Utilizing IP & Data Services to provide Secure Global Push To Talk Communications
Who we are

Tracer Technology Systems global headquarters is located in Billings Montana and is a Technology development company for over 27 years. Specialize in both conventional and IP communications technologies:

- Public Safety, Law Enforcement, and Military Customer Base
- 2-way radio communications agencies
- Industrial services in remote areas
- Critical Communications for Homeland Security
- Radio Over IP (RoIP) and Voice Over IP (VoIP)
- Radio Interoperability
  - 2-Way radio communications with any other device
  - Other 2-way radios, IP Transport, Cellular, Computers...

*We are Push To Talk Experts*
How can IP technology be used to securely extend the range of Push To Talk (PTT) communications to field personnel (and others)?
PTT technology points to consider

• Region
  • Forces are deployed globally and must be able to utilize many different communication transport methods without losing the ability to communicate based on the area they are sent to. Therefore the technology must be capable of utilizing IP available in the area.

• Form Factor
  • Forces already carry enough equipment therefore additional equipment necessary to accomplish the benefit will be outweighed by the additional weight.
  • A handheld 2-way radio is a device with knobs and antenna on the top, a PTT bar on the left side, a speaker and display in the front with a removable battery. This form must remain the same to maximize the operational capability for the user.
  • Users of 2-way radios are not the kindest to this equipment therefore it must be rugged and forgiving of the environment used in.

• Cost
  • Funding is tight, therefore it must be priced similar to existing 2-way radios.

*If anyone of these points are not considered, the technology will not be accepted*
“Inherent in wireless communications is the surety of failure when only one method of transport is utilized”

Murphy’s Law

Conventional Radio Thinking

• **Range**
  • Conventional 2-way radio distance without a repeater is ~14 miles
  • Trackable even if encrypted using Radio Direction Finding (RDF)
  • Easily Jammed by higher power transmitters
    • *Spread Spectrum helps minimize this threat*

• **Interference**
  • Susceptible to interference from other electronic technology

• Difficult to manage encryption among multiple radios
• GPS tracking is only useful if able to access a wide area transport mechanism
• Licensing “can” be an issue in urban environments

...*but we have always used conventional/digital radios, why change?*
How to Enhance Push To Talk?

1. The radio must be secure
2. The radio must look, sound and operate like current radio technology
3. All technologies required to operate must be contained within the radio, not externally
4. Multiple technologies must be available in the event that the primary IP source is not available
5. Must be usable regionally, which is now globally, without any modifications, changes or methods
6. Must be able to interact with other technologies with a minimal amount of additional hardware
   1. Telephony: SIP telephone networks
   2. 2-Way radio: Other 2-way conventional radios
   3. Any other technology not yet developed
What IP Communicator® Push To Talk is not...

Are not a switch or router technology provider (REDCOM, Cisco… or other secure router product) we don’t make switches or routers

A toy technology that tries to act like a 2-way radio using IP as the backhaul

A bandwidth hog that requires high speed IP connections to operate

A communications solution that can only be used for casual non-secure communications and operations.
What IP Communicator® Push To Talk is ...

Are an IP device that can ride on your existing secure connection or we can ride public WiFi, Cellular or satellite networks while maintaining encryption from end to end, pole to pole using private or public IP.

Provide robust Push To Talk communications (PTT) between personnel globally utilizing any number of different IP communications media.

A high IP bandwidth application that requires large amounts of data to provide PTT communications.

Most importantly, a reliable radio technology that provides a secure method of communicating regionally or globally utilizing both private and public networks.
1. Powerful secure communications system that provides a complete communications solution to an organization.

2. Does not rely on a single organization's communications network to function, removing downtime when the network fails or is unavailable (more on this later)

3. Provides a complete toolset of devices necessary for efficient operation
   - Computer based dispatch
   - Windows™ based Virtual IP Communicator units
   - Vehicle and rapid deployment case units
   - Communications on the Move and Pause operation
   - Away from the vehicle operation with handheld radios
   - Smartphone operation on Android OS (in development)
IP Communicator® Push To Talk Overview

- Low data bandwidth operation optimized for cellular transport
  - Less than 12kbps transport
- Form and feel like a “normal” 2-way PTT radio
- Not an Android phone, but a rugged 2-way handheld
- Loud 3W audio speaker, optional speaker microphone, replaceable battery pack with +12V~48V vehicle operation
- IP65 water/sand resistant physical design
- Channel/Volume knob on the top with an external antenna for better operational coverage. Built-in WiFi and GPS/GNSS antenna
- Internal Cellular operation option
  - LTE (4G), HSPA+(3G) with internal SIM module support
IP Communicator Diagram

V Trunk™
Cloud Based Radio Service
(Public or Private)

IP Connection
- WiFi
- Cellular
- Satellite

IPR Device
User Hits their Push To Talk Button

Immediately begin sending the VoIP stream to the V Trunk™ service for routing

V Trunk™ immediately spawns connections to devices that are within the same Talk Group

Unlimited

Data rate: 12kbps

IP Radio Routing

V Trunk™

Cloud Based Radio Service

IPR Devices
IPR5000

- ¼ VGA Color Display
- Configurable sealed rubber button interface
- Vehicle mounted or table top design
IPR1500 (coming soon)

- Direct sunlight readable LCD display
- Integrated Cellular operation (option)
- GPS/GNSS location (optional)
- Configurable sealed rubber keypad control
- Handheld design
- Attaches to any power source, such as a cigarette lighter or AC power supply or can be powered over any POE Network Port
- External Ethernet Connection supporting POE operation (option)
I PR4500 (coming soon)

- Direct sunlight readable LCD display
- Integrated Cellular operation (option)
- GPS/GNSS location (optional)
- High capacity battery for days of operation from a single battery
- Drop-in Charger for battery
- Side power and Man Down buttons
- Side PTT button for PTT activity
- Sealed rubber keypad for user control
- Replaceable internal battery, belt clip
- Handheld design
- Bottom accessible speaker microphone connector for an external PTT mic.
- Side volume/backlight control buttons
  - (on the right side of the mic)
IPR1500/4500 Telephone Operation

- Integrated Cellular operation
- Incoming and outgoing calls
- Caller ID on incoming calls
- SMS text message send and receive
- Cell Phone call phonebook
- Bluetooth headset
- Programmable Ringtone
2-Way Radio Integration
TTS-IP2 LMR gateway interface

Integrates Land Mobile Radios (2-way) into the IP Radio Network
- Supports two radio per interface
- Integrates over cabled Ethernet
- Supports low data 12kbps bandwidth
- Additional features such as repeater controller from with ID’s and timers over each port
- Streams VoIP, SIP, and Multicast

- Small affordable interface to integrate your radios over IP
IP Radio Dispatch tools

LinkTDS: Computer based dispatch tools available for and Windows™ based computer. Enables centralized or distributed dispatch control for your IP Radio connections and users.
IP Radio Virtual Radio Unit

- Windows® based complete radio that utilizes the computer's microphone and speaker to provide a soft IP Radio
- Application can run in the background for real-time access to the PTT system or can be started when needed
- No cost application, user only pays a small fee on a monthly basis to use the service
- Ideal tool for office communications without any hardware costs
IP Radio Android App

- Support for access to the systems multiple Zones
- Support for access to multiple channels under the selected Zone
- Operates over WiFi or Cellular, depending on the Android smartphone
- Application can run in the background for real-time access to the PTT system or can be started when needed
- Displays caller ID from the unit which is currently active on the device
- No cost application, user only pays a small fee on a monthly basis to use the service
Why IP Communicator®?

• Complete solution, not just a nice Black box. The IP Radio solution covers all bases of operation from the office to the field without compromising operation or quality.

• Is the only global PTT technology that does not force operation from only one carrier. If your PTT system fails because of satellite or cellular carrier, and you cannot move to a different carrier because of exclusivity, then your operations are affected. IP Radio does not care about the source of the IP, just the availability of the IP. If the carrier fails then simply redirect your service to a carrier that is operational without any affect to the routing and operation of your system.

• Designed by radio Push To Talk experts, to operate like a 2-way radio was intended to operate like.

• Reliable, Affordable and Available.
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