

The background is a dark blue gradient with a technical, futuristic aesthetic. It features several circular elements: a large frequency scale on the left side with markings from 150 to 260; several smaller circles with dashed outlines and arrows indicating clockwise rotation; and a dotted line that curves across the upper portion of the image. The overall design suggests a focus on engineering or technology.

AMATEUR RADIO SLOW SCAN TV (SSTV) A TECHNICAL OVERVIEW

JERRY GRIMES, K8GNG

INTRODUCTION

- Slow Scan TV (SSTV) is a method of transmitting still images over amateur radio frequencies
- SSTV uses a variable frequency audio signal to encode a picture and transmit it over the air

APPLICATIONS

- Casual QSOs
- Sharing images during amateur radio events.
- Experimenting with image transmission techniques.
- Educational purposes and promoting STEM activities.
- Emergency communications for transmitting visual data.

BRIEF HISTORY

- Developed in the 1950s by Cophorne Macdonald.
- Initially used modified TV systems for image transmission.
- Became popular due to its low bandwidth requirement.
- Modern SSTV is considered a digital mode, operates on audio portions of ham bands. It uses digital techniques with software like MMSSTV and Yoniq.




HOW IT WORKS - OVERVIEW

- The sender's SSTV software breaks a visual image into lines, converts the lines to tones, and transmits them as audio signals via radio.
- The SSTV software on the receiving end converts the audio information back into an image.
- Tone frequencies represent the pixel brightness or color value.

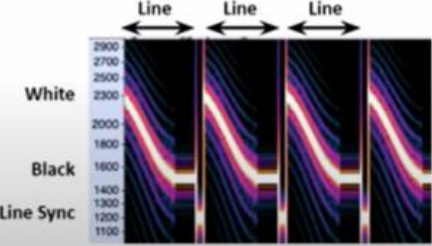
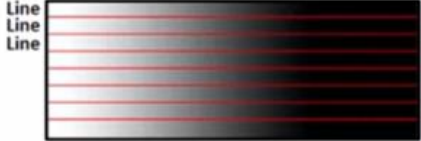
TECHNOLOGY OVERVIEW –

(BY AMATEUR RADIO EXPERIMENTER'S GROUP (AREG) ON THE "HAM RADIO DX" YOUTUBE CHANNEL, ~6 MINUTES):

Slow-Scan Image Encoding



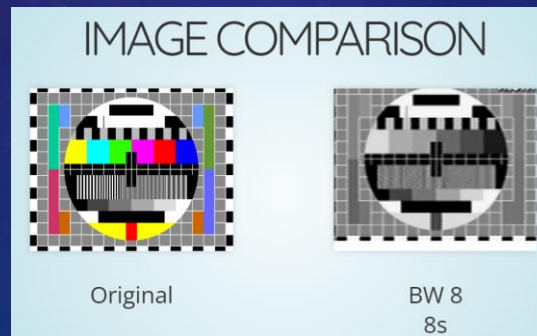
- Each line of image encoded with varying frequency audio.
 - Line Sync: 1200 Hz Pulse
 - Line Data: 1500 (Black) - 2300 (White) Hz
- Line duration and number of lines vary with mode.
- Similar to image modulation in composite video - hence 'slow scan TV'



<https://youtu.be/4UJSMfdajV4>

COMMON SSTV MODES

- Different resolutions and transmission times. Greater clarity usually means longer transmission times.
- Image size is commonly 320x256 (4:3 aspect ratio),
- Common: Scottie 1 (110s), Scottie 2 (71s), Martin 1 (114s), Martin 2 (58s)
- Less common: PD120 (126s), B/W 8&12 (8s, 12s), Robot24&36 (24s, 36s),
- Many, many others; some up to 406s (6 min 46s!)
- For repeater operation choose modes less than time-out timer (3:00 TOT = 2:30 or less). Most common modes are acceptable.




GETTING STARTED, MMSSTV

K8GNG (K8GNG.MDT) - MMSSTV Ver 1.13A [based on 44100Hz]

File Edit View Option PProfiles Program RadioCommand Help

Sync | RX | History | TX | Template



Scottie 2 (320x256)
115 2025/01/03 1652Z

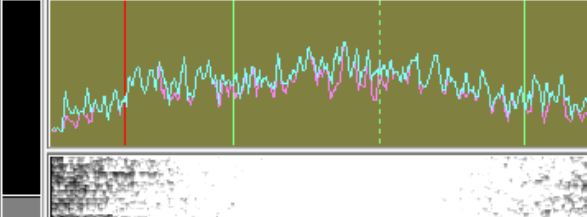
RX Mode

- Auto
- Robot 36
- Martin 2
- SC2 180
- Scottie 2
- ScottieDX
- Robot 72
- PD160
- B/W 12
- MP73-N

DSP

AFC LMS

1200 1500 1900 2300



Log

Call His 595 My






Name Qth

Note

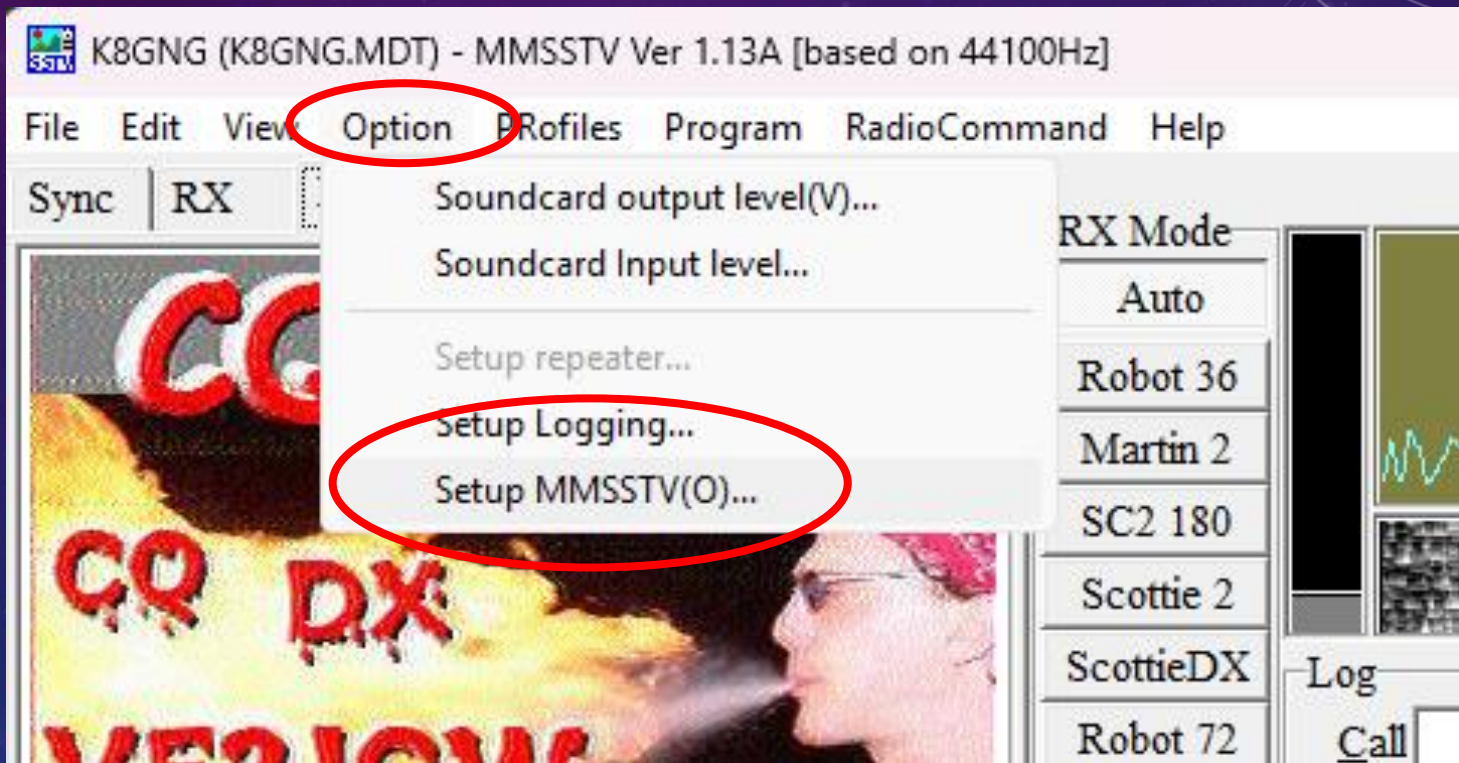
QSL RxID TxID

QSO Data Find Clear List 14

S.pix | S.templates 1 | 2 | 3 | 4 | Show with template Draft 10/25

GETTING STARTED, MMSSTV



RADIO SETUP: PTT AND AUDIO

YAESU FTDX10



Setup MMSSTV

RX TX Misc

PTT **Drive level**

Port COM3

Exclusive lock

RTS while Scan

Radio command

Digital output level

Vari SSTV

Template Callsign K8GNG

VOX tone

Standard NONE

User defined

TxBPF/TxLPF

Tx BPF Tap 512 f

Tx LPF Freq 1000 Hz

Loop back

OFF Internal External (full-duplex)

Fixed mode

Encode FSKID

Tune button

Freq 1750 Hz

Time length -1 s

Auto TX (for SAT/UHF)

CWID

OFF CW MMV 1000 Hz

Slow Fast

Macro

OK Cancel

RADIO SETUP: PTT AND AUDIO

YAESU FTDX10



Audio: Mic and Speakers

Setup MMSSTV

RX TX Misc

Sound Card
In FTdx10 Mic (2- USB AUDIO)
Out FTdx10 Speakers (2- USB AL)

FIFO
RX 4 TX 4

Priority
 Normal Highest
 Higher Critical

Source
 Mono Right
 Left

Clock
44100.00 Hz Adj
Tx offset 0.01 Hz

WaterFall
L H

History max.
256

JPEG
Quality 80 %

Save window location
 Always use DIB

System Font
Window Times New Roman Size 0
Japanese English Other

FFT
Background
Signals
Trails
Sync marker
Freq marker

Priority of MMSSTV
 Normal Higher

OK Cancel

COMMONLY USED CALLING FREQUENCIES

- 7.171 MHz 40m Band
- 14.230 MHz 20m Band (primary active location)
- 145.500 MHz 2m Band (USA, may differ elsewhere).

ISS DOWNLOADS: (12/25/24 – 1/5/25 [145.800, PD120])



mmsstv_01Jan25_045735Z.jpg



mmsstv_05Jan25_014540Z.jpg



mmsstv_05Jan25_032107Z.jpg



mmsstv_30Dec24.bmp



mmsstv_31Dec24_054600Z.jpg

EXAMPLE – SSTV QSO PATTERN

The screenshot displays the MMSSTV software interface. The main window title is "K8GNG (K8GNG.MDT) - MMSSTV Ver 1.13A [based on 44100Hz]". The menu bar includes File, Edit, View, Option, PProfiles, Program, RadioCommand, and Help. The interface is divided into several sections:

- Left Panel:** A large graphic for "CQSSTV" with the text "OP: MIKE RIG-IC7300 BELLA VISTA AR 1.2 KW PEP OUTPUT 5/8 VERT. EM26ul KG5JJ". Below this is a status bar for "Martin 1 (320x256)" dated "20 2025/01/10 1543Z".
- Top Right:** A frequency display with markers at 1200, 1500, 1900, and 2300. Below it is a waterfall plot showing signal activity.
- Middle Right:** A "Log" section with fields for "Call" (KG5JJ), "His" (599), and "My". There are also fields for "Name" and "Qth".
- Bottom Right:** A "DSP" section with "AFC" and "LMS" options, and a "QSO" section with buttons for "Data", "Find", "Clear", and "List". A frequency value of "28.680" is displayed.
- Bottom:** A grid of thumbnail images for templates, with "S.templates 1 2 3 4" and "Show with template" checked. The "Draft" status is also visible.

EXAMPLE – SSTV QSO PATTERN

K8GNG (K8GNG.MDT) - MMSSTV Ver 1.13A [based on 44100Hz]

File Edit View Option Profiles Program RadioCommand Help

Sync RX History TX Template

KG5JJ MMSSTV Ver 1.13.3 YONIQ
K8GNG
P3
KG5JJ

RX Mode
Auto
Martin 1
Martin 2
Scottie 1
Scottie 2
Robot 24
Robot 36
MP73-N
B/W 8
B/W 12

DSP
AFC LMS

Log
Call KG5JJ His 599 My
Name Qth
Note
QSL RxID TxID ABC

1200 1500 1900 2300

Martin 1 (320x256)
19 2025/01/10 1547Z

S.pix S.templates 1 2 3 4

QSO Data Find Clear List 28.680

✓ Show with template ✓ Draft 7/25

320x256 320x256 320x256
320x256 320x256

EXAMPLE – SSTV QSO PATTERN

K8GNG (K8GNG.MDT) - MMSSTV Ver 1.13A [based on 44100Hz]

File Edit View Option PProfiles Program RadioCommand Help

Sync RX History TX Template

KG5JJ
73!
TX 4 QSO
de K8GNG

320x240

TX Mode






- Auto
- Martin 1
- Martin 2
- Scottie 1
- Scottie 2
- Robot 24
- Robot 36
- MP73-N
- B/W 8
- AVT 90

DSP
AFC LMS

Log
Call KG5JJ His 599 My
Name Qth
Note
QSL RxID TxID RBC

QSO Data Find Clear List 28.680

S.pix S.templates 1 2 3 4 Show with template Draft 7/25


 320x256	 320x256	 320x256			
 320x256	 320x256				

EXAMPLE – SSTV QSO PATTERN

K8GNG (K8GNG.MDT) - MMSSTV Ver 1.13A [based on 44100Hz]

File Edit View Option Profiles Program RadioCommand Help

Sync RX History TX Template



MMSSTV Ver 1.13.3 YONIQ

KG5JJ

K8GNG

73

KG5JJ

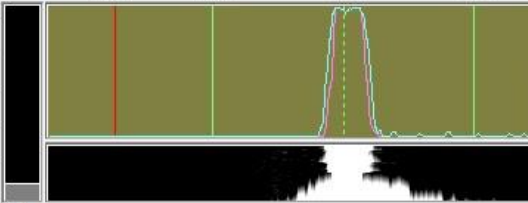
RX Mode

- Auto
- Martin 1
- Martin 2
- Scottie 1
- Scottie 2
- Robot 24
- Robot 36
- MP73-N
- B/W 8
- B/W 12

DSP

AFC LMS

1200 1500 1900 2300



Log

Call KG5JJ His 599 My

Name Qth

Note

QSL RxID TxID ABC

QSO Data Find Clear List 28.680

Martin 1 (320x256)
18 2025/01/10 1551Z

S.pix S.templates 1 2 3 4 Show with template Draft 7/25

APPENDIX



RADIO SETUP: PTT AND AUDIO



ICOM IC-7100

Setup MMSSTV

RX TX Misc

PTT **Drive level**

Port **NONE**

Exclusive lock

RTS while Scan

Radio command

Digital output level

Vari SSTV

Template

Cal sign **K8GNG**

VOX tone

Standard NONE

User defined

TxBPF/TxLPF

Tx BPF Tap **512** f

Tx LPF Freq **1000** Hz

Loop back

OFF

Internal

External (full-duplex)

Fixed mode

Encode FSKID

Tune button

Freq **1750** Hz

Time length **-1** s

Auto TX (for SAT/UHF)

CWID

OFF CW MMV **1000** Hz

Slow Fast

Macro

OK Cancel

RADIO SETUP: PTT AND AUDIO



ICOM IC-7100

Radio command

Port definition

Port **COM3** Baud **19200** Char. wait 0 ms

Data length: 7bits 8bits

Stop: 1bit 2bits

Parity: None Odd Even

flow control: XON/XOFF CTS

DTR/RTS: PTT

Commands

Init: xx= **88**

Rx: \ \$FEFExxE01C0000FD

Tx: \ \$FEFExxE01C0001FD\w10

VFO polling: NONE

Polling interval: 1 s

Icom xx=addr 01-7F Load Save OK Cancel

RADIO SETUP: PTT AND AUDIO

ICOM IC-7100



Setup MMSSTV

RX TX Misc

Audio: Mic and Speakers

Sound Card

In Microphone (USB Audio CODEC)

Out Speakers (USB Audio CODEC)

FREQ

RX 4 TX 4

Priority

Normal Highest

Higher Critical

Source

Mono Right

Left

Clock

44100.00 Hz Adj

Tx offset 0.01 Hz

WaterFall

L [Black] H [White]

History max.

256

JPEG

Quality 80 %

Save window location

Always use DIB

System Font

Window Times New Roman Size 0

Japanese English Other

FFT

Background [Olive]

Signals [Magenta]

Trails [Cyan]

Sync marker [Red]

Freq marker [Green]

Priority of MMSSTV

Normal Higher

OK Cancel

RADIO SETUP: PTT AND AUDIO

YAESU FTM300DR W/DIGIRIG



Setup MMSSTV

RX TX Misc

PTT **Drive level**

Port **COM6** Digital output level Template Callsign **K8GNG**

Exclusive lock Vari SSTV Standard NONE

RTS while Scan User defined

Radio command

TxBPF/TxLPF

Tx BPF Tap 512 f

Tx LPF Freq 1000 Hz

Loop back

OFF Fixed mode

Internal Encode FSKID

External (full-duplex)

Tune button

Freq 1750 Hz

Time length -1 s

Auto TX (for SAT/UHF)

CWID

OFF CW MMV 1000 Hz

Slow Fast

Macro

OK Cancel

RADIO SETUP: PTT AND AUDIO

YAESU FTM300DR W/DIGIRIG



Setup MMSSTV

RX | TX | Misc

Audio: Mic and Speakers

Sound Card
In: Digirig Mic (USB Audio Device)
Out: Digirig Speakers (USB Audio)

FIFO
RX: 4 TX: 4

Priority
 Normal Highest
 Higher Critical

Source
 Mono Right
 Left

Clock
44100.00 Hz Adj
Tx offset: 0.01 Hz

WaterFall
L [] H []

History max.: 256

JPEG
Quality: 80 %

Save window location
 Always use DIB

System Font
Window: Times New Roman Size: 0
Japanese English Other

FFT
Background: []
Signals: []
Trails: []
Sync marker: []
Freq marker: []

Priority of MMSSTV
 Normal Higher

OK Cancel