PSK-31 Workshop

This presentation is Available on the Radio Central Web Page: www.rcarc.org
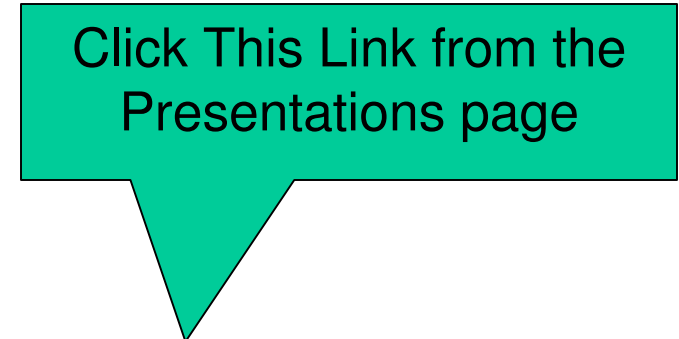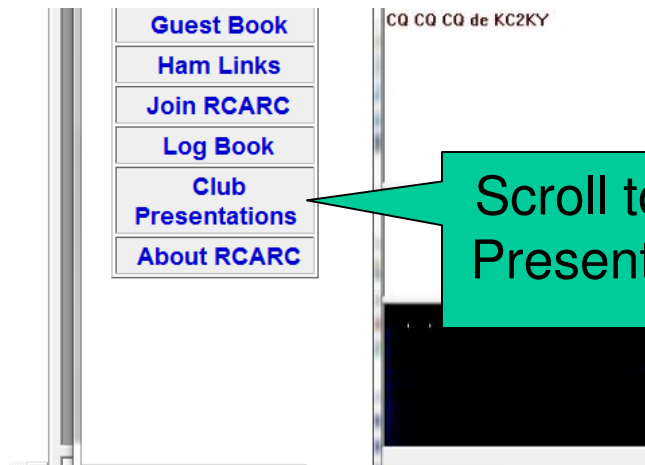
Why PSK31?
History
Original Software
Digi-Pan
Multi-Mode Programs
Theory
Setting Up a Station
Digi-Pan Basics
Tuning
Multi-Channel Mode Monitor
Macros
Logging

WHY PSK-31 ?

PSK-31 is a Keyboard to Keyboard Chat Mode Similar to RTTY

Performance is better than traditional Baudot, especially for rag chewing

PSK-31 uses the full ASCII character set

Backspace gets sent out so you can fix your mistakes

Minimum cash outlay to get on PSK-31 – PC, Rig, Interface Box

Several shareware and freeware programs are available

History of PSK-31

PSK evolved from "SLOWBPSK", a phase shift keying mode invented by Pawel Jalocha, SP9VRC
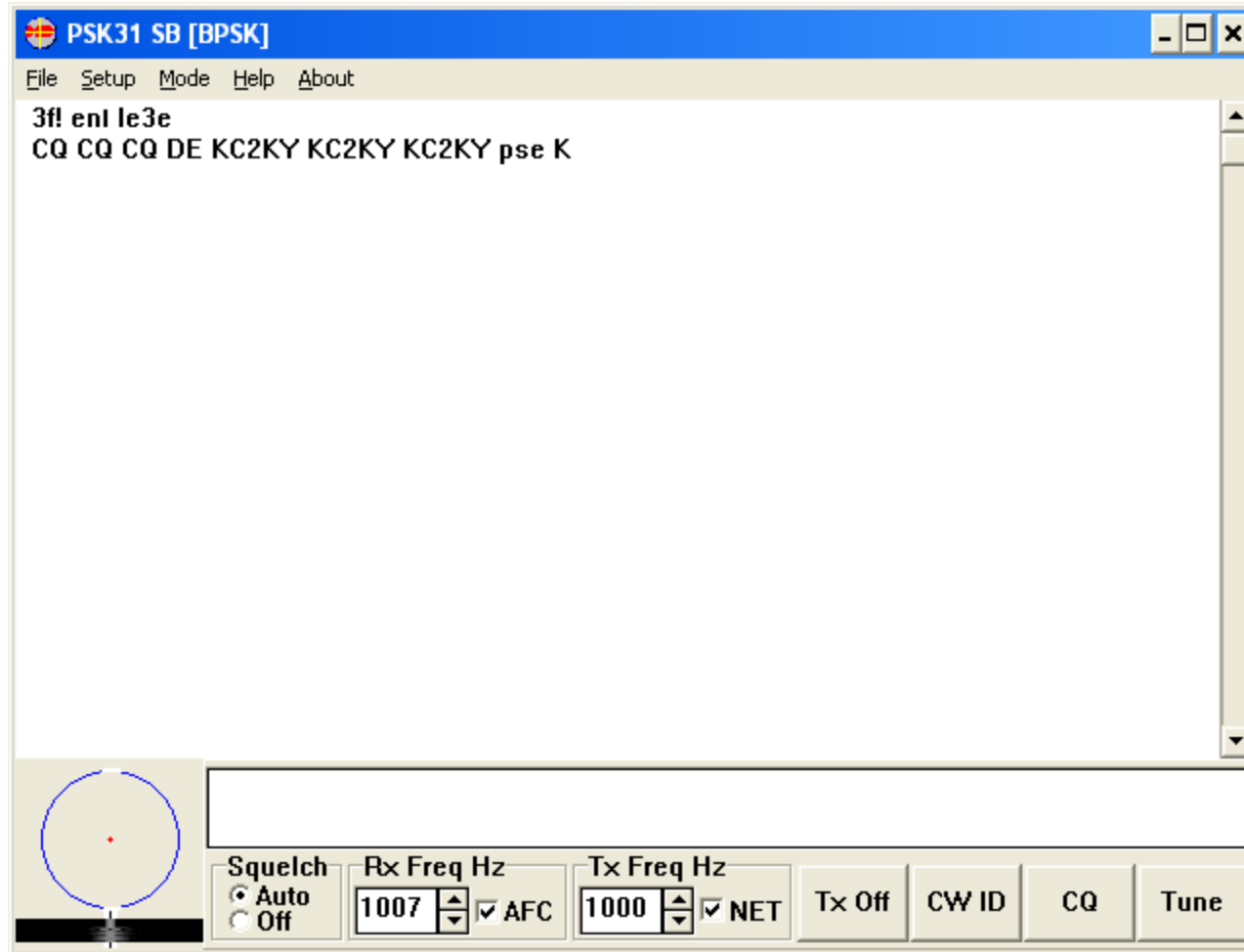
SLOWBPSK ran on a Texas Instruments DSP evaluation module (EVM)

1998 - Peter Martinez, G3PLX, created an adaptation of SLOWBPSK that would run on a Windows PC with a sound card, making PSK31 accessible to a great many more hams

1999 Skip Teller, KH6TY and Nick Fedoseev, UT2UZ, introduce DigiPan, which enhances the G3PLX program with the ability to monitor and tune signals with the PC

2000 to Present – Further improvements as well as cheap, commercially available rig interface boxes have exploded onto the scene

Original Peter Martinez PSK31-SB software, Introduced to the Ham community in 1998
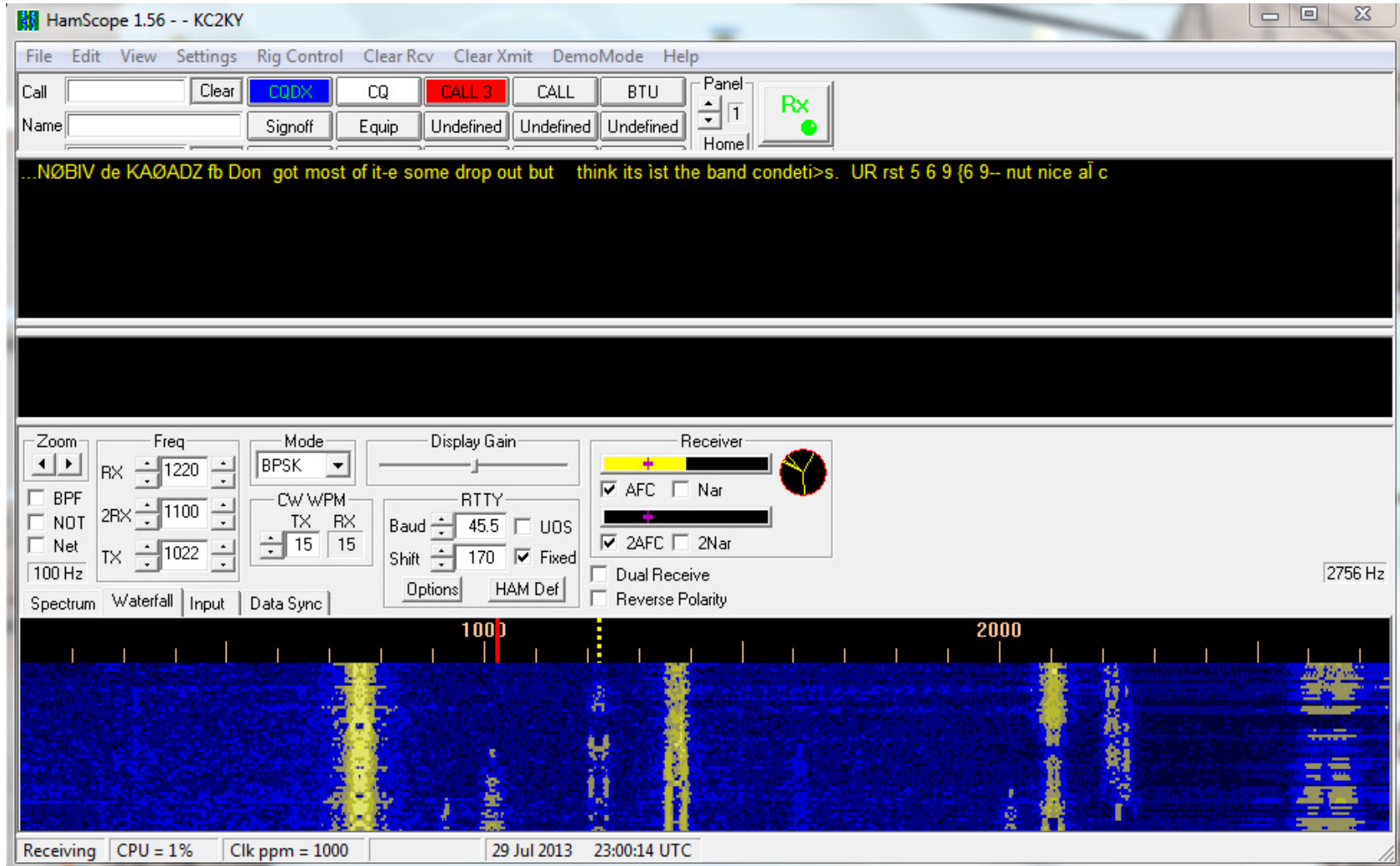
Latest Version of Digi-Pan

HamScope – Introduced in 2001, Latest Version 2007

FLDigi – Introduced in 2004, Latest Version 2012

PSK-31 Waveforms

Phase Shift Keying
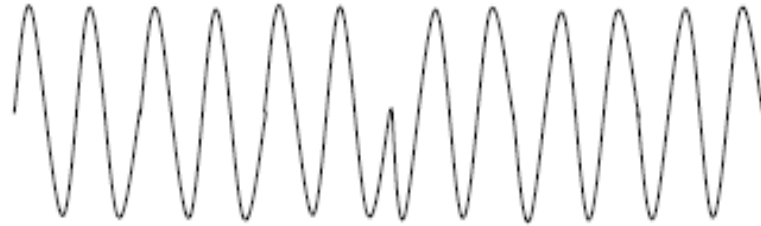
Shaped Phase Shift Keying

PSK-31 Envelope
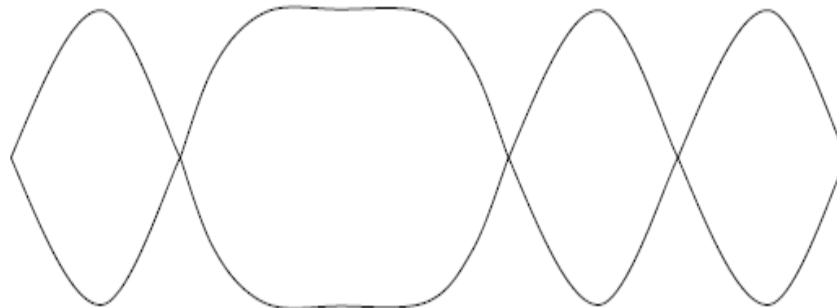
5 bit RTTY Codes

Code	Letter	CCITT No.2 Figures
00000	N/A	N/A
00001	E	3
00010	LF	LF
00011	A	-
00100	Space	Space
00101	S	'
00110	I	8
00111	U	7
01000	CR	CR
01001	D	WRU
01010	R	4
01011	J	Bell
01100	N	,
01101	F	!
01110	C	:
01111	K	(
10000	T	5
10001	Z	+
10010	L	)
10011	W	2
10100	H	£
10101	Y	6
10110	P	0
10111	Q	1
11000	O	9
11001	B	?
11010	G	&
11011	Figures Shift	Figures Shift
11100	M	.
11101	X	/
11110	V	=
11111	Letters Shift	Letters Shift

PSK 31 "Varicodes"

Char	Code	Char	Code
SP	1	C	10101101
!	111111111	D	10110101
"	101011111	E	1110111
#	111110101	F	11011011
$	111011011	G	11111101
%	1011010101	H	101010101
&	1010111011	I	1111111
'	101111111	J	111111101
(	11111011	K	101111101
)	11110111	L	11010111
*	101101111	M	10111011
+	111011111	N	11011101
,	1110101	O	10101011
–	110101	P	11010101
.	1010111	Q	111011101
/	110101111	R	10101111

Char	Code	Char	Code
0	10110111	S	1101111
1	10111101	T	1101101
2	11101101	U	101010111
3	11111111	V	110110101
		W	101011101
4	101110111	X	101011101
5	101011011	Y	101110101
6	101101011	Z	101111011
7	110101101	[	1010101101
8	110101011	\	111110111
9	110110111	]	111101111
:	11110101	^	111111011
;	110111101	_	1010111111
<	111101101	.	101101101
=	1010101	/	1011011111
>	111010111	a	1011

Char	Code	Char	Code
?	1010101111	b	1011111
@	1010111101	c	101111
A	1111101	d	101101
B	11101011	e	11
f	111101	s	10111
g	1011011	t	101
h	101011	u	110111
i	1101	v	1111011
j	111101011	w	1101011
k	10111111	x	11011111
l	11011	y	1011101
m	111011	z	111010101
n	1111	{	1010110111
o	111			110111011
p	1111111	}	1010110101
q	110111111	~	1011010111
r	10101	DEL	1110110101

PSK Station Setup

PC

Interface
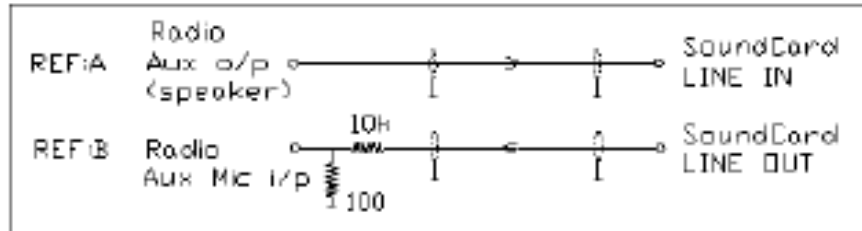
Radio
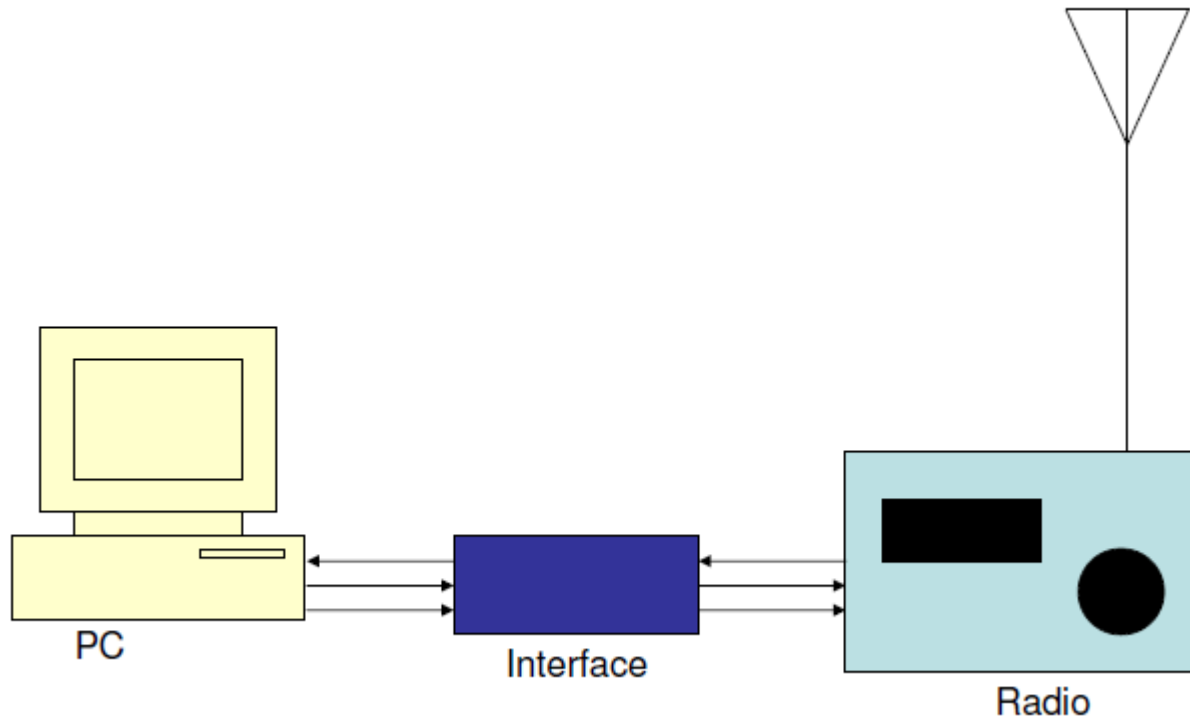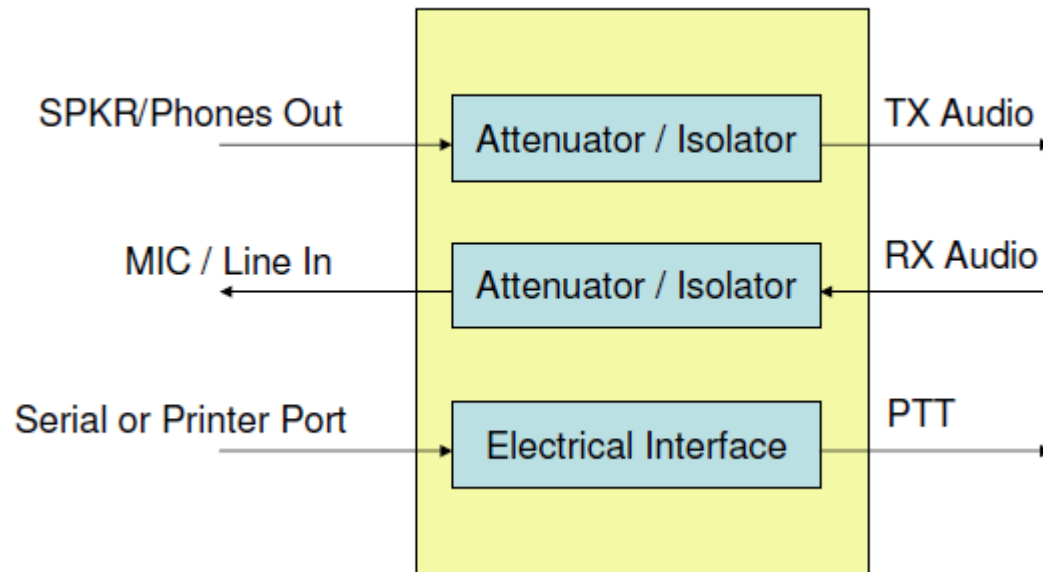
PSK Interface Box

PSK Interface – Easy to homebrew

Several Inexpensive "Store Bought" Units Available

Can be used for several other digital modes, not just PSK-31
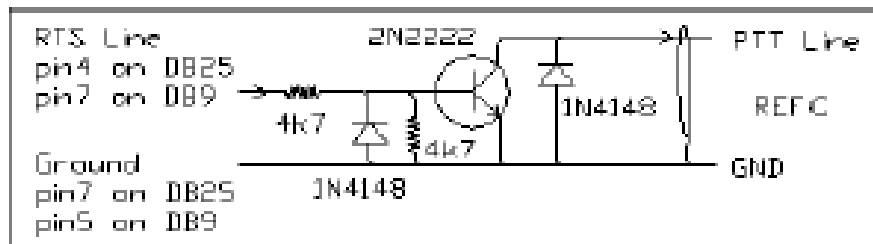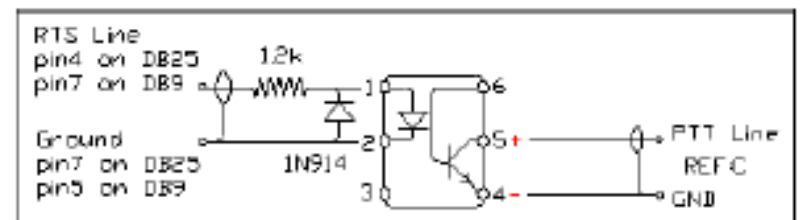
Circuits for Homebrew Interface Boxes

Credit goes to WM2U's PSK-31 Web Page http://www.qsl.net/wm2u/psk31.html
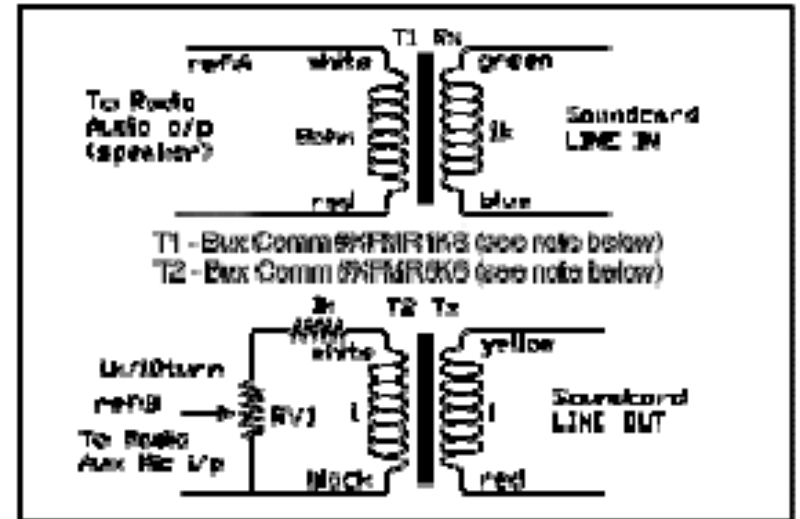
Commercial Digital Mode Interfaces

RIG Basics

Increase TX drive until RF output power stops increasing, then back off a little

Maximum power – 50% of rig's "rated" power (wattmeters rarely show peak power)

Speech Processor – OFF!

Leave RIT and XIT turned off

Use rig's Freq LOCK function if available – let the PC take care of frequency control

Start with widest filter

AGC – Slow or OFF

For very weak signals, go to narrow filter. You may need to adjust the IF Shift to center the filter over the station of interest

Recommended PSK-31 Frequencies

PSK31 HF Frequencies		PSK31 VHF Frequencies	
Band	**Frequency**	**Band**	**Frequency**
160 meters	1.838 MHz	6 meters	50.290 MHz
80 meters	3.580 MHz	2 meters	144.144 MHz
40 meters	7.035 MHz	1.25 meters	222.07 MHz
30 meters	10.140 MHz	70 centi-meters	432.2 MHz
20 meters	14.070 MHz	33 centi-meters	909 MHz
17 meters	18.100 MHz		
15 meters	21.080 MHz		
10 meters	28.120 MHz		