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Getting Started in Slow Scan TV (SSTV)

Slow Scan Television (SSTV) has been around since 1957 when it was an electromechanical contraption strictly for those in the hi-tech vanguard. It was a time of tube-fired gear when most operators were still using AM mode for voice. But since the computer revolution of the 1980s, things have changed. With the rapid progress of personal computers and the availability of sophisticated software driven interfaces, SSTV has become just one of many digital modes available at the click of a virtual SSTV control panel button. Now, anyone with a decent computer, a low cost interface, and widely available free software can enjoy SSTV.

❖ What You'll Need

Until a few years ago, the computer requirements for reliable SSTV would still have been out of the reach of many hams, especially beginners. That's because SSTV operation requires most of the computer's attention. Most computer operating systems will work, even a PC as slow as 100 MHz, but the faster the processor the better your results. You'll need at least 32 MB RAM. SSTV images eat up memory, and if you really get into this end of the hobby you may be saving hundreds of images on file.

Tigertronics SignaLink Model SL-1+ Comes with enough basic digital software to get you well started in this part of the radio hobby. Prices range from $69.95 to $74.95 with connecting cable. Power supply extra. (Courtesy: Tigertronics)

Even the less expensive portable radios today are capable of copying SSTV. But, you will need upper and lower sideband capability or a tunable BFO (beat frequency oscillator) to fine tune the signal. The most important part of your receiving system will be a good outdoor antenna. With a telescoping whip you'll be able to copy stronger nearby stations, but DX (distant signals) will be very hard to copy. I use an all-band wire dipole at 30 feet which does a great job in most

MFJ-1279 Sound card interface allows operation of PSK-31, packet, APRS, AMTOR, RTTY, SSTV, CW and can be used as a voice keyer and CW contest memory keyer. Price is $99.95 and includes software, cables, and AC power supply. (Courtesy: MFJ Enterprises)

cases, but I've found that a multi-element high frequency (HF) beam is needed to work the real DX.

You'll need a digital multi-mode interface to go between your radio and your computer. If you have some skill with a soldering iron you can home-brew your own. However, there are many inexpensive interfaces on the market from which to choose. For some advice on any particular model, check out **http://www.eham.com** and look in the reviews section for the unit in which you're interested. I have been using a Tigertronics SignaLink model SL-1+ with excellent results.

And, finally, you'll need the software to make it all happen. Again, there are a number of software options and you may need to try a few of them before making your final choice. Many are free and even the commercial ones have a 30 day trial period. You'll know long before the trial is up whether or not you like the program. Most have built-in logging programs which helps cut down on the paper work. I've been using HamScope v1.54 as the basic software and using MMSSTV v1.11, both of which are free via the Web and have worked flawlessly for me over the past year. Despite being a complete beginner when I started this year, I'm now using these programs like an old timer. You will, too.

❖ What's the Frequency?

The FCC requires that SSTV transmission take up no more space than an SSB transmission – about 2 kHz. Now, when you consider that your average TV station uses bandwidth 6 MHz wide, it's easy to see that we're going to lose a little something in resolution and action. Add to that the fact that off-air TV signals are sent at 60 frames per second and that one still picture takes about 2 minutes to send via SSTV, and you can see why HF amateur TV is limited to still images. You don't expect to get VHF or UHF TV images from 10,000 miles away, but that's what's possible with SSTV and that's what makes it interesting.

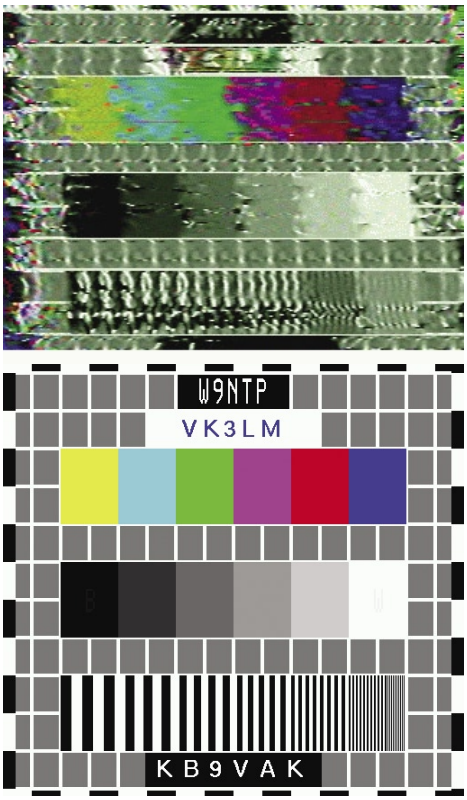
Unfortunately for SSTV operators, there's little space available to practice their art. SSTV is limited to certain frequencies on certain bands. To top it off, most hams are completely unaware of the SSTV calling frequencies and often set up on or near these frequencies and become irate when SSTV signals come in from around the world.

RIGblaster by West Mountain Radio provides all digital modes send and receive in this rugged black sound card radio interface. Includes cables and software for virtually all digital modes. Price is $129.95 from Universal Radio. (Courtesy: Universal Radio)

Regardless of band, most SSTV exchanges are found on the "calling frequencies" – see chart below. During the day and on weekends when there are more hams on the bands, expect to hear signals either side of the calling frequency. Because of band conditions in this part of the solar cycle there's less activity on 15 and 10 meters. But, when those bands are open, extraordinary DX catches can be had.

❖ Operating Tips

While the MMSSTV program has a good help button, I found that it was easier to print out the entire manual for easier reference while setting up the program. It's a substantial 23 page document but well worth the ink. The program was written by Makoto Mori, JE3HHT and ably translated into English by Nobuyuki Oba, JA7UDE. Additional help in the form of an SSTV Primer by Michael Tondee, W4HIJ, is found at **http://www.mmhamsoft.ham-radio.ch/mmsstv/priver.htm** The more I use this program the more amazed I am at what it can do. The version 1.11 was written in July of 2004,



Transmission tests on 20 meters of HDSSTV (later renamed Redundant Digital File Transfer, RDFT-SSTV) between VK3LM (Australia) and W9NTP (U.S.). The first figure shows an analog Robot36 SSTV 30.5 second transmission. The second figure shows a 30.5 second RDFT-SSTV transmission. (Courtesy: Barry Sanderson, KB9VAK's web site: http://www.svs.net/wyman/examples/hdsstv)

so it's not only new but others have worked out the bugs.

Reception is virtually pain free. After hooking up the hardware and loading the program, simply tune to any of the SSTV calling frequencies and stand by. I found most of the action was on 14.230 MHz. If you've hooked everything up properly, the program will come to life and an image will begin to appear on the screen when you hear the distinctive SSTV tones. If the image is slanted, simply adjust the slant by clicking on the "sync" button and watch the screen straighten up. The receive buffer will save up to 32 images.

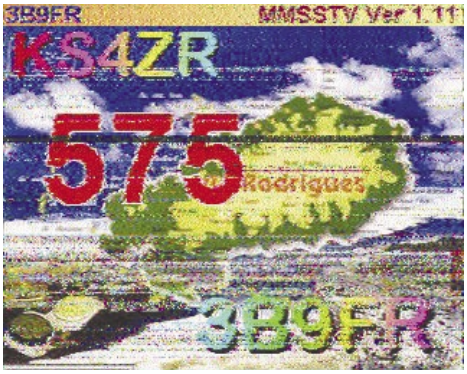


Image from 3B9FR, Rodriguez Island in the Mauritius Island group in the Indian Ocean, a distance of about 10,000 miles from the U.S. East coast, using 50 watts on 20 meters. (Courtesy: Author)

Additional image storing is done in a separate "history" folder. Leave your system in the receive mode for a couple of hours after which you can go back and check your catches.

It's much more difficult to transmit a good SSTV image than to receive one. Because sound cards have slightly different record and play frequencies it will cause a slant in the transmitted image. There are a number of ways to correct this slight offset. The only way you'll know if your image has slant in transmit is if the receiving station tells you so. If the slant is not great, the receiving station's autocorrect will take care of it. But, if it's severe, then you'll have to go through the correction procedures in the manual.

While MMSSTV supports 24 SSTV modes, in practice, four modes are used more than others: Scottie 1 or 2 in North America and Martin 1 or 2 in Europe. HF SSTV frequencies are in the voice portion of the bands which allows operators to chat about their images before or after they're sent. In practice, most U.S. hams do chat but most DX operators don't.

Remember that transmitting in SSTV is a full "key down" mode for almost two minutes. For this reason you should set the output of your transmitter for no more than 50 watts. Turn off any processing or other output enhancements.

Image from VE1HBV, Nova Scotia, a distance of about 1,300 miles from the receiver, shows improved image quality of a nearby station. (Courtesy: Author)

❖ On the Horizon

There are other aspects to amateur television (ATV) which are worth noting: Many hams around the country use their 2 meter FM transceivers on repeaters to share high resolution images or they get a net together on a simplex frequency to avoid the congestion of HF. In addition, real time ATV imaging is possible on the UHF ham band (see chart for frequencies) where greater amount of bandwidth is possible. Unfortunately, that also means reception is restricted to line of sight just as it is in commercial TV. However, future amateur radio satellites are being designed to include ATV capability, equipping the satellite with its own camera and including on-board SSTV repeater capability.

Another aspect has to do with improved software and the concept of digital SSTV. Experimental software now allows what amounts to high definition SSTV pictures on the HF bands or via amateur satellites (see images above). There are at least two VHF and HF nets exploring this territory. And, finally, Suitsat (145.990 MHz) is an experiment which will allow an ATV camera to be placed on an astronaut's helmet, allowing earth receivers to actually see what the astronaut sees.

❖ Final Thoughts

As with any type of communications intended to educate or otherwise elevate the hobby, there are those who don't quite get the spirit of the thing. Anyone who's tuned around the 20 meter band in the last decade or so knows that the on-air behavior of a few operators is not the example to which we want our kids to aspire. SSTV is no exception. In fact, the idea that it's a visual medium seems irresistible to some, making it regrettable for the rest.

Those operators aside, SSTV makes it possible for the technically oriented to explore the artistic side of the hobby. Layout, composition, and content aren't characteristics usually mentioned in amateur radio, but here's an opportunity, especially for hams who are also amateur photographers, to add a new dimension to their hobby.

SSTV FREQUENCIES

BAND (Meters)	FREQUENCY (MHz)
160	1.840-1.850 1.916
80	3.845 3.857
40	7.171
20	14.230
15	21.340
10	28.680
.70	420.00-426.00

(Repeater or simplex with 421.25 MHz video carrier, control links and experimental)

Four standard US ATV frequencies:
426.25, 447.25, 234.00, 439.25 (MHz)

Other Frequencies of note:

40 Meter Digital SSTV net
7.173 MHz, Noon weekdays
David Jones KB4YZ net control

Great Lakes SSTV Net
144.175 MHz USB most evenings
Sat. 9pm: Analog night
Wed. 10pm: Digital night
Look for digital pioneer Ralph Taggart WB8DQT