



DMS CloakCom™

Keyless & Featureless Secure Metaform

ABOUT DMS

DMS is Small Disadvantaged Business with a DoD Facility Clearance.

A Technology Services Firm

- Innovative & Customized Solutions
- Technology Transfer
- Science and Engineering Support
- Project Management
- Program Management

NAICS Codes

541330 541511
541512 541513
541519 541611
541712 561110
611420

Contract Vehicles

- NAVY SeaPort-e
- ARMY RS₃

A Small Company with Large Company Best Practices

- Functional efficiency
- Accurate and scalable operations
- Monitored and maximized quality

Client Base

- U.S. Army Research Laboratory
- Naval Sea Systems Command
- Marine Corps Systems Command
- Naval Air Systems Command
- Bureau of Engraving and Printing
- Department of Energy

“Making Technology work for you!”

Introduction:

Whether it's been H.G. Wells' "The Invisible Man" or Harry Potter's Invisibility Cloak or the Cloaking Device of Star Trek lore; people have always wanted to be able to move and communicate without detection. Being able to communicate securely is an extremely valuable asset to many businesses such as banking, medical institutions, and high technology firms as well as governmental organizations, especially the intelligence community. Billions of dollars have been spent on developing hardware and software solutions to secure electronic communications; however, to date, the industry has only been able to stay one step ahead of adversaries and hackers. Each new step has offered only incremental benefits and is increasingly more expensive to implement, because it relies on making more and more complex encryption codes and keys overlaid on existing technology. It's like trying to hide a brick under a rug by adding more rugs. You might make it less obvious, but you will still be able to locate the brick by looking for its features that are different than the rugs that cover it. DMS CloakCom™, on the other hand, pulverizes the brick, mixes it with dust, scatters it on the carpet making it invisible. Only the intended CloakCom™ recipient can, shake the rug, get only the brick bits to come out, and reassemble the bits back into a brick. Like a futuristic Transporter, the brick is beamed to its destination without being detected.

What Is It?

DMS CloakCom™ is a keyless and featureless, secure waveform that uses a specialized, stochastic, and keyless algorithm designed to remove waveform features without degrading the bandwidth (i.e. no transmission overhead). This featureless waveform we refer to as a "metaform" since it has no repetitive elements and is frequency agnostic. This metaform also provides the added benefits being highly resistant to jamming; and dramatically reducing, possibly eliminating, the need for Spectrum Management.

How Is It Different?

Bottom Line: CloakCom™ is **NOT** a Spread Spectrum technology.

Most current technologies (like Direct Sequence Spread Spectrum, DSSS) use transforms (i.e. multipliers) to attempt to obscure the signal. They are based on Probability Density Functions (PDF) that are smooth curves (i.e. differentiable) with repeatable elements ("ergodic") – these features make it possible for hackers to rebuild the whole signal from a few parts of an acquired signal.

DMS CloakCom™ uses algorithms that are built on Probability Mass Functions (PMF) that are discrete random variables without repeatable elements – so the whole signal can never be rebuilt by hackers even from a large number of parts. DMS CloakCom™ uses several layers of discrete random variables to ensure the metaform output is nearly identical to background noise.

Spread spectrum limitations are, respectively:

- 1) High overhead that limits transmission rates,
- 2) Specialized timing requires highly accurate clocks, and
- 3) Discernable features that can be exploited and jammed

DMS CloakCom™
Has None of
These Limitations.

DMS CloakCom™ is mathematically (not hardware) derived. The waveform combines highly randomized chains of stochastic processes, each with a unique modulation technique that effectively obfuscates the waveform's signature. Several coefficients are passed through multiple algorithm "gates" that ultimately produce the DMS CloakCom™ waveform, which is indistinguishable from White Gaussian Noise and thus is impervious to detection or deconstruction by an unintended recipient.

The DMS CloakCom™ metaform algorithm provides another equally attractive advantage. There are no keys! Nothing is ever exchanged, shared, or stored between communicants. The algorithm generates its metaform coefficients based on a single negotiated point in relative time. This "relative time" feature is quite unique in that communicants can agree when to set "time zero" and how often (at some "Delta-T") they will dynamically generate new coefficients – which can be as short as every 10ns (i.e., this is not session specific, as with other encryption solutions.)

This approach eliminates the need for highly accurate clocks (i.e. one can use commercial grade oscillators). Communicants can even have significantly drifted clocks and still be able to communicate. There is no reliance on external timing like GPS. The DMS CloakCom™ technology can also use a simple Omni-directional antenna which can save a lot of space and weight in aviation applications. Finally, DMS CloakCom™ requires significantly less power since it generates very little overhead and does not have to overcome interference from competing signals.

The Major Advantages of CloakCom™:

- DMS CloakCom™ is platform independent
- DMS CloakCom™ can use COTS equipment with no loss of feature integrity
- DMS CloakCom™ is frequency, data rate, and transmission medium agnostic
- DMS CloakCom™ can be retrofitted to existing equipment preserving investments in equipment
- DMS CloakCom™ secures the RF carrier itself as opposed to the information it carries
- DMS CloakCom™ has minimal overhead, secure real-time video and augmented reality now possible
- DMS CloakCom™ can be submerged in background noise, virtually invisible, except to intended communicants
- DMS CloakCom™ eliminates the need for highly accurate clocks
- DMS CloakCom™ does not require a high accuracy time reference such as Global Positioning System (GPS) or U.S. National Time Standard (WWVB)
- DMS CloakCom™ can provide ranging, relative position information in absence of GPS
- DMS CloakCom™ does not require individual RF spectral space
- DMS CloakCom™ can coexist in the same space as any number of other RF-enabled devices without interference, distortion, or detection – no spectrum management issues
- DMS CloakCom™ equipped networks essentially "go dark" to would-be hackers while still being able to send and receive information without detection
- DMS CloakCom™ allows communications in signal denied areas – deny adversaries situational awareness
- DMS CloakCom™ low power requirements make it suitable for unmanned systems, satellite comms, and Special Ops applications

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