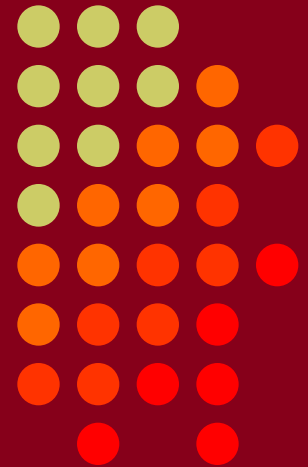


CTU 2018 Presents

Having Fun with RTTY Contesting

Ed Muns, W0YK



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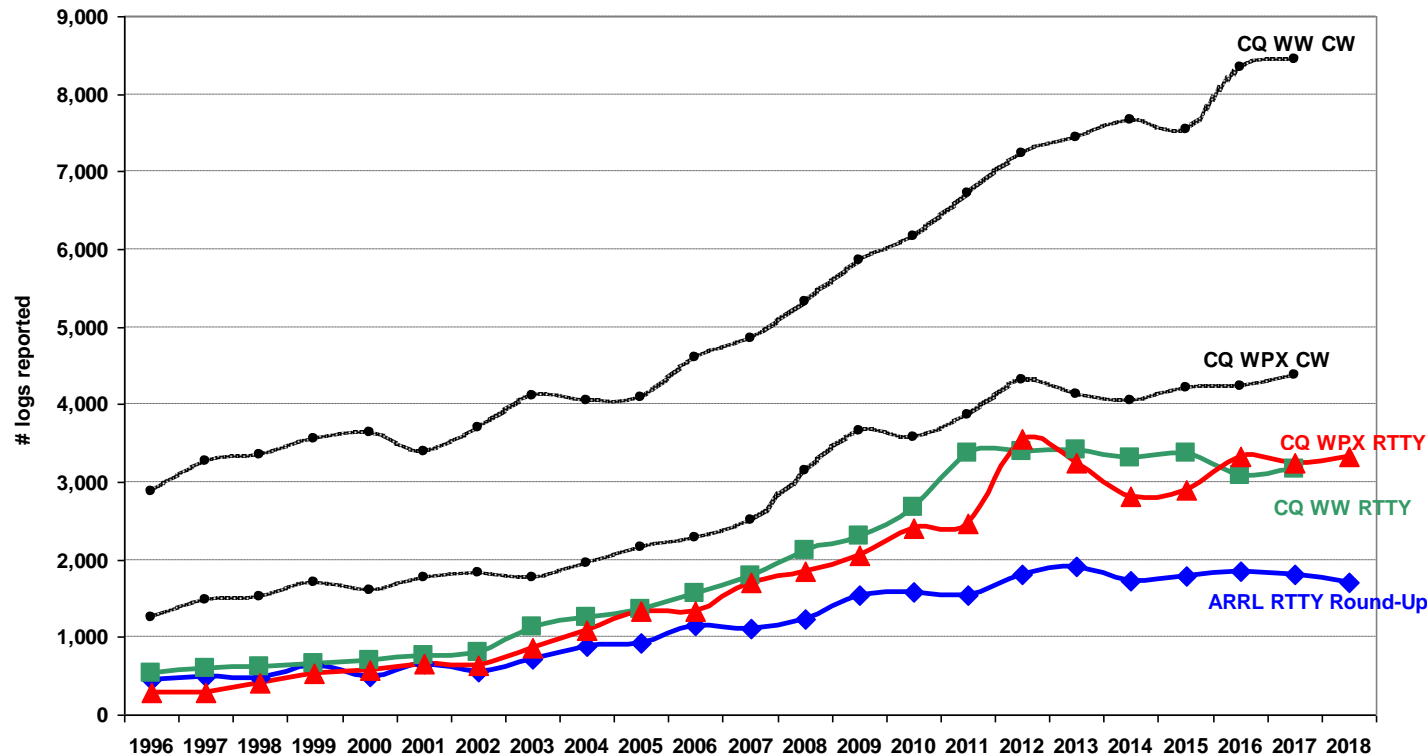
ICOM®

Having Fun in RTTY Contesting



- Introduction: What is RTTY?
- Part 1: Operating
- Part 2: Setting Up
 - Hardware
 - Software
- 2nd session: “*Pursuing the Limit in RTTY Contesting*”

Three Largest RTTY Contests



Lots of RTTY Contests

> *two/month*



- **Biglies (7)**

- CQ WW RTTY (last weekend in September)
- CQ WPX RTTY (2nd weekend in February)
- ARRL RTTY Roundup (1st weekend in January)
- BARTG (3rd weekend Jan, 3rd weekend March)
 - 75 Baud (April & September)
- WAE RTTY (2nd weekend in November)

- **NCJ contests (4)**

- NAQP RTTY (3rd Sat. in February, 2nd Sat. in July)
- Sprint RTTY (2nd Sat. in March & October)

- **Other popular RTTY contests (20)**

- Ten-Meter RTTY (1st Sat. in December)
- JARTS, Makrothen, SARTG (2)
- 15 others

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What Makes a Great RTTY Contester?



- 1) Contester who happily logs casual callers
- 2) Uses CW & SSB techniques where useful
- 3) Strives to exploit RTTY uniqueness
 - Auto-decode frees operator time ... use it to do things difficult with CW & SSB, e.g., SO3R!
 - Speed is ~2x CW
- 4) Applies learning back to CW & SSB

What is RTTY?

compared to CW



CW

- 1) **One** RF carrier
- 2) Local audio **pitch**
- 3) On **or** off
 - key up is data 0
 - key down is data 1
- 4) **Morse** code
 - typically 25-40 wpm

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RTTY

- 1) **Two** RF carriers 170 Hz apart (*Space & Mark; Shift*)
- 2) Local audio **tones**
- 3) One on **and** other off
 - Space is data 0
 - Mark is data 1
- 4) **Baudot** code
 - constant 60 wpm
(or 45.45 Baud)

What is RTTY?

Figures Shift



- 5-bit code → 32 chars.
- 2 sets:
 - Letters set & Figures set
 - 6 common control chars.
 - LTRS (unshifted)
 - FIGS (shifted)
 - Null, Space, LF, CR
- LTRS or FIGS toggle set

Code	Control Characters		
11111	LTRS		
11011	FIGS		
00000	Null		
00100	Space		
01000	LF		
00010	CR		
	Letters	Figures	
		ITA2	USTTY
00011	A	-	-
11001	B	?	?
01110	C	:	:
01001	D	ENQ	\$
00001	E	3	3
01101	F		!
11010	G		&
10100	H		#
00110	I	8	8
01011	J	BELL	'
01111	K	((
10010	L))
11100	M	.	.
01100	N	/	/
11000	O	9	9
10110	P	0	0
10111	Q	1	1
01010	R	4	4
00101	S	'	BELL
10000	T	5	5
00111	U	7	7
11110	V	;	;
10011	W	2	2
11101	X	/	/
10101	Y	6	6
10001	Z	"	"

What is RTTY?

code history



- Bacon's cipher (1605)
- Gauss & Weber (1833)
- Baudot code (1870)
 - Manual bit entry
 - 5-bit ITA1 code
 - Two 32-bit character sets
 - letters
 - figures
- Murray code (1901)
 - Teletype character entry
 - Western Union variation
- **5-bit ITA2 code (1930)**
 - **USTTY variation**
- ASCII (1963)
 - 7-bit ITA5 code

Code	Control Characters		
11111	LTRS		
11011	FIGS		
00000	Null		
00100	Space		
01000	LF		
00010	CR		
	Letters	Figures	
		ITA2	USTTY
00011	A	-	
11001	B	?	
01110	C	:	
01001	D	ENQ	\$
00001	E	3	
01101	F		!
11010	G		&
10100	H		#
00110	I	8	
01011	J	BELL	'
01111	K	(
10010	L)	
11100	M	.	
01100	N	/	
11000	O	9	
10110	P	0	
10111	Q	1	
01010	R	4	
00101	S	'	BELL
10000	T	5	
00111	U	7	
11110	V	;	
10011	W	2	
11101	X	/	
10101	Y	6	
10001	Z	"	



What is RTTY?

Figures Shift



- The *LTRS* and *FIGS* characters do not print
 - The code for the characters “Q” and “1” is the same; which one prints depends on if you are in Letters or Figures set
 - Note that the *LTRS*, *FIGS* and *Space* characters appear in both sets
- Example: “**KI7GUO DE K4GMH**” gets sent as:
 - *LTRS* **K I** *FIGS* **7** *LTRS* **G U O** *Space* **D E** *Space* **K** *FIGS* **4**
LTRS **G M H**
- Why do we care to understand this?
 - If a burst of static garbles the *LTRS* or *FIGS* character, then what prints after that is from the wrong set until the next *LTRS* or *FIGS* character appears

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What is RTTY?

UnShift on Space



- UnShift On Space (USOS or UOS)
 - Increases noise immunity for alpha text
 - Space character forces a shift to the Letters set
- Contest exchanges are alpha and numeric
 - Should UOS be on or off?
 - Should Space or Hyphen delimit exchange elements?
 - 599 JOHN NY or 599-JOHN-NY
- *Recommendation:*
 - *Turn on both RX & TX UOS and use Space delimiters*

What is RTTY?

audio tones



- Space and Mark audio tones
 - Default: 2295 and 2125 Hz (“high tones”)
 - Less fatiguing: 1085 and 915 Hz (“low tones”)
- Analogous to CW pitch
 - Operator choice
 - Each operator can use different tone pairs
 - Transmission is two RF carriers 170Hz apart
- Must be same in radio and decoder/encoder

What is RTTY?

AFSK vs. FSK



Two methods of transmission:

- AFSK (Audio Frequency Shift Keying)
 - keyed audio tones into SSB transmitter via:
 - Mic input, or
 - Auxiliary audio input. e.g., Line In
- FSK (Frequency Shift Keying)
 - on/off keys the transmitter just like CW

Note: Receiving is the same in either case.

What is RTTY?

dial frequency

spots are often wrong



- RTTY RF is independent of local audio tones and whether LSB or USB is used:
 - The higher RF frequency is the Mark (*14090.000 kHz*)
 - The lower RF frequency is the Space (*14089.830 kHz*)
 - The difference between the two is the shift (*170 Hz*)
- FSK displays Mark (*14090.000 kHz*)
- AFSK displays suppressed carrier which varies with local audio tones and sideband used!
 - For Mark tone of 2125 Hz (Space tone of 2295 Hz):
 - LSB (*14092.125 kHz*)
 - USB – Mark & Space tones reversed (*14087.005 kHz*)

What is RTTY?

AFSK vs. FSK



AFSK

- Indirect (*tones → Mic input*)
- Any SSB radio (*esp. legacy*)
- SSB (wide) filtering
- Dial = sup. car. frequency
- VOX
- Audio cable (*a'la FT8, JT65/9, PSK31*)
- Must use high tones

NET (*automatic TX tone control*)

Less bandwidth (*depends on radio*)

Easier hook-up; NET

FSK

- Direct (*like CW keying*)
- “Modern” radios
- RTTY (narrow) filtering
- Dial = Mark frequency
- PTT
- COM FSK keying cable
- Can use low tones

No audio level adjust

No disabling speech proc.

No erroneous sound keying

Less pitfalls

What is RTTY?

summary



- Uses 5-bit Baudot (actually, USTTY) code with two sets of 32 characters: Letters and Figures
- Space & Mark frequencies separated by 170 Hz “Shift”
- Local Space & Mark tones analogous to pitch in CW
- Constant 45.45 Baud (60 wpm) asynchronous character stream with 5 data bits and 2-3 sync bits
- Figures Shift & Letters UnShift
 - Use optional UnShift-On-Space (UOS), plus space delimiter
- AFSK vs. FSK transmission (receiving is the same)
 - Radio dial frequency differences
 - 100% duty cycle!

The Cynics Say ...



- “The RTTY decoder/encoder does everything.”
however, this attribute ...
 - frees the operator to improve other skills
 - enables more contest participants
 - provides mode diversity for contest junkies
- “RTTY is a pain to set up and get working.”
... stay tuned, it's really not that difficult!

RTTY Considerations



Much like CW and SSB, except:

- Non-human decoding implications
 - *serial number repeat, universal “fist” or “voice”*
- Distractions are tempting
 - *watch TV, do email, read, etc.*
- RTTY established practice
 - *‘CQ’ at end of CQ message*
- Whisper-level headphone volume; low tones
 - *just to detect presence & timing*
- Key-down transmission ... 100% duty cycle

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RTTY Sub-Bands



- 10 meters: 28080-28100, during contests 28080-28200
 - JA: 21070-21150
- 15 meters: 21080-21100, during contests 21080-21150
 - JA: 21070-21150
- 20 meters: 14080-14100, during contests 14080-14150
 - JA: 14070-14150
- 40 meters: 7025-7050 & 7080-7100, during contests 7025-7100
 - JA: 7030-7100
- 80 meters: 3580-3600, during contests 3560-3600
 - JA: 3520-3575 and 3599-3612
- 160 meters: No RTTY contesting

RTTY Sub-Bands

don't QRM!



- Avoid audio-digital operations near:
 - e.g., 14070-14080
- Avoid the NCDXF beacons:
 - e.g., 21150 and 14100
- More details:

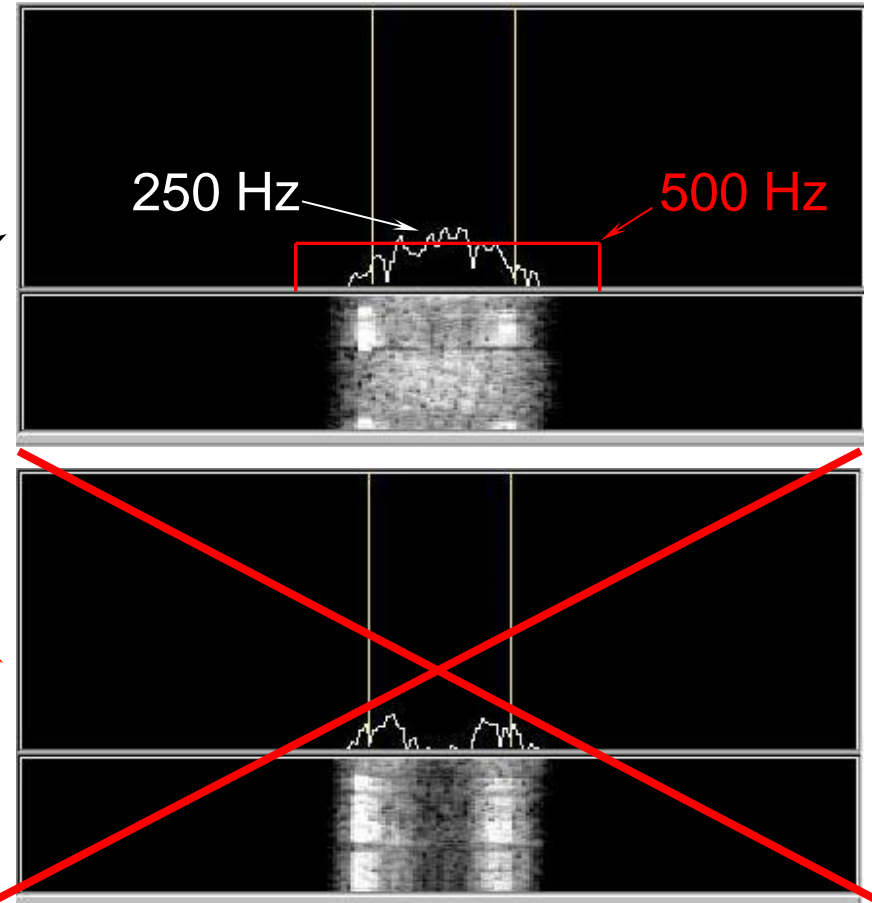
www.aa5au.com/rtty/rtty-sub-bands

Receiving

radio IF filtering

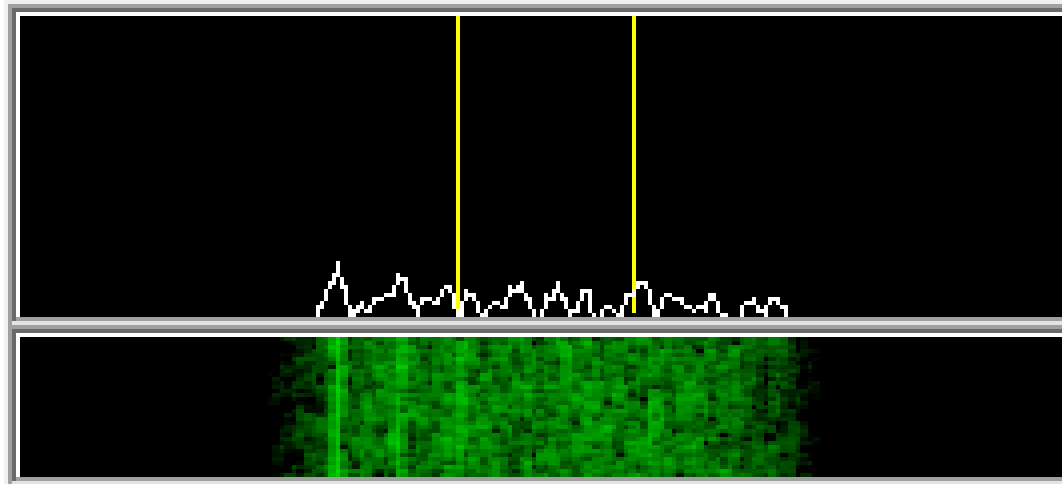


- PC Audio isolation
 - Transformer
 - Commercial interface
 - Some radios (K3, Flex)
- Narrow IF filters (Roofing & DSP)
 - 500 Hz - normal
 - 250 Hz - extreme QRM only
 - Tone filters – **don't use!**
 - Icom Twin Peak Filter
 - K3 Dual-Tone Filter



Receiving

adjust audio



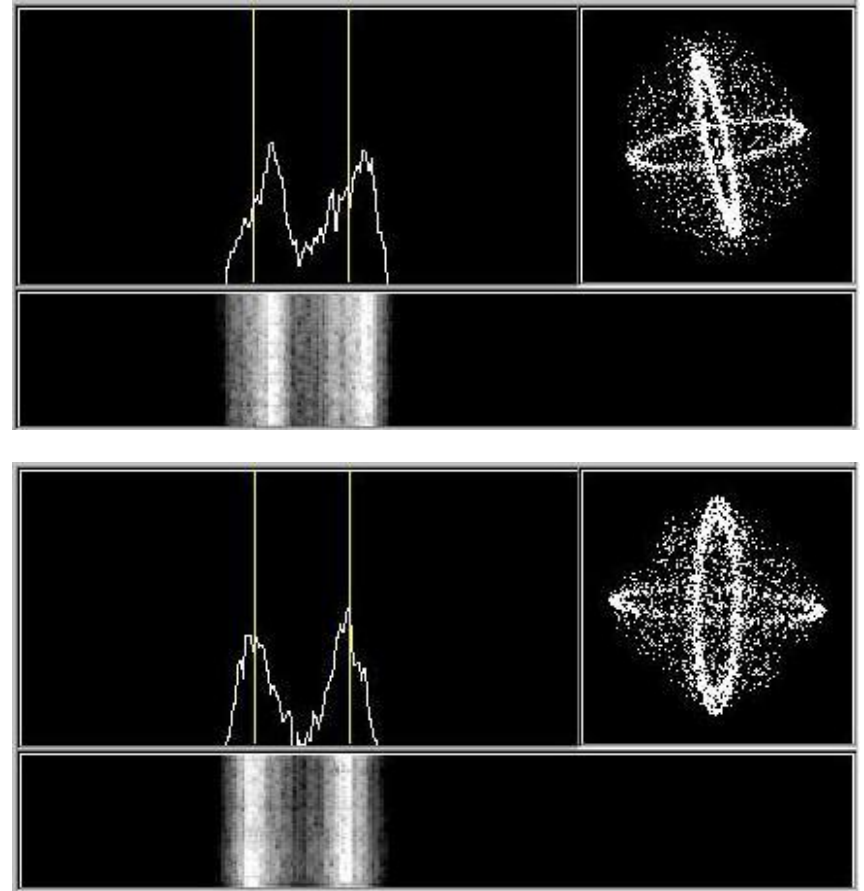
- Set RX audio level for noise 5% of full-scale
 - Receiver audio out level control, and/or
 - *Windows* Recording Volume Control applet

Receiving

tuning a RTTY signal



- Use narrow filtering
 - CW filters ~ 500 Hz
- Set RX audio level
 - noise 5% of full-scale
- Learn to tune by ear
 - practice with eyes closed
 - get within 10-20 Hz



Receiving

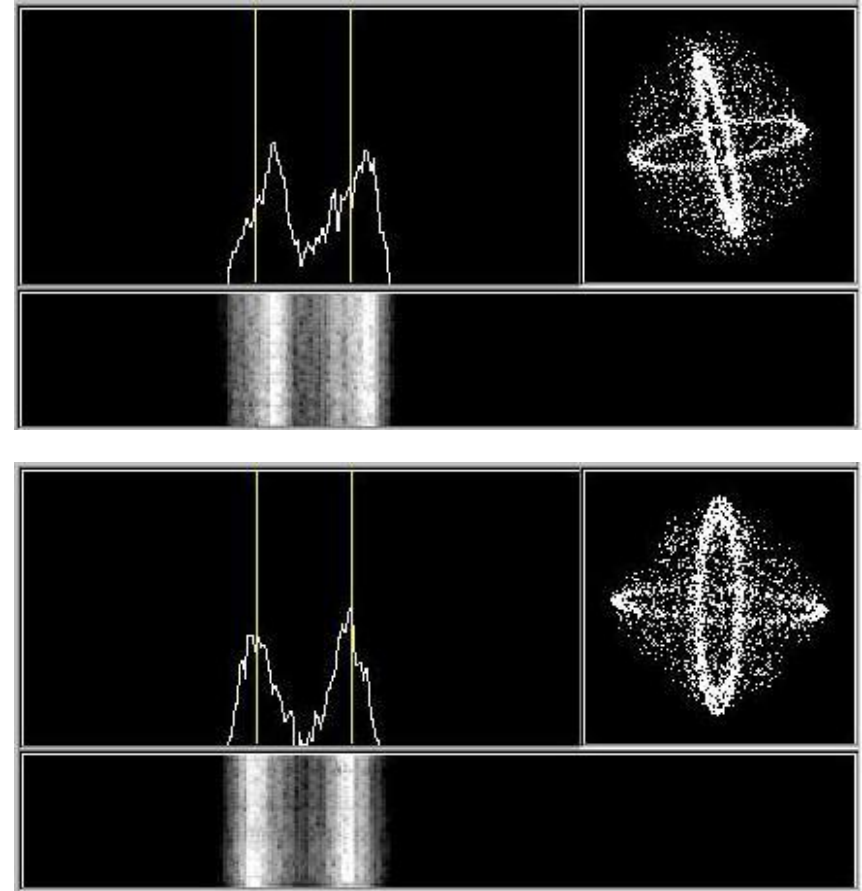
MMTTY AFC



- Use narrow filtering
 - CW filters ~ 500 Hz
- Set RX audio level
 - noise 5% of full-scale
- Learn to tune by ear
 - practice with eyes closed
 - get within 10-20 Hz
- AFC On or Off
 - 'On' may cause TX frequency to be off

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Transmitting

AFSK adjustment



Insure SSB processor (compression) is Off.

- Adjust:
 - the *Windows* Playback Volume control, and
 - the transmitter Mic (or auxiliary audio input)
- Such that:
 - ALC is just backed off to zero, and
 - full power output is attained.

Transmitting

FSK adjustment



- None!

(That's the whole point of FSK.)

Basic RTTY Contest QSO

CQ WPX RTTY Contest



- ***WPX K5AM K5AM CQ***
- ***ZC4LI ZC4LI***
- ***ZC4LI 599 1349 1349***
- ***[K5AM] TU 599 985 985***
- ***[ZC4LI] TU K5AM CQ***

K5AM: running station

ZC4LI: S&P station

RTTY Messages

CQ WPX RTTY Contest



- Short, as with CW/SSB
- No extraneous info
- 599 (not 5NN) once
- Serial number twice
- Space (not hyphen)
- Omit 'DE'
- RTTY chars (%R, %E)

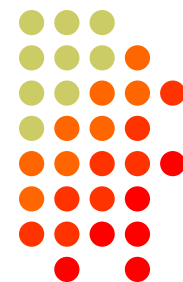
www.rttycontesting.com/tutorials/messages

F02:	%RWPX P49X P49X CQ %E
F03:	%R P49X %E
F04:	P49X %E
F05:	%R%C 599 %N2 %N2 %E
F06:	%RTU P49X CQ %E
F07:	%RQRV %ZR.1 %E
F08:	%R %C TU .. NOW%L
F09:	%RAGN %E
F10:	%RNR? %E
F11:	%R%N3 %E

F02:	%RWPX P49X P49X P49X CQ %E
F03:	%RQSL LOTW OR WOYK %E
F04:	%R%C %E
F05:	%RTU 599 %N2 %N2 %L%E
F06:	%RKB %H P49X CQ %L%E
F07:	%RQRV %ZS.1 %E
F08:	%R%H %C KB .. NOW%L
F09:	%RQRZ %E
F10:	%RCALL? %E
F11:	? %E

RTTY Messages

formatting



CR/LF

Space

Receive

F02:	%RWPX P49X P49X CQ %C%E
F03:	%R P49X %E
F04:	P49X %E
F05:	%R%C 599 %N2 %N2 %E
F06:	%RTU P49X CQ %O%E
F07:	%RQRV %ZR.1 %E
F08:	%R %C TU .. NOW%L
F09:	%RAGN %E
F10:	%RNR? %E
F11:	%R%N3 %E

Super Check Partial

call sign selection



- SCP (Super Check Partial) enables computer to select call signs in receive window
 - Unworked calls (no mult)
 - New mults and double mults
 - Dupes
- Use main SCP from CW/SSB/RTTY contests
 - RTTY SCP is a subset

XYZAB	AA5AU	XYZAB
XYZAB	9Y1VC	9N8TT
XYZAB	W5UKM	XYZAB

N1MM Logger

Super Check Partial

logger differences



XYZAB	AA5AU	XYZAB
XYZAB	9Y1VC	9N8TT
XYZAB	W5UKM	XYZAB

- Background option
- Custom colors

N1MM Logger

XYZAB	AA5AU	XYZAB
XYZAB	9Y1VC	9N8TT
XYZAB	W5UKM	XYZAB

WriteLog

XYZAB	AA5AU	XYZAB
XYZAB	9Y1VC	9N8TT
XYZAB	W5UKM	XYZAB

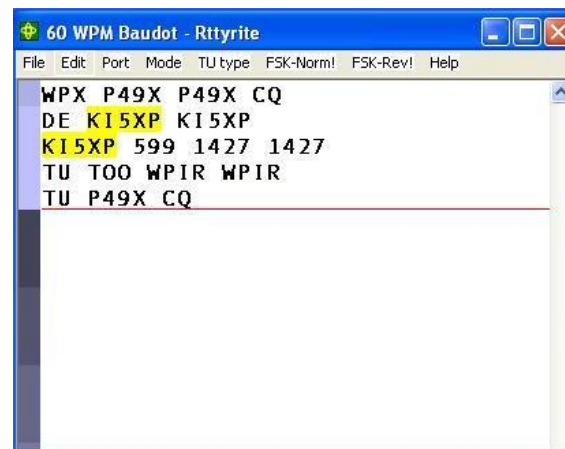
Win-Test

Tips

“All I receive is gibberish!”



- “Upside-down”
 - Reverse Mark & Space
 - LSB vs. USB
- Figures vs. letters
 - TOO=599, WPIR=2084
 - UOS should be on
 - Shift-click to convert, or look at top two rows
- Audio-In level, tones, flutter
- (Other station’s signal)



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Tips

“They never answer me!”



- “Upside-down”
 - FSK: polarity switch in radio
 - AFSK: LSB vs. USB; polarity select in software
- Off frequency
 - AFC on with NET (AFSK only) off [recommend RIT instead]
 - AFC & NET are on by default; changes non-sticky
 - Change defaults in USERPARA.INI
- AFSK: Mic & SC levels; speech processor on
- Radio mode, tones, FSK interface

More Tips



- 100% duty cycle ... *caution!*
- Practice
 - During RTTY contests (~ two per month)
 - NCCC Thursday night practices (weekly)
- Multi-Ops

RTTY Operating

summary



- Many casual RTTY contest participants
- RTTY sub-bands; 10-80 only; avoid audio-digital & beacons
- 500 Hz receive filtering; USOS on
- Messages (“macros”)
 - Short, ~~5NN~~, unique exchange twice, Space delimiter
- Common problems
 - “Upside-down” (reversed Space/Mark or LSB vs. USB)
 - Figures vs. Letters
 - Audio:
 - RX audio output level and TX (AFSK only) audio input level
 - Unmuted soundcard inputs and outputs
 - Space and Mark tone consistency between decoder and radio
 - Off-frequency tuning (AFC & NET); band conditions

The Cynics Say ...



- “The RTTY decoder/encoder does everything.”
however, this attribute ...
 - frees the operator to improve other skills
 - enables more contest participants
 - provides mode diversity for contest junkies
- “RTTY is a pain to set up and get working.”
... stay tuned, it's really not that difficult!

How Do I Set it Up?

overview



- **Acquire** and set up hardware and/or software to convert between the RTTY signal and text:
 - RTTY *receive* decoder
 - RTTY *transmit* encoder
 - PC-radio interface
- **Configure** decoder/encoder
- **Integrate** decoder/encoder with logger

The rest of the station setup is the same as for CW and SSB

How Do I Set it Up?

RTTY decoder/encoder



- RTTY *receive* decoder converts printed characters from the two RTTY tones.
 - CW decoders seldom used
 - Ears/brain/hands for CW/SSB
- RTTY *transmit* encoder converts typed characters (or messages) into the two tones (AFSK) or keying (FSK).
 - logger *CW keyers and SSB DVKs are also used, similar to RTTY encoders*
 - Otherwise, brain/hands/mouth for CW/SSB

How Do I Set it Up?

decoder/encoder terminology



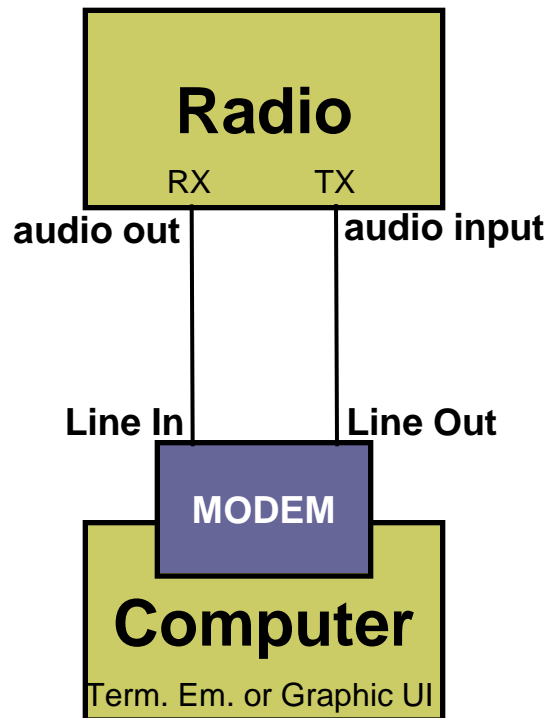
- The RTTY *transmit encoder* and *receive decoder* is sometimes referred to as a MODEM or a TNC:
 - MODEM = MOdulator DEModulator
 - TNC = Terminal Node Controller
- MODEMs can be:
 - a hardware box, or
 - a software application driving a PC soundcard

How Do I Set It Up?

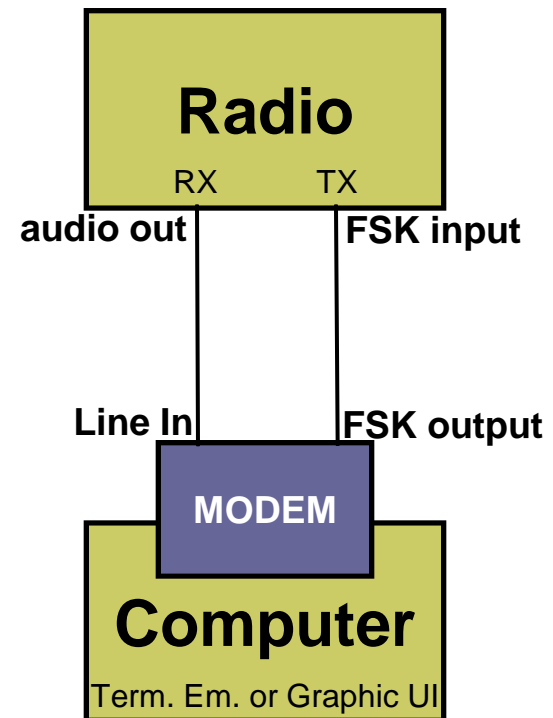
hardware MODEM



AFSK

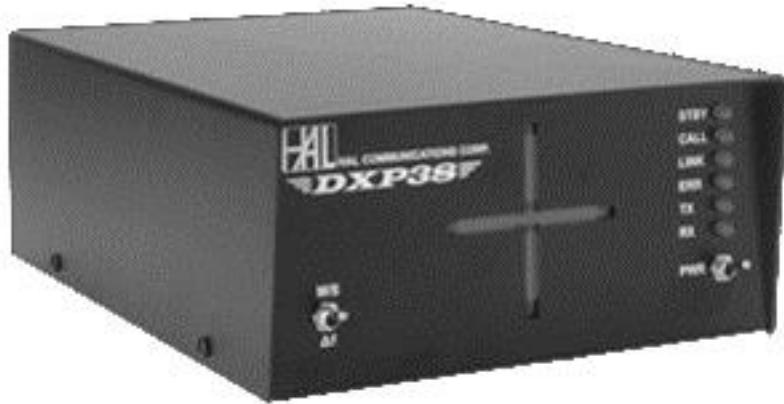


FSK



How Do I Set It Up?

hardware MODEM

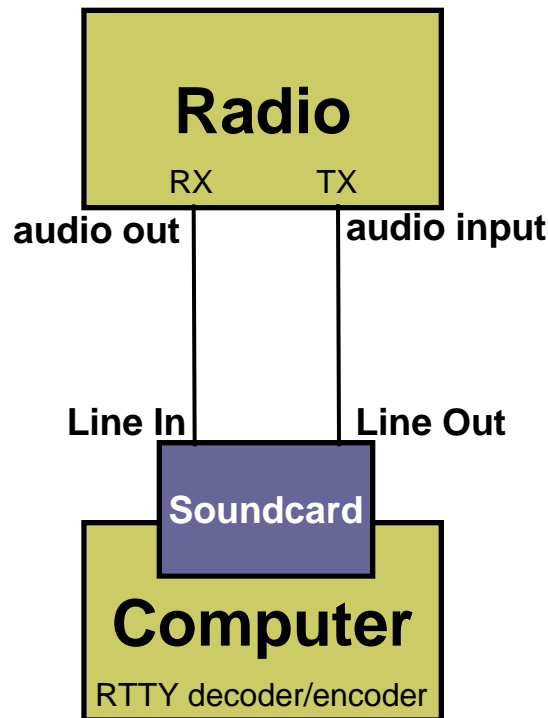


How Do I Set It Up?

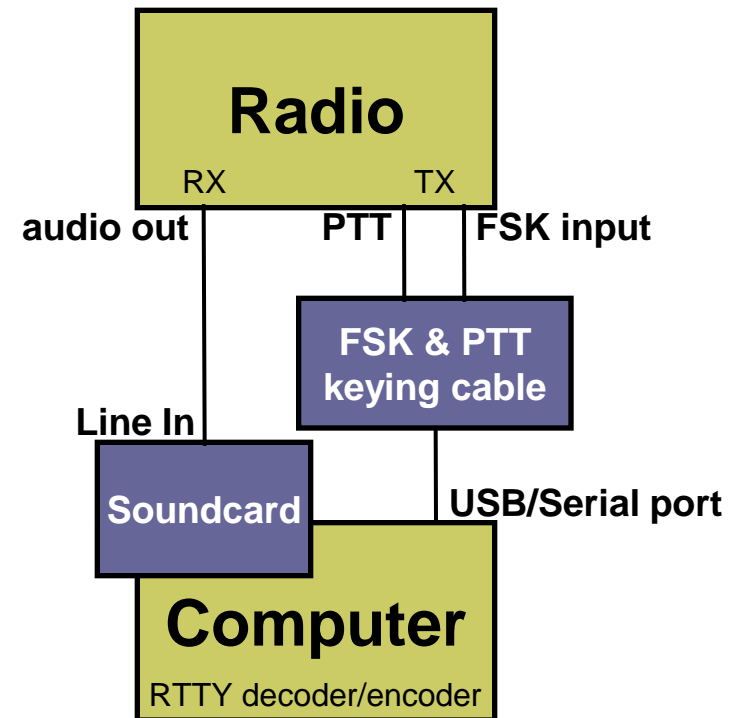
software application & soundcard



AFSK



FSK



How Do I Set it UP?

cables



- Receive:
 - RX audio out to soundcard
 - *Optional DSP filter*
- Transmit:
 - AFSK: TX audio in from soundcard, or
 - FSK: FSK/PTT keying
- Receive:
 - 1:1 isolation transformer
 - *JPS NIR-12, or ...*
- Transmit:
 - 1:1 isolation transformer, or
 - Keying interface

How Do I Set It Up?

ground loops

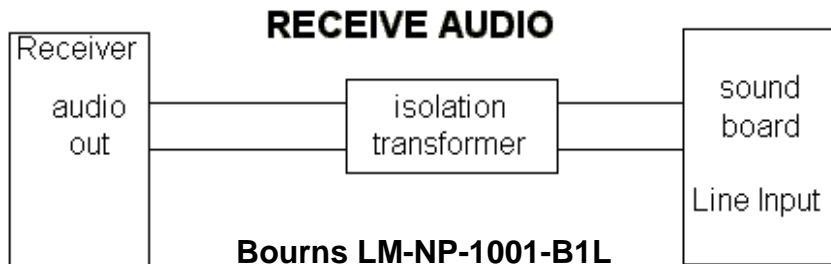


- Eliminate ground loops between radio and PC
- Otherwise insert 1:1 audio isolation transformer on:
 - RX output
 - TX Mic input (*AFSK only*)
- Alternatives:
 - Bourns LM-NP-1001-B1L transformer → homebrew cable
 - Ground loop isolators
 - W2IHY iBox
 - Commercial RTTY interfaces
 - K3 (uses Bourns LM-NP-1001-B1L on LINE IN & OUT)

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How Do I Set It Up?

homebrew audio isolation



\$1.78

-90 dBc 3rd order IMD



How Do I Set It Up?

ground loop isolators



Radio Shack \$19.49 or eBay \$6.99
-64 dBc 3rd order IMD



eBay \$3.35



eBay \$5.50



eBay \$7.45

How Do I Set It Up?

W2IHY iBox audio isolation



How Do I Set It Up?

commercial interface audio isolation



Rascal



RIGblasters



How Do I Set It Up?

radio audio isolation



K3 audio isolation IN - LINE - OUT



How Do I Set It Up?

SDR digital audio isolation



digital: soundcard
analog: IN - LINE - OUT



How Do I Set It Up

optional radio AF filtering

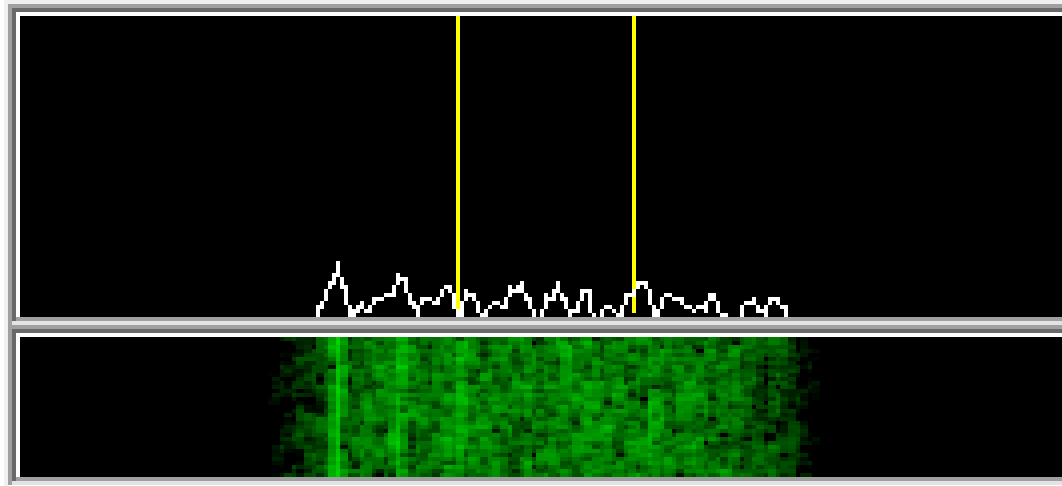


- PC Audio isolation
 - Transformer
 - Commercial interface
 - Some radios (K3, Flex)
- Narrow IF filters (Roofing & DSP)
 - 500 Hz - normal
 - 250 Hz – extreme QRM only
 - Tone filters – don't use
 - Icom Twin Peak Filter
 - K3 Dual-Tone Filter
- Audio filtering
 - JPS NIR-10/12
 - Timewave DSP-599zx
 - Modern DSP rigs



How Do I Set It Up?

adjust RX audio



- Set RX audio level for noise 5% of full-scale
 - Receiver audio out level control, and/or
 - *Windows* Recording Volume Control applet

How Do I Set It Up?

adjust AFSK audio



Insure SSB processor (compression) is Off.

- Adjust:
 - the *Windows* Playback Volume control, and
 - the transmitter Mic (or auxiliary audio input)
- Such that:
 - ALC is just backed off to zero, and
 - full power output is attained.

How Do I Set It Up?

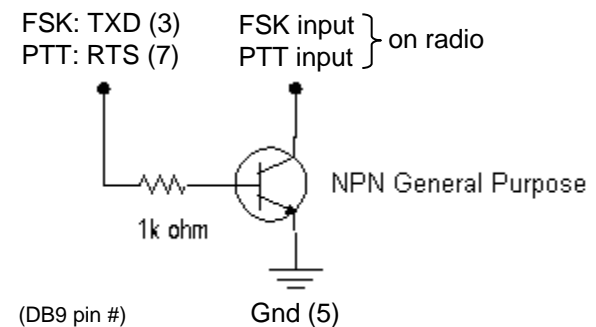
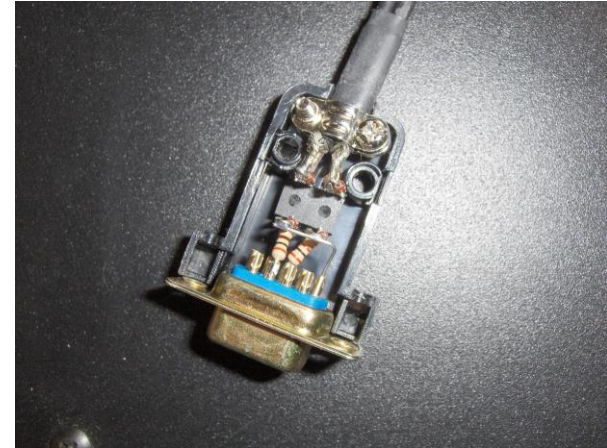
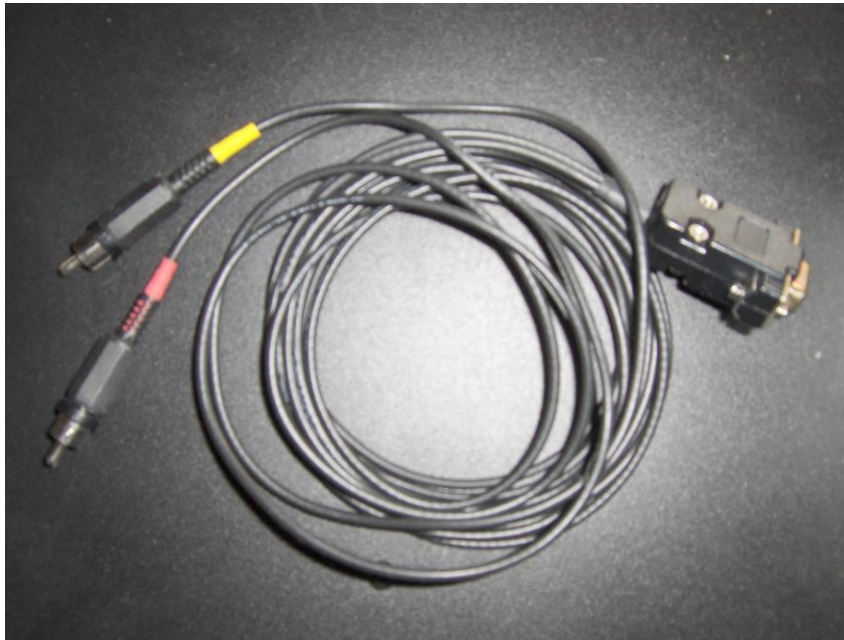
PTT vs. VOX



- AFSK uses VOX or PTT
 - radio Mic input will allow VOX
 - rear panel auxiliary audio input may not; then PTT
 - PTT can usually be keyed via the radio CAT cable
- FSK uses PTT
 - Serial port controls FSK and PTT signals

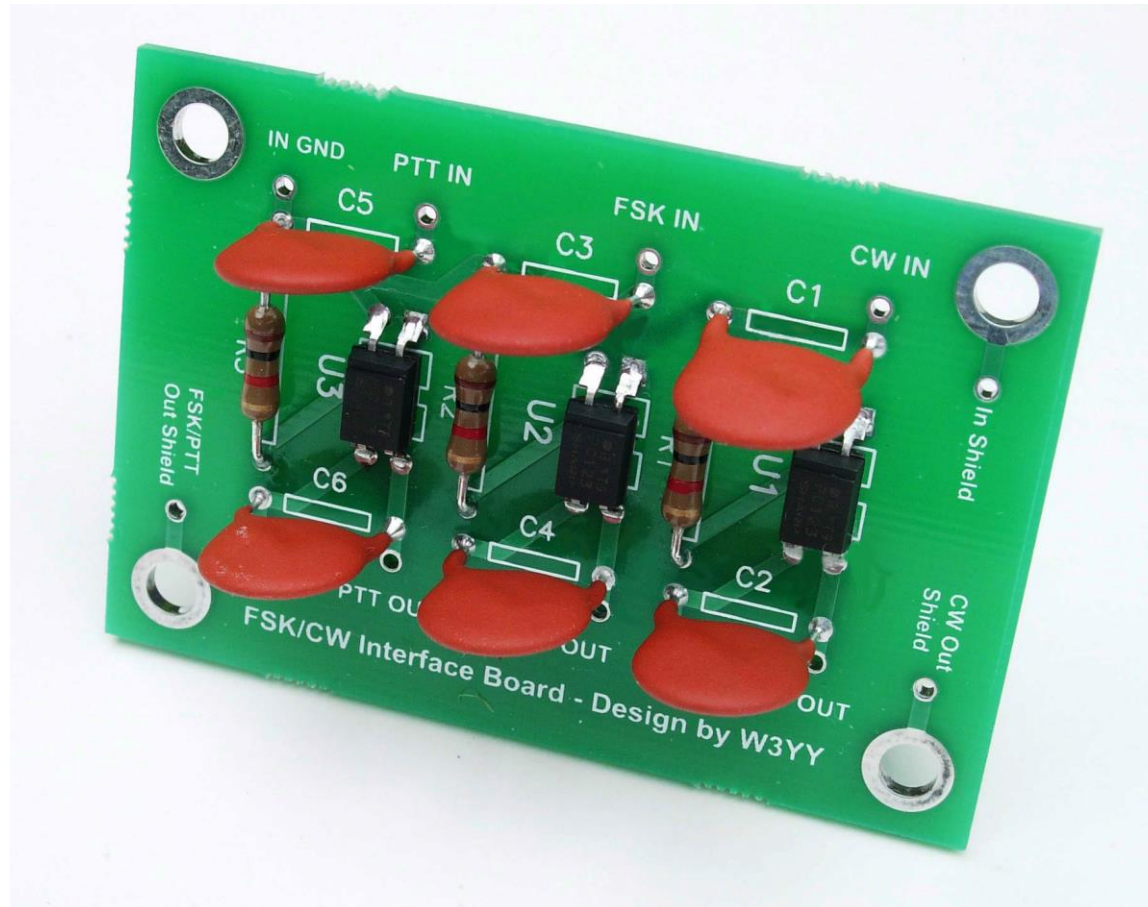
How Do I Set It Up?

homebrew FSK & PTT keying cable



How Do I Set It Up?

W3YY FSK & PTT keying cable



How Do I Set It Up?

commercial interfaces



RASCAL



RIGblasters



How Do I Set It Up?

RigExpert Interfaces



How Do I Set It Up?

commercial interfaces



Vendor	Model	Price	PC In'fc	PTT	Soundcard	Level ctrl	FSK	CW	WinKey	Voice	Radio in'fc
generic (with K3)	(2) 3.5mm M-M audio cables	\$ 10	-			√					
Buxcomm	Rascal-IIB or -IIIA	\$ 69	-								
Buxcomm	Rascal GLX	\$ 79	Serial	√							
Tigertronics	SL-1+	\$ 80	-	auto							
Tigertronics	USB	\$ 110	USB	auto	√	√					
MFJ	1273B	\$ 60	Serial	√							
MFJ	1275	\$ 110	Serial	√							
MFJ	1279	\$ 140	Serial	√	√						
Mountain Radio	RIGblaster Nomic	\$ 60	Serial/USB	√							
Mountain Radio	RIGblaster Plug & Play	\$ 120	USB	√				√			some
Mountain Radio	RIGblaster Plus II	\$ 160	USB	√			√ or CW	√ or FSK			some
Mountain Radio	RIGblaster Advantage	\$ 200	USB	√	√	√	√ or CW	√ or FSK			√
Mountain Radio	RIGblaster Pro	\$ 300	Serial/USB	√			√	√			√
Navigator	Navigator	\$ 417	USB	√	√	√	√	√	√		√

See May-June 2012 NCJ, "RTTY Contesting" column

How Do I Set It Up?

microHAM interfaces



One Radio

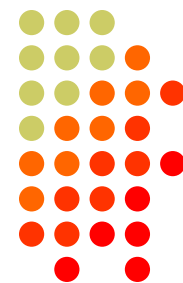


SO2R



How Do I Set It Up?

RigExpert & microHAM interfaces



Vendor	Model	Price	PC In'fc	PTT	Soundcard	Level ctrl	FSK	CW	WinKey	Voice	Radio in'fc	SO2R
RigExpert	Tiny	\$ 120	USB	✓	✓			✓		✓	✓	
RigExpert	Standard	\$ 265	USB	✓	✓	✓	✓	✓	✓	✓	✓	
RigExpert	TI-5	\$ 365	USB	✓	✓	✓	✓	✓	✓	✓	✓	
microHAM	USB Interface II	\$ 179	USB	✓				✓			✓	
microHAM	USB Interface III	\$ 225	USB	✓	✓	✓		✓			✓	
microHAM	Digi KEYER II	\$ 369	USB	✓	✓	✓	✓	✓	✓		✓	
microHAM	microKEYER II	\$ 479	USB	✓	✓	✓	✓	✓	✓	✓	✓	
microHAM	micro2R	\$ 369	USB	✓		✓	✓	✓	✓	✓	✓	✓
microHAM	MK2R	\$ 899	USB	✓		✓	✓	✓	✓	✓	✓	✓
microHAM	MK2R+	\$ 999	USB	✓	✓	✓	✓	✓	✓	✓	✓	✓

See May-June 2012 NCJ, "RTTY Contesting" column

How Do I Set It Up?

summary - receive



1. Connect receiver audio output, via isolation, to ...
 - MODEM Audio In,
or
 - MMTTY via Soundcard Line In (or Mic In with pad):
 - Enable/adjust soundcard Line In (or Mic) input, disable/mute other inputs
2. Optional receive audio filtering

How Do I Set It Up?

summary - AFSK



1. Connect radio's Line In (or, Mic In with pad), via isolation, from:
 - MODEM Audio Out
or ...
 - Soundcard Line Out
2. Speech processor off
3. Enable/adjust SC audio level
 - Disable or mute all other SC outputs

How Do I Set It Up?

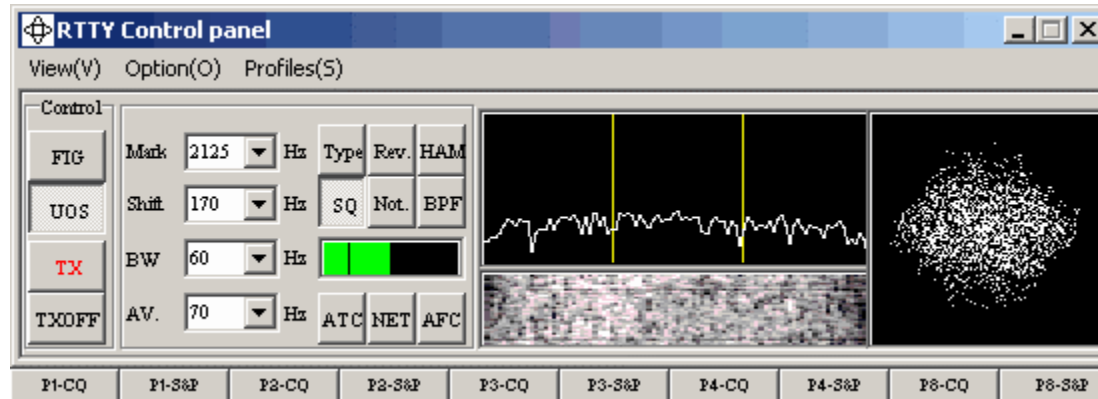
summary - FSK



1. Connect the radio FSK and PTT inputs to:
 - the MODEM FSK and PTT outputs and connect the MODEM Serial port to the PC (USB adapter)
or, if MMTTY ...
 - the RTTY interface FSK and PTT outputs and connect the interface Serial port to PC (USB adapter)
2. If no PC Serial port, then use a USB-Serial adapter.
 - Beware that some won't key FSK properly.
Edgeport USB-Serial adapters are known good.

Decoders

MMTTY



- Dominant soundcard MODEM in use today
- Exceeds performance of most other MODEMs
- Freeware since introduction in 2000
- Written by Mako, JE3HHT

How Do I Set It Up?

MMTTY standalone



Squelch

Messages

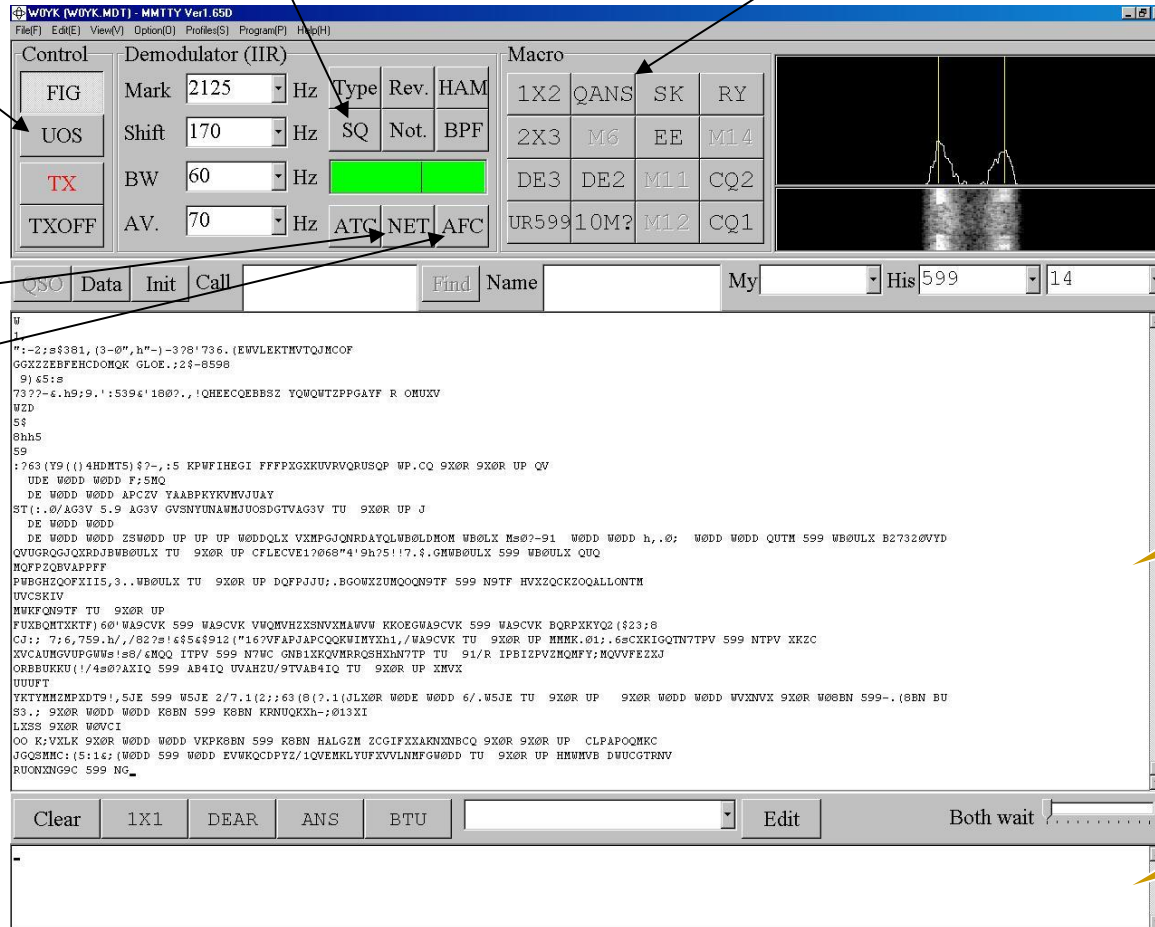
Leave UOS on

Turn off: NET
AFC

Don't click
inside display

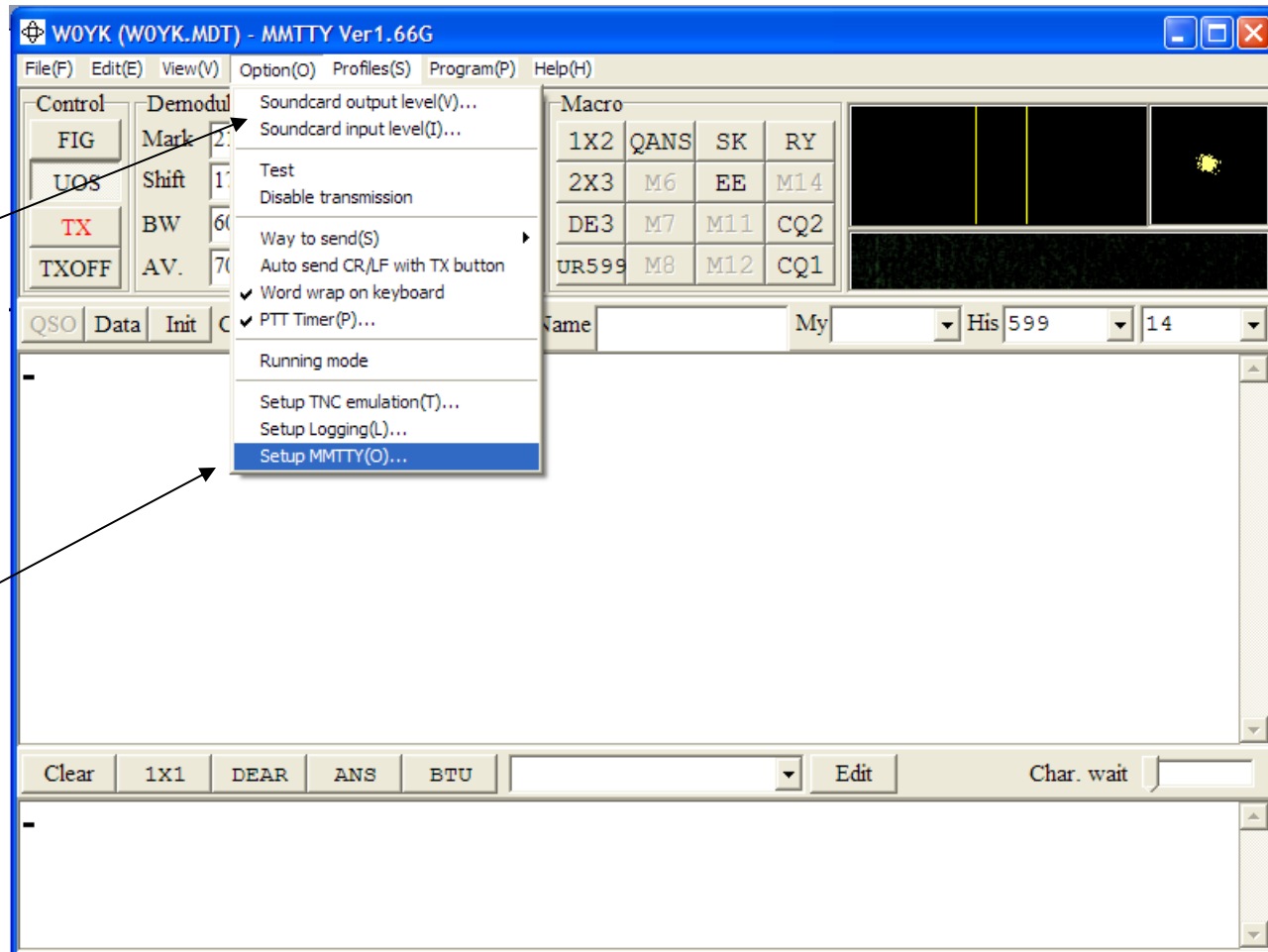
received
text

transmitte
d text



How Do I Set It Up?

MMTTY Option menu



Soundcard
levels

MMTTY
setup

How Do I Set It Up?

MMTTY Option/Setup/Demodulator



Set tones
(radio same)

The screenshot shows the 'Setup MMTTY Ver1.66G' window with the 'Demodulator' tab selected. The window has several sections for configuring the demodulator. The 'Discriminator' section has radio buttons for 'IIR resonator' (selected), 'FIR BPF', and 'PLL'. Below it are dropdown menus for 'Mark' (2125 Hz), 'Shift' (170 Hz), and 'BW' (60 Hz), with a 'Show' button. The 'Limit Amp.' section has checkboxes for 'AGC' (checked) and 'Over Sampling', and a 'Gain' dropdown (200). The 'Pre-Filter' section has a 'Show' button, a 'BPF' dropdown (LMS/Notch), an 'ON' checkbox, a 'Tap' dropdown (56), a 'FW' dropdown (100), and an 'AFC Connection' checkbox (checked). The 'Smooth LPF' section has radio buttons for 'FIR av.' (selected) and 'IIR', a 'Freq' dropdown (70 Hz), and a 'f' button. At the bottom left is a 'Reverse' checkbox. At the bottom center is a 'HAM Default' section with two input fields containing '2125' and '170'. The bottom of the window has buttons for 'HAM', 'Set Default(Demodulator)', '?', 'OK', and 'Cancel'. Two arrows from the text 'Set tones (radio same)' point to the 'Mark' and 'Shift' dropdown menus.

Setup MMTTY Ver1.66G

Demodulator | AFC/ATC/PLL | Decode | TX | Font/Window | Misc | SoundCard

Discriminator
Type
☒ IIR resonator
☐ FIR BPF
☐ PLL

Mark 2125 Hz
Shift 170 Hz
BW 60 Hz
Show

Limit Amp.
☒ AGC
☐ Over Sampling
Gain 200

Pre-Filter
Show
BPF LMS/Notch
☐ ON
Tap 56
FW 100
☒ AFC Connection

Smooth LPF
☒ FIR av. ☐ IIR
Freq 70 Hz
f

☐ Reverse

HAM Default 2125 170

HAM Set Default(Demodulator) ? OK Cancel

How Do I Set It Up?

MMTTY Option/Setup/TX



TX UOS on

Select LTR

512 Tap, if PC has perf.

FSK/PTT port

Soundcard Line Out level

AFSK PTT

The screenshot shows the 'Setup MMTTY Ver1.66G' window with the 'TX' tab selected. Annotations point to various settings: 'TX UOS on' points to the checked 'UOS' checkbox; 'Select LTR' points to the 'LTR' radio button in the 'DIDDLE' section; '512 Tap, if PC has perf.' points to the 'Tap' dropdown set to '48'; 'FSK/PTT port' points to the 'Port' dropdown set to 'NONE'; 'Soundcard Line Out level' points to the 'Radio command' button; and 'AFSK PTT' points to the 'Radio command' button. The 'Macro' section shows 'WOYK' as the call sign.

How Do I Set It Up?

MMTTY Option/Setup/Misc



Soundcard

Soundcard Format, 4x

AFSK

FSK

Setup MMTTY Ver1.66G

Demodulator AFC/ATC/PLL Decode TX Font/Window Misc SoundCard

Sound Card

FIFO

RX 12 TX 4

Priority

☐ Normal ☐ Highest

☒ Higher ☐ Critical

Device Identifiers

RX 0 TX 0

Source

☒ Mono ☐ Right

☐ Left

Clock

11025 Hz Adj

0.00 Hz

Tx offset

☐ Save window location

Sound loopback

☐ OFF

☒ Int.

☐ Ext.(SAT)

Tx Port

☒ Sound

☐ Sound + COM-TxD (FSK)

☐ COM-TxD(FSK)

System Font

Window Times New Roman Set 0

Fixed pitch Courier New Set 0

Japanese English

HAM Set Default(Demodulator) ? OK Cancel

How Do I Set It Up?

MMTTY Option/Setup/SoundCard



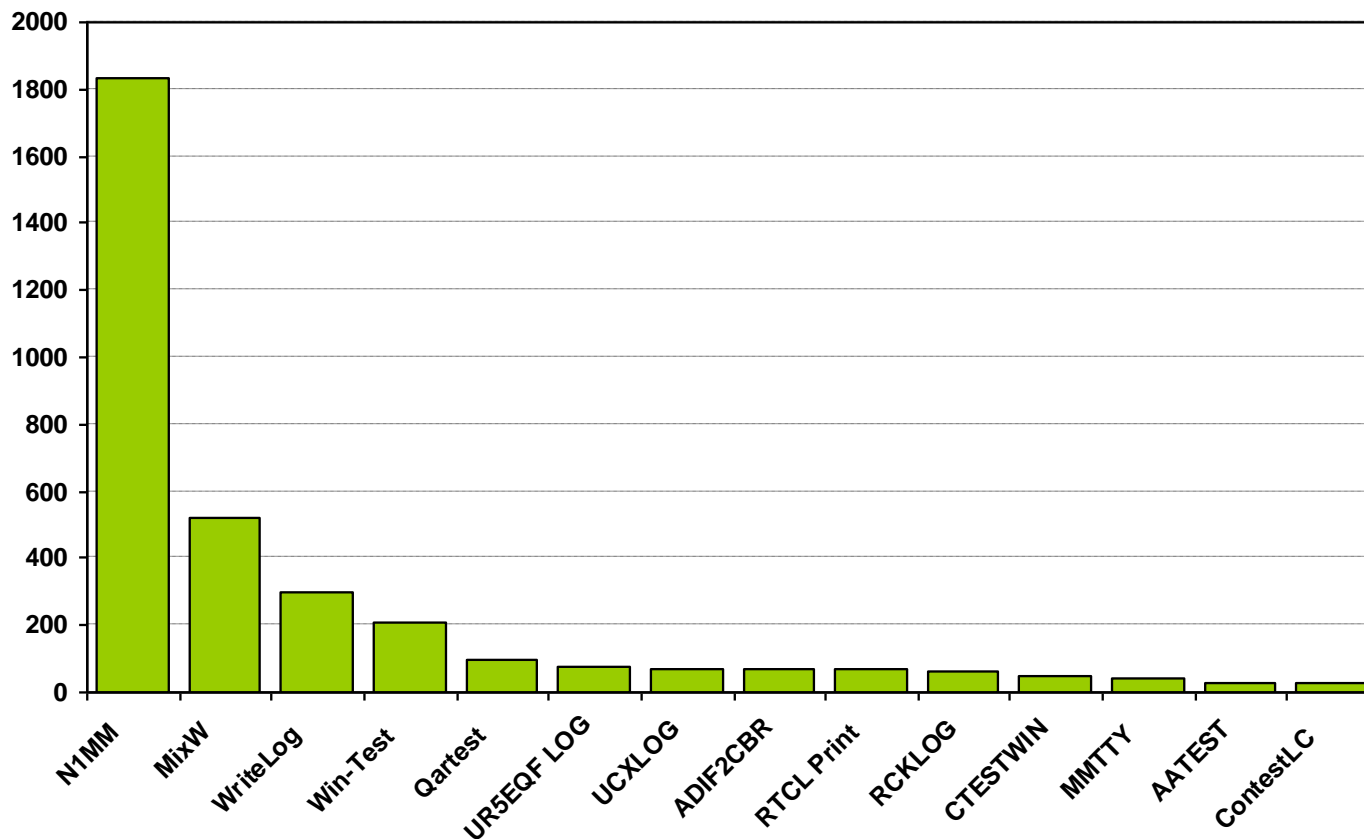
Select receive
Soundcard

The screenshot shows the 'Setup MMTTY Ver1.66G' window with the 'SoundCard' tab selected. The window has a blue title bar and a menu bar with options: Demodulator, AFC/ATC/PLL, Decode, TX, Font/Window, Misc, and SoundCard. The main area is divided into two columns: 'Reception' and 'Transmission'. In the 'Reception' column, the 'Line in/Mic in' option is selected with a radio button. Below it are 'Modem #0 Line Record' and 'Realtek HD Digital input', followed by several empty radio button slots. In the 'Transmission' column, the 'Realtek HD Audio rear output' option is selected with a radio button. Below it is 'Modem #0 Line Playback', followed by several empty radio button slots. At the bottom of the window are buttons for 'HAM', 'Set Default(Demodulator)', a help button with a question mark, 'OK', and 'Cancel'.

Select transmit
Soundcard
(AFSK only)

2012 CQ WPX RTTY

3550 submitted logs



RTTY Contest Loggers



- WriteLog (1994)
 - created for RTTY (CW & SSB came later)
 - www.rttycontesting.com/tutorials
- N1MM Logger+ (2000; dedicated RTTY software designer)
 - Free
 - www.rttycontesting.com/tutorials
- Win-Test (2003; RTTY is low priority)

All three integrate MMTTY and have similar functionality for basic RTTY contesting.

A Blizzard of Details!

this is fun??



Start Simple, then Enhance

- MMTTY (*free*)
 - get RX working (*std audio cable from radio to PC*)
 - get TX working; use either:
 - AFSK (*2nd std audio cable from radio to PC*)
 - FSK (*keying cable or commercial interface*)
- Integrate MMTTY with logging software
- Enhance later
 - Audio isolation (*highly recommended*)
 - Higher capability interface (DIY or commercial)
 - Advanced setup: SO2V, SO2R, multiple decoders, ...

◦ GTU ◦

Resources



- www.rttycontesting.com premier website
 - Tutorials and resources (beginner to expert)
 - WriteLog, N1MM Logger+ and MMTTY
- rtty@groups.io Email reflector
 - RTTY contester networking
 - Q&A
- Software web sites
 - hamsoft.ca/ (MMTTY)
 - n1mm.hamdocs.com/tiki-index.php (N1MM Logger+)
 - www.writelog.com (WriteLog)
 - www.win-test.com (Win-Test)
- Software Email reflectors
 - mmtty@yahoogroups.com (MMTTY)
 - N1MMLoggerplus@groups.io (N1MM Logger+)
 - Writelog@contesting.com (WriteLog)
 - support@win-test.com (Win-Test)