The Wonderful World of SSTV

There is a wonderful fraternity of hams operating SSTV. You will find many stations on 14.230 MHz, a frequency I often visit. This guide endeavors to provide ideas, hints and tips for the new SSTV operator: to help get you started quickly to enjoy this fascinating area of amateur radio. The guide is long, but definitely not exhaustive. It is written to give you some resources and guidance. If you are stumped, better if you simply jot me an email on the specific topic and perhaps I can further assist with some details. My email: larry@wa9tt.com

Can You Hear Me Now?

I quickly realized the importance of good signal reception. You certainly want to copy the ham's call sign when answering the CQ! I discovered that QRN plays a big role in quality image reception. So, importantly, you should have a good antenna.

I routinely monitor sister SSTV cam stations and compare my copy. In 2012, I had a simple attic dipole. These days I have an AN Wireless tower and a Force 12 C-3 Yagi at 51'.   That helps considerably!

Check Those Pics

There are some hams that go a step further and routinely port their received SSTV images to the Internet. I do so at www.wa9tt.com I have found many sister SSTV cams which TEND to receive the same images as I do. They spread out nicely from the east to west in the US, plus some in Canada. When you transmit your picture, you can quickly go to my 20M SSTV tab to see my copy, or that of other stations and observe the propagation at that moment.

The Silent QSO

Most SSTV QSOs are done is silence—no voice conversation, just images. Sure, it's legal to talk on 14.230 MHz, but 14.230 has become very crowded, so most SSTV'ers move to another frequency to have voice conversations to keep the SSTV "channel" clear for image transmissions. Most of the time hams 'talk' by trading pictures overlaid with a template of words. The typical SSTV QSO involves five transmissions with three types of images.

Station A	Station B
Calls 'CQ SSTV'	Replies with call signs and signal report
Replies with signal report, etc.	Sends a 73 transmission
Sends a 73 transmission	

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Each transmission takes from 8 to 114 seconds, or longer, depending on the format used. So you can see it is possible to hold a 10-minute QSO!!

There are a multitude of different image transmission formats from which to choose, but there are only about a half dozen that are widely used. Here they are and their transmission times:

Scottie 1 – 110 seconds

Scottie 2 - 71s

Martin 1 - 114s

Martin 2 - 58s

B/W8 – 8s

Robot 36 - 36s

Scottie 1 and Scottie 2 are the formats most used today (2022) and of those two Scottie 2 is sufficient for most QSO's when the noise floor is reasonably low and the station is using 500W and a directional antenna (eg. Yagi). However, if you have only 100W and a dipole you are better off using Scottie 1.

Even better, I suggest using Martin 2. That requires only 58 seconds. It has several advantages:

- Image fidelity is still good

- Faster QSO rate in the crowded 20m band

- Less stress from heating of your rig and perhaps linear amplifier

Energy vs Power

Many hams do not realize this, but the most important factor in image quality is not power. It is the total amount of energy received, and thus transmitted, to get the image across. There are 2 ways to maximize the probability of a good received image:

- Higher power (including antenna gain) or

- longer transmission time

That is why there are so many formats out there. It is a fact of life on 14.230 MHz that QRM, QRN and QSB will degrade the image received by the other station. The longer the undesired problem lasts the more lines in your image will be damaged.

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The structure of noise is horizontal in SSTV. If QRM lasts 10 seconds during your image, then, 1/7th of lines in the image will be ruined in Scottie 2 but only 1/11th will ruined in Scottie 1. Almost all of the image will be ruined in B/W12 but only 1/27th will be ruined in Scottie DX.

So why not use Scottie DX for everything? Because there could be dozens of hams using 14.230 at any one time; and there is no better way to irritate the SSTV community than to hog the frequency. So be judicious in your choice of formats.

Pretty in Pink

A major aspect of SSTV is the pictures we share with one another. They represent the personality and interests of each ham. I attempt to find striking images. I get them from friends who pass those emails around! I do Google searches sometimes. Other times I just stumble across an image while reading something on the web.

The picture editor in MMSSTV is very limited. Hence, I do all my image manipulation on my desktop computer using GIMP 2 software to edit those JPG images. MS Paint, usually included with Windows, is another picture editor you can use.

You will notice that SSTV pictures are pretty much square in aspect ratio so you may as well crop, stretch or shrink your prepared images in your picture editor to be at least close to 'square-ish'.

The most common SSTV image format is 320 pixels WIDTH by 256 pixels HEIGHT. I will size and crop a desired picture to those dimensions, if possible. If not, I may set the height to 256 and crop the edges while still attempting to retain a decent photo, or I will set the WIDTH to 320 and settle for an SSTV presentation which runs out of picture before the end of my transmission.

I suggest to begin with you have a dozen nice pictures stored in your MMSSTV software.

MMSSTV—What is that?

In order to decode a slowscan TV signal, you need software on your computer to encode and decode the audio you must send to and receive from your transceiver. Then if you simply connect the audio of you radio to the microphone input of your computer, you can begin receiving. (Transmitting is a little more involved.)

MMSSTV is THE most used SSTV program in amateur radio by far. You may download a free copy of MMSSTV at https://hamsoft.ca/pages/mmsstv.php It isn't being updated any more, so grab version 1.13A and install.

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There are other SSTV programs available, although MMSSTV is quite good.   You could alternatively use Digital Master 780 if you have a subscription to Ham Radio Deluxe.   You might use ChromaPIX. Some choose to use MMSSTV-YONIQ which has a couple of new features.

How does one store pictures in MMSSTV?

Simply set up a file folder.   I call mine 'My Pictures' and place that folder inside the HAM>MMSSTV sub-directory. That's my storage site. You will then grab a picture from this file and quickly have it ready for ongoing SSTV transmissions.

I go a step further and categorize pictures thematically, and therefore, I organize sub-directories within 'My Pictures' for further ease of access. Eg, sub-directories for themes like: cowboys, islands of the Caribbean, Halloween, comedians, sunsets, etc, etc.

Image Management Made Simple

That is a lot of images to consider when conducting an SSTV QSO. There is an easy way to help you quickly select the next image you wish to transmit. And you can make your choice while the other ham is part way through his latest SSTV transmission. You will soon find that 1 minute and 50 seconds is a lot of time to select your next image, select your next template (more on that in a moment), personalize if necessary and still have plenty of time to return to the RX tab to see the latest transmitted image unfold.

In order to bring up a picture grid like what you see below, go to the View menu option at the top, and from the drop-down list, click on 'Always show thumbnails of files folder.'   You can size rows & columns to suit your wishes.

When ready, you will simply double click on the desired image and it will automatically load into your Template screen, and after you then select a suitable template, you will be cued up to transmit!

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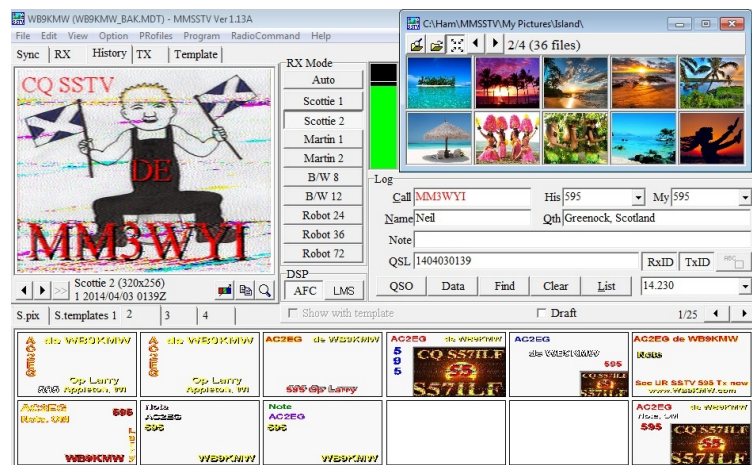
Template Talk

Well, that took long enough to get to templates!   There are two parts to an SSTV image:

- The picture and

- The words

Templates are the word overlays to your pictures which round out your next transmission message. You need a variety of templates in order to carry on an intelligent QSO via pictures. You are now going to learn how to do this.

Recall I said there are generally three parts to a QSO? Please review 'The Silent QSO.'

The three essential templates necessary to establish a typical QSO are:

1. CQ   MyCall

2. HisCall   signal report   MyCall

3. 73   HisName (optional)   HisCall   MyCall

I create and organize my templates so that I very easily move from one phase of the QSO to the next, and still have lots of time to go back to view the latest picture I am receiving.

MMSSTV offers a wonderful way to organize things. See 'S. templates 1' in the screen shot on the previous page? Next to that is 2, 3 and 4. Well, I take full advantage of that organizational potential. Here is how I choose to do it.

If you click on 'S. templates 1,' you will see six boxes in a row. Towards the lower right hand corner you will see x/50 next to the right & left arrows. That means just in this #1 section you could store a whopping 300 templates. You may notice in the previous screen shot that I have set my MMSSTV window to display two rows of six templates.

I store all my CQ, QRZ?, Testing and 'to a specific call sign' templates in this section. I liberally space them out over the next couple of pages, so, for example, all my 'Test SSTV' templates are in one cluster.   I create a new template whenever I get a new idea for one.

As a beginner, you need just <u>one</u> CQ SSTV template. And it should only say CQ on one line and MyCall on another. Don't broadcast to the world that you are a complete newbie and don't know how to use your software. Everyone knows its SSTV. So just say CQ. You could use one of the pre-built templates that comes with MMSSTV. By now, I have discarded every one of them in favor of all my own designs.

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Now that you get the idea, I then have my 'first reply with signal report' templates all stored and sorted into a few six-section pages in '2.' I have many to choose from.

Section '3' is naturally reserved then for any subsequent QSO reply. I again have many stored templates. This would help me express things like: my equipment, QTH (including a picture of Wisconsin), info about my ham web site and so on. Many times I don't use them and instead opt for shorter QSOs.

Section '4' is for good-byes. I have many different 73s templates. Of course, to begin with, you only need <u>one</u>.

For a few of my templates in sections 2-4, I also have them set up for variable data, ie, Name or Note, as drawn from the logging area of MMSSTV (below the signal spectrum display). More about logging later.

Template Time

Enough talk, now let's build a template. It will be easiest if you take an existing stock MMSSTV template and modify it. Once you get the hang of it, you'll be creating them at will.

So very basically, please go to 'S. template 1' and double click on a template you wish to modify. It will then appear in the Template tab screen. You can then begin to work on it. When you double click on any existing text entry, eg, de WB9KMW (my prior call sign), the Text & Colors dialog box will appear.

You can then change the text, play around with all the different color controls, and even use controls such as Vert to display your text from top to bottom, or even rotation with the Rotation control.

When satisfied, click OK. You can drag the newly created image around the template screen until you are satisfied with its placement.

Continue until you are satisfied with all text entries. And if you need a new one, simply click on the big T in the menu choices under the picture and the Text & Colors dialog box will again appear.
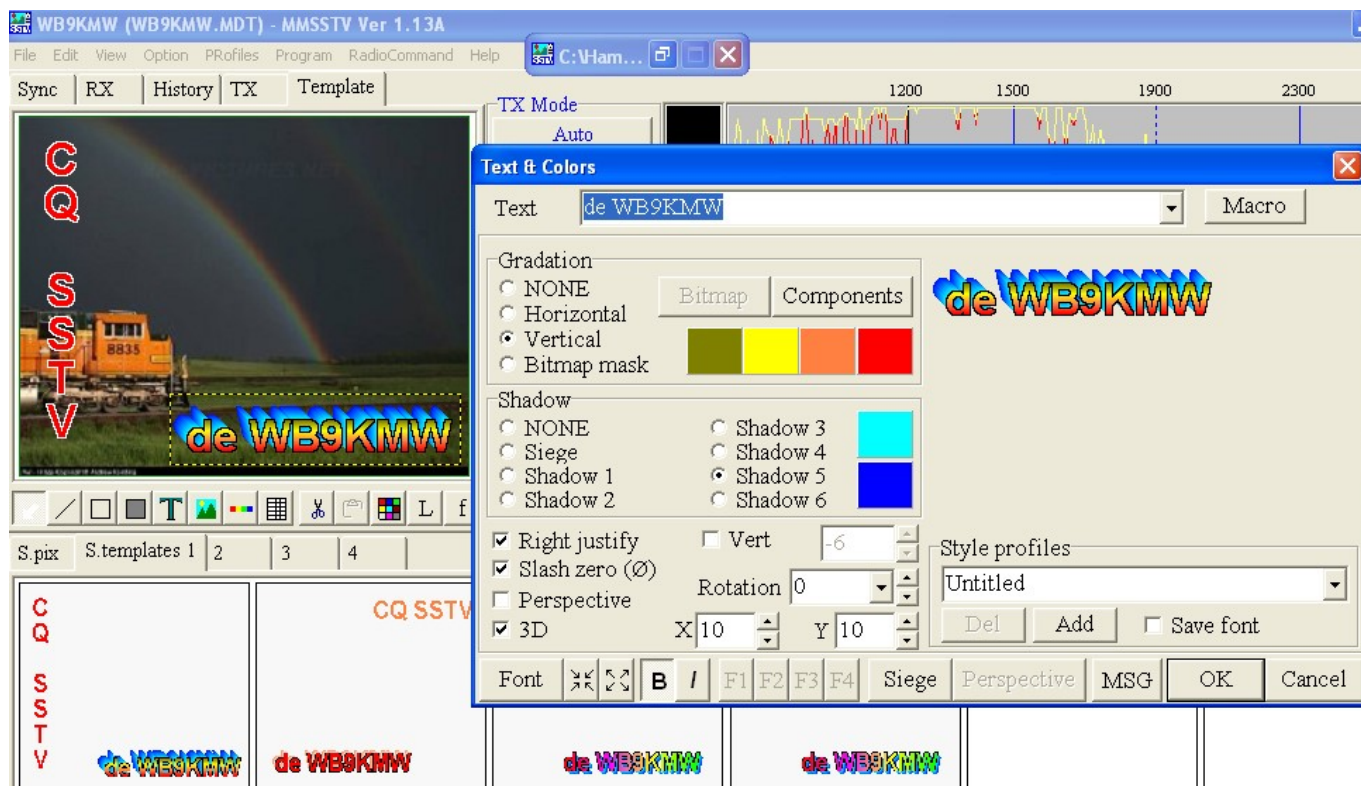
Now there is a nice feature in the upper right-hand corner of the dialog box, called Macro. Click on that and you will see some handy items which pick up data from the MMSSTV log and post it into your template.

For example, %c is the other station's call sign. Other useful macros are:

- %r for the signal report you are sending him

- %n for the other ham's name

- %m for your call (MyCall)

- %o for your very brief note

Once you are done, simple click somewhere in the middle of your screen (not on any text area) and drag & drop into any open template square below (or into one of the other 49 sections). You could also simply drag and drop over an existing template to permanently replace it.

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Isn't It About Time I Get On The Air??
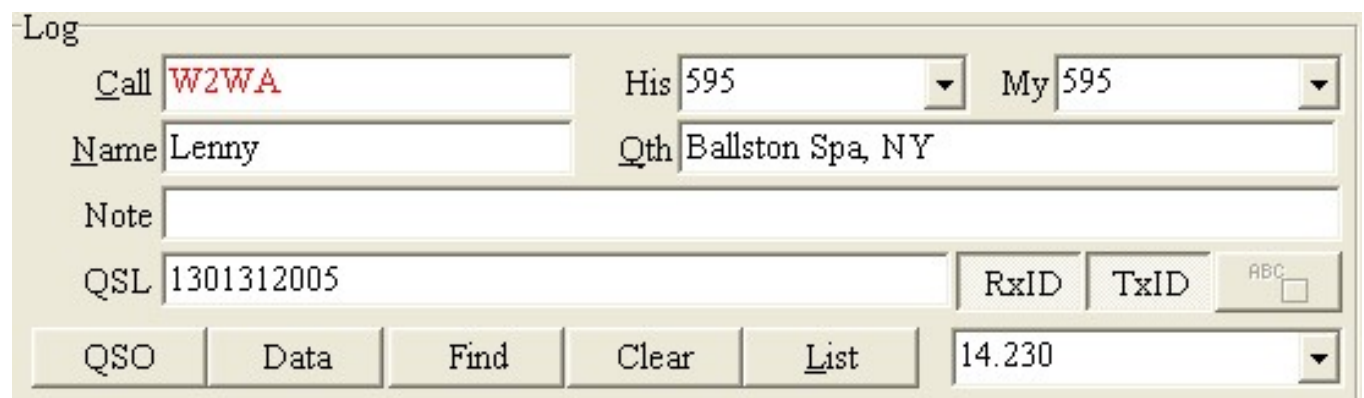
Guess what? You ARE ready. If you have your picture and template loaded as you wish, simply click on the TX tab and you will see the same thing you just readied appear in this transmit screen. If the template does not appear, simply right click in the transmit window and be sure that 'Show with template' is checked. Click on the **TX** in the left corner below your picture and you are on the air for the next 1 minute and 50 seconds.

Oh yes, did we ever mention this is a 100% duty cycle—like full key down? You can get a real hot & bothered transmitter if you don't scale things back a little bit, say cut your power in half. I typically run my ICOM 7300 at 50 watts.

Log that QSO

MMSSTV has a nice, little logging feature which I like to use for all my SSTV QSOs. If you are into exporting this into a master log, that function is there for you. But for now, let's just concentrate on the logging.

The beauty of the MMSSTV logging system is that you don't need to go into the templates and edit them for every QSO. Just enter the callsign, name, RSV and QTH. And if you used %c, %n, %r and %q respectively in your templates, the images will be automatically populated with the correct information. No muss, no fuss. I highly recommend you do all your SSTV logging with MMSSTV.

Above are the basic logging entries for my QSO with Lenny, W2WA. Since I have worked him before, his call sign appears in red, and his name and QTH are automatically set in place. All I need to do is select today's signal report from the drop down box, or type one in, and also insert the report he gives me.

To log this QSO, simply click on the QSO button in the lower left portion. It will post the current time (UTC). If not accurate, you can always adjust on the detail screen after your QSO.

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Once you are finished with the QSO, click that QSO button once again to restore it to its normal, 'off' position.

Now let's take a look at our log book. Simply click on List and up pops the following log book entries. You will see W2WA listed at the bottom representing my latest entry in this log book.

Now if we double click on one of the entries in this row, it will pop up the detailed log for this QSO. You can now make any adjustments to the details (perhaps correcting the beginning or ending time of the QSO or adding QTH if you looked it up in QRZ.com).

You will also notice this shows a history of repeat QSOs with Lenny. After any adjustments to this latest log entry are made, just click on the Write button in the bottom right corner and your updates will be saved.

Once you are finished viewing your log book, just x-out this browser screen and you will return to the main MMSSTV screen.


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MMSSTV Configuration

There are three MMSSTV configuration screens in the menu area: Option > Setup MMSSTV(O). Here are settings which I have found useful. They may help you, too. Let's begin with the **RX** tab.

Notice that I do NOT check 'Auto slant' and many other hams do not, either. We are interested in seeing the pure picture as transmitted. If you have a slanted transmission image, you are in big trouble with us. We won't be able to read your template text, and you may not get a reply from your CQ. For help on slant, please read my How To: *That Pesky Slant* at www.wa9tt.com
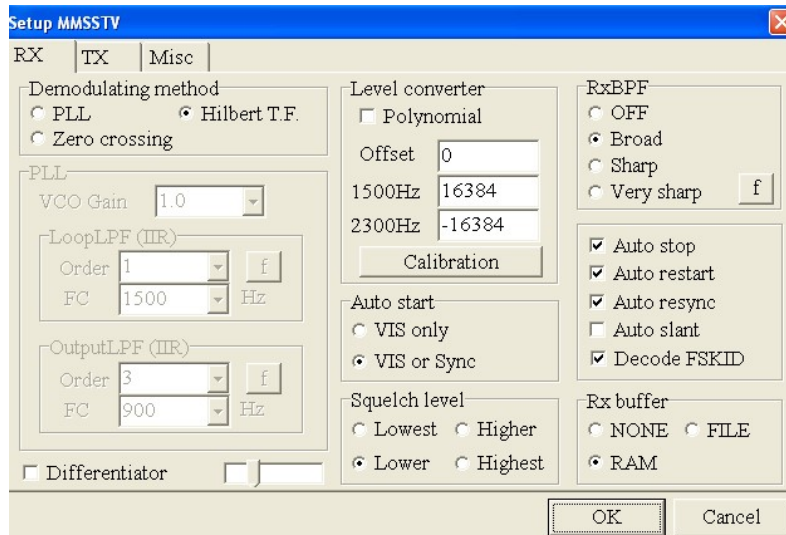

The PTT info in the **TX** tab will be very specific to your set up. You may need to designate a COM port. Hams use a variety of interfaces between their rig. I have used direct cabling, SignaLink, RIGblaster and now the internal soundcard in my ICOM 7300.

If you have one of the newer transceivers built in the last 10 years you may be lucky enough to only need a USB printer cable to connect between your PC and transceiver. Once you have made the appropriate physical connections between PC and transceiver you are ready to set up the software.

IMPORTANT: You may need to download drivers for your transceiver from the radio manufacturer and load them into the computer BEFORE plugging your radio into the PC. There is a well-known bug in the latest Silicon Labs drivers requiring you to use an old one for Yaesu and ICOM radios. If you connect the radio to the PC before setting up the drivers the PC may set up the latest driver (that doesn't work right) and things won't work right.

If you want a CW identification after your transmissions, click CW for the CWID. Most hams do not use this, and generally I do not either.

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'Encode FSKID' is handy. This means that your call sign will be encoded into your transmission and it will automatically pop into my MMSSTV log at the end of your transmission, assuming in the previous RX screen that I have checked the 'Decode FSKID' box.
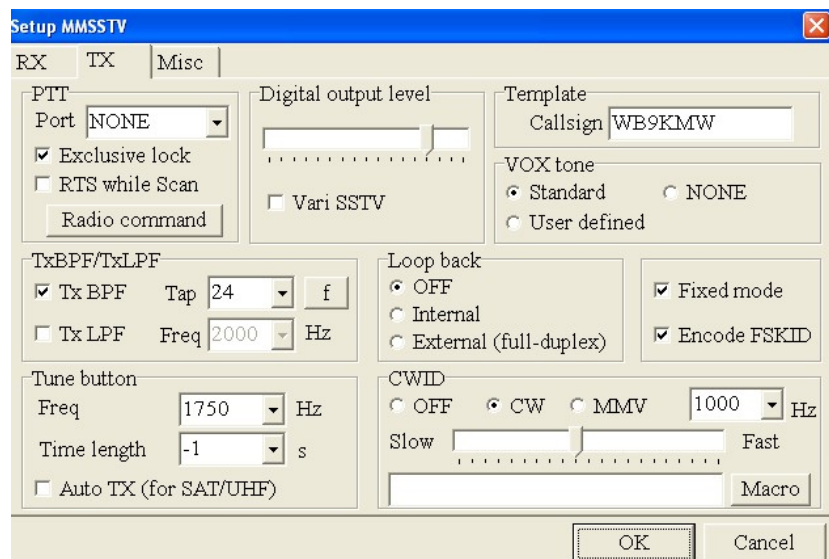
The **Misc** tab is also very important. You must have your Sound Card correctly set to the soundcard you are using. Otherwise, no reception and/or no transmission! In this example, it is pointing to CODEC for RIGblaster.

The Clock settings are vital for straight reception of images AND straight transmission of images. Use 44100.00 Hz if possible. Otherwise the highest value that works with your PC. This is covered in detail in an outstanding tutorial on my web page, *That Pesky Slant*.
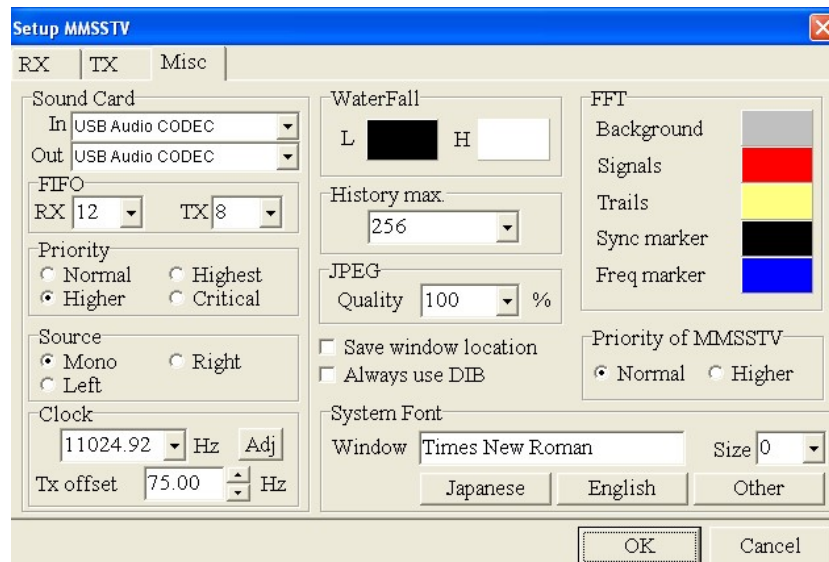
I look forward to many SSTV QSOs on 14.230 MHz with you. Larry WA9TT

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