

## About Stratign

Stratign FZCO is a UAE based company, providing High Grade state of the art Communication Intelligence solutions for defense and law enforcement agencies globally. Established in the year 2002, the company has a very strong presence in Middle East, South East Asia, Africa, Europe, Latin America and CIS countries. Continuous endeavor in the field of R&D with committed and highly skilled manpower, providing precise solutions for the challenges faced by the customers has made Stratign a well known entity within a short span of time. We are committed to provide competent technologies at an affordable price to defense and law enforcement government Agencies, we would like to offer you our strategic products on GSM, Thuraya Monitoring and Satellite Monitoring etc. The user-friendliness and capabilities of these systems have made them immensely popular among various agencies world wide. Stratign is uniquely positioned to offer latest technological, cutting edge mission-critical products systems and customized solutions for Communication Surveillance, Signal Analysis, Communication Security and Jamming Systems. All solutions meet the best quality or military Standards.



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## GSM Monitoring System





## Introduction

GSM (Global System for Mobile Communications, originally Groupe Spécial Mobile) has become an essential means of communication in our modern society. This applies to everyone, including criminals who make use of phones as an accessory to their illegal activities. For these reasons intercepting GSM communications has become essential for Government Law Enforcement and Defence Agencies.

Stratign offers two different ways of intercepting GSM communications, namely "Off-The-Air" and "Switch Based" Lawful Monitoring System. This brochure discusses about "Off-The-Air" GSM Monitoring Systems.

An "Off-The-Air" GSM Monitoring System is designed to intercept GSM communications from the radio link between the Base Station (BTS) and the Mobile Handset (MS). This radio link is called the UM interface. These systems operate without any cooperation from the network operator. They are generally undetectable, and its operation is fully transparent.

Keeping in mind various operational scenarios and user requirements, Stratign offers two different solutions. These are **Passive GSM Monitoring System** and **Semi Active GSM Monitoring System**.

## Passive GSM Monitoring System

Stratign's Passive GSM Monitoring System is the most advanced "Off-The-Air" GSM interception and monitoring system that currently exists worldwide. The system does not transmit any information and hence is completely undetectable either by the operator or by the target that is being intercepted.

### Features of the system

- The System can monitor both forward and reverse channels (duplex conversation).
- The system support FR, EFR, HR, AMR voice codec's.
- The system automatically handles Frequency Hopping and Handovers.
- Scalable for intercepting up to 16 simultaneous communications.
- Multiple systems can be linked to achieve higher number of simultaneously monitored channels.
- All intercepted communications are stored in a database for easy access by the operators.

The system is capable of operating on all GSM frequency bands (850/900/1800/1900 MHz) and can decipher A5/0, A5/2 and A5/1 encryption standards in real time. It can be integrated with a 3G IMSI catcher to intercept communications from 3G (2100 MHz) networks.

- Can work in Random Call Interception Mode as well as Target Call Interception Mode.
- Selection of the Targets by different parameters such as IMEI, IMSI, TMSI, Target distance from the base station, Type of target handset, Target's dialed & received number (PLMN).
- Possibility of round-the-clock operation in an auto mode without the operator involvement.
- Remote operation of the system, using a wide area network from virtually any part of the world.
- The system can be configured either as Portable (Carry Case), Transportable (Installed in Vehicle) or Static (Fixed Location).

System Block Diagram

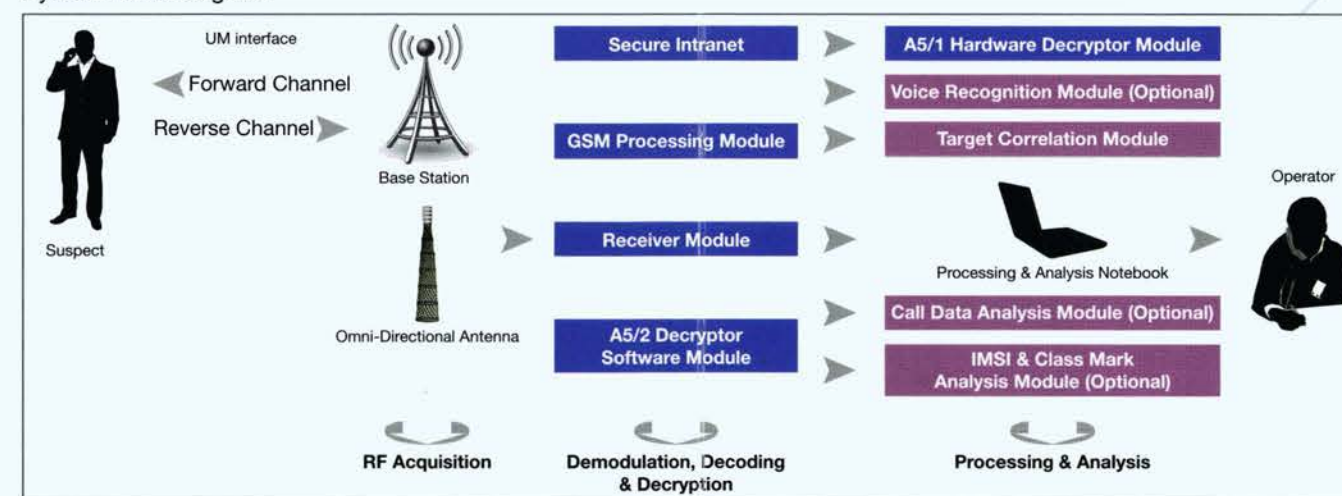


Fig: Block Diagram of Passive GSM Monitoring System

### Technical Specifications of Passive GSM Monitoring System

Parameter	Value			
Frequency Bands	GSM 850	EGSM 900	DCS 1800	PCD 1900
Forward Channel (MHz)	869 to 894	925 to 960	1805 to 1880	1930 to 1990
Reverse Channel (MHz)	824 to 849	880 to 915	1710 to 1785	1850 to 1910
Supported Voice Codecs	FR, EFR, HR, AMR			
Monitored Channels	BCCH, CCCH, SACCH, SDCCH, FACCH, TCH			
Supported Deciphering	A5/1 (External Hardware), A5/2, A5/0			
No. Of Duplex Calls	Upto 16 duplex channels			
Intercepted Traffic type	Voice & SMS			
Mode of Operation	Random Mode, Target Mode			
Selection of the Targets	IMEI, IMSI, TMSI, Target distance from the base station, Target's dialed & Received Number (PLMN)			
Area of coverage	Upto 30Km (depending on terrain)			
Available Option	High Gain Directional Antenna, Vehicle Integration Kit, A5/1 Decryptor			
Power Supply	240 VAC, 50Hz or 12VDC Direct from Car Battery			

## Semi Active GSM Monitoring System

Stratign's Semi Active GSM Monitoring System is designed to intercept GSM communications between the Base Station (BTS) and the Mobile Handset (MS) using the principle of "Man-In-The-Middle" attack. The system emulates the service providers BTS, thereby forcing mobiles within the coverage range to log on to it. All the communications (Voice and SMS) of mobiles logged on to the system is passed on to the actual network through the system and in the process all the communications are recorded. The system can intercept both incoming as well as outgoing communications.

The system is capable of operating on all frequency bands (850/900/1800/1900 MHz) of the GSM network and can decipher A5/0, A5/2 and A5/1 encryption standards in real time. It can be integrated with a 3G IMSI catcher to intercept communications from 3G (2100 MHz) networks.

### Features of the system

- The system is transparent to the suspect and the Service Provider.
- Can Intercept Voice and SMS communications form a 3G network by forcing 3G mobiles to communicate using 2G or 2.5G.
- Can monitor upto 12 duplex calls.
- Does not require the service providers SIM for operation.
- 100% target call monitor rate: The system can monitor all communications of the target (SMS and Voice) till he/she is within its coverage range.
- The system can be integrated with Direction Finder, to provide the direction of the target.
- The system is capable of extracting the Suspect's actual Mobile Number from the network.
- The system can be configured to ignore certain subscribers from being intercepted.
- The system can perform selective jamming; using which the operator can disable certain services of the suspect like Outgoing Call, Incoming Call, SMS, SS etc.
- Can modify the ID of selected targets for both incoming and outgoing calls.
- Can make fake call (or send Fake SMS) to target.
- Can Make call (or send the SMS) using target identity.
- Target list can be created using PLMN, IMSI or Suspects Mobile Number.
- The system can be configured either as Portable (Carry Case), Transportable (Installed in Vehicle) or Static (Fixed Location).



## System Block Diagram

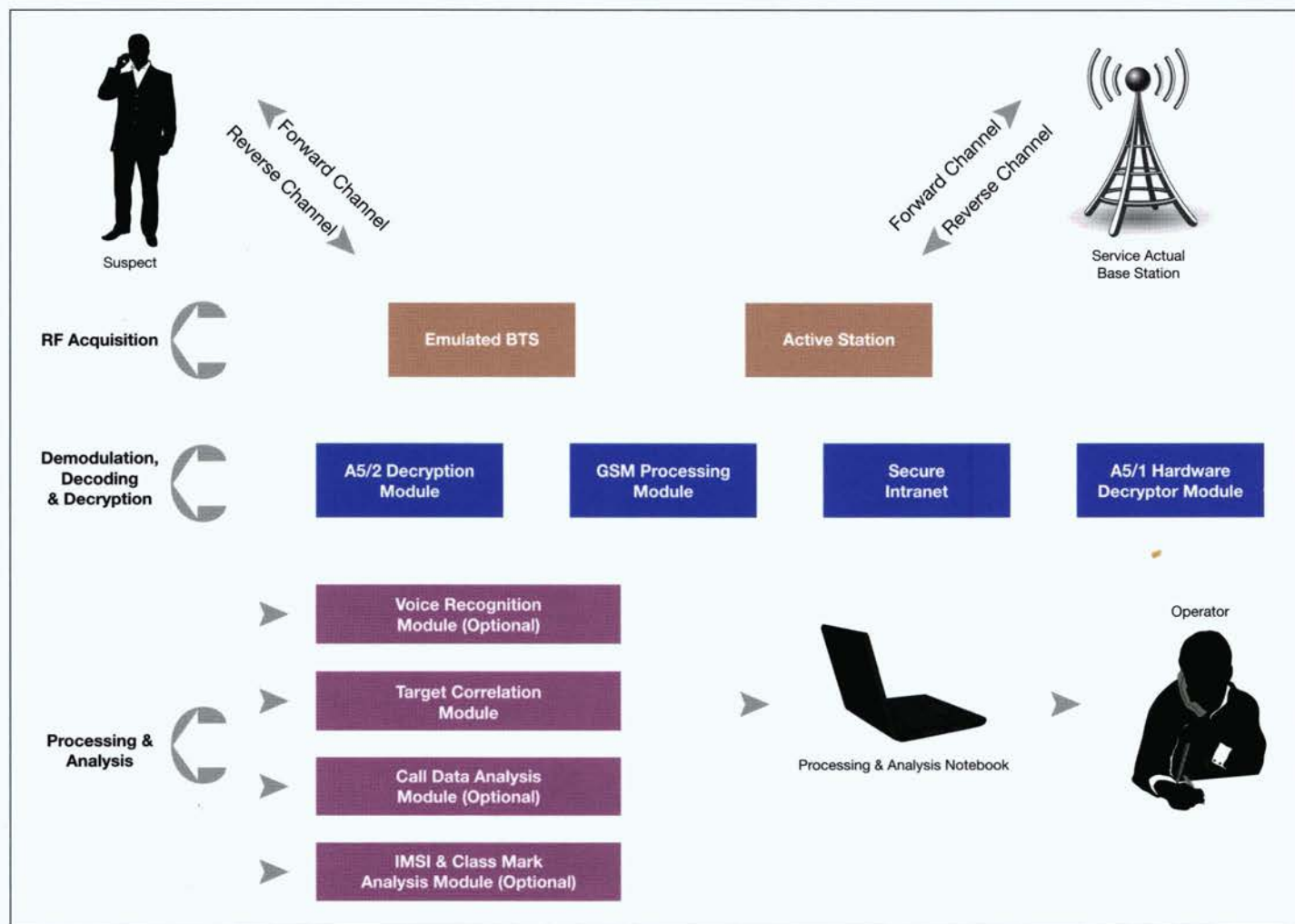


Fig: Block Diagram of Semi Active GSM Monitoring System

## Technical Specifications of Semi Active GSM Monitoring System

Parameter	value			
Frequency Bands	GSM 850	EGSM 900	DCS 1800	PCD 1900
Forward Channel (MHz)	869 to 894	925 to 960	1805 to 1880	1930 to 1990
Reverse Channel (MHz)	824 to 849	880 to 915	1710 to 1785	1850 to 1910
Supported Voice Codecs	FR, EFR, AMR			
Monitored Channels	BCCH, CCCH, SACCH, SDCCH, FACCH, TCH			
Supported Deciphering	A5/1 (External Hardware), A5/2, A5/0			
No. Of Duplex Calls	Upto 12 duplex channels			
Intercepted Traffic type	Voice & SMS			
Mode of Operation	Random Mode, Target Mode			
Selection of the Targets	IMEI, IMSI, MSISDN (Target's Actual Mobile Number)			
Area of coverage	Upto 1.5 Km (Extendable upto 5 Km using Amplifier)			
Available Option	High Gain Directional Antenna, Vehicle Integration Kit, A5/1 Decryptor			
BTS Transmitted Power	Max. Upto 10 Watts			
Dimensions	BTS – 260 x 290 x 130 mm (L x W x H) AS – 260 x 290 x 70 mm (L x W x H)			
Weight	Approx. 9 KG's (May vary based on configuration)			
Operating Temperature	0°C to 50°C			
Power Supply	VAC, 50 Hz or 12 VDC Direct from Car Battery			



## Comparison of Passive GSM Monitoring System and Semi-Active GSM Monitoring System

Feature	Passive GSM Monitoring System	Semi - Active GSM Monitoring System
<b>Mode of Operation</b>	Completely Passive (The presence of the system cannot be detected)	Semi Active (Very difficult to detect, but not impossible)
<b>Supported Voice CODEC's</b>	FR, EFR, HR, AMR	FR, EFR, AMR
<b>Multi-Network Simultaneous Monitoring</b>	Independently Tunable Receivers to any service provider.	System can be configured to monitor multiple service providers based on user requirement.
<b>Maximum Distance that can be covered by the system</b>	Depends on the terrain and line of site and the power transmitted by the service providers BTS. Maximum can be up to 14 KM	Depends on the terrain and line of site, usually upto 500 mts, but can be increased upto 5 KM by using power amplifiers
<b>Possibility of Intercepting Full Duplex calls</b>	Possibility of missing trans side of conversation if the target handset is too far from the system	100%. All the intercepted calls will be full duplex, which means that both the trans and receive side of the conversation of the target will be intercepted
<b>Call routing</b>	Passive hence routing not required	Call is routed through the system
<b>Possibility of Spoofing SMS</b>	Not Possible	Possible
<b>Possibility of Spoofing Calls</b>	Not Possible	Possible
<b>Possibility of Retrieval of Public Number</b>	Not Possible	Possible
<b>Automatic target interrogation</b>	Can be Done, during the process the system is not fully passive, because it has to establish a silent call to the target's mobile phone. However chances of detection of the silent call by the target is very rare	Possible
<b>Selective Jamming</b>	Not Possible	Possible

## Options

### A5/1 Decryptor

A5/1 decryptor is intended for monitoring of GSM communications from networks employing A5/1 encryption schemes. It can serve more than one GSM Monitoring System. It is a typical server-client application. Usually the decryptor is located in headquarter connected to Internet with static IP address, while GSM Monitoring System (Passive or Semi Active) can be located virtually in any place of the world.

### 3G IMSI Catcher

The 3G IMSI catcher is used to selectively force the targets' phones operating in the 3G network to migrate to GSM mode, rest of the phones stay in 3G modes. Being pushed into GSM mode, 3G phones stay there until reboot. It makes possible interception of such phones by GSM Passive or Semi Active monitoring systems. Semi Active systems, after finishing interception, can send these phones back to 3G-mode.

### GSM Direction Finder

The GSM Direction finder is designed to work along with the Semi Active GSM Monitoring System. GSM direction finder combined with a body antenna is intended for find the direction of mobile stations operating in the ranges 900, 1800, 1900 MHz

### Power Amplifier

To increase the range of system we have developed 20/40 Watt power amplifier. The amplifier is suitable for GSM base station and repeaters applications in the cellular frequency range. Amplifier is available for GSM 900, 1800, 850 and 1900 MHz frequency band.

### High Gain Directional Antenna

High gain directional antenna is specially designed to work with High Power Amplifier to achieve the maximum range.

### Vehicle Integration Kit

If customer prefers to deploy the system in a vehicle for transportable application, we can provide complete vehicle integration kit for the installation of the system in Car/SUV. The vehicle integration kit will consist of Shock Proof 19" Rack, Shock Absorbers, Power Supply Accessories, Camouflaged Antenna, RF Shielding to protect the operator, Notebook Stand etc.