 16 10:06:22 2004
Subject: [R-390] Rube Goldberg 400 cycle ac

Take an automobile alternator and open it up. Solder three wires just ahead of the diode module, and run them to the outside. Power the alternator from a variable speed source. Attach a speaker through a resistor and adjust for 400 cps. Use three identical transformers to get proper voltage. Maybe with adjustment of exciter voltage you can get proper voltage.

From petros88 at optonline.net Tue Aug 17 11:48:05 2004
Subject: [R-390] Rube Goldberg 400 cycle ac

Just a thought, if you're looking for small amounts of 400Hz power.

I once bought a vacuum state gyroscopic fluxgate compass, just 'cos it
was a cheap, and nice looking piece of WWII machinery. It needed 28V 400Hz, 50 watts or so, and after puzzling a bit, I pulled out an old audio power amplifier (more robust vacuum state stuff - a Dyna mkIII I think), hooked it up to a audio sine wave oscillator, set the thing for 400 Hz, connected the thing up and adjusted the output to give me more or less the right voltage. Voila... the gyro spun up, the tubes lit, and I was able to point myself north !

From hcjoel at direcpc.com Tue Aug 17 14:39:32 2004
Subject: [R-390] 400 Herzt Power Transformer

Might there be someone who could use a 400 Hz power transformer? Its yours for the cost of shipping plus $3.00 Here is whats written on it: Technipower\ Winding 1: 57VAC @6.2A Windings 2 and 3: 8VAC @20A All rated at 400V Working Weight: 11.5 lbs See it at
http://www.folderol.biz/images/4929.jpg

From dpharr53 at swbell.net Tue Aug 17 15:40:59 2004
Subject: [R-390] Mechanical Filter Repair

I'm afraid I already know the answer to this, but does anyone know if it's possible to repair the mechanical filters in the R390A? I was listening to my R390A EAC last night when the 4kc filter failed.

Before anyone asks, I had already replaced C553 before I powered up the unit the first time, so that's not the problem. All the other filters are working OK.

I would appreciate any information anyone has on this. I know replacement filters are available, but the price seems a bit excessive ($175 ea.). 73, Dennis Pharr WD5JWY

From chacuff at cableone.net Tue Aug 17 18:16:58 2004
Subject: [R-390] Mechanical Filter Repair

Greetings, The 4 Kc filter is the most used filter in the radio from what I understand. One option is to contact Fair Radio sales and pick up another used 4 Kc filter. They should be able to test it for function before shipping it so you should be able to get a working one. The other option is a new replacement...looks like you already have that info...

I have heard of guys getting them open to analyze the failure but I have not heard of anyone having success in repairing one and getting it back together. Cecil...

From stevehobensack at hotmail.com Tue Aug 17 18:22:00 2004
Subject: [R-390] 400 cycle ac

Hash: SHA1

A lot of times an old 400 cycle powered military or aircraft radio can be made to operate on single phase ac power by replacing the power transformer with a single phase 60 cycle unit. Voltages do not have to be exact but close. The filter cap value will need increased. The transformer will be larger and present a size problem. Usually an external power supply is homebrewed. 73...Steve...KJ8L

From bill at iaxs.net Tue Aug 17 18:36:42 2004
Date: Tue Aug 17 18:41:30 2004

The audio amplifier works just fine. I found a 200 watt SS amp for a building system that ran off 28 VDC or 120 VAC.

Years ago I had a WWII gyrocompass with a 3 phase 400 cycle motor. Found a small 28 VDC to 400 cycle, 115 VAC that was single phase. Hooked it across two of the three phase wires and connected a 2 mfd cap between the third and either of the two power leads and spun up that gyro.

The thrill faded, as thrills do, and I lost track of the stuff.

Sometimes you can find cheap old frequency synthesizers that don't reach high enough to be interesting to most people.

If you're really a fan of Rube, you can build an inverted RC phase delay circuit (180 + 60) after a 400 Hz oscillator and feed 2 audio amps to get something close to true 3 phase power. Regards, Bill Hawkins

From ham at cq.nu Tue Aug 17 19:04:36 2004
Subject: [R-390] Mechanical Filter Repair

Hi, I seem to remember that American Trans Coil had IF decks with all the filters on them for about $72 a while back. They are at http://www.atc-us.com/ATCSHOP/ If they still have them that's a lot less than $175. There's no guarantee that the filters on their units are good, but the ones I have gotten from them in the past have worked fine.

The new proprietor of the R-390 end of ATC is a regular list member so he might know a bit more about what they do and don't have. I have never attempted the repair process on the filters so I will leave description of that to others here on the list .... Take Care! Bob Camp KB8TQ

From vk2abn at batemansbay.com Tue Aug 17 20:00:39 2004
Subject: [R-390] 400hz

Ok Rube you are generating 400 hz ac but the max power that you can get from a auto alternator is about is 520 watts devided by 3 will give 170 watts per phase NOT enough !!! a arc58 system needs at least 3.5kva and a 618 system needs 2.5kva , even a big truck alternator will only deliver about 1kw , I have run these systems my making a regular psu and the only things that need 400 hz are the servo systems and you can get away with 20 watts for these but major surgery has to be resorted to in the radio ,regards to everyone on the site

From ham at cq.nu Tue Aug 17 20:30:43 2004
Subject: [R-390] Rube Goldberg 400 cycle ac

Hi, I don't know how many have taken a look at the output of a UPS on a scope. If you ever get a chance it can be a significant surprise. These days the waveform rarely is anything close to a sine wave. I'm not sure that you can run everything on those weird waveforms but they seem to work for most stuff.

A two step sine wave approximation is a whole lot closer to a sine wave than the stuff that a UPS puts out. A multi winding filament transformer and four cheap mosfets should get you quite a bit of power. If you find a source for several identical transformers then three phase would work the same way. In either case a pretty small chunk of code on a PIC processor would give you all the drive waveforms you would ever need. Makes all the turn off this one before you turn on that one stuff fairly easy. Enjoy! Bob Camp KB8TQ

From ham at cq.nu Tue Aug 17 21:06:45 2004
Subject: [R-390] 400hz

Hi, Well for anything in the couple KVA range you are not going to get there with a couple of junk box filament transformers. Small stuff will work fine that way but I think you are in trouble past a couple hundred watts.

Probably the best bet for a home brew lash up would be to bulk rectify the 220 and then use an H bridge with some large FET's to get a 400 Hz square wave off of the result. Of course at those power levels a mistake would get pretty expensive pretty fast .... Take Care! Bob Camp KB8TQ

From ToddRoberts2001 at aol.com Tue Aug 17 21:28:47 2004
Subject: [R-390] Mechanical Filter Repair

Dennis, some people have opened up the R-390A mechanical filters and repaired them. The usual failure mode is one of the fine wires from the transducer coils to the terminal pins breaks causing an open circuit. This can be repaired without too much trouble unless the wire breaks somewhere inside the turns of the transducer coil, then it would be almost impossible to fix. Checking across the terminal pins with a DVM can determine if the input-output coils are open-circuit confirming a break in the wire somewhere. If both input-output side terminals have continuity then the trouble could be in the disc assembly somewhere and would be very unlikely to fix. The filters have been known to suffer from corrosion inside which can cause the fine wire to break. The corrosion seems to come from foam-rubber packing that disintegrates over time inside the sealed filter cans. Also I think corrosion can occur over time where the fine wires are soldered to the terminal pins. Good luck 73 Todd Roberts WD4NGG.

From LairdThomasN at JohnDeere.com Wed Aug 18 08:55:45 2004
Subject: [R-390] RE: Mechanical Filter Repair

>From the WC9M archives: Hope this helps, Tom Laird WC9M Moline, IL.

Success with the 75A-4 filter repair. The solder on the end opposite the pins does not have to be removed. It is only for sealing the filter. I used a small butane torch, and removed the shell. No foam, but 2 rubber supports. Everything looked ok. Played with it, but could not get it to work. Both coils at the ends checked ok at about 44 ohms. Gave up, and went to bed. Next AM, I was looking throughout the KWS-1 manual, and looked at the drawing of the mechanical filter. There is a small wire that comes from the coil assembly, and is attached to the second disk at each end. On looking at the filter again, found that one wire on the top of the filter (opposite the pins) was missing. Tapped filter, and the wire came out of the coil and touched the disk. I applied a small amount of super glue and let it sit for the day. Works fine. No signal loss when switching to this filter now. Do not know how the wire was originally attached, but the super glue seems to be working. Ken, WW3KP, soon to be W3KMP

----------more----------
I was thinking about a common topic on the net about the failure of the 4 Khz filter, and the problem with the failure of the dc blocking cap that feeds them. If I remember correectly, the common failure mode is that the input wire (around #36 in size) to the input transformer breaks near the solder connection. We used to just send the filter back to the line, they would open it up and resolder the wire. You have to carefully unsolder both ends of the tube, and withdraw the total assembly. I suspect that the failure mode would be the same for the shorted cap, and the metal fatigue type, a break near the solder termial. If you don't care to try, mail a couple to me, and I will see if my educated guess is correct. The address is: John Watkins 302 Cheshire Circle Seguin, Tx. 78155

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Rockwell Collins still makes mechanical filter modules using modern design. You can buy them on small boards as plug ins for the S Line from Inrad. Or you can buy the modules directly from Rockwell I believe. Also, I think **Longwave Products** sells direct replacements for the 75A-4 and 390A that uses the Rockwell modules mounted in the metal cans. The modules are small and could easily fit inside an old mechanical filter can.

From W1RC at verizon.net Wed Aug 18 09:37:06 2004
Subject: [R-390] FS: R-390(*) Frequency Display Covert Covers

Hi Gang: I have two of these very rare items to offer up for sale. These are the covers that mount on the R-390 and 390A (also the R-389 and 391) mechanical frequency readout. They flip up and down to conceal the frequency to which the receiver is tuned. There were used by the super-secret "three latter" agencies who obviously didn't trust their own employees from knowing these top-secret frequencies even though they all had presumably undergone thorough security clearances before getting into the building. I never quite understood this.

Nonetheless, here they are. $30.00 each plus shipping and insurance. Sorry but I will not sell both to the same person. In case of many offers to buy them I may opt to sell them to the best offer. 73, Michael Crestohl, W1RC w1rc@verizon.net

From lester.veenstra at lmco.com Wed Aug 18 09:42:06 2004
Date: Wed Aug 18 09:46:44 2004

Gee, we just put a burn bag over their heads so they could not read the dials while being escorted through the area! Les K1YCM/3 (x CTM1)

From dpharr53 at swbell.net Wed Aug 18 11:37:15 2004
Subject: [R-390] RE: Mechanical Filter Repair

All: Many thanks for the responses to my question. It looks like my options are the following:

1. Purchase a spare IF strip module from American Trans Coil($72) and hope that the 4kc filter is good.
2. Purchase a replacement filter through ER Mag ($175).
3. Purchase a new Collins filter from Inrad ($125) and still have to deal with the impedance matching issue.
4. Look into the cheap ceramic filters offered by Toko and Murata and also deal with the impedance

matching issue.
5. And finally, try to repair the filter, but reports are that the success rate, had by others that have tried, has been very low.

Right now I'm looking at pursuing options 1 and 4. I think $72 is a reasonable price to pay for an entire IF strip module, even if some of the filters are bad. Also, the Toko and Murata filters are cheap at about $2 each and they would be fun to play with, although I don't expect to see performance equal to the mechanical filters. All in all, I suspect I'll get what I pay for. Thanks again, 73 Dennis Pharr WD5JWY

From Llgpt at aol.com Wed Aug 18 12:20:37 2004
Subject: [R-390] RE: Mechanical Filter Repair

Another option. Purchase a filter module from Kiwa Electronics. They have a variety of bandwidths. The shape factors are much better than the mechanical filters. They are 3 filters cascaded in a small module. They have much better audio characteristics than the mechanical filters too. _http://www.kiwa.com/kiwa455.html_ (http://www.kiwa.com/kiwa455.html) Les Locklear

From Dave_Faria at hotmail.com Wed Aug 18 19:52:00 2004
Subject: [R-390] Black Faced 390A on Ebay - R-390a Trivia

I've got one of those curiosity questions. There is a 390A on Ebay and the seller says its a repainted panel and it made me wonder. Is it true the black faced radios were used on submarines and the lettering was red rather than white?? I don't know where I heard that or read it - anyone know?? Thanks Dave WA5TEZ

From hankarn at pacbell.net Wed Aug 18 18:33:16 2004
Subject: [R-390] Black Faced 390A on Ebay - R-390a Trivia

Dave, I do R-390A panels in black with red lettering on order and have 2 or 3 in stock. Hank KN6DI

From Llgpt at aol.com Wed Aug 18 19:33:13 2004

Well, the story as related to me several years ago by a then Motorola employee goes like this: At night onboard Naval ships, they use red lighting. In a radio room, the grey panels with white lettering tended to "wash out", Motorola built 50 or so with a black matte finish and "white" lettering. I've never heard of the red lettering theory, but who knows? Maybe the Shadow does..... Les Locklear

From jlkolb at cts.com Thu Aug 19 01:17:37 2004
Subject: [R-390] RE: Mechanical Filter Repair

Failures in mechanical filters could be of two types. Some filters have foam supports that decompose into a gummy, sticky mess that increases the attenuation, and I've heard that R-390A filters do that, although very seldom, unlike Kokusai filters. This would be easy to fix, once the filter has been opened. A sudden failure such as you report, however, is much more serious, caused by either a coil failing, or a mechanical failure such as Tom Laird reported. I haven't seen coils fail internally, although they would if C553? fails. I have seen the connecting wire between the coil and the terminal break or have a bad solder joint at the terminal. The wire can be spliced and lengthened if it breaks in the middle or right at

the coil on the outside - unwind a couple of turns from the coil to get something to splice to. A break at the coil on the end going to the inside of the coil is best repaired by replacing with a good coil from a different filter. If the filter is broken, nothing is lost by trying to repair it.

A loss of signal in one filter position is not always the coil, however. It occasionally can be the switch or the capacitors at either end of the filter.

A 6th choice is to buy a used tested and plotted filter from me, <http://members.cts.com/king/j/jlkolb> - I've just added a number of R-390A filters - or a filter from that auction place - about 80% of the filters I've bought there are OK. John

From vk2abn at batemansbay.com Thu Aug 19 04:41:20 2004
Subject: [R-390] Mech filters

I have pulled apart a 4Khz filter and these wires were SPOT Welded to the resonating discs, I think you did pretty well to fix it with superglue, interesting subject matter of late keep it flowing.

From ka4prf at us-it.net Thu Aug 19 05:04:37 2004
Subject: [R-390] Pre-selector

Hi all, What happens if you install a small preselector or preamplifier in front of an R-390A? Does it help or hinder? Chuck ka4prf@us-it.net

From JMILLER1706 at cfl.rr.com Thu Aug 19 09:25:58 2004
Subject: [R-390] Pre-selector

The entire front end of a 390 is in essence one very high performance tuned preselector, and probably does the preselection function very well by itself. So unless you have a particularly strong interfering signal in an adjacent band needing additional attenuation, I couldn't see another preselector as helping. If you have a less than optimum antenna, the preamplification (or maybe an active antenna) could help overcome antenna loss, but you also run the risk of overloading the 390 front end, although this is unlikely. Sensitivity at the high bands might be improved with a pre-amp. I have also heard that 390a's have a slight droop in sensitivity in the 7 Mc range, so there might be some improvement there. But in general I would think it would be like hitching a self-propelled mower in front of a Mac truck to improve its pulling torque.

From roy.morgan at nist.gov Thu Aug 19 12:20:57 2004
Subject: [R-390] Pre-selector

wrote: The entire front end of a 390 is in essence one very high performance tuned preselector, and probably does the preselection function very well by itself.

R-390 Afficianados, To support J's message, it would be an unusual situation where an R-390A needed extra front end selectivity or RFI rejection. I can think of a few, however:

1) As J mentions, > So unless you have a particularly strong interfering signal in an adjacent band needing additional attenuation, I couldn't see another preselector as helping.

The R-390's were perhaps not meant primarily for broadcast band use, and some of us live near

transmitters in that part of the frequency range. For example, here at my QTH, there is a moderate power AM transmitter less than 4 miles away, and a clear channel 50 kilowatter some 10 miles away. If this is your situation, a filter or preselector of the sort used by MWL folks or beacon hunters may be all you need. If there is just one station causing trouble, try a simple series tuned trap at the frequency of the offending station from the antenna connector to ground. Here are some links to start a search for filters and the like:

Long Wave Radio (UK) <http://www.wireless.org.uk/index.htm>

the Beaconworld Website (UK) <http://beaconworld.org.uk/>

the Longwave Club of America http://lwca.org/

Altair's Lowfer Page <http://www.altair.org/lowfer.htm>

Kiwa Broadcast Band Rejection Filter ($60) http://www.kiwa.com/bcb.html

Bandpass and I.F. Filter Information <http://www.qrp.pops.net/bandpass.htm> (not suggested for BCI problems from the high end of the band)

2) If you are getting cross modulation of any sort:

A) Check front end and mixer tubes for weakness or incorrect tube types. Many of our receivers suffered at the hands of folks who wanted to "make it a lot hotter" by putting in wrong tubes of higher gain, or cranking up the IF gain setting.

B) Check the IF GAIN SETTING. Do the check from Chuck's website, and set the IF gain at a reasonable level. See: http://www.r390a.com/ and specifically: <http://www.r390a.com/html/gain.html>

3) Preamplifiers and active antennas lead to trouble if not carefully selected and used. As J says:
> If you have a less than optimum antenna, the preamplification (or maybe > an active antenna) could help overcome antenna loss, but you also run the > risk of overloading the 390 front end, although this is unlikely.

It's easy for BCI or other interference to exceed the ability of an active antenna amplifier to stay linear. Even a properly working preamp can cause mixing of normal strength signals if it's not a really good one. Look for product reviews and performance reports from the SWL and ham literature before you buy any pre amplified device.

The preamps built by Millen, RME and others, were intended to improve the performance of pre-war and budget receivers in use at the time. The SX-28, for instance, is terrible at higher frequencies when compared to the R-390 radios. Using one of those preamps with a well tuned-up R-390 would be quite instructive.

4) The LF "mod": One trick published some years ago to get the R-390 to operate below 500 kc is to feed the antenna to the set past the first RF stage. This opens up the receiver to all sorts of distortion and overload. At least one article mentions the use of a preselector if you are looking for signals below the BC band. The 55G-1 RF Preamplifier made by Colllins for use with the 51S-1 receiver might be good for this, but unfortunately the only one I know of sold in quite some time apparently went for over $2,000. (On my to do list is a functional equivalent with a toobe instead of a FET.)

5) Antenna thoughts: > Sensitivity at the high bands might be improved with a pre-amp.

I can't quote correctly, but the very first ARRL Antenna Book mentioned that the most and least costly improvement in any station can be made by improving the antenna. In most situations that advice still holds even though many decades have passed. Happy preselecting, Roy

From chacuff at cableone.net Thu Aug 19 18:00:41 2004
Subject: [R-390] Mech filters

Well I've had my fill of crow for a while. (tastes a lot like chicken)

I had no idea so much was being done with defunct IF filters. That's great news....it adds to our ability to support these great radio's well into the future. I for one vote that no filter gets thrown in the trash....at least until someone knowledgeable in filterage deems it un-repairable. Beats the land fill. Who knows there may be a core charge on purchasing repaired filters in the future....or a deposit like on soda bottles years back to keep them out of the land fill. Cecil....

From ham at cq.nu Thu Aug 19 19:28:24 2004
Subject: [R-390] Pre-selector

Hi, One place that a pre-amp might help an R-390 is up on 10 meters. The radio is plenty sensitive enough on the lower bands but as frequency goes up the noise level off a typical antenna goes down. The antenna it's self gets smaller and both the man made and natural noise drop off some as frequency goes up. You can come up with a sub one dB noise figure pre amp for just about any band from 1 GHz on down. That has to be significantly better than the front end of most HF radios.
A simple way to check if it will help:

Listen to the noise out of the radio as you attach the antenna. If it goes up you don't need a pre-amp. Since you have an antenna trimmer involved it's a little more complicated than with a rice box, but the net result is the same. Take Care! Bob Camp KB8TQ

From stevehobensack at hotmail.com Thu Aug 19 19:55:05 2004
Subject: [R-390] RE: Mechanical filter repair

Hash: SHA1

Dennis, If you figure out how to match those Toko or Murata filters, post it on it on the net. Maybe a tech from those companies or Kiwa will know how to install them in Collins tube rigs. I know the filters limit bandwidth to 3 khz on my Sony 2010, and work well. As I remember, the speck sheet that comes with those filters shows typical installations only on transistor circuits. 73...Steve...KJ8L

From djmerz at 3-cities.com Thu Aug 19 23:03:20 2004
Subject: [R-390] Pre-selector

Bob, I've heard this said before - and I always delight when my receiver shows noise when the antenna is connected - a good sign. But what if the pre-selector that I add has narrower bandwidth than the front

end of the receiver I'm using but is still wide enough for what I want to hear? Won't I see a benefit by adding this pre-selector? another misinformed listener ready to be informed, Dan.

From dpharr53 at swbell.net Thu Aug 19 23:44:22 2004
Subject: [R-390] RE: Mechanical filter repair

Will do Steve. Actually, I've been looking at several alternatives in the ceramic Filter/resonator line. One other choice suggested by Les Locklear is: http://www.kiwa.com/kiwa455.html

These appear to be ceramic filters with a solid-state preamp to overcome the slight insertion loss. Also, they come pre-packaged so they might be easier to install. However, my plan was to gut the existing mechanical filter housing and insert the ceramic. But, of course, I would breadboard the thing first to make sure it works before destroying the already defunct filter.

>From everything I've read the mechanical filters in the R390A exhibit a 25db loss. The 6BA6 stage following the filters makes up this loss. So, since the ceramic filters want to see a low impedance source and load, I would think it would be relatively easy to design an attenuation/impedance matching network for each end of the filter. This would insure that the filter 'sees' the driving and load impedances it wants and also that the 455kc RF levels seen by the following 6BA6 stage are closely matched to the output level of the other filters.

I have found one interesting product by Toko in the Digikey catalog:

http://dkc3.digikey.com/PDF/T042/0701.pdf
http://www.tokoam.com/passives/filters/ceramic/pdf/cfm2.pdf

Also, here's an interesting tidbit - in the R390A-Y2K-Release-1.pdf manual on page 3-16 under the NOTES at the bottom of the page it states:

3. R-390A/URR MFG by EAC Serial No. 1 thru 460 have ceramic filters. Replace with mechanical filters when ceramic type are defective.

Apparently, the early EAC's had ceramic filters. So, I guess it can be done. 73 Dennis WD5JWY

From ham at cq.nu Fri Aug 20 10:35:04 2004
Subject: [R-390] Pre-selector

Hi, The balanced input to the R-390 has some fairly good filters on it already. In order to do better you would have to go to a fairly complex filter. The exception to this would be a notch filter for something like broadcast band overload.

So far pretty straightforward ..... now off the deep end .....

Passive LC filters are not quite as simple as they look. As you add sections of a filter together they interact with each other. A simple example is to whip up two identical three element pi section 1 MHz low pass filters. Check them out to make sure they 3 dB right at 1 MHz. Next put them in series and check out the result. For most filters you now have something that peaks significantly and may or may not cut of anywhere near 1 MHz. If you do the math for a proper five element filter you will find that the parts values are not the same as for the two three sections put together. The two filters interacted in a

fashion that is predictable (the math works) but not intuitive (1 + 1 does not = 2). Filters can be cascaded but you can't design them to run into and out of a resistive load and then go and run them into something way different ....

Now back to reality .... sorry for the drop off into theory land.

If you have a passive filter on the front end of the R-390 *and* its narrower than the filter that's already in the R-390 front end then they probably are going to interact. The result may be a filter with more loss or a wider pass band than you expected.

A solution to the problem is to isolate the two filters. That way they won't interact. The good old way to do this was to slap a tube in between the two filter sections. That keeps each filter so it runs like it should. Another equally good solution is to slap a 10 dB attenuator in between the two filters. Either way the filters each see a proper resistive load and they work right.

If you go with gain to isolate the two filters then you have a real possibility of overload and distortion. If you put in a pad then you have cut your sensitivity. Either way you are trading off one thing for another. I'm not suggesting that you can't do a better job than was done on the radio originally. All I'm saying is that it's a fairly complex thing to do. Take Care! Bob Camp KB8TQ

From ham at cq.nu Fri Aug 20 10:43:50 2004
Subject: [R-390] RE: Mechanical filter repair

Hi, The early EAC's did indeed have ceramic filters in them. Of course they were designed to match tube input and output impedances. Needless to say that made them very different parts than the ceramic filters you can buy today.

If you are going shopping for filters be careful to check out both the skirt selectivity and the ultimate attenuation numbers. It would be a shame to go to all the work of matching them into the radio and find out that the selectivity of the radio had been degraded. IF filters are *very* sensitive to matching impedances so it will be a fair amount of work to get it right ....

There is a note in one of the Collins reports on the R-390A that suggests the original requirement for the ultimate selectivity of the radio was not met in the final design. There is no further elaboration on exactly what the issue was. If they are referring to an IF issue then there may not be a whole lot of extra margin on the filter chain. Take Care! Bob Camp KB8TQ

From ham at cq.nu Fri Aug 20 11:05:26 2004
Subject: [R-390] Antenna Noise

Hi, We (I) keep talking about the noise of the radio going up as the antenna is attached. That's all well and good and it's an excellent way to check a receiving system. Like everything there are a few things you need to be careful of on any radio and a few things specific to the R-390's.

The first thing to watch out for is a front end that is going in and out of oscillation. This is not a problem on a well designed radio, but not all radios are well designed. It can be an issue on a radio that's broken. Generally the effect is dramatic, the noise goes from "lots" to "none" when fairly small changes are made. The front end gain goes pretty much to zero dB when it starts to oscillate....

If you have a radio with a very hot front end then it may have a significantly different noise output with 25 ohms on the antenna terminals than with 100 ohms. To be absolutely accurate you should first measure the noise with the correct resistor on the antenna terminals and then check it with the antenna. If you are working on a moon bounce 0.4 dB noise figure pre-amp for your R-390 then this is something to watch for.

An R-390 and most of the radios of it's era have a tuning adjustment on the front end of the radio. Modern radios seem to have forgotten just how neat a thing this is. Unfortunately this makes the antenna test a little more difficult on the older radios. To be totally accurate you need to first peak up the radio with the resistor on the antenna input and then peak it up with the antenna. The proper comparison is between the two peaked conditions.

On a radio with a good AGC you can have a case where the AGC comes in and makes this all a bit hard to check. Most noise measurements are made with the AGC turned off for this reason. As an alternative you can monitor the AGC voltage and see what's going on. Of course to do this you need a radio that was nicely designed to have the AGC voltage show up on a easy to get to terminal strip on the back, or better yet a nice Navy installed jack on the front panel.

IF filters do not all have the same insertion loss. If you have a radio with significant differences between filters this can be an issue. One example would be a 4 KHz filter that has the foam inside turning to sludge. In that case you need to check with the filter you will be using. On a normal radio with well matched filters the measurement will be lots easier with the widest bandwidth filter you can switch to. That way the noise through the filter will swamp any audio chain hum and noise as much as possible.

So now we have a really complicated way to do something that was nice and simple. What you used to be able to do in about 10 seconds now takes the better part of an hour and requires a spread sheet to interpret the results. Well maybe not. The human ear is a marvelous thing. You can pretty quickly tell the difference between antenna noise (static pops and crashes) and thermal noise (no pops). Once you get used to the difference it's easy to spot a problem. So much for all the theory junk above and back to a quick and easy check. Take Care! Bob Camp KB8TQ

From chacuff at cableone.net Fri Aug 20 11:24:14 2004
Subject: [R-390] Pre-selector

Group, I agree with Lester and others that have commented.

I think the first question that needs to be asked is what problem are we trying to fix? Are we trying to increase sensitivity, reduce noise floor, eliminate adjacent channel interference..etc...?? (probably others that could be added to this list)

Then determine two things....is the radio fully up to specification and not the source of, or contributing to, the problem. (try other radio's on the same antenna system and determine if the problem still exists...even a high quality modern rig.)

Then when all those questions are answered and the radio is eliminated as part of the problem...what would be the most appropriate fix for the problem. Could be as simple as some grounding improvements. Could be a local interference source that needs to be located...might be contributing to the creation of an intermod problem which can present itself as adjacent channel problems or overloading. (not a front end filter in the world going to fix an on frequency intermod problem)

As you can see we are shooting in the dark here....

I would say in general, the addition of a preselector to the front end of a properly working R-390A would probably not be an improvement....even with a preamp because unless the preamp is a late vintage, well designed preamp it would probably contribute more to the raising of the noise floor than to the improving of weak signal responsiveness of the radio. A well designed radio has the gain well distributed along the signal path to detection...adding significant additional gain to the front end brings along with it a truck load of new problems....even when combined with tunable selectivity.

I've heard stories of guys bringing in an R-390A to replace any number of receivers used in amateur rigs of the last 20 years at annual Field Day events practiced by the Amateur Community because a complete operating position was rendered useless due to overloading from a co-located transmitter and antenna system but on another amateur band. The R-390A didn't even know the co-located radio systems were there. (as the story goes) Makes sense since the same type conditions existed many times in ship board installations. Hard to improve on that! Cecil Acuff WB5VCE

From roy.morgan at nist.gov Fri Aug 20 11:27:49 2004
Subject: [R-390] RE: Mechanical filter repair

: >... I've been looking at several alternatives in the ceramic >Filter/resonator line. ...my plan was to gut the existing mechanical >filter housing and insert the ceramic.

Dennis, Please consider running a little DC into the reworked filter case for any needed amplifier. This could be delivered either by a DC supply in the case, or external to it, that runs from the radio filament supply.

There would be challenges in keeping "blowby/leakage" and noise controlled. Filament lines are notorious for carrying noise and unwanted signals. Notice the filtering in the B+ and filament lines to the oscillator module in the HP 606 signal generators, for instance. These are necessary to limit leakage. The same basic situation exists in the R-390 IF module.

> But, of course, I would breadboard the thing first to make sure it works > before destroying the already defunct filter.

I imagine a bit of 5/8" copper tubing with end caps held on with screws.

Related note: A short piece of 1-inch copper tube, two end caps, and a couple of BNC connectors make a fine substitute for those often-missing URM-25 accessories: the 50 ohm load, standard antenna, impedance converter, and voltage divider. Clever workers will mount a Twinax connector on one end and incorporate the needed grounding of one twinax terminal, proper loading of the generator, and the advisable 10:1 or 100:1 voltage divider all in one unit. Roy

From roy.morgan at nist.gov Fri Aug 20 11:29:13 2004
Subject: [R-390] Pre-selector

wrote: >... what if the preselector that I add has narrower bandwidth than the >front end of the receiver I'm using but is still wide enough for what I >want to hear? Won't >I see a benefit by adding this preselector?
Dan, The preselector is operating at the received frequency, and will almost certainly have a bandwidth

wider than the IF if the receiver.

The IF bandwidth is set by the mechanical or crystal filters (and by the whole IF strip for those with "the MAN's R-390".) The Pre-selector is a tuned circuit (or maybe two) at the normally much higher received frequency, and the Q needed for, say, 4 Kc bandwidth is not practical to build.

The situation is different at LF and VLF, and in particular with TRF and regenerative detector receivers (such as the RAK/RAL at lower frequencies.) Roy

From wf2u at starband.net Fri Aug 20 11:32:34 2004
Subject: [R-390] Antenna Noise

Re.: low noise front ends - it is good to keep in mind, that the ambient atmospheric noise in the HF band (up to 30 MHz) averages 8 dB. Going out of the way on HF with attaching sub - dB noise figure preamps is a complete waste of effort, as it's not going to reduce the 8 dB noise you're going input to your receiver even under the most idealized conditions. Antenna mismatch from the lowest noise input complex impedance at a particular frequency and individual receiver is going to contribute additional noise. As we all know, the best noise figure is not at the best impedance match anyway...

Fractional dB preamps are only valuable and necessary in the higher frequency bands - VHF, UHF and microwave - where the ambient noise is under a dB or less. My 2 cents' worth... 73, Meir WF2U Gowensville, SC

From ham at cq.nu Fri Aug 20 11:54:14 2004
Subject: [R-390] Pre-selector

Hi, I agree that it's better to have a destination in mind before you pull out of the driveway ...

One of the things that we all are putting up with a lot more of these days is man made crud. Seemingly simple stuff like toasters all of a sudden are full of strange RFI inducing gizmos. This not the world that the R-390 was designed for.

There are several paths that RF can take to get into an R-390. The antenna connectors are the obvious ones, but the power cord is an equally good path under some conditions. Almost any wire that attaches to the radio *can* act as an antenna.

For those of us who live on multi hundred acre estates with several rhombics to choose between for any particular direction and band this is a particularly significant issue. It also impacts those of us who live in the real world.

The line filter on the R-390 is there for a purpose. On a lot of radios this filter has not survived very well. Replacing it with an outboard filter is a reasonable solution to the problem.

Isolation of any lines you have off of the radio may be as simple as a couple of resistors and maybe a coil or two. It may be a lot more complicated depending on how much crud you have in the same room as the radio.

How does this all relate to preselectors?

If the crud is coming from your VGA through the audio cable to the speaker no amount of preselection on the antenna lead is going to help you. You first need to be sure that the radio is quiet *without* the antenna. This is a bit easier on something like an R1051 with it's monster shield of a case than it is on a R-390.

One nasty thing can be an RF loop that runs from a local crud source out to the antenna ground. The radio sounds fine with no antenna so the assumption is that the curd is not local in origin. A balanced antenna connection can help this out. Also an RF isolation transformer may be of help. Until you are sure that the problem is definitely coming from the antenna any work on preselection will be a very frustrating exercise. Take Care! Bob Camp KB8TQ

From ham at cq.nu Fri Aug 20 12:09:43 2004
Subject: [R-390] Antenna Noise

Hi, Absolutely true.

The only case that can be made for a super pre amp on a good efficient antenna is up in the UHF / moon bounce area. Even a good antenna will have a significant amount of thermal noise if it's pointed at ground level targets.

Not all antennas are good efficient antennas.

Sixty feet of coax buried three feet down in the back yard terminated in 50 ohms will act as an antenna. It's not an efficient antenna, but it is an antenna. It will pick up signals and they can be heard on the receiver. Since the efficiency of this kind of antenna is quite low it will not have as much atmospheric noise out of it as a matched dipole. It's source impedance may be similar to the source impedance of the dipole, but it's noise will be lower. Of course the signal is also lower so who knows which antenna is better.
There are a number of these sorts of antennas out there. Most of them are quite small compared to a dipole and are resistively loaded in some way to improve directivity. The impedance match on these antennas does not imply that they have the same power capture as a properly matched short dipole.

In the case of a low efficiency antenna like this you might need a lower noise front end even down at some fairly low frequencies. I'm not suggesting that we all go use our coax feed lines as antennas, only that it has been done. It is a special case but it does come up from time to time. Take Care! Bob Camp KB8TQ

From roy.morgan at nist.gov Fri Aug 20 12:20:46 2004
Subject: [R-390] Antenna Noise

wrote: >... the ambient atmospheric noise in the HF band (up to 30 MHz) averages >8 dB.

Can someone give a relatively simple explanation of what this means?

I seem to remember that the "8dB" indicates that a certain (standard?) antenna will deliver 8 dB more noise to the receiver than a resistor (at room temperature?) equal to the antenna's impedance. Do I have that right?

Maybe we could watch the RF Level meter and see such a change.

Related musing: I wonder if anyone has measured the response of the RF Level meter and receiver system to see if the indications are anywhere near right. Roy

From kgordon at moscow.com Fri Aug 20 12:46:02 2004
Subject: [R-390] Antenna Noise

Concerning noise levels below 30 Mhz: while I agree that noise in this range averages 8db, as implied by the word "average", there are times when it is both significantly lower, and significantly higher than 8db.
Although, hanging a pre-amp on an R-390(A) is completely unnecessary, IMHO, there ARE times when, with OTHER receivers, a lower receiver noise level would be very useful.

In my experience, some of these times were when I was doing 'phone patching into SEA during the Vietnam troubles. I was operating for AFMARS and working above the 20 meter band.

I purposely modified the driver I was using, an SB-101.5 (!), for lowest receiver noise possible, and could often run phone patches long after the SEA stations could not be heard at all on a KWM-2A sitting along side the SB-101.5, because of the higher noise level in the KWM-2A.

Admittedly, this did not often occur, but it did often enough that I thought the effort well worth while. Hopefully, the guys in SEA thought so too. Ken W7EKB

From ham at cq.nu Fri Aug 20 13:21:49 2004
Subject: [R-390] Antenna Noise

Hi, Simply put it's how much "extra" noise the antenna has.

A resistor at room temperature generates a certain amount of noise all by it's self. In a 50 ohm system this is about -174 dbm in a 1 hertz bandwidth.

Any antenna the size of a dipole or smaller *if* properly matched to it's load (and that's a big if in the case of antennas well below a 1/2 wavelength) will pull a certain amount of power out of the air.

To keep things simple let's just say that we compare a normal 50 ohm resistor to a normal dipole and that the dipole is up high enough that it is working well.

The common way to look at it is "how much more noise did I get from the antenna than from a normal resistor?". It's a lot easier to understand 1.9 dB that way than in terms something like -172.1 dbm in a 1 hertz bandwidth. The definition also fits into the noise figure concept fairly well. You can also look at it as the noise figure of your antenna. People sometimes carry it one step further and talk about the noise temperature of the antenna.

People have spend a lot of time looking at how much background noise you get at various frequencies, times of year, angles of polarization, and for all I know as a function of the phase of the moon. You also see data up at radar type frequencies that is correlated to how far above the horizon the antenna is pointed. If anything there is more data on this stuff than you can keep up with.

The measuring systems I am familiar with sit there on the antenna and average the output of a receiver over a period of several minutes and then record the result. When you do this there are a bunch of

variables like antenna gain and the sensitivity of the radio. One of the most common ways to do this was with an R390 hooked to a chart recorder. An awful lot of universities have an R-390 or ten sitting around from these 1950's and 1960's projects.

I suspect that does not qualify for the winner in the "simple explanation" category ..... Take Care! Bob Camp KB8TQ

From ham at cq.nu Fri Aug 20 14:05:55 2004
Subject: [R-390] Antenna Noise

Hi, Here's a link www.ofcom.org.uk/static/archive/ ra/topics/interference/documents/rsgb.pdf to a little four page thing on noise. One of the things it shows is that the picture changes fairly dramatically at about 15 MHz. Below 10 MHz the 8 dB number is probably optimistic most all of the time. The chart they give shows numbers in the 15 to 20 dB range for most of the 500 KHz to 10 MHz region. The other thing they plot is man made noise. In that case you are talking about 50 dB of noise by the time you get to 1 MHz. A lot is going to depend on how much noise you get from your neighbors. Take Care! Bob Camp KB8TQ

From vk2abn at batemansbay.com Fri Aug 20 21:58:52 2004
Subject: [R-390] preselectors

The only case I could see for the use of a preselector with a 390A RX is if you wanted to hear in duplex mode close to your transmit frequency . Both Racal and Collins have produced boxes for this purpose, I had a Pair of URC32 trancievers from one of our Oberon class Submarines that were fitted with Tracking Preselectors and I was able to have Full Duplex QSO s with in the 80 meter band with with 200Khz separation and running 1Kw input .I have also seen similar boxes for the 618T system to permit full duplex telephone calls on 747 aeroplanes ,I still own a Racal box called a preselector and protection unit that I use in conjunction with my Ra17L ,it was desighned so that you could opperate the reciever in a transmitter hall and not burn out the rf coils when you tuned across the transmit freq. and so you dont hear birdies associated with mixer overload This box also has the facility to instataniously switch it out of circuit so you can see what it is doing and I have never experienced a change in signal to noise ratio and all these boxes do is Increase the dynamic range of the system, further the dynamic range is increased much more on the lower frequencies than the higher frequencies due to the attainable Q of the tuned circuits dropping off as the frequency goes up there are diminishing returns.But in a contest on 80 or 40 meters and someone running a kilowatt just down the road one can opperate with impunity , or if you lived next door to a 50 Kw broadcast station you would probablly gain from having one of these boxes, the dynamic Range of the 390A is in the order of 80Db which is pretty amazing for a general coverage reciever of this age. HOW GOOD is it well looking on the TENTEC site the published figures on the Kenwood TF2000 is 69Db the FT1000Mp is 73Db and so on, so even after all this time the 390A is still a FORCE to be reckoned with amongst recievers, I hope I have explained the use of PRESELECTORS , regards to all.

From ham at cq.nu Fri Aug 20 22:17:52 2004
Subject: [R-390] preselectors

Hi, Sherwood Engineering has a pretty good page on comparing various radios http://www.sherweng.com/table.html . The amazing thing about the R-390 is that it combines good sensitivity with good overload performance. It is not tops in either category. It's the combination of the two that makes the R-390 one heck of a radio. Take Care! Bob Camp KB8TQ

From w9ran at oneradio.net Fri Aug 20 23:12:24 2004
Subject: [R-390] ER mods

Any comments on the Felton R-390A mods in the last issue of Electric Radio? 73, Bob W9RAN

From djmerz at 3-cities.com Fri Aug 20 22:01:01 2004
Subject: [R-390] Pre-selector

Bob, ok, I am listening and becoming informed. My idea probably has no bearing on making a 390a work better. I do remember an article by D. Langford where he put a 6 khz filter in a 390a in front of all the other filters to improve the set, closer to the front end. My thinking started extending to the idea that if you didn't want to tune the radio and were happy with a fixed channel, how close to the antenna could you put a crystal or mechanical filter, and derive much improved performance. Have such receivers been built? It would seem that whispering is one of the earliest forms of hiding your conversation from another listener. Has this principle been extended to radio transmission by making the receiver capable of hearing such weak signals that no one else, except someone with the same type of receiver, can hear the deliberately weak signal. Or is this wishful thinking that such a concept would work? I suppose it's simpler to just encode the information by other means. Dan

From ham at cq.nu Sat Aug 21 17:26:33 2004
Subject: [R-390] Pre-selector

Hi, That's a couple of different questions on a couple of different topics. Yell if I miss one of them.

Back when I worked for Motorola one of the standard products we made was a crystal filter that you stuck in the antenna line of your two way FM radio. Since the filter was in front of the entire receiver I suppose that's about as far forward in the process as you can possibly push the filter. I have seen the same thing done at HF both by Ham's and in military settings. NASA uses the same idea on their command destruct receivers.

One problem with putting a poor little filter way up by the antenna is that filters have overload problems and produce intermodulation products. You can have a situation where the little narrow crystal filter actually produces a worse result than a big helical LC filter with a wider pass band. It all depends on how far away the overloading signals are from your channel.

Another problem with any kind of narrow front end filtering is that they generally have measurable insertion loss. If you have a six dB loss in the front end filter you drop the noise figure of the radio by at least six dB. If you are trying to pick a weak signal this is probably not a real good idea. To use your analogy of whispering, it only works in a quiet room. Making the room more noisy isn't going to help things much ....

Cascading filters to get better selectivity is a workable idea. You have to be careful about pass band ripple. Depending on just where each filter peaks and dips you can wind up with some odd results. One solution is to use filters that have been designed from scratch to be cascaded. Another solution is to make one filter much wider than the other and pick a wide filter with very little ripple in the middle of it's pass band.
Using the minimum amount of power to get a message through is one way to reduce the probability of intercept. One issue is the relative location of the intercept station If my R-390 has a better path to the

transmitter than the intended receiver then my R-390 is going to get more power than the guy the message is intended for. Since propagation can be very strange stuff a better path may or may not be related to being closer to the transmitter. There are a number of stories about HF and even VHF intercept taking place at significant distances from the transmitter. Of course they may just be stories ....

Like it or not there is natural noise out there. It's a fact of life. As long as you are operating on a terrestrial path it's going to be a very significant limiting factor on what you can or can not do. Even with space communication they get to a noise limited situation, they just have to work harder to get there. Different modulation techniques result in different relationships between channel noise and noise after demodulation. They all run out of steam at some point though.

A guy named Shannon came up with a relationship about all this back in the 1940's. Still seems to hold true today ..... You can go real slow and real narrow and use low transmit power. You can go nice and fast and wide and use lots of transmit power.

One interesting experiment with your R-390. Next time there's a lightning storm running a couple of towns over try to listen to a distant station through a narrow filter and through a wide one. Narrower is not *always* better .....

You can design a system to perform optimally under a stated set of conditions. That often means it will be non-optimum under a much wider set of conditions. No free lunch .....

The R-390 is an amazing compromise design that works awfully well under a wide range of conditions. It's a few dB shy of being optimum on a number of measures. It is a good example of covering a lot of bases well rather then just one base and throwing the rest of it away. Even so it's only a few dB away from perfect .... Take Care! Bob Camp KB8TQ

From djmerz at 3-cities.com Sat Aug 21 20:36:16 2004
Subject: [R-390] Pre-selector

Bob, thanks for the examples of real attempts at doing this sort of thing. I'll chew on it awhile. I've never read any of the initial defining theory for all this stuff - but the slow/narrow vs fast/wide makes sense and relates to what I've mostly heard and read about information theory. It may be analagous to picking any two of - price, schedule, quality- and I'll tell you what the third will be. Pick any two of bandwidth, speed (information rate), power and I'll tell you what the third has to be. Now this is getting far afield. thanks for relating your memories of some real gadgets - I'd love to know more about those filters at the front end - a crystal or mechanical filter only has so much off-frequency suppression which just isn't always good enough to keep out the strong signal relative to the one that we desire going down the pike unless we put it where the relative level of the two is more favorable, and you have to worry about noise figure degradation as well, best regards, Dan.

From drw at tennis.org Sat Aug 21 21:21:18 2004
Subject: [R-390] New to the list / My R-391 & those ELUSIVE Tools!

Greetings, Name here is Dan - KG4WTL I am the proud owner of Collins R-391 #169, it resides with me in Chattanooga, TN

Why are the back panel parts Soooooo hard to come up with! ALL of mine are missing.

Need both Tube Pullers, the Screwdrivers, and the Wrenches.

Also still need the spare fuse cover.

The Huntsville, AL Hamfest netted me a Power plug and an Antenna C to BNC adaptor today. I have been slowly restoring this old beast, been a long hard road!

Have put 2 reproduction tags on the front (why are the tags always missing!) 2 new Reproduction top and bottom covers Reproduction covers on back

This reciever came out of an old out building and had been sitting on a pallet with a TON of other vingage STUFF, I brought it home (it was free for the hauling (almost soiled myself LOL)) and spent 6 hours cleaning it up inside and out, checked it over and plugged it in... (keep in mind it had been sitting in an unheated building for over 10 years!) and it worked! This is a testamonial to how rugged these radios really are, this one is a real performer, it will outdo my kenwood TS-520, my Yaesu FT-101, it runs circles around my Harris RF-350K!

Now, WHERE CAN I GET THOSE DARNED ELUSIVE TOOLS!?!?!?!????!!!! Dan - KG4WTL

From ham at cq.nu Sat Aug 21 22:49:43 2004
Subject: [R-390] New to the list / My R-391 & those ELUSIVE Tools!

Hi, Well the tools are missing for a very simple reason. The first tech to get a hold of he radio who does not have a set grabs them and puts them in his tool box.

The R-392 comes with the tools inside the bolted shut radio outer case. This makes the tools hard to snag without a bit of work. Most of these radios come out of the military with the tools still in place. Few of them make it past their first ham owner with the tools still there. I certainly never let a set get past me ....
The tube pullers are fairly easy to find. They show up at hamfests and on auction sites from time to time. If you are not to particular about color there are places like **Contact East** that will sell you wrenches that are approximately correct. Good luck finding original wrenches ...Take Care! Bob Camp KB8TQ

From drw at tennis.org Sun Aug 22 17:12:55 2004
Subject: [R-390] This Mailing List & my R-391

I want to thank everyone who replied to my R-391 tool inquiry. It really looks like it was my lucky day when I found the list. I still havn't found any of the original tools for my 391 (might never) but I did get some useful leads on reproduction and almost tools.

Now, where can I get a manual with alignment procedure? My 391 works well for a radio that sat in an unheated shack for 10+ years in a PILE of vintage gear but I would like to see it get a tuneup as is deserving of this exceptional old reciever. Does anyone have a lead on front panel touchup paint?
Dan - KG4WTL proud papa of R-391 #169

From dpharr53 at swbell.net Sun Aug 22 19:17:25 2004
Subject: [R-390] R390A Carrier Level Meter Question

Does anyone happen to know for certain the value of the meter movement used for the Carrier Level meter on the R390A? Is it a 0-1 milliamps, 0-50 microamps, 0-200 microamps or what? My R390A, as usual, has no meters, so I'm trying to build an external rack-mount panel with larger meters for some type of visual indication. I already have a large VU meter that works for the line-level and I have numerous DC meter movements that should work for the carrier level meter. I could probably determine the value of the original meter movement experimentally, but if someone knows exactly what was used in the original design, I would appreciate the info. 73 Dennis Pharr WD5JWY

From Llgpt at aol.com Sun Aug 22 20:33:10 2004
Subject: [R-390] R390A Carrier Level Meter Question

FS = 1 Ma. Full scale 1 Milliamp. Les Locklear

>FS = 1 Ma. Full scale 1 Milliamp.

Yes, but there's more. Not just any 1 ma full scale meter of the right size will work. The original meters had an internal resistance of 17 ohms or some such. Hard to find. Not impossible to have made but they's cost some $100 each if we ordered over a hundred. There have been a number of articles and web pages that describe how to use other meters instead of the original one. Roy

From djmerz at 3-cities.com Mon Aug 23 13:29:45 2004
Subject: [R-390] LPF-1 i.d.

Hi, this question may be related to 390a but I think it's more likely related to some other military radio. At a swapmeet, I picked up what I thought was a small enclosed transformer with 4 posts marked grnd, 500, 15K, and 100K on the terminals and marked LPF-1 (low pass filter??), about the size of an audio output transformer in the 390a. I thought it might work well for 100K to 500 ohm impedance match for a crystal set to sound powered phones - which it did using the 15k, 500 and ground connections with the ground in common. And it worked better than some of the transformers recommended for this use that I picked up at Fair. But it's not a transformer - more like an autoformer with only one leg (continuity dc-wise between the four posts) or a leg with two branches to the 15K and 100K posts. It's a bit of a mystery but works well for what I wanted. It didn't match anything I see in an RAL-8 or the 390a. Has anyone run across this or know what it came out of. I suspect it's part of an audio filter. There are no other numbers or i.d. on it - it's black with 6 screw holes on the bottom flange.

There were only a few boatanchors at the swapmeet in Seattle, which was an antique radio club event. I did see a couple of Hamm. HQ-129's, one for $50, which surprisingly I think went unsold, and one SX-28. No sign of 390's. thanks for any help, on or off the list, Dan

From chacuff at cableone.net Mon Aug 23 14:18:45 2004
Subject: [R-390] R390A Carrier Level Meter Question

Probably would be good to include the specs. on the VU meter as well...I assume it is unique in some way as well..

From David_Wise at Phoenix.com Mon Aug 23 14:27:45 2004
From: David_Wise at Phoenix.com (David Wise)

Wondering what will happen if you put in any old 1mA meter? The R-390, R-391, and R-390A use the meter as one leg of a bridge circuit, and the meter was wound with unusually heavy wire to get the exact resistance required to give the correct calibrated response. Most 1mA meters have coil resistance higher than 17 ohms. If you install such a meter, the radio won't be harmed, but the meter will not go upscale as far as it should for a given carrier level.

There is info around which explains how to modify the radio to use a given meter, and other info on building an amplifier to make a meter compatible with an unmodified radio. I don't know if the following is mentioned anywhere. It probably is, but it doesn't take much space to explain, and if you can find an appropriate meter it's the "smallest" mod possible.

You are not restricted to a 1mA meter per se. You can use a more sensitive meter along with a shunt to give a 1mA full-scale response. This does not escape the basic problem of coil resistance, but it does widen your options a bit. For example, if you had a 50uA meter with 340 ohms coil resistance, you could shunt it with 17.9 ohms. The problem is, 340 ohm 50uA meters are just as rare as 17 ohm 1mA meters. Still, you never know what will pop up in the junk box.

By the way, there's nothing sacred about the exact 17 ohm value, that's just what they found would give about the right cal most of the time. If you really care about this and have a signal generator where you can trust the output level, you can calibrate the meter to match your particular radio by tweaking its resistance slightly. On the other hand, this goes against the idea of interchangeable parts, which was a fundamental tenet of the radio's design. 73, Dave Wise (SWL)

From ham at cq.nu Mon Aug 23 18:56:57 2004

Hi

One of the amazing things about an R-390 is just how accurate the carrier meters are. Every one I have checked has stayed pretty darn close over the whole range above 20 dB. They have been pretty good at 10 dB. When you take a look at what they had to do to make that happen there's a lot that went into it.

All that said there is another way to go. The good old back panel connector has the AGC voltage on it. No big surprise that the AGC voltage also follows the carrier level. In a number of situations the AGC voltage was used instead of the carrier level for accurate signal monitoring. If you are going to rig an external setup there should be a way to do a LCD display that would show signal level to a tenth of a dB over a 100 dB range. You'd be the only one in town with one of those .....

By using the AGC voltage you would also get around the normal problems with the carrier meter zero pot. That alone would be worth the effort. Enjoy! Bob Camp KB8TQ

From DCrespy at aol.com Mon Aug 23 19:39:35 2004
Subject: [R-390] R390A Carrier Level Meter Question

Dennis, I assumed you were asking to decide on a substitute? If so: the problem is not the full scale current, it is the internal resistance of the meter.

Most 1ma movements are 100 ohms. The R-390A needs (if I remember right) 18 ohms. I have successfully used up to 38 ohm movements with completely comparable results. 100 ohm movements

just do not work. If you are thinking of shunting a meter, the problem is the same. Most 100 microamp meters are 1000 ohms, so shunted, you still wind up with a 100 ohm / 1 ma meter! The 38 ohm meters I have used (International brand) had a series internal resistor, that when removed dropped the meter resistance. Good luck and have fun! 73 Harry KG5LO Saline MI (home of a dozen meters that fit, but don't)

From dpharr53 at swbell.net Mon Aug 23 22:08:59 2004
Subject: [R-390] R390A Carrier Level Meter Question

Thanks Harry (and all the other respondents) for the advice. Actually, I was aware of the meter resistance issue. I was never intending to try to directly substitute another 1 ma. meter movement directly into the existing R390A bridge circuitry. I've found a couple of matching 5 ma. meter movementments in my junkbox that I've decided to use. I'm planning to use an (dare I say this) external opamp DC amplifier along the lines of the Jan Skirrow article "Adapting Surplus Meters for the R-390A" (link below): http://skirrow.org/Boatanchors/TechTalk2.pdf

Calibrating the Line Level VU meter will be no problem. Trying to calibrate the Carrier Level meter is another issue entirely - I'm not even going to try. The plan is to install the opamp and meters, tune to a locally strong broadcast band station and set the pointer on the Carrier Level meter at about 75% full scale and call it done.

Thanks again to everyone for all the advice. This email list is the best resource I've ever run across on any subject in amateur radio or SWL. The wealth of knowledge here is simply amazing. 73 Dennis Pharr WD5JWY

From ToddRoberts2001 at aol.com Mon Aug 23 22:53:43 2004
Subject: [R-390] R390A Carrier Level Meter Question

writes: Dennis, I assumed you were asking to decide on a substitute? If so: the problem is not the full scale current, it is the internal resistance of the meter.

Most 1ma movements are 100 ohms. The R-390A needs (if I remember right) 18 ohms. I have successfully used up to 38 ohm movements with completely comparable results. 100 ohm movements just do not work. If you are thinking of shunting a meter, the problem is the same. Most 100 microamp meters are 1000 ohms, so shunted, you still wind up with a 100 ohm / 1 ma meter! The 38 ohm meters I have used (International brand) had a series internal resistor, that when removed dropped the meter resistance. Good luck and have fun! 73 Harry KG5LO Saline MI

Very good points Harry! I had investigated using other meters in the past. I had determined that if you picked up a nice assortment of 100 and 50 microamp meters (usually at hamfests - 1 3/4" square size) you would hit on one that had the right amount of internal resistance that could be shunted and end up with a 0-1ma movement with a resistance in the 18-40 ohm ballpark. From then on you would know which scale and type of microammeter to be on the lookout for. Lafayette Radio used to sell a line of Argonne panel meters that would fit the R-390A front panel. (1 3/4" square size) I have one R-390A with a Lafayette/Argonne VU meter that fits just right and looks very nice and appears to have the right sensitivity. That would be one meter to be on the lookout for to substitute as a line-level meter. 73 Todd Roberts WD4NGG.

From mparkinson1 at socal.rr.com Mon Aug 23 23:46:16 2004
Subject: [R-390] R-390a meters

How can you really test what the resistance is on the sub 1Ma meter? I have several of them I did put it into the R-390a receiver to test it and it seems to work very well. I compared it to the original meter watch both working at the same time and frequency and didn't see any difference. But would like to know how to test the internal resistances of the movement. thanks Matt.

From woodrat at citynet.net Tue Aug 24 05:17:50 2004
Subject: [R-390] Dead Line Level Meter

A couple of weeks ago I asked if anyone was able to "unleash" a line meter to replace a dead one I had. I wanted to thank all who responded, with advice on how to tackle possible repairs. It was the meter...it was "open". One kind lister is supplying me with a replacement. I will put the old one away, to be opened when the next one goes south or till my poor, long suffering wife has to peddle all my "junk" in my estate sale! Thanks again, Larry

From chacuff at cableone.net Tue Aug 24 10:05:22 2004
Subject: [R-390] Wives and Boatanchors

That brings up a worry of mine Larry, I keep bringing more "Stuff" home and very little "Stuff" ever goes out. One of these days my Lovely and Understanding better half is going to get stuck having to liquidate this mess....when do you decided enough is enough and start unloading the collection of stuff. I am certainly not ready at this point but worry I probably never will be. Tough problem for spouses of boatanchor lovers. Cecil....

From roy.morgan at nist.gov Tue Aug 24 11:07:48 2004
Subject: [R-390] R-390a meters

wrote: >How can you really test what the resistance is on the sub 1Ma meter? ... would like to know how to test the internal resistances of the movement.

Matt, and others, There was a long thread on this some time ago. I now can't find any of the posts, but here is a summary of the situation:

1) There is a technique in at least some ARRL Handbooks to measure the internal resistance of a DC meter. Part of the discussion was that the method described would lead to some errors. Those errors may be small with a higher voltage battery (such as 6 volts instead of the single cell they suggest.)

Be *very* careful with clip leads and such. Any normal battery will destroy a 1 mA or 50uA meter in less time than it takes you to say "OH DARN!"

2) Short method: Get a voltage source and a resistor estimated to get the meter to full scale. Make up the resistor of mostly fixed and partly variable (this reduces the chance of a disaster.) Set the current to full scale and then connect a second variable resistor *across* the meter and adjust till it reads *half* scale. Remove the parallel resistor and measure it with an ohmmeter to get the internal resistance of the meter.

3) Refined method: Do as above but put a current meter in series with the circuit (a DMM is good here).

Alternately adjust both variables for the original full scale circuit current and half scale reading. This will eliminate errors due to changed total current. The difference may be negligible with sensitive meters. If your meter has a full scale current of 25 mA or so, it will matter a lot.

4) If you know or can measure the full scale current of the meter, and you can measure very small voltages with moderate accuracy (e.g. 50 millivolts): Set up the series circuit with variable resistor and measure the voltage across the meter. Apply Ohm's law to figure the internal resistance.

From barry at hausernet.com Tue Aug 24 11:15:09 2004
Subject: [R-390] Wives and Boatanchors

Hi Cecil & Gang

Yup -- that concerns me often. Whether it be one's "Lovely & Understanding" or "She Who Must Be Obeyed" or whomever, in most cases, survivors won't have the time and/or interest to optimally sell off everything -- where optimal means both money and getting the stuff to a good home. Another factor, Cecil -- you're a relative youngster -- but most of the constituency is up there and aging, so unless there's a psychographic paradigm shift and a lot of younger folk get into it, there's a shrinking pool of acquirers.

Sometimes when I really think about it, I want to start selling off aggressively now -- while the potential market is still alive and kicking -- well at least walking. The worser half keeps threatening to dumpsterize my collection regardless of the value. But, I still keep acquiring more instead and I had plans of restoring all the stuff that needs it - and that's most of it. That will require extreme longevity -- maybe another 50 years -- if I get my a-- in gear now. This plan also relies on several major medical breakthroughs happening sooner rather than later.

One solution is the buddy system whereby one guy acts as excecutor of a portion of the estate -- everything electronic and maybe that 1927 Zorchmobile in the barn. The surviving buddy would get a percentage for selling off, doing the shipping, etc. However, there is a flaw in that plan. After Buddy #1 goes to BA heaven, he's obviously not in a position to reciprocate when it's time for Buddy #2 to exit stage right.
So, that approach would call for a larger group, hopefully with some younger guys in the mix. The last man standing would have to sell off his own stuff. To whom - -I dunno. Maybe we need an organization -- like the International Federation of Electronics Gear Collectors -- with a special traveling "graves detail" -- maybe a big black 18-wheeler draped in crepe.

Here are some other options: Boatanchor Pharoah Method - - An oversized mausoleam lined with racks of radios and test equipment. Pyramid design would be stylish, but impractical.

Viking Funeral Take-It-With-You Method -- Instruct that your remains be laid out and all your gear piled up on top of you and set afire. Have to forget about the boat part due to the weight, unless you have a surplus LST. To work right this might call for thermite. I don't think we're zoned for that here.

Presidential Method -- A library with BA's and manuals -- maybe one old teddy bear and a skate key.

More seriously, there are plenty of estate buyers around who know how to sell almost anything. All they have to know is how to take digital photos and accurately type what's on the tag into the item description. I suppose that's the last resort. Thanks a lot Cecil -- I was depressed enough before I read your post ;-(Barry

From richardlo at admin.athabascau.ca Tue Aug 24 13:13:13 2004
Subject: [R-390] Wives and Boatanchors

wrote: > That brings up a worry of mine Larry, I keep bringing more "Stuff" home and very little "Stuff" ever goes out. One of these days my Lovely and Understanding better half is going to get stuck having to liquidate this mess....when do you decided enough is enough and start unloading the My wife solved that problem by liquidating me.

From roy.morgan at nist.gov Tue Aug 24 12:24:01 2004
Subject: [R-390] Wives and Boatanchors

wrote: > ... in most cases, survivors won't have the time and/or interest to optimally sell off everything -- where optimal means both money and getting the stuff to a good home.

In earlier discussion of this topic, it's been mentioned that good documentation helps the survivors a lot. One fellow keeps a spreadsheet including information such as: item, photo, purchase value, notes on condition, current market value, buddy who should get this thing, notes and comments.

No survivors can be expected to know the difference between a badly built Heath SB 301 worth $150 and a mint-in-the-box Collins 51S-1 worth $3000. They are both the same size after all, and the Heath has more knobs!

Some notes on local clubs which have a widows assistance activity would help a lot. And warnings about the very friendly sounding "good buddy" of the SK who will clean out the shack of "all that old stuff" for a fixed price. 'Tis a challenge for sure. Roy

From lester.veenstra at lmco.com Tue Aug 24 12:35:22 2004
Subject: [R-390] Wives and Boatanchors

Thanks all, forwarded to "She Who Must Be Obeyed".

From David_Wise at Phoenix.com Tue Aug 24 13:03:39 2004
Subject: [R-390] R390A Carrier Level Meter Question

BWA-HA-HA-HA I can't stop laughing oh ouch my sides hurt! Thank you Michael. <wipes tears away> 73 (what's the code for "still laughing"?) Dave Wise

From bill at iaxs.net Tue Aug 24 13:06:31 2004
Subject: [R-390] Wives and Boatanchors

Cecil, Actually, its a lot like drinking. One radio acquired makes you feel good. The next one makes you feel better, and there's no pesky hangover.

Depressed? Had a bad day? Buy another radio, examine the beauty of it and cast it upon the pile of things to fix someday. There's a feeling of accomplishment that comes from buying a radio. If you're a fierce competitor, there's a feeling of accomplishment from stealing another radio. There's a feeling of

accomplishment from fixing a radio, but too often it is preceded by frustration that nothing you have done will make it work.

And so, bad day by bad day, the pile grows. If one radio is good, an estate must be ecstatic.

Then, when you thought the good times would never end, you discover that there really are limits to growth. It is time for the 4 step program:

1. Realize that there is a higher power.
2. Realize that your rational brain is no match for it.
3. Discover that there is joy in selling radios.
4. When they are all gone, re-discover the joy of buying radios.

Repeat 1 through 4 as often as necessary, for as long as there is a market in old radios. What Death doesn't accomplish by killing us off, BPL will. Happy collecting and recycling, Bill Hawkins

From woodrat at citynet.net Tue Aug 24 13:26:05 2004
Subject: [R-390] The Big Estate Sale

My darling wife keeps telling me to start making lists of everything I own and their approximate values so that she will have some clue as to how to peddle all this stuff one day. (Yeah, like that's gonna happen....I'll still be trying to buy stuff on my death bed"!) When I am in my "Florida mode" I belong to a regional club, the FAWG (Florida Antique Wireless Group). It seems like all us old f--ts eventually end up in Florida with most of our collections intact. The club has taken on the task of selling members collections when the need arises. This means about two or three monster auctions a year and it seems to have worked out very well for the club, collectors and the bereaved. Since the 390 list is not localized it couldnt work the same way, but I would suggest that anyone who is near "old f--t status" consider looking for and tying into a regional club. It sure works well for we Floridians. Larry, Hinton, WV

From redmenaced at yahoo.com Tue Aug 24 18:04:12 2004
Subject: [R-390] R-390a meters

--- mparkinson1 <mparkinson1@socal.rr.com> wrote: > How can you really test what the resistance is on > the sub 1Ma meter?
++++++++
Well, You would do the 1/2 scale method. That is you put a high-value pot in series with the meter and a low-value pot, those in parallel. Then you put a small DC voltage acrossed that set-up and set the high-value pot to the point where the meter reads full scale, then you set the low-value pot to where the meter is at 1/2 scale. The resistance of the low-value pot is now equal to the DC resistance of the meter.
Joe

From wf2u at starband.net Tue Aug 24 22:42:42 2004
Subject: [R-390] Wives and Boatanchors

My XYL is understanding: I explained to her that I've been a ham and owned radios longer than I've known her.

I also encouraged her to collect certain pottery patterns she likes. The agreement is I don't ask why she

needs another plate or pitcher for her collection as long as she doesn't ask why I need another radio for my collection. I even go with her to antique shops and markets - as long as it's not on hamfest days...

She told me that she'd like to park her car in the garage, which of course is where my radios live. I agreed, so we agreed on a budget to build a 24x24 shack so I can vacate the 24x24 garage. As to spending time outside the house, in the shack - she agrees it's much closer than the closest pub... (and much more convenient for her to summon me from there for "honeydo's"). Marital harmony reigns! 73, Meir WF2U Gowensville, SC

From N4BUQ at aol.com Tue Aug 24 22:52:19 2004
Subject: [R-390] Wives and Boatanchors

My favorite quote is one I saw on a T-shirt: "My wife said she was going to leave me if I didn't stop talking on these radios....Over". Barry(III) - N4BUQ

From ba.williams at charter.net Tue Aug 24 23:55:37 2004
Subject: [R-390] The Big Estate Sale

Maybe some members remember the story I told about the guy who had so many R-390s/boatanchors that his poor wife couldn't do the laundry unless he rolled the fully stocked rack out of the way of the washing machine/dryer. The same guy who started me out with my first R-390A (and my second one too.) Well, that is the same Larry. A real boatanchor kind of guy.

Good to hear from you again, Larry. Would you believe that my wife fell for the line that a nice SP-600 was to be for her to enjoy? Yup, and she didn't have any interest either. Was I ever surprised! It ended up being mine. (g) Barry P.s. I still have both of those R-390As

From sparks at codepoets.com Wed Aug 25 00:32:13 2004
Subject: [R-390] Wives and Boatanchors

I remember as a kid my Dad was into HO Scale model trains. He had an impressive railroad layout that many loved to see operate. One day my Mother, while watching the little trains roll by, casually asked my Dad how much he had invested in this "train stuff" his response was "About two cases of top shelf whiskey" she never asked again. She's still there, and so are the trains. 73 Tom K4NCG

From w5kp at direcway.com Wed Aug 25 09:29:12 2004
Subject: [R-390] Wives and Boatanchors

Yep, same deal here. I put in a Radio Shack FM intercom between the shack and the kitchen that piggybacks on the phone wires. That has saved us both a lot of steps, and helps lessen the isolation factor. It also gives her a "panic button" for peace of mind, since we live in the boondocks. I also ran a buried 100MB Ethernet link to the shop/shack, so the computer out there can share broadband service with the house. It took a run of about 450 feet total (250' as the crow flies). Of course that's too long for a straight Ethernet run, so it's broken up in the middle with a 100MB switch installed in the gazebo halfway to the house. Works like a charm, and allows me to share printers both ways, too. A side benefit is I can plug into the switch and surf with the laptop in the gazebo if I want, although can't imagine why I would. I also bridged a little USB wireless transceiver to the PC in the house, so I can surf from the

recliner during Sooner football games. Life is good! :-)

Before I retired, I was reluctant to spend much time out in the shack, since there wasn't much spare time at home to start with. But now it's a good deal, and probably helps by keeping us both somewhat out of each other's hair. Togetherness, like almost any other good thing, can be overdone. She sticks her head in the shack door about once a week or so, points at something, and asks "is that new?". Of course, I shuffle the gear around occasionally just to keep her guessing. She doesn't know one big box with a lot of knobs from another, and doesn't want to learn, but certainly is capable of retaining a visual pattern of what's been there a while, so I gotta be careful. She's getting smarter, though, and takes a closer look right after I've been to a hamfest. Jerry W5KP

From barry at hausernet.com Wed Aug 25 11:10:56 2004
Subject: [R-390] Wives and Boatanchors

wrote: > She sticks her head in the shack door about once a week or so, points at something, and asks "is that new?". Well, with boatanchors, the answer is always truthfully "No .. it's at least XX years old. I finally dug it out and I'm working on it. Very valuable now." > Of course, I shuffle the gear around occasionally just to keep her guessing. She doesn't know one big box with a > lot of knobs from another, and doesn't want to learn, but certainly is capable of retaining a visual pattern of what's been there a while, so I > gotta be careful. She's getting smarter, though, and takes a closer look right after I've been to a hamfest.

Ah yesss!! The ol' boatanchor shell game or variant of Three-Card Monty. Just be careful the "mark" doesn't try to mark the cards, uh radios.

Another trick, conjured up from some of the other posts -- Next time you come back from a hamfest, leave a Jack Daniels carton in plain view. When she asks you about it, fearful that you're taking up some serious drinkin', there will be just be some humble radio parts inside and you say ... "Yup .. pickin's were awfully slim at that hamfest, but I did pick a box of ol' parts for a few bucks." She'll be so relieved at the harmlessness of the contents, she won't notice the Clyde-Bide-Bedeiter 300A that followed you home.

Of course, if you get nailed, there's always "Yeah, but you shoulda' seen what I SOLD off!" or ... "Oh this little thing, I got it in trade for that big ugly one that needed a paint job -- remember that one?"

Of course, around here, SWMBO has more shoes than Imelda Marcos and that's supposed to be OK. I make do with two pairs of shoes at a time -- due to the need for multiple radios. Barry

From ghayward at uoguelph.ca Wed Aug 25 21:04:11 2004
Subject: [R-390] Wives and Boatanchors

I guess I'm one of the luckier ones. My wife is VA3LWH and all I do when a new boatanchor moves in with us is point to the stack of 6m rigs that she scrounged. Cheers es 73 de Gord, VE3EOS

From lester.veenstra at lmco.com Thu Aug 26 08:33:49 2004
Subject: [R-390] Wives and Boatanchors

Actually, I took over the entire basement, which included the nominal quest quarters. In response she had a new wing put on the house with quest quarters and home office. Now the problem is I have filled

the basement. Horror of horrors, I now have to carry some of this heavy valuable "stuff" upstairs and out to the FestMobile for resale, so I can buy more BAs and refill the basement. I think I need counseling! 73 Les K1YCM/3 Frederick MD

From mjmurphy45 at comcast.net Thu Aug 26 19:19:11 2004
Subject: [R-390] R390A Carrier Level Meter Question

Too bad the whole list could not see it. I guess my 81K JPEG attachment bounced the system. Mike WB2UID

From chacuff at cableone.net Thu Aug 26 21:13:35 2004
Subject: [R-390] Wives and Boatanchors

That's the same deal I have here...my wife collects antique tea pots. I think at last count though she is spending more than me....oh well. Cecil...

From kellerfamily01 at charter.net Fri Aug 27 11:13:05 2004
Subject: [R-390] Wives and Boatanchors

I've expanded to include a large walk-in closet, most of a spare bedroom and a portion of the garage. My wife isn't complaining yet, but I am still thinking about giving up the boatanchor part of the radio hobby. I'm getting to the age where bad things can happen to you pretty fast, and I don't want to leave my wife with all that heavy stuff to get rid of. If I do decide to do this, would it be against the rules to offer things for sale or trade to this group a little at a time until they are gone, or should I go ahead and go to the E place? I know that I would get more money for it on e-bay, but I wouldn't be trying to make any money off any of the stuff - I just think that this group would deserve first shot at the R-390s, SP-600s and related items. Bill K.

From N4BUQ at aol.com Fri Aug 27 14:18:47 2004
Subject: [R-390] Wives and Boatanchors

Well, Bill, like most guys on this list, I wish you would stay with the BA hobby, but if you do decide to give it up, I would like to see the stuff here on this list. I need another BA like a proverbial hole in the head, but I'm always interested in "new" stuff. Barry(III) - N4BUQ

From ka4prf at us-it.net Sat Aug 28 12:45:30 2004
Subject: [R-390] Question 1

Hi all, I am a new owner of an R-390A. I have a question about the speaker and ear phone socket. Is there a connection on the rear of the receiver that will allow me to hear the speaker without earphones, but when the ear phones are plug in, the speaker cuts out? Just like modern receivers do? Thanks in advance Chuck B

From DJED1 at aol.com Sat Aug 28 14:03:36 2004
Subject: [R-390] Question 1

Afraid the R-390A doesn't work that way with the earphone jack. I put a switch on the speaker so that i can turn off the speaker when listening to the headphones. Also, note that the headphone jack and the speaker are for 600 ohms. You will get better audio if you insert a transformer betweenn the speaker output and an 8 or 4 ohm speaker. Ed WB2LHI

From jpl15 at panix.com Sat Aug 28 14:24:21 2004
Subject: [R-390] Question 1

wrote: > Hi all, > > I am a new owner of an R-390A. I have a question about the speaker and ear > phone socket. Is there a connection on the rear of the receiver that will > allow me to hear the speaker without earphones, but when the ear phones are > plug in, the speaker cuts out? Just like modern receivers do? >
Hi Chuck - I'm a newcomer to this list, but have had several (6) 390s over the years, as well as many other Boatanchor radios. If you envision one of the roles of the R-390 - a multiple reciever set-up - say, on board a destroyer - you might have ten of them in a rack. Some would be feeding teletype circuits, some receiving crypto, some hearing voice or SSB - all feeding their respective outputs to the various 'users' via audio circuits.

You, as the attendant of the radio room, get a call that Channel 6 is fuzzy and not readable. You walk up to the rack, plug your headphone into Radio 6, and discover that the sending transmitter is off it's assigned freq. You nudge the dial a bit, now the signal is clear. You check the output meter, reduce the LIne Gain a bit to bring the output level back near a 'zero', and unplug the headphones.

Now - if the headphone jack interupted the Line Audio feed - and, let's say that it was feeding a crypto set - you would have just caused a loss of sync, or a garbled line of the TTY. That's why the two outputs are seperate. You can monitor without disturbing the feed.

To do what you want to do, the easiest (IMHO) would be to just turn the Line Gain down when you don't want the speaker on. And I *know* it's a mismatch to hook a speaker up to the Line Outs on the back, but it works well enough for most applications - you can always use a transformer, or an external amp if you wish... I don't. Then you can use the Local Gain to control your headphone volume.

Alternatively, you can hook a 'normalled' jack up to the Line Out, and when you plug your headpones into that, it will interupt the speaker feed. However, I find it very convenient just to lower the Line Gain pot when I'm using phones with the 390. Hope this helps... Cheerz John KB6SCO

From ham at cq.nu Sat Aug 28 14:41:54 2004
Subject: [R-390] Question 1

Hi, The R-390 is in a class all by it's self in this respect. It actually has three audio channels and two volume controls. You have the two back panel outputs, each with it's own volume control and the headphone output. Since you have so darn many audio channels nothing cuts out anything else.

If you want to go nuts you can actually look at the diode load output as another audio channel and hook it up to a high impedance input on an amplifier. I typically run the audio around to a 1/4 inch jack panel and patch things around that way. I have more radios than speakers ..... Take Care! Bob Camp KB8TQ

From ka4prf at us-it.net Sun Aug 29 04:07:47 2004

Subject: [R-390] Notch filter

Hi all, Is there any one add on that I can get to produce a notch filter function for my R-390A. I don't want to modify the receiver. I have the QF-1A unit, but it's kinda of old and I don't trust it. Thanks Chuck

From ham at cq.nu Sun Aug 29 09:20:05 2004
Subject: [R-390] Notch filter

Hi, As far as I know there is no way to do an internal notch filter on the IF of the 390 without significant modifications to the radio. The IF output is probably your best bet combined with an external IF. In order to really do a good job with a notch filter it's better if the filter is at the IF.

Of course this is just the start of the process. Since you now have the entire tail end of the IF outside the radio some things have changed. The AGC now really should come from the external unit and feed back into the radio. The 390 is at least set up for this part of the process. I don't know of many boxes that are set up that way though ....

The next thing is that the demodulator is now in the external box as well. That makes the mode select switch on the radio nonfunctional.

Finally feeding the audio back into the radio is a little problematic. It can be done but it is not as easy as it should be. A lot of the boxes just went ahead and did their audio. That takes out the volume control knobs and audio filtering as well.

That's a lot of stuff just for an IF notch filter. But if you are still game, keep on reading .....

Most of the good old IF notch filter designs worked with IF's around 50 KC or so. They would mix down from 455 to a final low IF, filter, and then demodulate. I do not remember any good notch designs that worked directly at 455. They may be out there, but not on any radios I ever owned. If you go that way it's not just a notch, it's an entire extra IF strip.

One thing that has come along since the R-390 was born is digital signal processing. Most people look at this as a neat way to do filtering, but it's more than that. The one thing that most DSP units do very well is adaptive notch filtering. Properly done they also made good demodulators. You can do the process at either audio or at the IF. The IF processing is better, processing at audio is cheaper.

Of course if you are going to do it all at audio then there is another solution. A lot of people use outboard audio filter boxes. The AGC does not work the way it should and you still need some strange stuff with speakers. The one I happen to like is the JPS NIR-10. They show up on various sites fairly cheap.
If you want to go the IF route about the only source I know of for outboard boxes is Sherwood Engineering. Their box works well with the R-390 and they have good support for their products. It's a small market and I'm a bit surprised anybody can afford to make new gear like this.

Now if you still are not satisfied there is the roll your own approach .... 24 bit A/D's and 32 bit floating point DSP on an R-390. A little work with the good old C compiler and you'd be in business. Think of the possibilities ..... we could name it the R-390B Take Care! Bob Camp KB8TQ

From w5kp at direcway.com Sun Aug 29 12:12:33 2004
Subject: [R-390] Notch filter

Or, you could run your 390A audio into a Timewave DSP-599ZX like I do, have it all in one neat little box, and still have a spare channel left over for an additional receiver. Jerry W5KP

From dougnhelen at moonlink.net Wed Aug 25 12:59:55 2004
Subject: [R-390] Wives

My wife likes radios. That is one of the reasons I married her.

However (you knew there would be a "however"), she is financially conservative and I usually have to have a pretty good explanation for something relatively expensive. That is a good thing. She also doesn't like change around the house, so there are some BA's I don't like particularly that she thinks are cute, so they stay.

Why didn't amplifier manufacturers make windows on their amps? A pair of 3-400Z's casting a warm glow will win over almost anyone. One advantage is that we occasionally visit ham friends with monster BA collections or huge stations which makes her feel lucky that I don't have "that" much stuff. So get to know someone who is a real pack rat. It will make you look good.

One of my favorite hobby contrasts is Rock Hounds. The guys that collect minerals. Usually they have a spectacular collection of rocks in cases in the living room that will knock your eyes out. However they usually have a garage full of potentials in boxes and piles. Or in the entire basement. That's not the problem. Nor is taking the wife and kids to Trona, Ca. (North of China Lake East of 395) every weekend for rocks for years. Neither is camping out in a small shell camper and cooking over a cook stove. Never mind that its 120f in the summer time, 60 miles from a store, blows like a wind tunnel, and there is NOTHING to do at all. What is the problem is that there is a sulphur mine next to Trona and it smells like rotten eggs 24/7. These women build up genuine resentment. As soon as Pops hits room temperature, she already knows the guy she is going to call with the dumper and all that stuff is going to the dump and she is going to Maui. Permanently. Nice thread. I have learned some interesting things and enjoyed the sometimes bittersweet humor. Doug K6JEY

From N4BUQ at aol.com Sun Aug 29 22:53:15 2004
Subject: [R-390] Using Surplus Meters in an R390A

I downloaded Jan's article about using surplus meters. Looking at the schematic, it appears that inserting the OpAmp where the meter used to be will result in a minimun of 9.4K ohms where (according to what I remember posted on this list) the original meter's DC resistance is somewhere around 30 ohms.

Can someone comment on how/if this affects the performance in this part of the radio? The text of the article indicate it is necessary to reset the carrier meter adjust control for the proper readings. I assume that the difference of the resistance will cause this setting to be somewhat different than with a meter with 30 ohms resistance.

I haven't looked at the entire circuit yet and perhaps resetting the carrier meter adjust control to compensate the difference in resistance causes the circuit to become "normal" again, but not sure.

I have some replacement meters I am interested in using, but their internal resistance is around 600 to

800 ohms so I was looking for a way to use them. It appears Jan's method is easy enough, but I was wondering what the effects are when using it. Any comments? Thanks, Barry(III) - N4BUQ

From N4BUQ at aol.com Mon Aug 30 15:00:36 2004
Subject: [R-390] Using Surplus Meters in an R390A

David, I agree with this. I was trying to come up with a solution using the existing (hi-ohm) meters with a resistance network. As I was drawing it up and attempting to come up with shunt resistor values, etc., it occurred to me that I would need the voltage across the original meter. As I started looking at this, it became crystal clear that a network of resistors would not work. The voltage across the meter could not be increased by the network (hope that makes sense). Maybe I'll try your carrier level mod on my next radio. I replace the one in my current radio with the 10-turn wirewound. Works fine. Thanks again! Barry(III) - N4BUQ

From LairdThomasN at JohnDeere.com Mon Aug 30 16:00:18 2004
Subject: [R-390] RE: Using Surplus Meters

The following is from my archives dated 1997. I'm not sure if any meter sets are still available or even the status of the author! You still may have to do the op-amp trick. Tom Laird WC9M Moline, IL.

I have located a source for some used meters that are very similar in appearance to the original meters used in the R-390a's. I took the meter faces from my original R-390a meters and scanned them into a drawing program so that I am able to print them out on adhesive backed polyester sheets. I then dissasembled the new (used) meters and applied the labels to the back of the meter cards, reassembled, and voila, instant R-390A meters!

Of course there is the matter of converting the line level meter over to AC operation, but this is easily done with a bridge rectifier. The rating of the new meters are 30 ohms at 1 mA for the carrier level meter and 100 ohms at 1 mA for the line level. I was skeptcal at first that I would have much luck with the line level meters due to the great difference between the specs of the originals and the replacements. I have found, however, that functionally the only difference is that when the Line Meter attenuation switch is set one position higher the behavior of the meter is almost identical to the original.

A couple of my friends saw my R-725 with its new meters and wondered where in the heck I had managed to come up with a set of original meters for the thing. After I told them the secret I gave them the parts and a few instructions and now they too have working meters where there used to be holes. They liked the new meters so much that they talked me into getting busy and making up a set of illustrated instructions on my computer.

My question for you BA folks is this; How many of you might be interested in a R-390a meter kit, with all of the parts and instructions for the prncely sum of $25, shipped? This is about what I figure it would take in order to pay for the parts and make it worthwhile to run back and forth to the post office. The kit would include all mounting hardware, 2 used (checked) meters, meter appliques in both white on black and black on white, diodes, and an instruction sheet.

Tom KK8M
THOMAS W BOWES
5529 25 MILE RD

SHELBY TOWNSHIP MI 48316

From dpharr53 at swbell.net Mon Aug 30 16:27:39 2004
Subject: [R-390] Using Surplus Meters in an R390A

Barry: I had the same thought when I started building my version of the op-amp circuit. I believe that by not having a resistance that simulates the meter impedance it may upset the way the bridge circuit works. Although it may not make a big difference, I installed an 18 ohm resistor across the input to my version of the op-amp circuit. The op-amp then essentially just amplifies the dc voltage drop across this resistor. With an 18 ohm resistor shunting the input, the voltage seen by the op-amp is only about 18mv (assuming a full scale 1ma reading), so the voltages you are dealing with are quite small.

Actually, the way I understand op-amps, the combined resistance of the two 4.7K input resistors wouldn't make any difference anyway, since no current flows into these inputs. Without the 18 ohm resistor, the op-amp circuit would only amplify the voltage difference seen between the arms of the bridge circuit.
Also, the 10K ten-turn pot used on the output of the Skirrow circuit is much too large for effective use. I used a 1K ten-turn pot. This made it much easier to set the sensitivity of the meter I used (5ma meter movement). Good Luck 73 Dennis Pharr WD5JWY

From r390a at bellsouth.net Tue Aug 31 08:12:57 2004
Subject: [R-390] RE: Using Surplus Meters

Y'know I still have one of Tom's kits. I ordered one way back when in case I ran across a receiver with no meters. So far all I've gotten have had meters, but those with them seem few and far between, so, no it isn't for sale. :-P Tom NU4G (how many Toms do we have on this group anyway??????)

From N4BUQ at aol.com Tue Aug 31 11:42:49 2004
Subject: [R-390] RE: Using Surplus Meters

Tom,

Could you perhaps tell us what is in the kit? I have some surplus meters that I'd like to use; however they have an internal resistances of 600 and 800 ohms. Mr. Bowes didn't mention the internal resistance of his meters or how he compensated for them. I realize the VU meter isn't as tricky, but the carrier level meter probably needs some attention to matching resistances, etc.

Thanks, Barry(III) - N4BUQ (Do we still have three Barrys on this list?)

From LairdThomasN at JohnDeere.com Tue Aug 31 13:21:00 2004
Subject: [R-390] RE: Surplus Meters

Barry and group, I don't know the meter details of Tom's KK8M KIT'S. I did a search on his name and came up with **Thomas Bowes phone: 586-677-9498 email: bowes@klondyke.net** I did not try to call him or email him, but you might give it a try. Tom Laird WC9M (Moline Tom, HI)

From: Behalf Of N4BUQ@aol.com

Could you perhaps tell us what is in the kit? I have some surplus meters that I'd like to use; however they have an internal resistances of 600 and 800 ohms. Mr. Bowes didn't mention the internal resistance of his meters or how he compensated for them. I realize the VU meter isn't as tricky, but the carrier level meter probably needs some attention to matching resistances, etc.

Barry(III) - N4BUQ (Do we still have three Barrys on this list?)

From ka4prf at us-it.net Tue Aug 31 16:26:04 2004
Subject: [R-390] Matching network

Hi all, what can I do to get a better match of balanced antenna (dipole) to my R390A. At the moment the antenna is attached to J106 and in the same configuration as shown on http://www.r3980a.com/html/feedpoint.html top picture. Would an antenna tuner help such as the MFJ 959B? Chuck

From ham at cq.nu Tue Aug 31 19:56:16 2004
Subject: [R-390] Matching network

Hi, If the purpose is general listening then a "matched" antenna may not be the best bet unless you have room to put up lots of them. If you are like most people you have limited room and the real question is how to get the most out of the antenna you have.

More or less a dipole is at it's minimum impedance at resonance. The magnitude of the impedance goes up as you go away from resonance.

If your objective is to get as much out of the antenna over as wide a band as possible then you want a higher impedance on the antenna. Simply put 120 ohms will work better than 75 and 75 will work better than 50 ohms. This holds true up to about 200 ohms or so for normal dipoles. After that point the bandwidth does not get any better.

This is not to say that you will get more signal out of the dipole at resonance when you load it in 120 ohms. If fact at resonance you will get a bit less. The point is that by say 20% off resonant frequency you will be even with the matched load and past that you will beat it.

The total difference is the square root of the ratio of the impedances so for a six dB change in signal you would go from 50 ohms to 200 ohms. Even with a fairly compact antenna you should have enough to get a R-390 going below 10 MHz in the evening with either feed impedance. Take Care! Bob Camp KB8TQ

From mjmurphy45 at comcast.net Tue Aug 31 20:29:20 2004
Subject: [R-390] R390A Carrier Level Meter Question

Hey Bob,

Here is a link for the whole list that shows the variable persistance meter modifications. http://home.comcast.net/~gerboid/R390Magic1.jpg. Mike Murphy WB2UID

From ham at cq.nu Tue Aug 31 21:11:46 2004
Subject: [R-390] Matching network

Hi, If this list took the stand of "leave well enough alone" then 99% of what we do would be off limits ..... I'm only suggesting that the improvement may not be quite as much as you would think. A lot depends on how far off resonance the antenna is. Take Care! Bob Camp KB8TQ