Soundcard modem configuration



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Overview of today's talk

Setting some context – where does this fit in?

Options for getting data on the air

Zooming in on soundcard modems

Step-by-step configuration and helpful (I hope) tips

Feel free to take notes, but these slides will be posted

Questions welcome any time

The task at hand

Using Winlink to send a digital message

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**ICS 213** 

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A TNC: serial data input / analog audio output (sometimes built-in to radios, like D710)
A sound card: digital audio in / analog audio out (built-in to most computers and *some* radios)

Hardware modems vs. Soundcard modems

Hardware modem (Kantronics, Pactor, Kenwood D710G ...)

- + Simple to configure
- + Never get PC audio on the air
- Fixed function (e.g., packet only, no SSTV, Vara, etc.)
- Expensive, both per unit, and need a new one per mode

Soundcard modem

- + Less expensive
- + Flexible (packet, SSTV, Vara, ...)
- Can be difficult to configure
- PC audio can accidentally get transmitted

You've head them, but I couldn't resist:

Example Packet transmission

Example Vara transmission

Soundcard hardware options

Cabling

Masters communications DRA-70



DIN to DIN



Signalink USB

digirig



RJ-45 to DIN configured internally





⅓" to DIN



Step-by-step tutorials

- 1) Configure Windows to *default* output to your speakers (not your soundcard)
- Re-check this each time you plug in your soundcard
- 2) Create a shortcut to Sound preferences
- 3) Rename your Soundcard modem device(s)
- 4) Configuring modem software: Soundmodem, Vara
 - Sound device
 - PTT

Configuring default Windows sound device

Check this every time you plug in a soundcard modem – to prevent computer sounds from getting broadcast





Right-click on the Speaker icon in the lower-right, select "Open Sound settings"

Under **Output**, choose where system beeps and boops, Zoom and YouTube's audio, etc. will be played. This should be your **computer's built-in speakers**, also select the **built-in microphone under Input**, which is where, say, Zoom gets its audio input from.

Getting to Sound controls

Windows 10: (it's more hidden in Windows 11)

- Right-click on the speaker in the task bar
- Choose "Sounds", and a window pops up
- Select the Playback and Recording tabs

To make a handy desktop shortcut (Windows 10 or 11):

- Right-click on your desktop background
- Select New >> Shortcut
- In the "Location of item", enter: %windir%\system32\mmsys.cpl
- For the name, enter something like Sound Controls
- Finish!
- Update the icon by right-clicking on it, select **Properties**, then **Change icon...**

Key things in Sound control panel

It is super-handy to *rename your soundcard modem*(s)

- Select the **Playback** modem device, choose properties and enter a new name
 - e.g., "DRA-70 output" or "Signalink output"
- While you're there, under Levels, set it to 100%
- Under Enhancements, check "Disable all enhancements", then click OK
- Select the **Recording** tab, select the modem device, and choose properties
- Enter a new name in the General tab
- Under Listen, "listen to this device" *should not* be checked, but do check continue running when on battery power
- Under Custom, AGC should not be checked
- Levels should be 100%, then click OK
 - For a dual Vara/Packet gateway, under Advanced, un-check both Exclusive Mode options

Configuring soundcard device name, output levels, etc.

| Set | 🕅 DRA-70 output Properties >> |
|-----|--|
| l | General Levels Enhancements Advanced Spatial sound |
| 1 | DRA-70 output |
| | Change Icon |
| | Controller Information |
| 1 | 2- USB PnP Sound Device Properties (Generic USB Audio) |
| | Jack Information
No Jack Information Available |
| | Device usage: Use this device (enable) V |

Open the Sound control panel, Select **Playback** tab, then your soundcard device (e.g. USB PnP Sound Device), select **Properties.** In the **General** tab, rename the device from "Speakers" to "DRA-70 output" or "Signalink output"

| layback | Recording | Sounds | Commun | nications | | _ |
|---------|--------------|----------|---------|-----------|-------------------|--------|
| Se | DRA-70 out | put Prop | oerties | | | |
| Ge | eneral Level | s Enhan | cements | Advanced | Spatial sound | 1 |
| 1 | Speakers | | | • | 100 ()) B | alance |

| k Rec | ording | Sounds | Commun | nications | | _ |
|--------------------------|---|------------------------------------|----------------------------------|---------------------------------|--|-----------|
| DRA | -70 out | out Prop | erties | | | |
| General | Levels | Enhan | cements | Advanced | Spatial sound | |
| Selec | t the enliguration. | nanceme
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In the **Levels** tab, set Speakers to 100

In the **Enhancements** tab, select Disable all enhancements

Finally, click **OK**, then go on to the **Recording** tab of the Sound window

Sound control panel's Recording settings

| - / | Recording Sounds Communications | |
|-----|--------------------------------------|---|
| Se | Microphone Properties | × |
| Ge | eneral Listen Custom Levels Advanced | |
| | DRA-70 input | |
| | Change Icon | |
| | Controller Information | |
| | 4- USB PnP Sound Device Properties | |
| | (Generic USB Audio) | |
| | | |
| 37 | Jack Information | |
| | No Jack Information Available | |
| | | |
| | | |
| | | |

| yback Recording Sound | ls Communications | |
|-----------------------|----------------------|-------------|
| Microphone Prop | erties | × |
| General Listen Cus | tom Levels Advanced | |
| AGC | | |
| | | |
| | | |
| | | |
| Sound | | × |
| yback Recording Sound | ds Communications | |
| 🚽 Microphone Prop | erties | × |
| General Listen Cus | stom Levels Advanced | |
| Microphone | 100 | (1) |
| | | |

In the **Custom** tab, *make sure* **AGC** is *not* selected

In the **Levels** tab, set Microphone to 100*

In the General tab, rename the recording device to "DRA-70 output", or "Signalink output"

* for an unattended station (like K7MCE) I have found it helpful to set both playback and record levels to 90 so they can be increased without needing physical access to the system

Two more things to configure: Winlink & modem software

To configure a mode (e.g., Packet, Vara FM, ...)

- Select that mode in Winlink, then Open Session,
- In the session window, use the Browse button to select your modem software
 - Soundmodem.exe for packet http://uz7.ho.ua/packetradio.htm
 - VaraFM.exe for Vara https://rosmodem.wordpress.com/
 - Select "Show ____ screen when open"
- Exit the session, then re-open it, and the modem software should open
- In the modem software window (either packet or Vara), you can now choose your soundcard device

Configuring PTT

If your modem is sending signal but your radio isn't transmitting, you need to configure PTT

- Signalink generates PTT from modem signal
- DRA soundcards' PTT is controlled by the modem software

Soundmodem - don't forget ptt.dll

- Signalink Select PTT Port to NONE
- DRA Select PTT Port to EXT, Advanced PTT settings, choose DRA device

Vara

- Signalink Settings >> PTT select VOX
- DRA Settings >> PTT select RA Board

Screenshots of various configurations

Vara for DRA-70 (do PTT first)

| PTT 🗃 | | | | |
|----------------|---------------|-------------|------------|-------|
| O CAT | С СОМ 🤄 | RA-Board | C VOX | |
| Speakers Pro | perties | | | |
| General Levels | Enhancements | Advanced | Spatial so | und |
| Speakers | 1 | | 00 | Balan |
| 🗢 DRA-30 Pro | perties | - | _ | |
| General Listen | Custom | els Advance | ed | |
| AGC N | lust not be (| checked | | |
| | Clos | e | | |
| | | | | |

Soundmodem for DRA-70

| ettings | × |
|------------------------------|-----------------------|
| Sound Card | |
| Output device DRA-70 output | (2-USB PnP Sound |
| Input device DRA-70 Input (| 2-USB PnP Sound 🔹 |
| 🔲 Dual channel | TX SampleRate 11025 |
| TX rotation | TX corr. PPM |
| 🔽 Single channel output | RX SampleRate 11025 |
| 🥅 Color waterfall | RX corr. PPM |
| 🥅 Stop waterfall on minimize | Priority Highest 🔹 |
| 🥅 Minimized window on startu | p |
| Server setup | |
| AGWPE Server Port 8000 | 🔲 Enabled |
| KISS Server Port 8100 | 🔽 Enabled |
| PTT Port | |
| Select PTT port EXT | 🔲 Dual PTT |
| Advanced PTT settings | Swap COM pins for PTT |
| ок | Cancel |

Vara for Signalink

| Soun | dCard | | | | |
|--------------|-------------------------------|---------------|-------------|----------------|--------|
| Devi
Sigr | ice Input
nalink input (2- | USB AUDIO |) | | |
| Devi | ice Output | 2-USBAUD | 0 | | |
| Tu | Drive lev | vel: | J <u> </u> | | -15 dB |
| | | | Close | | |
| | PTT | | | | × |
| | O CAT | С СОМ | C RA-Boa | rd © VOX | |
| | Signalink | TX Properties | | | |
| | General Leve | ls Enhanceme | nts Advance | d Spatial sour | nd |

Soundmodem for Signalink

| ettings | > | | |
|-------------------------------|-----------------------|--|--|
| Sound Card | | | |
| Output device Signalink outpu | ıt (2- USB AUDIO 🗾 | | |
| Input device Signalink input | (2- USB AUDIO | | |
| 🔲 Dual channel | TX SampleRate 11025 | | |
| TX rotation | TX corr. PPM | | |
| 🔽 Single channel output | RX SampleRate 11025 | | |
| 🔲 Color waterfall | RX corr. PPM 0 | | |
| 🔲 Stop waterfall on minimize | Priority Highest | | |
| 🥅 Minimized window on startu | p | | |
| Server setup | | | |
| AGWPE Server Port 8000 | 🔲 Enabled | | |
| KISS Server Port 8100 | 🔽 Enabled | | |
| PTT Port | | | |
| Select PTT port NONE | 🔲 Dual PTT | | |
| Advanced PTT settings | Swap COM pins for PTT | | |
| OK | Cancel | | |

Close

Finally - activity (not ICS) logging in Vara

Soundmodem's default display has a nice log

- You can see which stations are connecting, when they're done, etc.

Vara doesn't have a built-in live log, but in Settings >> Vara Setup, check "SysLog"

This creates a running log, which you can view with Visual Syslog Server

- https://maxbelkov.github.io/visualsyslog/
- Run this while Vara is running, and you can see Vara contacts as they happen

Using Visual syslog server with Vara

Enable "Syslog" in Vara Setup

Run Visual Syslog and see Vara events as they happen!



| Visual Syslog S | Server 1.6.4 | essing | Highligh | nting | Cots new More View prev Vew next View Te Clear About Terminate | > |
|--------------------|--------------|--------|----------|----------|--|---|
| View fil | le syslog | Alle | | match | v | |
| Displaying 832 mes | sanes | 2010 | lessages | match | | |
| Time | IP | Host | Facility | Priori T | g Message | |
| Aug 02 15:44:46 | 127.0.0.1 | 1 | local0 | info | 2023-08-02T22:44:46Z XFR-Windows VARAFM Connecting to KX/YT-10 1/2 | |
| Aug 02 15:44:50 | 127.0.0.1 | 1 | local0 | info | 2023-08-02T22:44:50Z XFR-Windows VARAFM Connecting to KX7/T-10 2/2 | |
| Aug 02 15:44:54 | 127.0.0.1 | 1 | local0 | info | 2023-08-02T22:44:54Z XFR-Windows VARAFM KX7YT-10 disconnected TX: 0 Bytes (Max: 0 bps) RX: 0 Bytes (Max: 0 bps) Session Time: 00:08 | |
| Aug 02 15:45:18 | 127.0.0.1 | 1 | local0 | info | 2023-08-02T22:45:17Z XFR-Windows VARAFM Connecting to K7MCE-10 1/2 | |
| Aug 02 15:45:20 | 127.0.0.1 | 1 | local0 | info | 2023-08-02T22:45:20Z XFR-Windows VARAFM Connected to K7MCE-10 | |
| Aug 02 15:45:37 | 127.0.0.1 | 1 | local0 | info | 2023-08-02T22:45:37Z XFR-Windows VARAFM QRT Received | |
| Aug 02 15:45:37 | 127.0.0.1 | 1 | local0 | info | 2023-08-02T22:45:372 XFR-Windows VARAFM K7MCE-10 disconnected TX: 87 Bytes (Max: 566 bps) RX: 100 Bytes (Max: 566 bps) Session Time: 00:17 | |
| Aug 02 16:01:22 | 127.0.0.1 | 1 | local0 | info | 2023-08-02T23:01:22Z XFR-Windows VARAFM VARA FM Started | |
| Aug 02 16:01:30 | 127.0.0.1 | 1 | local0 | info | 2023-08-02T23:01:292 XFR-Windows VARAFM <-REGISTERED N4LYD | |
| Aug 02 16:12:13 | 127.0.0.1 | 1 | local0 | info | 2023-08-02723:12:13Z XFR-Windows VARAFM VARA FM Started | |

Just for fun: the DRA-70 can be bought as a kit!

What you get in the mail

Hours of fun soldering later





More resources

This page is useful, but they suggest a different PTT mechanism: <u>https://winlink.org/sites/default/files/RMSE_FORMS/rms_packet_dual_mode_singl_e_radio_setup_0_0.pdf</u>

Another setup guide:

https://winlink.org/sites/default/files/RMSE_FORMS/quick_setup_guide_for_winlin k_sound_card_packet_for_vhf-uhf_on_windows_v1.2.pdf

And if you're a reluctant Windows 11 upgrader - here's an install/config guide:

https://www.pcworld.com/article/828207/7-frustrating-windows-11-annoyances-ho w-to-fix-them.html