Picture(s) of Kenwood - TS-2000

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03-03-2001 add a comment

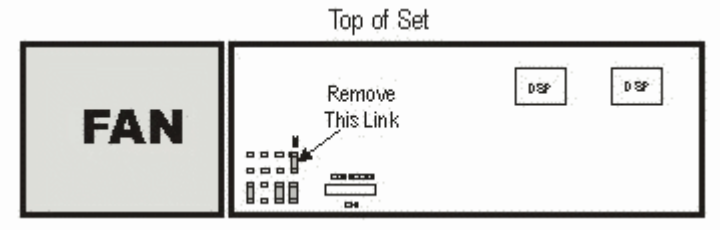
TS-2000 Mars/Cap Mod

Author: *M0DZO & G4KQU - g4kqu@btinternet.com.MODIFICATION.NET*

- Disconnect power cord and antenna from the transceiver.
- Remove the top and bottom covers.
- Remove the top screw from each side of the front panel assembly.
- Loosen the bottom screw from each side of the front panel assembly.
- Carefully rotate the front panel forward to gain access to the control board(X53-3910-11). This board is mounted vertically against the body of the transceiver. It is not the board that is mounted in the front panel assembly.
- Locate and remove resistor R53 from the control board.

- Assemble the transceiver then perform the CPU reset procedure by holding the A=B button in while turning on the power.

Transmit Range: 1.705-30MHz, 49-54MHz, 142-152MHz, 420-450MHz, 1240-1300MHz.



Date: 24-07-2002 **User comment** **From:** ea2cdo

Subject: NEU MENU OCULTO

PLEASE MENU OCULTO TS 2000
CRISGO@TERRA.ES

Date: 24-09-2002 **User comment** **From:** K7BIT

Subject: TS-2000X 12 month review

My congraduations to Kenwood. Very solid radio. ACP-2000 works very well compared to others. Mods listed work great. I am looking for the programming model for the rig and flash protocol. I have the tech manuals but they don't describe the details of the unit for software. The only limitation on this radio is the antenna tuner. Its only good for 1:1 to 3:1 range of tuning. I use an external tuner MFJ - 969 and it works well if the internal tuner is set to off. This rig also is great for ARPS using UIview and Street Atlas 9.
Keep up the great work on your site. Its invaluable.
Cheers K7BIT and give my regards to 1 Harbour Exchange & Island Garden. Kinda miss ole London town.

Date: 09-10-2002 **User comment** **From:** G7OGG / M3OGG

Subject: Be careful when connecting to a PC !

The TS-2000X is a great radio, I love it. But, and it's a big but, be careful when connecting it to your PC. I found that if you ground earth your TS2000 and then want to connect it to your PC's sound card you can get an earth difference (holding onto the radio and the cable going into your soundcard can make your eyes light up,hi). Connecting the TS2000 to my PC's soundcard made the HF block go dead short (all four transistors). To get round this problem earth bond the PC to the radio's earth as well, maybe this is a standard thing to do, but I learnt the hard way, so be warned. You would think though that the radio would have some insulation on the ACC2 socket on the rear, well if it has it doesn't work !

Date: 26-10-2002 **User comment** **From:** marcus/m1eqs

Subject: kenwood ts 2000

ive had many radios and i must say that this is the best radio ive ever had simply great.....

Date: 06-12-2002 **User comment** **From:** KC7EKK

Subject: Free TS-2000 Controller Software

Do you want to pay almost $100 for Kenwood's TS-2000 radio control software? Neither do I. So I wrote my own.
Currently, it is only in a Dos Box Format and does a handful of functions like:
Set the VFO

Change Mode (LSB USB CW FM AM FSK)
Tune Antenna
Enable Noise Reduction (NRed1 NRed2 BeatCncl NoiseCncl NotchFilter)
Audio Gain
Scan Frequencies
and a couple others.

I am all for free software. This is my own hand typed code and it will be exchanged freely and without cost.

I am working on a GUI version for windows. It is almost done.

Anyway, here is the Dos version for you to have and use.

Date: 16-12-2002 **User comment** **From:** KC7EKK

Subject: Latest Controler program for Windows

Here it is. The latest (Gui Version) of my Home made TS-2000 Controler program. It is still buggy buy, hey it is free.
EnJoy.

Date: 07-07-2003 **User comment** **From:** OZ1MAX Hardy

Subject: 70Mhz on this rig.!

is there someone who knows how we are going to work on 70Mhz on the TS-2000 any mods for that ??

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add a comment

04-03-2001 add a comment

TS-2000 modification information (TX and RX)

Author: - *modifying@hotmail.com.MODIFICATION.NET*

I got the modification information on the TS-2000 from reliable sources recently. The info. seems to be correct. My TS-2000 (K-type) worked.

1. Remove the top and bottom cover.
2. Loosen the 4 screws that tighen the front panel.
3. Pull the front panel forward, holding the upper part.
4. You will see a fan on the left.
5. At the bottom right of the fan, there are jumpers.

- Remove R52 to expand the RX frequency.
- Remove R53 to expand the TX frequency.
- Remove R54 to expand the features.
  (Cross-band Repeat, SkyCommand, External Remote and etc.)

R52 and R54 have been already removed on my transceiver.

After the modification, it transmits:
1.705 - 30MHz, 49-54MHz, 142-152MHz, 420-450MHz.

* It does not expand too much, though :-(

Oh, I forgot one important thing.
You must perform ALL RESET by pressing and hold [A=B] key when you turn on the transceiver. (You will lose all the memory data).

Date: 24-07-2002 **User comment** **From:** ea2cdo

Subject: new menu secret ts 2000

please please new menu secret ts 2000
crisgo@terra.es

Date: 27-12-2002 **User comment** **From:** anonymous

Subject: TX/RX convert worked.

I tried the conversion and it worked fine with NO problems at all, except the opening of the radio was a bit more complex than stated.
To carry out the conversion, you WILL need a LOW Heat or adjustable soldering iron on the lowest setting and a good magnifying lamp to read the resistor numbers on the PCB. Other than the above, wow it realy does open things up. VERY GOOD MOD.

Date: 01-06-2003 **User comment** **From:** iw2niq michele jn45op

Subject: LOW POWER ON SSB TX

I noted that the power on tx in ssb are about 50/60 watts and not 100 watts as usual on FM !!! the problem i have observd is due to low level modulation on tx !!! somebody can help me ????

Date: 01-07-2003 **User comment** **From:** anonymous

Subject: LOW POWER ON SSB TX

CW and FM under keydown conditions have 100% duty cycle whereas SSB does not

Average power on SSB is normally going to be about 65-75% of what you get on CW or FM and it all depends on the characteristics of the voice of the person speaking. You wouldn't see 100W average power on SSB unless your transmitter was running around 140W.

Date: 06-07-2003 **User comment** **From:** Tom

Subject: WORKS VERY WELL ON 60 METERS

JUST THOUGHT I WOULD PASS IT ALONG THAT THE MODIFICATION GIVEN HERE FOR THE MARS/CAP WORKS VERY WELL FOR THE 5 CHANNELS ON 60 METERS. IT IS NOT DIFFICULT TO PERFORM AND QUICK AND EASY.

I CAUTION YOU TO BE CAREFUL WITH FRONT OF RADIO AFTER REMOVING THE 4 PHILLIPS #2 SCREWS LOCATED ON THE SIDES OF THE FRONT PANEL. THE PANEL HAS SEVERAL "RIBBON WIRES" ATTACHED TO THE PC BOARDS. BE SURE YOU HAVE NOT UNSEATED THEM IN THE PROCESS OF MOVING THE PANEL. USE NO MORE THAN A 25 WATT SOLDERING IRON, AND BE QUICK WITH IT.

FURTHER SUGGESTION FOR 60 METERS, WRITE THE CHANNELS INTO THE MEMORY CHANNELS, WITH THE PROPER OFFSET OF 1.5 KC DOWN. IT IS A SNAP TO GET THERE QUICKLY AND ON FREQUENCY. THE ANT TUNER HAS DIFFICULTY WITH THIS "BAND" SO I RECOMMEND THAT YOU USE A RESONATE DIPOLE ANTENNA, CUT POWER TO 40-50 WATTS ENJOY THE NEW BAND.

Date: 09-07-2003 **User comment** **From:** Alberto

Subject: Low power in SSB..how to increase ?

I have noted the TS2000 does push 60/70% of the nominal power while is used in SSB. And I can pilot correctly the amplifier. Is there any way for increasing the power up to 100W in SSB (i assume, as read before, i need to increase the power up to 140w in some way). Suggestions are very welcome.

Alberto

Date: 19-07-2003 **User comment** **From:** KG4TPB

Subject: SSB low power answer

The low power "*problem*" is a feature of SSB. The way your voice is converted into the wave does not use all the power available. If you are getting 70% of your power you are doing very well. I use the speech compressor and output filters on the TS-2000 to help increase the power out in SSB. But other than that, if you want more power out, put more power in. 60% - 70% is the nature of the beast. If you are getting more than 70% power out you are almost definitly over modulating and causing an unreadable signal. That won't help at all. If you want to know more look into how a SSB signal is created. It is intersting.

73's
KG4TPB

Date: 25-07-2003 **User comment** **From:** Steve K 9 D C I

Subject: Power output in SSB

Folks,
You should never see 100 Watts on a watt meter on a 100 Watt transmitter in SSB. The 100 Watt number is PEP (Peak Envelope Power). This is the power at the peak of the audio waveform and is the same power when key-down on CW or when you whistle into the microphone.
Voice has a peak to average power ratio in the range of 5 to 10. Therefore, when running

non-compressed, you will see power readings jumping around in the range of 10-20 watts. This is perfectly ok. You should be operating the rig in the recommended ALC range.
The compressor does some magic to bring the lower level audio portions up to a higher level so they are more easily heard and therefore improve intelligibility under poor signal conditions. With a compressor properly adjusted, you should then see the reading bouncing in the neighborhood of around 50 watts. You can get more, but the speach will sound poorer and poorer, not better.
Also remember that there is something called accuracy in watt meters and that common amateur units can differ by 20-25% from each other - so be careful assuming you know your true power. A recent article in QST also stated that the "peak" reading watt meters were also rather poor at showing PEP.
Also, it is extreemly unlikely that you can get 140W out of a 100W rig. There will be some variation across the bands, but if the manufacturer could get the extra power they would have. Increasing your power by 25% is only 1dB and is NOT noticable, nor useful and will most likely just reduce the life of the final devices anyway (even with tubes). 2dB ain't doing anything worthwhile either...
73, Steve
PS there are no 'u's in my email should you have the burning desire to write.

Date: 23-08-2003 **User comment** **From:** KC8WRI

Subject: 2000X Mod.

Very nicely described mod. I would add that it is very small & close up work. Make sure you have your reading Glasses! My 2000X only had the TX & RX resistors on the board. The others had been removed. VERY GOOD MOD! Opened things up nicely! Thanks! KC8WRI-Tom

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30-05-2001 add a comment

Sensitivity Kenwood TS-2000

Author: *Hans - PA3HGT*

Sensitivity Kenwood TS2000 measured with Rohde & Schwartz CMS52

10dB/sinad SSB			12 dB/sinad FM	
freq.	uV	dBm	Uv	dBm
1 Mc	1,127	-106		
1,8 Mc	0,35	-115,9		
3,7 Mc	0,4	-115		
7 Mc	0,39	-115,1		
10 Mc	< 0,045	< -133,9		
14 Mc	0,21	-120,4		
18 Mc	0,113	-125,9		
21 Mc	0,194	-121		
24 Mc	0,126	-120		
28 Mc	0,091	-127,9	0,163	-122,8
50,1 Mc	0,106	-126,5	0,184	-121,5
145 Mc	0,093	-127,6	0,19	-121,4
430 Mc	0,07	-130	0,14	-123,6
440 Mc	0,082	-128,7	0,146	-123,7

The valeus are measured with the pre-amp on .

73 , Hans , PA3HGT

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12-07-2001 add a comment

Firmware upgrade for TS-2000 1.03

New firmware release since August 2003 (Version 1.03) TS-2000.

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add a comment

01-01-2002 add a comment

ARCP-2000 windows CAT software for Kenwoods TS-2000

Author: *Kenwood*

Notice
Support for customers using ARCP-2000 Radio Control Program.

December 5, 2001

We've updated ARCP-2000 Radio Control Program Ver 1.01 to Ver 1.02. We are offering Ver 1.02 as a download to owners of Ver 1.00 and Ver 1.01. This update can be downloaded from below.

ARCP-2000 Radio Control Program Ver 1.01 update to Ver 1.02 details:(December 05, 2001)

1. Resolves the issue where received data is not updated in the terminal window while continually monitoring packet data.
2. Readability of characters within the terminal window has been improved.

ARCP-2000 Radio Control Program Ver 1.00 update to Ver 1.01 details:(March 30, 2001)

1. SUB frequency display direct entry not possible in satellite mode issue resolved.
2. Resolves frequency number adjustment issue in MAIN display and SUB display while in satellite mode.
3. Resolves the issue where in bands that CTRL is not displayed, MODE is not displayed correctly when calling up satellite memory.
4. Resolves the issue where only 7 characters could be entered in the satellite memory channel name. Now up to 8 characters may be entered.

Download

Note: Download is only available to purchasers of the ARCP-2000 Radio Control Program Ver 1.00 and Ver 1.01.
Please note that 'Ver 1.00' can also be updated to 'Ver 1.02'.

Please note that even if software is downloaded, it cannot be used by non-purchasers.

Installation instructions:

1. Execute downloaded file and extract the ARCP-2000 installation program into a designated folder.

2. In the previously designated folder, a folder labeled Arcp2000 will be created. There you will find a folder labeled "disk1". Execute the Setup.exe file within the "disk1" folder to begin installation.

3. Once installation begins, follow the instructions to continue with installation.

Latest update: ARCP-2000 Ver 1.10: Arcp110.exe 2.4MB.

Date: 16-10-2002 **User comment** **From:** Webmaster

Subject: ARCP-2000 ID codes

Dear users..

If you have the ID codes that should be used to the ARCP program, then **don't** publish the ID code on this site (www.mods.dk). The ID codes is only for user that have bought the program.
If you publish the ID code, it will be removed immediately.!!

Best regards
webmaster
Erik Hansen

Date: 19-10-2003 **User comment** **From:** get this quick

Subject: ts2000 arcp2000

hurry with this code it wont be on here for long!!!in capital letters/// type: 2OOK55123456AVTF HOPE YOU GOT THAT FROM A FREIND WHO THINKS IT SHOULD COME WITH THE RADIO FOR FREE!!

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26-04-2002 add a comment

Improving RX below 1.7Mhz

Author: *Alex, N3GX - n3gx@cox.net.MODIFICATION.NET*

AM Broadcasting stations are poorly received by the TS-2000 as it comes from factory. Fortunately, there is a quick and easy solution. It only takes a Phillips screw driver. No soldering is required.

- Remove the bottom cover.
- Locate plastic mini-jumper labeled "Local / DX" near antenna connector
- Move jumper from "Local" to the "DX" position.

- Replace bottom cover.

Done!

73's from Alex (N3GX)

Date: 04-09-2002 **User comment** **From:** BARRY M0APO / G7OFR

Subject: IMPROVING RX BELOW 1.7MHz ON TS-2000

*REMOVE THE BOTTOM COVER.

*LOCATE THE PLASTIC 2 PIN MINI JUMPER NEAR THE "N" TYPE UHF ANTENNA CONNECTOR MARKED NORMAL / DX.

*REMOVE THE JUMPER FROM THE NORMAL (CN4) POSITION AND REPLACE IT TO THE DX (CN3) POSITION.

*REPLACE BOTTOM COVER.

* NO RADIO RESET REQUIRED

Date: 10-11-2002 **User comment** **From:** PABLO CUADRADO, LU6KCT

Subject: expantion rx ft 3000

I need expantion rx for FT3000

Date: 03-06-2003 **User comment** **From:** Mark Wooldridge M3MPW

Subject: More info on Local/DX Jumper

Hi,

I have spoken directly to Kenwood reference the CN3/CN4 Local/DX jumpers.

Changing the jumper to the DX position changes the sensitivity of the load band reception to that of the other bands.

Reasons for not changing this is if you are in an area of high power broadcast stations in which this mod could cause frontend overload.

Regards,

Mark
M3MPW

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06-01-2003 add a comment

TS-2000 RX mod

Author: *Richard - w6du@aol.com.MODIFICATION.NET*

My Rig came from the factory with R54 removed. I removed R52 myself. Then I did a system reset.

New sub band RX is 118 to 174 mhz and 220 to 512 mhz.

This includes the 220 mhz ham band.

I did not remove R53 to expand the TX frequency but the RX mod works fine.

Richard

Date: 27-01-2003 **User comment** **From:** da6lek

Subject: Is it def on 220mhz?

Is your rig def on the 1 1/4m band?

Date: 18-03-2003 **User comment** **From:** joe

Subject: will this radio tx at full power ?

and will it tx full power on gmrs and 11 meters ?

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add a comment

10-07-2003 add a comment

Separate Receive Inputs

Author: *Russ K2TXB - k2txb@dxcc.com.MODIFICATION.NET*

In August 2001 I bought a new Kenwood TS-2000X transceiver. I had fallen in love with it from the QST review and had heard glowing reports from other owners. So although I had a brand new Yaesu FT-847, I went ahead and got the TS-2000 too.

My station was already set up to use separate receive feedlines for every band, so before I ever powered up the TS-2000 I opened it up and modified the 144 and 432 sections to provide coaxial inputs indepent from the main connector for each band. The original connector is then used only for the transmit signal. But for the 1296 band it was not so easy to see how to separate and I did not get around to figuring out how to do it until recently (June 2003). There are many advantages to setting up a station this way and I will outline some of these things in the future, but for now I just want to show how I made the modifications.

Separate Receive Inputs for the TS-2000X

For 2 meters and 432 Mhz, the changes are simple and do not involve any electrical or mechanical changes to the TS-2000. For the 1296 band a trace must be cut and two solder connections to the board must be made.

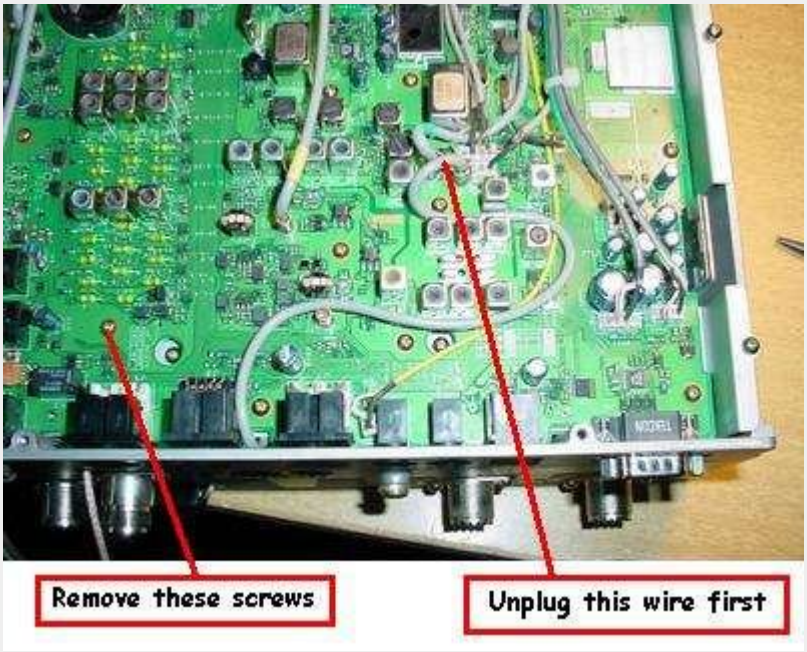
Here is a picture of the back of the modified TS-2000X, showing the three new coaxial inputs.

The wires come out through existing holes in the TS-2000 chassis. Each input is terminated with a BNC connector.

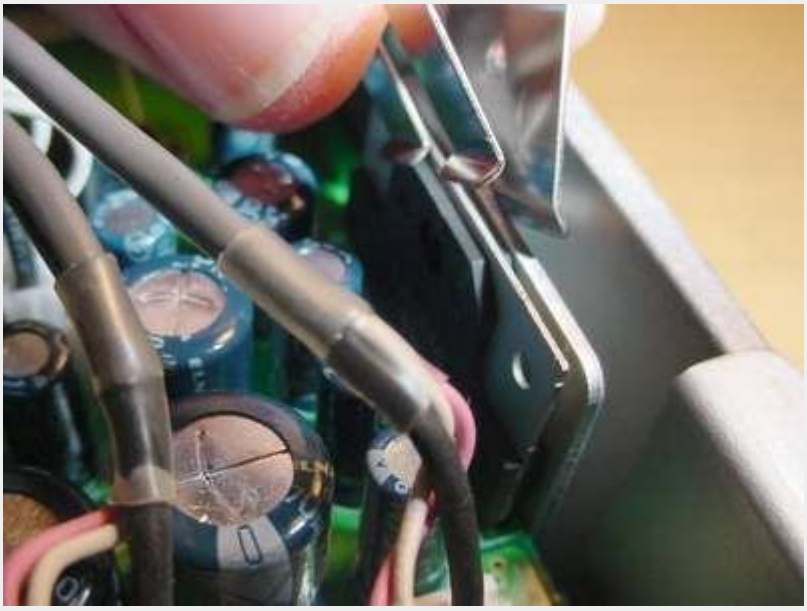
Note that the two meter input is wrapped around the two slots to provide strain relief.

Taking the Rig apart Opening the TS-2000 to make the 144 or 432 mods requires the bottom cover to be removed.

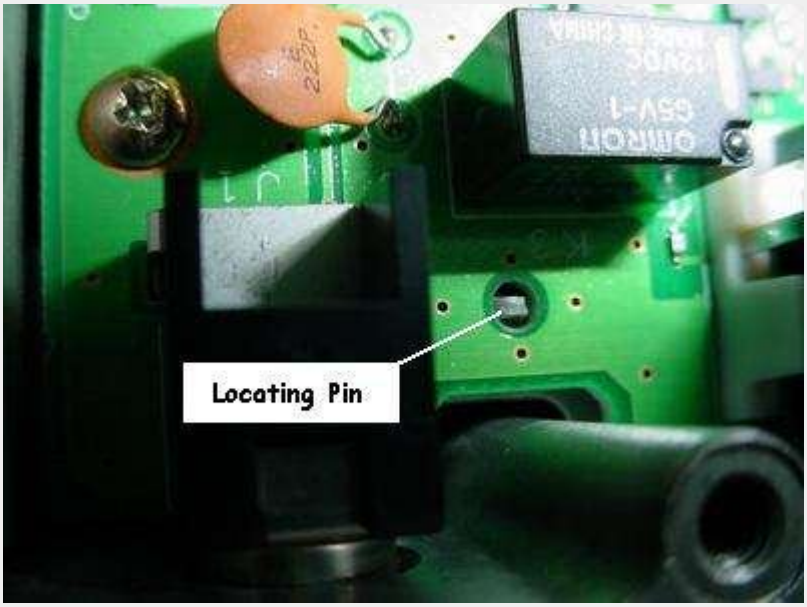
Turn the rig upside down and remove the bottom cover. the PC board that you now see must be partially removed. You need to unplug one coax plug and remove the 17 tapping screws that hold down the board, and remove the ground clip on the right hand edge (see second picture below):



Removing the ground clip.



Once all 17 screws are removed, gently lift the board from the front until it is high enough to clear the locating pin at the rear of the board, shown below, and then slide the board forward until the connectors protruding through the rear panel are clear and the rear of the board can be raised.



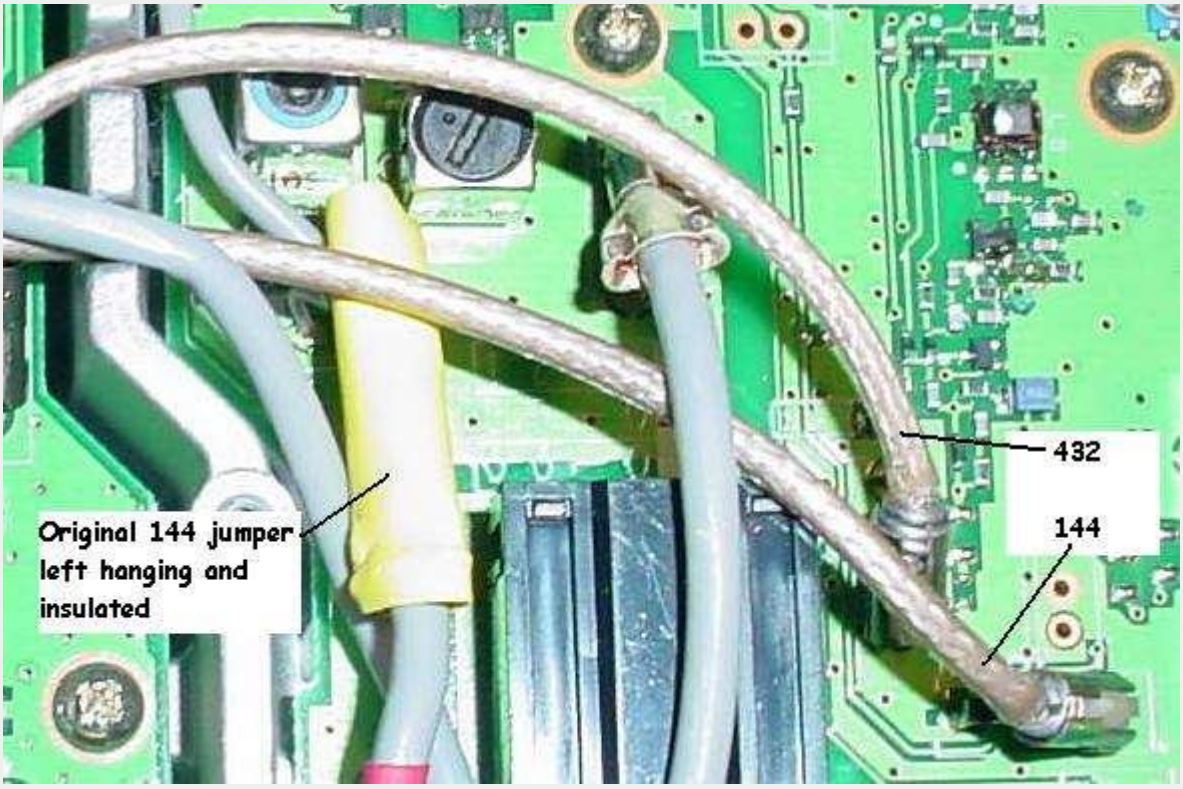
Once the rear is free, lift the board from the rear and carefully turn it upside down, towards the front. All the wiring at the front of the board is loose enough so you will not have to disconnect any of it. Here is the board being removed:

Next remove the metal shield that is below the board (10 screws):

Here is the TS-2000 with the bottom board removed and ready to make the modifications:

Making the 144 and 432 Mods

The input connectors to the 144 and 432 receiver RF sections are next to each other in the center compartment of the rig. Each one has a coaxial jumper that goes through the center shield to the left hand compartment (as viewed in the pictures). I removed the short jumper used on 432 and saved it for reinstallation later if I want to undo this change. The two meter jumper was insulated and left hanging (see the picture below).



If you can find suitable plugs to match the RF jacks on the board you can use them. I made my own as shown below:

The center pin is enlarged and stiffened by soldering a short piece of solid bare wire alongside the stranded center conductor. Slightly larger solid bare wire (about #22) was wound around the shield and soldered in place to match the size of the jack that it plugs into. It only takes about a minute to make a connector like this and it works just fine.

Here is the inside of the modified TS-2000 showing all the 144 and 432 changes.

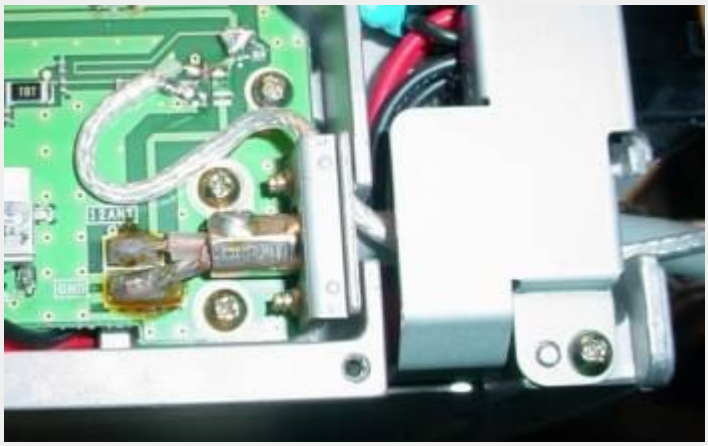
I neglected to make the 432 line long enough to wrap it for a strain relief. So far I've had no trouble with it but I can always do it over if it breaks.

This completes the 144 and 432 mods. Put the TS-2000 back together (except for the covers if you are going to do the 1296 mod too).

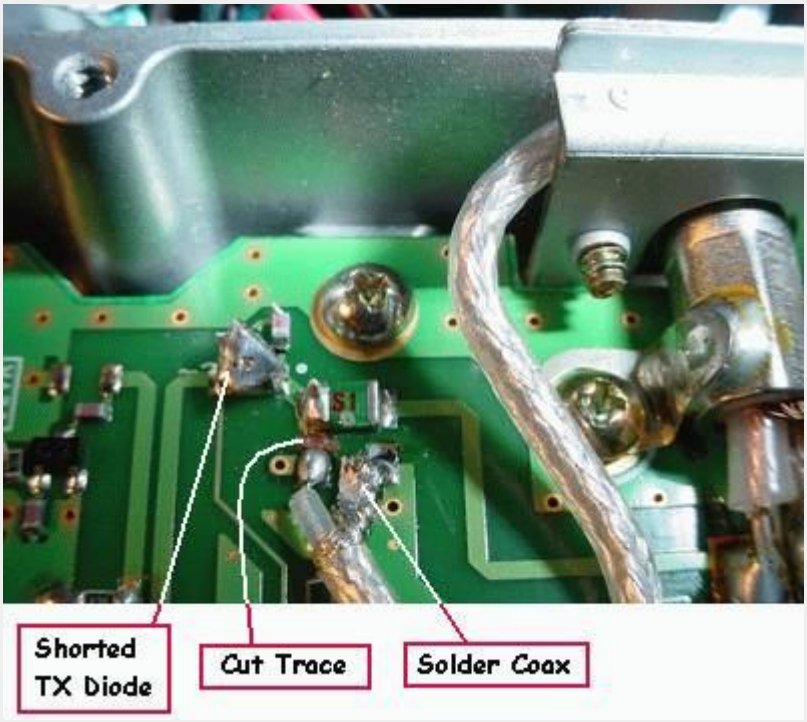
Making the 1296 Modifications

The antenna switching in the 1296 module does not use relays or jumpers, but rather is diode switched. To convert to a separate receive antenna input it is necessary to cut a trace to isolate the receiver from the transmitter, short out the transmit RF path switching diode, and solder a small piece of coax to the circuit board.

Remove the top and bottom covers and the side cover from the 1296 module. Below are pictures of the inside modifications:



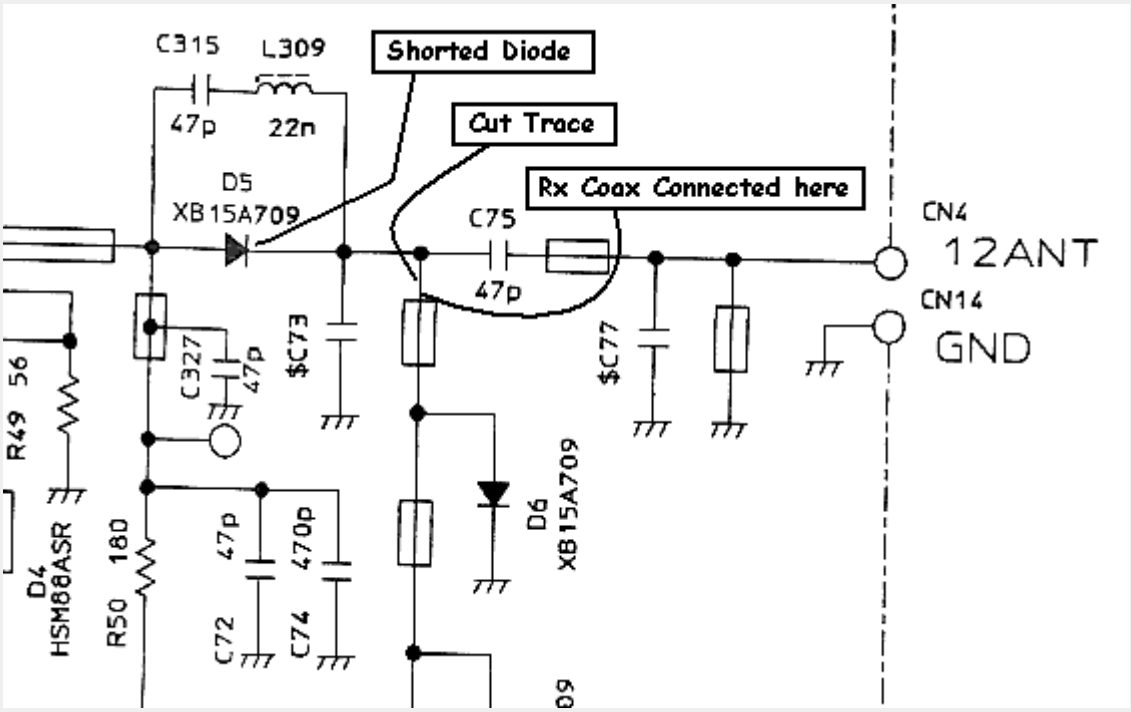
The trace is cut between the capacitor marked S1 and where the center conductor of the coax is soldered on.



The TX diode is shorted out by a small piece of copper foil soldered across it.

Remove the bracket shown in the upper picture and grind a small hollow into the upper side of the hole where the transmit feedline exits. Smooth the edges so it cannot cut your coax and clamp it back down over your new RX coax. Make it tight to provide strain relief. Here is the outside view:

Below is the schematic of the output portion of the 1296 module, showing the changes you have now made:



This article can also be found at http://mywebpages.comcast.net/russk2t/ts2000.htm.

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add a comment

This modification has been read 3195 times.

10-07-2003 add a comment

Frequency Calibration

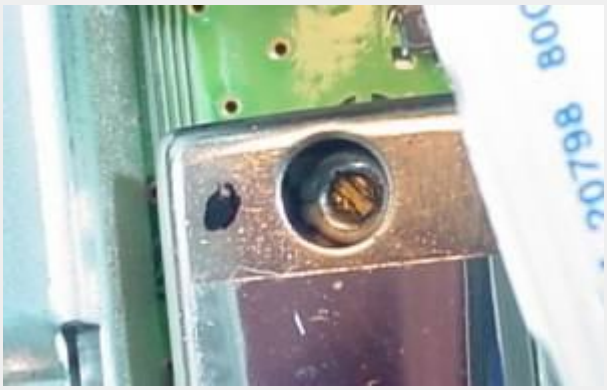
Author: *Russ K2TXB - k2txb@dxcc.com.MODIFICATION.NET*

After 2 years of operation I had a couple of minor problems with the TS-2000. The most disconcerting was that the rig was getting out of frequency calibration. I measured it to be about 200 Hz low on 144, 600 hz on 432, and almost 2 Khz on 1296! I checked out the users manual and did not see anything about calibration, nor did I see any information about where to get a service manual so I started scouting around on the internet. Eventually I found the Yahoo group called the KenwoodTS-2000 group. There I found some knowledgable people and, in the library, some description and text from Durl, ZF1DG, showing where the adjustment for the master oscillator or TCXO in the TS-2000 is. Here are pictures and text showing how to recalibrate the TS-2000.

Frequency Calibration for the TS-2000

The TS-2000 is a great transceiver but it is possible for the frequency calibration to be off. I have heard from owners whose rigs were off from the start but mine was 'right on ' when new. But after 2 years of operation I found it to be seriously out of calibration.

The master oscillator adjustment can be accessed from the bottom. Turn the radio upside down and remove the bottom cover. The photos show the oscillator adjustment point.



Adjustment Techniques

If you have access to a high quality calibrated frequency counter you could measure the TCXO frequency directly. After an hour of hunting on the schematics I found it and it appears to be at 15.6 Mhz.

Another way is to calibrate the receiver against WWV. I found it very difficult to detect zero beat since there is no IF shift available in the TS-2000, so I used the technique described by ZF1DG. Connecting the audio output from the TS-2000 to the sound board of a computer and using the Spectran program, you can see the frequency of an audio tone to within about 1-2 Hertz. WWV alternates between sending a 500 or a 600 Hz tone during each minute, so it is easy to see. First put the receiver in AM mode and look at the tones with Spectran (or some other waterfall program). If the sound board and Spectran are working properly together, the tones should be seen EXACTLY at 500 or 600 hertz.

Next switch the receiver to USB and tune the receiver so that the dial reads exactly 5, 10, or 15 Mhz (depending on which WWV frequency you are listening to). Tune using the multi-function knob, set to tune in 10 Khz steps, or enter the frequency directly with the number pad. If you tune with the knob the frequency will not be exact. Now observe the tone with

Spectran. It should still be exactly at 500 or 600, but will probably be off a little.

Adjust the TCXO until the tone shown in Spectran is exactly 500 or 600 Hertz. Do it carefully. A 1 Hz error here will translate to a 10 to 28 Hertz error at 2 meters (depending on which WWV frequency you are using). And it translates to a 90 to 250 Hz error at 1296). I was unable to get it that close using this technique. I ended up with about a 400 Hz error at 1296, indicating I was about 3 Hz off at 10 Mhz.

Fortunately I had a better way available to me and I think it is probably the best of all. I had available a rubidium standard locked oscillator at 1296.0000 Mhz. By adjusting the receiver to 1296.0 and then using the RIT to offset the receiver 1 Khz lower, I was able to generate a 1 Khz tone from the standard signal. Then I adjusted the TCXO so the tone showed exactly 1000 Hertz on Spectran. With a possible error of 2-3 Hz, this means that at 2 meters I should be off no more than 1/3 of a cycle!

However the picture is not that rosy. The oscillator has some short term drift due to heating effects. I found that when cool the TS-2000 is about 25 Hz high at 1296, and when hot it runs about 25 Hz low. Still this is not bad and a lot more accurate than most other amateur transceivers.

Where did I get the rubidium standard? On the air. In Princeton, NJ there is a 1296 Beacon, W2ETI, run by the SETI League. It transmits a rubidium standard locked carrier at 1296.000000 for the first minute of each 5 minutes whenever the moon is above the horizon in NJ. Fortunately I live about 40 miles from this beacon and it is S9 here.

If you aren't lucky enough to live near an atomic standard, you can buy your own for $300 or so, or you can probably take your TS-2000 to a nearby lab where they have standard equipment. Ask around the local hams and see who has access to such a lab.

This article can also be found at http://mywebpages.comcast.net/russk2t/ts2000.htm.

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15-07-2003 add a comment

Yahoo groups: kenwood ts2000 Adjustments &Mods

http://groups.yahoo.com/group/adjust_ts2000

Date: 28-08-2003 **User comment** **From:** rt337grab

Subject: great news and it works

This is the solution where I was waiting for,
All the things are there to reprogramm the Ts2000 on things
what was not possible before.
the adjustment software works great and the how to do it (help files)
are very helpfull.

thanks to the guys who did the job

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31-08-2003 add a comment

TS-2000 10.695 CW IF Filter Change

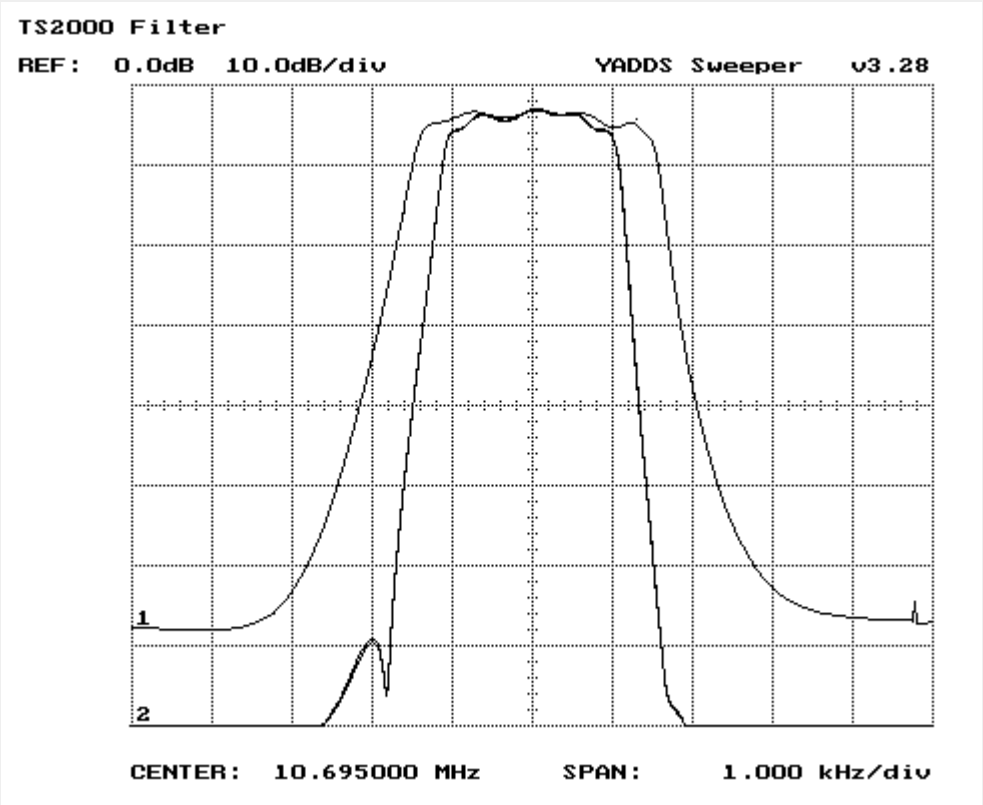
Author: *Charlie W5VIN - w5vin@earthlink.net.MODIFICATION.NET*

This is a mod to replace XF-6 IF crystal filter with an eight pole 2.1 Khz. International Radio unit. Their # for the filter is #92 and it is also used in the TS-50.

Began by removing the bottom cover of transceiver and then remove the seventeen screws which hold the rf circuit board in place. Also remove the clip from IC9 near edge of board. There is no insulating material here. There is one rf coax connector near the rear of board that has to be unplugged to raise and flip over circuit board. Be sure to mark where this connector is as there is an unused one nearby.

XF-6 is clearly labelled and is chrome plated. Using a small isolated tip soldering iron and small solder wick clean solder from the four pins and two mounting ears of XF-6 then gently remove it. Using small coax (I found some .045 teflon) or the supplied RG-174 remotely mount the filter. Since the original filter uses .01 micro farad coupling caps none are required at the filter.
I mounted mine on the double sided tape pad where the voice chip mounts as I'm not using one. There is ample room near the fan area also. The other thing I did was to peak the IF inductors L69, L71, L87, L613 and L614. All of these inductors are labelled on the circuit board. Inject a signal at hf frequency and using an oscilloscope or AC millivolt meter across the speaker leads peak these inductors for maximum output. Set the injected signal and audio control for a good meter reading before starting to adjust. Always remember what position the tool was in before any adjustment is made in case of error. One can use jewellers screwdrivers for adjustment tools.
Peaking up these IF inductors helped the receive level on my unit.

On the air tests came back with excellent Kenwood audio on both side bands. Results were very pleasing with the IF crystal filter change. For those who say this transceiver suffers from filter blow bye this may be a good mod. It does not deter from the excellent audio this transceiver has on both receive and transmit. My Kenwood filter is at International Radio for sweep test versus their replacement and I'll post the results here. Wilbur wilby@pix.net has an operating manual for this radio on CD for a great price and it's printable. There are small components in this radio and exercising care while doing this mod is very important. I claim no responsibility in someone else performing this mod with disastrous results.



As is evident by the filter sweeps George W2VJN of International Radio did on my original filter versus his there are obvious advantages in this modification.

Charlie W5VIN

Date: 10-10-2003 **User comment** **From:** W5VIN

Subject: TS-2000 10.695 IF filter changeout

This filter changeout as posted is for the CW filter network. I've got the SSB filter modification installed and working in my TS-2000. George with International radio is going to design a switched board that will use the original monolithic filters (2) plus his filter. Through use of a tiny toggle switch mounted in a cooling slot on rear of the TS-2000 one can change filter networks. No extra holes.

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13-09-2003 add a comment

TS-2000 RF bandpass filters Modification

Author: *Charlie W5VIN - w5vin@earthlink.net.MODIFICATION.NET*

This is a mod to replace the hf RF bandpass filters diodes with low noise schottsky units. I used BAR43 diodes. Mouser's part number is 511-BAR43FILM and they are thirty two cents each.

This is a three leg device and only two leads conduct. The single leg is the cathode and if one looks at the diode right side up with the dual leads facing up the right one is the anode. Began by removing diodes D8, D12, D14, D16, D18, D20, D22, D24, D27, D29, D31 and

D33. D20 has another diode D11, close by. **DO NOT remove D11.** These are all on the component side of board.

Replace with the BAR43 diodes observing polarity and correct lead hook-up. I check my connections with an ohmmeter set to the diode position before and after changing individual diodes..

After finishing the top side of board remove the seventeen screws which hold down board, the one rf cable near back and IC9 clip. Flip board over and replace diodes D10, D13. D15, D17, D19, D21, D23, D25, D28, D30, D32 and D34.
These are all in line with each other and are rounded. Observing polarity and correct lead orientation replace with the BAR43 diodes.

After replacing diodes on bottom side of board it can be fastened back in place with the seventeen screws. The heat sink clip and the rf cable are put back in place.

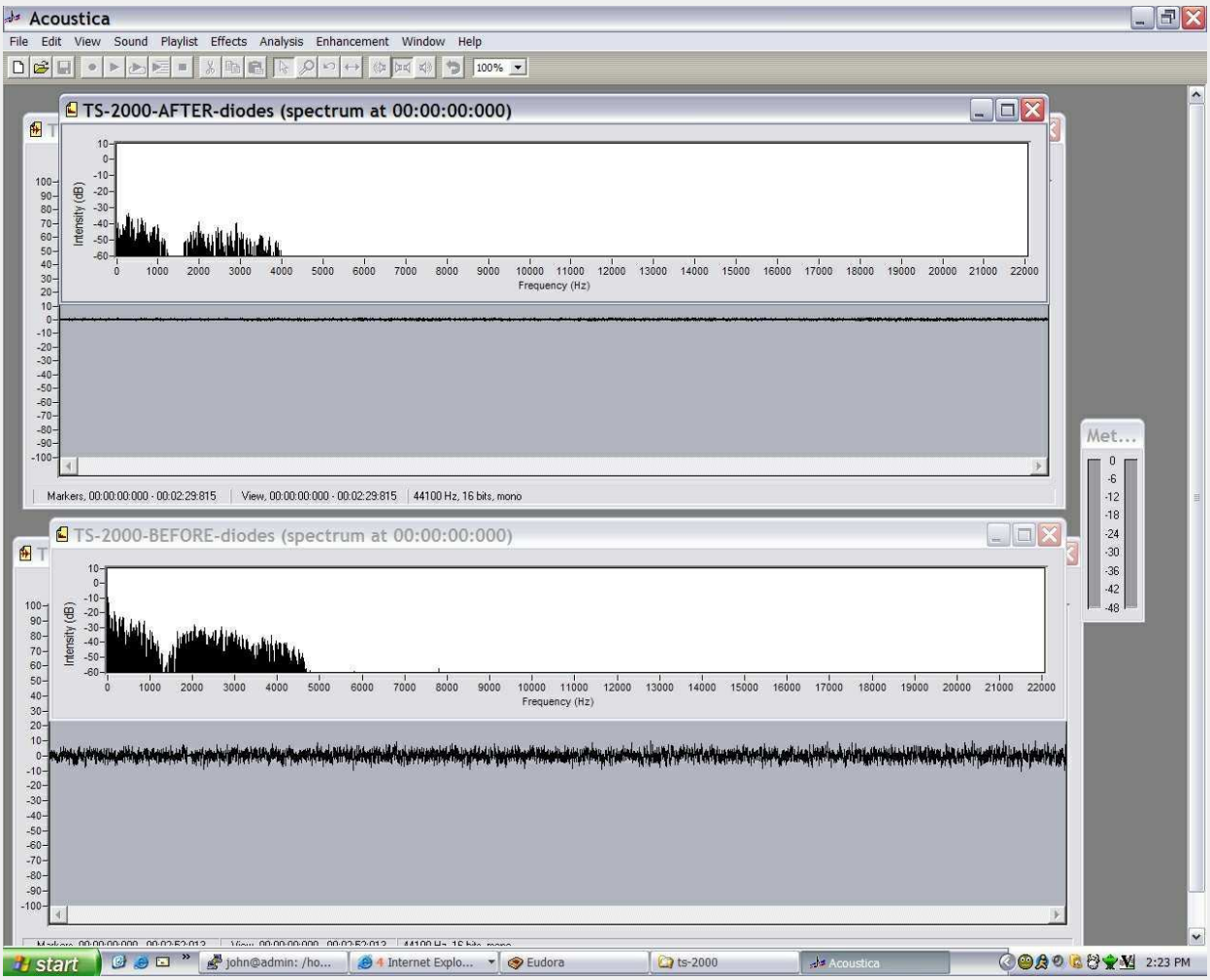
This modification does wonders for the internally generated noise the TS-2000 has. One can leave the antenna lead off on hf or 50 Mhz and even with the volume wide open in hf SSB this receiver is quiet. Checking this before and after mod does wonders as the TS-2000 is a noisy receiver. The modification also helps receive sensitivity.

SMT components are tiny so exercising care, an isolated tip soldering iron and using the right tools is a must. I accept no responsibility for someone performing this mod with disastrous results. Downloading the service manual on CD and checking parts location is very important.

Charlie W5VIN

Thanks to John VE3NFK for the audio analyse before and after modification.

I took 15 sec recordings of all the major bands in USB, full bandwidth, and neutral controls with all antennas disconnected - through a sound card using 'audio out' from the TS-2000 to avoid volume control problems. The results are amazing - before, the noise level was -24 db and after -36 db....



The results from an audio analysis program showing the before /after.

John VE3NFK

Date: 15-09-2003 **User comment** **From:** DL9HAM

Subject: Diodes

Are you sure about the replacing pin diodes with schottky diodes?
How does the modified TS-2000 handle large signals from BC (I have a 500 KW AM BC TX some 5 Miles away, and Pin Diodes always cured the IMD caused by standard diodes in my QTH).....

rgds
DL9HAM
Mike in Hamburg

Date: 02-10-2003 **User comment** **From:** John VE3NFK

Subject: works great!

I was able to get a competent friend (:-)) to do this for me last night. The night before, I took 15 sec recordings of all the major bands in USB, full bandwidth, and neutral controls with all antennas disconnected - through a sound card using 'audio out' from the TS-2000 to avoid volume control problems. The results are amazing - before the mod the noise level

was -24 db and after -36 db....
I used BAR43C (the dual diode version) simply because they were 1/2 the price here (Canada) compared to the BAR43 's - just did not use one leg. Charles comment on 'why' this works:
"
The TS-2000 as per factory uses silicon, PN hot carrier diodes on the input (top) side of these butter worth filters and silicon PIN diodes on the output (bottom) side. The shottky diodes are a lower barrier voltage diode thus generate less noise than silicon diodes. The bar 43 series has approximately 50 percent of the noise as a resistor would have in a circuit."

Also - better gain on the low bands...

Thanks, Charles

John VE3NFK

ps - got the BAR43C from Newark and the price for the dual diodes was 22 cents each (Canadian - about $0.15 US)

. NEWARK INONE PART #: 18C5745 Discrete Semi's Diode/Rectifier, Schottky, 330 mV, 200.0 mA, TO-236
QUANTITY: 80 * @ $0.22 = $17.60
ORDER TOTAL: $17.60 (plus about $10 ship/handle/tax!)

Date: 05-10-2003 **User comment** **From:** W5VIN

Subject: TS-2000 Bandpass filters Diode Switches

I performed some additional bias voltage tests on the TS-2000 input filters switching diodes. The unused diodes are reverse biased five + volts by having 12.61 volts positive, (supply) on their cathodes and 7.11 volts positive on all the anodes. Any IMD products entering on an unused filter network would have to over come these voltage differentials on both input and output switches. The Kenwood engineers achieved this novel biasing scheme with the enclosed resistors in the bandpass filters transistor switches.

Date: 13-10-2003 **User comment** **From:** Peter, HB9PJT

Subject: Realy a good modification?

The diode modification brings perhaps a little less noise and more sensitivity. But when the antenna is connected I never can hear the noise of the TS-2000 because the antenna noise is in every case much stronger. So I think this modification brings nothing. I can not copy better with this modification because the sensitivity of the TS-2000 is already much more then the antenna noise. When changing the diodes you could get a lot of problems with IP2. BC signal interferences become strong on 20 and 15 meter.

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24-09-2003 add a comment

TS-2000 upgrade problems

Author: *PA1AP - pa1ap@amsat.org.MODIFICATION.NET*

When troubles upgrading your TS-2000 to latest firmware you could try the following. It

worked for me.

With default settings on Windows XP (using P4-2Ghz) the upgrade failed somewhere around 13..20%. Tried many times but always failed. After some investigation the following procedure solved the issue for me.

- goto device manager
- select the communication port (com 1 in my case)
- click on "restore defaults"
- select advanced
- enable FIFO buffers
- set receive to value 8 (range is 1 to 14)
- set transmit to value 4 (range 1 to 16)
- click ok
- click ok again
-
- then select the communication port again (com 1 in my case)
- disable it ! (right mouse button, select disable)
- enable it again (right mouse button, select enable)

then do your upgrade. It worked great first time after the change. Seems the fifo handling on windows XP is different then win98.

Also for the one's who want to check if upgrade actually did something: Press Mic & NR during power on. You will see the firmware code numbers like:
firmware 102: adj ok prog (bb7d) check sum (2511e8a9)
firmware 103: adj ok prog (4611) check sum (2511e8a9)

hope this helps. 73 de PA1AP

Date: 25-09-2003 **User comment** **From:** EC3DEZ

Subject: It´s able to adapt or modify the TS-2000 (american version) to the TS-2000 (spanish/european version) ?????

I´m asking for this, because I´m interested to use Sky Command feature with the Kenwood TH-D7.

Thanks a lot in advance!!

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