> *version 4.1* > *27. June 2003*

## PRODUCT OVERVIEW

The NetHawk MSC/A Simulator is an effective PC-based tool for simulating

the functions of the mobile switching centre (MSC) of the GSM network on the A interface. It is useful in laboratory tests for BSS and MS, commissioning and demonstrations, i.e. in those occasions where light weight is an asset and a real MSC and the location registers are unavailable or impractical to use.

### NetHawk MSC/A Simulator consist of

> NetHawk MSC/A Simulator software
  - NetHawk Configuration
  - NetHawk Simulation
  - NetHawk Script Builder
  - NetHawk Monitoring
> NetHawk N2 Adapter
> PCM cables and User´s guide(s)

### NetHawk MSC/A Simulator in brief

The NetHawk MSC/A Simulator simulates the functions of the mobile switching centre (MSC) of GSM network on the A interface.

> simulates MSC, VLR and HLR functionality towards BSS on A interface
> an effective tool for BSS, MS and transmission testing and BSS troubleshooting during commissioning and for

demonstration and education systems concerning GSM systems.
> can be connected to two base station subsystems (BSS) (two T1 or E1 PCM primary rate interfaces), up to 10 cells / BSS
> can switch traffic channels to enable call with speech from mobile station (MS) to another or from MS to the simulator handset (A-law or μ-law coding depending on the selected hardware)
> 30 simultaneous mobile to simulator or simulator to mobile calls with speech connection can be signalled
> 15 simultaneous mobile to mobile calls with speech connection can be signalled, when MSes are located to the same BSS
> 15 simultaneous mobile to mobile calls can be signalled, and 8 (of these 15) calls with speech connection, when MSes are located to different BSSes
> 8 simultaneous mobile to mobile calls can be signalled, when MSes are located to different BSSes, and at the same time 14 simultaneous mobile to simulator calls can be signalled, when MSes are located to the same BSS
> with MS to simulator calls possible to use loopback connection, additionally one of these calls can be connected to the PC Audio System with speech (A-law or μ-law). A transcoder is required in the BSS site
> instructive scripting and message editing with Watches

## ENVIRONMENT OVERVIEW

The drawing illustrates the operating environment of NetHawk MSC/A Simulator. The transcoding and rate adapting units (TRAU) are not needed if only signalling is tested.

## FUNCTIONS AND SPECIFICATIONS
### *Software*

**NetHawk MSC/A Configuration**
The NetHawk Configuration is an easy and conducive way to set the system parameters for simulation. The parameters of the simulated part of the network as well as the system under test can be described by using dialogs which inform you about the purpose, legal values and ranges of the parameters. The context sensitive help is always at hand with references to the messages and specifications.

**NetHawk MSC/A Simulation**
NetHawk Simulation consists of three parts: link layer service, protocol simulation core and the simulation user interface. The Link layer service contains the MTP2 protocol. The Protocol simulation core contains ready to run, multi-connection capable implementation of the protocol entities above the link layer. The Core autonomously responds to the incoming signals. Above all, there is the
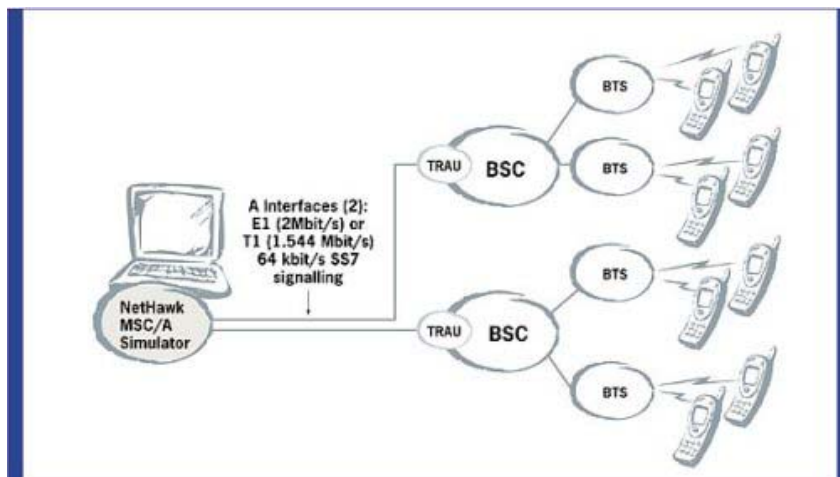
simulation user interface featuring simulation command menus, Console window for full control of the simulation, Call Status windows for each ongoing call connection and the Script Viewer window showing the dialog of the currently active script file.

With **Watches** it is possible to instruct the simulator to edit messages with commands such as skip, delete, insert and replace bytes. The simulator UI provides you the means to visually verify the effects each editing command has on the original message as you specify the editing commands. The editing instructions come into effect as soon as they are completed and will edit the subsequent messages matching the specification. The same functionality is available for scripts too: A message watch can be used to instruct the simulator Core to report protocol messages of interest, modifying and replacing contents of a message being encoded or decoded at a particular protocol layer. The purpose in using watches in scripts could be to monitor protocol messages, synchronise a script with protocol execution or to modify the protocol implementation.

NetHawk Simulators can automatically connect traffic (speech) channels of the calls. This enables immediate **audio** testing of the traffic channels.

### NetHawk Script Builder
The NetHawk Script Builder is a visual tool for creating and modifying test scripts. The user interface of the scripts is implemented with HTML. The controlling part of the scripts is implemented with JScript or VBScript.

The NetHawk Script Builder and Script Viewer in the simulation user interface both utilise the Microsoft Internet Explorer web browser and its scripting features. Thus, in addition to HTML, also DHTML and ActiveX controls can be used in script user interface production.

### NetHawk MSC/A Monitoring
NetHawk Monitoring decodes and analyses signalling protocols in various formats, levels of detail and coding options. Statistics information about the traffic is collected simultaneously with analysis. The traffic can also be recorded on the PC hard disk for later analysis. NetHawk Monitoring also contains a powerful and easy-to-use environment for setting filters and triggering selected actions on the specified events. The online monitoring help as well as comprehensive online

protocol descriptions are always available.

### Supported protocols
> SCCP, Q.713, CCITT (ITU-T) Blue Book / ANSI T1.112-1992, implemented for end node operation
> MTP3, Q.704, CCITT (ITU-T) Blue Book / ANSI T1.111-1992, implemented for end node operation
> MTP2, Q.703, CCITT (ITU-T) Blue Book / ANSI T1.111-1992
> BSSAP, GSM Rec. 08.08
> GSM L3 protocol layers RR, MM and CC, GSM Rec. 04.08
> SMS point to point, GSM Rec. 04.11, GSM Rec. 03.40
> GSM phase 1 and phase 2 compatible signalling, and partially phase 2+.

### *Hardware*

**NetHawk N2 Adapter**
> PC Card type II card and an extension pod for connectors,
> Cardbus compatible,
> Support for simulating two lines with one card,
> ITU-T G.703 / G.704 (E1) 2 Mbit/s physical primary rate interface,
> PCM30 mode with AMI coding and CRC4 supported,
> ITU-T G.703, G.704, G.733, ANSI T1.111 (T1) 1.544 Mbit/s physical primary rate interface.

### STRUCTURAL OVERVIEW

The structure of the NetHawk MSC/A Simulator software is illustrated in picture.



### PC REQUIREMENTS
> Windows® 2000 Professional with the NetHawk N2 Adapter
> Pentium® @ 500 MHz CPU or faster
> Microsoft Internet Explorer 5.5 or newer with full installation (Active desktop not needed)
> 128 MB of RAM and 30 MB of free disk space when IE 5.5 is already installed
> CardBus (PC card type II) slot for the NetHawk N2 Adapter