Digital Modes featuring Sound Card Software

PSK31 Software

DigiPan: http://members.home.com/hteller/digipan
W1SQLPSK: http://www.faria.net/w1sql/psk31.htm
PSK Deluxe: http://www.kns.ch/sysgem/hb9drv/PSK31%20Deluxe.htm

CW Software

CWget: http://ua9osv.da.ru

RTTY Software

TrueTTY: http://www.dxsoft.com

HamScope: http://www.qsl.net/hamscope/
CW, RTTY, PSK, MFSK, Rig Control for most models (Icom, Yaesu, Kenwood)

WSJT: http://pulsar.princeton.edu/~joe/k1jt/
Weak Signal High Speed CW using FSK411 mode for meteor shower propagation. Also includes Very Weak Signal / EME (Moon bounce) JT44 mode permits communications at 25+ db below noise level. Moderate stations can now do moon bounce.

Connecting your Radio to your Computer

Receive Audio Connection

Connect an audio cable between the transceiver audio output and the soundcard LINE IN jack. The audio output of the transceiver may be the speaker output, an auxiliary audio output, or an earphone jack. It is best to use a transceiver audio output that is unaffected by the transceiver volume control if available.

In case the audio output of the transceiver is too low to produce a blue speckled background on the PSK Software Spectrum Window, change the connection at the soundcard end of the cable from the soundcard LINE IN jack to the soundcard MIC jack.

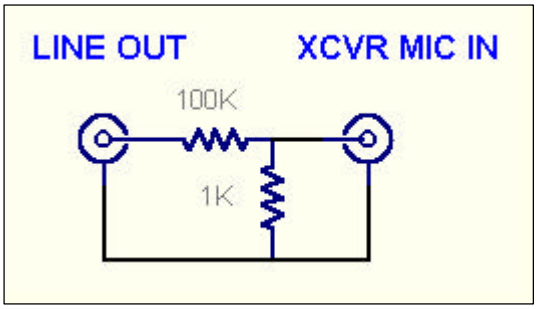
Receive audio level is controlled by the PSK Software Receive Volume and, if coming from the transceiver speaker or earphone audio output, also by the transceiver volume control.

Set the soundcard for the best sample rate conversion quality for the sharpest possible display of received signals. PSK Software works best at a sample rate of 11025 Hz or higher.

Transmit Audio Connection

Connect a shielded audio cable between the transceiver MIC input and the soundcard LINE OUT jack through a 40 db attenuator, consisting of a 100K series resistor feeding a 1K parallel resistor. This attenuator will reduce the soundcard LINE OUT level from about 1 Volt down to the normal MIC input level of about 10 millivolts, so the higher soundcard output level does not overdrive and distort the transceiver MIC input.

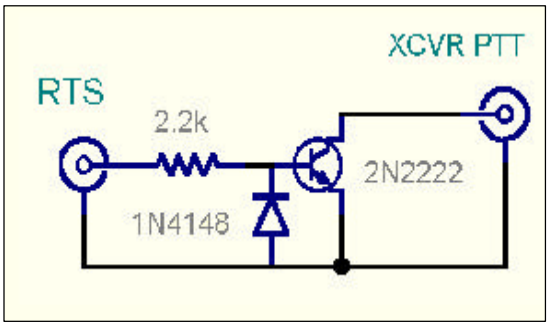
If the transceiver is equipped with a high-level auxiliary input, then the attenuator is unnecessary, and the transceiver auxiliary input may be connected directly by shielded cable to the soundcard LINE OUT. If using the auxiliary input of the transceiver, be sure the transceiver microphone is disabled when operating PSK31, to prevent illegal modulation of the transceiver in the CW band by sounds picked up by the microphone!



T/R Connection

The transceiver's VOX can theoretically be used to control the transmit/receive function, however it is often difficult to adjust for reliable operation while still maintaining the proper audio levels needed to preserve an undistorted PSK output signal. For this reason, Digipan provides for positive control of the transceiver's PTT via the RTS and/or DTR outputs of the computer's RS-232 serial port.

Signal	DB9 Connector	DB25 Connector
RTS	Pin-7	Pin-4
DTR	Pin-4	Pin-20
Ground	Pin-5	Pin-7



The RTS and DTR outputs of the serial port are not directly compatible with the PTT control of most transceivers. The serial port outputs +12 to +15 VDC for transmit and –12 to –15 VDC for the receive condition. Transceiver PTT circuits on the other hand, generally require a ground for transmit and an open circuit for receive. For most modern solid-state transceivers, a simple NPN switching transistor (2N2222 or equivalent), with a 2.2K resistor inserted in series between the base and the serial port, emitter connected to ground, a diode connected between the base and emitter (to prevent the –12 to –15 VDC from reaching the transistor), and the collector to the transceiver PTT line will suffice.

Connect a cable from the computer RS-232 connector to the transceiver PTT line, through a switching transistor as described above, using pin 7 or pin 4 if a DB-9 (small) connector, or pin 4 or pin 20, if a DB-25 connector (large).

In case there is no voltage available at the transceiver PTT input, try connecting the coil of a 12 volt, 1020 ohm, sensitive reed relay between ground and the output of the RS-232 connector, with a small signal silicon diode in series with the RTS or DTR output and the relay coil, cathode to the coil, and using the relay contacts to operate the transceiver PTT input. Also connect a small signal silicon diode in parallel with the reed relay coil, with the anode connected to the ground, in order to absorb any "inductive kick", or transient, created by the relay coil when de-energized. Transceiver PTT operation can also be switched manually if necessary.

Software Adjustment

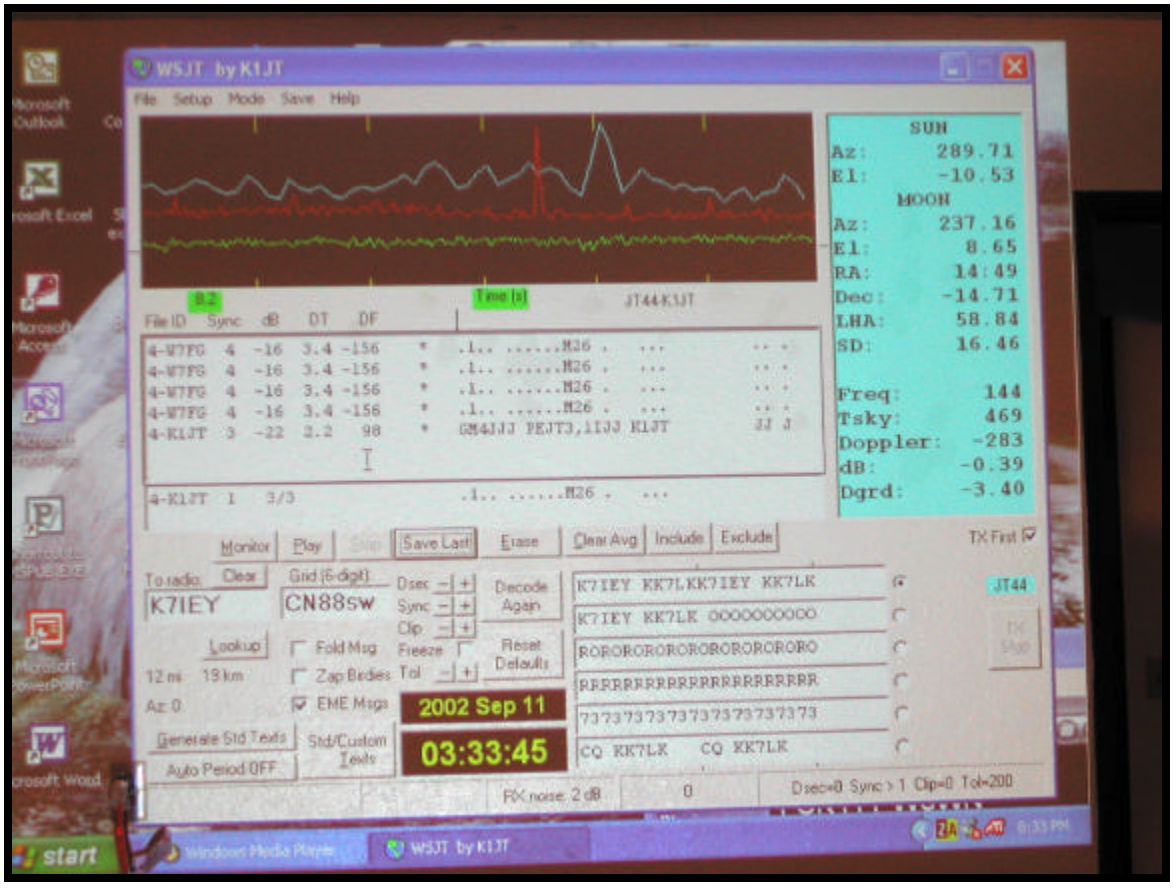
After connecting the RS-232 port to the transceiver, the correct serial port must be selected in the PSK Software, under Configure/Serial Port, and the "RTS as PTT" or "DTR as PTT" box checked. Since the internal modem, or other device, of the computer may be using one of the serial ports, it is necessary to physically connect to an unused serial port and then select that same serial port in the PSK Software. The PSK Software will send a PTT signal to either RTS or DTR, or both, so either one can be used for PTT. However, your cable wiring must agree with your PTT selection.

Troubleshooting

In some installations, ground loops on receive or transmit, or RF feedback on transmit, may cause problems in reception or transmission. In these cases, it is sometimes helpful to isolate one of both of the audio lines connecting the transceiver and the soundcard with a 1:1 audio isolation transformer to break the ground loops or even help keep unwanted RF out of the audio lines. Feeding the audio lines through small ferrite beads as RF chokes is often helpful in reducing feedback caused by RF on the lines.

Sometimes, simply muting the Microphone and Line inputs on the Windows Volume Control panel, which controls the sound fed to the computer speakers, is enough to stop audio feedback. In this case, never mute the Volume or Wave level controls, or the soundcard audio that is generated for transmitting will be shut off. Only mute the Microphone and Line controls, which will then make it necessary to use the transceiver audio system for monitoring the band by ear, as the receiver sound will no longer be passed to the computer speakers. However, since the PSK Software is a visual method of reception, actually hearing what is happening on the band is only seldom necessary.

Note: Connecting your Radio to your Computer is text from the DigiPan PSK Software Help Reference.


WSJT by K1JT
File Setup Mode Save Help
SUN
Az: 289.71
El: -10.53
MOON
Az: 237.16
El: 8.65
RA: 14:49
Dec: -14.71
LHA: 58.84
SD: 16.46
Freq: 144
Tsky: 469
Doppler: -283
dB: -0.39
Dgrd: -3.40
File ID Sync dB DT DF
4-W7FG 4 -16 3.4 -156 * .1.. .....M26 . ...
4-W7FG 4 -16 3.4 -156 * .1.. .....M26 . ...
4-W7FG 4 -16 3.4 -156 * .1.. .....M26 . ...
4-W7FG 4 -16 3.4 -156 * .1.. .....M26 . ...
4-K1JT 3 -22 2.2 98 * GM4JJJ PE3T3,1IJJ K1JT JJ J
4-K1JT 1 3/3 .1.. .....M26 . ...
Monitor Play Stop Save Last Erase Clear Avg Include Exclude
TX First
To radio: Clear
K7IEY
Grid (6-digit)
CN88sw
Dsec Sync Clip
Decode Again
Lookup
Fold Msg
Zap Birdies
Freeze
Tol
Reset Defaults
12 mi 19 km
Az: 0
EME Msgs
2002 Sep 11
03:33:45
Generate Std Texts
Auto Period OFF
Std/Custom Texts
K7IEY KK7LK K7IEY KK7LK
K7IEY KK7LK OOOOOOOOO
RORORORORORORORORORO
RRRRRRRRRRRRRRRRRRR
73737373737373737373
CQ KK7LK CQ KK7LK
JT44
RX noise: 2 dB
0
Dsec=0 Sync > 1 Clip=0 Tol=200
start
Windows Media Player
WSJT by K1JT