TVS-2
Hopping Code Scrambler

Midian's TVS-2 voice scrambler protects two-way radio communications from eavesdropping by casual and determined listeners. By using true frequency hopping, the TVS-2 provides the highest level of rolling code voice privacy.

The TVS-2 is protecting communications worldwide in systems for Armed Forces, Intelligence Services, Public Safety (Police, Fire, Ambulance), Fleets (Taxi, Towing, Fishing, etc.), Industrial and Utility users.

The TVS-2 radio encryption can be installed into virtually any model of two-way radio and into most any type of radio system. In fact, Midian supports many radios from the most popular radio manufacturers with plug-in versions of the TVS-2.

Features

Security: The TVS-2 offers 5 user-programmable levels of security, including 4 hop rates and voice inversion. Midian uses frequency hopping rather than frequency sweeping for the highest level of security in rolling code technology. With the TVS-2 each hop is at least several hundred Hertz in length compared to a "sweepers" hop of only 1-2 Hz per "hop". This prevents tracking of the residual inversion tone that is a weakness inherent to sweepers. Please see the chart on the opposite side of this page.

- 5 user-programmable levels of security
  - Level L4: 12-25 hops per second
  - Level L3: 6-12 hops per second
  - Level L2: 1.2-2.4 hops per second
  - Level L1: 0.8-1.2 hops per second
  - Voice Inversion

Voice Quality: Midian's TVS-2 provides excellent voice quality and speaker recognition between scrambled and clear audio.

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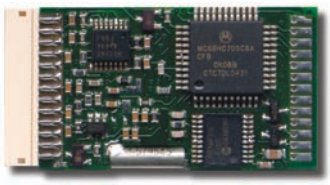

Shown: TVS-2

Features Continued

Plug-In Modules: Midian offers plug-in versions of the TVS-2 for Icom, Kenwood, Maxon, Motorola, Tait and Vertex radios. For radios without an options connector, Midian's TVS-2 will wire into the radio. Midian offers many application notes for installation into various radios.

Dual Mode: When ordered with the Dual Mode option the TVS-2 can have one or more security codes set for rolling code and one or more codes set for inversion scrambling. This is ideal for systems upgrading from voice inversion scramblers to rolling code scramblers.

Midian's Kryptic Signaling: Midian's Kryptic signaling format is a digital form of signaling that offers the following features when used with Midian's CAD-300, DDU-300 or TRC-300 controllers:

- ANI & Emergency ANI
- Selective Calling
- Radio Kill
- Spy
- Radio Check
- Over-The-Air-Reprogramming (OTAR) of the security keys

Use in Most Systems: Midian's TVS-2 can be used in conventional, trunked, simulcast and voted systems. For HF Systems Midian recommends using the VS-1200 or the VPU series scramblers.

Automatic Detection: The TVS-2 can be programmed to automatically detect scrambled and clear conversations. This eliminates the need for the receiving radio's operator to manually toggle the mode of the voice scrambler.

Product Quality: Midian believes in and adheres to a strict quality program. This is backed up by Midian's 3-year warranty on parts and labor.

TVS-2: General Specifications	
Operating Voltage	Varies on Module
Operating Current	< 9 mA
Operating Temperature	-30 to +60 C
RX Input Level	Varies on Module
TX Input Level	Varies on Module
TVS-2: Security Specifications	
Total Code Combinations	+40 Trillion
Security Keys	+4 Billion
System ID's	10,000
# of Selectable Keys	4
Rolling Code Type	Hopping
Minimum Length of Hop	300 Hz
Export Controls	Minimal
TVS-2: Kryptic Signaling Specifications	
ANI	0000-9999
Emergency ANI	Yes
Status	00-99
Location	100 (10 x 10 grid)
Selective Calling	Yes
OTAR of Security Keys	Yes
Radio Kill	Yes
Spy	Yes

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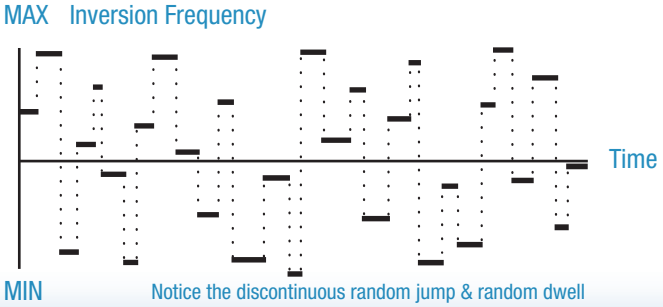
Hopping versus Sweeping Rolling Code Scramblers: Midian's TVS-2 uses the hopping type of rolling code scrambling, instead of the sweeping type, for higher security. Both types of scramblers claim a certain number of hops per second. Sweepers imply a higher level of security because they "hop" hundreds of times per second. However, it is the length of the hop that is important rather than the number of hops per second. Each "hop" of a sweeper is approximately 1 Hz in length whereas each hop of a true hopping scrambler is at least 300 Hz. Therefore it would take ~300 hops of a sweeper to equal the change of a true hopper in one hop. Because of the negligible frequency change of a sweeper, sweepers are susceptible to attack by tracking the sweeping with a phase lock loop (PLL) circuit.

Midian's Frequency Hopper



Competitive Frequency Sweepers