

DELTASWITCH

Tactical
Delta
Switch

TDS 200



DELTASWITCH — a part of
the **DELTAMOBILE** system.

DELTASWITCH is a digital
circuit switch for use in
military communication
networks.

DELTASWITCH provides non-
blocking high-capacity
switching of voice, data, tele-
printer and facsimile traffic.

DELTASWITCH can be used
in tactical, semi-permanent
and strategic networks.

DELTASWITCH covers appli-
cations ranging from full
transit to local subscriber
switching.

DELTASWITCH is based on
NATO and Eurocom
specifications.

DELTASWITCH is field proven
and in operational service.



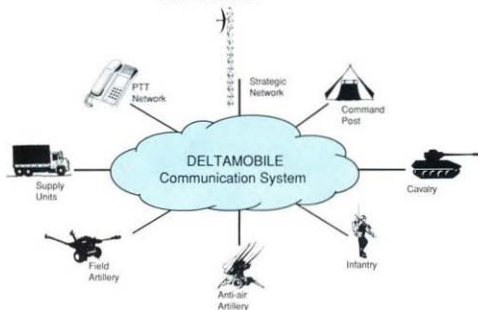
DELTASWITCH

DELTAMOBILE Operational Concept

Fast, secure and reliable interchange of information is essential for effective operation of any army.

Coordinated real time operations between all relevant units is the key to successful results.

DELTAMOBILE provides the communication solution.



The Deltaswitch TDS 200

The Deltaswitch is the switching element in the DELTAMOBILE system. Together with transmission and multiplexer equipment, it forms an automatic circuit switched system for voice and data.

The processor-controlled Deltaswitch is fully autonomous, and adapts automatically to changing network configurations. The Deltaswitch has 8 ports, each providing 30 traffic channels, giving a total capacity of 240 channels. Normal port bit

*Environmental
Freeze Test*



rate is 512 kbit/s (Eurocom A), with channel bit rate of either 16 or 32 kbit/s. Ports may freely be connected either to Deltamultiplexers or other Deltaswitches.

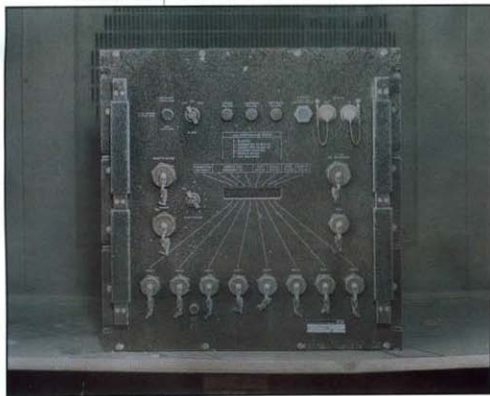
Several switches can be stacked to form higher capacity nodes. The Deltaswitch is able to handle high traffic intensity, and ensures that high priority calls always get through.

In addition to the circuit switching capabilities, the Deltaswitch has an integrated packet switch providing network control communication and X.25 user traffic.

The Deltaswitch is easy to operate. All connections are located on the front panel. After initiation, no manual operation is required. Overall status is indicated by alarm lamps and acoustic signals. More detailed status information, such as transmission quality, can be obtained from the alphanumeric display.

Main Characteristics

- Services according to Eurocom
- 240 channels
- 8 ports (Eurocom A)
- Free allocation of ports
- Channel bit rate 16 or 32 kbit/s
- No initial programming
- Remote network control
- Full military specifications
- Easy installation (19 inch rack)
- Built in test functions (BITE)
- Low power consumption
- Low weight, portable



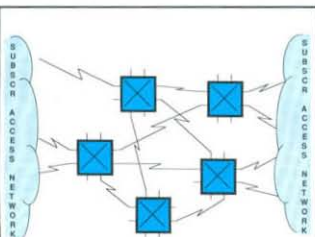
Network Features

Flexibility

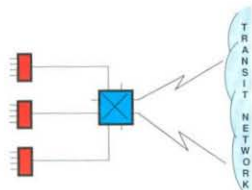
The Deltaswitch is flexible and acts as the switching element in different networks and node constellations:

- as **Transit Switch**
- as **Access Switch**
- as **combined Transit and Access Switch**

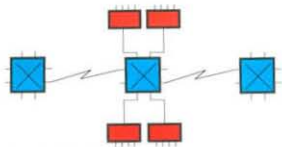
This flexibility is achieved without any modification or programming.



The Deltaswitch as Transit Switch



The Deltaswitch as Access Switch



The Deltaswitch as combined Transit and Access Switch

Legend



Numbering System

Various numbering systems may be provided, such as:

- 7 digits directory in accordance with Eurocom D/1, IA7
- 4 digits directory compatible with Eurocom.

Independent of where the subscribers are located in the network, a connection will automatically be established between them. Each subscriber has a fixed individual telephone number regardless of the subscriber's physical location in the network. Any subscriber line may be given several telephone numbers.

When a subscriber moves to another position, he reaffiliates by dialling a code plus his telephone number and security code. The security code will prevent unauthorized access to the system.

After reaffiliation, the switches will automatically update their subscriber directories.

Supervision and Control

The Deltaswitch is an integrated part of the DELTAMOBILE Network Control System. By connecting a Network Control Terminal, the system offers centralized network management with remote supervision and control. However, the Deltaswitch is autonomous and will operate independently of the Network Control Terminal.

Deltaswitch Subscriber Facilities

- Normal call
- Precedence
- Pre-emption
- Camp on busy
- Ring back
- Call hold
- Call forward
- Call transfer
- Affiliation
- Re-affiliation
- De-affiliation
- Direct outward dialling
- Compressed dialling
- Sole user circuit
- Switched hot line
- Delayed hot line
- Random conference
- Fixed conference
- Broadcast
- Line grouping
- Group number
- Closed user groups

The Deltaswitch subscriber facilities may be individually assigned.

Establishing a Network



Step 1: Initiating the Deltaswitch

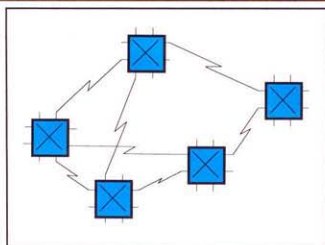
- Connect local cables
- Power on
- Observe self-test program

The switch is ready for operation without any programming or tuning.

Step 2: Interconnection of Delta-switches to a transit network

- Connect transmission equipment to the Deltaswitch ports
- Establish transmission links
- Check transmission status

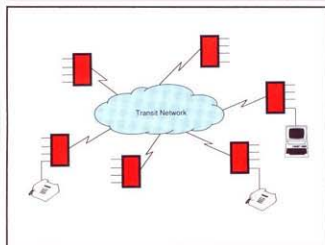
The switches automatically adapt to the network, and port status is displayed.



Step 3: Connecting subscribers

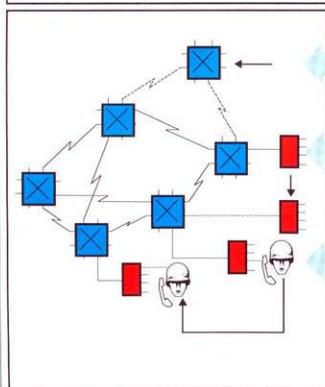
- Connect Deltamultiplexers to the Deltaswitches
- Connect subscriber terminals to the Deltamultiplexers
- Define telephone numbers

The definition of telephone numbers may be performed by the Network Control System or by the individual subscriber.



Step 4: Redeployment

- Deltaswitch redeployment
To expand the network, new switches can be connected freely to the transit network.
- Deltamultiplexer redeployment
When an operational unit is moving, the assigned Deltamultiplexer can freely reconnect to the transit network.
- Single subscriber redeployment
Subscribers can freely move in the network and still keep their individual telephone numbers. The Deltaswitches will automatically route all calls to the new position.



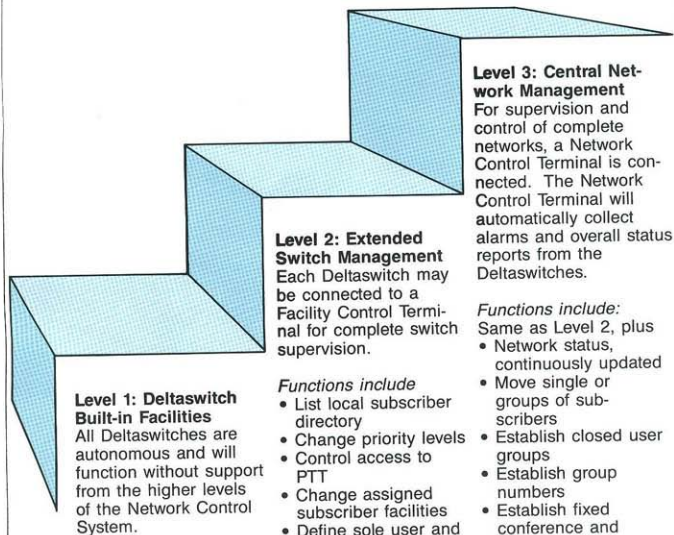
Network Management

Network Control System

The DELTAMOBILE network control concept is based on both centralized and decentralized management. This

ensures overall status and control, as well as autonomy and flexibility.

The network control system consists of three levels:



Functions include

- List local subscriber directory
 - Change priority levels
 - Control access to PTT
 - Change assigned subscriber facilities
 - Define sole user and hot lines
 - Operator assistance
- Functions include:*
Same as Level 2, plus
- Network status, continuously updated
 - Move single or groups of subscribers
 - Establish closed user groups
 - Establish group numbers
 - Establish fixed conference and broadcast lists

Routing System

Due to frequent network changes, saturation routing is applied as the search algorithm. This ensures a successful call even if the network is heavily loaded or degraded.

Synchronization System

The Deltaswitches can utilize different synchronization systems to minimize the bit slip rate in various network configurations. A Deltaswitch may operate in any of the following modes:

Mutual Synchronization

All Deltaswitches in the network will automatically be stabilized to the same frequency.

Plesiochronous Operation

Each Deltaswitch will use its local oscillator, independently of the frequency of the other Deltaswitches.

External Reference Clock

The Deltaswitch can synchronize to a separate high stability oscillator, or to a reference signal from another network.

Default operation is Mutual Synchronization.



Subscriber



Subscriber



Subscriber

Deltaswitch Architecture

Hardware Structure

The Deltaswitch hardware design is based on distributed processing applying a front-end processor for each functional element in the switch. The main processor in the Deltaswitch is an Intel 8086.

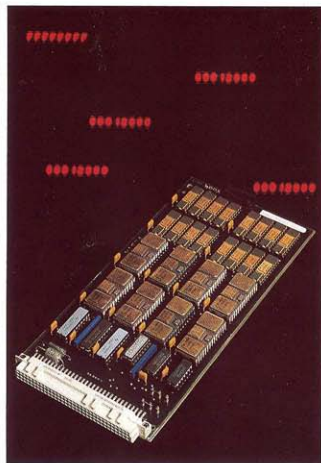
Software Structure

The Deltaswitch software consists of a large number of processes. Each process is a finite state machine, and the processes communicate by means of sending and receiving messages via strictly defined interfaces.

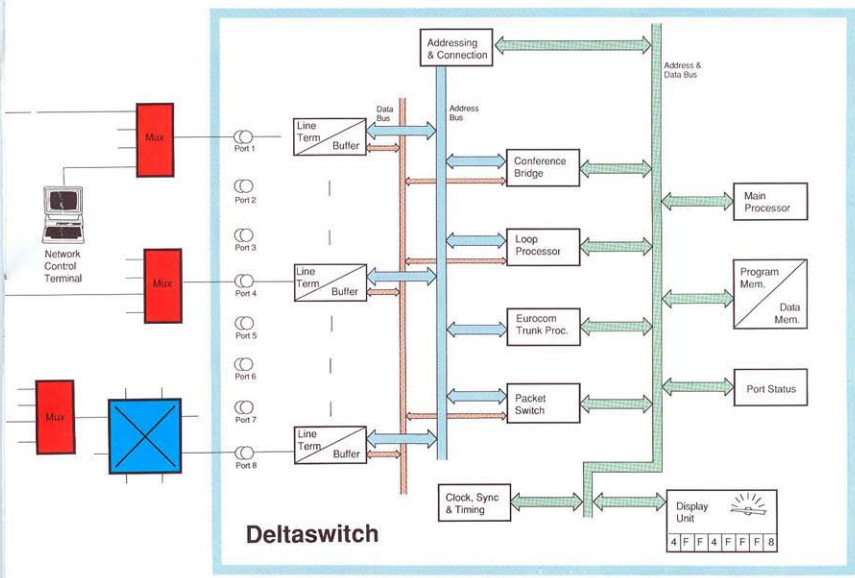
The coding of the software in the Deltaswitches is performed in CHILL (CCITT High Level Language).

Maintainability

The built-in special test programs ensure easy and reliable maintenance procedures without use of complex test equipment facilities. Together with a modular



hardware and software design, this gives a high reliability and low life cycle cost.



Main Technical Data

Capacity

- 8 ports
- 240 channels

Channel Bit Rate

- 16 or 32 kbit/s

Group Interface

- 512 kbit/s
- EUROCOM A

Numbering System

- Free numbering system
- Directory structure: Eurocom D/1 IA7

Network Routing

- Saturation search

Synchronization

- Mutual
- Plesiochronous
- External reference

Environmental

- *Temperature (operating)*
-40°C to +55°C (-40°F to +131°F)
up to 95% relative humidity
- *Bump, shock, vibration and free fall:*
DEF-STAN 07-55
- *EMC:*
MIL STD 461

Dimensions (WxHxD)

- *Main unit:* 483x488x368 mm
- *Power Supply:* 483x222x368 mm

Weight

- *Main unit:* 42 kg
- *Power supply:* 22 kg

Power Supply

- 220 VAC or 28 VDC

Front Panel Indicators

- Alphanumeric display
- Hardware failure lamp
- Software failure lamp
- Power failure lamp
- Humidity indicator

This publication is issued to provide general information about the equipment, and is not to be regarded as a complete system specification, or to be used as a contract document. We reserve the right to change the design or specifications for any product without prior notice.



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DELTA SWITCH