# **TS-590S HOWTO: Digital QuickStart**

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### Introduction

This HOWTO serves as a beginners' cookbook for running some of the well-known digital packages with the Kenwood TS-590S. To keep things simple, a common approach has been adopted throughout:

- Audio tones are conveyed between the PC and the TS-590S via the USB port.<sup>1</sup>
- Two TX keying methods are described for most packages:
  - VOX TX Keying
  - CAT Command TX Keying

This approach requires only a single USB cable connecting the radio to the PC. No other cables or hardware interfaces are required.

This HOWTO is confined to the basics of persuading the selected packages to communicate with the TS-590S. Nothing more. Some of the packages offer alternative ways of TX keying control – discovering those is left as an exercise for the reader!

#### Software and Hardware Configuration

Configuration details for each of the packages are covered in two or three pages. The first page for each package contains a table showing the following settings:

- Audio device section (USB Codec device)
- Audio Output Level Control
- Audio input level control
- PTT port configuration (for CAT control)
- TS-590S front panel and menu settings

The second and subsequent pages for each package contain screenshots showing the relevant configuration settings.

All of the configuration settings apply to a Windows XP environment, but should be similar under other members of the Windows family.

The information described in this HOWTO is intentionally cryptic, but hopefully self explanatory.

<sup>&</sup>lt;sup>1</sup> With some JT65-related modes the TS-590S USB port may not be suitable for audio transport, as the time delays introduced by the USB link may be unacceptably long. In this case it will be necessary to use the ACC2 port instead – see the TS-590S Digital HOWTO [1] and the TS-590S SSB Audio Handling TechNote [2].

#### **Some General Comments**

- Getting digital software to work properly with *any* radio is not a five-minute "Plug n' Play" exercise.
- You need to spend a lot of time reading the documentation that comes with the software.
- You need to spend a lot of time adjusting the transmit and receive audio levels to prevent signal overload.
- When making transmit adjustments, you need to run low power into a dummy load.
- You need to transmit with the speech processor switched off.

### **Digital Software Installation**

Some digital software packages give you the option of deciding where to install them, with the default folder being C:\Program Files. If you are running Windows Vista or Windows 7, it is highly recommended that you do <u>not</u> install in C:\Program Files – this is because the operating system places restrictions on user actions in this folder that may prevent correct operation of the software.<sup>2</sup>

Instead, it is much cleaner all round to create a special folder for digital software packages (for example, C:\Digital Programs), then install individual packages in folders below it. See Figure 1.



Figure 1: Create a special folder for digital programs, then create a separate folder for each package below it.

<sup>&</sup>lt;sup>2</sup> A known issue with Fldigi, for example.

### TX Keying

VOX TX Keying: The simplest method. See Figure 2.

- The USB cable transfers the TX and RX data between the PC and the TS-590S.
- In the radio, Data VOX (Menu 69) is switched ON.
- In the PC, the codec driver is automatically installed by Windows when the codec inside the radio is first detected there is no need to install any other drivers in the PC.
- No serial COM connection is required. This leaves both the USB virtual COM port and the serial COM port free for other purposes.
- VOX keying is simple, but slow (compared against CAT command keying).



Figure 2: VOX TX Keying

CAT Command TX Keying: The method to use for faster TX/RX switching<sup>3</sup>. See Figure 3.

- The USB cable transfers the TX and RX data plus the CAT Control commands between the PC and the TS-590S.
- In the radio, Data VOX (Menu 69) is switched OFF. TX keying is achieved with the "TX1;" CAT command that originates in the digital package.
- In the PC, the codec driver is automatically installed by Windows when the codec inside the radio is first detected.
- In the PC, it will be necessary to install the UART Bridge driver (which Kenwood calls the "Virtual COM Port Driver") from [3], for the CAT commands, if the operating system has not already installed it.
- This leaves the serial COM port free for other purposes.



Figure 3: CAT Command TX Keying

<sup>&</sup>lt;sup>3</sup> Necessary for ARQ modes such as V4.

#### **Device Names**

The screenshots in this HOWTO show actual detected device names, which may differ slightly from PC to PC, depending on the operating system and device drivers installed.

The configuration table for each package shows the USB COM port as **COM***n*. This corresponds to **COM11** in the screenshots.

#### What Next?

Once basic communication is achieved between the digital package and the TS-590S, you then have to read the package documentation in detail to see how to drive it.

More background information is contained in the TS-590S Digital HOWTO [1] and in the TS-590S SSB Audio Handling TechNote [2].

#### Which Mode?

The packages described in this HOWTO are capable of transmitting and receiving many different digital modes, and the beginner often finds it very confusing – which mode to use? This summary by Scott Traurig, WU2O, provides a succinct starting point.

The following are arguably the most popular modes and probably represent 99% of the data traffic on the amateur HF bands. They are popular for a reason; that is, they are widely considered the best modes for the listed "purpose":

- Want to see how far you can get on very few watts in an automated fashion that requires very little effort? Use <u>WSPR</u> (you need an internet connection to see how you are doing as stations report reception on a website).
- Want to have very tiny, pro forma "QSOs"" on very few watts or in extremely poor conditions in a semi-automated fashion with very little effort? Use **JT65**.
- Want to have a QSO in extremely poor conditions with a mode so slow you can run to the bathroom after you push "transmit", and perfect for two finger typists? Use <u>Olivia 16/500</u> (and also <u>Olivia 8/500</u>, which is a little faster with a little less link margin).
- Want to have a decently fast QSO in extremely poor conditions, almost as good as Olivia 16/500 but good for medium fast touch typists? Use <u>Contestia 16/500</u> (all upper case mode, strangely not as popular as it ought to be given its performance).
- You are a fast typist or want to send a lot of data/canned messages? Use <u>MT63-MT1000</u> (Kind of a bandwidth hog, but speed has a price. <u>MTTY</u> is also damn fast but not very common).
- Want to make a million contacts, either short award/logbook building stuff or longer QSOs? Use <u>PSK31</u>. This is *THE* most popular mode, hands down. Occasionally in good conditions you will see people switch to the faster <u>PSK63</u> or <u>PSK125</u> modes, both very easy to recognize when you see them.
- Want to send/receive email? Use <u>Pactor</u> or <u>Winmor</u>, and to a much lesser but growing extent <u>PSKmail.</u>
- Want to be old school? Use <u>**RTTY</u>. ③**</u>
- Want to be really old school? Use <u>CW</u>. 🕲 🕲

### **Digital Packages**

The following digital packages (in alphabetical order) are covered in this HOWTO. More may be added later.

The "VOX" and "CAT" columns contain the page numbers in this HOWTO for the package setup descriptions.

Package	CAT Page	VOX Page	Comment
Digipan		20	No obvious means of CAT control
DXLab WinWarbler + Commander	6	23	
Fldigi	8	25	
MixW	12	27	
MMTTY	15	30	
V4 Chat	18		VOX control not fast enough for ARQ

For most packages you can use either "CAT Command TX Keying" or "VOX TX Keying". The advantages and disadvantages of each method are:

TX Keying Method	Advantages	Disadvantages
CAT Command	Simple to set up	Uses a COM port
	Provides CAT control of frequency tuning and TX/RX switching	Requires a separate cable if using the serial COM port
	Faster TX/RX switching time (recommended for ARQ modes)	
vox	Does not use a COM port	Can be difficult to set up the correct VOX levels
		Slower TX/RX switching time (not suitable for ARQ modes)

The remainder of this HOWTO sets out the essential configuration details for the digital packages. The banner headline on each page is in:

- PURPLE for CAT Command TX Keying
- BLUE for VOX TX keying

# DXLAB WINWARBLER + COMMANDER TX KEYING: CAT COMMAND TX1;

WINWARBLER	Audio Device Selection	<ul> <li>&gt; Config</li> <li>&gt; Soundcard</li> </ul>	Reception: USB Audio CODEC	Transmission: USB Audio CODEC
	Audio Output Level	<ul> <li>&gt; Config</li> <li>&gt; Soundcard</li> <li>&gt; Mixer Adjustments</li> <li>&gt; Transmission</li> </ul>	Speaker USB Audio CODEC	
	Audio Input Level	<ul> <li>&gt; Windows Recording</li> <li>Control</li> <li>&gt; Options</li> <li>&gt; Properties</li> <li>&gt; Mixer Device</li> </ul>	Recording USB Audio CODEC	This Windows option may not provide any volume control sliders. In that case, the WINWARBLER input level must be adjusted by the TS-590S USB Audio Output Level control (Menu 65).
COMMANDER	Radio Select	> Config > General	Radio: KENWOOD	Data transmission using ACC2 input: check
	PTT Port	> Config > Ports	Primary CAT Serial Port	<u>Port#</u> : COM <i>n</i> <u>Baud</u> : 115200 <u>Word</u> : 8 <u>Parity</u> : None <u>Stop</u> : 1 <u>DTR</u> : Off <u>RTS</u> : On
TS-590S	TS-590S Front Panel	PROC	OFF	
		DATA	ON	
	TS-590S Menus	Menu 27: SSB-DATA Low Cut	200	
		Menu 28: SSB-DATA High Cut	2500	
		Menu 30: TX Equalizer	oFF	
		Menu 31: RX Equalizer	oFF	
		Menu 62: USB Baud Rate	115200	Switch radio off and on again after changing this value
		Menu 63: Line Select	USB	
		Menu 64: USB Audio Input Level	3	
1				
		Menu 65: USB Audio Output Level	5	Use this menu to control input level into WINWARBLER

# DXLAB WINWARBLER + COMMANDER

General Display PSK & RTTY Reception Windows default soundcard 0 SigmaTel Audio	PIT	Soundcard Phone ransmission PSK & RTTY	Psk
PSK & RTTY Reception Windows default soundcard 0 SigmaTel Audio	c	ransmission PSK&RTTY	Phone
Windows default soundcard 0 SigmaTel Audio	c	PSK & RTTY	Phone
Windows default soundcard 0 SigmaTel Audio	c		
0 SigmaTel Audio		Windows default soundcard	с
	0	0 SigmaTel Audio	C C
1 Wintual Cable 1	C L	1 Virtual Cable I	C C
2 USB Audio CODEC	e 🔇	2 USB Audio CODEC	@ C
3 QuickLam for Dell Notebooks Mic	C	3 not installed	C C
4 not installed	0	4 not installed	C C
5 not installed	0	5 not installed	C C
6 not installed	0	6 not installed	C C
7 not installed	0	7 not installed	C C
8 not installed	0	8 not installed	C C
9 not installed	0	9 not installed	C C
10 not installed	0	10 not installed	C C
11 not installed	0	11 not installed	C C
12 not installed	0	12 not installed	C C
13 not installed	C	13 not installed	C C
14 not installed	C	14 not installed	C C
15 not installed	C	15 not installed	C C

Filter Groups Memories Multi Radio	Bandspread	Transverters
KENWOOD Model		Reset
Continuous interrogation No interrogation while transmitting provide A/B and TF-SET buttons	Scan dwell	Display Error Log

Commander Co	ifiguration				
Filter Groups	Memories	Multi Radio	Bar	ndspread	Transverters
General	Ports	Device 0	Dev	/ice1	Device 2
Primary CAT Seria Port# Baud 11 • 115200	Word	Parity None 💌	Stop	DTR Off 💌	RTS

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## TX KEYING: CAT COMMAND TX1;

FLDIGI	Audio Device Selection	<ul><li>&gt; Configure)</li><li>&gt; Soundcard</li><li>&gt; Devices</li></ul>	Port Audio: check	Playback: USB Audio CODEC <u>Capture</u> : USB Audio CODEC
	Left/Right Channel Selection	<ul> <li>&gt; Configure)</li> <li>&gt; Settings</li> <li>&gt; Right Channel</li> </ul>	Reverse Left/Right channels: check	
	Audio Output Level	<ul> <li>&gt; Windows Volume Control</li> <li>&gt; Options</li> <li>&gt; Properties</li> <li>&gt; Mixer Device</li> </ul>	Playback USB Audio CODEC	
	Audio Input Level	<ul> <li>&gt; Windows Recording Control</li> <li>&gt; Options</li> <li>&gt; Properties</li> <li>&gt; Mixer Device</li> </ul>	Recording USB Audio CODEC	This Windows option may not provide any volume control sliders. In that case, the FLDIGI input level must be adjusted by the TS-590S USB Audio Output Level control (Menu 65).
	PTT Port	> Configure > Rig Control > RigCAT	Use RigCAT: check Rig description file: TS-590S.xml	Device: COMn Baudrate: 115200 Stopbits: 1 CAT command for PTT: check RTS/CTS flow control: check
TS-590S	TS-590S Front Panel	PROC	OFF	
		DATA	ON	
	TS-590S Menus	Menu 27: SSB-DATA Low Cut	200	
		Menu 28: SSB-DATA High Cut	2500	
		Menu 30: TX Equalizer	oFF	
		Menu 31: RX Equalizer	oFF	
		Menu 62: USB Baud Rate	115200	Switch radio off and on again after changing this value
		Menu 63: Line Select	USB	
		Menu 64: USB Audio Input Level	3	
		Menu 65: USB Audio Output Level	5	Use this menu to control input level into FLDIGI
		Menu 69: Data VOX	oFF	

8

# **FLDIGI**

#### TX KEYING: CAT COMMAND TX1;

#### Installing the TS-590S XML file

Prior to configuring fldigi, you need to download and save the TS-590S xml file:

- 1. Go to: http://www.w1hkj.com/xmls/kenwood/TS-590S.xml
- 2. In the browser, move the cursor to the displayed window, then right-click on "Save Page As" (or similar, depending on the browser), and save the file as TS-590S.xml in the fldigi folder - see the screenshot below.

www.w1hkj.com/xmls/kenwood/TS-5905.xml		
This XML file does not appear to have any style information associat	ed with it. The document tra	ee is shown below.
Rig definition file for use with fldigi</th <th><u>B</u>ack</th> <th></th>	<u>B</u> ack	
>	Eorward	
- <rigdef></rigdef>	<u>R</u> eload	
<rig>Kenwood TS-590S</rig>	Stop	
PROGRAMMER> Dave Freese, W1HKJ	Bookmark This Page	
<status></status>	Save Page As	>
	S <u>ord Link</u>	
$\sim$	Lisur De duerra d'Arre es	
	vie <u>w</u> Background Image	
ZTITI ENDIA CAT. ITS 500SZITITI EN		
<pre>&gt;ITTLEFRIGUAT-TO-0000&gt;ITTLEF&lt; </pre>	View Page Source	
>	View Page Info	
<timeout>50</timeout>	Inspect Element (Q)	
<retries>4</retries>		
<pre><write delay="">25</write></pre>		
<baudrate>9600</baudrate>		
<rtscts>true</rtscts>		

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Operator UI Waterfall Mo	dems Rig Audio ID Misc Web	
Devices Settings Right cha	nnel	
0055	Device:	
	Capture: USB Audio CODEC	<b> </b>
PortAudio	Playback: USB Audio CODEC	
PulseAudio	Server string:	
□File I/O only		



## **FLDIGI**

TV VEV		CAT	COMM	AND T	V-1 .
	ING:	CAL	COMM		

Hardware PTT RigCAT Hamlib MemMap XMI	L-RPC	
C Use Rig		
Rig description file.		
T5-5905.xml Open	Device: COI	411 🔻
Retries Retry interval (ms)		
4 50	Baud r	ate: 115200
Write delay (ms) 25	Sto	pbits 🗨 1 🕨
Commands are echoed	CAT command for F	
O Toggle RTS for PTT	Toggle DTR for PTT	
○RT5 +12 v	ODTR +12 v	Revert
RTS/CTS flow control	○VSP Enable	Initialize
Restore defaults	Save	Close /-

When setting up the RigCAT page as above, click on the "Open..." button, and select the downloaded TS-590S.xml file.

Attention: When you select the XML file, the baudrate is automatically set to 9600. You may need to change this back to your normally used rate.

Click on "Initialize", "Save" and "Close" ...

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MIXW	Audio	> Configure	Device: Sound	Output:
	Selection	> Sound Device Settings	external)	
	Selection			Samplerate: 11025
			IIIput.	
	Audio Output			Adjust TX audio drive level
	Level		CODEC	Aujust 1X audio diffe level
	20001	> Windows Mixor	OODLO	
		> Speaker		
	CAT Control	> Configure	Unselect	
		2 Comgaro	Disable CAT	
	PTT	> Configure	CAT	Kenwood
		> TRCVR CAT PTT		
			Model	TS-480
			Check	
			PTT via CAT	
			Command	
TS-590S	TS-590S Front Panel	PROC	OFF	
TS-590S	TS-590S Front Panel	DATA	OFF ON	-
TS-590S	TS-590S Front Panel TS-590S Menus	DATA Menu 27: SSB-DATA Low Cut	OFF ON 200	
TS-590S	TS-590S Front Panel TS-590S Menus	PROC DATA Menu 27: SSB-DATA Low Cut Menu 28: SSB-DATA High Cut	OFF 200 2500	
TS-590S	TS-590S Front Panel TS-590S Menus	PROC DATA Menu 27: SSB-DATA Low Cut Menu 28: SSB-DATA High Cut Menu 30: TX Equalizer	OFF 200 2500 0FF	
TS-590S	TS-590S Front Panel TS-590S Menus	PROC DATA Menu 27: SSB-DATA Low Cut Menu 28: SSB-DATA High Cut Menu 30: TX Equalizer Menu 31: RX Equalizer	OFF 200 2500 0FF 0FF	
TS-590S	TS-590S Front Panel TS-590S Menus	PROC DATA Menu 27: SSB-DATA Low Cut Menu 28: SSB-DATA High Cut Menu 30: TX Equalizer Menu 31: RX Equalizer Menu 62: USB Baud Rate	OFF           ON           200           2500           oFF           oFF           57600	Switch radio off and on again after changing this value
TS-590S	TS-590S Front Panel TS-590S Menus	PROC DATA Menu 27: SSB-DATA Low Cut Menu 28: SSB-DATA High Cut Menu 30: TX Equalizer Menu 31: RX Equalizer Menu 62: USB Baud Rate Menu 63: Line Select	OFF 200 2500 oFF oFF 57600 USB	Switch radio off and on again after changing this value
TS-590S	TS-590S Front Panel TS-590S Menus	PROC DATA Menu 27: SSB-DATA Low Cut Menu 28: SSB-DATA High Cut Menu 30: TX Equalizer Menu 31: RX Equalizer Menu 62: USB Baud Rate Menu 63: Line Select Menu 64: USB Audio Input Level	OFF ON 200 2500 oFF oFF 57600 USB 3	Switch radio off and on again after changing this value Use this control in
TS-590S	TS-590S Front Panel TS-590S Menus	PROC DATA Menu 27: SSB-DATA Low Cut Menu 28: SSB-DATA High Cut Menu 30: TX Equalizer Menu 31: RX Equalizer Menu 62: USB Baud Rate Menu 63: Line Select Menu 64: USB Audio Input Level	OFF ON 200 2500 oFF oFF 57600 USB 3	Switch radio off and on again after changing this value Use this control in conjunction with the MMTTY
TS-590S	TS-590S Front Panel TS-590S Menus	PROC DATA Menu 27: SSB-DATA Low Cut Menu 28: SSB-DATA High Cut Menu 30: TX Equalizer Menu 31: RX Equalizer Menu 62: USB Baud Rate Menu 63: Line Select Menu 64: USB Audio Input Level	OFF 200 2500 oFF oFF 57600 USB 3	Switch radio off and on again after changing this value Use this control in conjunction with the MMTTY Audio Out Level control to
TS-590S	TS-590S Front Panel TS-590S Menus	PROC DATA Menu 27: SSB-DATA Low Cut Menu 28: SSB-DATA High Cut Menu 30: TX Equalizer Menu 31: RX Equalizer Menu 62: USB Baud Rate Menu 63: Line Select Menu 64: USB Audio Input Level	OFF 200 2500 oFF oFF 57600 USB 3	Switch radio off and on again after changing this value Use this control in conjunction with the MMTTY Audio Out Level control to achieve suitable level.
TS-590S	TS-590S Front Panel TS-590S Menus	PROC DATA Menu 27: SSB-DATA Low Cut Menu 28: SSB-DATA High Cut Menu 30: TX Equalizer Menu 31: RX Equalizer Menu 62: USB Baud Rate Menu 63: Line Select Menu 64: USB Audio Input Level Menu 65: USB Audio Output Level	OFF ON 200 2500 oFF oFF 57600 USB 3 5	Switch radio off and on again after changing this value Use this control in conjunction with the MMTTY Audio Out Level control to achieve suitable level. Use this menu to control
TS-590S	TS-590S Front Panel TS-590S Menus	PROC DATA Menu 27: SSB-DATA Low Cut Menu 28: SSB-DATA High Cut Menu 30: TX Equalizer Menu 31: RX Equalizer Menu 62: USB Baud Rate Menu 63: Line Select Menu 64: USB Audio Input Level Menu 65: USB Audio Output Level	OFF ON 200 2500 oFF oFF 57600 USB 3 5	Switch radio off and on again after changing this value Use this control in conjunction with the MMTTY Audio Out Level control to achieve suitable level. Use this menu to control input level into MMTTY

# MIXW

🔀 G3NRW - Current log: Mix	tW2.log(CSV)	
File Edit Mode Options View	Configure Help	
AutoCQ CQ Call 3 Ca	Personal Data Interface language	Clear TX RX << >>
QSO         Mode         Freq         Date           QSO	Default macros Macros for this mode Macros for this contest ✓ Merge macros	QTH RST_Sent RST_Recv Notes
1 BPSK3 14072.1 08/07/20 6℃ 📓 🗙 🖬	Text colors Fonts •	599 599
de e otee ee	Interface Setup Wizard	
gp or ytttt eree itotrr-n sl =oeeo og Mree s	Disable CAT TRCVR CAT/FTT LPT port settings Secondary PTT port FSK port WinKey port TNC emulation	× e as ;mOepe
14071	Rotor Disable sound device Sound device settings Output volume	14073 14074 3 Hz IMD: BPSK31 08/07/2012 15:03:40 z

💥 Sound Device Settings	
Device: Sound card (internal or external) Input: USB Audio CODEC Output: USB Audio CODEC Samplerate: 11025 Clock adjustment, ppm: RX: 0 TX: 0	OK Cancel Calibrate
Sound history: 20 sec Spectrum speed: Slow 💌 DSP filter None 💌 FFT window Cosine 💌	
Full duplex     Disabled       Audio processing:     Message-based (standard)	

# MIXW

TY KEVI			ND TY1-
	NG. CAI	COMMA	$\mathbf{N} \cup \mathbf{I} \wedge \mathbf{I}$

CAT K Model T
PTT & CA COM11 Save fre PTT via CW via CW via CW is LS CW gitch FSK center Default digi

MMTTY	Audio Device Selection	> Option(O) > Setup MMTTY > Soundcard	Reception: USB Audio CODEC	Transmission: USB Audio CODEC
	Audio Output Level	<ul> <li>&gt; Option(O)</li> <li>&gt; Soundcard output level (V)</li> <li>&gt; Windows Volume Control</li> <li>&gt; Options</li> <li>&gt; Properties</li> <li>&gt; Mixer Device</li> </ul>	Playback USB Audio CODEC	
	Audio Input Level	<ul> <li>&gt; Option(O)</li> <li>&gt; Soundcard input level (I)</li> <li>&gt; Windows Recording Control</li> <li>&gt; Options</li> <li>&gt; Properties</li> <li>&gt; Mixer Device</li> </ul>	Recording USB Audio CODEC	This Windows option may not provide any volume control sliders. In that case, the MMTTY input level must be adjusted by the TS-590S USB Audio Output Level control (Menu 65).
	PTT Port	> Option(O) > Setup MMTTY(O) > TX	PTT & FSK Port	COMn
	Radio Command	> Option(O) > Setup MMTTY (O) > TX > Radio Command	Port	COMn
			Baud	57600
			Stop	1 bit
			Flow Control	CTS
			Тх	TX1;\w10 The default is TX; Be sure to change this to TX1;
			Model	Kenwood, Elecraft
			Frequency Offset	LSB or USB
			Group	Kenwood, Elecraft
TS-590S	TS-590S Front Panel	PROC	OFF	
		DATA	ON	
	TS-590S Menus	Menu 27: SSB-DATA Low Cut	200	
		Menu 28: SSB-DATA High Cut	2500	
		Menu 30: TX Equalizer	oFF	
		Menu 31: RX Equalizer	oFF	
		Menu 62: USB Baud Rate	57600	Switch radio off and on again after changing this value
		Menu 63: Line Select	USB	
		Menu 64: USB Audio Input Level	3	Use this control in conjunction with the MMTTY Audio Out Level control to achieve suitable level.
		Menu 65: USB Audio Output Level	5	Use this menu to control input level into MMTTY
		Menu 69: Data VOX	oFF	

## TX KEYING: CAT COMMAND TX1;

G3NRW	(G3NRW	.MDT) - MMTTY	Ver1.68A								
File(F) Edit(B	E) View(V	) Option(O) Pro	iles(5) Program(P)	Help(H)							
Control FIG	–Demod Mark	ul Soundcard ou 11 Soundcard in	itput level(V) put level(I)	-Macro 1X2	QANS	SK	RY				
UOS	Shift	1 <sup>°</sup> Test Disable trans	mission	2X3	M6	EE	M14	www.www	w <sup>an</sup> ww.	humph	www
TXOFF	ыw AV.	<ol> <li>Way to send</li> <li>Auto send CF</li> <li>Word wrap of</li> </ol>	S)  VLF with TX button keyboard	UR599	M8	M11 M12	CQ2 CQ1				
QSO Dat	a Init	C V PTT Timer(P)	··	Jame			My	✓ Hi	is 599	• 14	-
MY WORK C	CONDICI	OI Running mod	e	-					,	,	
TX/RX-YAE MODEN : F SOFT : F WEB :H7 ANT : F ANT : I HOW2BTU J 2 )7 9:00 WKRUNK NF	TX/RX-YAESU FT 1 Setup INC emulation(T) SoFT : MMTTY V WEB :HTTP://FA ANT : FORCE 12-6 ELM (10-15-20) ANT : DIPOLO.(12-18-30-40-80) HOW?BTU I3/K2AMK (KEVIN) DE EA4HW SK. 2 )7 9:0WCQ CQ SUGHKN WKRUNK NKCNKK2-5										
ANTENNA L2YEGO599 VIA EQSI	MCC, D	NGI RGSU B EV PPU DXMK IRECT OR LOJ	w	N SOFT	JARE :	пкр					-
Clear	1X1	DEAR AN	S BTU				•	Edit	Both	wait 🗍	
											•

Setup MMTTY Ver1.68A	
Demodulator AFC/ATC/PLL Decode TX	Font/Window Misc SoundCard
Reception SigmaTel Audio Virtual Cable 1 QuickCam for Dell Notebooks Mic USB Audio CODEC	Transmission C Virtual Cable 1 C SigmeTel Audio C USB Audio CODEC C

16

Setup MMTTY Ver1.68A Demodulator AFC/ATC/PLL Dec	ode TX Font/Window Misc SoundCard
DIDDLE C NONE C BLK C LTR Random WaitTimer TX UOS Double shift Disable Wait Always fix sh	Digital Output Digital Output Char. Wait Diddle Wait ift Char. Wait Diddle Wait
TxBPF/TxLPF Tx BPF Tap 48 • f Tx LPF Freq 100 • Hz Input Button 1x1 DEAR ANS BTU	Macro Your Callsign G3NRW 1X2 QANS SK RY 2X3 M6 EE M14 DE3 M7 M11 CQ2 UR599 M8 M12 CQ1 Convert Immediately
HAM Set Default(Demod	lulator) ? OK Cancel

Radio co	nmand 🔀
_Port d	finition
Port	COM11 Baud 57600 Char. wait 0 ms
	Data length     Stop     Parity     flow control     DTR/RTS       ○ 7bits     ○ 1bit     ○ None     □ XON/XOFF     □ PTT       ○ 8bits     ○ 2bits     ○ Odd     □ CTS     □ PTT
Comm	ands
Init	
КX	RX;
Tx	
Mode	Kenwood, Elecraft   Polling interval 1  secs
	Frequency offset O OFF © LSB O USB
Group	Kenwood, Elecraft   Load Save ? OK Cancel

17

# V4 CHAT

V4 CHAT	Audio Device Selection	> File > Setup	V4 Capture Device: USB Audio CODEC-03	<u>V4 Playback Device</u> : USB Audio CODEC-03 (Click on Update when done)
	Audio Output Level	<ul> <li>&gt; Windows Volume Control</li> <li>&gt; Options</li> <li>&gt; Properties</li> <li>&gt; Mixer Device</li> </ul>	<u>Playback</u> USB Audio CODEC	
	Audio Input Level	<ul> <li>&gt; Windows Recording Control</li> <li>&gt; Options</li> <li>&gt; Properties</li> <li>&gt; Mixer Device</li> </ul>	Recording USB Audio CODEC	This Windows option may not provide any volume control sliders. In that case, the V4 CHAT input level must be adjusted by the TS-590S USB Audio Output Level control (Menu 65).
	PTT Port	> File > Setup > Radio Setup	Radio Model	Kenwood Radios
			USB	Select
			Radio Control Port	COMn
			Baud	115200
			Enable RTS	Select
			PTT Serial Port	K590-Data
TS-590S	TS-590S Front Panel	PROC	OFF	
		DATA	ON	
	TS-590S Menus	Menu 27: SSB-DATA Low Cut	200	
		Menu 28: SSB-DATA High Cut	2500	
		Menu 30: TX Equalizer	oFF	
		Menu 31: RX Equalizer	oFF	
		Menu 62: USB Baud Rate	115200	Switch radio off and on again after changing this value
		Menu 63: Line Select	USB	
		Menu 64: USB Audio Input Level	3	Use this control in conjunction with the Windows Volume Control to achieve suitable level.
		Menu 65: USB Audio Output Level	5	Use this menu to control input level into V4 CHAT
1		Menu 69: Data VOX	oFF	

# V4 CHAT

Call Sign: G3NRW Grid Square: I091SX Autosend GS V4 Capture Device: USB Audio CODEC-03 V4 Playback Device: USB Audio CODEC-03 Virtual TNC host address/name: 127.0.0.1 Virtual TNC Command Port: 8510 C Data Port: 8511 Enable Auto Updates V Text Box Font Size: 10 C	ARQ Timout (seconds): Identify with Morse Code Atto Tuning Range (Hzt: 100
Character Set: ASCII 7 bit	Enable Full Duplex on FEC  Radio Setup Setup Help Update Cancel

Radio Selection	
Select Radio Model Kenwood Radios	> 🔽 Antenna Selection Default 🛛 🗸
Icom Address 00 USB 💿	USB Digital 🔿 VHF FM 🔿 Use Internal Tuner 🗌
Radio Control Port	
Serial Port to Use	Baud 115200 💟 Enable RTS 💟 Enable DTR 🗌
PTT Port (Optional)	
Serial Port to Use K590-Data	🖌 Baud 9600 💌 Enable RTS 🗹 Enable DTR 🗹

# DIGIPAN

DIGIPAN	Audio Device Selection	<ul> <li>&gt; Configure</li> <li>&gt; Soundcard</li> </ul>	<u>Type</u> : Computer Soundcard <u>Input</u> : USB Audio CODEC	Output: USB Audio CODEC Samplerate: 11025
	Audio Output Level	<ul> <li>&gt; Configure</li> <li>&gt; Transmitter Drive</li> <li>&gt; Speaker</li> </ul>	USB Audio CODEC	Adjust TX audio drive level
TS-590S	TS-590S Front Panel	PROC	OFF	
		DATA	ON	
	TS-590S Menus	Menu 27: SSB-DATA Low Cut	200	
		Menu 28: SSB-DATA High Cut	2500	
		Menu 30: TX Equalizer	oFF	
		Menu 31: RX Equalizer	oFF	
		Menu 63: Line Select	USB	
		Menu 64: USB Audio Input Level	3	Use this control in conjunction with the DIGIPAN Audio Output Level control to achieve suitable level.
		Menu 65: USB Audio Output Level	5	Use this menu to control input level into DIGIPAN
		Menu 69: Data VOX	on	

# DIGIPAN

TX KEYING: VOX

21

- Opinium - Digirali		
File Edit Clear Mode Options View Lock	Configure Help	
Lookup CQ Call 3 Call BTU	Personal Data Fn macros	Squelch Clear Multi
<u>Call: Name: QTH:</u>	Ctrl-Fn macros Load macros	
RZ?? de YU0KRUNA a h io de RA4LK RA4LK RA4LK k taote ee ) e ode ea ooAr eneeet t1PA UT1F	i Waterfall drive	oe a oele l t IKRUNA YUOKRUNA
CQ CQ UT1PA UT1PA CQ CQ UT1PA UT1PA CQ CQ UT1PA UT1PA CO Kn	Sound card Sample Rate Corrections	
IN . CQ CQ UT1PA UT1PA CQ CQ UT1PA U	Serial port Font Colors	tu cu onipa o
	Band Markers Sound history	107 com
	Multichannel scroll Multichannel inactivity timeout	· · · · · · · · ·

📰 Sound o	card		×
Туре Со	omputer soundcard	•	эк 🔤
Input US Output US	ISB Audio CODEC		incel
Samplerate,	Hz [11025		

D	G	Ρ	Δ	Ν

	TX KEYING: VOX
T and the f	
PTT interface	
None 💌	

ΟK

🚺 Speaker	
Options Help	
Speaker	Wave
Balance:	Balance:
	₿   ₿ -,,, 4
Volume:	Volume:
Mute all	Mute
USB Audio CODEC	

🔲 Use Icom CI-V

Cancel

WINWARBLER	Audio Device Selection	<ul> <li>&gt; Config</li> <li>&gt; Soundcard</li> </ul>	Reception: USB Audio CODEC	Transmission: USB Audio CODEC
	Audio Output Level	<ul> <li>&gt; Config</li> <li>&gt; Soundcard</li> <li>&gt; Mixer Adjustments</li> <li>&gt; Transmission</li> </ul>	Speaker USB Audio CODEC	
	Audio Input Level	<ul> <li>&gt; Windows Recording</li> <li>Control</li> <li>&gt; Options</li> <li>&gt; Properties</li> <li>&gt; Mixer Device</li> </ul>	Recording USB Audio CODEC	This Windows option may not provide any volume control sliders. In that case, the WINWARBLER input level must be adjusted by the TS-590S USB Audio Output Level control (Menu 65).
COMMANDER	Radio Select	> Config > General	<u>Radio</u> : KENWOOD	Data transmission using ACC2 input: check
	PTT Port	> Config > Ports	Primary CAT Serial Port	Port#: (blank)
TS-590S	TS-590S Front Panel	PROC	OFF	
		DATA	ON	
	TS-590S Menus	Menu 27: SSB-DATA Low Cut	200	
		Menu 28: SSB-DATA High Cut	2500	
		Menu 30: TX Equalizer	oFF	
		Menu 31: RX Equalizer	oFF	]
		Menu 63: Line Select	USB	
		Menu 64: USB Audio Input Level	3	
		Menu 65: USB Audio Output Level	5	Use this menu to control input level into
				WINWARBLER

# DXLAB WINWARBLER + COMMANDER

# DXLAB WINWARBLER + COMMANDER

	External Modem		Log		Contest
General Y Display Y	PTT ľ	Soundcard L	Phone	Ύ F	PSK
General     Display       SK & RTTY Reception       Windows default soundcard       D SigmaTel Audio       D Windows default soundcard       D SigmaTel Audio       D Windows default soundcard       D SigmaTel Audio       D Windows default soundcard       D Windows default soundcard       D Windows default soundcard       D Windows default soundcard       D Not installed       D not install	C C C C C C C C C C C C C C C C C C C	Soundcard SignaTel Audio Vindows default soundcard SigmaTel Audio Vindar Lable 1 USB Audio CODEC not installed	rd		Phone-

Filter Groups	Memories	Multi Radio	Bandspread	Transverters
General	FUIIS	Device 0	Device 1	Device 2
Radio				
KENWOOD	Model			Beset
Continuous inte	rrogation 2(	interval (ms)	1 dwell	Display
No interrogation	h while transmitting			Error Log

Filter Groups	Memories	Multi Radio	Bandspread	Transverters
General	Ports	Device 0	Device 1	Device 2
🗁 Primary CAT Sei	ial Port 🔿 🚽 🚽			

_	

FLDIGI	Audio Device Selection	<ul> <li>&gt; Configure)</li> <li>&gt; Soundcard</li> <li>&gt; Devices</li> </ul>	Port Audio: check	<u>Playback</u> : USB Audio CODEC <u>Capture</u> : USB Audio CODEC
	Left/Right Channel Selection	<ul> <li>&gt; Configure)</li> <li>&gt; Settings</li> <li>&gt; Right Channel</li> </ul>	Reverse Left/Right channels: check	
	Audio Output Level	<ul> <li>&gt; Windows Volume Control</li> <li>&gt; Options</li> <li>&gt; Properties</li> <li>&gt; Mixer Device</li> </ul>	Playback USB Audio CODEC	
	Audio Input Level	<ul> <li>&gt; Windows Recording Control</li> <li>&gt; Options</li> <li>&gt; Properties</li> <li>&gt; Mixer Device</li> </ul>	Recording USB Audio CODEC	This Windows option may not provide any volume control sliders. In that case, the FLDIGI input level must be adjusted by the
				Output Level control (Menu 65).
TS-590S	TS-590S Front Panel	PROC	OFF	Output Level control (Menu 65).
TS-590S	TS-590S Front Panel	<b>PROC</b> DATA	OFF ON	Output Level control (Menu 65).
TS-590S	TS-590S Front Panel TS-590S Menus	PROC DATA Menu 27: SSB-DATA Low Cut	OFF ON 200	Output Level control (Menu 65).
TS-590S	TS-590S Front Panel TS-590S Menus	PROC DATA Menu 27: SSB-DATA Low Cut Menu 28: SSB-DATA High Cut	OFF ON 200 2500	Output Level control (Menu 65).
TS-590S	TS-590S Front Panel TS-590S Menus	PROC DATA Menu 27: SSB-DATA Low Cut Menu 28: SSB-DATA High Cut Menu 30: TX Equalizer	OFF ON 200 2500 oFF	Output Level control (Menu 65).
TS-590S	TS-590S Front Panel TS-590S Menus	PROC DATA Menu 27: SSB-DATA Low Cut Menu 28: SSB-DATA High Cut Menu 30: TX Equalizer Menu 31: RX Equalizer	OFF ON 200 2500 oFF oFF	Output Level control (Menu 65).
TS-590S	TS-590S Front Panel TS-590S Menus	PROC DATA Menu 27: SSB-DATA Low Cut Menu 28: SSB-DATA High Cut Menu 30: TX Equalizer Menu 31: RX Equalizer Menu 63: Line Select	OFF           ON           200           2500           oFF           oFF           USB	Output Level control (Menu 65).
TS-590S	TS-590S Front Panel TS-590S Menus	PROC DATA Menu 27: SSB-DATA Low Cut Menu 28: SSB-DATA High Cut Menu 30: TX Equalizer Menu 31: RX Equalizer Menu 63: Line Select Menu 64: USB Audio Input Level	OFF           ON           200           2500           oFF           oFF           USB           3	Output Level control     (Menu 65).
TS-590S	TS-590S Front Panel TS-590S Menus	PROC DATA Menu 27: SSB-DATA Low Cut Menu 28: SSB-DATA High Cut Menu 30: TX Equalizer Menu 31: RX Equalizer Menu 63: Line Select Menu 63: Line Select Menu 64: USB Audio Input Level Menu 65: USB Audio Output Level	OFF           ON           200           2500           oFF           oFF           USB           3           5	Use this menu to control input level into FLDIGI

# **FLDIGI**

Operator	UI	Waterfall	Modems	Rig	Audio	ID	Misc	Web					
Devices	Setti	ngs   Right	: channel										
Ooss									Device	:			
Rort	Audio		C.	apture	: USB A	Audio	CODE	>				:	•
	Hadio		Pla	yback	: USB A	Audio	CODE	>	)			:	\$
OPuls	eAudio	D		Ser	ver strin	ig:							
⊖File	I/O or	nly											
Deal	tore d	ofaulte	]		( ) ( )		Sav	/e			Close		15



# MIXW

## TX KEYING: VOX

			-	
MIXW	Audio Device Selection	<ul> <li>&gt; Configure</li> <li>&gt; Sound Device Settings</li> </ul>	Device: Sound card (internal or external) Input: USB Audio CODEC	Output: USB Audio CODEC <u>Samplerate</u> : 11025
	Audio Output Level	<ul> <li>&gt; Configure</li> <li>&gt; Output Volume</li> <li>&gt; Windows Mixer</li> <li>&gt; Speaker</li> </ul>	USB Audio CODEC	Adjust TX audio drive level
TS-590S	TS-590S Front Panel	PROC	OFF	
		DATA	ON	
	TS-590S Menus	Menu 27: SSB-DATA Low Cut	200	
		Menu 28: SSB-DATA High Cut	2500	
		Menu 30: TX Equalizer	oFF	
		Menu 31: RX Equalizer	oFF	
		Menu 63: Line Select	USB	
		Menu 64: USB Audio Input Level	3	Use this control in conjunction with the MIXW Audio Output Level control to achieve suitable level.
		Menu 65: USB Audio Output Level	5	Use this menu to control input level into MIXW
		Menu 69: Data VOX	on	

27

# MIXW

🔀 G3NRW - Current log: Mix	W2.log(CSV)	
File Edit Mode Options View	Configure Help	
AutoCQ CQ Call 3 Ca	Personal Data Interface language	Clear TX RX << >>
QS0         Mode         Freq         Date           QS0	Default macros Macros for this mode Macros for this contest ✓ Merge macros	QTH RST_Sent RST_Recv Notes
1         BPSK3         14069.1         25/05/201           6√         ≦         ×         ■	Text colors Fonts	▶ 599 599 ▶ <b>∑</b>
e ei s = s mel tr to celebrate the in Poland and	Interface Setup Wizard V Disable CAT IRCVR CAT/PTT	euton , Championship 2012
cq de <b>SN2012PO</b> pse tt E	LPT port settings Secondary PTT port FSK port WinKey port TNC emulation Rotor	2000
	Disable sound device Sound device settings Output volume	. \$

🔀 Sound Device Settings
Device:       Sound card (internal or external)       ▼       OK         Input:       USB Audio CODEC       ▼       Cancel         Output       USB Audio CODEC       ▼       Calibrate         Samplerate:       11025       Clock adjustment, ppm:       TX:       0
Sound history: 20 sec Spectrum speed: Slow DSP filter None FFT window Cosine Full duplex Disabled Audio processing: Message-based (standard)

**MIXW**`

6	Speaker	
C	Options Help	
\$	Speaker	Wave
E	Balance:	Balance:
	♦ 4	
N	Volume:	Volume:
C	Mute all	📃 Mute
	ISB Audio CODEC	

MMT	ГҮ			TX KEYING: VOX
MMTT	Y Audio Device Selection	> Option(O) > Setup MMTTY > Soundcard	Reception: USB Audio CODEC	Transmission: USB Audio CODEC
	Audio Output Level	<ul> <li>&gt; Option(O)</li> <li>&gt; Soundcard output level (V)</li> <li>&gt; Windows Volume Control</li> <li>&gt; Options</li> <li>&gt; Properties</li> <li>&gt; Mixer Device</li> </ul>	Playback USB Audio CODEC	
	Audio Input Level	<ul> <li>&gt; Option(O)</li> <li>&gt; Soundcard input level (I)</li> <li>&gt; Windows Recording Control</li> <li>&gt; Options</li> <li>&gt; Properties</li> <li>&gt; Mixer Device</li> </ul>	Recording USB Audio CODEC	This Windows option may not provide any volume control sliders. In that case, the MMTTY input level must be adjusted by the TS-590S USB Audio Output Level control (Menu 65).
	PTT Port	> Option(O) > Setup MMTTY(O) > TX	PTT & FSK Port	NONE
TS-59	0S TS-590S Front Panel	PROC	OFF	
		DATA	ON	
	TS-590S Menus	Menu 27: SSB-DATA Low Cut	200	
		Menu 28: SSB-DATA High Cut	2500	
		Menu 30: TX Equalizer	oFF	
		Menu 31: RX Equalizer	oFF	
		Menu 63: Line Select	USB	
		Menu 64: USB Audio Input Level	3	Use this control in conjunction with the MMTTY Audio Out Level control to achieve suitable level.
		Menu 65: USB Audio Output Level	5	Use this menu to control input level into MMTTY
		Menu 69: Data VOX	on	

TX KEYING: VOX	
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🕀 G3NRW	(G3NRW	/.MDT) - MMTTY Ver1.68A								
File(F) Edit(E	E) View(\	V) Option(O) Profiles(S) Program(P)	Help(H)							
Control	Demo	dul Soundcard output level(V)	Macro	)						
FIG	Mark	1 Soundcard input level(I)	1x2	QANS	SK	RY				
UOS	Shift	1 Test Disable transmission	2X3	M6	EE	M14	~~~~	many	www.www	win
TX	BW	1: Way to send(5)	DE3	М7	M11	CQ2	10000			
TXOFF	AV.	61 Auto send CR/LF with TX button	UR59	9 M8	M12	CQ1				er, ka sen
QSO Data	a Init	✓ word wrap on keyboard ✓ PTT Timer(P)	Jame			My		- His 599	. 14	•
MY WORK C	CONDICI	LOI Running mode	<u> </u>							-
TX/RX-YAE	CSU FT	10 Setup TNC emulation(T)								
MODEN : F	ADIO 1 AMTTV V	IN Setup Logging(L)								
WEB :HT	TTP://E	Setup MMTTY(O)								
ANT : F	FORCE 1	12-6 ELM (10-15-20)								
ANT : D	)IPOLO.	. (12-18-3Ø-4Ø-8Ø)								
2 17 9:01	ICO CO	SUGHKN								
WKRUNK NK	CNKK2-	-5								
TONY, MY	STATIC	ONJI RGSU YA VLS ZMVEY	N SOFT	WARE :	HRD					
L2 YEGO599	YUØF	KPPU DXMK								
VIA EQSL	MCC, I	DIRECT OR LOTW								-
Clear	1X1	DEAR ANS BTU				•	Edit	E	Both wait	
-										-
L										



TX KEYING: VOX
31

Setup MMTTY Ver1.68A       Image: Comparison of the setup of the setu			
DIDDLE C NONE C BLK C LTR Random WaitTimer TX UOS Double shift Disable Wait Always fix shift	Digital Output Char. Wait Diddle Wait Char. Wait Diddle Wait Char. Wait Diddle Wait		
TxBPF/TxLPF Tx BPF Tap 48 f Tx LPF Freq 100 Hz Input Button 1x1 DEAR ANS BTU	Macro Your Callsign G3NRW 1X2 QANS SK RY 2X3 M6 EE M14 DE3 M7 M11 CQ2 UR599 M8 M12 CQ1 □ Convert Immediately		
HAM Set Default(Demodulator	r) ? OK Cancel		

## References

	Resource	URL
[1]	TS-590S Digital HOWTO	Go to the TS-590S Resources Page:
		http://homepage.ntlworld.com/wadei/ts-590s.htm
		Scroll down to the HOWTOs section, then click on the link:
		"HOWTO set up the Kenwood TS-590S for Digital Data and Digital Voice Operation"
[2]	TS-590S SSB Audio Handling TechNote	Go to the TS-590S Resources Page:
		http://homepage.ntlworld.com/wadei/ts-590s.htm
		Scroll down to the TECHNOTEs section, then click on the link:
		"TS-590S TechNote: SSB Audio Handling"
[3]	Virtual COM port driver	http://www.kenwood.com/i/products/info/amateur/vcp_e.html

## Acknowledgement

Many thanks to Rick Muething (KN6KB) for his comments on an early draft of this HOWTO. Thanks also to Scott Traurig (WU2O) for his illuminating introduction to digital modes.

## **Document Version History**

Version	Date	History
1.0	3 May 2012	First public version
1.1	4 May 2012	Added note saying that the configuration descriptions apply to a Windows XP environment
1.2	25 May 2012	Major upgrade: Added explanation of VOX and CAT TX keying Added MixW Added VOX setup for several packages Added requirement for Fldigi TS-590S XML file
1.3	10 July 2012	Added summary of advantages and disadvantages of CAT Command and VOX methods of TX keying Added Scott Traurig's introduction to digital modes Added MixW with CAT Command TX keying
1.4	2 November 2012	Corrected minor typo in several places: TS-590S RX Equalizer setting is Menu 31, not Menu 30

Version 1.4