

Leon Jurczyszyn

K8ZAG

Pronounced

VERY CAREFULLY

or

Your chi shun

Jur czy szyn

Some Background

Retired From Ameritech Telco.
After retirement contracted with
Several different Telco's.

TCG

Hits

K8ZAG

- 1st Amateur License 1957-1962 ???
- Thanks to Hal Lloyd, Dennis Hardoin and Brad Castelli
- Attended A Few Club Training Sessions
- Technician & General Exam (YAHOO)
- Passed both & Licensed as KJ4TUX
- Obtained Vanity Call Sign K8ZAG

Music

PC's

Photography

Two Parts

1. *PSK31 Using DM780*

2. *Overall Use of HRD*

HAM RADIO DELUXE

- Ham Radio Deluxe is composed of three main programs in one and several sub programs.
- Ham Radio Deluxe Beta Version 5 (**HRD**)
- Digital Master 780 (**DM 780**)
- Logbook

What Is PSK31

- PSK31 is a DIGITAL mode using keyboard to keyboard QSO's on the HF bands.
- Usually short QSO's exchanging station info, weather, name and report etc..
- This is a full duty cycle mode.

Define PSK31

- Phase Shift Keying 31
- The 31 stands for 31.25 baud and has a narrow band width of 31.25Hz.
- This is derived from 8 KHz sample rate which a lot of DSP systems use. (Digital Signal Processing)

Technical Information

PSK31 is created by shifting the phase of the carrier. In the most-commonly-used variant (BPSK31), binary information is transmitted by either imparting a 180-degree phase shift (binary zero) or no phase-shift (binary one) in each 32ms symbol interval. The boundaries between character codes are marked by two or more consecutive zeros. Since no character code contains more than one consecutive zero, the software can therefore instantly detect the 'space' between characters. Martinez arranged the character alphabet so that, as in [Morse code](#), the more frequently occurring characters would have the shortest encodings, while rarer characters used longer encodings. He gave the name '[varicode](#)' to this encoding scheme.

Technical Info cont.

PSK31's bandwidth of 31.25 Hz was chosen because a normal typing speed of about 50 words per minute requires a bit rate of about 32 bits per second, and specifically because 31.25 Hz could easily be derived from the 8 kHz sample rate used in many DSP systems, including those used in the computer sound cards commonly used for PSK31 operation (31.25 Hz is 8 kHz divided by 256, and so can be derived from 8 kHz by halving the frequency eight times).

Technical Information cont.

Colloquial usage of the term 'PSK31' in amateur radio usually implies the use of the most commonly-used variant of PSK31: binary phase shift keying. BPSK uses no error control, but an allied mode, QPSK31, uses four phases instead of two, to provide a degree of forward error correction. It is very simple to switch from BPSK to QPSK if difficulties arise during a contact.

Spectrum efficiency compared to other modes

PSK31's efficiency and narrow bandwidth make it highly suitable for low-power and crowded-band operation. PSK31 contacts can be conducted at less than 100Hz separation, so with disciplined operation at least twenty simultaneous PSK31 contacts can be carried out side-by-side in the bandwidth required for just one SSB voice contact.

Advantages Of BPSK31

- Very Efficient, can use less power, has a narrow bandwidth.
- Most contacts can be made with as little power as 10 to 30 watts..
- Remember the FCC rule of only using as much power as needed to communicate.

BPSK Vs. QPSK

***BPSK:** Accomplished in 2 Phases*

***QPSK:** Accomplished using 4 Phases*

*Math analysis shows **QPSK** can be used either to double the data rate compared to a **BPSK** system while maintaining the same bandwidth of the signal...*

OR

*to maintain the data -rate of **BPSK** but halving the bandwidth needed*

Common BPSK31 Frequencies

- 80 Meters----3580
- 40 Meters----7070
- 30 meters---10140
- 20 Meters---14070
- 17 Meters---18100
- 15 Meters---21070
- 12 Meters---24920
- 10 Meters---28120
- 6 Meters---50290

Detailed Explanations

Can be found on the web on Wikipedia at

www.wikipedia.org

What's Required To Operate

- SSB Transceiver And a Laptop or desktop PC.
- PSK Software.... (usually free)
- Some examples are DIGIPAN, HRD w/DM780 and others...

My Shack and Equipment



MAX S-405-12
40 WATT
5V 2A
12V 3A
15V 2A
18V 1.5A
24V 1A

MFJ
MFJ MF-1000
1000 WATT
1000 WATT
1000 WATT

Signalink USB
1000 WATT
1000 WATT
1000 WATT

YT-250 Antenna
LDG

14.070.00 MHz-001





My Force 12 Flagpole Antenna





Wishful Thinking

Make my XYL's decoration into a loop antenna

Hi Hi



DEFINITION OF A PC (COMPUTER)

*An electronic time-saving device that
is commonly used*

*For Time
Wasting
Activities*

Transmit Drive Level

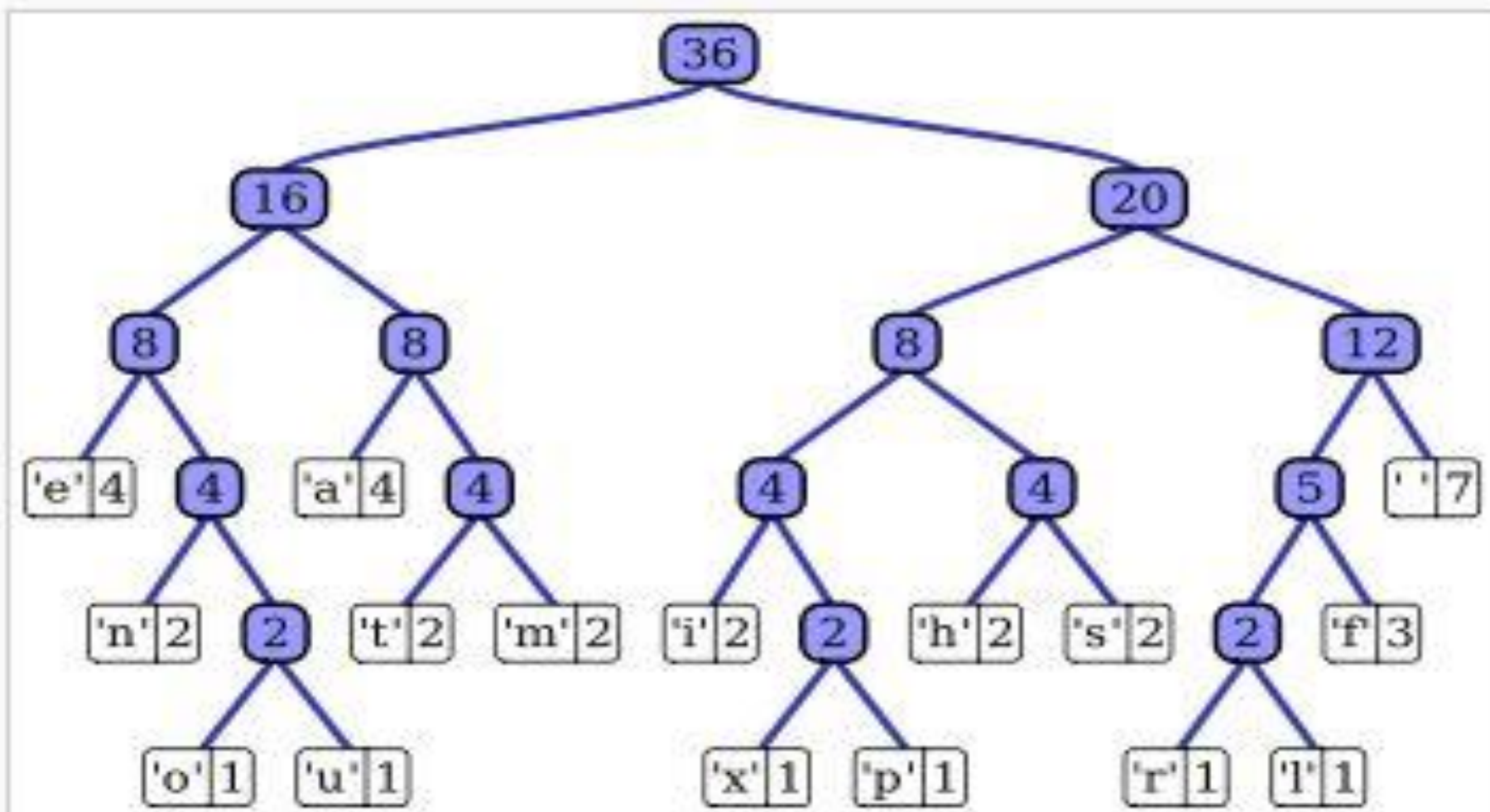
- Do not overdrive your Xmtr
- Watch your ALC Level. Should be no ALC
- WHY.. It will splatter outside the 31 Hz bandwidth causing QRM
- Use Lower Case Letters.

Text Continued

- *2 reasons to use lower case.*
- All caps could be harder to read.
- But most important is lower case text in PSK has fewer bits because it uses Varicode mode.
- Lower case transmits faster and decodes better

Varicode is a Huffman code for use in PSK31. It supports all ASCII characters, but the characters used most frequently have shorter codes. The space between characters is indicated by a 00 sequence, a variation of Fibonacci coding. Originally created for speeding up real-time keyboard-to-keyboard exchanges over low bandwidth links, it is a very useful format to shrink text files. Varicode is freely available.

[1] [2]



Huffman tree generated from the exact frequencies of the text "this is an example of a huffman tree". The frequencies and codes of each character are below. Encoding the sentence with this code requires 135 bits. (This assumes that the code tree structure is known to the decoder and thus does not need to be counted as part of the transmitted information.)

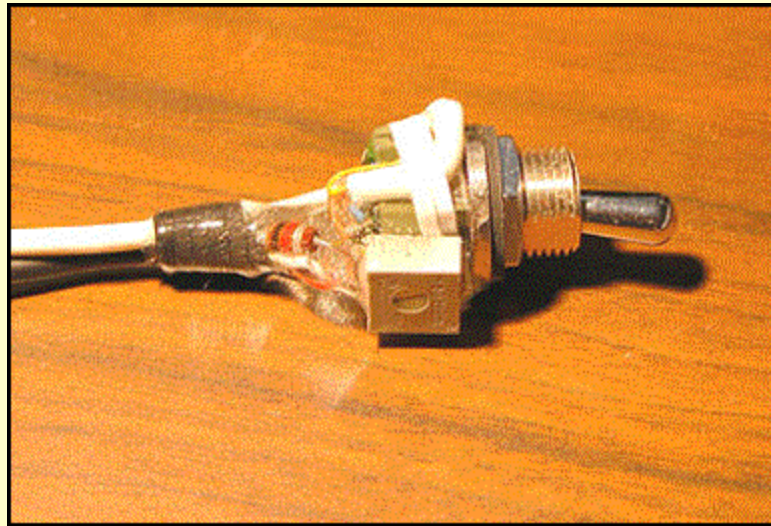
Printable characters

Varicode	Oct	Dec	Hex	Glyph
1	040	32	20	SP
111111111	041	33	21	!
101011111	042	34	22	"
111110101	043	35	23	#
111011011	044	36	24	\$
1011010101	045	37	25	%
1010111011	046	38	26	&
101111111	047	39	27	'
11111011	050	40	28	(
11110111	051	41	29)
101101111	052	42	2A	*
111011111	053	43	2B	+
1110101	054	44	2C	,
110101	055	45	2D	-
1010111	056	46	2E	.
110101111	057	47	2F	/
10110111	060	48	30	0
10111101	061	49	31	1
11101101	062	50	32	2

Varicode	Oct	Dec	Hex	Glyph
1010111101	100	64	40	@
1111101	101	65	41	A
11101011	102	66	42	B
10101101	103	67	43	C
10110101	104	68	44	D
1110111	105	69	45	E
11011011	106	70	46	F
11111101	107	71	47	G
101010101	110	72	48	H
1111111	111	73	49	I
111111101	112	74	4A	J
101111101	113	75	4B	K
11010111	114	76	4C	L
10111011	115	77	4D	M
11011101	116	78	4E	N
10101011	117	79	4F	O
11010101	120	80	50	P
111011101	121	81	51	Q
10101111	122	82	52	R

Varicode	Oct	Dec	Hex	Glyph
1011011111	140	96	60	`
1011	141	97	61	a
1011111	142	98	62	b
101111	143	99	63	c
101101	144	100	64	d
11	145	101	65	e
111101	146	102	66	f
1011011	147	103	67	g
101011	150	104	68	h
1101	151	105	69	i
111101011	152	106	6A	j
10111111	153	107	6B	k
11011	154	108	6C	l
111011	155	109	6D	m
1111	156	110	6E	n
111	157	111	6F	o
111111	160	112	70	p
110111111	161	113	71	q
10101	162	114	72	r

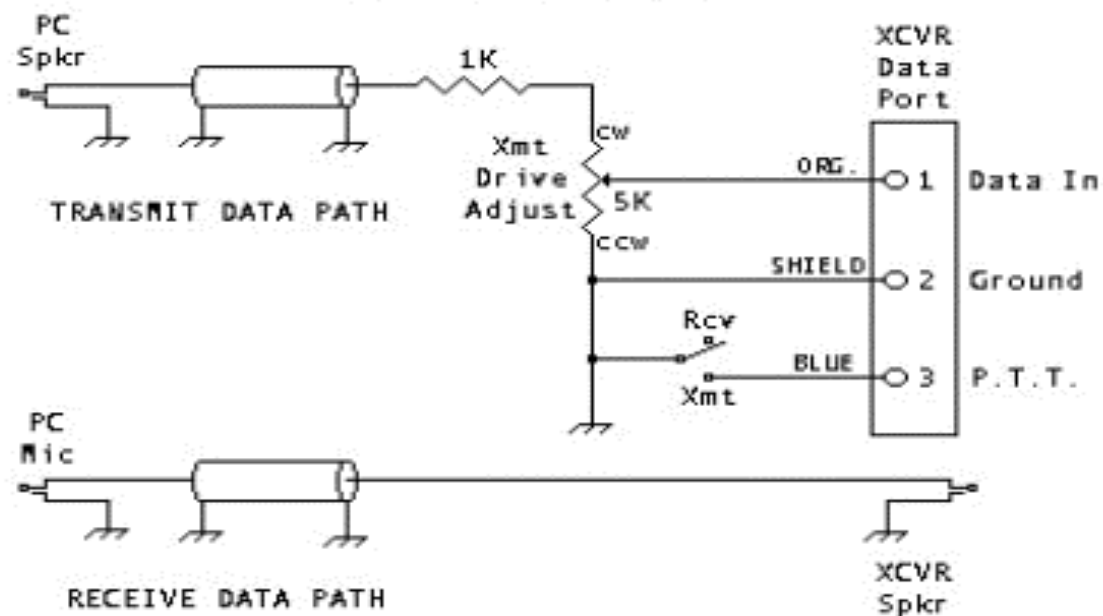
Simple Interface



Thanks to N6HI

SIMPLE XCVR TO PC INTERFACE FOR SOUNDCARD DIGITAL MODES

J. Rehak N6HI 10/28/07



*Just an Example
Other's available
on the WEB*

SENDING A TEST SIGNAL

BPSK-31 x

Add Log Entry

(F2) Start: 17:41

(F3) End: 18:22

(F5) Call:

Name:

QTH:

Locator:

Country:

Frequency: 14.071.579

Band: 20m

Mode: PSK31

Sent: 599

Add More My... QSL Help

Leon 1

4) Him de Me
5) Him de Me Pse K
6) Report, Name, QTH
7) Station

Closing

8) BTU
9) 73
0) 73 (long)

Various

Testing

Leon 1 Tags

BPSK-31

>>>>nVU2UR Dn_n 2iFC i
t C PSQKo
-
ea ri te
ooutil
2:24:03 PM> Main
Testing Testing Testing de K8ZAG K8ZAG K8ZAG
Testing Testing

Send (F1) Auto (F2) Pause (F3) Stop (F4) Repeat

Call CQ Reply Closing Various Leon 1

~~Testing Testing Testing de K8ZAG K8ZAG K8ZAG~~
~~Testing Testing Testing de K8ZAG K8ZAG K8ZAG~~
Testing Testing Testing de K8ZAG K8ZAG K8ZAG

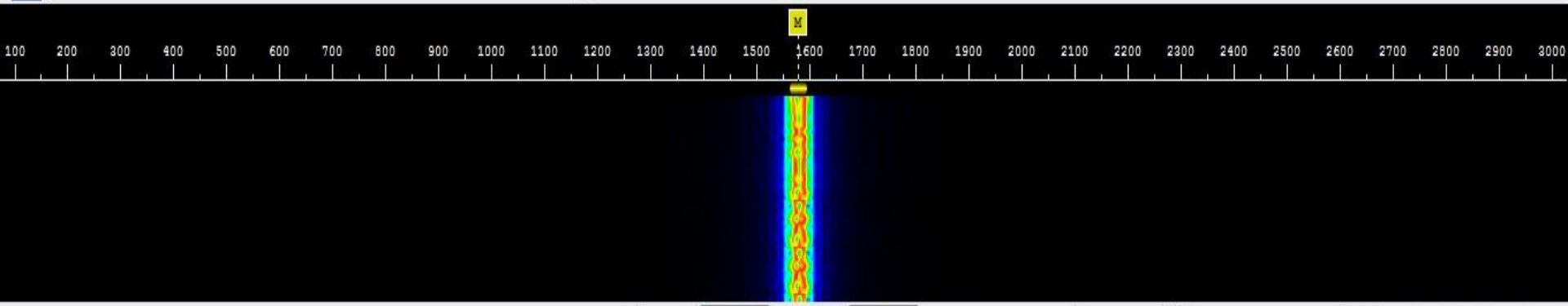
Sending, press Escape to abort

1579 Hz IMD: S/N: 24dB

Waterfall

Zoom: x1 Main: << 1579 >> Signal: AFC Decode Options 14.070.000 80m 40m 30m 20m 15m 10m 6m << >> Fav

PSK QPSK CONTESTIA CW DominoEx Hell MFSK MT63 OLIVIA RTTY RTTYM THOR Throb Modes



***Waterfall Of Many Received
BPSK 31 Signals***

Add Log Entry

(F2) Start: 17:41

(F3) End: 17:41

(F5) Call:

Name:

QTH:

Locator:

Country:

Frequency: 14.070.845

Band: 20m

Mode: PSK31

Sent: 599

Add More My... QSL Help

Leon 1

Leon 1

Call CQ

- 1) CQ x 2
- 2) CQ x 3
- 3) QRZ

Reply

- 4) Him de Me
- 5) Him de Me Pse K
- 6) Report, Name, QTH
- 7) Station

Leon 1 Tags

BPSK-31

t ot

-

]n inoe

-

tn oJe

-

.

-

>>>>nVU2UR Dn_n 2iFC i

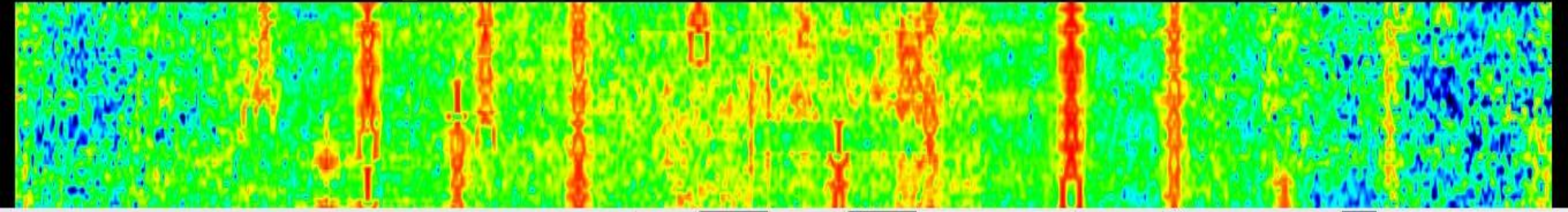
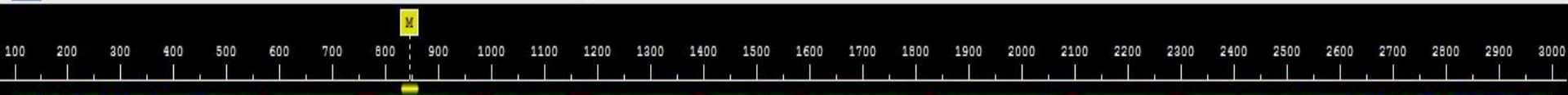
t C PSQKo

Send (F1) Auto (F2) Pause (F3) Stop (F4) Repeat

Call CQ Reply Closing Various Leon 1

Enter text to be sent

845 Hz IMD: -21dB S/N: 25dB



BPSK-31 x

Add Log Entry

(F2) Start: 18:53

(F3) End: 18:53

(F5) Call: SM6UQL

Name: Bengt Halvordsson

QTH: 44294 Ytterby

Locator:

Country: Sweden

Frequency: 14.070.000

Band: 20m

Mode: PSK31

Sent: 599

Add More My... QSL Help

Macros

Leon 1

Call CQ

- 1) CQ x 2
- 2) CQ x 3
- 3) QRZ

Reply

- 4) Him de Me
- 5) Him de Me Pse K
- 6) Report, Name, QTH
- 7) Station

Macros Tags

BPSK-31 14 AFC

e K
...
CQ CQ CQ DE IK3RIP IK3RIP IK3RIP CQ CQ CQ DE IK3RIP
NV
e K
CQ CQ CQ de IN3GNV IN3GNV IN3GNV
CQ e
R VA3MJR VA3MJR pse Kh8
Cr CQ hM6UQL QL SM6UQL
CQ CQ de SMQ. SM6UQL SM6UQ stoot \

Send (F1) Auto (F2) Pause (F3) Stop (F4) Repeat

Call CQ Reply Closing Various Leon 1

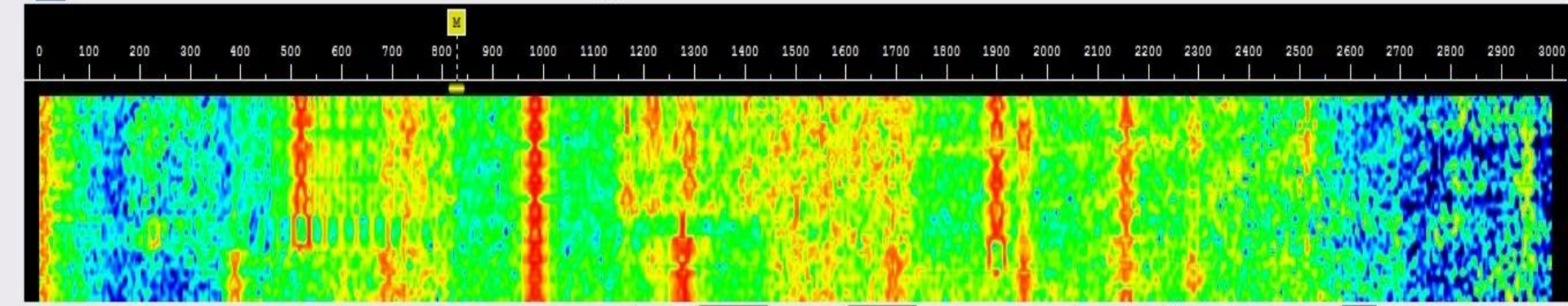
CQ CQ de K8ZAG K8ZAG
CQ CQ de K8ZAG K8ZAG
PSE K <stop>

Stopping 828 Hz IMD: -24dB S/N: 23dB

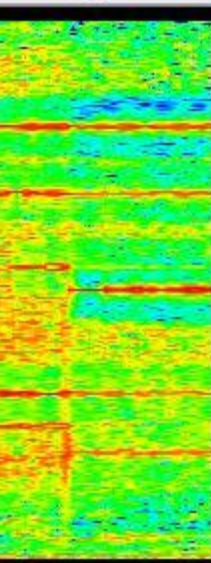
Waterfall

Zoom: x1 Main: 828 Signal: AFC Decode Options 14.070.000 80m 40m 30m 20m 15m 10m 6m Faves

PSK QPSK CONTESTIA CW DominoEx Hell MFSK MT63 OLIVIA RTTY RTTYM THOR Throb Modes



USING *SUPER* BROWSER



WSIPA X ✓ ØwK9SOU de W5IP

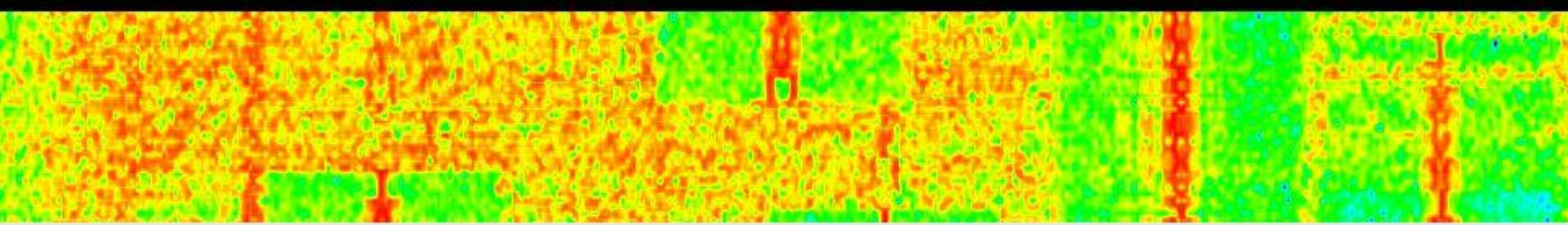
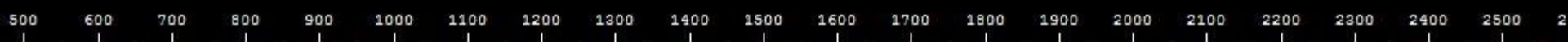
N8JIW X ✓ 5 WØPAS DE N8JIW N8JIW N8JIW UR RST 599 599 DON DON NE OHIO NR CLEVELAND OHIO , CITY IS SH

7QR m o.Bio and photo there also - 73 and my best wishes to you and your family Arnaud Bye Bye F4EA

Hambden,Ohio;Geauga Cty.Hambden,Ohio;Geauga Cty. loc : En91jo [2.8° 1,407.4km] En91jo BTU Roy, J38

nna : Cushcraft A4-S w/4Øm Operator : Created 1943, licensed 1968 My QSL is OK via LOTW only OTU OM

Active: 6/20 Hold: 20 secs Rewind: 10 secs Decod



***CONTACT WITH
SWITZERLAND***

HB9ELE



QSL Via:

CQ Zone 15 • ITU Zone • 28 Loc: JN47SH

Confirming: Our 2-way QSO Your SWL report.

Dietmar Seiss
Staatsstrasse 146
CH-9464 Rüthi/SG
Switzerland

TO RADIO:

K8ZAG

D	M	Y	UTC	MHz	2-WAY	RST
24	03	11	1333	14	PSK31	599

PSE QSL

TNX QSL

Best 73'

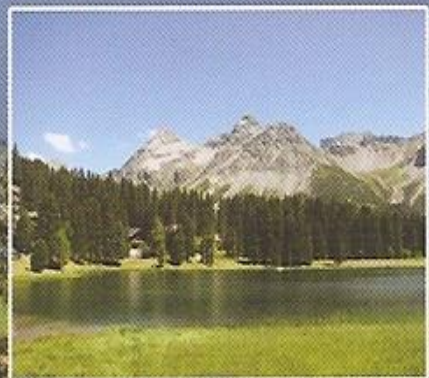
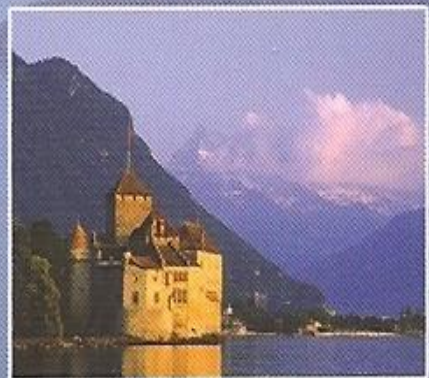
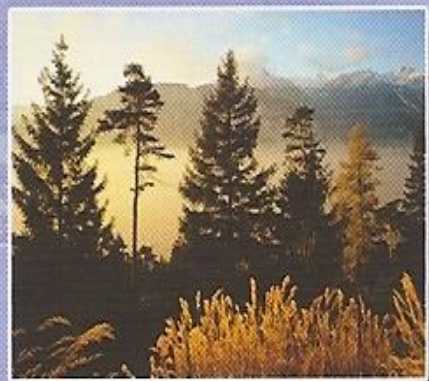
Diet

ON5UR SL

www.on5ur.be

HB9ELE

CQ Zone 15 • ITU Zone • 28 Loc: JN47SH



Switzerland

SSTV

*Sub Part Of
DM780*

Slow-scan television

From Wikipedia, the free encyclopedia

Slow-scan television (SSTV) is a picture transmission method used mainly by amateur radio operators, to transmit and receive static pictures via radio in monochrome or color.

A technical term for SSTV is narrowband television. Broadcast television requires 6 MHz wide channels, because it transmits 25 or 30 picture frames per second (in the NTSC, PAL or SECAM color systems), but SSTV usually only takes up to a maximum of 3 kHz of bandwidth. It is a much slower method of still picture transmission, usually taking from about eight seconds to a couple of minutes, depending on the mode used, to transmit one image frame.

Since SSTV systems operate on voice frequencies, amateurs use it on shortwave (also known as HF by amateur radio operators), VHF and UHF radio.

SSTV

Transmissions often include station call signs, RST reception, reports, and radio amateur jargon.

*Is Station ID on the Picture
Adequate?*

*Is Station ID on the Picture
Adequate?*

NO!

*Is Station ID on the Picture
Adequate?*

NO!

You must ID with either

Voice or CW Code.

*See Transmit Template On The
Bottom Tabs*

Add Log Entry

(F2) Start: 16:40

(F3) End: 16:40

(F5) Call:

Name:

QTH:

Locator:

Country:

Frequency: 14.230.000

Band: 20m

Mode: SSTV

Sent: 595

Rcvd: 599

Remark:

Tags: 1 2 3 4 5

About Me

Callsign	K8ZAG
Name	Leon
Age	70
Locator	EL88XX
QTH	The Villages Nor
E-Mail	K8ZAG@arrl.org
HomePage	Club
Clubs	TVARC (www.k

My Equipment

Radio	Yaesu FT-450
Antenna	Force 12 Flagpo
Power	30 Watts
Computer	ASUS 1630
Interface	Signalink USB
Accessories	

Other


Temperature	
Weather	
Other1	
Other2	
Other3	
Other4	

Computer

Mode	
Program	DM780 v5.0 Bet
ProgramFull	Digital Master 78

Receive Transmit Webcam

EL88XX DM780 K8ZAG



Edit FTP TX

Image BBC Philips

- Receive
- None
- Martin 1
 - Martin 2
 - Scottie 1
 - Scottie 2
 - Scottie DX
 - Robot 36
 - P3
 - P5
 - P7

Transmit

Robot 36

Same as RX

Signal

None

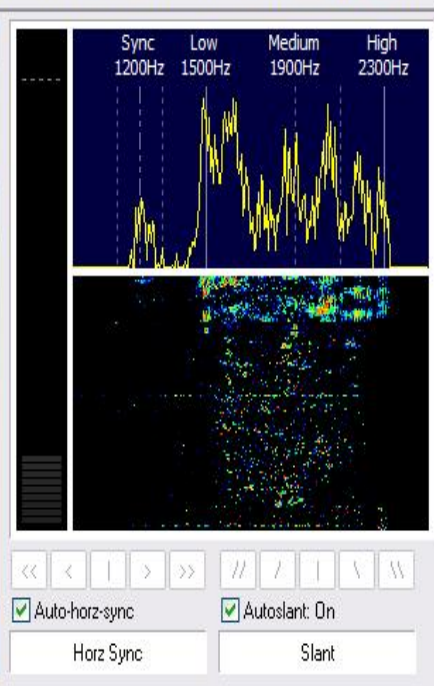
None

None

None

None

None

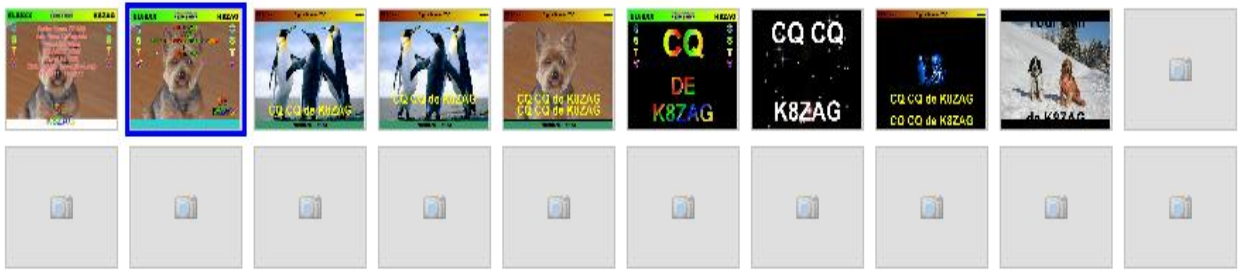


Add (F1) Reset (F4)

Add More My... QSL Help

Saved Images TX: Background Images TX: Templates Logfile

File Deselect All Refresh Edit TX Image: Keep Replace



*Tab To Select Background
Image*

Add Log Entry

(F2) Start: 16:40 <

(F3) End: 16:40 <

(F5) Call:

Name:

QTH:

Locator:

Country:

Frequency: 14.230.000

Band: 20m

Mode: SSTV

Sent: 595

Rcvd: 599

Remark:

Tags

1 2 3 4 5

About Me

Callsign	K8ZAG
Name	Leon
Age	70
Locator	EL88XX
QTH	The Villages Nor
E-Mail	K8ZAG@arrl.org
HomePage	Club
Clubs	TVARC (www.k

My Equipment

Radio	Yaesu FT-450
Antenna	Force 12 Flapgo
Power	30 Watts
Computer	ASUS 1630
Interface	Signalink USB
Accessories	

Other

Temperature	
Weather	
Other1	
Other2	
Other3	
Other4	

Computer

Mode	
Program	DM780 v5.0 Bet
ProgramFull	Digital Master 780

Receive Transmit Webcam

EL88XX Digital Master 780 Leon

CQ CQ de K8ZAG
CQ CQ de K8ZAG

Northern Florida

Edit FTP TX

Image BBC Philips

Receive...

- None
- Martin 1
- Martin 2
- Scottie 1
- Scottie 2
- Scottie DX
- Robot 36
- P3
- P5
- P7

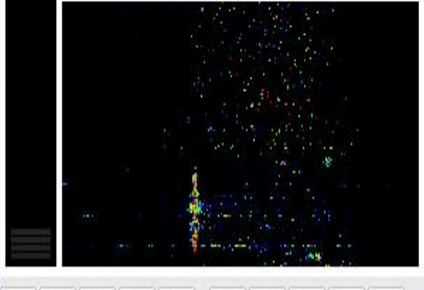
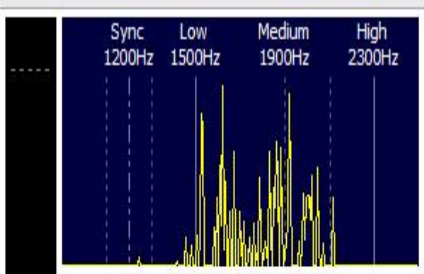
Transmit

Scottie 2

Same as RX

Signal

None



<< < | > >> // / \ \

Auto-horz-sync Autoslant: On

Horz Sync Slant

Saved Images TX: Background Images TX: Templates Logfile

File <> Deselect All < > <> <> <> <> Import Refresh Erase TX

Saved Images

Add Log Entry

(F2) Start: 16:45
 (F3) End: 16:45
 (F5) Call: WA3SVW
 Name: Gary E Mirkin
 QTH: Sewell, Nj 08080
 Locator:
 Country: United States
 Frequency: 14.230.000
 Band: 20m
 Mode: SSTV
 Sent: 599
 Rcvd: 599
 Remark:

Add (F1) Reset (F4)

Not worked

Add More My... QSL Help

Tags

1 2 3 4 5

About Me

Callsign: K8ZAG
 Name: Leon
 Age: 70
 Locator: EL88XX
 QTH: The Villages Nor
 E-Mail: K8ZAG@arrl.org
 HomePage: Club
 Clubs: TVARC (www.k

My Equipment

Radio: Yaesu FT-450
 Antenna: Force 12 Flagpo
 Power: 30 Watts
 Computer: ASUS 1630
 Interface: Signalink USB
 Accessories:

Other

Temperature
 Weather
 Other1
 Other2
 Other3
 Other4

Computer

Mode:
 Program: DM780 v5.0 Bet
 ProgramFull: Digital Master 78

Receive Transmit Webcam

On FTP AFC TX: Edit TX

Autostop Reset

Receive

None

Martin 1
 Martin 2
 Scottie 1
 Scottie 2
 Scottie DX
 Robot 36
 P3
 P5
 P7

Transmit

Scottie 2

Same as RX

Signal

None

None

Auto-horz-sync Autoslant: On

Horz Sync Slant

Saved Images TX: Background Images TX: Templates Logfile

File Details Deselect All Refresh Delete FTP All

SOME REFERENCES

- WWW.HAM-RADIO-DELUXE.COM.
- WWW.DIGIPAN.NET
- WWW.WESTMOUNTAINRADIO.NET
- WWW.TIGERTRONICS.COM
- Search YOUTUBE for K7AGE
- WWW.K4VRC.ORG

Ham Radio Deluxe User Guide

*By Simon Brown, HB9DRV
Version 4.0 May 6, 2008*

Can Be Downloaded As PDF File

Also There Is A Forum

INSTRUCTION MANUAL

INSTRUCTION MANUAL

***An Explanation Of How To Use Something Written In A Way
That Is Easily Understood***

INSTRUCTION MANUAL

*An Explanation Of How To Use Something Written In A Way
That Is Easily Understood*

***ONLY BY
THE
AUTHOR***

History Of RTTY

Landline teleprinter operations began in 1849 when a circuit was put in service between Philadelphia and New York City. ????? ?????? designed a system using a five unit code in 1874 that is still in use today. Teleprinter system design was gradually improved until, at the beginning of World War II, it represented the principal distribution method used by the news services.

History Of RTTY

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Punched tape of the type used with radio teletypes
Landline teleprinter operations began in 1849 when a
circuit was put in service between Philadelphia and
New York City. [Émile Baudot](#) designed a system using
a five unit code in 1874 that is still in use today.



RTTY, using either AFSK or FSK modulation, is moderately resistant to vagaries of HF propagation and interference, however modern digital modes, such as [MFSK](#), use Forward Error Correction to provide much better data reliability.

Comparison with Other Modes

RTTY has a typical [baud rate](#) for Amateur operation of 45.45 baud (approximately 60 words per minute). It remains popular as a "keyboard to keyboard" mode in Amateur Radio. RTTY has declined in commercial popularity as faster, more reliable alternative data modes have become available, using satellite or other connections.

g Entry

Call: 00:57

Time: 00:57

Call: RX0AK

Name: Nickolay P. Nepomny.

Address: Achinsk, Krasnoyarsky

Region: Asiatic Russia

QSO: 14.077.131

Mode: 20m

RTTY

599

More My... QSL Help

Leon 1

Call CQ

- 1) CQ x 2
- 2) CQ x 3
- 3) QRZ

Reply

- 4) Him de Me
- 5) Him de Me Pse K
- 6) Report, Name, QTH
- 7) Station

Leon 1 Tags

RTTY-45

Reverse Defaults Baud: 45.45 Shift: 170 Hz Bits: 5 Stop: 1.5 UoS LtoF

PSE K
 RX0AK RX0A E AB0AL AB0AL AB0AL PSE K
 Q DX CQ DX DERX0A RX0AK RX0AKPSE
 RX0AK RX0AK EAL AB0AL AB0AL
 RXPA QRZQB BH
 RX0AK RX0E AB0AL AB0AL AB0-
 P

Send (F1) Auto (F2) Pause (F3) Stop (F4) Repeat

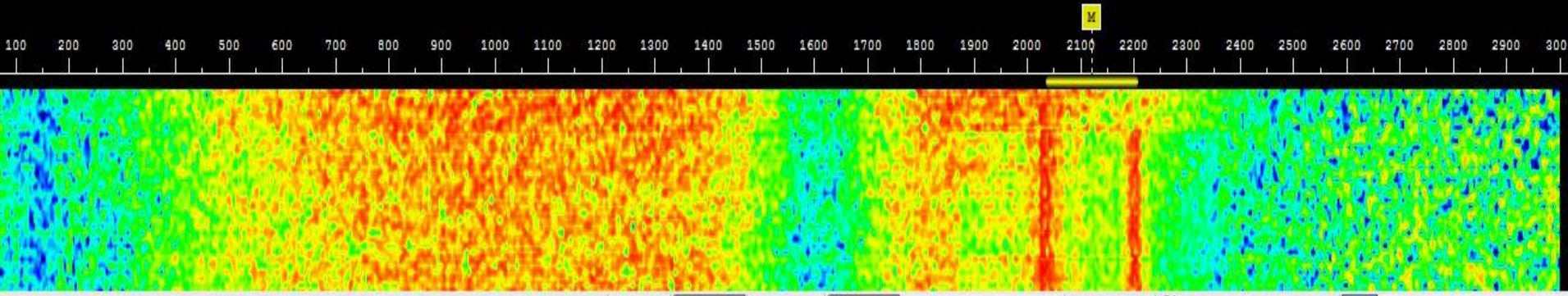
Call CQ Reply Closing Various Leon 1

Enter text to be sent

2121 Hz IMD: S/N: 0dB

x1 Main: 2121 Signal: AFC Decode Options 14.075.010 80m 40m 20m 15m 10m Faves

QPSK CONTESTIA CW DominoEx Hell MFSK MT63 OLIVIA RTTY RTTYM THOR Throb Modes



7th INNING STRETCH

EasyPal Digital SSTV (not so slow)

<http://vk4aes.com/>

<http://www.amateurradio.com.au/content/easypal-experiments-vk3rml>

This information is primarily for EasyPAL users and those that just want to see the *digital* pictures being sent both over the air and via the internet.

EasyPal is a DRM SSTV or DSSTV program that is available for free. You can download it at KC1CS.com or from the author at VK4AES.com.

Primary activity is on 14.233 USB, 7.173 LSB and 3.723 LSB in the U.S. You can find plenty of help setting up and using EasyPAL on any of these frequencies almost anytime of day.

For EasyPAL : www.kc1cs.com (<http://www.kc1cs.com>) or
www.vk4aes.com (<http://www.vk4aes.com>)

For Digi-Sites : www.w3wvg.com (<http://www.w3wvg.com>)

For InterACE : www.g4xgt.co.uk/interace-sstv.htm
(<http://www.g4xgt.co.uk/interace-sstv.htm>)

For Digi-FTP : www.w3wvg.com (<http://www.w3wvg.com>)

With thanks to John ZL1GWE

VE3KBT

Mode B B

Width 2.4 2.4

Error HI HI

QAM 16 16

LeadIn 24

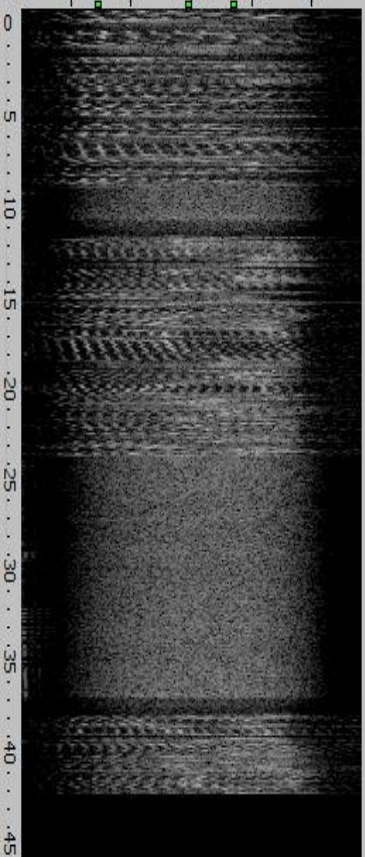
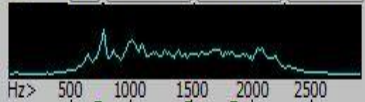
Position - - missed segments

ABORT

TRANSMIT Replay RX FIX BSR

TUNE ID Send Text WAV Pic/QSL

RS2 M EmbedTxt Station Log Session



RX TX View Edit MSC

Last RX Pictures



...419141305-pict p13.jpg ...56-Last_TX_Picture.jpg

Last TX Pictures



110419143550-Dogs.jpg ...133528-Butterfly Pic.jpg ...18154056-Penguins.jpg ...945-Chrysanthemum.jpg ...18095809-Penguins.jpg ...357-Chrysanthemum.jpg



110418154056-Penguins.ipa (640*480)

Full Screen >>Tx >>Edit Delete Send To To Web >>Rptr

Digital SSTV

Advantage to D-SSTV Are:

- 1. Picture Quality is excellent*
- 2. You use the same equipment as for BPSK*
- 3. If some of the Scan has errors they can be corrected without re-sending the entire picture.*

Note: The EASYPAL program is a separate program not related to HRD (Ham Radio Deluxe)

NOTE

If you connected to the Internet while viewing the presentation,,,,,

Some highlighted words if clicked on with the mouse will take you to the resource for more information. Close the Internet window and the presentation will resume.