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
• 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
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.
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).
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.
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
<table>
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<th>Band</th>
<th>Frequency</th>
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</tr>
<tr>
<td>6 Meters</td>
<td>50290</td>
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</table>
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
My Force 12 Flagpole Antenna
Wishful Thinking

Make my XYL’s decoration into a loop antenna

Hi Hi
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.
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.)
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<td>32</td>
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<td>34</td>
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Simple Interface

Thanks to N6HI
SIMPLE XCVR TO PC INTERFACE FOR SOUND CARD DIGITAL MODES

J. Rehak N6HI 10/28/07

TRANSMIT DATA PATH

RECEIVE DATA PATH

Just an Example
Other’s available
on the WEB
SENDING A TEST SIGNAL
Waterfall Of Many Received BPSK 31 Signals
BPSK-31

Add Log Entry

(1) Start: 17:41
(2) End: 17:41

Leon 1

Call CQ

jnt

th oJe

>>> nVU2UR Dn_n 21FC 1

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

Waterfall

Zoom: x1   - Main: 845   - Signals: - AFC
Decode

14.070.000

PSK   QPSK   CONTESTIA   CN   DominEEx   Hel   MFSK   MT63   OLIVIA   RTTY   RTTYW   THOR   Throb   Nodes

120 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400 2500 2600 2700 2800 2900 3000

CPU 1%   Audio: 38%   Soundcard Rxt: 7999.759Hz   Overload   HRD Logbook: My Logbook  RSID  QSY  CAP  NUM  SCRL  14:19:12
USING SUPER BROWSER
W5IPA x

N8JIW x

ØwK9SOU de W5IPA

N8JIW WØPAS DE N8JIW N8JIW N8JIW UR RST 599 599 DON DON NE OHIO NR CLEVELAND OHIO, CITY IS SHOWN

7QR m o. Bio and photo there also – 73 and my best wishes to you and your family Arnaud Bye Bye F4EJ

Hambden, Ohio; Geauga Cty. Hambden, Ohio; Geauga Cty. loc: En91jo [2.8°, 1,407.4km] En91jo BTU Roy, J38I

nna: Cushcraft A4-S w/40m Operator: Created 1943, licensed 1968 My QSL is OK via LOTW only OTU Only

Active: 6/20 Hold: 20 secs Rewind: 10 secs Decode: 0
CONTACT WITH SWITZERLAND
**QSL Via:**

**Confirming:**
- [x] Our 2-way QSO
- [ ] Your SWL report

**TO RADIO:**

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**Best 73’**

Dietmar Seiss
Staatsstrasse 146
CH-9464 Rüti/SG
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
Tab To Select Background Image
Saved Images
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

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. 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.
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.
PSE K
RX0AK RX0A E AB5AL AB5AL AB5AL PSE K
Q DX CQ DX DERX0A RX0AK RX0AKRX0A PSE
RX0AK RX0AK EAL AB5AL AB5AL
RXPA QRZQB BH
RX0AK RX0E AB5AL AB5AL AB5A
P
7th INNING
STRETCH
EasyPal Digital SSTV (not so slow)
http://vk4aes.com/
http://www.amateurradio.com.au/content/easypal-expirements-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 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
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.