

KSL

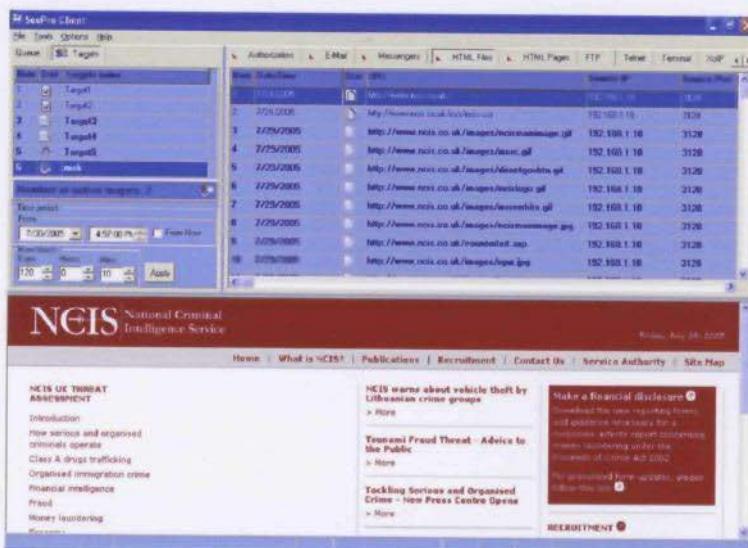
КОМПЕРТ SOLUTIONS LIMITED



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Broadband Internet Processing

SeePro



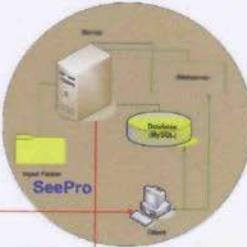
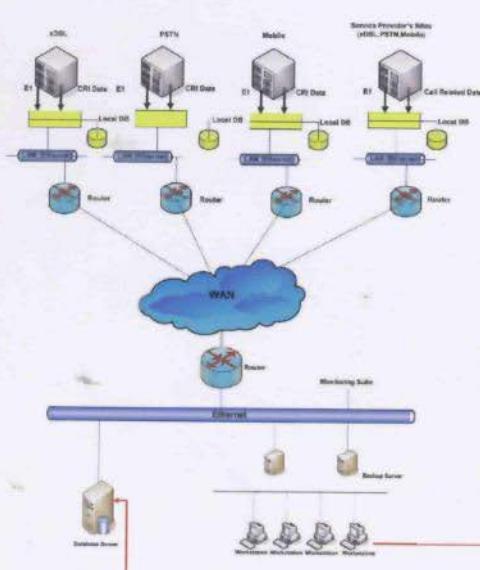
SeePro takes demodulated data intercepted from analogue, digital or satellite networks and files recorded from an Ethernet network. These raw data files are made available to the SeePro server through shared directories or FTP, and decoded. Data can be processed both online (live) or offline (previously recorded), depending

on when it is moved into the shared directory by the intercepting recorder.

The SeePro Client application runs across a network, adding value through flexibility by providing many operators access to one server of decoded data. The SeePro Client's straightforward user interface shows all Internet product as it was viewed on the target's screen – emails with attachments, web pages as they were first loaded, and chat conversations in order of the messages.

SeePro offers debug information on all product not recognised and therefore not decoded; very useful for the rapid advances in Internet technology to add new features to SeePro.

SeePro is the invaluable upgrade to bring your monitoring suite up to the standards of today's Internet communications.



Technical Specification

Captured Information:

Authorisation (username/password), e-mail, messengers, HTML pages, FTP, XoIP, Terminal and Telnet, Other protocols

Protocols:

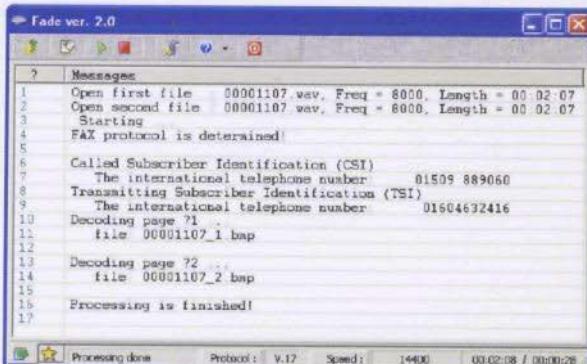
POP3, IMAP4, SMTP, HTTP, FTP, ICQ, IRC, MSN, Telnet, XoIP

Transport:
XoIP:

PPP, Synchronous PPP, IP, TCP/IP
VoIP, FoIP, Video over IP

Fax/Modem Decode

FADE & MADE



Entirely software solutions, the FADE and MADE packages decode recorded Fax and Modem transmissions with ease; reliably, effectively and efficiently.

Covering all major fax formats and modem protocols for Internet transmission over analogue or ISDN lines, these solutions add major advantages to your monitoring centre.

The Komcept FADE software has been developed for the demodulation and decoding of facsimile sessions that have been recorded by professional monitoring equipment. This software processes data that has been collected by either a digital E1 stream or an analogue line.

The Komcept FADE software outputs restored image files of transmitted facsimile pages (BMP or JPEG files). These files can be viewed using standard Microsoft Internet Explorer, Microsoft Paint, Imaging for Microsoft and other applications.

The Komcept MADE software suite is a solution to demodulate and decode information that has been transmitted over standard analogue or ISDN lines during an Internet session. It processes a vast array of protocols used online and presents the recorded Internet session in a neat and user friendly format.

The software will process sessions that have been previously recorded by law enforcement agencies using professional digital recording equipment. MADE runs on standard Windows operating systems. Files from captured Internet sessions can be displayed in their original applications such as emails (complete with attachments) in Microsoft Outlook Express, web content in Internet Explorer, transferred documents in Microsoft Word etc. as appropriate.

Komcept MADE reveals the username and password of the individual opening the Internet session and will capture all activity when known protocols are utilized.

The approach taken by both software applications allows both to be integrated into existing monitoring centres, saving infrastructure, time and cost.

Each software package is supplied with installation CD, USB dongle and handbook.



Technical Specification

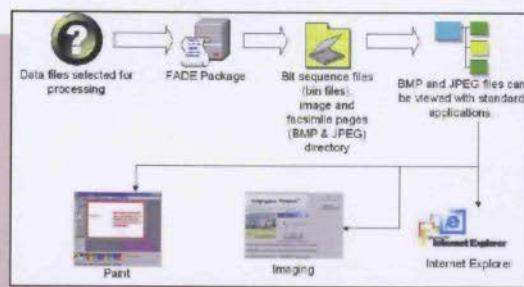
FADE

Protocols: ITU-T V.17, V.29, V.27ter, V.21, V.34
Modes Recognised: Interfacing Mode to ITU-T T.30

MH, MR, MMR images coding mode - ITU-T T.4, T.30
ECM (Error Correction mode) - ITU-T T.4, T.30
JPEG colour image coding mode - CCITT T.81

MADE

Protocols: ITU-T V.90, V.34, V.32, V.32bis, V.22, V.22bis, V.21, Bell 212A
PPP, IP, TCP/IP: POP3, IMAP4, SMTP, HTTP, FTP, ICQ, IRC, MSN, Telnet, XoIP
VoIP and FoIP: IP, UDP, RTP, RTCP, RAS, RTP, G.711, G.723.1
Upon request, optional: PPP STACC, PPP MPPC, x.25, SS7, ISDN Q.761-Q.764, Q.766, BBS



Lawful Interception

LI Recorder



Komcept Solutions' recorders give you full fidelity audio reproduction of voice, fax and data transmitted over the telecommunications network.

Equipment that will record telephone conversations rarely has the quality to wholly reproduce not only the words but the meaning of the words – Komcept's recorders can give you this.

Both digital and analogue recorders are available.

The Analogue recorder will accept up to 48 analogue telephone lines from standard copper-pair taps.

The E1/T1 Digital recorder may receive up to 64 telephone channels on two E1 trunks, recording calls in either voice operated or tone triggered mode, or by a digital signalling method. All signalling systems can be accepted, including GISH, Q.391 DSS1, DASS and DPNSS.

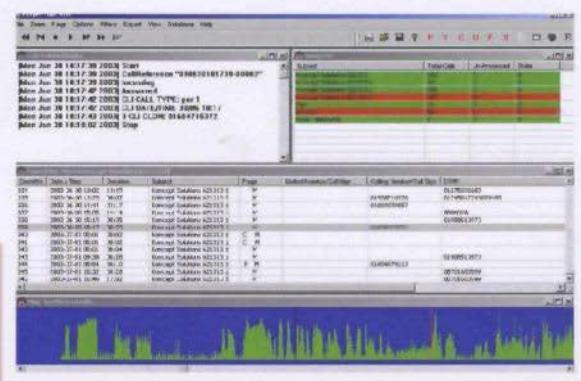
KSL Recorders will report all call related data such as DTMF, CLI and Pulse tone dials, as well as any GSM location information etc. supplied via the digital signalling from the intercepting switch. Audio can be stored in mono and binaural, A-Law, μ-Law and 16-bit linear.

The recorders have an optional CD or DVD recorder for permanent evidential archiving of recorded calls. They may have larger arrays of hard disks to record for months or years without the worry of running out of space, or be connected to a Network Attached Storage (NAS) device.

Included with all recorders are feature-packed transcription software licenses which allow standard PCs connected with recorders over an ethernetwork to play and transcribe all calls at will. Alternative language options are available. Fax and data calls may be automatically decoded with the addition of a Fax and data processor, also available from Komcept.

Komcept Solutions' database system can link all KSL Recorders and transcription machines together to collate call related data for efficient activity monitoring and history preservation. More recorders may be added allowing a modular expansion of the system over time.

With fast and easy exporting to analytical applications such as i2, all communication may be visually connected to add to the bigger picture and aid live operations.



Technical Specification

Environmental Specifications

Operating Temperature: 0°C to 60°C (32°F to 140°F)
Operating Humidity: 5% to 95% (non-condensing)

Physical Dimensions

427 x 480 x 177 mm (W x D x H)
Rackmount 4U

Recording Inputs

E1/T1: Up to 64 channels on 2 E1/T1 trunks.
Digital Analogue: Up to 48 analogue line taps.

Storage

DVD-R permanent optical archive drive
Customisable array of hard disks; 1TB, 1.5TB, etc

Audio Outputs

Stereo 3.5" jack Line Out
Stereo 3.5" jack with 2W/channel power amplifier

KSL's Interception Range Overview



Komcept Solutions' recorders give you full fidelity audio reproduction of voice, fax and data transmitted over the telecommunications network.

Graphical interfaces and optional processing tools provide you with a complete armoury for telephone interception using individual modules to scale your system for your needs and price, and allowing it to be built upon over time.

Analogue Telephone Interception

The *Analogue Recorder* provides Law Enforcement with a comprehensive facility for the un intrusive interception of analogue telephone circuits. High impedance parallel connections to target lines can be routed to the interface which will detect activity on the line and record both sides of the conversation. All call related data (Caller ID, DTMF, MF, Pulse Dial) is decoded by the recorder and stored for presentation upon playback.

Analogue Interception with Call Routing

The Analogue Recorder is best used where the targets' telephone lines have been routed to the recording centre. If this is not possible but access to the switch is available then the Analogue Recorder may be customised to route all calls from the telephone switch to the recording centre over another analogue line (*RemoteTap*) or a DSL-line (*VPN Recorder*).

Switch/LI Software Dial-up Receiving

The *Dial-up Recorder* is designed for situations where interception is provided through switch software and the intercepted product is routed

from the switch on a digital (ISDN) dial-up connection. The Dial-up Recorder is capable of receiving this intercepted product on one or more ISDN trunks, as well as data channels for CALEA J-STD-025A or ETSI ES201 671 compatible signalling. The dial-up recorder takes a primary rate ISDN Q931 connection and can be configured to all national standards.

Digital Trunk Interception

The *E1 Activity Recorder* may receive up to 120 simultaneous telephone channels on four E1 trunks, recording calls in either voice operated or c-tone triggered mode, or by a digital signalling method. All standard signalling systems can be accepted including GISH, SS7, DASS and DPNSS.

GSM Interception

Komcept Solutions' own *A-Interface Interception System* allows the capture and analysis of the data on the A-interface (between the MSC and BSC) of a GSM network. It keeps a live database to provide translations between TMSIs and target IMSIs to which they relate. This can be scaled for a small system right up to a multi-sited GSM network.



Interception Systems offered by Komcept Solutions for :

Analogue telephone interception.

Analogue interception with call routing.

Switch/LI software dial-up receiving.

Digital trunk interception.

GSM interception.

PBX monitoring.

Available to enhance Komcept Solutions' interception systems :

Fax, modem (dial-up internet) and broadband internet.

Location mapping.

PBX Monitoring

The *PBX Monitor* offers the unintrusive interception of a majority of digital PBX telephone circuits. High impedance parallel connections to target lines can be routed to the monitor which will detect, analyse and decode the activity on the line and record the resulting audio and call related data. Up to 96 digital lines can be monitored and recorded by each monitor. All call related data (Caller ID, DTMF, MF) is recorded and can be displayed when replaying the calls.

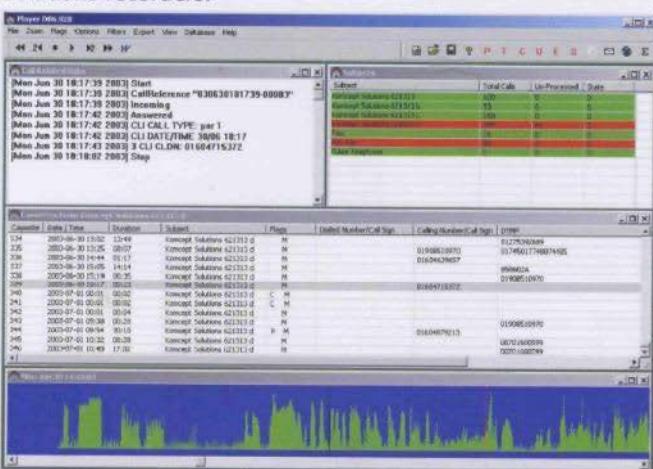
The range of digital PBX switches and handsets which can be monitored is constantly growing.

Call Playback

The *Komcept Solutions Digital Player* is a software application for a call replay machine based on a Windows PC. When used in conjunction with Komcept's Lawful Interception suite it provides a versatile playback facility packed with features for the displaying and decoding of called/calling numbers, flexible filtering and sorting, looping and flagging, amongst a host of other tools. The population of a Word Processor transcription document can be controlled from within the Player, saving much of the operator's time.

For mobile targets SMS messages and location information can be displayed instantly.

This product is normally supplied free of charge with Komcept Solutions recorders.



Fax Processing

Fax calls recorded on any of the Lawful Interception suite's recorders can be processed and decoded, producing an image of the transmitted fax. This process is automatic when connected to the Lawful Interception network, yet can also be used standalone with fax calls fed into it as .wav files.



Modem Decoding - Dial-up Internet

Modem Decoding requires a four-wire tap to record both directions of the call; differences between Fax and Modem are substantial in the way data is intercepted - fax being possible from a 2-wire tap. The recorded .wav file from the 4-wire tap is stored, and processed through the Modem decoding server.

Broadband Internet

Depending upon the architecture of the operator's network, there are various ways a *Komcept Solutions' Broadband Interception System* can monitor a target's broadband line. With the high data rates of modern broadband connections the product can be filtered to only store relevant material, for example between certain times, just email, particular web sites etc. The Delta SeePro application presents the whole session neatly and conveniently organised.

The screenshot shows the 'DeltaSeePro v2.0 (Trial Version)' application. It has a menu bar with File, Options, View, Help. Below the menu is a toolbar with icons for File, Open, Save, Print, Copy, Paste, Find, Replace, and others. The main area has two panes: the left pane shows a list of network traffic with columns for ID, Router Type, Call Speed, and Modem Speed; the right pane shows a browser window displaying a search results page for 'Yahoo!'.

Mapping

Geraudis, Komcept Solutions' own mapping application, displays the likely location of a target based upon their location messages from a GSM interception system, and cell locations from the CSP (Cellular Service Provider). Geraudis displays a navigable history of a target's whereabouts, allows time-filtering, and alarms when they move. It is based upon best-guess geography of cell usage.



GSM Alarm Announcer

GAA-8



The GSM Alarm Announcer allows your equipment to send your "on-call" engineers or staff descriptive alerts by text message.

With eight independent trigger inputs and a fully programmable array of messages and recipient lists, the GSM Alarm Announcer adds flexibility and assurance to your systems.

Whether you need your equipment to send you an alert when system resources run low, or to reassure you an event occurs, the GSM Alarm Announcer will get the message across.

With two-way GSM communication, the recipient can text back to acknowledge the alarm, cancelling it. In fact, full interactivity is provided via SMS; users can check the status of any alarm, cancel alarms, and trigger outputs lines. It can even be configured to acknowledge announcements.

The inputs and outputs are totally isolated to ensure that the GAA-8 does not influence or harm the existing equipment. Connection is simple and either a 5V logic level or a closing contact can instigate an alarm.

The unit is programmed from a Microsoft Windows application through USB or RS232 connection. Full control is offered over the text of each SMS message,

allowing you to be as descriptive (or ambiguous) as desired.

Adding to the security resume of this device, there are various configurable levels of access control; message identifier, passwords, authorised numbers, and command aliases. The main user is notified of any unauthorised control attempts.

Aliases can be assigned to standard controls, which not only disable the original command name, but can also make them more memorable.

Eight LEDs illuminate on the front of the unit to visually display input alarms, and eight LEDs illuminate to show status of any active outputs. A choice of rackmountable or standalone versions is offered.



Technical Specification

Unit Dimensions:

Depth = 131mm

Height = 37.5mm

Width = 200mm

Weight = 520g

Inputs/Outputs:

8/8, D-type connector

Power input:

12V DC, PSU supplied

Configured by:

RS232 or USB connection

Covert Surveillance Camera

CSC-1



The KSL CSC-1 is a discreet recording system, fully self-contained in a rugged casing. It is designed for body-worn and other covert observation tasks and can be easily concealed in everyday items.

The CSC-1 can record continuously for up to 12 hours onto a removable memory card. Options available to trigger the start of a recording include a simple button press, timer or signal from an external sensor.

The miniature camera and lens provide image resolutions of up to 640 x 480 pixels, making each JPEG frame around 40k bytes in size. This allows 20,000 frames per gigabyte of storage capacity, or even more if using the 320 x 240 resolution. Recordings are stored onto a removable CompactFlash card, capable of holding over 1.5 hours of VGA video per gigabyte at around 4 frames per second, with the time of each frame stored alongside it. CompactFlash cards are currently available in sizes of up to 8GB, with the release of 12 and 16GB versions imminent.

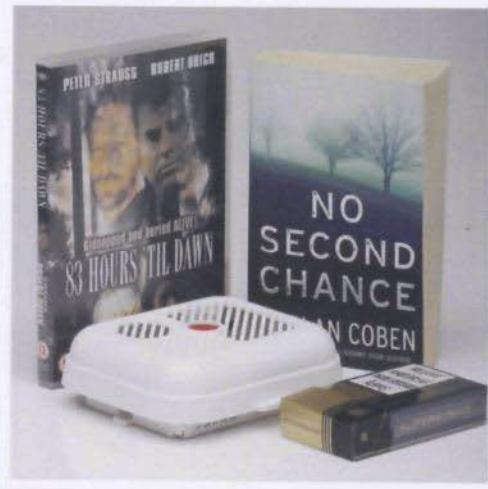
The CSC-1 offers a variety of options to trigger the start of a recording, including an integrated button, timer, and a conventional switch contact is also provided for use by ancillary devices such as motion sensors, contact switches, or light sensors. Configuration of the CSC-1 for these and other options, such as frame rate and resolution, is carried out via PCPC software,

which interfaces with the device using an Infrared connection.

The supplied lithium-Ion rechargeable battery will provide power for up to 12 hours of continuous recording, or over a week of standby time. Power consumption is less than 10mA in standby mode and 200mA when the camera is in operation. A charger is supplied for the internal cell.

The complete system is housed in a rugged milled aluminium case, roughly 106 x 60 x 21mm in size, and could be easily concealed or worn in a shirt pocket. The camera lens orientation is configurable to enable side or face observation. The CSC-1 can be supplied without the case for a more sophisticated concealment.

The Komcept CSC-1 is designed to be robust and simple to operate, whilst providing a wealth of features applicable to many surveillance tasks.

**Technical Specification**

CSC-1 unit dimensions:

Length = 106mm
Width = 59/62mm
Height = 20.5/22mm

Camera module size:

6 x 7 x 5.7mm

Viewing angle:

62°±5%

Max frame rate:

7.5fps (variable)

Data storage:

CompactFlash Card

Recording capacity:

Over 20,000 frames per gigabyte at VGA resolution (~1.5 hours)

Power source:

3.7v Lithium Ion battery (supplied)

Battery Life:

Approx 12 hours recording time or over a week in standby.

Configured by:

Infrared via RS-232 serial connection

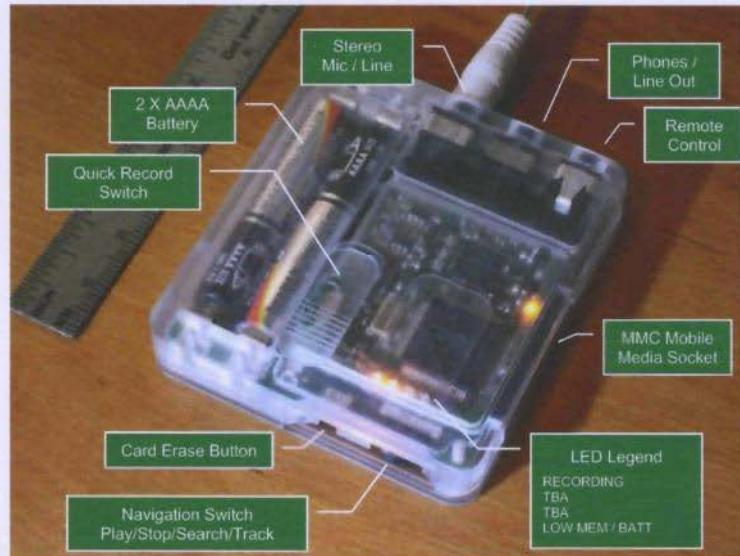
Audio Recorder

GPAR4A

Komcept Solutions is pleased to present the GPAR4A Audio Recorder, the highest quality miniature recorder

Features of the Audio Recorder:

- Can record to MMC Card from a microphone or line source
- Genuine 16bit performance for CD quality recordings
- Miniature size with standard 3.5mm jack connections
- Compatible with input signals over a 124dB range
- Low noise +/- 15ppm high precision sampling clock
- Quick Record Switch with negligible start-up time
- Excellent battery life and ultra long standby time
- High quality stereo headphone or line output
- Built in playback navigation with fast scan facility
- Plug-in power for direct microphone powering
- Fully remote controllable using wired serial port
- Close-contact input for external record control
- Robust against sudden power loss during record
- Rapid memory card erase and formatting function

**Technical Specification**

External Dimensions:

Connectors:

External Remote Control Options:

Recording Time:

Battery Life over range of settings:

Dynamic Range:

Maximum Input Levels:

Microphone Preamp:

Low Noise Microphone Bias Output:

Time from 4.7uA standby to recording:

Audio In/Out:

Remote Control:

Wired Switch:

1.8V Inverted RS-232:

44.1kHz:

22.05kHz Stereo / 44.1kHz Mono

22.05kHz Mono

Recording:

Standby (serial port active):

Line:

Mic (Standard Gain):

Mic+ (High Gain):

Total Equivalent Input Referred Noise:

53mm x 59mm x 10.5mm

3 pole 3.5mm Jack socket

4 pole 3.5mm Jack socket

Close to contact record

Simple Control Protocol

3 hours

6 hours

12 hours

20 to 40 hours

>10 years

>94dB

+4 dBu (Pro Audio Reference)

-20dBu

-26dBu

<2uV

1.6V @ 1mA max

<1s

v1.0

Directional Microphone

DM-144



The DM-144 features an array of high quality miniature microphones and state of the art digital signal processing technology to produce the most sophisticated microphone of its type anywhere in the world.

The microphone array and processing engine can be disguised in different concealments to suit the requirement but is commonly used in a laptop computer bag or small overnight case.

Output is sent to a recorder built into a PDA which also allows live listening and control of the processing, all over a radio link. This means that the array in its case can be left on a chair or bench and the user can listen, record and control

the array whilst appearing to be listening to an iPod™ and working on a PDA.

The PDA provides control of the parameters of the signal processing as well as volume and tone controls. The array can also be steered using the PDA.

All parts of the system have integral, rechargeable power supplies and the system is supplied with all the necessary batteries and chargers.



Technical Specification

Array size:	420mm x 270mm
No. of microphones:	144
Power supply:	Internal rechargeable batteries
Processing:	400MHz 32/40 bit floating point DSP, up to 2.4 GFLOPS
Control:	Windows CE compatible pocket organiser; WiFi
Recording:	Windows CE compatible pocket organiser; WiFi
Concealment:	User defined, typically full size laptop case

v1.2

Radio Microphone

OC07

Komcept Solutions - in conjunction with Ocean Communications - is pleased to present the OC07 digital scrambled radio microphone, a member of its family of small surveillance devices.

The OC07 digital radio-microphone provides a discrete solution to audio surveillance. The small transmitter (50mm x 30mm x 6mm thick) is housed in a rugged aluminium casing for easy deployment.

Remote control of the transmitter from the supplied receiver allows real control over its features, frequency shift, output power and audio gain to ensure that, in all situations, optimum use can be made of the hardware.



The transmitter can be pre-set to 3 separate frequencies (within 1MHz) anywhere in the band 300MHz to 1GHz, making it suitable for most applications.

The FSK output is digitally scrambled to ensure that transmissions are not overheard providing that extra level of security.

It's small size and versatility make it suitable for use in very small, quick-plant situations as well as more strategic, longer term operations.

The USB and ancillary sockets built into the receiver allow remote control and monitoring of multi-transmitter systems.



Technical Specification

Receiver specification:

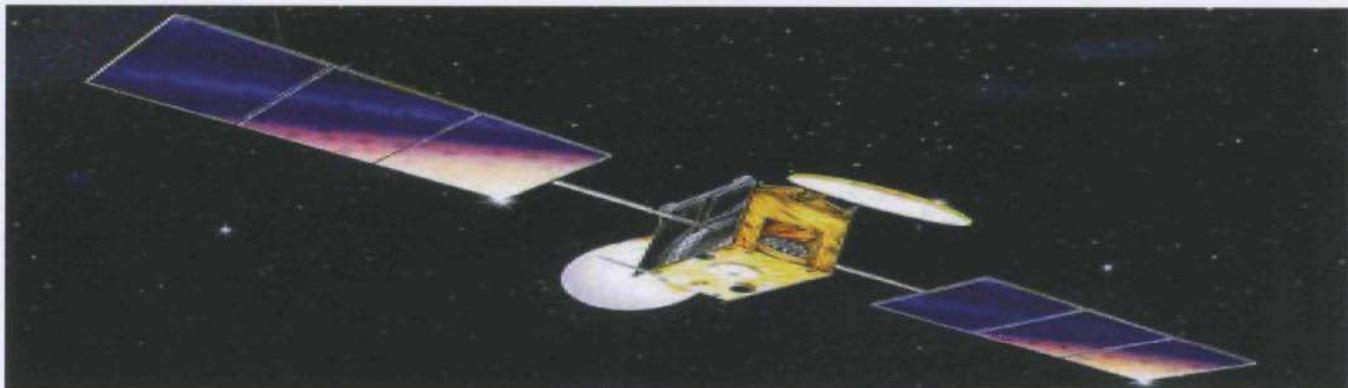
Frequency:	300MHz to 1Ghz
Typically	430MHz - 460MHz or 850MHz - 870MHz
Sensitivity:	-97dBm @ 850Mhz; -100dBm @ 450Mhz
Antenna:	50 ohm SMA, short whip antenna supplied
Output:	Headphone output; recording output; USB interface
Housing:	Professional aluminium enclosure, can easily be body worn or carried in a pocket.
Power:	1.5V DC – takes a single internal AA cell
Size:	102mm x 62mm x 20mm

Transmitter specification:

Frequency:	From 300MHz to 1GHz
	Typically supplied in either 430MHz - 460MHz or 850MHz - 870MHz bands.
Output power:	+5dBm @ 850MHz or +10dBm @ 433MHz max
Modulation:	FSK @ 76.8kb/s
Concealment:	Digital pseudo-random code scrambling
Control:	On/off remote control from OC07 receiver;
Power level:	
Audio gain:	
Power supply:	2.5 to 4.5 volt DC
Size:	50mm x 30mm x 6mm

Inmarsat 3 Monitoring

SI3MS & TI3MS



The Inmarsat 3 satellites were launched between 1996 and 1998. This satellite constellation provides the space segment of Inmarsat's M, M4 and mini-M services.

Komcept Solutions Ltd is able to supply off-air monitoring equipment for the Inmarsat 3 services, enabling Law Enforcement Agencies to identify and monitor users of the system.
Inmarsat M and mini-M provide voice services at 4.8kb/s and fax /data services at 9.6kb/s.
Inmarsat M4 provides additionally some 64kb/s services.

Reliable monitoring of communications with the Inmarsat 3 satellite constellation provides voice, fax and data from Inmarsat M, mini-M and M4 terminals (M4 under development).

Tactical Inmarsat 3 Monitoring System

The TI3MS receives L-band transmissions between the satellite and M series terminals. Designed as a portable system it is ideal for vehicle based monitoring in the field.

Two antennas are provided; a patch antenna to receive the circularly polarised downlink transmissions from the satellite, and a small circular polarised helical antenna to receive the L-band line-of-sight transmissions from the terminal.

All communications are recorded on the unit for later replay or download to a larger analysis system.

Tactical units are available in portable Peli-case versions or built into a luggable, transportable PC.

Strategic Inmarsat 3 Monitoring System

The SI3MS uses a large dish antenna to intercept the C-band downlink signals from the satellite to the Inmarsat ground station and a smaller antenna to intercept the L-band downlink signals from the satellite to the terminal.

All usage of the Inmarsat system passes through the Inmarsat Ground Segments in various locations around the world. All communication in both directions between terminal and satellite is received by the system.

For mini-M and M4, the downlink from satellite to terminal uses seven spotbeams to allow some frequency reuse over the satellite's footprint. A suitable L-band antenna is able to receive communication from the spotbeam covering the antenna and adjacent spotbeams.



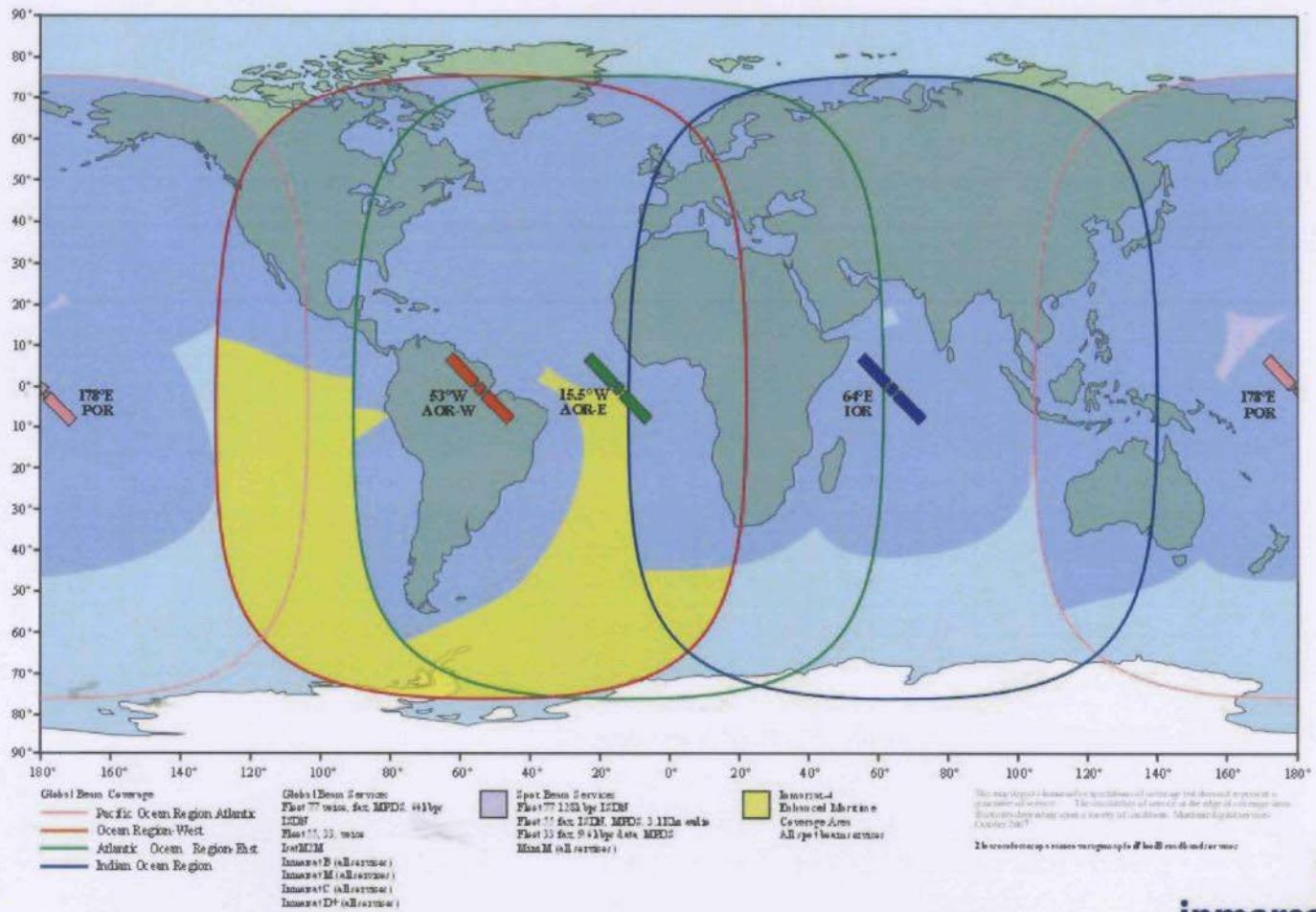
Technical Specification

Inmarsat Tactical Monitoring System (TI3MS)

Receive frequencies: 1.525GHz - 1.559GHz; 1.6265GHz - 1.6605GHz
Antenna requirements: RHCP patch & Helical antenna

Inmarsat Strategic Monitoring System (SI3MS)

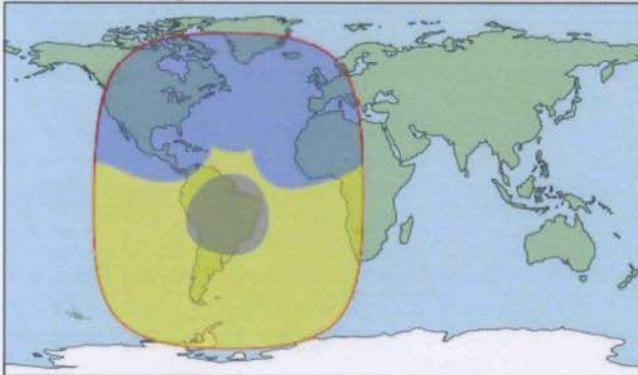
Receive frequencies: C-band 3.4 - 3.7 GHz; L-band 1.5 - 1.7 GHz
Antenna requirements: Approx 7 to 9 metre C-band dish for most of the coverage area
RHCP L-band patch or equivalent



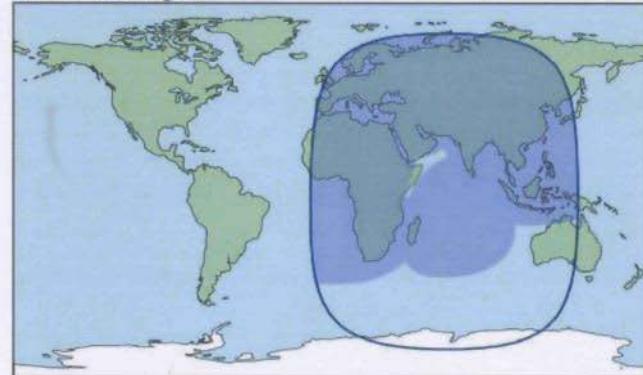
The may depend on the specificities of coverage (not shown) type
and number of services. The availability of services at the edge of care
is also dependent upon a variety of conditions. *Maternal Health*,
October 2007

inmarsat

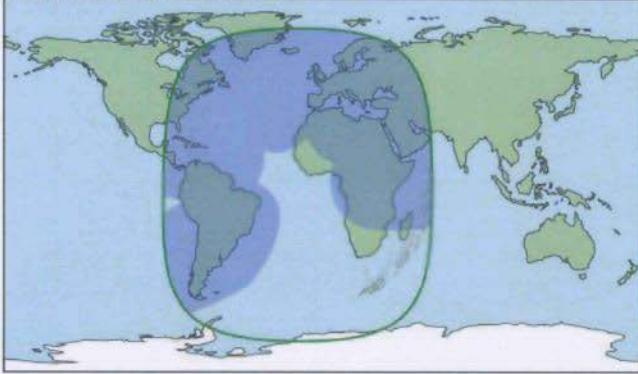
Atlantic Ocean Region-West



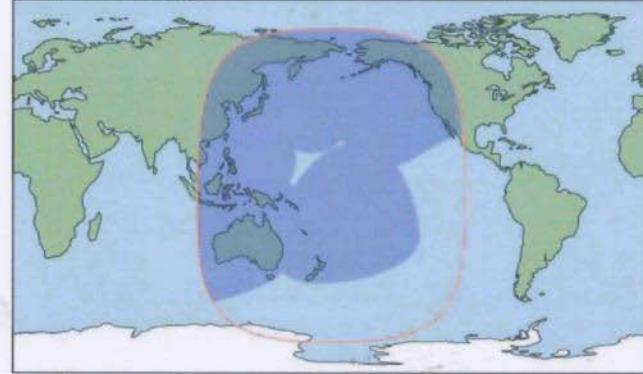
Indian Ocean Region



Atlantic Ocean Region-East

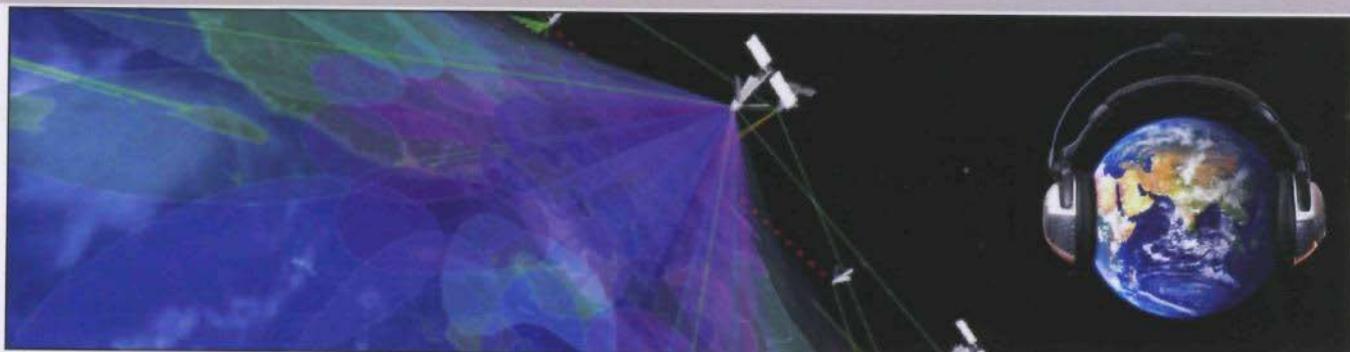


Pacific Ocean Region



Iridium Monitoring System

IMDS



The Iridium Satellite Telephone System was conceived in 1987 and was the first private global mobile satellite telephone system with complete coverage of the earth including oceans, airways and polar regions.

The Iridium Satellite Telephone System uses a mesh network of 66 low earth orbit satellites to provide full coverage of the earth. Calls from handsets on the ground to satellites are passed through the satellite network to a satellite currently in communication with a ground station where they are passed to the international public telephone network. Consequently, monitoring can be achieved only for calls and satellites in range of the monitoring antenna.

The satellite network switches calls between adjacent satellites and between spot-beams on each satellite to provide frequency re-use and highly targeted antenna gain.

The tactical monitoring unit, IMDS, uses one circularly polarised antenna to receive both the transmissions from all satellites in view and from all handsets in line-of-sight range. These signals are converted to an intermediate frequency where they are processed in a software receiver using the latest digital signal processing techniques.

Processing of the received signals is carried out in the processing unit which analyses call content and call related information to provide a clear display front end for the operator.



Photo : Daniel Deak



The Iridium Monitoring Unit, IMDS can be supplied in a portable or fixed format depending on the requirement. Replay of the data and content can be supplied to a network of PC based operator terminals allowing more than one operator to access the system.

The system is capable of receiving, demodulating and presenting voice calls, SMS messages, data traffic and FAX messages. It will monitor the active satellites in view and their antenna spot-beams. The system will allow targeting of handsets using TMSI, IMSI or IMEI and can detect and present the handset's geographic location.

A mapping application provides the operator with a visual indication of the location of the target handsets.

Technical Specification

IMDS Fixed Version:

Rack mountable with a powerful processing engine and Network Attached storage. Playback on an array of desktop PCs, scalable for any desired sized monitoring centre.

IMDS Portable Version:

Rugged luggable PC providing decode and processing with playback on one or several laptop PCs.

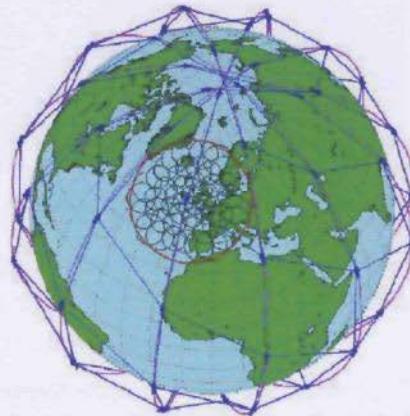
The Iridium Satellite Telephone System

The original configuration was for a constellation of 77 low earth orbit (LEO) satellites and was named after the atom Iridium which has 77 orbiting electrons. In an effort to minimise satellite usage, the constellation was optimised and the number of satellites was reduced to 66. It is the largest commercial satellite system in the world.

The satellite constellation comprises 11 satellites in 6 orbital planes operating as a fully meshed network and is supported by in-orbit spares. Each satellite is in communication with 4 others, 1 satellite in each adjacent plane as well as the two satellites each side of it in the same plane.

Iridium satellites orbit at 780km from the earth's surface and the orbit time is 100 minutes giving an in-view time of between 9 and 10 minutes. Each plane is separated by 31.6° and each satellite has an antenna which has 48 spot beams arranged as 16 beams in 3 sectors.

Communication to handsets from the satellite uses L-band, 1.616 GHz to 1.625 GHz. Communication between satellites is an Ku band, 23.18 GHz to 23.38 GHz and links operate at 10Mb/s. The communication between the satellite and ground user uses a TDMA and FDMA based system and uses QPSK modulation. Each timeslot is 8.2ms long and sits in a 90ms frame. Within each FDMA channel there are four TDMA timeslots in each direction.



The TDMA frame starts off with a 20.32 ms period which is used for simple messaging to devices such as pagers and to alert Iridium phones of an incoming call, followed by four upstream slots and four downstream slots. Small guardbands are used between each timeslot. Channels are spaced at 41.666 kHz and each channel occupies a bandwidth of 31.5 MHz to allow space for doppler shifts.

The Iridium voice communications links use an Advanced Multi-band Excitation codec which reduces the bandwidth to 2.4 kbaud.

IMDS Typical specification:

- L-band fixed mast antenna;
 - Frequency: 1616-1625.5 MHz;
 - Polarization: right hand circular;
 - Antenna gain: 3 dB.
- Antenna pre-amplifier:
 - Frequency band: 1611 - 1631 MHz
 - Gain at mid-band: 3.5dB
 - Noise figure: 2.5dB
 - Connector type: SMA
- Main signal processing unit:
 - L-band receiver; Frequency: 1616-1625.5 MHz;
 - Input impedance 50 ohm
 - Bandwidth: 15 MHz;
 - Sensitivity: 100 dB.
 - Noise figure 6dB at 0dB attenuation
 - Input RF level -45dBm to -60dBm
 - Phase noise at 1kHz offset: -75dBc/Hz
 - DSP-board PCI (2 unit):
 - Minimum PC spec: Intel Core 2 Duo 2GHz, 2GB RAM, 2 x 512GB RAID HDD
 - Optional network attached storage
- Operator terminal unit:
 - Minimum spec: Intel Core 2 Duo 2GHz, 2GB RAM, 120GB HDD, ethernet
 - Monitor TFT 17in or larger

Thuraya Monitoring

TTMS & TSMS



The Thuraya satellite network was introduced in 2001 and allows a user to make calls from any area covered by the satellite using a Thuraya hand-held mobile phone, similar in size to a cellular telephone. The advantage over conventional GSM telephones is that the user is able to make calls from places where terrestrial GSM coverage is poor or non-existent.

Komcept Solutions Ltd is able to supply off-air monitoring equipment for the Thuraya network, enabling Law Enforcement Agencies to identify users of the system and their precise locations.

Reliable monitoring of basic features can be achieved using the KSL Thuraya Monitoring Systems. With the decrypt package full monitoring of voice, SMS, fax and data in both directions is provided.

Tactical Thuraya Monitoring System
The TTMS receives L-band transmissions from the satellite and handset. Designed as a portable system it is ideal for vehicle based monitoring in the field.

Two antennas are provided; a patch antenna to receive the circularly polarised downlink transmissions from the satellite, and a small whip antenna to receive the L-band line-of-sight transmissions from the handset.

Strategic Thuraya Monitoring System
The TSMS uses a large dish antenna to intercept the C-band downlink signals from the satellite to the Thuraya ground station and a smaller antenna to intercept the L-band downlink signals from the satellite to the handset.

All usage of the Thuraya system passes through the Thuraya Ground Segment in the United Arab Emirates where the operations centre also provides control and management of the satellite. All communication in both directions between handset and satellite is received by the system, including locations of all handsets.

The downlink from satellite to handset uses a series of spot-beams to allow frequency reuse over the satellite's footprint. A suitable L-band antenna is able to receive communication from the spot-beam covering the antenna and the surrounding six spot-beams.

By locating an additional L-band antenna and receiver away from the TSMS Site an additional seven spot-beams can be added to the system.

The precise GPS coordinates of handsets allow for real-time graphical mapping. With the addition of the optional decrypt package the voice content, SMS and fax data are presented.

Technical Specification

Thuraya Tactical Monitoring System (TTMS)

Receive frequencies: 1.525GHz - 1.559GHz; 1.6265GHz - 1.6605GHz
Antenna requirements: LHCP patch, Colinear whip
Weight: 16Kg

Thuraya Strategic Monitoring System (TSMS)

Receive frequencies: C-band 3.4 - 3.7 GHz; L-band 1.5 - 1.7 GHz
Antenna requirements: Approx 5 to 7 metre C-band dish for most of the coverage area
LHCP L-band patch or equivalent



Komcept Solutions' TTMS

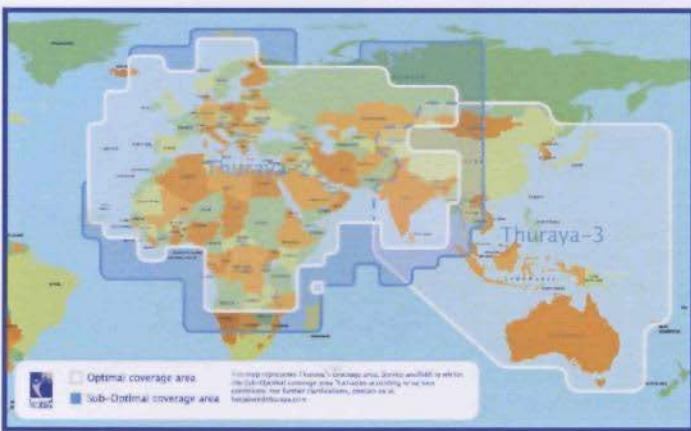


Coverage:

Coverage of the original Thuraya network is shown below.



The addition in 2008 of the Thuraya 3 satellite situated over Borneo has increased the coverage to include the Far East and Australasia.



Tactical or Strategic??

Strategic:

The Thuraya Strategic Monitoring System provides a user with continual live monitoring of handset users in the area of interest. The C-band dish antenna captures all handset uplink calls and the L-band antenna captures all L-band calls down from the satellite in the covered clusters. These calls are recorded and stored in an SQL database which can either be used as a stand-alone system or interfaced to a proprietary recording centre for analysis and transcription.

Installation on a customer's site is carried out by Komcept Solutions approved and experienced engineers and only basic site facilities and services are required from the customer. Typically a C-band dish antenna between 7 and 9 metres is required to receive the satellite C-band downlink.

Tactical:

The Thuraya Tactical Monitoring System is a tool for use by operational teams "on the ground" providing real-time intercept of handset users in the local operational theatre. The system is highly portable and can be rapidly disassembled and moved to another area as circumstances dictate. Good choice of monitoring location and use of an antenna mast, provide greater range for the handset uplink signal which is line-of sight and the only limiting factor in deployment of the system.

Operation from a vehicle battery is a standard feature of the tactical system which is housed in a rugged Peli-case.

Demonstrations of the systems are possible,
please contact Komcept Solutions to arrange this.

Other Satellite Monitoring Products:

Komcept Solutions Limited is also able to supply monitoring solutions for Iridium, Inmarsat and IsatPhone, Inmarsat's new hand-held satellite communicator based on ACeS handsets. The systems are all based on state-of-the-art software receivers using the latest DSP and high performance RF stages. Strategic and tactical solutions are available for Inmarsat and IsatPhone and tactical only (because of the LEO nature of the system) for Iridium.

Satellite Communications Monitoring

Komcept Solutions is able to supply off-air monitoring systems for the most popular active networks: Thuraya, Iridium, Isatphone and Inmarsat enabling Law Enforcement Agencies to identify users of the system and their precise locations. Supplied solutions can be either tactical or strategic for the most effective and timely intelligence.

Recent years have seen a surge in hand held satellite telecommunications systems largely due to the development of technology both in the handsets and also on the satellite. Because they are easy to use, portable and can be used almost anywhere, they are the communications tool of choice for many criminals and terrorists.

Thuraya Monitoring:

The Thuraya satellite network currently covers from Scandinavia, the UK and Spain in the West to the Far East and Australasia in the East using two geostationary satellites. The network will provide voice, SMS, fax and data over an L-band radio path. The antenna on each Thuraya satellite forms an array of spot-beams. These are similar to the cellular coverage of a GSM network, providing the antenna gain necessary for a hand-held communications system using a geostationary satellite.

Iridium Monitoring:

Iridium uses a network of 66 low earth orbit satellites to provide full global coverage including all sea masses and the North and South Poles. It is the world's largest commercial satellite network. The system uses 11 low-earth orbit satellites in each of the 6 orbital planes and each satellite communicates with its 4 nearest neighbours. Use of spot beams requires significant switching and control of calls. A single call may be switched between several satellites in its duration.

Product range:

- Thuraya Tactical Monitoring System
- Thuraya Strategic Monitoring System
- Iridium Monitoring System
- IsatPhone Tactical Monitoring System
- IsatPhone Strategic Monitoring System
- Inmarsat 3 Strategic Monitoring System
- Inmarsat 4 Monitoring System

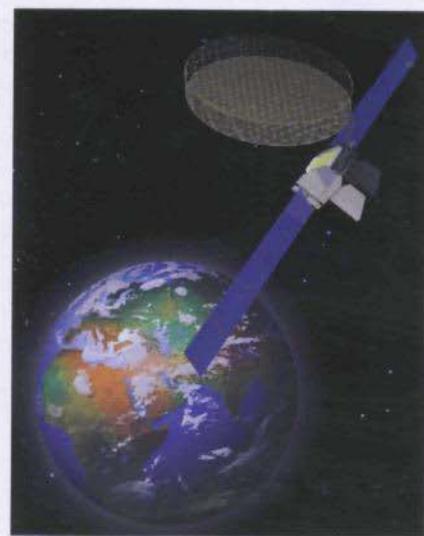


Inmarsat Monitoring:

Inmarsat were the first to provide satellite based communications networks and their Inmarsat M and mini-M terminals are still very widely used. The newer systems based on their Global Area Network (GAN), concept provide facilities for faster data communications.

Recently, collaboration with ACeS has given Inmarsat a hand-held voice terminal, IsatPhone, to allow it to compete with Thuraya and Iridium. Coverage of IsatPhone is currently Africa and a large part of Asia, with little or no coverage of Europe at the present time.

Like Thuraya, IsatPhone coverage of the Americas is planned for the near future.



Thuraya

The Thuraya Tactical Monitoring System (TTMS) is a transportable receiver mounted into a rugged peli-case which receives the L-band transmissions from both the satellite and handset. Designed as a portable system it is ideal for vehicle based monitoring in the field. Two antennas capture transmissions from the satellite and handset which are converted to an intermediate frequency before processing in the digital signal processing engine.

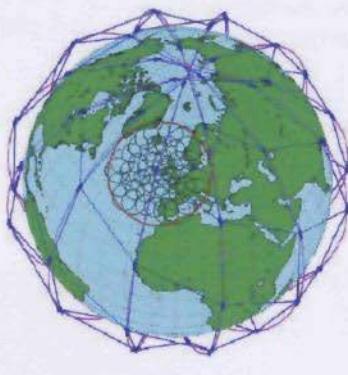
The Thuraya Strategic Monitoring System (TSMS) uses a large dish antenna to intercept the C-band downlink signals from the satellite to the Thuraya ground station and a smaller antenna to intercept the L-band downlink signals from the satellite to the handset. All communication in both directions between handset and satellite is received by the system, including locations of all handsets. Using additional L-band receivers, coverage can be extended to cover the whole C-band footprint.



Inmarsat

Iridium

Due to the design of the network and the number of satellites, only tactical interception of Iridium is possible. Communication between satellite and handset is on L-band and the Iridium monitoring system uses a two channel down-converter and digital signal processing engine to monitor separately the up-link and down-link channels. The signal processing unit carries out registration of the Iridium signals, identifying the satellite, spot-beam, sub-band, time-slot and frequency of each signal. All captured data can be presented to the operator for examination.



Iridium

VSAT

Komcept Solutions is able to monitor some of the various VSAT systems currently in use - contact Komcept to discuss your requirements.



TTMS - Thuraya Tactical Monitoring System

Inmarsat

Inmarsat M and mini-M terminals use the Inmarsat 3 family of satellites and, as with Thuraya, both tactical and strategic monitoring solutions can be provided.

Inmarsat IsatPhone terminals use the new Inmarsat 4 satellites and transponders for IsatPhone are currently installed on the EMEA and Asia pacific satellites.

Inmarsat BGAN is the new high speed data service which uses the Inmarsat 4 family of satellites. Komcept Solutions and its partners are currently working on a solution for monitoring this service.

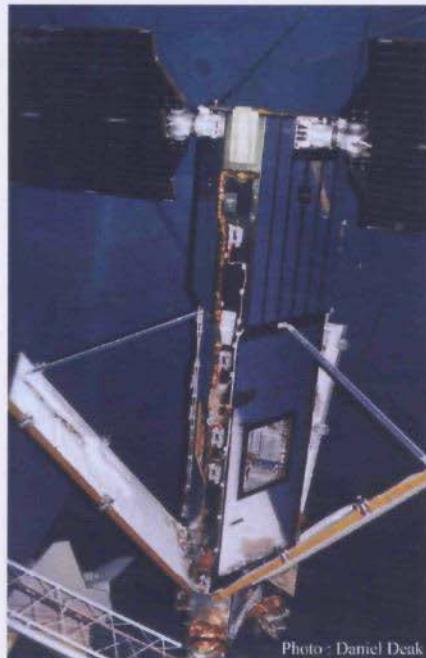


Photo : Daniel Deak

Iridium

Komcept Solutions Ltd.

Company Information

Komcept Solutions Limited provide expert solutions to digital audio and video requirements.



The company's founders have many years of experience in telecommunications and security and have worked with many Government departments solving problems and producing innovative solutions in the telecommunications field.

Communications Monitoring

With a pedigree in security, Komcept Solutions is familiar with the requirements for Lawful Interception of communications and provides Law Enforcement Agencies with hardware and software solutions to both voice and data interception. KSL is able to provide complete solutions from network access to data through to recording, transcription and geographical mapping.

Interview Recording

This is demonstrated in partner company One Digital's AIR - audio interview recorder, which makes digital recordings of evidential interviews on CDs and optionally onto network storage.



www.onedigital.ltd.uk

Miniature Surveillance

Komcept Solutions' new OC07 Radio Microphone is a low power miniature radio microphone, configurable between 300MHz and 1GHz. A digitally scrambled audio link to the pocket-sized receiver protects the audio, which also offers remote control of the transmitter and monitoring of its battery life.

To complement the OC07 Radio Microphone is the CSC-1 - Covert Surveillance Camera, which stores motion image data to a Compact Flash card for downloading to a PC. With an extensive range of triggers and concealments the device may be used for many covert surveillance tasks, or be body-worn for later review of an incident.

Komcept can also supply a highly efficient concealed directional microphone, utilising a DSP to provide state of the art performance. The microphone array is built into a laptop carrying bag and is controlled using a handheld PDA, giving it a very discreet appearance in our current hi-tech society.



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- Members of 'Advancing UK Aerospace Defence & Security industries'.
- Northamptonshire Chamber of Commerce.
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BY DESIGN

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