

	<b>Matrix Portable</b>	<b>BlueBox</b>	<b>Vector</b>	<b>Matrix Rack</b>
<b>Built for the real world</b>				
Rugged design for years of trouble-free use.	Field-proven	Field-proven	Field-proven	Space efficient, 1 U rack
Software updates	Via data port	Via data port	EPROM exchange	Via data port
Switching power supply works everywhere.	Yes, plus optional, rechargeable battery for up to seven hours operation.	Yes	Yes	Yes
Store and forward via phone line mode	Ability to record and store 10 minutes of full-fidelity audio to send in non-real time.	No	No	Yes
Two contact closures for remote control. One is automatically enabled upon codec synchronization, while the second is a momentary closure activated by a button press on the codec on the other side of the signal path.	Yes	Yes	Yes	Yes, plus abilities to dial on contact closure and to remotely control contact closures.
Custom road cases optionally available.	Yes	Yes	Yes	No

# COMREX

## All About POTS Codecs

### What is a POTS Codec?

POTS is an acronym for Plain Old Telephone Service. It's a straightforward way to describe the familiar dial-up telephone service that we use every day. (In some parts of the world, it is called PSTN for Public Switched Telephone Network, but we'll use POTS.)

A codec is a coder-decoder. A signal goes into the "coder" part and is processed according to the function it is supposed to perform. In this case, analog audio is converted to digital and then processed (digitally compressed) to reduce the size of the digital signal to make it more compact. On the "decoder" side, the converse happens. The signal goes through digital decompression and then is converted back to analog audio.

Functionally, POTS Codecs are used in pairs. At one location, a POTS Codec is used as a coder. Attached to a POTS line, it sends the compressed digital signal to the other location via the POTS line where the second POTS Codec decodes the signal. Comrex POTS Codecs are fully bidirectional, allowing both units in the pair to transmit and receive high-quality audio.

### When would I want to use a POTS Codec?

The most frequent use is for live broadcast of news, interviews, traveling talk shows, sports, and entertainment audio. POTS Codecs often stand-by as backups when ISDN or satellite is used for the primary feed. Some radio stations use a POTS Codec as a backup to their studio-to-transmitter link.

By the way, as long as we mentioned ISDN, Comrex also offers ISDN Codecs. If quality is paramount, ISDN is the clear choice. However, for grab-it-and-go situations, POTS can't be beat. For more info on our ISDN Codecs, contact us or visit our website. For quick reference, here is a comparison of the advantages of these two services:

	<b>POTS</b>	<b>ISDN</b>
Set up	Faster	
Usability	Easier	
Availability	Better	
Installation time	Shorter	
Costs	Lower	
Audio quality		Best
Line stability		More predictable

## How do POTS Codex sound on the air?

Comrex has elevated POTS Codec performance to a new level, providing low-artifact, two-way 15 kHz audio response on most connections. When telephone line quality is below standard and does not support full data rates, our POTS Codex can adapt and provide lower audio response rather than drop the connection.

Computer modem users know that, on some phone lines, connection speeds are not as good as on others. The same is true with POTS Codex. We specify up to 15 kHz audio performance on typical phone lines that are able to function at data rates of 24 kbps and above. On lines with data rates as low as 9.6 kbps, your Comrex POTS Codec will provide acceptable audio quality for broadcast. Contact us or visit our website for full details on audio performance.

### *You say that a POTS Codec is two-way – so is a phone line?*

Yes, but the POTS Codec turns the phone line into a full four-wire circuit. This means that both program and cueback can be sent over the same phone line. This is a real advantage when off-air monitoring is delayed from real-time, such as with HD Radio, when using a profanity delay, or where off air monitoring cannot be used on live remotes.

### *I've seen some devices by Comrex that are called "frequency extenders." Are these POTS Codex?*

No they are not. Frequency extension is an early technology, developed by Comrex and introduced in 1976, to improve the quality of audio transmission over POTS lines. While many of the thousands of frequency extenders remain deployed, our introduction of the first high-quality, dependable POTS Codex in 1996 again redefined remote audio transmission over POTS.

For more information on frequency extenders, visit the Comrex website.

### *1996 was a long time ago in technology years. Have you kept up?*

Absolutely. Our first POTS Codec was officially named HotLine, but most users affectionately called it "the Red Box." While no longer manufactured, we still support and provide occasional software updates to keep HotLines, and all of our POTS Codex, as up-to-date as possible.



Matrix



Matrix Rack



BlueBox

### ***So what POTS Codec models do you make now?***

We offer three choices for use in the field: Matrix Portable, BlueBox, and Vector elevate POTS performance to new levels, providing up to 15 kHz audio response on most connections. They are designed to be very portable, used virtually anywhere in the world, and operated by non-technical staff.

For the studio side, the Matrix Rack is the perfect companion to all of your field POTS Codecs.

Every Comrex POTS Codec is compatible with the others, including the original HotLine.

Mobile phones are almost POTS. Do these POTS Codecs function wirelessly using the mobile phone network?

You actually ask two questions and the answer to both is, "Yes."

All three portable units can be connected to the hands-free port of many mobile phones. Although audio quality is not much better than a standard mobile phone call, it provides a useful backup tool.

The exciting news is that there is now an optional GSM wireless module for Matrix Portable that incorporates mobile telephone technology with a new Comrex audio coding algorithm. Frequency response of up to 7 kHz is possible with reduced artifacts. Comrex is the first to introduce this new option in remote broadcast and the reviews from the field are excellent.



Vector

### ***How do I know which Comrex POTS Codec is best for me?***

All of our POTS Codecs offer a core feature/function set that includes the standard-setting Comrex audio quality and reliability.

Choice of a field unit depends primarily on your input, output, and mixer requirements.

- Matrix Portable offers the greatest flexibility, as optional modules allow it to be used with ISDN and GSM wireless in addition to POTS.
- BlueBox, with a single input and single output, is your best choice if you have a tight budget or need the smallest POTS Codec with no compromise in performance.
- Vector incorporates a full-featured remote studio in a three-pound package. Non-technical users appreciate its easy-to-use interface.

For the studio, Matrix Rack works with all of our POTS, ISDN, and GSM Codecs, as well as those from nearly everyone else. Matrix Rack provides a great home base for every remote you may do.

A full comparison chart can be found at the end of this primer.

***Don't other companies make POTS Codecs? Why should I buy Comrex?***

Confidence is the best reason. When you purchase any Comrex product, you can be confident that you are using the most rugged and reliable remote broadcast equipment available. We've been at this for 40 years and understand that with live broadcast, you don't get a second chance.

Ease-of-use and reliability save you time and money on training and downtime. Problems with our POTS Codecs are rare, but when they do happen, our support is fast and effective. That's why there are more Comrex POTS Codecs in the field than all other brands combined.

If you are still not convinced, contact Comrex or your favorite broadcast dealer for information on a no-obligation demo.

***So if I put a Comrex Codec side-by-side with the other guy's unit, the Comrex will perform at least as well and probably better?***

You don't expect us to be modest, do you? But our reputation demands that we be honest.

The answer to your question is, "Yes" if you compare POTS Codecs carefully.

- Performance of all POTS Codecs is dependent on telephone line quality that can vary from call to call, even on the same line. So side-by-side comparisons can be anecdotal rather than scientific.
- As previously noted, our original HotLine was introduced some time ago and there are many thousands of these units deployed. When comparing HotLine with Comrex's current POTS Codecs (or those from other manufacturers), these newer products will, of course, perform better. We offer our HotLine customers special programs to help them trade-up their "Red Box" to our latest technology.
- This technology advances quickly. Comrex provides our POTS Codec customers with free performance updates. Without these updates, our users may not be getting the best from their units.

We are confident that, in comparison tests using our current range of products, Comrex POTS Codecs function as well, if not better, than anything on the market.

## Comrex POTS Codec Feature/Function Comparison

	Matrix Portable	BlueBox	Vector	Matrix Rack
<b>Audio Quality</b>				
Full duplex FM quality (15 kHz) audio bandwidth at connect rates of 24 kb/s and above.*	Yes	Yes	Yes	Yes
Full duplex audio scales from 12 kHz to 5 kHz at connect rates of 21.6 kb/s to 9.6 kb/s.*	Yes	Yes	Yes	Yes
Selectable "Voice Mode" allows 7 kHz audio with a 300-baud ancillary data channel and extra forward error correction. Can be used when ancillary data is needed or line quality is particularly troublesome.	Yes	Yes	Yes	Yes
Built-in peak limiter.	Yes	Yes	Yes	Yes
Short coding delay (100 mS) allows seamless two-way conversation.	Yes	Yes	Yes	Yes
* Audio performance may vary with phone circuit conditions.				
<b>Line Connection Reliability</b>				
Automatic modem negotiation connects at highest possible rate supported by telephone connection.	Yes	Yes	Yes	Yes
Phone line quality is continuously monitored and modem renegotiates if the line degrades during the call. Renegotiation may be disabled to prevent dropouts at inconvenient times.	Yes	Yes	Yes	Yes
If transmission errors occur, a one-button function resets the modem to the next lower data rate without dropping the line.	Yes	Yes	Yes	Yes
Maximum data rate can be manually preset to provide a safety margin.	Yes	Yes	Yes	Yes

	<b>Matrix Portable</b>	<b>BlueBox</b>	<b>Vector</b>	<b>Matrix Rack</b>
<b>Easy to use dialing and configuration interface</b>				
Quick-dial memory storage in nonvolatile memory.	20	20	50	20
One-touch redial.	Yes	Yes	Yes	Yes
Auto-answer (on first or sixth ring) and manual answer.	Yes	Yes	Yes	Yes
Works with external phones, for PABXs and operator-assisted calls.	Yes	Yes	Yes	Yes
Accepts dialing strings of up to 44 digits with pauses.	Yes	Yes	Yes	Yes
Dialing parameters for 20 countries are menu selectable.	Yes	Yes	Yes	Yes
LCD displays modem connection speed.	Yes	Yes	Yes	Yes
<b>Interconnection and compatibility</b>				
Compatible with all Comrex POTS Codec models.	Yes	Yes	Yes	Yes
Module to add GSM wireless phone. Includes antenna.	Optional	No	No	No
Interface to cell phone data ports.	Optional	Yes	No	No
Coupler mode to place standard phone call.	Optional	No	Yes	No
Module to use codec with ISDN.	Optional	No	No	Optional

		<b>Matrix Portable</b>	<b>BlueBox</b>	<b>Vector</b>	<b>Matrix Rack</b>
<b>Audio connections and mixing</b>					
Microphone mixer		Yes	No	Yes	No
Audio inputs	Mic inputs XLR variable level	One		Two	
	Mic/line inputs XLR variable level	One	One	One	
	Line inputs	One mini-jack line; fixed level.	One mini-jack line; fixed level.		One XLR line; adjustable level.
	Other			One XLR mic/line; adjustable level and assignable to main program or headphones	
Headphone output (adjustable mix of send & receive audio).		One	One	Three	No
Balanced line level audio out (XLR)		Adjustable mix of send/ receive audio	Adjustable mix of send/ receive audio	Adjustable mix of send/ receive audio	Yes