

SSTV



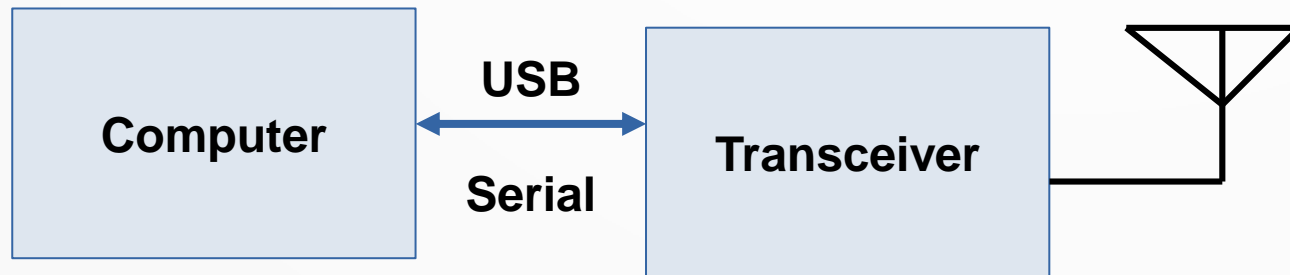
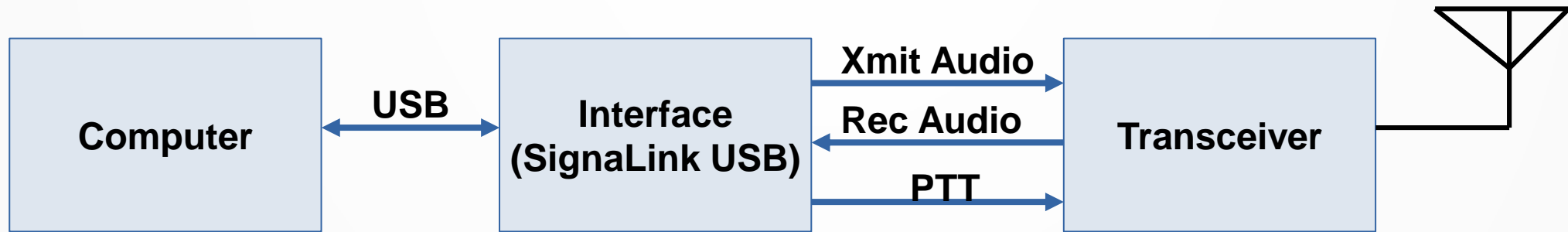
Slow-scan TV for the Radio Amateur

Carl Foster KB7AZ

SSTV Overview

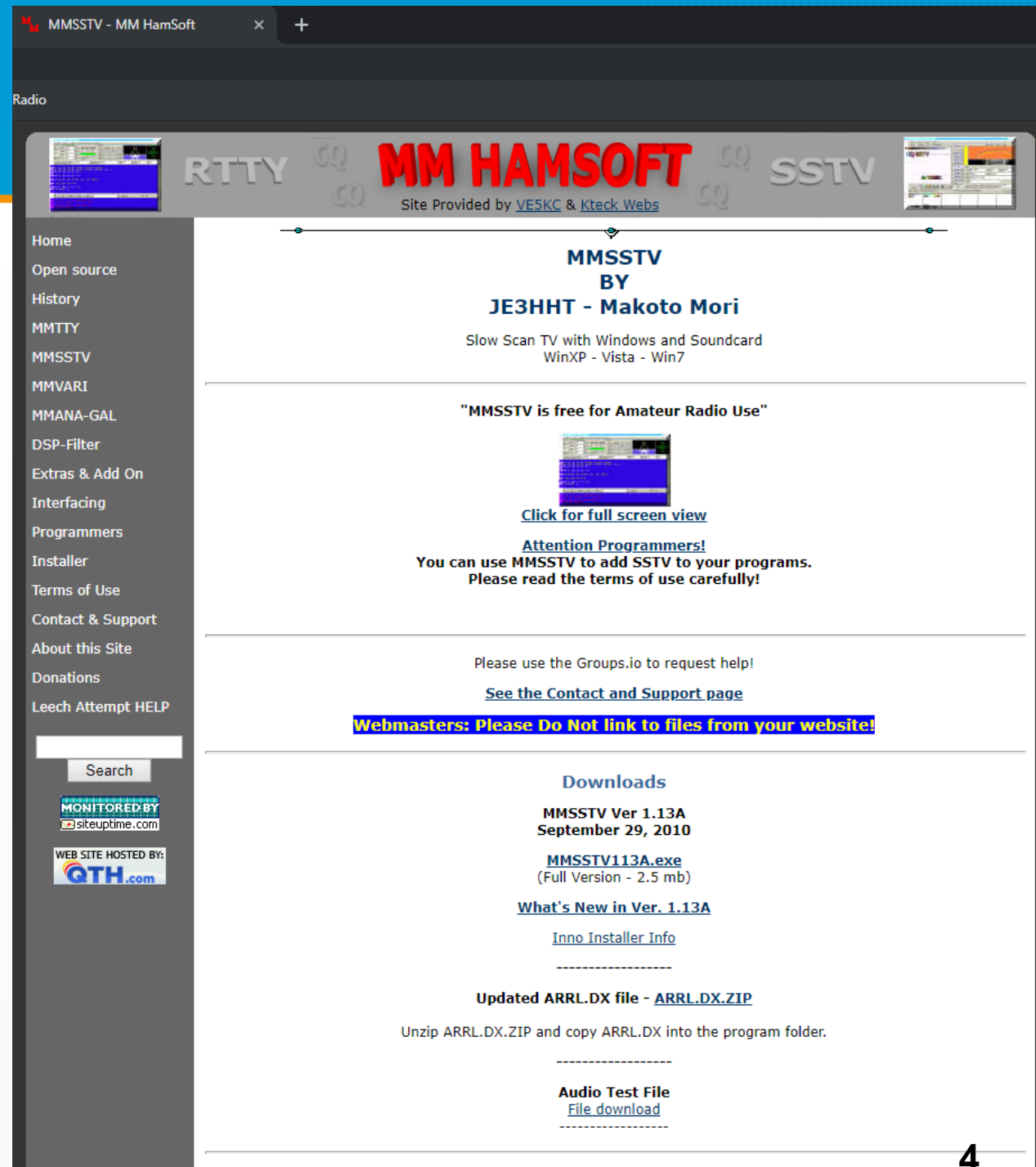
- **Slow-scan TV is a way to transmit images over a voice bandwidth audio channel**
- **The SSTV transmission is very similar to FAX**
- **SSTV images began as monochrome images displayed on a CRT with a long-persistence phosphor.**
- **Current technology includes color images**

Hardware



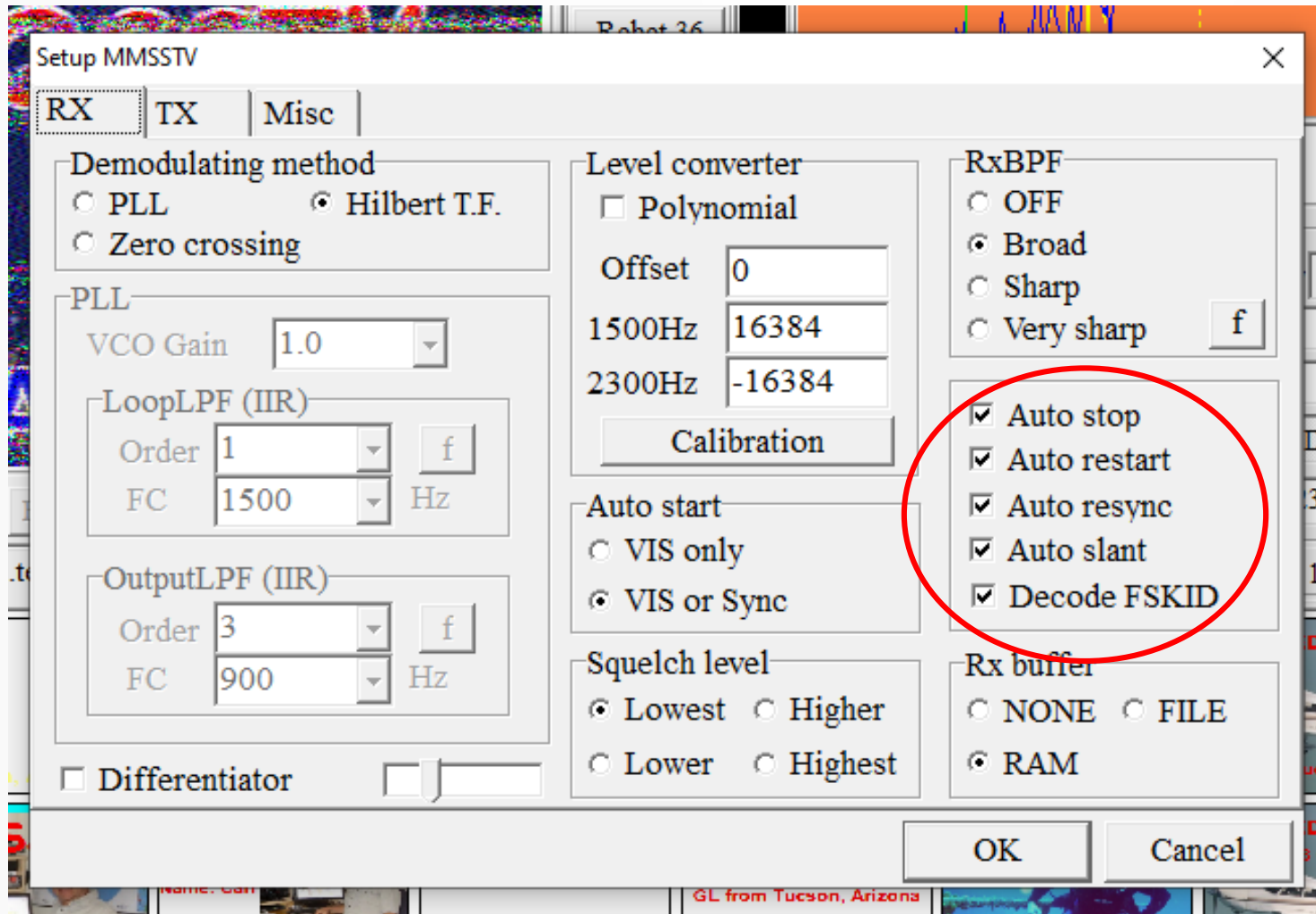
Getting Started

- MMSSTV is the most popular, and it is free
- You will need to download and install MMSSTV software.
- <https://hamsoft.ca/pages/mmsstv.php>
- Software is also available for LINUX, MAC, and Android



The screenshot shows the homepage of the MMSSTV website. The browser tab is labeled "MMSSTV - MM HamSoft". The page features a navigation menu on the left with links to Home, Open source, History, MMTTY, MMSSTV, MMVARI, MMANA-GAL, DSP-Filter, Extras & Add On, Interfacing, Programmers, Installer, Terms of Use, Contact & Support, About this Site, Donations, and Leech Attempt HELP. The main content area is titled "Radio" and includes a header with "RTTY", "MM HAMSOFT" (in red), and "SSTV". Below the header, it states "Site Provided by VE5KC & Kteck Webs". The main heading is "MMSSTV BY JE3HHT - Makoto Mori", followed by "Slow Scan TV with Windows and Soundcard WinXP - Vista - Win7". A section titled "MMSSTV is free for Amateur Radio Use" includes a small screenshot of the software and a link to "Click for full screen view". Below this, it says "Attention Programmers! You can use MMSSTV to add SSTV to your programs. Please read the terms of use carefully!". A note mentions "Please use the Groups.io to request help!" and a link to "See the Contact and Support page". A warning for webmasters is highlighted in yellow: "Webmasters: Please Do Not link to files from your website!". The "Downloads" section lists "MMSSTV Ver 1.13A September 29, 2010" and "MMSSTV113A.exe (Full Version - 2.5 mb)". It also includes a link for "What's New in Ver. 1.13A" and "Inno Installer Info". A section for "Updated ARRL.DX file - ARRL.DX.ZIP" provides instructions: "Unzip ARRL.DX.ZIP and copy ARRL.DX into the program folder." Finally, there is a link for "Audio Test File" with a "File download" option.

Receive Setup

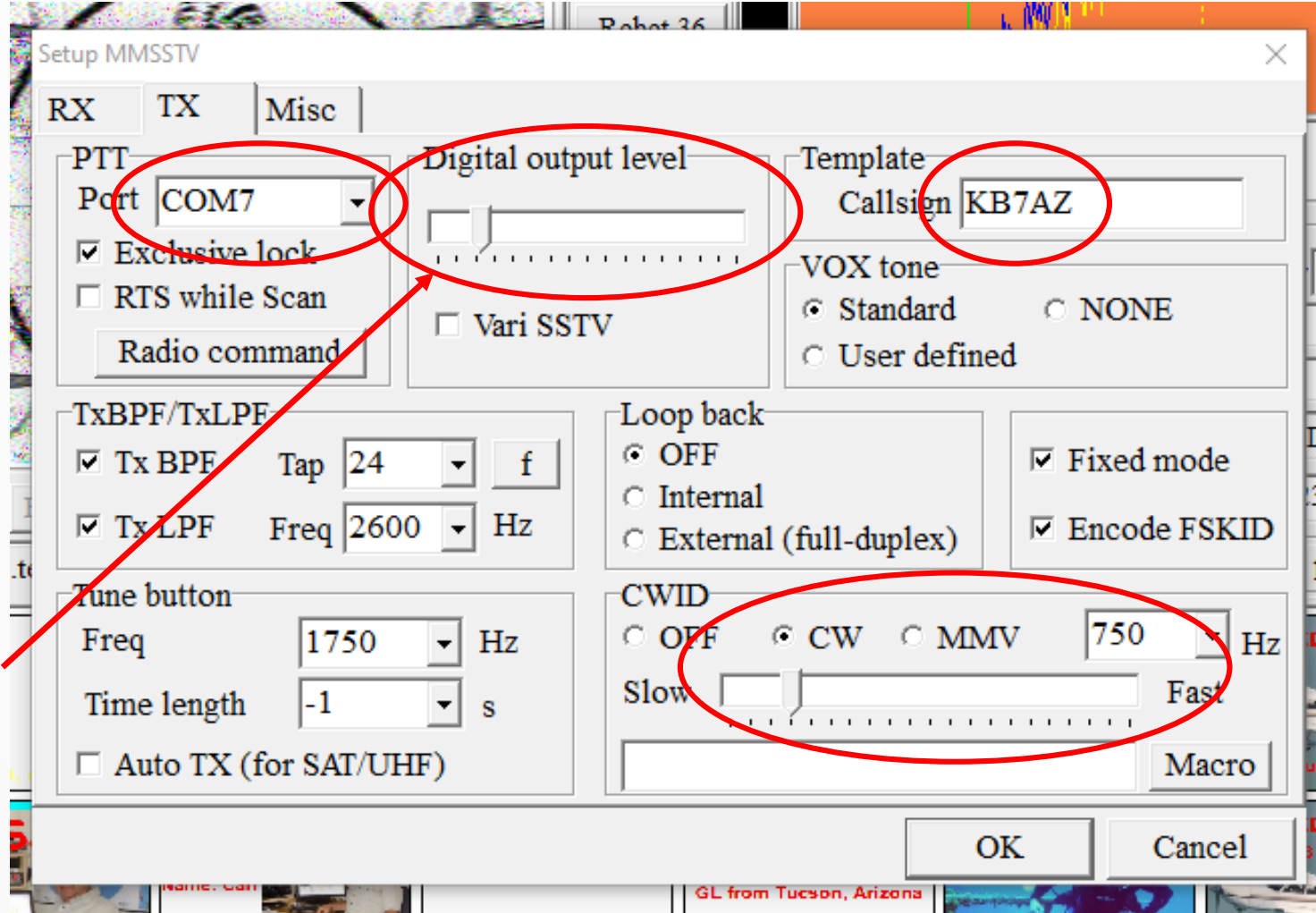


**Experiment with
Auto restart to
see if you like it**

Transmit Setup

The transceiver port number and digital output level are specific to the computer to transceiver set-up

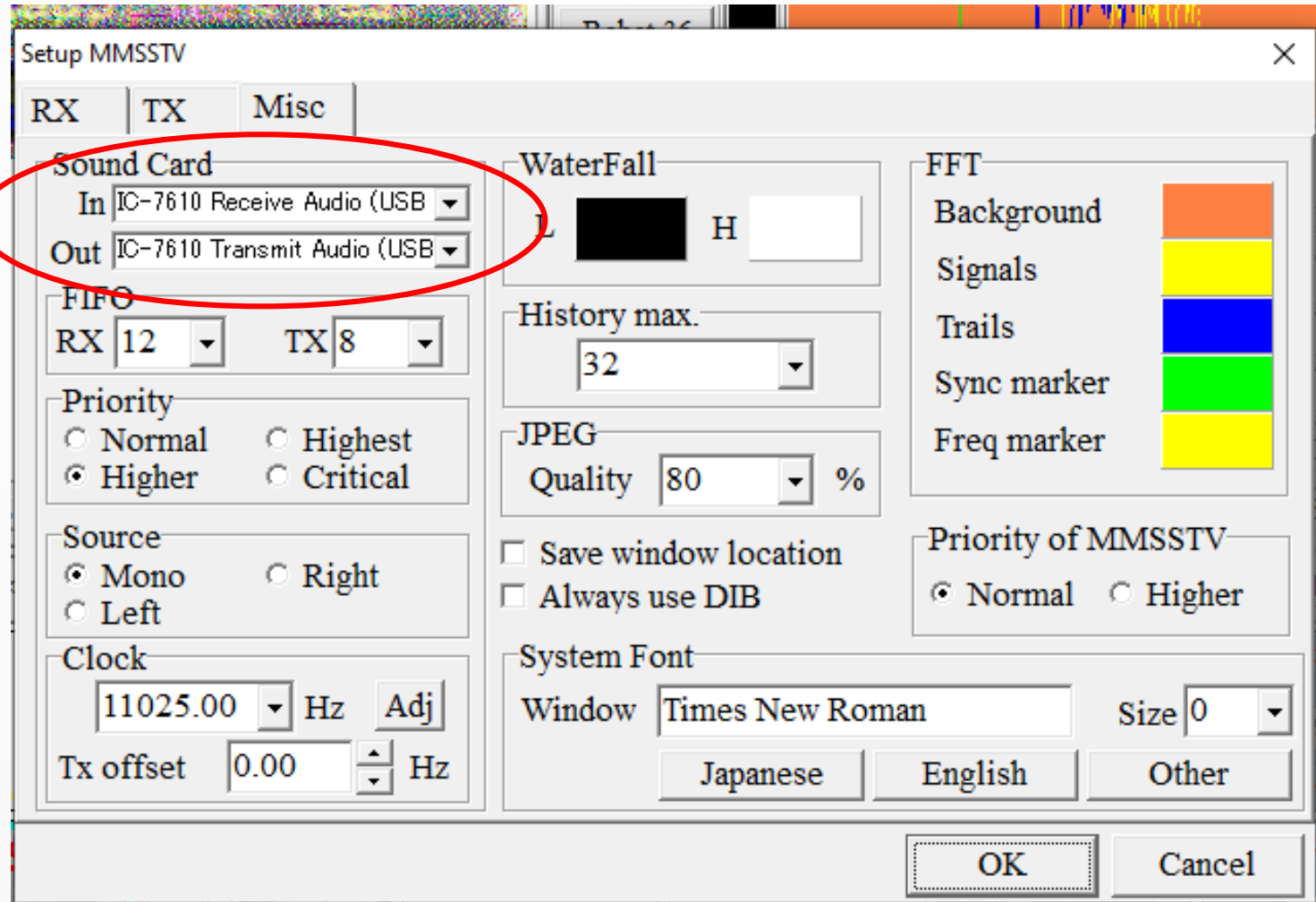
Adjust the Digital Output Level for no (or occasional) ALC indication



I prefer to send a CWID after each transmission

Misc Setup

The transmit and receive audio channels are specific to the computer to transceiver set-up



Main User Interface

Menu Bar

Image space for transmitted and received images

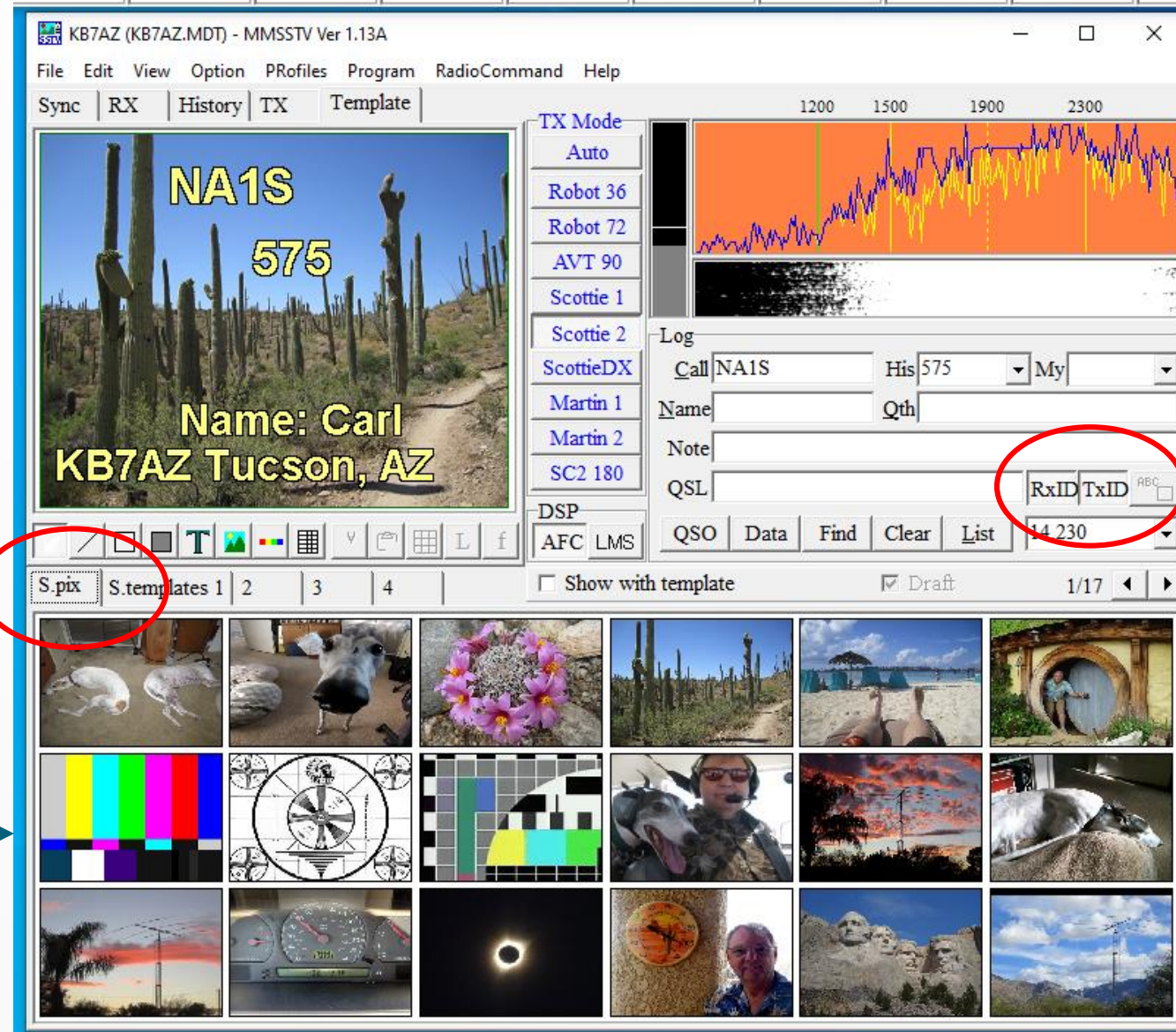
Templates



Spectrum Display

QSO Information

Pictures

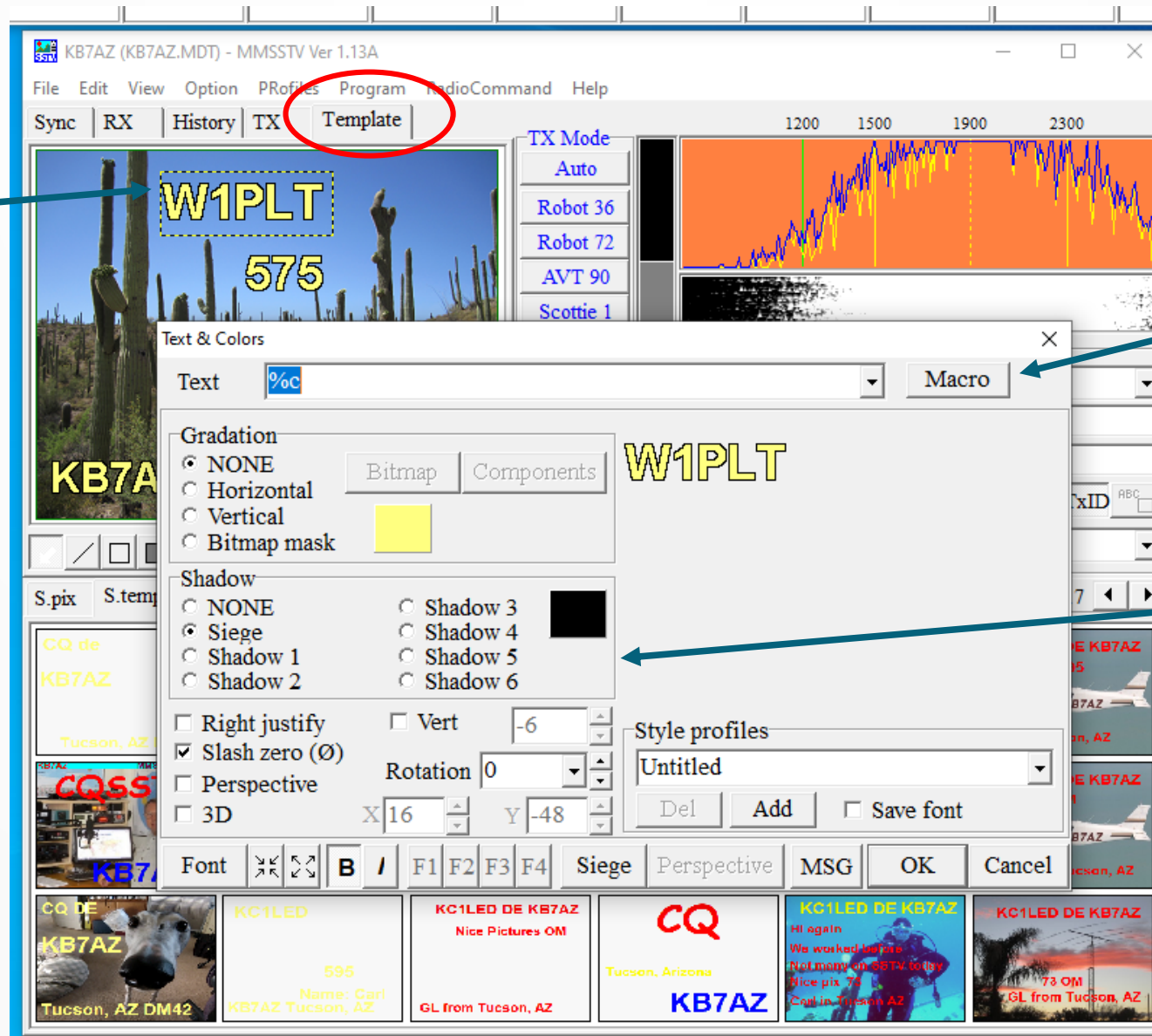


- Use your mouse to move images that you will be transmitting to the "S.Pix" boxes
- The software will re-size the image for you

Click these to automatically send and receive callsigns

Templates

Double click on a text box to edit it



Macros include callsigns, names, QTHs, and signal reports

You can change the font size and color, and add effects

Received Images

After each image is received it is copied to the received image display.

The screenshot displays the MMSSTV software interface (KB7AZ (KB7AZ.MDT) - MMSSTV Ver 1.13A) and a 'Thumbnails of recent history' window. The main window shows a received image of a man standing outdoors, with the call sign 'NØGZK' and the text 'To Call de NØGZK' overlaid. The software interface includes a menu bar (File, Edit, View, Option, PProfiles, Program, RadioCommand, Help), a toolbar (Sync, RX, History, TX, Template), and a control panel with various settings like RX Mode (Auto, Robot 36, Robot 72, AVT 90, Scottie 1, Scottie 2), Log (Call, Name, Note, QSL, QSO, Data, Find, Clear, List), and DSP (AFC, LMS). The bottom of the main window shows a grid of received images with call signs like 'CQ de KB7AZ', 'KC1LED 595', 'CQSSSTV', 'KB7AZ', 'KC1LED DE KB7AZ', and 'CQ'. The taskbar at the bottom shows several running applications: Wkscan.exe - Shortcut, NanoVNA... - Shortcut, AIM_916.exe - Shortcut, arc500.exe - Shortcut, EchoLink.exe - Shortcut, Soundcard Scope, and direwolf.exe - Rev-only iG... The system tray shows the date and time as 12:57 PM 1/1/2020.

SSTV Signal Report

- **There are two signal report formats, RSV and Picture quality**
- **RSV**
 - **Readability is on a 5-point scale with 5 denoting perfectly readable.**
 - **Strength is on a 9-point scale with 9 reserved for extremely strong transmissions.**
 - **Video, or the quality of the received SSTV picture, is placed on a 5-point scale and 5 means perfectly viewable. This would correspond to P5, or broadcast quality.**
- **Picture Quality is a 5-point scale**

Readability

- **Readability**

- **1 = Unreadable**
- **2 = Barely readable, occasional words distinguishable**
- **3 = Readable with considerable difficulty**
- **4 = Readable with practically no difficulty**
- **5 = Perfectly readable**

Signal Strength and Video

- **Signal Strength**

- 1 = Faint, barely perceptible
- 2 = Very weak
- 3 = Weak
- 4 = Fair
- 5 = Fairly good
- 6 = Good
- 7 = Moderately strong
- 8 = Strong
- 9 = Extremely strong

- **Video**

- 1 = Unreadable
- 2 = Barely viewable, just distinguishable
- 3 = Viewable with considerable difficulty
- 4 = viewable with practically no difficulty
- 5 = Perfectly viewable

Picture Quality Examples

Scale is P0 to P5



P5: Broadcast quality



P4: Good, some noise



P3: Usable, noisy



P2: Barely use, noisy



P1: Barely see text



P0: Unusable

More Common SSTV Modes

Most Common Modes

Mode	Color	Time (sec/image)	Usable scan lines	Mode	Color	Time (sec/image)	Usable scan lines
Martin				Robot Color			
M1	RGB	114	240	12	YC	12	120
M2	RGB	58	240	24	YC	24	120
M3	RGB	57	120	36	YC	36	240
M4	RGB	29	120	72	YC	72	240
Scottie				Robot B&W			
S1	RGB	110	240	8	B&W	8	120
S2	RGB	71	240	12	B&W	12	120
S3	RGB	55	120	24	B&W	24	240
S4	RGB	36	120	36	B&W	36	240
DX	RGB	269	240	72	B&W	72	240

SSTV Spectrum

Use a wide receive filter
that will pass 2.3 kHz

SSB Freq

Sync

Black

White

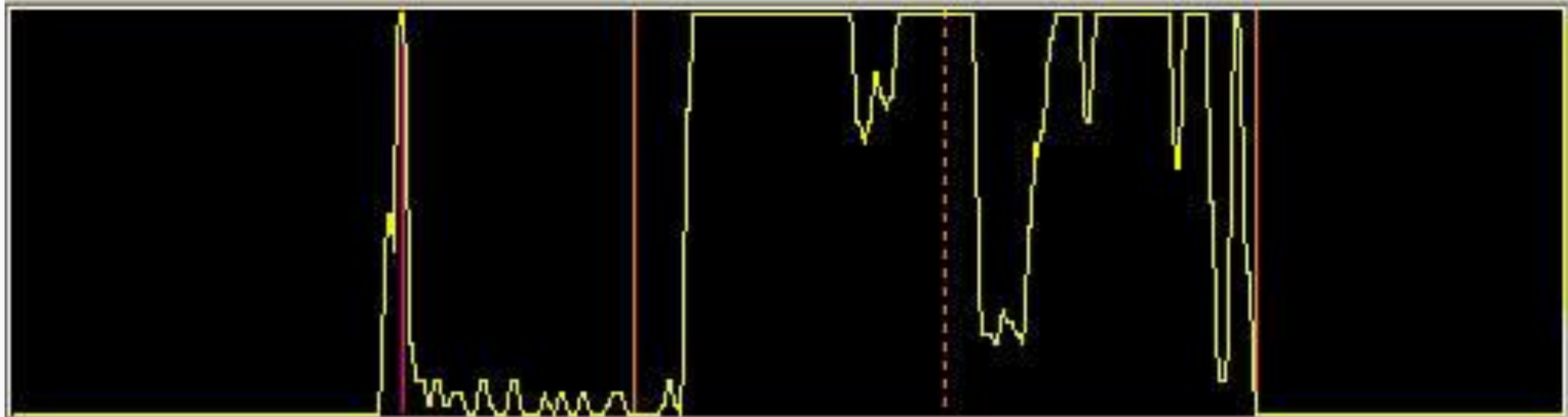
0 Hz

1200

1500

1900

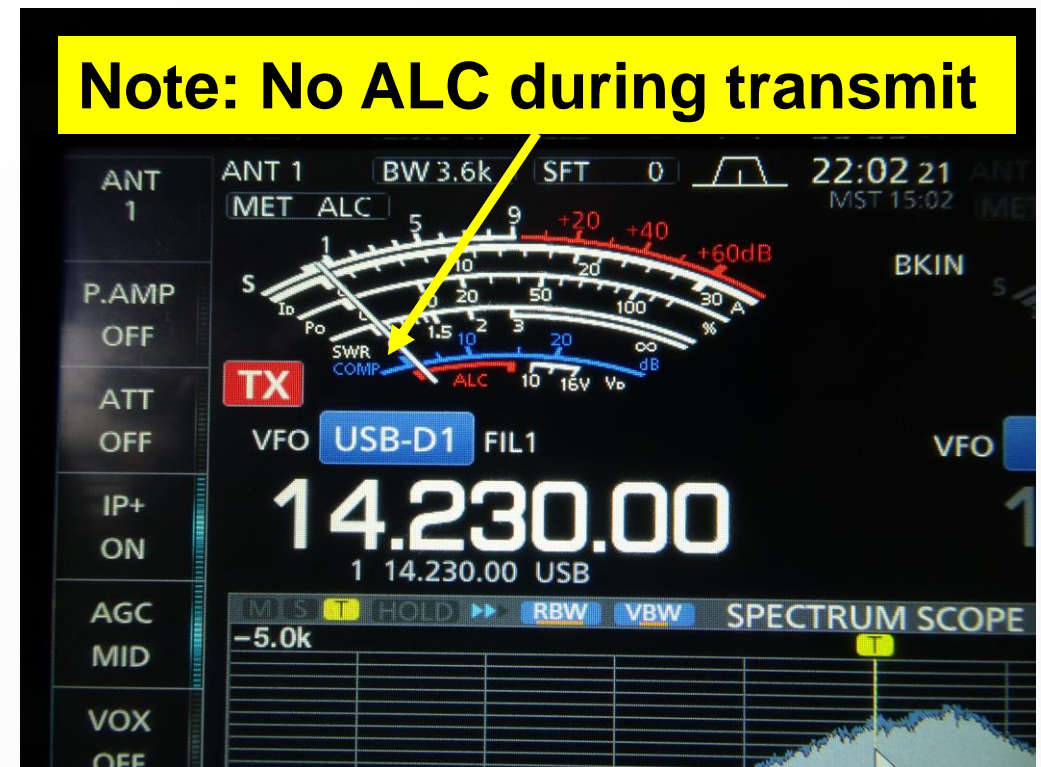
2300



Typical SSTV QSO

- Receive a CQ
- Transmit a reply
- Receive a reply
- Send a final picture

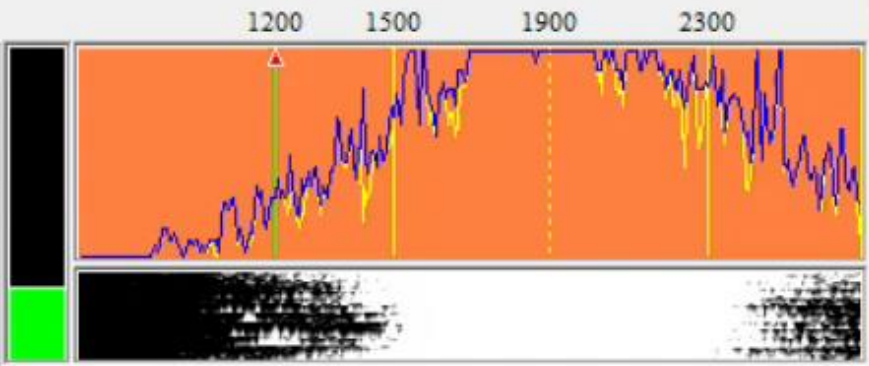
- Video Follows





Scottie 1 (320x256)
1 2020/01/13 1808Z

- RX Mode
- Auto
- Robot 36
- Robot 72
- AVT 90
- Scottie 1
- Scottie 2
- ScottieDX
- Martin 1
- Martin 2
- PD90



Log

Call: [] His: 595 My: 595

Name: [] Qth: []

Note: []

QSL: [] RxID: [] TxID: []

QSO Data Find Clear List 14.230

DSP
AFC LMS

S.pix | S.templates 1 | 2 | 3 | 4 | Show with template Draft 2/25



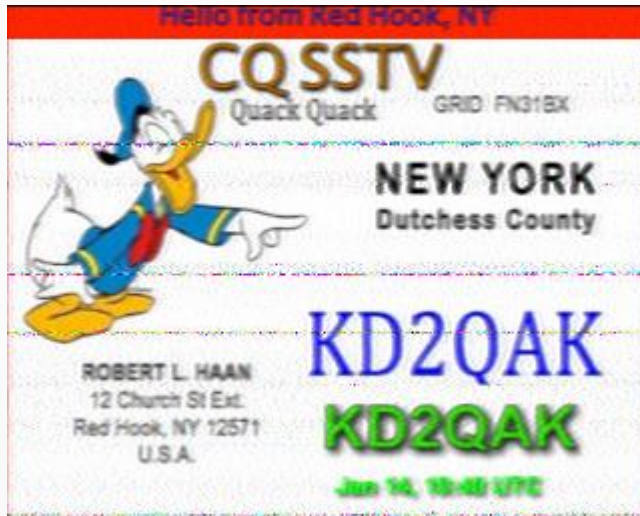
Common HF Frequencies

- **The most common HF frequency is 14.230 MHz**
- **Other HF frequencies**
 - 14.233 MHz**
 - 3.73 MHz**
 - 7.171 MHz**
 - 21.340 MHz**
 - 28.680 MHz**
- **Images can be sent on FM frequencies, including through repeaters**
Use short image modes to avoid repeater timeout

Some Received Pictures



More Received Pictures



Remember

- **SSTV is 100% duty cycle and some images take up to three minutes to transmit**
- **Do not overdrive the transmitter, i.e., no ALC when transmitting**
- **Load images before starting so you have something to send**
- **Size your images as they are loaded into the image area**
- **Have a few text overlay templates ready to go**
- **Practice editing templates before starting a QSO**
- **If answering a CQ, reply with the same mode**
- **If the calling frequency seems busy, you can always transmit QSY 14.233 MHz (or another nearby frequency)**

The QSO is in the Log

Any questions?