



## Practical Considerations of Patrol Monitoring

### Overview

It is common practice for patrol monitoring to be undertaken with non real-time systems. These are cheap to implement because there are few technical problems to overcome, especially with communication and the supply of power.

Many in operation are based on the Dallas Semiconductor DS1990 Serial Number iButton “coin”. These coins are mounted around a site at designated patrol points and do not need to be powered. They are probed (read) at intervals by guards equipped with an active reader, typically in the form of a baton. The information stored in the baton (reader) is downloaded by a computer at a later time and checked against the required route. DS1990 elements sell for under \$3-00.

### Consider the basic elements required:

- Fixed patrol points which are distributed around a client’s site.
- Mobile readers carried by the guards.
- Computer system on site (preferably) to download and correlate the patrol information.

### There are many drawbacks to the system, amongst them:

- Damage or tampering with the patrol points or batons is difficult to trace to its source.
- Until the information stored in the baton is downloaded, the guards’ performance of their duties is unknown and cannot be rectified.
- If the computer system is not on site and managed by the client, further room for information loss/alteration exists.

### What changes are needed to provide the client and security company with a more useful system?

- The system must be real-time. If a patrol point is visited (or missed or tampered with), immediate notification must be provided.
- The real-time status of the system must be able to be viewed by anyone with the appropriate authority from anywhere in the country/world.
- Information collection should be centralised and automatic. No information is stored at the client’s site. Neither the client nor the security company should be able to modify the information, although they should be able to add notes.

While non-real-time systems are perceived as relatively inexpensive, the major hidden costs of information loss and management coupled with ineffectiveness are not normally taken into consideration.



## Elements of a real-time system

Before returning to a more traditional recommendation, consider first what might be the ultimate guard patrol system.

A GPS/GSM based system, similar to those used for vehicle tracking, could be used to monitor guard patrols. The system would know in real-time the location of each of the guards and whether they were where they were supposed to be.

### Disadvantages:

- Cost of the unit supplied to the guards coupled with the risk of theft/loss or damage.
- Difficulties with GPS reception could cause problems, especially in city areas.
- Limited location resolution. This means that it could not be verified that a particular door was checked for example.

However, technology will continue to drive down the cost of these devices until they become practical in many instances.

The function of the GPS receivers was to assign a location to each guard. Without GPS, patrol points have to be distributed around a client's site to establish positional information.

For communication back to the central computer, each guard has to carry a device to relay his identify and the patrol point visited. GSM units are preferred for cost and flexibility.

It might be argued that alternative configurations could be used. For example the patrol point could contain the communication device. In most cases the following could be argued:

- If the patrol point contains the communication device, it has to be powered. This could be expensive in a lot of cases, such as with a boundary wall.
- If the patrol point is in a poor location, there could be communication problems whereas the guard could move to a better position to relay the information.
- There are likely to be more patrol points than guard devices. To minimise cost, patrol point costs should be kept low.

### Bearing in mind the above, the following is recommended:

- Simple patrol point containing unique identifier. Does not require contact with the reader/communication device carried by the guard. Battery life of several years. Optional tamper detection.
- Low cost digital radio system carried by the guard. Range should be country-wide. (In other words a cell phone.)
- Centralised computer server system providing reporting over the Internet.



## Dial Tech (DT)

### The Server System (Recommended Solution)

Dial Tech is principally a centralised computer system. Its function is to collect information, take any action that is necessary, and report status on the Internet.

#### The system is set up as follows:

- The security company sets up a list of its clients.
- For each client, a list of the premises patrolled is created.
- For each of the premises, a list of the posts (shifts) together with the roster pattern is entered.
- For each post, a list of the patrol points to be visited and the agreed time window is added.

The system then calculates a set of tickets. Each ticket is an expected event. There is a separate ticket for each guard visit to each patrol point for each day. Supposing that in a 30 day month there are 10 day shift and 15 night shift posts, and during each 12 hour shift a guard has to visit a patrol point every 30 minutes including at the start and end of the shift (25 visits), then for that month there are:

$$30 \text{ days} * (10 + 15) \text{ shifts} * 25 \text{ visits per shift} = 18\,750 \text{ tickets}$$

As the month progresses, each time a guard reports (or doesn't report) the corresponding ticket is marked with the status. The status of the tickets, in a friendly form, is viewed over the Internet.

The server computer hosts a complete roster system to generate the necessary tickets.

The methods by which the guards can report are flexible. This includes legacy methods where a guard speaks by radio to a control room operator who manually updates the ticket over the Internet. However the use of cell phones by guards is recommended for their versatility and coverage.

Should GPS based systems become cost effective, direct reporting of the coordinates of the guard to the computer system will be implemented.

### Physical Supervision Point (PSP)

The PSP is a small weatherproof computer with LCD readout. It contains an accurate clock and is powered by standard alkaline batteries which last several years. Each one contains a unique set of keys which are combined with the clock to generate a new "random" number every 5 minutes.

This "random" number is converted to one entry in a short list of computer phone numbers which is displayed on the LCD. The guard must read the display and use his cell phone to dial the selected computer phone number. The computer system registers the number dialled together with the caller ID. The appropriate ticket is updated if the right number is dialled, otherwise an exception is raised. The call is equivalent to a missed call, which does not attract a charge from the network.



Alternatively, if the guard's cell phone is equipped with GPRS, the guard can enter the "random" number directly on a web page. This method adds additional functionality.

All PSP devices have the same "rank" in the system. This is important in being able to track supervisors, who move between sites, as well as guards who are stationed at a single site.

## Summary

The Dial Tech system is in two distinct parts to provide flexibility and upgradeability.

Dial Tech only implements real-time systems as a means to meet market requirements.

Dial Tech uses GSM and Internet systems as the preferred means of cost effective communication. These industry supported standards offer better long term viability than proprietary systems.