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# Ogden Amateur Radio Club

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**Next Club Meeting/Activity** **NEW!**

Date: 3rd Saturday, February 16, 2008  
 Time: 09:00 am  
 Location: [Riverdale Fire Station](#) [MAP](#)  
 Topic: HF Digital Communications for beginners - psk31, rtty, sstv  
 by Val Campbell K7HCP & Jeff Anderson KD7PAW

**Latest Edition OARC "Watts News" e-Magazine**

- ["Watts News" e-Magazine \(January 2008 edition\)](#)  
 (published 1 week prior to club meeting/activity)

**NOTICE:**

- **Weber VE Test Session**
  - o 1st Wednesday February 6, 2008
  - o [Details & Map](#)
- **NEW! OGDEN AREA 2 meter NET** (informal [general](#) information net)
  - o Wednesdays 21:00 (09:00 PM)
  - o Little Mountain Repeater (146.90 Mhz, Offset="-", Tone=123.0)
  - o Everyone welcome - check-in and chat with your friends

OARC Membership Database

Internet 100%

# HF Digital Communications

for beginners

Psk31, Rtty, Sstv

Val Campbell - K7HCP  
Jeff Anderson - KD7PAW

# RECEIVE MODE

psk31

Phase Shift Keying @ 31 baud / 31 hertz

# Minimum Configuration

SW Radio, Computer, Microphone



Sound Card Mic-In

# Radio Setup

## psk31

- SSB/CW (USB) ← Receiver Mode
- 14.070 mhz [20 meters] ← Day time
- 7.070 mhz [40 meters] ← Early evenings
- 3.580 mhz [80 meters] ← Night time

↑  
3 popular bands

# Digipan is Freeware

<http://digipan.net>

**DigiPan Download Page**

**A Freeware Program for PSK31 and PSK63**

DigiPan stands for "Digital Panoramic Tuning" and brings the ease and simplicity of PANORAMIC reception and transmission to PSK31 and PSK63 operation. DigiPan provides a panoramic display of the frequency spectrum in the form of an active dial scale extending the full width of the computer screen. Depending upon the transceiver IF bandwidth, it is possible to "see" as many as 40 to 50 PSK31 stations at one time. Low-cost transceiver kits for 10 meters, 20 meters, 30 meters, 40 meters, and 80 meters, the PSK-10, PSK-20, PSK-30, PSK-40, and Warbler (PSK-80), are available from [Small Wonder Labs](#) that make full use of DigiPan's panoramic capabilities through the use of a 3000 Hz wideband IF. An article about DigiPan and the panoramic transceiver can be found starting on page 33 of the June, 2000, QST magazine. Other information about PSK31, including a downloadable copy of the article, is currently available for members from the [ARRL Technical Information Service](#).

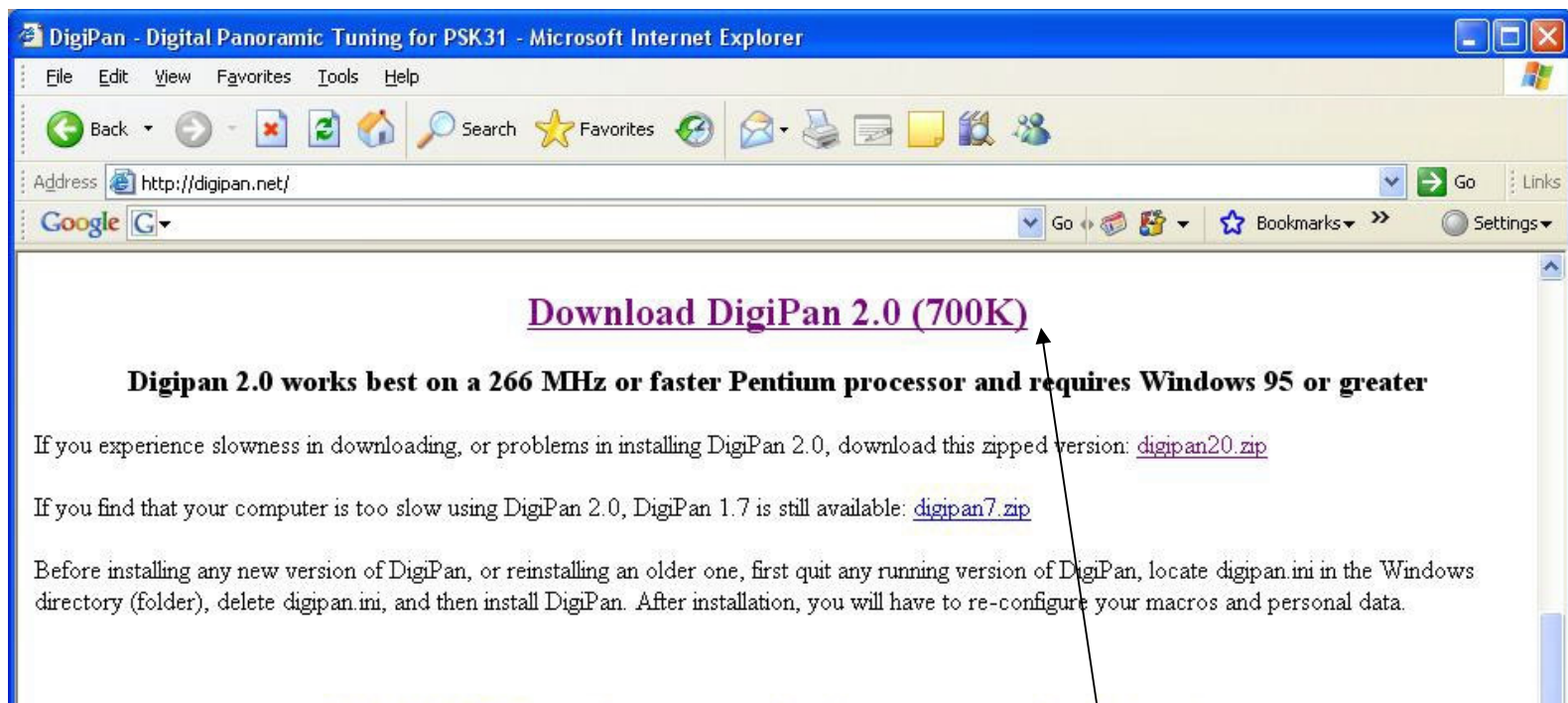
DigiPan 1.0 forever changed how PSK31 tuning was done, from manually tuning the transceiver, to "point-and-click" mouse tuning, in which a signal on the waterfall is clicked with the mouse button to find out the station's call sign and decide whether or not to contact that station...

**Now, DigiPan 2.0 again changes how PSK31 tuning is done!**

Digipan is free software

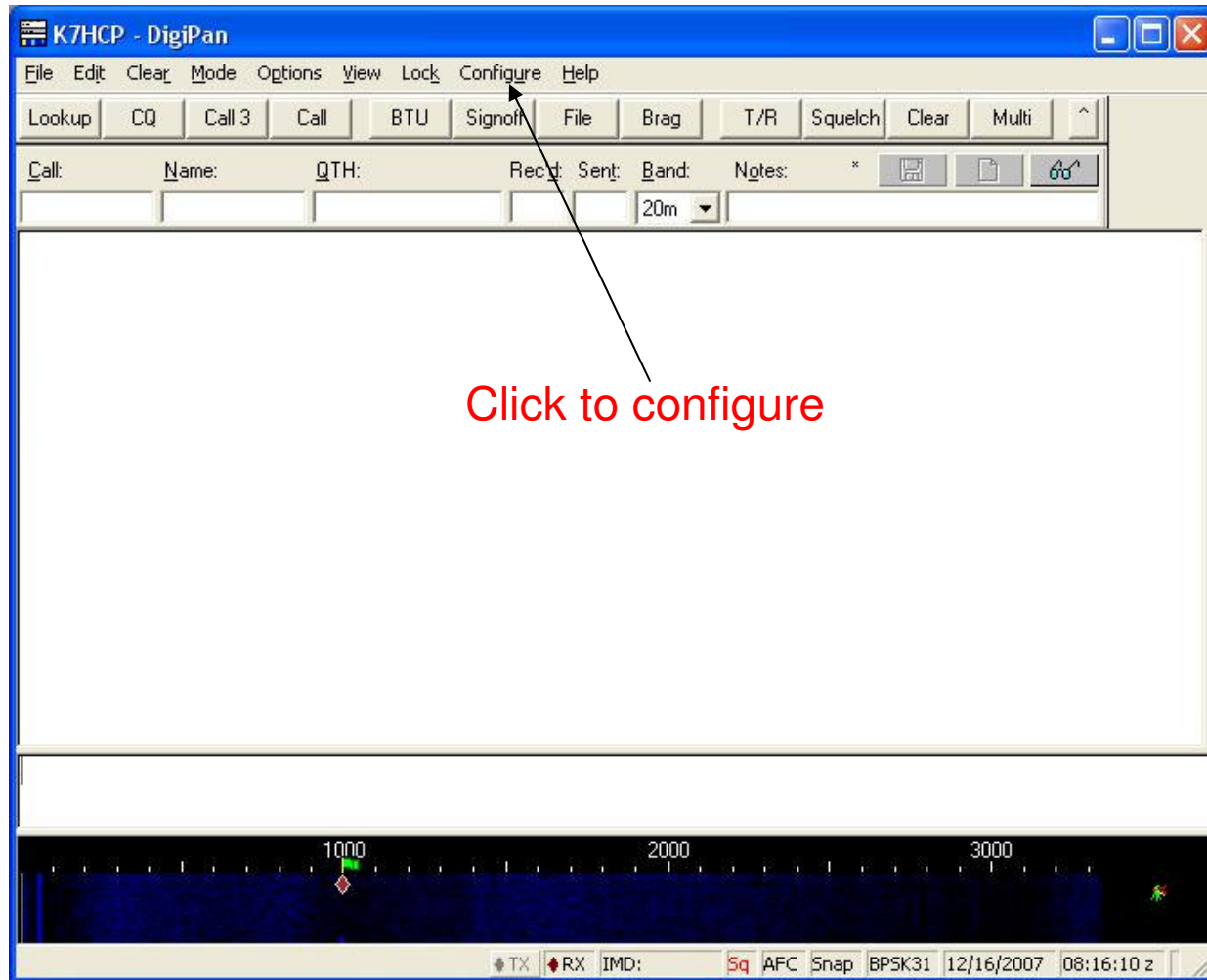
Written by hams

# Download DigiPan



Small, downloads quick

# Initial Program Screen



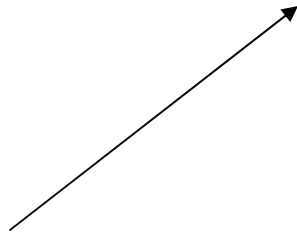


# Configure Personal Information



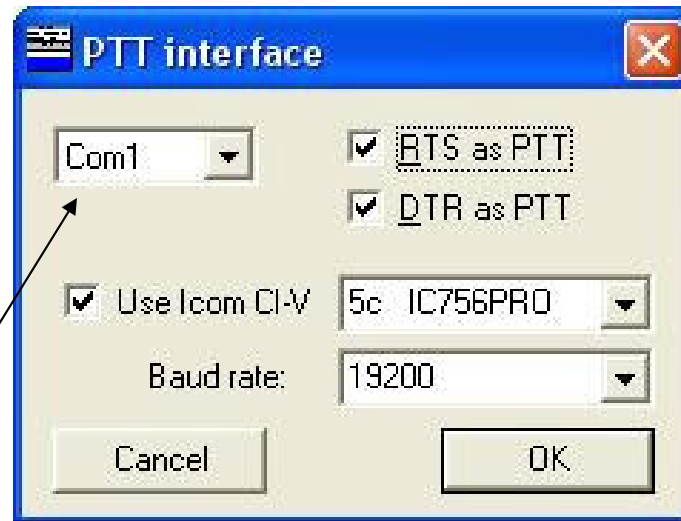
A screenshot of a software dialog box titled "Personal data". The dialog box has a blue title bar with a close button (X) in the top right corner. It contains several input fields and controls:

- Call:** A text field containing "K7HCP" with an "OK" button to its right.
- Name:** A text field containing "Val" with a "Cancel" button to its right.
- QTH:** A text field containing "Ogden UT".
- Use CWID:** A checkbox that is currently unchecked.
- Speed:** Two radio buttons labeled "Fast" and "Slow", with "Fast" selected.
- CWID:** A text field containing "de K7HCP sk".



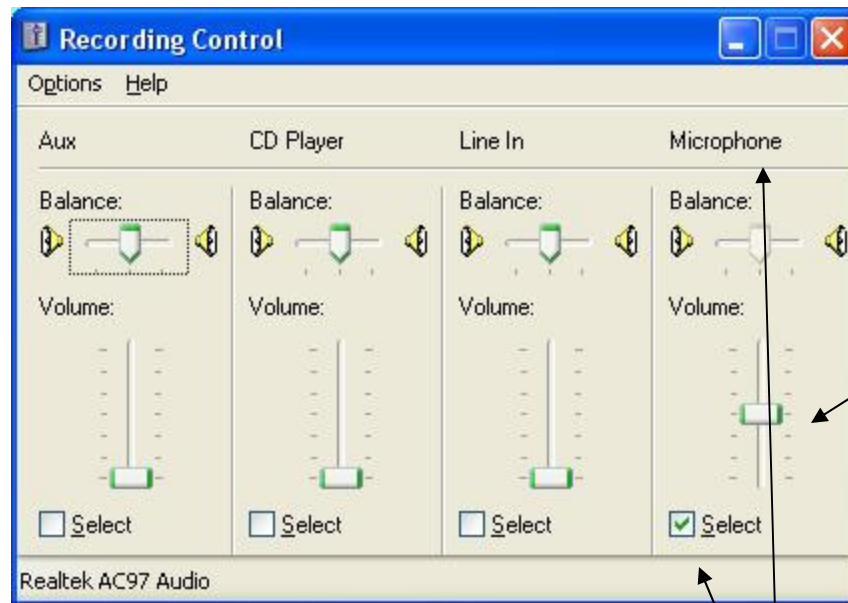
Enter personal data

# Configure PC Com Port



Select com port #

# Receive - Microphone Gain

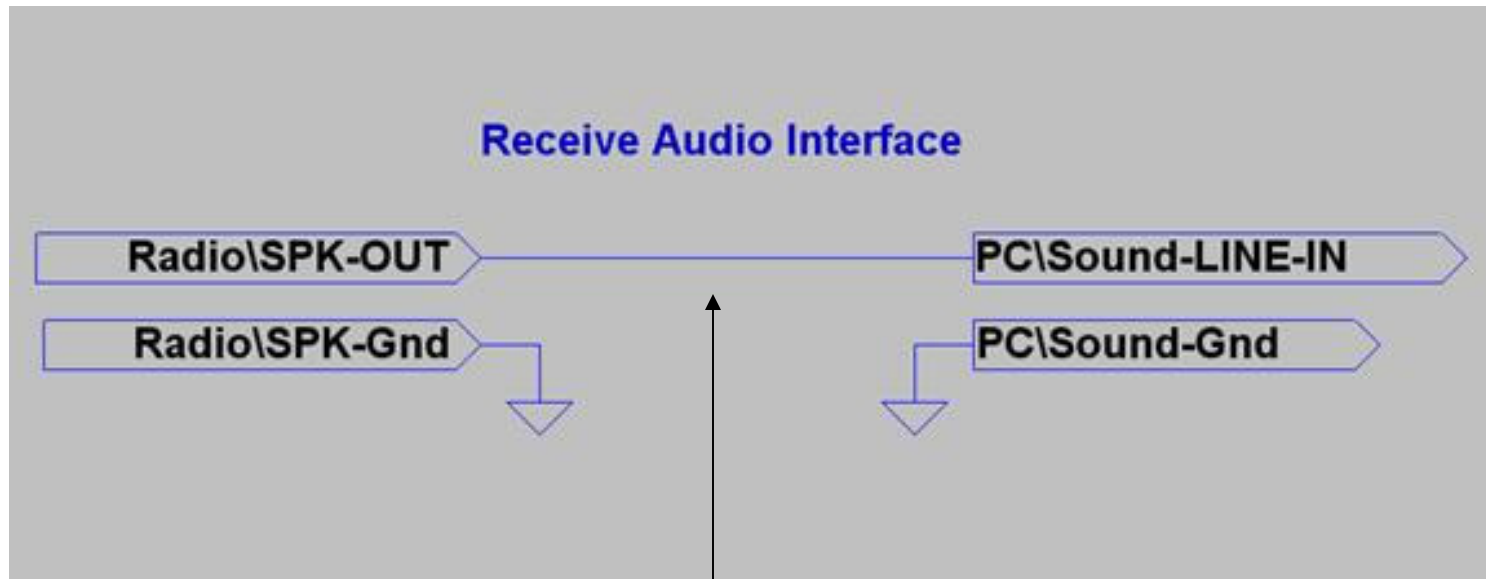


Adjust input level

If using microphone input option

Select Microphone

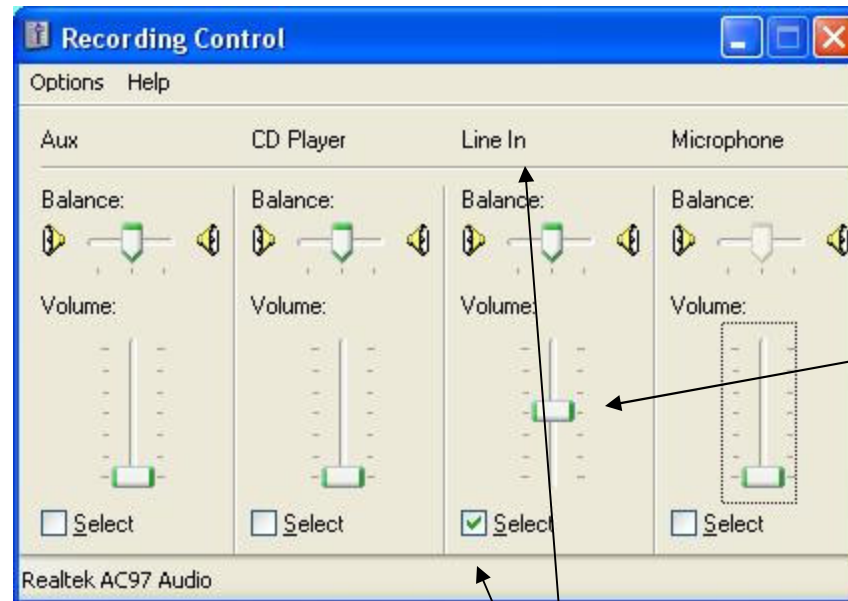
# Speaker-Out >>> Line-In



Direct connection - preferred method

Use direct connect stereo cable  
instead of microphone

# Receive – Line In Gain



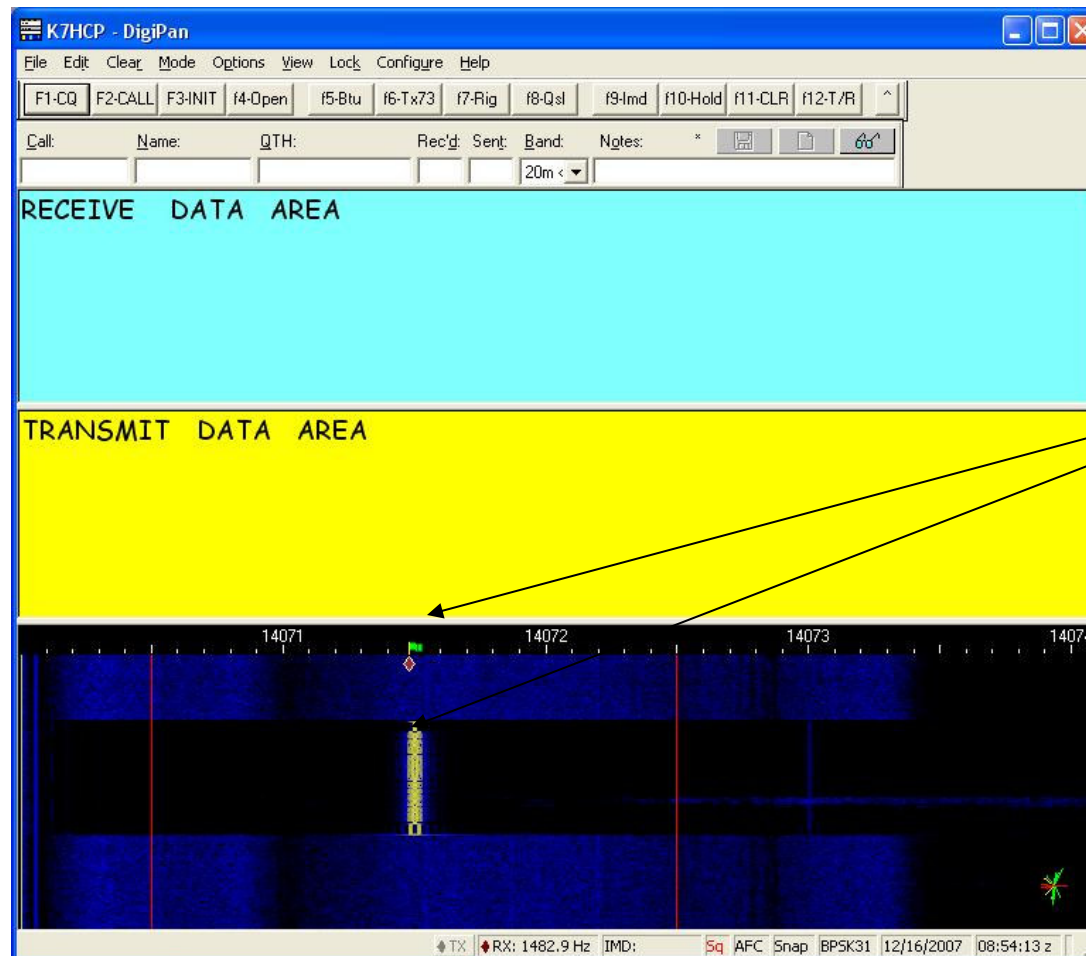
Adjust input level

If using speaker direct connection option

Select Line-In

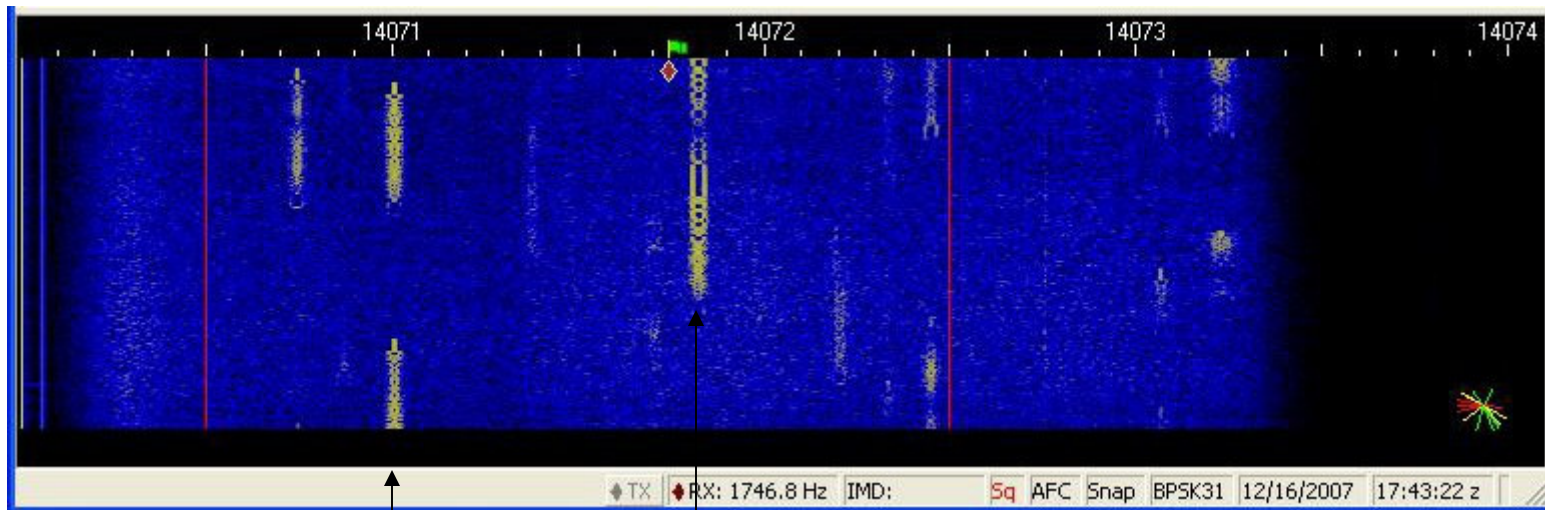
# Display Screen Areas

Receive Data, Transmit Data, Waterfall



Psk31 signal  
Waterfall Tracks

# Water Fall - Tuning Area

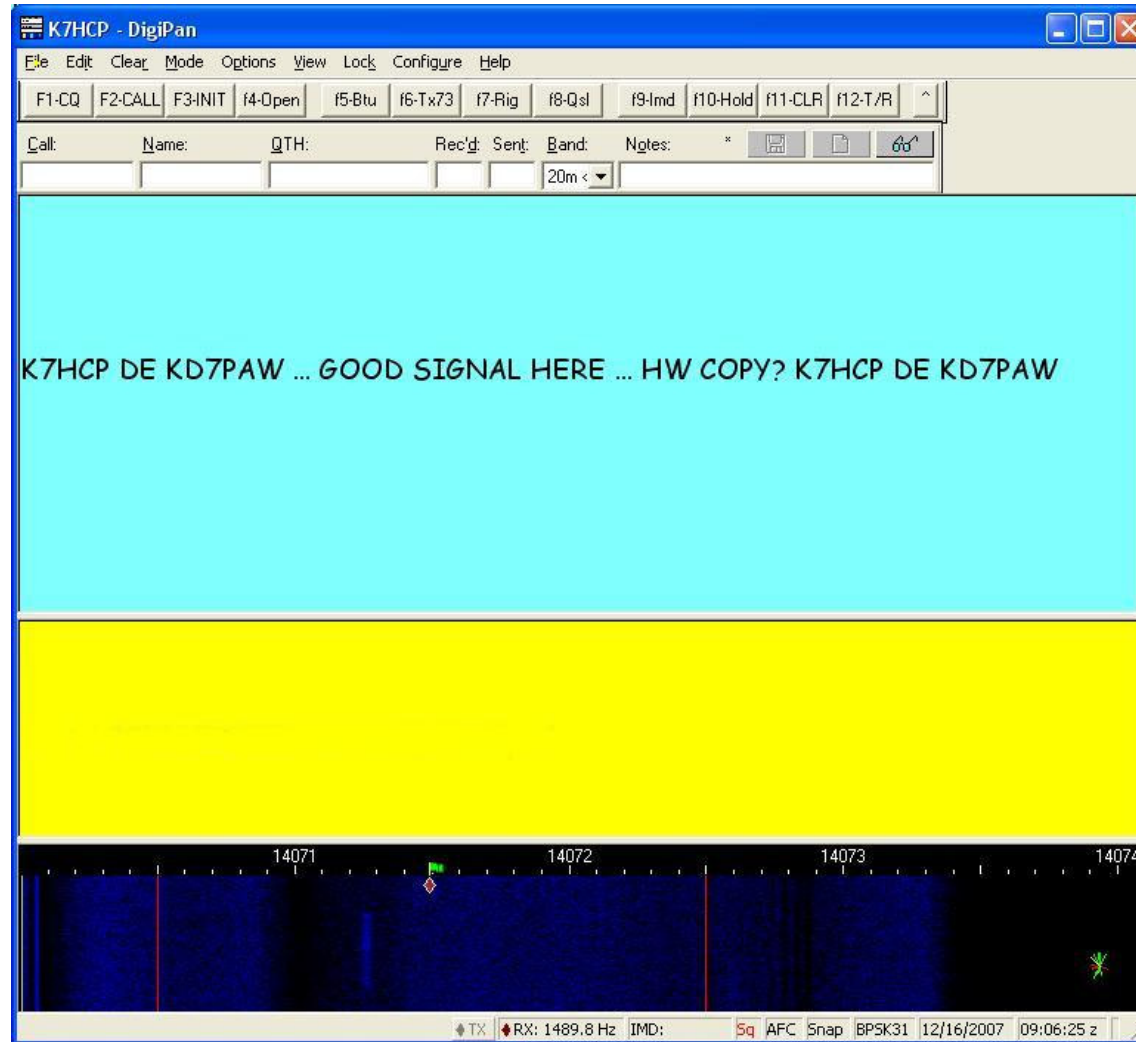


Station at 14.071.00

Station at 14.071.80

Tune with your mouse pointer – just click desired “track” to decode

# Receive Data Decode



Received data  
displays here

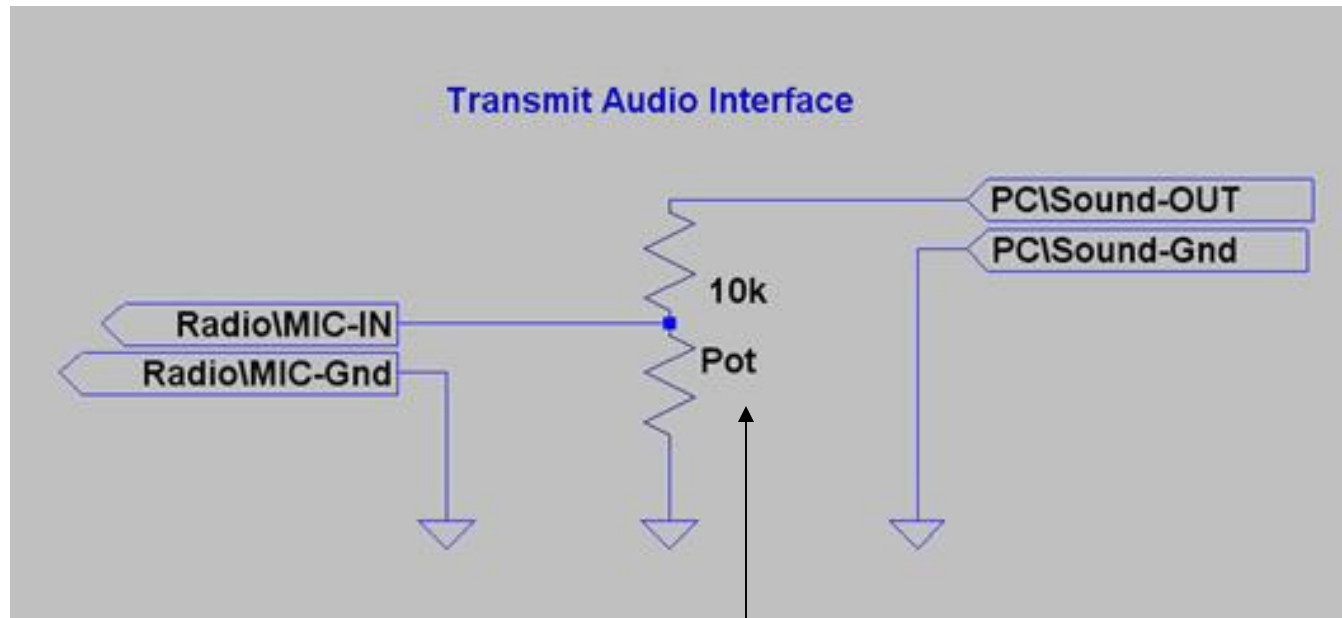


# TRANSMIT MODE

psk31

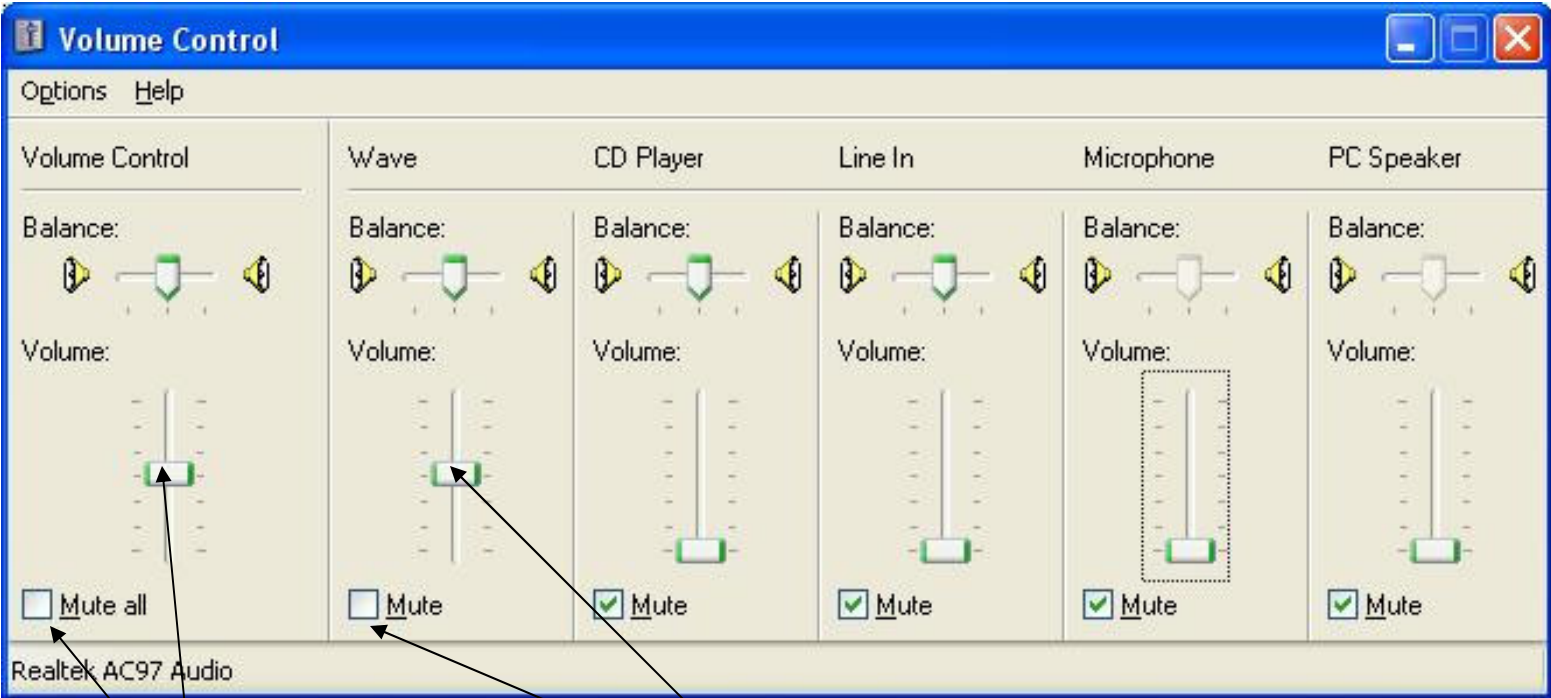
Phase Shift Keying @ 31 baud / 31 hertz

# Sound-Out >>> Mic-In



Various radios require different mic level settings

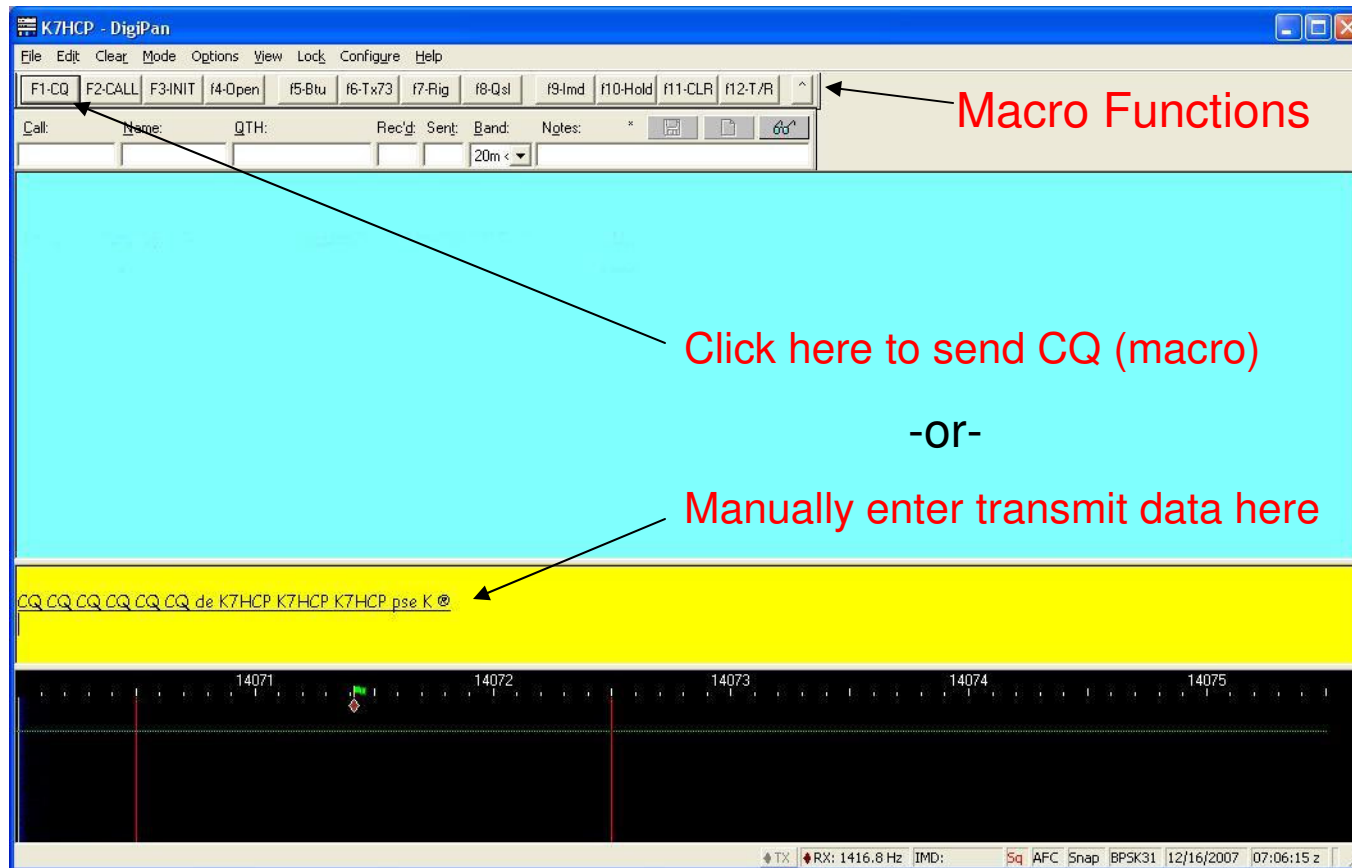
# Transmit Audio Gain



Master Volume Control

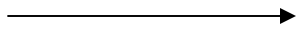
Wave output level

# Transmit Data - CQ



# PSK31 QSO

Received data



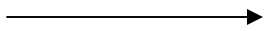
K7HCP DE KD7PAW ... GOOD SIGNAL HERE ... HW COPY? K7HCP DE KD7PAW

KD7PAW KD7PAW KD7PAW DE K7HCP K7HCP K7HCP pse K

14071 14072 14073 14074

TX RX: 1489.8 Hz IMD: 5q AFC Snap BPSK31 12/16/2007 09:06:25 z

Transmit data

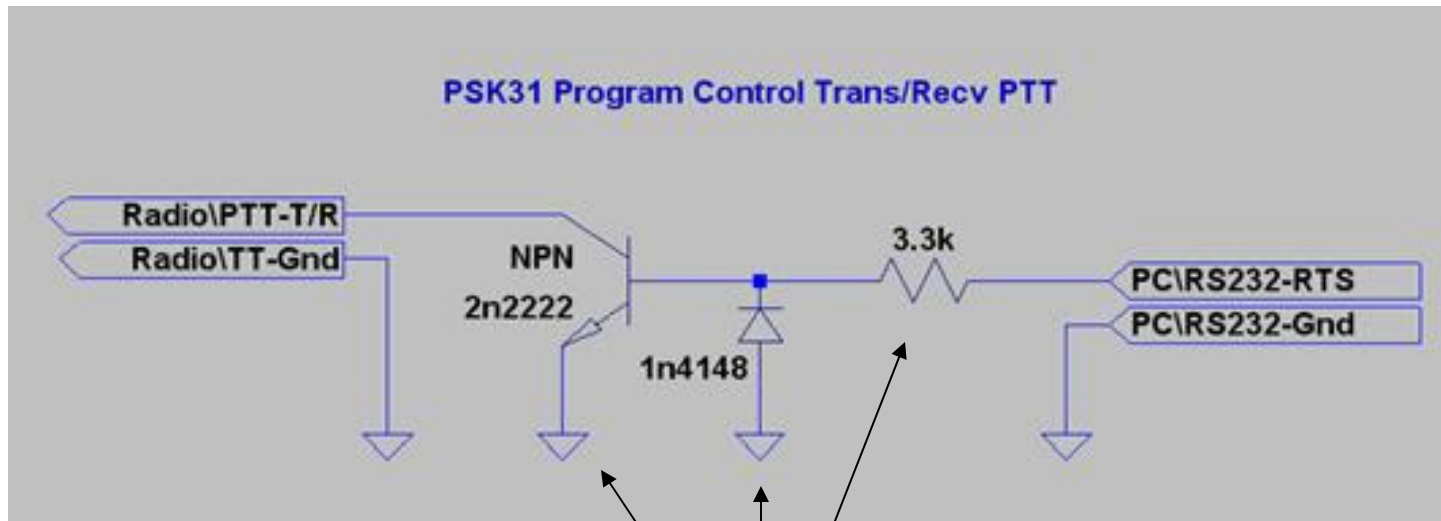


# PROGRAM CONTROLLED PTT

Automatic Trans / Recv switch over

# Basic PTT Interface

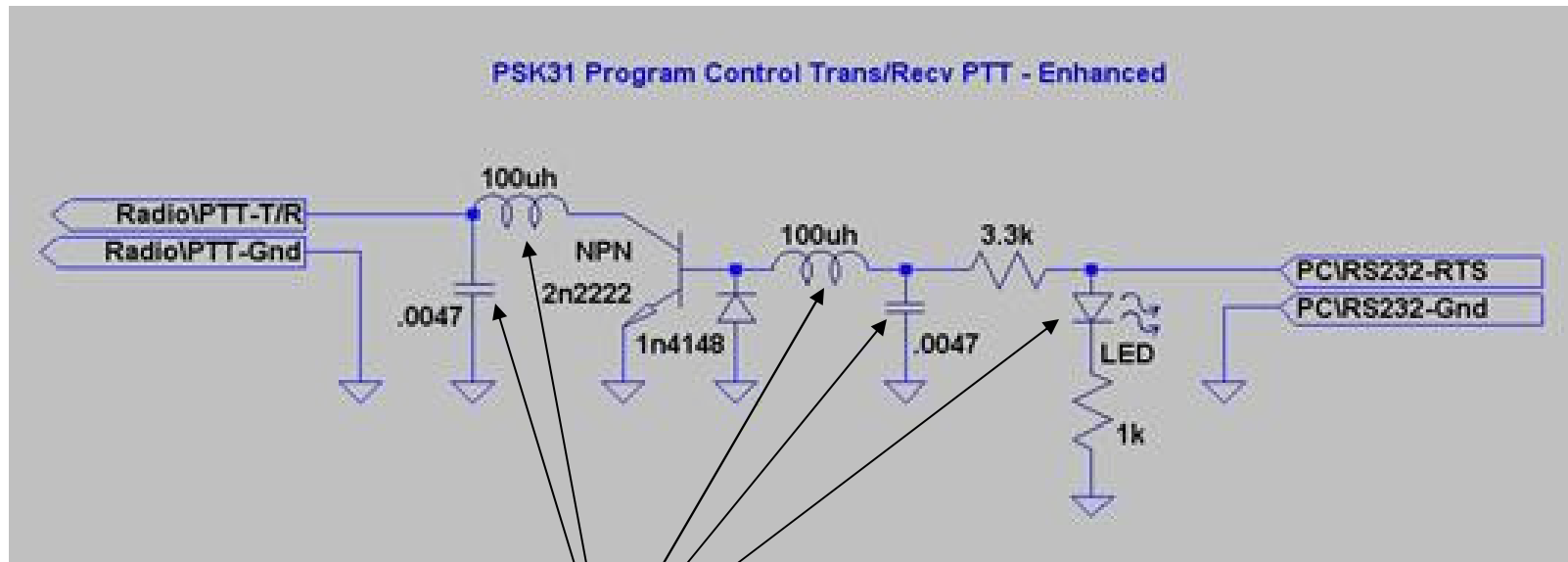
PC RS232 >>> Radio PTT



Only 3 common components required

# Enhanced PTT Interface

PC RS232 >>> Radio PTT

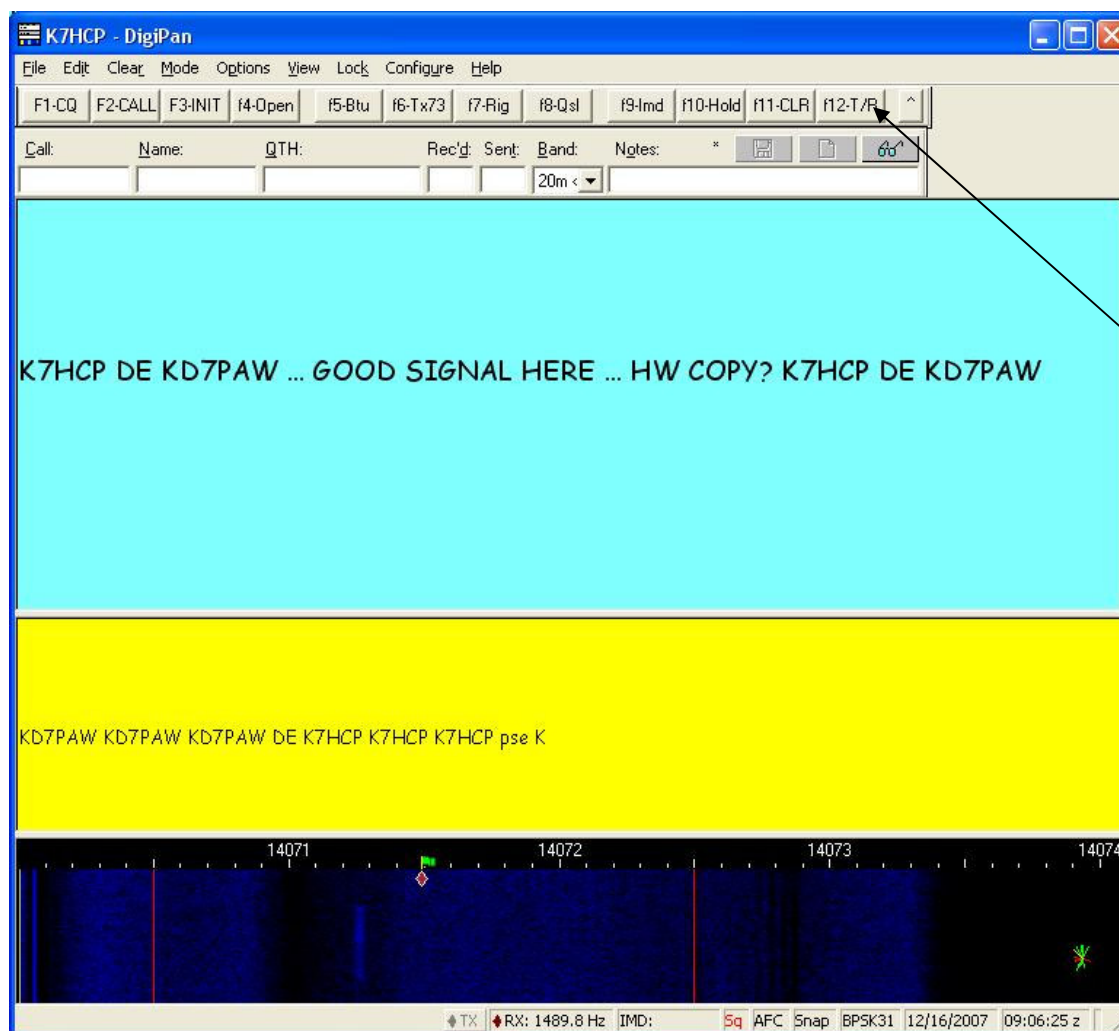


Only 5 more common components required...

Provides enhanced RF isolation / protection + Xmit indicator LED



# Trans / Recv



Click to transmit

- OR- Click to transmit

# LOGGING QSO DATA

The screenshot shows the K7HCP - DigiPan software interface. The window title is "K7HCP - DigiPan". The menu bar includes "File", "Edit", "Clear", "Mode", "Options", "View", "Lock", "Configure", and "Help". The toolbar contains buttons for "F1-CQ", "F2-CALL", "F3-INIT", "F4-Open", "F5-Btu", "F6-Tx73", "F7-Rig", "F8-Qsl", "F9-Imd", "F10-Hold", "F11-CLR", and "F12-T/R". Below the toolbar, there are input fields for "Call:", "Name:", "QTH:", "Rec'd:", "Sent:", "Band:", and "Notes:". The "Call:" field contains "K7HCP DE KD7PAW". The "QTH:" field contains "... GOOD SIGNAL HERE ... HW COPY?". The "Notes:" field contains "K7HCP DE KD7PAW". The main text area is highlighted in cyan. Below the text area is a yellow bar. At the bottom, there is a frequency display showing "14071", "14072", "14073", and "14074". The status bar at the bottom shows "TX: RX: 1489.8 Hz IMD: Sq AFC Snap BP5K31 12/16/2007 09:06:25 z".

Annotations:

- 2<sup>nd</sup> click to save (points to the "Call:" field)
- 1<sup>st</sup> click here (points to the "QTH:" field)
- Click to commit qso data (points to the "Notes:" field)
- Automatically time stamped (points to the status bar)

# PSK vari-code

Most frequently used characters  
assigned fewest number of bits

Optimized for lower case

## The Varicode alphabet

ASCII	Varicode.	ASCII	Varicode.	ASCII	Varicode.
0x00	1010101011	*	101101111	T	11011101
0x01	1011011011	+	111011111	U	101010111
0x02	1011101101	,	1110101	V	110110101
0x03	1101110111	-	110101	W	101011101
0x04	1011101011	.	1010111	X	101110101
0x05	1101011111	/	110101111	Y	101111011
0x06	1011101111	0	10110111	Z	1010101101
0x07	1011111101	1	10111101	[	111110111
0x08	1011111111	2	11101101	\	111101111
0x09	11101111	3	11111111	]	111111011
LF	11101	4	101110111	^	1010111111
0x0b	1101101111	5	101011011	_	101101101
0x0c	1011011101	6	101101011	`	1011011111
CR	11111	7	110101101	a	1011
0x0e	1101110101	8	110101011	b	1011111
0x0f	1110101011	9	110110111	c	101111
0x10	1011110111	:	11110101	d	101101
0x11	1011110101	;	110111101	e	11
0x12	1110101101	<	111101101	f	111101
0x13	1110101111	=	1010101	g	1011011
0x14	1101011011	>	111010111	h	101011
0x15	1101101011	?	1010101111	i	1101
0x16	1101101101	@	1010111101	j	111101011
0x17	1101010111	A	1111101	k	10111111
0x18	1101111011	B	11101011	l	11011
0x19	1101111101	C	10101101	m	111011
0x1a	1110110111	D	10110101	n	1111
0x1b	1101010101	E	1110111	o	111
0x1c	1101011101	F	11011011	p	111111
0x1d	1110111011	G	11111101	q	110111111
0x1e	1011111011	H	101010101	r	10101
0x1f	1101111111	I	1111111	s	10111
space	1	J	111111101	t	101
!	111111111	K	101111101	u	110111
"	101011111	L	11010111	v	1111011
#	111110101	M	10111011	w	1101011
\$	111011011	N	11011101	x	11011111
%	1011010101	O	10101011	y	1011101
&	1010111011	P	11010101	z	111010101
'	101111111	Q	111011101	{	1010110111
(	11111011	R	11010111		110111011
)	11110111	S	1101111	}	1010110101
				~	1011010111
				127	1110110101

Some implementations may not support all control codes (less than 0x20)

Notice that Varicode is optimized for lower case transmissions.

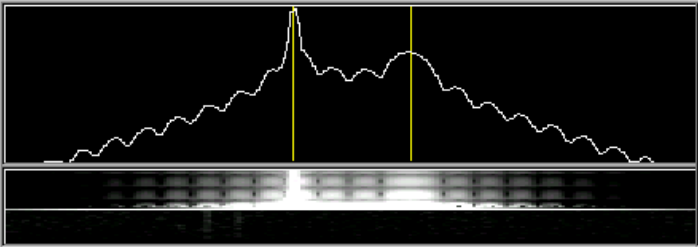
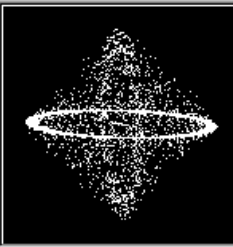
# Digital Decoder Programs

- **PSK31 – Phase Shift Keying**
  - **DigiPan** <http://digipan.net/> ← best for Psk31
- **RTTY - Radio TeleType**
  - **MmRTTY** <http://amateur-radio.ca/> ← best for Rtty
  - **TrueTTY** <http://dxsoft.com/>
- **SSTV – Slow Scan TV**
  - **MmSSTV** <http://amateur-radio.ca/> ← best for Sstv
- **CW – Morse Code**
  - **GetCw** <http://dxsoft.com/>
- **Multi Mode programs**
  - **HamScope** <http://www.qsl.net/hamscope/>
  - **MixW** <http://mixw.net> ← \$ supports most popular modes
- **Logging programs**
  - **AALog** <http://dxsoft.com/>
  - **ACLog** <http://n3fjp.com/>

# Radio Tele-Type (mmRtty)

K7HCP (MmRtty.mdt) - MMTTY Ver1.65D

File(F) Edit(E) View(V) Option(O) Profiles(S) Program(P) Help(H)

<b>Control</b>		<b>Demodulator (IIR)</b>								
FIG	Mark	2125	Hz	Type	Rev.					HAM
UOS	Shift	170	Hz	SQ	Not.					BPF
TX	BW	60	Hz	[Green bar]						
TXOFF	AV.	70	Hz	ATC	NET	AFC				

CALL ANS Rtn BTU Rig 73'S sf7 sf8 RY.. TEST QRZ CQ f9 f10 Tx Rx

QSO Data Init Call Find Name My 599 His 599 14

```
<080208 04:55:47 TX>
```

Clear CALL ANS Rtn Btu Edit Char. wait

# Slow Scan Amateur TV (mmSstv)

The screenshot displays the MMSSTV software interface. At the top, the window title is "K7HCP [MmSstv\_BAK.MDT] - MMSSTV Ver 1.11G [65536 colors]". The menu bar includes "File", "Edit", "View", "Option", "Profiles", "Program", and "Help". Below the menu bar are tabs for "Sync", "RX", "History", "TX", and "Template", with "TX" currently selected.

The main interface is divided into several sections:

- TX Mode:** A vertical list of modes including "Auto", "Robot 36", "SC2 120", "AVT 90", "Scottie 1", "Scottie 2", "ScottieDX", "Martin 1", "Martin 2", and "SC2 180".
- DSP:** A section with "AFC" and "LMS" buttons.
- Log:** A section for logging calls, including fields for "Call", "Name", "Note", "QSL", "His 595", "My 595", and "Qth".
- Frequency Spectrum:** A graph showing signal activity across a frequency range from 1200 to 2300.
- Image Grid:** A 2x6 grid of images. The top row includes a "CQ SSTV de K7HCP" call sign over an American flag, a rainbow test pattern, a globe, another American flag, and two "K7HCP" call sign templates. The bottom row includes a Polaris snow machine, a hot air balloon, a jet airplane, a formation of jets, and a stealth bomber.

At the bottom of the interface, there are buttons for "TX", "1750", "CW", "ABC", and a search icon. Below these are "S.pix" and "S.templates" tabs, with "S.templates" showing a list of 1 through 4. A "Show with template" checkbox and a "Draft" indicator are also present.

# OgdenArc.org

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  - Little Mountain Repeater (146.90 Mhz, Offset="-", Tone=123.0)
  - Everyone welcome - check-in and chat with your friends

16559  
Visits Since April '05  
Hello K7HCP. Your IP address is 67.137.2.3  
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[WebMails](#)

click downloads



# Club's Website Downloads page

Ogden Amateur Radio Club

Downloads

The following "Downloads" are provided by OARC club members for your use. For links to off-site locations check our [Ham Links & Favorite Links](#) page.

Do you have any Downloads that you would like to be placed here? OARC [webmaster](#) welcomes your submissions.

**Articles**

- [www.GeoClock.com](#) NEW!
- [User Controlled Online Tuners - UCOT](#)  
by member Jim Southwick N7JS
- [Beacon in a Box \(10 meter auto beacon\)](#)  
by member Jim Southwick N7JS
- [No Fueling - Hydrogen Fuel Cell](#)  
by member Kim Owen KO7U
- [What Time Is It \(WWVB\)](#)  
by member James Clarke KD7SWL
- [Scanning the Top of Utah - Public Service \(UCAN\)](#) NEW!  
by member Val Campbell K7HCP
- [HF Digital Modes Primer - \(getting started with psk31\)](#) NEW!  
by member Val Campbell K7HCP
- [HF Digital Modes for Beginners - psk31 \(powerpoint presentation\)](#) NEW!  
by member Val Campbell K7HCP

**Downloads**

- [ARRL Frequency Chart](#) NEW!
- [GeoClock 8.4 \(shareware\)](#) NEW!
- [Morse Code \(font 1\)](#) [Morse Code \(font 2\)](#)
- [Tina Tin QRP project files](#) NEW!
- [APRS links by K7UHP](#)
- [OARC - Contest Logs](#) NEW!
- [UCAN documentation pkg](#) NEW!  
by member Val Campbell K7HCP
- [UTC \(Zulu\) Time Conversion Chart](#)  
by member Val Campbell K7HCP

**Member Downloads**  
by member Val Campbell K7HCP

- [Kenwood TH-F6 programming pkg](#)
- [Kenwood TM-D700 programming pkg \(ARES nets\)](#) NEW!
- [Kenwood TM-G707 programming pkg](#)

**Member Downloads**  
by member Charles Horn KD7SST

- [Kenwood TH-F6 programming pkg](#)
- [Kenwood TM-D700 programming pkg](#)
- [Kenwood TM-G707 programming pkg](#)

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Primer (pdf)

Powerpoint presentation

# The End

Val Campbell - K7HCP  
Jeff Anderson - KD7PAW

Visit: <http://OgdenArc.org>

then click: downloads