A "users" review of the JRC NST-245

By Matt Erickson KK5DR

JRC ?

Japan Radio Company founded in 1915, is not the best known of the Japan radio manufacturers, at least not here in the U.S.A. Well known in the rest of the world as makers of high quality commercial radio gear. Many of the models they make are found on ships of the western Pacific.

Once again, I will not display a lot of lab numbers, & graphs, which most hams don't understand. Instead I'll look at this radio as most hams do, from the end users point of view.

For those who want to see lab reports & graphs, I suggest you seek and find the ARRL review, which appeared in the September 1995 issue.

A look at the box

The exterior of the 245, is a nice charcoal/black flat finish. Steel sheet metal is the basic building foundation of the cabinet and chassis.

The interior of the rig is well shielded by steel covers, which separate the various boards and modules. The final amp unit has a heat sink on top of it, which is cooled by air cross-flow from the twin mini-fans for the PA section. The PA heat sink is made of a large number of thin aluminum "leaves", which are a highly efficient cooling system.

The power supply section is a relatively small area that has a full-time fan running as long as the rig is powered up. This fan blows out, drawing air from the front of the rig. The PA section has twin fans that cool it separately from the PS. When all the fans are running on high mode, it can get rather loud. A thermal control turns the fans up and down as the PA & PS temp varies, from RX to TX.

I see a mixture of discrete components and SMT (Surface Mount Technology), on the boards. The design and construction of these boards is top notch, first rate, commercial-grade.

To summarize, the 245 is built heavy duty, and reliable.

Speaking of fans, the noise produced by all three fans, to some, might be annoying, but, as far as I can hear, it is minimal, and far less than most computers, while in low speed mode, but when the unit switches to high, it can be a little loud. It would be hard to get enough airflow with less noise, to do that, would require a much larger fan spinning at low RPMS, and would make the radio a much larger unit. A radio with this kind of RF output really needs this much air.

Transmitter

Power! Lots of power! 150+ watts output on all bands, thanks to the POWER MOSFET power amp section, and a 50vdc supply.

The review unit clocked in at 200+ watts out, on CW. I thought this a little strange perhaps the previous owner had "turned it up". I checked with another 245 owner who had his since new, he told me that on CW his also does 200 watts with the RF power output control fully clockwise.
I then checked with another 245 owner, who reported 170+ watts output. I would guess that this is the norm from the factory.
I reduce my Po control to a nice cool running 150 watts most of the time. It's nice to not need an outboard amp most of the time with the 245.

Display
Wow! This is a really nice, "colorful" display that is BIG, and bright, easy to read, with lots of features. Even an operator that is hooked on the ICOM PRO's scope display, such as myself, can see beauty in this "rainbow" style radio display.
Those of you, who have less than "youthful" eye-sight, should have little or no trouble reading this display.

Audio, RX type
Really clean, low distortion receive audio is here. Most radio manufacturers tend to cut corners on audio amplifiers. But, when you listen to a 245, you know they didn't cut it here. Absolutely no high frequency hiss can be heard, very, very low distortions are present at moderate volume levels. This will make hours of listening a delight rather than fatiguing. A very sweet, smooth sound, much like an old tube type receiver. Of course, the audio is adjustable, to suit most every operator's tastes. The 2.7Khz standard SSB filter, is the primary reason the RX audio is so nice, but the audio does not change very much, even when the optional 1.8Khz filters is cascaded in. Very nice.

TX mod
The one and only modification I could find on this radio is for "all band transmit", the US version of the 245 transmits only on ham bands when shipped from the factory.
The mod is permanent, but can be "undone".
Here is the procedure;

(1) (1) Place the radio in VFO-A mode, then power down the rig.
(2) (2) While holding down the 50Mhz button, power on the rig, continue holding the 50Mhz button until two groups of three beeps are heard, about 10 seconds apart between groups, then release the button.
(3) (3) Now the radio will transmit on all bands.
(4) (4) To "undo" this mod, repeat the above procedure.

I assume no liability for any possible damages to, or illegal use of this radio as a result of performing this mod.

Why a JRC?
You might ask your self this question, but I say "Why not?" Today Japanese radios are very common in ham radio, and it's not unusual to call CQ, and have a QSO with a ham that is using the same radio as you, or have a "round-table" with a number of hams running the same gear. To me, that sounds a little boring. Why run with the pack? Perhaps you might find that the 245 is a pleasant surprise
And that taking the road less traveled, makes all the difference.
I have a few friends that use the 245, and love them. They also have told me that the rig is trouble free, and has never needed servicing. However, if servicing is needed, the only US factory authorized sales & service center is Universal Radio Inc. Reports say that all JRC servicing is prompt, and reasonable through them. Optional parts are available here too.
So far, I know of nobody that has had any trouble with their 245, so servicing has not been needed. This in itself says allot.

Non-JRC amps
The 245 is designed to operate with JRC optional outboard units, which all use +5vdc TTL level control signals.
If you want to use the 245 with a non-JRC amp, it will be a good idea to build an "interface" relay that uses 5vdc at very low current to key the amp. Relays of this type are easy to find, and very small.

The 245 also has a 13.8vdc on TX available at the DB-15 port, which can be used to key an outboard relay, but the current rate is not stated in the manual, so, err on the conservative side, by using it to operate a solid state DC-DC relay, which will draw a super low gate current draw. These units can be found through many electronic suppliers, and should cost around $13. I bought one that can use 3-32vdc for the gate control (from the rig), and switch up to 60vdc @ 4A. (on the amp side). The advantage of these relays is that they are silent, and very fast, and small.

The "Manual"

Boy, I have seen some poor translations of Japanese to English before, and this is one of them. It is very clear that JRC did not use an English-speaking tech writer to edit this thing.
Some info is down right confusing, and other areas are completely omitted (i.e. voltage & current ratings on most items).
The metaphorical nature of Japanese make it poorly suited to highly technical writing, the result is a manual that sounds much like Haiku poetry. I need a translator for my translation copy.
I thought ICOM manuals left a lot to be desired, but then I saw a JRC.

Notch

The notch is a standard analog type, but has a "tracking" option. I found the notch to be deep, but narrow and a little hard to find while trying to remove a "tuner-upper". On a steady heterodyne, the notch works well, and I tried the "Tracking" function, and it did well too. Once you have notched the offending signal, press the notch button again, and it locks the notch to the frequency of the notched out signal, and you can tune the VFO from side to side, and the signal remains within the notch. A very good feature, to bad it isn't DSP "auto" type. I have found that the 245's notch filter is better that the ICOM PRO, in the area of dealing with a multi-tone signals, case in point, the carrier that can be found on 14.317mhz most of the time. There is some sensitvity reduction when the notch is in use. The only other notch I found that could completely remove this signal was the filter on the ICOM 775, but it had the advantage being able to use both auto & manual notches simutainously.

Audio, TX type

I used a Heil HC-5 with a mic that was wired for a YAESU (the 245 uses the same mic wiring scheme).
I talked on the rig for a while to hams that I have known for a long time, and none could tell that I was not on my ICOM PRO, however, once I told them what I was using, they said it didn't sound like the PRO, but then it shouldn't.
I listened to the 245 transmitter on the PRO, and what I heard was very clean, clear TX audio. I liked what I heard.
There are no TX audio adjustments on the 245, but it really does not need any.
The Heil HC-5 had plenty of drive, I only needed to run the mic gain at the 10-11 O,clock level.
Compression was only used when conditions were noisy, or weak signals called for it. The level I used was not readable on the Comp meter position, but showed a big change on the output, with a higher average power.

JST-245 vs. ?

What to compare it to? To compare the 245 to the ICOM PRO overall, would not really be a fair comparison. I thought that a better, more equal comparison would be to the FT-1000. In a side by side with the FT-1000, the 245 would fare well, as good or better than the YAESU, although it does have fewer features than the 1000, but basic RX/TX performance would be quite close.

Phase noise

I did detect some phase noise in the 245 receiver, but my unscientific test was not very accurate. The phase noise I heard, was not unmanageable, and did not cause problems. Using a narrow filter, and lower RF gain, along with the PBS (Pass Band Shift).
On air phase noise testing, is very subjective. The close by transmitters that induce it, can sometimes contain more phase noise in them, than the 245 generates in it's I.F.
I found that most transmitters I listened to, that were clean, generated little to no phase noise in the 245, however, transmitters of the same signal strength, that contained large amounts of phase noise, and distortion products, would generate lots of phase noise in the 245.

Phase noise measurements, even in a lab, are very subjective I place little stock in any of them.

Noise Blanker

To start off, I have a set of high tension, long distance transmission lines that run with in 1/2 mile of my QTH. These lines are a periodic source of RF noise that covers some or most of the HF spectrum during certain conditions. I have found only one radio that could remove the noise completely with out any distortions in the receiver, that was a YAESU FT-990, in my opinion it has the best NB ever made, all others have fallen far short of it.

The JST-245 does OK, but misses the mark. With rhythmic "pulse type" noise, such as ignition, or and electric cattle fence, the NB does very well, but for the wide band 60hz "line noise" of which I have and many other hams have too, the 245's NB wide position does little or nothing to reduce or remove the noise. I did notice that the NB narrow (pulse type), did not produce distortions in the receiver like many older radios do.

I say, nice try, would you care to try again?

I have a JPS ANC-4 phasing noise canceller, which I could not use on my ICOM PRO, due to some strange distortions the phasing induced in the ALL DSP radio, but the 245 is all analog I.F. chain, so I'll give it a try on it, to remove my line noise.

Tuning noise (VFO type)

I noticed a buzz type noise while tuning the 245 around 40 meters. It is a very low level, and tuning speed specific noise, like a pulse/buzz. I only found it on 40 meters, and could only hear it with no antenna connected. As soon as an antenna was connected the noise was masked by static background noise normally found on most bands.

This is no something new. The Ten-Tec Paragon had this noise on all bands, at a much higher level than I hear on the 245.

Maybe a little more decoupling of the photo-encoder on the tuning knob would reduce or remove it.

Optional filter

The 245 can have as many as five optional filters installed, two in the 9Mhz IF, and three in the 455Khz IF. The review unit has three in the 455Khz IF installed, 1.8Khz, 500hz, & 300hz.

The stock wide SSB filter is a 2.7Khz. An AM filter of 6Khz is standard on the 245. When optional filters are installed, they are cascaded as the filter selection is narrowed, so, when in SSB wide, the 6Khz and 2.7Khz are cascaded, when in intermediate, two 2.7Khz on the 455khz & 9.4mhz IFs are cascaded. When in narrow SSB mode, the 2.7 & 1.8khz are cascaded.

If the unit is equipped with equal filters in both IF section, the overall shape factor is improved when the filters are cascaded.

When in CW or AFSK modes, the narrow SSB filter is cascaded with the CW filters, in the same manner.

The transmitter filter is fixed at 2.4Khz, which keeps the radio within the I.T.U.'s bandwidth requirements for SSB transmit.

PBS & BWC

Pass Band Shift, is a useful tool and works well, much like the PBT of ICOM gear, and IF shift of many others, it is very effective.

Band Width Control, or variable band width control, allows you to use any fixed filter like a variable filter, going from the basic filter band width, you can narrow it down to as little as 300hz. Very good when working CW. Go wide to check for nearby signals, then "squeeze" down narrow to work them.

Both of these controls can be use at the same time, along with filter selections.

General items

The meter is a little quirky, the only way to switch meter functions is to transmit, different, but it works.

There are 26 menu items, but not as complex as late model radios that allow the user to get their self into trouble. These are basic, user options to configure the radio to run the way you want it to they are on or off, this or that options.

The RF gain control on the 245 is one of a very few solid state radios that can be reduced until you hear little or no noise, but signals seem to "pop" right out at you, this in combo with the stepped attenuator, can work wonders on interference.

In conclusion

If you are one of those guys who still likes a really high quality "analog" radio, with no DSP, but very good performance, the JST-245 just might be for you, especially if you want to be a little bit different, a little "out of the ordinary".

The 245 is a great rig, designed and built very well, but like nearly all radios, there are a few areas that need some work.

If you see a used 245 for sale out there, give it a shot, you may be pleasantly surprised.

I like it.

These are my opinions, thoughts, and observations, yours may differ.

73 de Matt