Kestrel TSCM ® Professional Software

Now You Can Have Tomorrows Software—Today!

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Advancing the Art and Science of Technical Security

The competition tells its potential customers that the problem with the Kestrel TSCM ® Professional Software, is that it captures too many signals — Inexplicably Ironic!

Kestrel ® is a highly evolved TSCM | SIGINT specific, operator centric SDR application, and we make <u>no</u> apologies for the advanced capability of this industry disruptive, standards based capability, in meeting evolving challenges of technical operators, working within the private sector, regulatory authorities, law-enforcement, government, military, and the national security apparatus, who are faced with a modern moving target threat model, in combating the insidious and growing threat of cyber-espionage, global terrorism, and the devastating financial damage and lost business opportunities caused by state sponsored, economic-espionage.

The Kestrel TSCM ® Professional Software is <u>not</u> a simplistic desktop spectrum analyzer, offering limited capability, but rather, is a highly deployable, mission scalable, travel friendly, full featured TSCM focused product, for professionals.

Kestrel TSCM ® Professional Software engages, and brings the professional technical operator back into the equation, with innovative, and many, never before seen, standard included, features and functionality.

Kestrel TSCM ® is mission adaptable, scalable, upgradable, and well-positioned to generate the opportunity, for new and recurring revenue streams, while exponentially improving, real-world Probability of Intercept (POI), and Probability of Detection (POD) for the end-user, by embracing a moving target threat model, as defined under the TSB 2000 (Technical) Standard ™.

Finally, the technical operator, and not the equipment manufacturers are defining and redefining field deployment capability and modern resources, that are decidedly founded, on an entirely new professional services methodology!

It is the experience and real-world needs, of professional level technical operators like you, that continue to drive the success, and the future of the Kestrel TSCM ® Professional Software development process.

Perhaps your innovative Software Defined Radio (SDR) idea, or feature, will be added to the next official release of the Kestrel TSCM ® Professional Software!
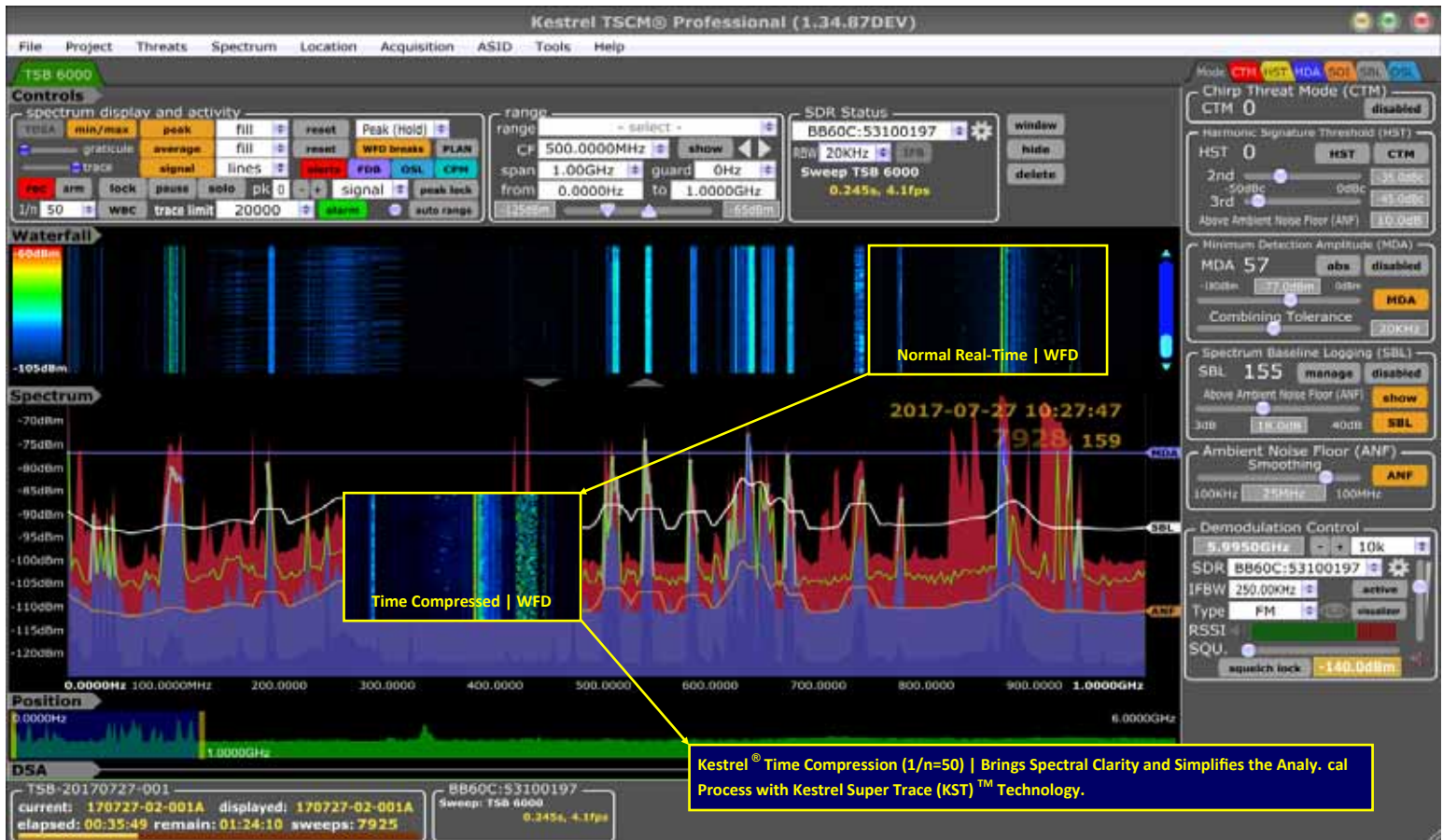
comsecllc.com/tscm-products/

End-User Expectations — Delivered!

The Kestrel TSCM ® Professional Software delivers exceptional value, without the need to compromise on features and functionality. Kestrel ® is the product of years of operational field experience in delivering real-world defensive Technical Surveillance Countermeasures (TSCM) at all operational threat levels. The unique approach to developing, not only the most technologically advanced TSCM software available, but also, changing a complacent, and outdated deployment methodology, has revolutionized the technical security industry worldwide. The Kestrel TSCM ® Professional Software is always considered a work in progress, with room for improvement, and the software engineering, development, and Technical Research and Standards (TRSG) ™, continue to work on entirely new, modern, operator centric, features and functionality. We encourage you to join the Kestrel ® revolution, and compare, the many benefits of making the Kestrel TSCM ® Professional Software part of your primary deployment kit. ✎

If you would like additional information about Kestrel®
please contact **lml@comsecllc.com**.

Kestrel TSCM ® Professional Software | Innovation is Simply the Beginning

Normal Real-Time | WFD

Time Compressed | WFD

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Kestrel ® Time Compression (1/n=50) | Brings Spectral Clarity and Simplifies the Analy. cal Process with Kestrel Super Trace (KST) TM Technology.

Kestrel TSCM ®
Professional Software

Signal Intelligence Support System (SISS) TM

The Kestrel TSCM ® Professional Software leverages advanced Software Defined Radio (SDR) concepts to deliver proven, industry leading, standalone RF Remote Spectrum Surveillance and Monitoring (RSSM) TM, collection and analysis functionality. Work flow oriented features tailored to professional TSCM applications are integrated into an intuitive operator centric user interface, and contribute to a high standard of usability. With its extensive functionality, the Kestrel TSCM ® Professional Software is the ultimate future-proof radio-frequency sensing solution for a wide range of applications. The Technical Research and Standards Group (TRSG) continues to develop unique and innovative products and deployment methods. Developed in Canada, the Kestrel ® software supports a wide range and level of professional receivers and spectrum analyzers, and is available to technical security professionals worldwide. ✎

User Interface (UI)

Kestrel's ergonometric user-interface promotes operator situational awareness by grouping and dynamically linking essential control elements, in combination with intelligent automation.

RF Spectrum Display (RSD)

Multiple tabbed spectrum windows permit any number of frequency Ranges of Interest (ROI), or band allocations to be searched in parallel.

Waterfall Display (WFD)

Kestrel's Waterfall Display (WFD) in combination with   spectra recording capability, enables the time history of signal events to be instantly reviewed.

Live View Analysis (LVA) TM

Real-time analysis of continuous and periodic signal events, is supported without the need to interrupt the runtime data collection process.

Artificial Intelligence (AI)

Kestrel's Threat Detection Algorithm (TDA), and Signal Combining Technology (SCT) TM detects and characterizes, wide bandwidth signals.

Spectrum Baseline Logging (SBL) TM

The technical operator can quickly capture a detailed baseline trace, and reference signal list.

Demodulation and Visualization

Demodulate and record AM, FM and SSB audio, FFT displays include the RF Spectrum, Spectral Density, IQ Diagram, IQ Vs Time, RSSI History, Analog RSSI, Audio Oscilloscope, AF Spectrum and NTSC Video demodulation.

Threat Detection Algorithm (TDA)

Detection modes include, Minimum Detection Amplitude (MDA), Harmonic Signature Threshold (HST), and Chirp Threat Mode (CTM).

Location Differential Signal Analysis (LDSA) TM

A graphical LDSA TM model permits the import of floor plans, vertical riser, geographical maps, 3D rendering, and photographs for direct comparative analysis, of all collected data.

Time Differenaàl Signal Analysis (TDSA) TM

Time DSA TM provides the capability to generate technical operator defined DSA TM traces, based on runtime or post review, consisting of defined time blocks, for direct comparative analysis.

Session Report Generator (SRG) TM

Kestrel's integrated report generator, and project management structure, provides unprecedented sophistication in a TSCM application.

User Interface (UI)

An intuitive, user-friendly, work-flow based, operator centric user-interface , places all essential, commonly used display, and control groups up-front. Dynamic control linking, the use of Artificial Intelligence (AI) and predictive logic, optimize settings that remain under the full control of the operator during collection, review and analysis. ✔

Spectrum Display Ac vity | Control Group

The operator can setup, navigate, view and analyze, multiple instances of independent spectrum and waterfall data sets, in a familiar tabbed window format. Various global and independent preferences are supported, improving operator situational awareness. ✔

Automatic Threat List (ATL) TM

Two primary levels of threat list integration and generation, work intuitively to provide advanced dynamic Positional Zoom Control (PZC) TM, and discrete signal demodulation ability. The sidebar ATL provides immediate access to discrete signal events captured, and displays the frequency (MHz) and signal level (dBm). The Master ATL TM provides additional signal parameters including identified harmonic relationships, frequency (MHz), signal level (dBm), estimated bandwidth, date and time of collection and location details. The operator can add "identity" and "notes" relating to discrete signal events. Signals are placed on a uniquely color coded tabbed window, and duplicated on the Master ATL TM automatically. Kestrel's "Drag and Drop" technology allows any detected signal to be demodulated, or dropped onto the spectrum display, to immediately invoke a 20x zoom focus on the Signal of Interest (SOI). The operator can enter a high resolution zoom up to 200x   manually using the mouse. ✔

Live View Analysis (LVA) TM

Real-time analysis of discrete spectral events is supported without the need to interrupt the runtime collection process, giving the operator the ability to instantly review historical trace data (on a trace by trace basis), directly on the RSD and WFD display, during runtime, or during off-line post event analysis and review, when working with a historical Kestrel Project File (KPF) TM. ✔

Automac Receiver and Spectrum Analyzer Identification | Configuration

All supported and connected receivers and spectrum analyzers, are automatically detected and initialized during the application start-up process. User definable configuration settings enable spectrum (sweep), demodulation, and analysis (threat detection) functions to be independently programmed at the receiver, or spectrum analyzer level. ✔

Kestrel ® Super Trace (KST) TM

Support for time compressed spectra and waterfall trace data, provide unsurpassed clarity within the analytical process. Time compression is an advanced feature that permits the operator to write a single KST TM consisting of the combined peak data captured from any number of standard traces. ✔

Kestrel TSCM ® Professional Software | IF Broadband (IFB) Mode TM

During traditional sweep operation, it is necessary to interrupt the runtime collection process to accommodate demodulation and signal analysis, for features such as the Automatic Export Control (AEC), and Triggered IQ recording capability. Kestrel's IFB TM mode, permits the maximum real-time receiver, or spectrum analyzer IF bandwidth, down to the discrete signal level, to be captured, recorded, processed and analyzed in | IF | sweep mode. The Kestrel ® IFB TM feature operates in a modified zero span runtime demodulation mode. This permits, the ability to capture pre-event buffering associated with the triggered IQ capability. In normal sweep mode, the sweep must be stopped to accommodate the demodulation function, resulting in a short mode change delay of up to 250 mSec (BB60C), and pre-event buffering is not available, unlike the Kestrel ® IFB TM mode. ✔

Kestrel TSCM ® Professional Software | Well Positioned to Hunt in a Complex Signal Environment

Multiple Receiver Operation (MRO) ™

Single Receiver Operation (SRO) ™, Dual Receiver Operation (DRO) ™, and Multiple Receiver Operation (MRO) ™, are all supported with "on-the-fly" dynamic (spectrum and demodulation) "hand-off" between any number and type, of supported SDR receivers and spectrum analyzers. ✗

### Professional SDR Receiver Support

Kestrel Support Profiles (KSP) ™ are available for a wide range of entry level and professional search receivers and spectrum analyzers, for TSCM, SIGINT, and Remote Spectrum Surveillance and Monitoring (RSSM) ™ requirements and applications. ✗

Multiple Spectral Windows

The ability of the operator to display, search and analyze any number of independent spectral range windows, is supported. Multiple independent search Ranges of Interest (ROI) can be accessed on a single monitor via a familiar tabbed window interface, or moved to a second, or third display monitor. The ability to select and view any portion of a currently displayed ROI, and open a new sub-band window, is supported. The Kestrel ® SOLO priority mode, allows the technical operator to assign real-time priority to any single tabbed window, and immediately zoom on any discrete runtime Signal of Interest (SOI). ✗

Positional Zoom Control (PZC)

The operator can utilize the mouse wheel to focus and direct the desired zoom level on the spectral display. The operator may also navigate within the Positional Zoom Control (PZC) ™ window. A double mouse click activates a 20x and 100x zoom factor. A right mouse click allows the operator to select from a menu list of dynamic zoom options based on the current CF and ROI displayed. A mouse based 200x high resolution zoom capability is also supported. "Drag and Drop" from the Automatic Threat List (ATL) focuses the SOI at CF with a 20x zoom factor. The CF, SPAN, START and STOP frequency can be set manually from the navigational control group. See Horizontal Range Control (HRC) ™ for further options. ✗

TDSA (5 MINUTE) WFD PLOT

TDSA TIME BLOCK (TRACE) COMPARATIVE
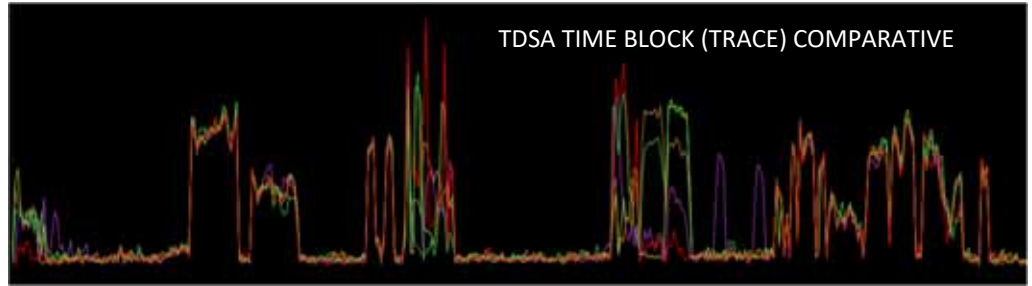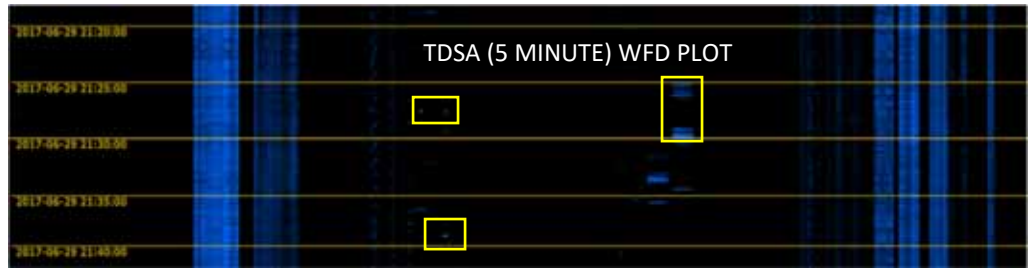
Time Differential Signal Analysis (TDSA) ™

TDSA ™ allows the technical operator to deploy the software for extended periods of time, in a Remote Spectrum Surveillance and Monitoring (RSSM) ™ role, and generate a series of fixed, operator defined time blocks, captured in real-time within a runtime environment (recommended), or applied as a post analytical analysis tool, for a detailed time based Differential Signal Analysis (DSA) ™, across hours, days, weeks, or months of complex spectra, captured from a single collection location. TDSA ™ is a very powerful capability deigned as an adaptive time block, based filter that is under full control of the professional technical operator. During post analysis specific operator defined data and time block periods can be generated, permitting a narrow more focused analytical time review of the spectra and waterfall data. ✗

Global Positioning System (GPS) | Receiver Support

The Kestrel TSCM ® Professional Software provides advanced support for USB based GPS receiver hardware, and permits the capture of the latitude and longitude coordinates for DSA antenna locations, in support of Geographical Area Reviews (GAR), RF Direction Finding, Search and Rescue (SAR) assignments, and wireless survey work. Geographical coordinates can also be entered manually when a GPS signal is not available, such as when working indoors, or underground. GPS coordinates are utilized for plotting FCC and IC frequency database reference mapping. ✗

Search Receiver "Hand-Off" Capability

Synchronized, dynamic "hand-off" is available across all supported search receivers and spectrum analyzer types, regardless of manufacturer, or connectivity method. Seamlessly "hand-off" both the spectrum and demodulation functions, to any connected receiver in real-time. Operator defined programming supports, independent sweep, demodulation, and analyze mode configuration, within the Analyzer Control dialog window. ✗

Location Differential Signal Analysis (LDSA) ™

LDSA ™ can be utilized in several operational modes depending on deployment parameters. Static and Echo LDSA ™ modes allow the operator to collect comparative traces from any number of target area locations and overlay the trace data. Unlike standard spectrum analyzer trace math, Kestrel ® supports MDA ™, CTM ™ and HST ™ spectral marker flag integration, adding an important analytical layer that enhances the Probability of Detection (POD), and ability to identify hostile signal events. ✗

Live View LDSA (LVD) ™

LVD ™ enables the operator to review specific antenna location, comparative traces without interrupting the collection of LDSA ™ trace data in the background. It can be used during active LDSA ™ trace collection, or during post event analysis. Full display functionality, including the Positional Zoom Control (PZC) ™ and all display parameters are preserved. When LDSA ™ Comparative and Peak ECHO Mode ™ are both active, real-time Differential Signal Analysis (LDSA) ™ is dynamically displayed. ✗

Trace Math Analysis (TMA) ™

The ability of the technical operator to display a differential trace comparison for any two antenna locations, is supported. The DSA ™ window supports (A - B) or (B - A) comparison modes for DSA ™ antenna locations. The operator can "Drag and Drop" any two locations to the docking station to display a dedicated differential trace. ✗

Multiple Display Monitors

The operator can open and display, any number of independent spectral windows, across multiple receivers, and dynamically drag the windows to a separate display monitor, or view separate "hand-off" receivers on any available display monitor at, or above 1280 x 800. ✗

Rapid Deployment Kit (RDK)

The entire Kestrel TSCM ® Professional Software | Signal Intelligence Support System (SISS) ™ can be pre-configured, and delivered in a standard transit hard case, or carried in a standard laptop bag. ✗
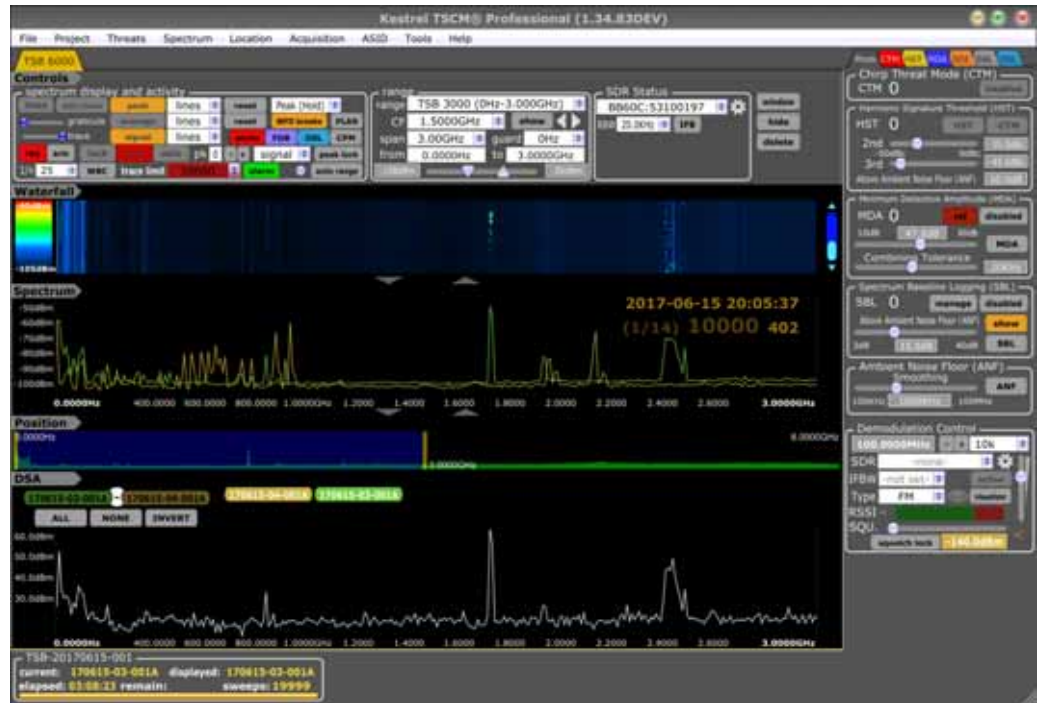
Export | Operator Defined (CSV) Spectra

The ability to manually define and export Spectra data to | CSV | format is supported, based on operator defined parameters, including the | LOCATION |, | BAND |, | START / STOP TRACE INDEX |, and | START / STOP FREQUENCY |. Exported | CSV | files can be utilized in third-party productivity   software to generate graphical representations of the original Spectra. ✗

Export | Runtime Triggered (CSV) Spectra and RSSI

Utilizing the Dynamic Alert Annunciator (DAA) ™ both | SPECTRA | and | RSSI | values can be operator programmed to automatically export | CSV | values on the detection of | SIGNAL EXCEEDANCE | and / or | SIGNAL LOSS | events within the same alert zone. The Kestrel TSCM ® Professional Software supports unlimited operator defined alert zones, which can be exported to | CSV | format and moved to another Kestrel ® system, or imported into a new, or another existing historical Kestrel Project File (KPF) ™. ✗

Automatic Export Control (AEC) ™ | OPT AEC

Kestrel's optional AEC ™ module adds an important dimension for long term, Remote spectrum Surveillance and Monitoring (RSSM) ™ deployment, by automating the export process of | TIME PERIODIC | and | TRIGGERED | spectral events to | CSV | file format. The AEC ™ capability also supports automatic | TRIGGERED IQ | export, across Single Receiver Operation (SRO) ™, and Dual Receiver Operation (DRO) ™ configurations. OPT AEC ™ is required to utilize the automatic | TRIGGERED IQ | sample recording feature. ✗

Command Line Programming (CLP) ™ | OPT CLP

Kestrel's optional CLP ™ module adds the ability to initiate triggered audio (sound) alerting across all existing detection modes. The ability to define system level actions, permits the use of additional external resources, including software programs, ECM command and control, IQ recorders and analyzers, and any number of hand-off and demodulation requirements. The ability to render operator defined network level alerts via email and SMS are fully supported. The CLP ™ module is integrated with the Dynamic Alert Anounciator (DAA) ™ and all other threat detection triggers. ✗

Kestrel TSCM ® Professional Software | Well Positioned to Hunt in a Complex Signal Environment

TSCM Deployment Consideraons

TSCM focused RF spectrum analysis requires innovative equipment resources, and perhaps more importantly, a comprehensive framework for applying the advanced procedures and deployment techniques needed, to meet a modern day, moving target threat model. ✎

Floor Plan (Import)

The ability to import | PNG |, | JPG |, or | GIF | images of the target area, or a facility floor plan, is supported in the Kestrel TSCM ® Professional Software. Differential Signal Analysis (DSA) ™ is a feature, integrated with antenna location spectral data collection points, and is graphically represented on the imported floor plan utilizing Kestrel ® "Drag and Drop" technology. ✎

Vertical Riser Plot (Import)

Support for the import of vertical riser plots allow the operator to utilize the DSA ™ functionality to capture and display collected spectrum data from multiple levels or floors of the target area, adding another dimension of comparative analysis. ✎

Geographical Area Map (Import)

RF surveys and TSB 2000 (Technical) Standard ™ based Geographical Area Reviews (GAR) ™ are easily accomplished by importing any suitable map or chart, and deploying the DSA ™ feature from a mobile collection platform such as a vehicle, aircraft or marine vessel. It is possible to deploy the software utilizing a series of fixed station, collection points, or even data from any number of non-related, co-located locations. ✎

Photo Realistic | Virtual Reality (Import)

Kestrel's photo realistic virtual reality feature allows the operator to import actual target area, or facility level photographs, and overlay DSA ™ antenna location data, directly on the image. This provides excellent situational awareness during Remote Spectrum Surveillance and Monitoring (RSSM) ™ assignments. ✎

Import Historical Comparative Bands

The operator can import comparative spectrum trace data from any previously captured historical Kestrel Project File (KPF) ™. ✎

The ability to import a 3D graphical facility visualization rendering, adds an entirely new dimension, which significantly enhances operator situational awareness when working protective assignments that require an element of real-time facility monitoring.
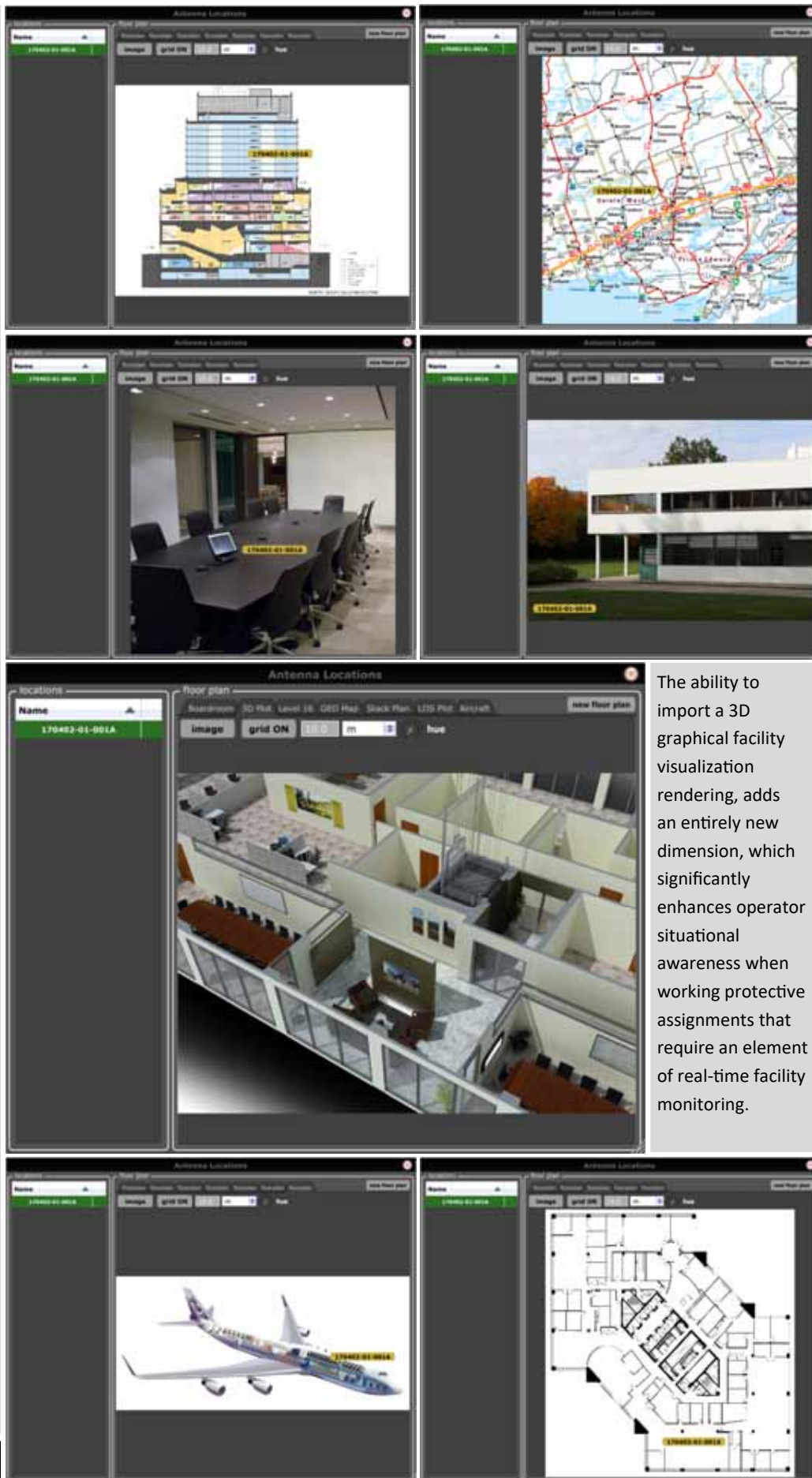
Award Winning | Industry Leading Software

The Kestrel TSCM ® Professional Software, is the first in its class to provide "on-the-fly" multiple receiver "hand-off" of the spectrum and demodulated signal events to all other supported and connected SDR search receivers and spectrum analyzers. ✗

Award Winning | Software Defined Radio (SDR) Design Excellence

The Kestrel TSCM ® Professional Software is the recipient of numerous awards including the CTSC 2013 and CTSC 2014 Software Defined Radio (SDR), Innovation, Research and Development Excellence award. The Kestrel TSCM ® Professional Software received the 2013 Glenn H. Whidden Award for the "Best New TSCM Product", at the Espionage Research Institute International (ERII) Counterespionage Conference in Washington DC. ✗

Technical Operator Centric Design

Designed from the outset to support Multiple Receiver Operation (MRO) ™, the Kestrel TSCM ® Professional Software enables the operator to exploit the full potential of any number and combination of supported receivers and analyzers. Using independent tabbed windows, the operator can sweep any number of independent (active or standby) spectrum band allocations, or custom frequency Ranges of Interest (ROI), across any number of receivers. The ability of the operator to "hand-off" spectrum band allocations "on-the-fly", facilitates uninterrupted dynamic "hand-off" to another connected device. Kestrel's dynamic "hand-off", dynamic synchronization, provides instantaneous connectivity, without data loss during the "hand-off" process. ✗

Kestrel TSCM ® Professional Software | New Technology = New Terminology!

New technology requires new terminology, and operators will soon become familiar with, and recognize, the level of sophisticated simplicity, workflow integration, and the wide ranging deployment benefits of Kestrel's Automatic Threat List (ATL) ™, Positional Zoom Control (PZC) ™, Live View Analysis (LVA) ™, Live View LDSA ™, Location Differential Signal Analysis (LDSA) ™, Time Differential Signal Analysis (TDSA) ™, Receiver Differential Signal Analysis (RDSA) ™, Spectrum Baseline Logging (SBL) ™, Chirp Threat Mode (CTM) ™, Harmonic Signature Threshold (HST) ™, Minimum Detection Amplitude (MDA) ™, Signal Combining Technology (SCT) ™, Threat Detection Algorithm (TDA) ™, RF Spectrum Display (RSD), Waterfall Display (WFD), Dynamic Alert Annunciator (DAA) ™, Kestrel Graphical Mapping (KDM) ™, Harmonic Calculator Tool (HCT) ™, Image Capture Tool (ICT) ™, Demodulation, FFT Visualization, Spectra and RRSI export, Automatic Export Control (AEC) ™, Command Line Programming (CLP) ™, Autonomous Measurement and Collection System (AMCS) ™, IF Broadband (IFB) ™, Heat Mapping Display (HMD) ™, and other innovative features and functionality, with new features in each software release. ✗

Key Deployment Benefits

The combination of the Kestrel TSCM ® Professional Software, and an application specific SDR search receiver or spectrum analyzer, becomes part of a modern, TSCM optimized, work-flow oriented, Signal Intelligence Support System (SISS) ™. Kestrel's cost-effective state-of-the-art RF collection and analysis technology approach, provides a comprehensive suite of TSCM focused capabilities:

- Powerful signal detection, collection and analysis;
- Demodulation and FFT visualization;
- Operator assisted, real-time deployment and analysis ready;
- Unattended and real-time, Remote Spectrum Surveillance and Monitoring (RSSM) ™;
- Automatic real-time project file write and save process of all captured data;
- Fail-safe defensive code integration and project recovery; and
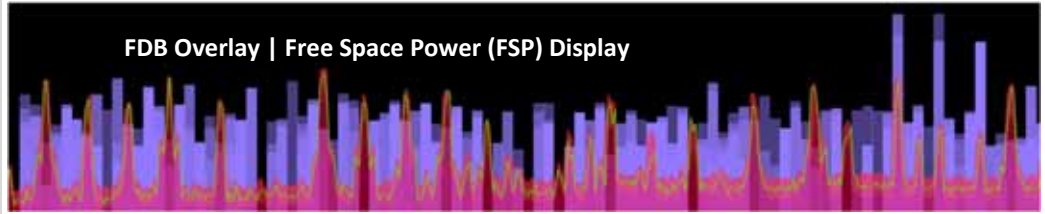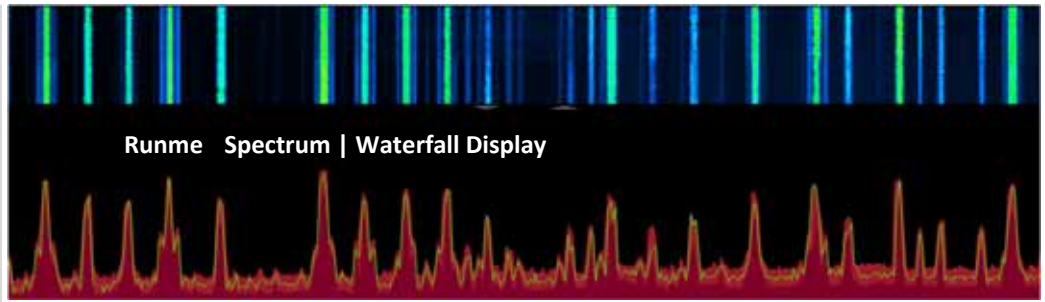- A fully integrated Session Report Generator (SRG) ™. ✗

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Proven Experience

Kestrel's software was conceived, and developed in Canada by TSCM professionals with 38 years of operational field experience in delivering TSEC / TSCM professional services at all operational threat levels. The all-encompassing experience of the company principals, forms the basis of the TSB 2000 (Technical) Standard ™ and the TSCM Operational Standard | Policy and Procedure Guideline (OS-PPG) ™. The Software Development Group (SDG) ™, in conjunction with the Technical Research and Standards Group (TRSG) ™, have applied a common-sense and balanced approach centred on the TSB 2000 (Technical) Standard ™ for designing and assimilating complex algorithms, Artificial Intelligence (AI) and Digital Signal Processing (DSP) technologies. This knowledge and experience is reflected in the successful development of an RF detection, collection, surveillance, and monitoring system that is both powerful and easy to use by operators at any experience level. The Kestrel TSCM ® Professional Software is suitable for TSCM deployment at all known and developing threat levels, and is currently sold in 29 countries worldwide, and is extensively utilized by the private sector, and national security apparatus, to replace obsolete equipment and methodologies. ✗

Kestrel TSCM ® Professional Software | Well Positioned to Hunt in a Complex Signal Environment

Advanced Signals Intelligence Database (ASID)

The ability to search Kestrel's proprietary Frequency Database (FDB) files, either geographically by radius distance, expressed in Nautical Miles (NM), and referenced to the current collection DSA ^{TM} antenna location, or by Free Space Propagation (FSP) ^{TM} for signal level (or both), is supported. It is possible to view FSP ^{TM} data (relative power levels) as a graphical overlay, directly on the UI during real-time collection, and during post analysis of historical Kestrel Project Files (KPF) ^{TM}. The "FDB Entry" dialog window displays the bearing and distance to and from the station, Free Space Power (FSP) ^{TM} power level, and provides the operator with the ability to directly export, and display the "FDB Entry" on Google Maps, Satellite, and Street View imaging. The ability to display, and save a relative static overview map showing both the emitter site and reference collection location is supported. ✗

FCC | IC | Frequency Database (FDB)

The Kestrel TSCM $^{®}$ Professional Software includes an Advanced Signals Intelligence Database (ASID) ^{TM} that encompasses a number of essential component features, such as the Frequency Database (FDB) ^{TM}, and Operator Signal List (OSL) ^{TM}. The technical operator has the ability to overlay official Industry Canada (IC) and Federal Communication Commission (FCC) licensing data directly on the UI, providing an excellent visualization of spectrum allocations for the geographical region of interest, which can be as large as North America, country wide, or as specific as a region, or frequency range. This capability provides the technical operator with the ability to quickly identify known emitters that are licensed within or adjacent to the geographical area. It is often just as important to verify legitimate signals to rule them out as potentially hostile. The technical operator can define the search query for licensed emitters at arbitrary distances referenced to the collection GPS fix, or manually entered geographical coordinates can be utilized. A query based on Free Space Propagation (FSP) ^{TM} RSSI values within a search range of (-20 dBm to -90 dBm) is also supported. ✗

Runme Spectrum | Waterfall Display

FDB Overlay | Free Space Power (FSP) Display

FDB Signal of Interest (SOI) Map View

Street View

FDB Signal of Interest (SOI) Satellite View

Collec on Location

Signal of Interest (SOI)

Positional Relave View

FDB ^{TM} Updates | Technical Support Group (TSG) ^{TM} | Resource Center

Periodic Frequency Database (FDB) ^{TM} updates are available for download free of charge to licensed technical operators, from the password protected Technical Support Group (TSG) ^{TM} | Resource Centre website. The operator may either download the entire FDB ^{TM} regional or national frequency database file sets, or a specific FDB ^{TM} file of interest, on demand during deployment. Internet access is required for FDB ^{TM} file download, and for access to online mapping resources.

Operator Signal List (OSL) ^{TM}

The Kestrel TSCM $^{®}$ Professional Software, Operator Signal List (OSL) ^{TM}, is an important spectrum management component of the Advanced Signals Intelligence Database (ASID) ^{TM}, as a user-defined database component list that spans multiple, Kestrel Project Files (KPF) ^{TM}, and is therefore independent of any particular Kestrel Project File (KPF) ^{TM}. Multiple OSL ^{TM} databases can be customized and maintained. An entry on the OSL ^{TM}, is prompted from an operator defined signal event, for inclusion within the current OSL ^{TM} database file, and may be recalled, and displayed against the real-time, or a historical Kestrel Project File (KPF) ^{TM}, during post analysis and review. ✗

Kestrel TSCM $^{®}$ Professional Software | Advancing the Art and Science of Technical Security

Receiver | Spectrum Analyzer Support

The Kestrel TSCM ® Professional Software supports select; industry significant, Software Defined (SDR) search receivers and spectrum analyzers that compliment mission specific deployment requirements, and fulfill scalable budget realities. ✗

Kestrel Support Profile (KSP) ™

Kestrel Support Profiles (KSP) ™, interface across supported SDR receiver or spectrum analyzer, allowing multiple manufacturers products to be deployed within the same system, and provides first in its class, dynamically synchronized hand-off, of the spectrum and demodulation processes without interruption, loss of spectrum data, or loss of search receiver communication. ✗

Custom SDR Hardware Support

Support for additional end-user specific, Software Defined Radio (SDR) hardware is accomplished with a powerful Kestrel Support Profile (KSP) ™ that becomes the interface between the Kestrel TSCM ® Professional Software, and all other supported receivers and spectrum analyzers, to achieve full operability across all of the standard features and advanced functionality, including support for both spectrum and demodulation hand-off. Virtually any SDR hardware can be ported to Kestrel for full operational support (please contact us for KSP ™ specifications, requirements, and anticipated development costs). ✗

Signal Hound | SM200A Receiver

The SM200A is a new generational industry disruptive technology, that is designed to tackle the most complex mission specific criteria, including, managed Remote Spectrum Surveillance and Monitoring (RSSM) ™ applications. The sweep speed is | 1 THz / Sec at 1 MHz RBW | 1 THz / Sec at 100 kHz RBW |, and | 1 THz / Sec at 30 kHz RBW |. This blazing sweep speed translates to | 160 GHz / Sec at 10 kHz RBW |, and | 20 GHz / Sec at 1 kHz RBW |. To appreciate just how fast the SM200A sweeps 100 kHz to 20 GHz @ 10 kHz RBW, this translates to 8 FPS, or 125 mSec for each 20 GHz ROI sweep. ✗

Kestrel TSCM ® Professional Soware | SDR Hardware Support

Signal Hound | United States of America | Exclusive Distribution Partner (Canada)

Model	Bandwidth	IFBW	Connection	ROI Speed
SM200A	100 kHz to 20 GHz	160 MHz	USB-C	USB 3.0	160 GHz @ 10 kHz
BB60C	9 kHz to 6 GHz	27 MHz	USB-C	USB 3.0	24 GHz @ 10 kHz
BB60A	9 kHz to 6 GHz	20 MHz	USB-C	USB 3.0	24 GHz @ 10 kHz
SA124B	100 kHz to 12.4 GHz	240 kHz	USB 2.0	140 MHz / Sec
SA44B	1 Hz to 4.4 GHz	240 kHz	USB 2.0	140 MHz / Sec

ThinkRF Corporation | Canada | Distribution Partner (Canada)

Model	Bandwidth	IFBW	Connection	ROI Speed
WSA5000-408	9 kHz to 8 GHz	100 MHz	GIGABIT LAN	TBD
WSA5000-418	9 kHz to 18 GHz	100 MHz	GIGABIT LAN	TBD
WSA5000-427	9 kHz to 27 GHz	100 MHz	GIGABIT LAN	TBD
R5500-408	9 kHz to 8 GHz	100 MHz	GIGABIT LAN	TBD
R5500-418	9 kHz to 18 GHz	100 MHz	GIGABIT LAN	TBD
R5500-427	9 kHz to 27 GHz	100 MHz	GIGABIT LAN	TBD

Rohde & Schwarz | Germany

Model	Bandwidth	IFBW	DEMOD	Connecon	ROI Speed (12.5 kHz)
EM100	9 kHz to 3.5 GHz	10 MHz	500 kHz	LAN	1.3 GHz / Sec
EM100	9 kHz to 7.5 GHz	10 MHz	500 kHz	LAN	1.3 GHz / Sec
PR100	9 kHz to 3.5 GHz	10 MHz	500 kHz	LAN	USB 2.0	1.3 GHz / Sec
PR100	9 kHz to 7.5 GHz	10 MHz	500 kHz	LAN	USB 2.0	1.3 GHz / Sec

Tektronix | Canada

Model	Bandwidth	IFBW	Connection	ROI Speed
RSA306-B	9 kHz to 6.2 GHz	40 MHz	USB-C	USB 3.0	TBD

Anritsu Corporaon | Japan

Model	Bandwidth	IFBW	Connection	ROI Speed
MS272xT	9 kHz to 9 GHz	TBD	LAN	TBD
MS272xT	9 kHz to 13 GHz	TBD	LAN	TBD
MS272xT	9 kHz to 20 GHz	TBD	LAN	TBD
MS272xT	9 kHz to 32 GHz	TBD	LAN	TBD
MS272xT	9 kHz to 43 GHz	TBD	LAN	TBD
MS272xC	9 kHz to 9 GHz	TBD	LAN	TBD
MS272xC	9 kHz to 13 GHz	TBD	LAN	TBD
MS272xC	9 kHz to 20 GHz	TBD	LAN	TBD
MS272xC	9 kHz to 32 GHz	TBD	LAN	TBD
MS272xC	9 kHz to 43 GHz	TBD	LAN	TBD

Shearwater TSCM | United Kingdom

Model	Bandwidth	IFBW	Connection	ROI Speed
Merlin MK 3	30 GHz	TBD	LAN	TBD

CRFS | United Kingdom

Model	Bandwidth	IFBW	Connection	ROI Speed
RFeye Node	10 MHz to 6 GHz	10 MHz	LAN	TBD
RFeye Node	10 MHz to 18 GHz	10 MHz	LAN	TBD

Keysight | FieldFox Handheld Microwave Spectrum Analyzer

| Model	Bandwidth	IFBW	Connection	ROI Speed
N9962A	9, 14, 18, 26.5, 32, 43, 50 GHz	5 kHz to 50 GHz	10MHz	TBD	TBD

Kestrel TSCM ® Professional Software | Well Positioned to Hunt in a Complex Signal Environment

Session Report Generator (SRG) ^{TM}

The Kestrel TSCM ® Professional Software includes the ability to generate and export a wide range of standard reporting elements for inclusion within a, structured session activity report. The Kestrel TSCM ® Professional Software, Session Report Generator (SRG) TM provides the technical operator with the ability to generate comprehensive, multiple on-the-fly, runtime and post capture analysis and review reports, to highlight different aspects of the project, and accommodate the needs of the technical operator and end-user. The SRG TM is easy to use and renders internally generated PDF reports that include virtually all aspects of the runtime session, such as, operator defined spectrum plots of the entire Range of Interest (ROI), and operator selectable signal list data that can be tailored to the needs of the intended reader. For example, a simplified overview report can be generated for the client, management, or end-user, and a detailed technical report can be rendered for the technical operator, or analyst. The ability to import target area photographs, images, floor plans, riser plots, and screen captures, adds the powerful dimension of virtual reality capability that strengthens the entire reporting process. Kestrel's convenient PDF file format is rendered as a standalone report, that can be viewed universally with any PDF viewing software, and custom mark-up can also be added with Adobe Acrobat. The exported PDF report is also ready for inclusion as an electronic attachment, within a more comprehensive, Electronic Reporting System (ERS) TM as defined under the TSB 2000 (Technical) Standard TM, or if necessary printed as an included attachment. ✗

Deployment Reference Database (DRD) ^{TM}

The ability of the technical operator to build and maintain simple reference databases for, captured IQ sample files, audio sample files, screen captures of signal characteristics, etc., can be accomplished by building a directory file structure and saving the reference files, filtered by date, location, or characteristics. The DRD TM concept is separate and apart from the Kestrel ® application, and becomes a powerful proprietary resource for the technical operator, and is mission specific to the operators client base. ✗
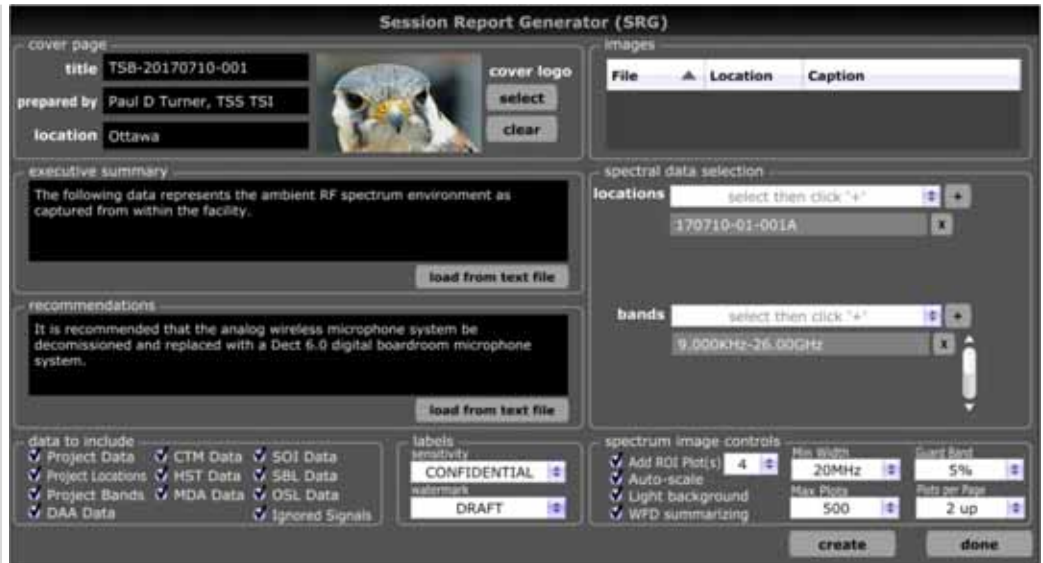
Enhanced Operator Centric Work-Flow

The ambient RF spectrum represents a extremely complex and challenging work environment for the professional technical operator. The ability to separate what often amounts to many thousands of "friendly" ambient signal events, from perhaps the one difficult to detect "hostile" Signal of Interest (SOI), by design, significantly increases the Probability of Detection (POD) during active field deployment, when faced with an unfamiliar spectrum environment. The ability to detect, identify, verify, and dismiss with confidence, benign signals, is of considerable practical value. This powerful capability is further enhanced by the ability of the technical operator to populate, load, and display any number and type of custom Operator Signal Lists (OSL) TM, designed to span multiple Kestrel Project Files (KPF) TM at the application level as an operator definable database resource. Any number of custom OSL TM files can be maintained for use within the application, defined by category, location, region, or other technical operator preferences, such as known friendly, known hostile, or reference Signals of Interest (SOI). The technical operators work-flow is intuitive from setup, through, runtime collection, event capture, and the analytical signal analysis process by the technical operator, or SIGINT analyst. The Kestrel TSCM ® Professional Software easily transitions across challenging, mission specific, and operator deployment objectives, including those associated with, TSCM, RSSM TM, SIGINT, Regulatory Compliance, Base Transceiver Station (BTS) site monitoring, and many other communications and Radio Frequency (RF) applications. ✗

Advanced Graphical Mapping | Heat Mapping Display (HMD) ^{TM}

The ability to import images, such as floor plans, riser plots, 3D graphics, photographs, maps, or an operator rendered image, is fully supported with a powerful receiver level heat map overlay. ✗

Kestrel TSCM ® Professional Software | Advancing the Art and Science of Technical Security

Channel Profile Mask (CPM) TM

The ability to build "on-the-fly" channel level, and band oriented, Channel Profile Masks (CPM) TM is supported by Kestrel's CPM TM editor. Multiple CPM TM files can be generated, maintained and recalled during runtime, copied to a new file, and imported from an operator defined | CSV | file. The ability to display overlapping channel masks, or band allocations is also supported. Operator level programming includes the Center Frequency (MHz), Bandwidth (MHz), and Rx Power (dBm), and the arbitrary display of a reference amplitude (dBm). The CPM TM database includes the ability to assign a | NAME | and | CLASS | tag. The database file is easily moved to another host computer running the Kestrel TSCM ® Professional Software. Channel Profile Masks (CPM) TM are displayed by selecting the CPM TM button located within the Spectrum Display and Activity control group. The CPM TM database editor and file management tools are located within the | SPECTRUM | menu structure. ✗
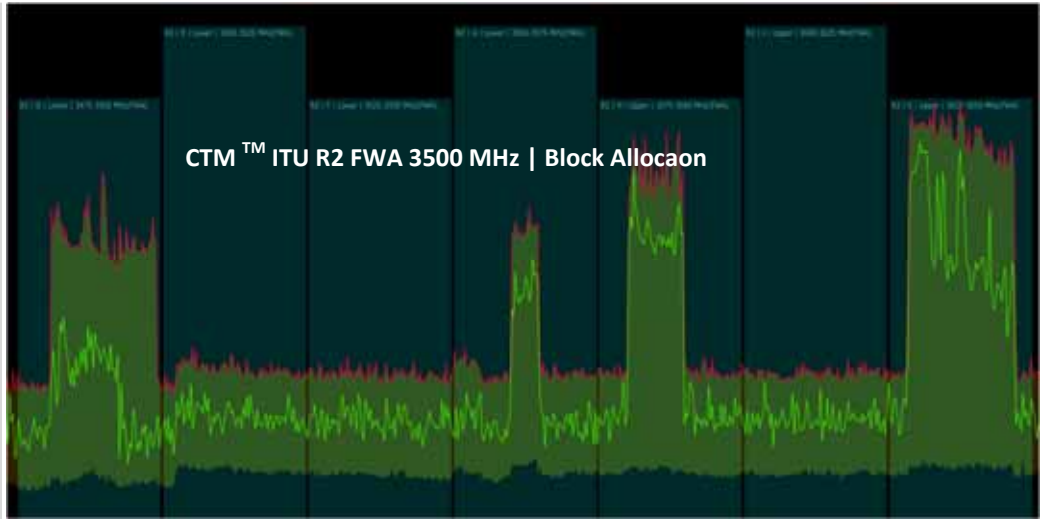
Sub-Harmonic | Harmonic Calculator

The ability to quickly predict, and display harmonic, and sub-harmonic frequencies, and than correlate these with observed spectral events, supports the identification of potential spectral threat characteristics. Provisions are included for the demodulation of any Automatic Threat List (ATL) TM, fundamental frequency or 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, and 9th order, harmonic, and sub-harmonic events. Kestrel's "Drag and Drop" functionality enables direct "Drag and Drop" to and from the demodulator frequency window, the sidebar ATL TM and the Master Automatic Threat List (MATL) TM, as well as to, and from, the Harmonic Calculator Tool (HCT) TM window. ✗

CTM TM ITU R2 FWA 3500 MHz | Block Allocaon

CTM TM ITU R2 DECT 6.0 | Channel Alloca on

Color Coded Spectrum Band | Receiver Status

Color coded spectrum band tabs enhance operator situational awareness with immediate visual verification of the SDR Rx runtime status:

| **RED** | indicates that no SDR search Rx or spectrum analyzer is assigned for the spectrum band, or frequency allocation.

| **YELLOW** | indicates the SDR Rx, or analyzer is currently assigned, but collection is paused.

| **GREEN** | indicates, active runtime search activity for the assigned spectrum band allocation.

| **BLUE** | indicates that the trace count limit (or trace time limit) for the current DSA location has been reached, and collection has automatically | STOPPED | and | LOCKED |.

All significant status visualizations are intuitively positioned on the User-Interface (UI) and are designed to enhance operational situational awareness when multiple SDR hardware and / or band allocations, are present.

Runtime SDR status dialog windows provide contextual operator feedback for each standby and active SDR Rx, or spectrum analyzer, and display the receiver name, runtime sweep speed, and the current SDR state, for sweep, demodulation, and analysis modes. ✗

Kestrel TSCM ® Professional Software | Well Positioned to Hunt in a Complex Signal Environment

Kestrel ® File | Write Management

Kestrel ® can capture and record all spectrum trace data in real-time (1/n=1), by default, or can be programmed to capture spectrum trace data at a recording rate (1/n=2, 1/n=5, 1/n=10, 1/n=20, 1/n=50, 1/n=100, 1/n=250, 1/n=500, 1/n=1000), or any value up to (1/n=10000), by the operator. Default recording is set for (1/n=1) real-time, for a measure of fail-safe deployment. "On-the-fly", alert recording is provides optimal write file management. ✎
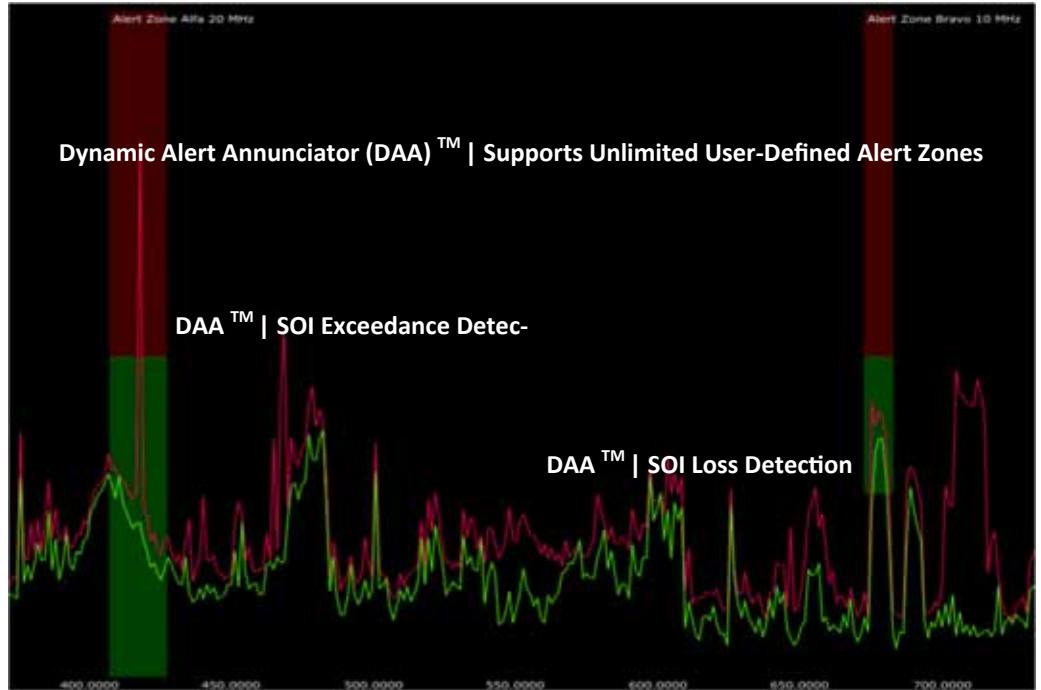
Spectrum Analyzer (SA) Mode

An advanced recording and file management mode allows the technical operator to run the software in a spectrum analyzer mode, without recording any spectrum data. If a potentially hostile Signal of Interest (SOI) is observed, the operator can quickly enable trace recording with a single button record ability, to initiate the capture of real-time spectrum trace data. This mode of operation results in a significant file size reduction since only, on-demand, spectrum trace data is recorded. ✎

Extended Deployment | File Size Management

To accommodate managed Remote Spectrum Surveillance and Monitoring (RSSM) TM assignments, incremental spectrum recording is fully supported. The operator is able to set the capture rate, from real-time (1/n=1) to incremental (1/n=10000) recording. Basically, for 1/n=100, 99 peak capture traces are represented as a single Kestrel Super Trace (KST) TM. This process identifies and captures the peak energy that occur over the (1/n=?), time / trace interval, so that all captured spectral events are preserved and recorded for analysis. WFD compression enables a file size reduction up to 10000 times the real-time recording value, with only a minor displacement in event time accuracy that varies with the (1/n=?) value. ✎

Dynamic Alert Annunciator (DAA) TM

The ability to capture targeted DAA TM signal events that either exceed, or drop below (loss), technical operator defined detection (alerting) thresholds, are delineated by any number of alert zones across the spectrum band allocation, is supported by the Kestrel TSCM ® Professional Software. The export and import of alert zones, to and from a CSV file format, is supported. ✎

Dynamic Alert Annunciator (DAA) TM | Supports Unlimited User-Defined Alert Zones

DAA TM | SOI Exceedance Detec-

DAA TM | SOI Loss Detection

Dynamic Alert Annunciator (DAA) TM | OPT AEC TM Triggered Export

The ability to automatically capture and record trace level data, based on technical operator defined alerting zone threshold levels at either the band allocation, or discrete signal level, is fully supported. This feature not only captures the signal event, but also the trace data relative to both pre-event and post-event triggering values, as defined by the operator. This advanced mode of operation reduces the file size by orders of magnitude compared to the real-time value, as only the traces associated with specific alerting events are captured and recorded. ✎

Real-Time | Triggered Event Capture

The Dynamic Alert Annunciator (DAA) TM, is a sophisticated feature designed to capture, log and display threshold defined signal level, exceedance and signal loss events. Kestrel's DAA TM recording control has proven to be a very powerful operator centric feature, adding an entirely new dimension to the collection, and discrete signal analysis process. Focused analytical statistics for each signal event provide a clear picture of signal characterization patterns and appearance signatures. Additional data table columns may also be displayed within a familiar table structure. The ability to capture operator defined "Alert Zone" data within the DAA TM Signal List structure is fully supported, even when the trace recording control is not enabled. The DAA TM Signal List can be exported to a | CSV | file for comparative analysis, storage, or for use within third-party productivity programs. ✎

Audio Alerts | Kestrel Voice Annunciation (KVA) TM

The operator can define audio alerts throughout the application, and utilize the custom Kestrel ® Voice Annunciation (KVA) TM Text-to-Speech files, including Kestrel's exclusive, Daisy and George. ✎

SIGNAL THRESHOLD ALERT 2.4602GHz -63dBm 2017-04-03 12:12:18

ALL CLEAR

Kestrel ® Analysis and Record Mode (ARM) ™

This feature provides significant operator flexibility and programmability, while providing for a powerful measure of active file size management. The technical operator can deploy the system in a basic Spectrum Analyzer (SA) mode without storing any spectra, trace, or waterfall data, while maintaining the ability to actively review the current trace level data on the user-interface in real-time (subject to availability of unrecorded, buffered data). There are two | RECORD | related controls, the first is located on the Spectrum Display and Activity control group that | STARTS | and | STOPS | the write process "on-the-fly", and the second is part of the | NEW SPECTRUM | dialog window. The | START | and | STOP | write process state can be changed on-the-fly, during runtime. ✗

Automatic Threat List (ATL) ™ | CSV Export

The ability to export standardized | CSV | signal list data, for any automatically captured, or manually entered signal event, is supported within the Kestrel TSCM ® Professional Software application. Support for the export of Chirp Threat Mode (CTM) ™, Harmonic Signature Threshold (HST) ™, Minimum Detection Amplitude (MDA) ™, Spectrum Baseline Logging (SBL) ™, Signal of Interest (SOI), Operator Signal List (OSL) ™, and Dynamic Alert Annunciator (DAA) ™ signal lists are supported. ✗

Kestrel TSCM ® Professional Software | Event Recording Mode (ERM) ™

The Kestrel TSCM ® Professional Software includes a fully automated alert, based recording control capability. Intuitive artificial intelligence and design level predictive logic enables the Kestrel software to begin active "alert zone" capture and storage recording processes ahead of a signal events appearance within the spectrum. The "Great Kestrel" utilizes keen eyes, a photographic memory, and maybe even a little psychic ability to produce a clear picture of any alert zone based capture, and trace level recording of any Signal of Interest (SOI), leading up to its appearance, for the duration of the event, and for an operator defined period of time beyond the active alert. This innovative feature permits the technical operator to build a detailed picture of the ambient RF spectrum environment leading up to the Signal of Interest (SOI) alert. Consequently, all new and periodic signal events are well-documented, and are available for post event analysis and review, while economizing on storage requirements. In addition to performing continuous capture and recording for the duration of the event, It is possible to record a period of real-time trace data before the beginning of any signal event, and for an operator defined period of time beyond the end of the alerting event. ✗

Innovative | Active File Size Management

In order to facilitate operational deployment, and file size management, the | REC | control group also includes an advanced write control capability (1/n) = | 1 | 2 | 5 | 10 | 20 | 50 | 100 | 250 | 500 | and | 1000 | option list (default), or manually up to | 10000 | traces, representing the actual number of recorded traces that occur during runtime capture with (1/n=1) being real-time and (1/n=50) representing (1) in (50) peak traces being written to the local or network, storage device | + | all peak data captured from 100% of the traces, referred to as a Kestrel Super Trace (KST) ™. The analytical advantages include an order of magnitude, of less trace by trace data, for the technical operator to analyze, and significantly enhanced performance of the host computer. ✗

Kestrel Project Template (KPT) ™

The technical operator can define any number of project templates directly, from the included Kestrel Project Template (KPT) ™ dialog window. Any number and type of deployment profiles can be created by the operator, managed, edited, stored, and recalled for deployment, for common runtime collection strategies. The ability to pre-configure a working template for different physical locations, or collection and analysis parameters, is fully supported. The current Kestrel Project File (KPF) ™ can also be saved as a Kestrel Project Template (KPT) ™. The KTP ™ database file is easily transportable to another host computer. This ability is in keeping with Kestrel's operator centric, and work-flow oriented philosophy, and provides a very powerful operator defined resource. ✗

1 DEFINE | 2 MANAGE | 3 EDIT | 4 DEPLOY

Operator Centric Design

The Kestrel TSCM ® Professional Software philosophy is firmly based on providing advanced professional level features and real-world functionality that places the technical operator back in control of the deployment, collection, and analytical process. ✗
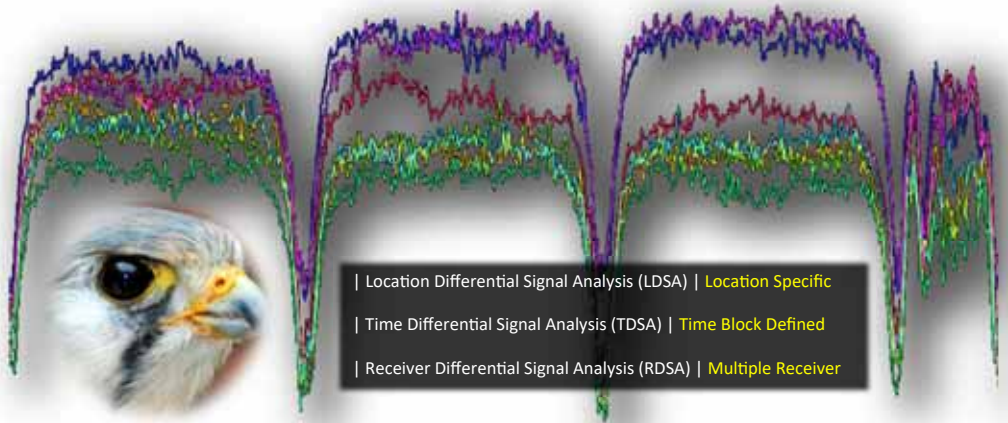

Kestrel TSCM ® Professional Software | Well Positioned to Hunt in a Complex Signal Environment

Operator Centric | Work-Flow Oriented

Kestrel TSCM ® supports operator defined spectrum profiles, rapid deployment (tactical) project templates, and high resolution positional zoom control (up to 200x) for detailed analysis, and precise signal parameter measurements. ✗

Typical Deployment Applications

Kestrel TSCM ® Professional Software is an ideal platform for a wide range of RF applications.

- Operator Assisted Radio Frequency (RF) Technical Surveillance Countermeasures (TSCM), Powerline Carrier (PLC), and Broadband Powerline (BPL) verification.

- Managed Remote RF Spectrum Surveillance and Monitoring (RSSM) ™.

- In-Place Spectrum Monitoring (IPSM).

- High-Risk, Protective Operational Support, Counter-Intelligence (CI) Applications, and Technical Surveillance Countermeasures (TSCM).

- Regulatory Spectrum Utilization, Enforcement, and Management.

- Regulatory Compliance, Investigations and Electro-Magnetic Interference (EMI) Analysis.

- Spectrum and Signal Integrity, Compliance and Verification.

- Telecommunications Industry, Base Station Transmitter Monitoring.

- Radio Frequency (RF), Spectrum Baseline Logging (SBL) ™.

- Tactical Intelligence Gathering, Barricaded Hostage, Radio Intercept and Communication Monitoring.

- Search and Rescue (SAR), Radio Direction Finding (RDF), Tactical Beacon Homing.

- Technical Surveillance Device (TSD), Testing, Analysis, and Signal Characterization, including Pre-deployment Testing of Offensive Surveillance Technology.

- Universities, Technical Colleges, Educational Institutions, and Radio Engineering.

- National Security Apparatus. ✗

| Location Differential Signal Analysis (LDSA) | Location Specific
| Time Differential Signal Analysis (TDSA) | Time Block Defined
| Receiver Differential Signal Analysis (RDSA) | Multiple Receiver

Kestrel ® High-Definition Spectra Literally wants to Fly off of the Display!

Kestrel TSCM ® Professional Software | Respected Worldwide

The Kestrel TSCM ® brand is responsive to the needs of the end-user. The advanced software engineering, unique design, and innovative concept of the Kestrel TSCM ® Professional Software has become the standard, against which, all other TSCM software applications will be compared, evaluated, and judged in the future. ✗

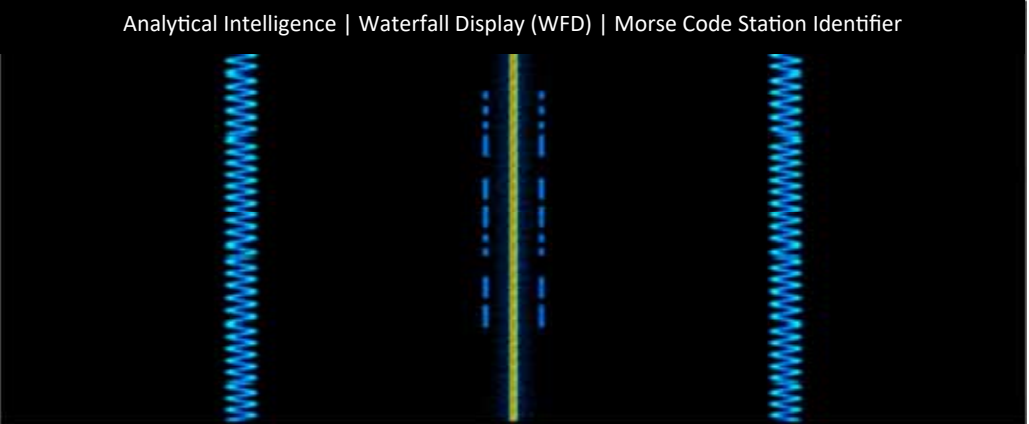### Unprecedented Innovation | Qualified Research and Development (R&D)

Kestrel ® requires significant annual financial investment in Research and Development (R&D), to achieve new and innovative deployment tools that are operator centric, and provide unprecedented collection, capture, analysis and reporting capabilities for deployment in a modern moving target threat model. Significant, on-going R&D is essential in meeting tomorrow's threat environment. ✗

Deployment Flexibility | Scalability

Standard included features and functionality, ensure that the Kestrel TSCM ® Professional Software is deployment ready at all known and developing threat levels, and encompasses the widest possible deployment requirements of professional operators. The Software Development Group (SDG) ™ is responsive to the needs of technical operators. In-fact, we encourage operators to share their software experiences and ideas, as part of "work in progress" deployment methodology. The development philosophy is well founded, on continuous improvement, and new features. ✗

Typical Hardware Configuration | Considerations

The Kestrel TSCM ® Professional Software is designed to run on the Windows OS, for deployment on an Intel i7 (6th, 7th, and 8th Generation) HQ processor, Laptop, or micro-computer with 16 GB of RAM. The software supports search receiver connectivity using USB 2.0, USB 3.0, USB-C, interfaces and virtual LAN and Fiber-Optic modules permit USB 2.0 / USB 3.0 search receiver connectivity to be managed remotely over Cat 5e or Cat 6 LAN cabling infrastructure, or across a multi-mode 50 / 125 Fiber-Optic cable. Remote Desktop Software (RDS) permits full command and control via a LAN, or an Internet connection, including the use of 3G / 4G / LTE cellular modems. ✗

Analytical Intelligence | Waterfall Display (WFD) | Morse Code Station Identifier

Kestrel TSCM ® Professional Software | Advancing the Art and Science of Technical Security

Kestrel ® Licensing Process | Options

Kestrel's standard End-User License Agreement (EULA) includes a full version of the Kestrel TSCM ® Professional Software, and two (2) Activation Security Keys (ASK) ™, for use with any two (2) supported receivers or analyzers, across any two (2) host computer installations. The software activation is machine, and hardware specific, requiring an Activation Security Key (ASK) ™ for each individual host computer and each receiver. Adding additional receivers, requires the purchase of a sub-license Activation Security Key (ASK) ™. ✗

Multiple License Management (MLM)

MLM is available to meet the deployment requirements of larger organizations that need to manage multiple licenses across distributed Remote Spectrum Surveillance and Monitoring (RSSM) ™ platforms. ✗

Kestrel ® Software | Release Updates

Software updates are always provided free of charge, within the same software generation indefinitely. The latest software release is always available for download, from the password protected Technical Support Group (TSG) | Resource Centre website. Additional tools, example files, and other resources are available for download, including the FDB spectrum licensing database for Canada, and the United States of America. We have also provide updated SPF ™, CPM ™, and OSL ™ working files and examples. Keeping your   Kestrel ® software, computer OS, USB and graphics drivers up to date, is essential. ✗

Kestrel ® Project Activity Scheduler | Time Zone Off-Set

The Kestrel TSCM ® Professional Software includes a uniquely versatile Project Activity Scheduler that provides the ultimate control over the runtime collection process. The ability to individually schedule runtime activity across multiple search receivers and analyzers, is just the beginning. Full activity scheduling support is provided at the spectrum band level, giving the technical operator the ability to easily program complex multiple start and stop activity across multiple, independent spectrum band allocations, across each connected device. Programming is accomplished from either the Setup Wizard, or within the application during runtime. Kestrel's advanced Time Zone Offset, provides accurate   spectral time-stamping, without the need to change the host computer clock, when traveling. ✗

Kestrel LAN Remote (KLR) ™ | USB 2.0 | Cat 5e / Cat 6 Standards | 100 Meters (328 Feet)

The Kestrel LAN Remote (KLR) ™, provides virtual Gigabit Ethernet Network support, when utilizing a supported receiver with a USB 2.0 interface. The KLR ™ hardware module, allows the technical operator to control remotely located receivers, directly via a virtual Gigabit LAN connection over a Cat 5e or Cat 6 network cable. The KLR ™ leverages the existing LAN infrastructure to provide an alternative remote network deployment method for search receivers. ✗

Kestrel ® Lightning Module (KLM) ™ | USB 3.0 | Fiber-Optic Remote ™

Support for USB 2.0 and USB 3.0 Fiber-Optic Remote modules utilizing Multi-Mode, 50/125 OM2 | OM3 Fiber-Optic connectivity, providing an additional option for remote receiver operation.   ✗

Kestrel ® Lightning Module (KLM) ™ | Gigabit LAN | Fiber-Optic Remote ™

Support for Gigabit LAN, Fiber-Optic Remote modules utilizing Multi-Mode, 50/125 OM2 | OM3 Fiber-Optic connectivity, providing an additional option for remote receiver operation. ✗

Time Differential Signal Analysis (TDSA) ™

Kestrel TSCM ® Professional Software | Well Positioned to Hunt in a Complex Signal Environment

Technical Support Group (TSG) ™

Several layers of advanced technical support are provided by the Canadian based Technical Support Group (TSG) ™ specialists, including self-help access to Kestrel's online (PW Protected) Technical Support Group (TSG) ™ Resource Centre website, and the exceptional local support knowledge offered by select international distribution partners, and direct lines of communication with hardware manufacturers. Resources include a very comprehensive proprietary Software Programming and Operation Manual (SPOM) ™, unlimited Email, and TeamViewer ™ based technical support assistance, all designed to keep your system running smoothly. ✗

Operator Training | Certification Opportunities

We offer a 3-Day, Kestrel ® Software | Technical Operator Certification program, and a 5-Day, Kestrel ® Technical Analyst Certification (TAC) ™ program. The instructors are experienced technical operators and bring real-world applications into the training environment. ✗

Third-Party | Productivity Software

The ability to export data to standard CSV file format, allows the technical operator to arrange, select, edit and analyze raw Spectra, and RSSI values. The ability to generate custom graphical spectrum models for reports and presentations is realized, adding a powerful analytical capability to the Kestrel ® software. ✗
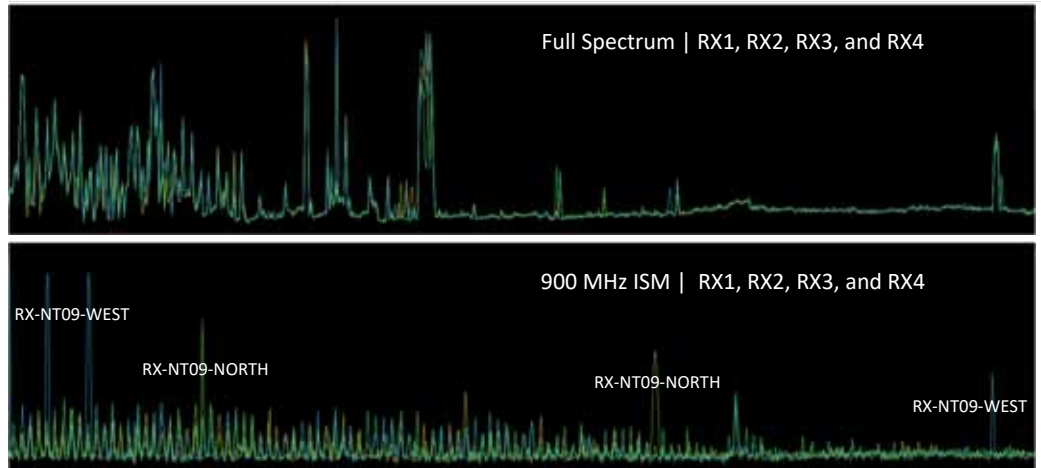
Frequently Asked Questions (FAQ)

Q | How does the Kestrel ® Dual Receiver Operation (DRO) ™ "Hand-Off" Work?

A | The dynamically synchronized, receiver "hand-off" capability extends to both the spectrum and demodulation process. It is not limited to Dual Receiver Operation (DRO) ™, but rather supports multiple receivers. It is possible to connect a Signal Hound BB60C, ThinkRF R5500, and any other supported receiver, or analyzer, and dynamically "hand-off" the spectrum sweep and demodulation process across each device in real-time. Simply select the hand-off" receiver, and the process is handled by the software, without data loss. ✗

Receiver Differential Signal Analysis (RDSA) ™ | Operator Defined Receiver Location

With powerful standard included features and capability, such as Kestrel's Location Differential Signal Analysis (LDSA) ™, for multiple (local) collection location comparative; enhanced by real-time echo differential mode, the powerful capability of Time Differential Signal Analysis (TDSA) ™, for single location capture, time block comparative and analysis, and the innovative mission critical advantages of Receiver Differential Signal Analysis (RDSA) ™, which removes the limitation of a single defined location, "collect and compare", for peak static traces only, which often have little or no meaning once they become historical. RDSA ™ is designed to provide the ability to display and compare real-time, peak, and average spectra across independent receivers, with the first in its class, dynamic sub-band drop in overlay — Kestrel ® has got you covered, no matter what your mission specific deployment requirements, objectives, or analytical plan. Receiver Differential Signal Analysis (RDSA) ™ allows the operator to select and display any available receiver, or spectrum analyzer, as an overlay, running in either a Dual Receiver Operation (DRO) ™, or Multiple Receiver Operation (MRO) ™, environment. The RDSA ™ feature not only supports real-time, and historical, multiple receiver trace level spectra comparative, but also extends the capability to include a unique, multiple trace Waterfall Display (WFD), providing the operator with a powerful, defined, real-time multi-layer waterfall display. RDSA ™ is another example of a new class of features specifically developed for a modern moving target threat model. Receivers can be independently designated and all bands and sub-bands can be displayed in real-time, as a spectra overlay. ✗

Full Spectrum | RX1, RX2, RX3, and RX4

900 MHz ISM | RX1, RX2, RX3, and RX4

RX-NT09-WEST

RX-NT09-NORTH

RX-NT09-NORTH

RX-NT09-WEST

RDSA ™ | Dynamic Waterfall Overlay (DWO) ™

The ability to overlay the spectra from multiple defined locations, multiple time blocks, and multiple receivers, is yet another Kestrel ® development milestone. We have included a powerful multiple receiver waterfall, providing unprecedented comparative data, directly on the waterfall display. ✗

Precision Navigation | Horizontal Range Control (HRC) ™

One of the many key design capabilities of the Kestrel TSCM ® Professional Software is the powerful operator centric, Positional Zoom Control (PZC) ™. The HRC ™ feature is yet another innovative milestone found within the Kestrel TSCM ® Professional Software, that significantly enhances rapid, precise spectral navigation. The technical operator can add, edit, maintain, or delete, any number of unique Spectrum Profile Files (SPF) ™, which are then utilized to set the search receiver or spectrum analyzer to specified user-defined bands or sub-bands, frequency blocks, spectrum allocations, or channels. The HRC ™ feature takes advantage of the SPF ™ database and turns it into a powerful Horizontal Range Control (HRC) ™ navigational tool. The technical operator can manually select any of the available HRC ™ menu options which directly reflect the SPF ™ database content, to precisely navigate to any defined Range of Interest (ROI). The Horizontal Range Control (HRC) ™ is available during runtime and post analytical review of historical Kestrel Project Files KPF) ™, along with all other spectrum and waterfall navigation tools. ✗

Kestrel TSCM ® Professional Software | Advancing the Art and Science of Technical Security

Kestrel Spectrum Analytics (KSA) ™

The ability to export user-defined Spectra trace data to CSV file format, is supported within the Kestrel TSCM ® Professional Software. Spectra trace data export is useful for detailed and focused analysis of any SOI trace level data, when utilizing third-party RF analysis hardware, or productivity software. ✎

Export (CSV) Spectra

To aid technical operators in a more detailed analysis of collected trace level data, the ability to export operator defined Spectra values is supported. The operator is able to export Spectra to a | CSV | file, based on | LOCATION | and / or | BAND | related criteria. The ability to further refine the exported data, includes selecting the | START | and | END | trace number sequence. This feature can be utilized during runtime collection, or during post event analysis and review, by the technical operator, or SIGINT analyst. ✎

## Dynamic Alert (CSV) | Spectra Export

The ability to export Spectra trace data as associated with a dynamic alert, threshold violation, to a | CSV | format is supported. ✎

Dynamic Alert (CSV) | RSSI Export

The ability to export RSSI values based on a dynamic alert, threshold violation, to a | CSV | format is supported. ✎
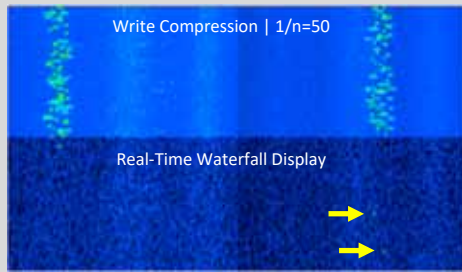
Waterfall Display (WFD) | Analytical Review

During normal runtime operation, all spectra and waterfall trace data is written to storage, in a playback ready format, unless the operator manually disables the write management feature for the runtime session, individual band allocation, or Range of Interest (ROI). This is an important element in the decision to purchase any particular TSCM equipment resource. All operator defined data must be stored in a format that permits full analytical playback and analysis. Kestrel TSCM ® provides the ability to store, open, and even continue runtime collection at any time in the future, within the same Kestrel Project File ™ bringing unprecedented capability to the analytical process. It is essential that write management be utilized to minimize the amount of data for long term deployment scenarios. ✎
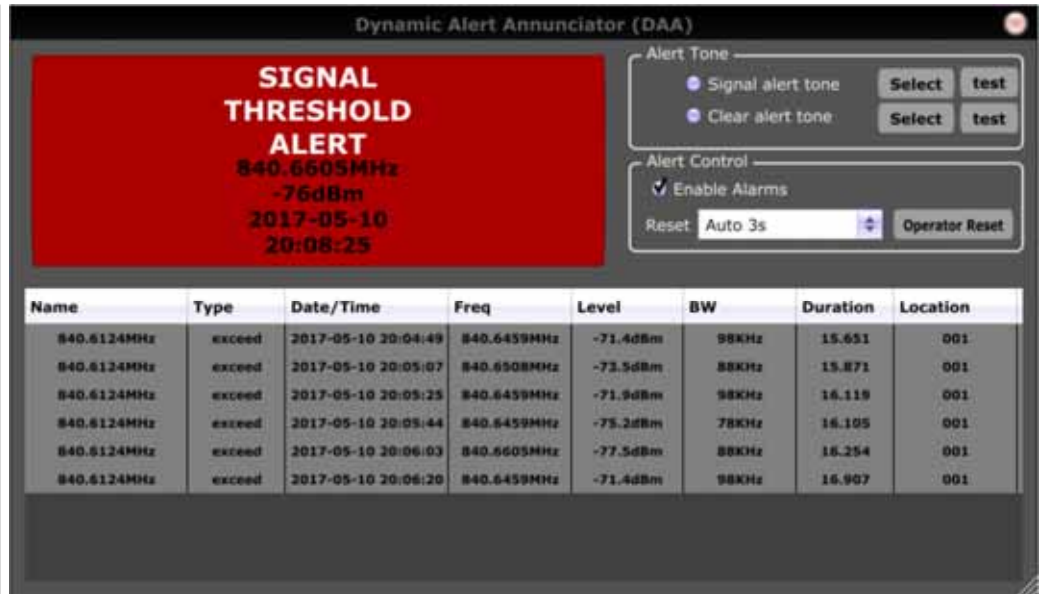
Kestrel Super Trace (KST) ™

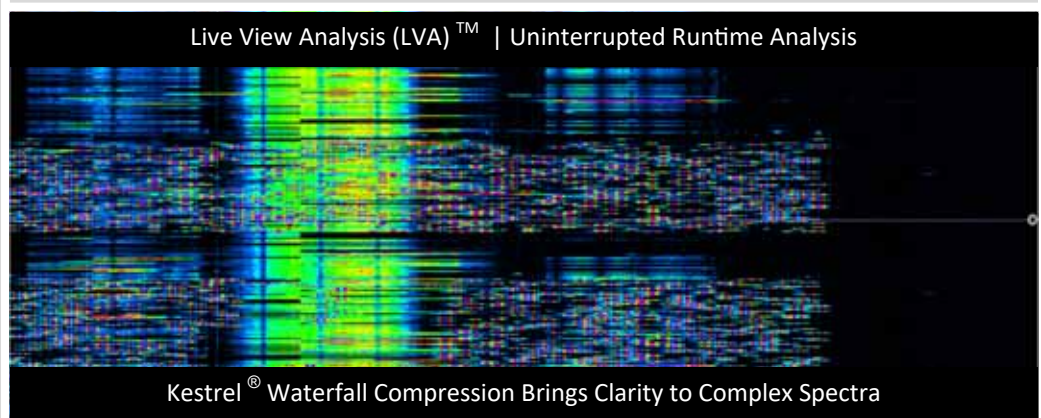During Remote Spectrum Surveillance and Monitoring (RSSM) ™ over a period of days, weeks, or months, waterfall and trace data can become a storage challenge, and requires time-intensive post event analysis, which can be a daunting process. The unique write management feature, in combination with the ability to compress the trace and waterfall data, is a powerful innovation that significantly improves the operators analysis and review capability. Kestrel's spectrum and waterfall compression method enhances rendering by reducing the memory and storage footprint, and brings exceptional clarity to the waterfall display. This unique functionality permits the technical operator to easily observe periodic peak energy patterns across the Range of Interest (ROI), over a period of time. A KST ™ is the total combined energy based on the number of captured traces, and runtime capture time. ✎

Kestrel Super Trace (KST) ™ | Waterfall Buffer Clear (WBC) ™ Button

The Kestrel Super Trace (KST) ™ feature is controlled by the technical operator, by first selecting the desired (1 / n = ?) write control setting value during setup, or within runtime capture. The WBC ™ feature may be invoked by the operator by pressing the Waterfall Buffer Clear (WCB) ™ button. This process clears all unsaved spectra data, leaving only the Kestrel Super Traces (KST) ™ spectra. Kestrel's write management strategy strikes an important balance between capturing too much, or too little analytical data. The technical operator should consider the anticipated length of the runtime deployment when configuring the optimal write management value. ✎

Live View Analysis (LVA) ™ | Uninterrupted Runtime Analysis

Kestrel ® Waterfall Compression Brings Clarity to Complex Spectra

Automatic Export Control (AEC) ™ | OPT AEC |

The Kestrel TSCM ® Professional Software by design supports Remote Spectrum Surveillance and Monitoring (RSSM) ™ for a wide range of unattended field deployment applications. The Automatic Export Control (AEC) ™ feature is a powerful, budget friendly, optional | OPT AEC | add-on module that seamlessly integrates with the Kestrel TSCM ® Professional Software, and significantly enhances unattended operation, by periodically exporting the Automatic Threat List (ATL) ™ data to CSV file format, on an operator defined, periodic, or event triggered basis. The technical operator can define the | EXPORT | directory location by selecting the | AEC   DIRECTORY | menu option located within the | FILE | menu structure. By default, AEC files will be stored within the default | DATA | directory, and not in the current Kestrel Project File (KPF). The operator can easily define the desired write storage location on any available local storage media, network drive, or cloud storage for easy retrieval, analytical review, and a measure of fail-safe data integrity. ✎

AEC ™ | Periodic Export (CSV)

The time periodic export of | MDA ™ | SBL ™ | CTM ™ | HST ™ | and / or | DAA ™ | data is supported, based on the selection of a default | AUTO EXPORT | value of | 1 | 3 | 8 | 12 | 24 | 48 | 72 | hours. Alternately, the operator may define any custom time value with the format | 30 S | 30 M | 30 H | 30 D | (seconds, minutes, hours, and days), to invoke the desired | TIME PERIODIC | export value. The operator can select | EXPORT ALL |, meaning all signal events are exported on each export cycle, or | ONLY CHANGES |, meaning only the changes since the last cycle are exported. The operator can reset the | AUTO EXPORT | time value at any time, and select | EXPORT NOW | should the operator not wish to wait for the current | AUTO EXPORT | cycle to complete. ✎

Kestrel IQ (KIQ) ™ | Record and Playback

Building an | IQ Sample | database has never been this easy! Record, playback, and loop IQ sample files, captured in a binary | Kestrel IQ (KIQ) ™ | or a | RAW CSV | file format, and easily convert | RAW CSV | files to | KIQ | format using a built-in conversion utility. ✎

AEC ™ | Triggered Export (CSV)

The AEC ™ triggered export of | DAA ™ EXCEED | DAA ™ LOSS | NEW MDA ™ | NEW SBL ™ | NEW CTM ™ | and / or | NEW HST ™ | data, is supported for | EXPORT RSSI | EXPORT SPECTRA | and / or | EXPORT IQ | to | KIQ | and | CSV | file format. Triggering is a function of operator level programming of the Dynamic Alert Annunciator (DAA) ™, Minimum Detection Amplitude (MDA) ™ threshold, Spectrum Baseline Logging (SBL) ™ threshold, as well as the CTM ™ and HST ™ detection profiles. The operator is able to define an IQ trigger | PRE-EVENT (IFB ™ Mode Only) |, capture setting value of | NONE | 100 mSec | 250 mSec | 500 mSec | 1 Sec (Default). A | POST-EVENT | capture setting value of | 100 mSec | 250 mSec | 500 mSec | 1 Sec | 2 Sec | and | 5 Sec | are currently supported. An operator defined | MAXIMUM EVENT DURATION | capture setting value of | NONE (Not Recommended) | 100 mSec | 250 mSec | 500 mSec | 1 Sec | 2 Sec | 5 Sec | 10 Sec | 15 Sec | 20 Sec | 30 Sec | 60 Sec |, and | 120 Sec | are currently supported. ✎

IQ Recording and Playback | Demodulation Visualizer

A | MANUAL |, operator initiated IQ Recording and Playback, is a standard feature within the Kestrel TSCM ® Professional Software, providing the technical operator with very powerful analytical capability. Record, playback, loop, and a CSV to KIQ file conversion utility, are all available, along with real-time | IQ | FFT displays. Please note that the | AUTOMATIC | IQ capture is only available within the optional Automatic Export Control (AEC) ™ | OPT AEC | module. ✎
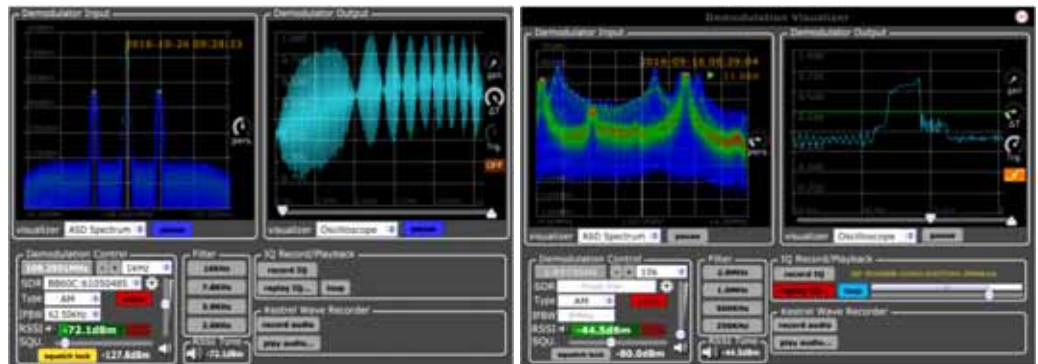

AEC ™ | CSV Table Data

The ability to define the | CSV TABLE DATA FORMAT | for export, is supported to allow the technical operator to decide which export elements are required. The operator is able to independently select the | MDA ™ | SBL ™ | CTM ™ | HST ™ | and | DAA ™ | elements, including select all columns, or select only those required. The technical operator can drag the desired values from the "available elements" to the "active elements" window. We have included a | RESET | defaults, and | CLEAR | button, to assist in advanced feature programming. ✎

Audio Demodulation | Signal Analytics

The Kestrel TSCM ® Professional Software provides direct demodulation of AM, AM-USB, AM-LSB, FM, and NTSC analog video. Kestrel's "Drag and Drop" technology allows any signal list event, to be dropped directly to the demodulation control group, from any populated signal list entry, including the Dynamic Alert Annunciator (DAA) ™, and Harmonic Calculator Tool (HCT) ™. Additional Digital Demodulators and Kestrel Protocol Analytics (KPA) ™ are under development. ✗

Kestrel Demodulation Visualizer (KDV) ™

The Demodulation Visualizer (KDV) ™ includes an RF Spectrum Display (RFD), Audio Spectral Density (ASD), IQ Diagram (IQD), IQ Vs Time Display, RSSI History Display (RHD), analog RSSI Display (ARD), and NTSC Video display. An Audio Oscilloscope Display (AOD), and (Audio Frequency) AF Spectrum Display (ASD), visualizes baseband signal representations, including the presence of embedded sub-carriers. Controls are provided for squelch, volume and mute. ✗

IF Filter Control (IFC)

During the demodulation process, various baseband (audio) filter options compatible with the currently selected IF Bandwidth (IFBW), are dynamically generated. The filter value is visually represented within the AF Spectrum Display (ASD), and applied to the demodulated audio stream. ✗

Kestrel Wave Recorder (KWR) ™

The Wave Recorder (KWR) ™ permits the operator to record audio samples for further technical analysis, inclusion in reports, and for evidentiary, and training purposes. ✗

RSSI Tone Locator (RLT) ™

The RSSI Tone Locator (RLT) ™ provides an amplitude sensitive audio alert tone that can be utilized independently, or simultaneously, over the originating audio, for emitter localization. ✗

RSSI Trending Display (RTD) ™

To assist in quick emitter localization, a powerful RSSI Trending Indicator (RTI) ™ is included to aid the technical operator, when utilizing a directional antenna, such as the Kestrel Log Periodic (KLP) ™ antenna kit. ✗
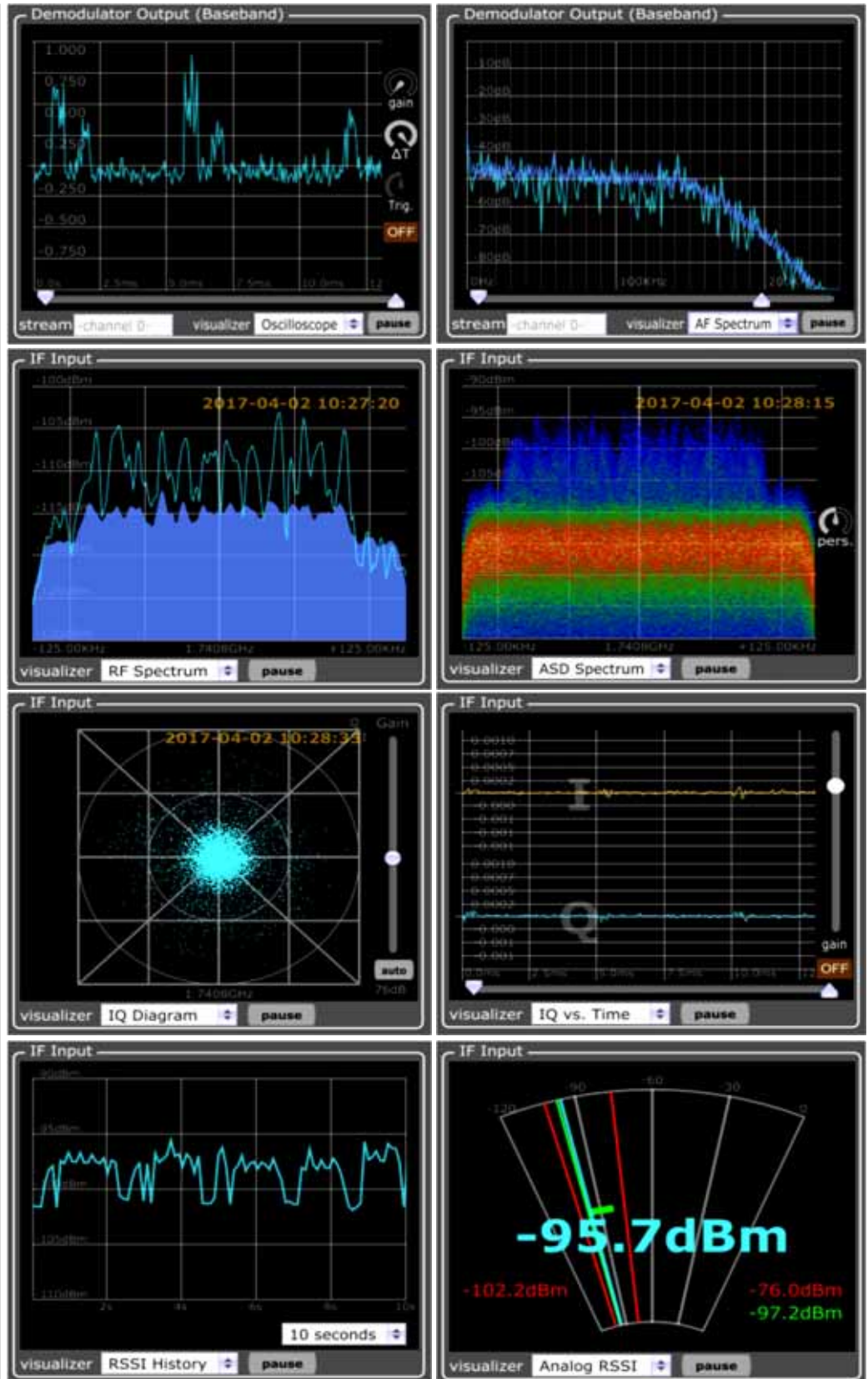
Operator Defined | Demodulation Rx "Hand-Off"

The ability of the operator to dynamically "hand-off" the demodulation and analysis process to any other supported search receiver, or analyzer is supported. This essential feature permits the operator to utilize a dedicated, receiver or analyzer, for the demodulation and analysis process, while allowing the search receiver to continue uninterrupted runtime capture. ✗

Kestrel TSCM ® Professional Software | Well Positioned to Hunt in a Complex Signal Environment

Signal Detection | Identification | Analysis

The ability of the Kestrel TSCM ® Professional Software to capture, and display near-field Signals of Interest (SOI), allows the technical operator to quickly identify the presence of potentially hostile signal events, and immediately, proceed to locate the source of the emission. Locating and neutralizing hostile emitters is the primary deployment objective of the operator. The analysis of any potential intelligence that might be contained within the Signal of Interest (SOI), or stored within the device is a secondary consideration. ✎

Channel Profile Mask (CPM) ™

The ability to clearly identify official ITU bandwidth specific allocations at the signal and / or band level, promotes exceptional situational awareness, allowing the technical operator to focus on the identification of potentially hostile signal events, while verifying and ignoring, known friendly signals. ✎

Peak Envelope Capture (PEC) ™

The ability to capture and display the ambient RF spectrum environment in a peak capture mode over a period of time, equal to the runtime capture time period, allows the technical operator, to not only detect, but clearly identify the presence of Frequency Hopping Spread Spectrum (FHSS) signals, even when operating at, or near the ambient noise floor. Often, the signal will hop at a rate that is difficult to observe within the Real-Time Event (RTE) trace, but will be easily identifiable using the peak capture mode. ✎

MIN-MAX | Peak Reference Trace

The MIN-MAX reference trace locks, and displays the minimum and maximum peak reference data, separate from the Peak Envelope Capture (PEC) ™ trace. ✎

TDSA ™ Reference Trace

When runtime TDSA ™ is enabled, this peak hold reference displays only the | PEAK | for the current TDSA ™ time block | PERIOD |, and automatically resets, with each operator defined time block, providing a real-time, peak hold component during the runtime process, that is time sensitive against the PEC ™, or the MIN-MAX peak reference trace. ✎
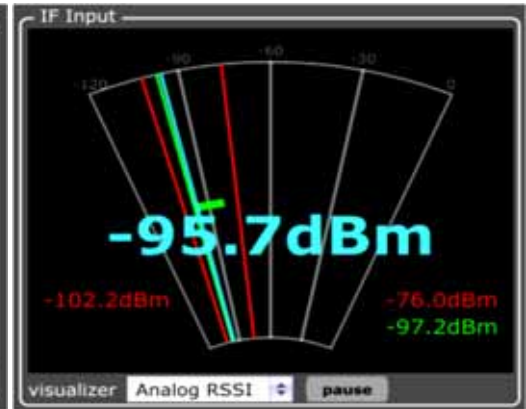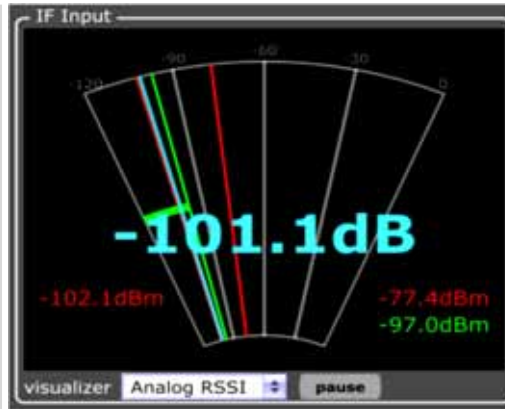
RSSI Trending Display (RTD) ™

The RSSI trending display provides visual information about the RSSI Vs Time, RSSI Vs Location, and RSSI Vs Direction, when utilizing the Kestrel Log-Periodic (KLP) ™ wideband search antenna. ✎

Power Line Carrier (PLC) | Broadband Power Line (BPL) | Signal Analytics

The growing popularity of Power Line Carrier (PLC), and Broadband Power Line (BPL) devices, utilizing advanced signal classifications, and modulation types such as BPSK, FSK, and OFDM, are easily identified using the Kestrel TSCM ® Professional Software, and the hardware based, Kestrel ® 3D Energy Probe (KEP), advanced powerline filter. ✎

Out of Band (Hostile) Signals

When the technical operator utilizes the Channel Profile Mask (CPM) ™ capability, the presence of potentially hostile, out-of-band emitters are easy to identify, as operating within the ambient RF spectrum. Near-field emitters will often exhibit harmonic characteristics, even when their fundamental frequency lies within a legitimate band allocation. The radiated harmonics will fall outside of legal band allocations, thereby providing additional opportunities for the detection and identification of harmonic events. ✎

Digital Signal | Display and Capture

Wi-Fi, Bluetooth, ZigBee, FHSS, BPSK, DSSS, OFDM, ATSC, NTSC, GSM, CDMA, LTE, FSK, OOK, and many other signals types, can be captured, displayed and analyzed visually, and via IQ Capture (Digital Protocol Analytics (DPA) ™ is currently under development). ✎

Software Programming and Operation Manual (SPOM) ™

The Kestrel TSCM ® Professional Software includes, excellent Canadian technical support, and a detailed Software Programming and Operation Manual (SPOM) ™. The manual provides advanced information for each feature, along with working examples, making it an excellent reference and training resource.

Kestrel training allows technical operators to gain the maximum benefit from their software investment. ✎

TDSA ™ | Time Block Peak Trace Reference

2017-04-11 23:56:43
2129325 4262
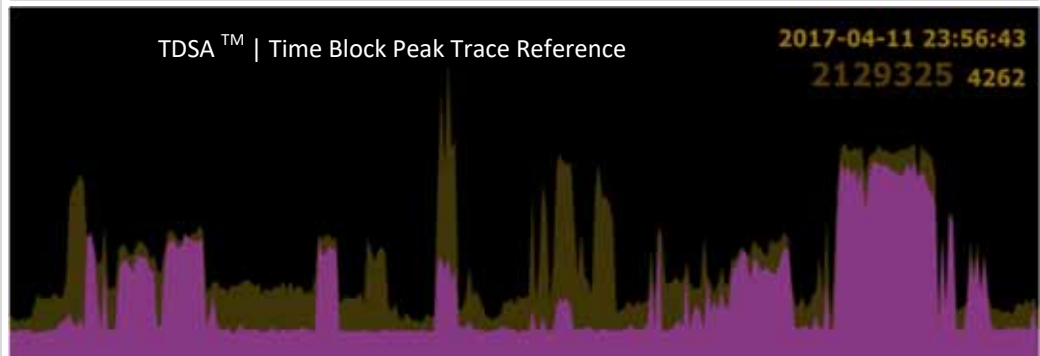
DSA Trace Count Limit | Trace Time Limit

The Kestrel TSCM ® Professional Software supports operator defined runtime DSA ™ trace count (time) limit automation. This feature allows the operator to complete other inspection related tasks, while the Kestrel ® software stops (locks) runtime collection after completing the specified number of Differential Signal Analysis (DSA) ™ traces (or time), for the current antenna collection location. ✔

Event User Alarm | Activity Scheduler

DTL ™ is supported by an event process alarm that notifies the operator when the DSA ™ collection for the current antenna location is complete. The operator can manually over-ride the locked status and continue collection, or relocate to the next DSA ™ Location. This feature is part of the Activity Scheduler and can be programmed to respond to any scheduled events, programmed by the operator. ✔

DSA ™ ICON | Antenna Location

The ability to change the displayed color of any DSA ™ ICON is supported, allowing the technical operator to edit the default color representation of the DSA ™ trace and ICON. This is an important ability when importing historical trace comparative data from another Kestrel Project File (KPF). ✔

Multiple Runtime Instances of Kestrel ®

The ability to run multiple instances of the application is supported, allowing the technical operator to maintain an active runtime session, and work with one, or more historical files outside of the runtime instance, for review, analysis, or report generation on the same host computer. ✔

Communication Receiver Mode (CRM) ™

The normal practice is to establish a Kestrel Project File (KPF) ™, and then demodulate any Signals of Interest (SOI) from within the runtime environment. However, it is also possible to simply open the application window, and directly enter the Center Frequency (CF), and activate the demodulation and visualization process to listen, and visualize the signal. The ability to playback Kestrel IQ (KIQ) ™ or IQ captured as CSV files, is supported at any time with, or without an initialized receiver. ✔

Automatic Measurement and Collec on System (AMCS) ™ | OPT AMCS

The AMCS ™ component within the Kestrel TSCM ® Professional Software allows the application to operate "headless" in an embedded computing environment, significantly reducing the required memory footprint and processing overhead. AMCS ™ is perhaps described as one of the most powerful features ever developed for professional deployment requirements, and is configured by the technical operator, with a Kestrel ® Configuration Script (KCS) ™ file. The Kestrel ® application will automatically generate the project files and runtime configuration, to be able to immediately begin collection and operator defined "reporter" activity. Client applications may be connected to the Kestrel ® software via a TCP/IP socket interface connection, to obtain the extracted data stream, and basic configuration information from the application. A measure of control is also offered to client applications. The AMCS ™ comprises of a powerful sub-system deep within the Kestrel ® application. "Reporters" include both TCP/IP streaming, and the ability to write to the host sub-system simultaneously, or independently. Kestrel's SDK provides an open-source API, that includes a graphical Data Visualization Interpreter (DVI), and console mode to recover, process and display the TCP/IP stream. An open source API and SDK is available to AMCS ™ licensed end-users.

AMCS ™ Licensing Activation

On initial connection of a supported receiver with Kestrel ®, a license key request must be generated in the form of a Challenge and Response (CRC) ™ code, and submitted to technical support by the technical operator. The CRC code is provided to the Technical Support (TSG) ™ of Professional Development TSCM Group Inc., and converted into an AMCS ™ specific Activation Security Key (ASK) ™ license, enabling the AMCS ™ capability. This process is necessary, even if the software currently is enabled with a valid license Comprehensive AMCS ™ programming and deployment documentation is available. ✔

AMCS ™ | Kestrel ® Configuration Script (KCS) ™

The AMCS ™ sub-system allows the Kestrel ® Software to be operated in a stand-alone fashion. A configuration file allows autonomous collection to be set up and initiated on application start. Client applications can then connect to Kestrel ® and obtain continuous TCP/IP measurement data. ✔

1 | Remote Spectrum Surveillance and Monitoring (RSSM) ™ | Setting up a kestrel ® instance and receiver at a remote location, permits a continuous monitoring data feed, that can be obtained at a secondary monitoring location. Kestrel ®, operating in this mode is suitable for operation on an embedded PC platform, providing a low-cost, and very powerful remote RF monitoring solution. ✔

2 | Data Feed Integration | The remote feed configuration, utilizes an open "xml" style format allowing easy integration with additional data feeds, to provide a richer data stream, and permits the synthesizing of multiple sources into a single data feed. ✔

3 | Alarm and Alerting Integration | The integration of the AMCS ™ capabilities with the unique alarm and alerting architecture within Kestrel ®, provides the capability of obtaining RSSM ™ data, when specific events of interest occur within the ambient RF spectrum environment, thereby reducing the data transmission load, and providing advanced actionable intelligence relating to spectral activity. ✔

4 | Distributed (Managed) Remote Spectrum Surveillance and Monitoring (RSSM) ™ | Integrating multiple instances of Kestrel ® with AMCS ™ and integrating their independent data feeds, ensures that powerful RSSM ™ solutions can be easily implemented at the facility level, or across national and international geographical collection locations. ✔

5 | Black Box Integration | The ability to utilize RF spectra as a sensory input to an existing black box system, or build powerful analytical solutions can be realized, when the AMCS ™ data feed is combined with other sensory inputs, including GPS, speed, altitude, temperature, RF interference detection, and other required end-user parameters. ✔

Kestrel TSCM ® Professional Software | Well Positioned to Hunt in a Complex Signal Environment

IQ Recording | IQ Playback | IQ Loop

The technical operator is able to Capture, Record and Playback real-world signal events during runtime, and post-event review and analysis. Controls for | RECORD IQ | PLAYBACK IQ | and | LOOP IQ | samples are located within the Demodulation Visualizer control group window. | RECORD IQ | writes the IQ sample as either a proprietary | Kestrel IQ (KIQ) | or a | RAW CSV | file format, with a dynamically formatted File Naming Convention (FNC). The | PLAYBACK IQ | capability allows the operator to select a previously captured historical | KIQ | or | CSV | file, and | PLAYBACK | spectra, IF visualization, and demodulated audio content within the Demodulation Visualizer control group, without a search receiver connected. The | LOOP | feature, allows the IQ sample to run as a repeating | LOOP | to enhance operator analysis (visual and audio content). Kestrel's Dynamic Source Transfer (DST) [TM] technology supports the capability of the operator to "hand-off" between live search receiver audio, and the historical | KESTREL IQ (KIQ) [TM] | or | RAW CSV IQ | file. ✗

RAW CSV IQ | Conversion Utility

The software includes the ability to convert the | RAW CSV | IQ files to the more efficient, proprietary Kestrel IQ (KIQ) [TM] format, allowing the operator to convert the larger format files to smaller working files for playback and storage. The RAW CSV files can often be manually reformatted (edited) for compatibility with third-party IQ analyzer resources. ✗

Bluetooth and WI-FI Detection

The ability of the Kestrel TSCM ® Professional Software to acquire and display WI-FI and Bluetooth signals within the immediate target area enables the technical operator to determine whether a signal originates from within the target area, or from outside, locate the emitter, and verify its origin and purpose. The Waterfall Display (WFD) verifies the presence of WI-FI and Bluetooth emitters operating within the ambient spectrum environment. The Kestrel ® Channel Profile Mask (CPM) [TM] provides the technical operator with a clear channel occupancy pattern, down to the channel level for easy analysis. ✗

Kestrelnet [TM] | Autonomous Measurement and Collection System (AMCS) [TM]

The Kestrel TSCM ® Professional Software, and the Autonomous Measurement and Collection System (AMCS) [TM] in combination, provide the means for the advanced Kestrelnet [TM] capability, a diverse remote surveillance application for defensive and offensive mission specific requirements, for government entities, regulatory compliance, law-enforcement, corrections environments, and a range of military applications across securely encrypted private communication networks. ✗
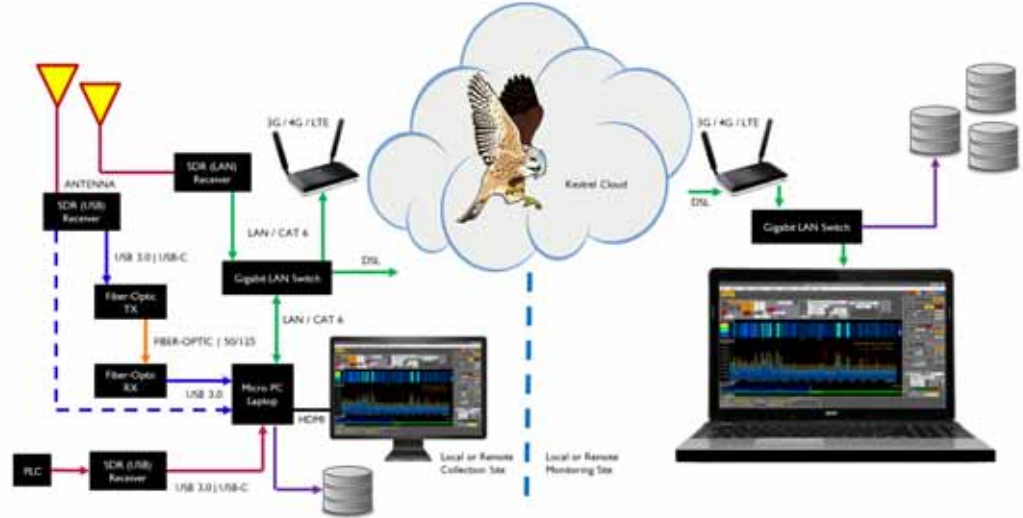
Typical TSCM Remote Spectrum Surveillance and Monitoring (RSSM) [TM] Deployment Profile

Kestrel TSCM ® Professional Software | Deployment Methodology

The Kestrel TSCM ® Professional Software addresses a major capability gap, by delivering exceptional value, and a full featured, operator centric, and work-flow oriented application that is scalable, flexible and responsive to changing mission requirements. ✗

1 | Deploy | Agile software with extensive TSCM specific features for traditional operator assisted Radio Frequency (RF) analysis; Unattended, managed Remote Spectrum Surveillance and Monitoring (RSSM) [TM]; Basic Test & Measurement; Educational Institutions and Training environments; Spectrum Analysis and Complex Signal Analytics; Testing and Evaluation of offensive Technical Surveillance Devices (TSD), and other RF emitters. ✗

2 | Detect and Capture | Runtime capability of days, weeks, or months; Capture spectrum data for real-time and post-event analysis and review; Manage long-term storage of spectrum data. ✗

3 | Analyze and Identify | Live View Analysis (LVA) [TM] functions in parallel with real-time data collection; Differential Signal Analysis (DSA) [TM]; Time Differential Signal Analysis (TDSA) [TM]; Receiver Differential Signal Analysis (RDSA) [TM]; Runtime and post event analysis, historical file review, with trace import capability; Export data for post event analysis, utilizing other available resources. ✗

4 | Confirm | Audio and NTSC Video Demodulation capability and real-time visualization and analysis of Signals of Interest (SOI) events. ✗

5 | Locate | Emitter localization is simplified utilizing a Relative Signal Strength Indicator (RSSI) value and basic Radio Direction Finding (RDF) techniques. ✗

6 | Neutralize | Quickly neutralize, and potentially exploit hostile emitters. Terminating the threat is the top priority, analyzing intelligence and exploitation is generally a secondary consideration. ✗

7 | Report | Generate custom, runtime, or post capture, session reports with support for images, photographs, and floor plans, internally generated as an exportable PDF file. ✗

Kestrel TSCM ® Professional Software | Advancing the Art and Science of Technical Security

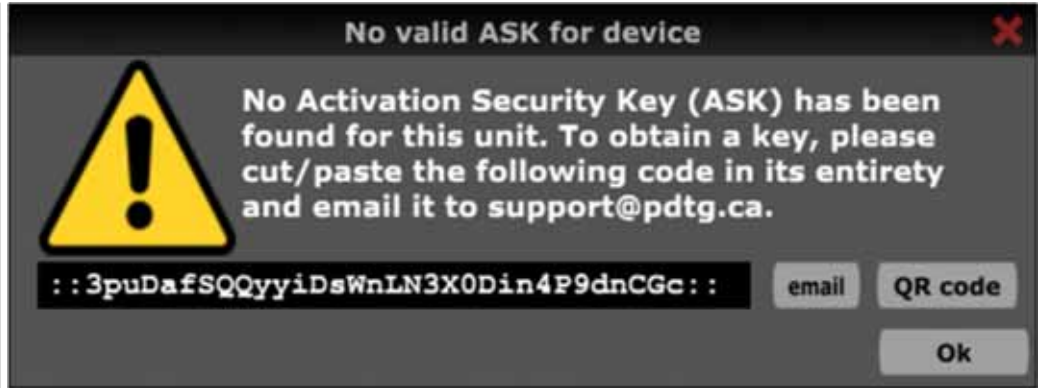**Air Gap Licensing Model | Classified Machines**

To meet the mandatory security requirements of many law-enforcement, government, military and national security organizations, the Software Development Group (SDG) ™ has implemented an "air gap" licensing process for both generating the Challenge and Response (CRC) ™ string and the return Activation Security Key (ASK) ™ required to activate the software. The "air gap" solution adds a QR code generator as part of the CRC key request process. The technical operator generates a QR code, rather than the CRC string. A mobile device (smart phone), with an optional QR code reader, can decode the CRC string and send it via the mobile device, creating a secure "air gap" process. Alternatively, the operator can use the mobile device camera to take a picture of the displayed QR code, and email the file to technical support for processing directly from th mobile device. The returned ASK ™ can be emailed as a QR code image to the "air gap" mobile device. The target computer camera can then be used to read the ASK QR code image and import the key directly, completing the licensing process. To illustrate this capability, the QR code on the right can be decoded with a QR code reader APP installed on a smart phone. There re many free QR Code readers available for download. Give it a try using the displayed QR code example. This eliminates the need to cut and paste or transfer the CRC and ASK by hand to activate classified computers. ✎

USB Media (CRC | ASK) Transfer

In the event that the target computer is not permitted to be connected to the network. USB media can e used to transfer the CRC and ASK from and to the machine. Other removable media such as an SD card may also be utilized where permitted. ✎

Resident Training Centre (RTC) ™

Additional nights of accommodation may be required to accommodate training planning. ✎

No valid ASK for device

No Activation Security Key (ASK) has been found for this unit. To obtain a key, please cut/paste the following code in its entirety and email it to support@pdtg.ca.

::3puDafSQQyyiDsWnLN3X0Din4P9dnCGc::

email | QR code | Ok

ASK Request QR Code

Understanding Licensing Options

The Kestrel TSCM ® Professional Software licensing model provides all updates, new releases, and technical support within the same generational software version (v1.0xx, 2.0xx and 3.0xx), for example. Most of the key functionality is included as standard features within the base software (OPT KTP). The following options add significant mission specific capability for specialized deployment requirements.

Kestrel TSCM ® Professional Software | OPT KTP | Call 800-615-0392 For Pricing

Additional Rx Activation Security Key (ASK) ™ | OPT ASK | Call 800-615-0392 For Pricing

Automatic Export Control (AEC) ™ | OPT AEC | Call 800-615-0392 For Pricing

Command Line Programming (CLP) ™ | OPT CLP | Call 800-615-0392 For Pricing

Autonomous Measurement and Collection System (AMCS) ™ | OPT AMCS | Call 800-615-0392 For Pricing

It is important to understand the importance of attending the Certified Technical Operator (CTO) TM training which significantly enhances operator knowledge and proficiency in deploying the software and many new technology features within a modern moving target threat model.

3-Day | Certified Technical Operator (CTO) ™ | OPT CTO3 | Call 800-615-0392 For Pricing

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