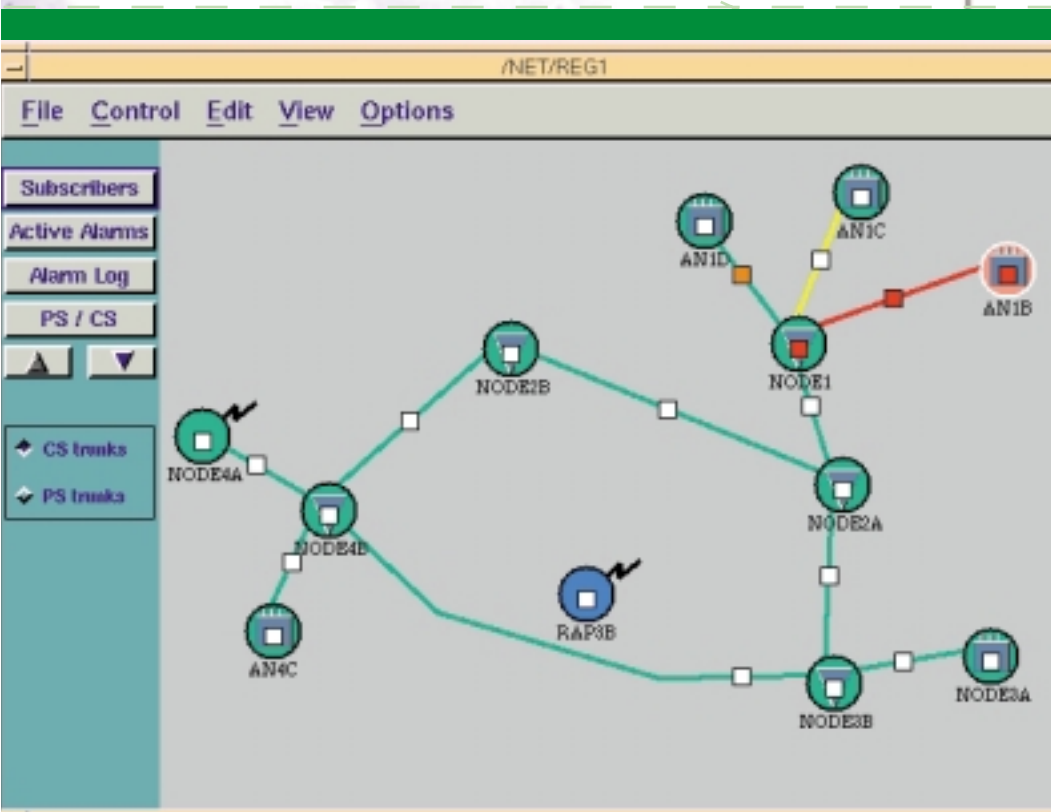


TNC 300

Tactical Network Control



THALES

TNC300

Tactical Network Control

SYSCOM is a set of powerful computer tools designed to control and manages the TAS switching system.

TNC300 is a workstation responsible for control and monitoring of the network, according to EUROCOM terms, Operational System Control (OSC) and Facilities Control (FC). SYSCOM also includes the SEP300 -System Executive and Planning - workstation which is the top level of the EUROCOM network management hierarchy.

TNC300 is in contradiction with civilian network management systems specially designed for tactical networks with frequent changing of network topology and interruption of network communication

The TNC300 is developed based on the requirements of a number of different customers as a generic system concept.

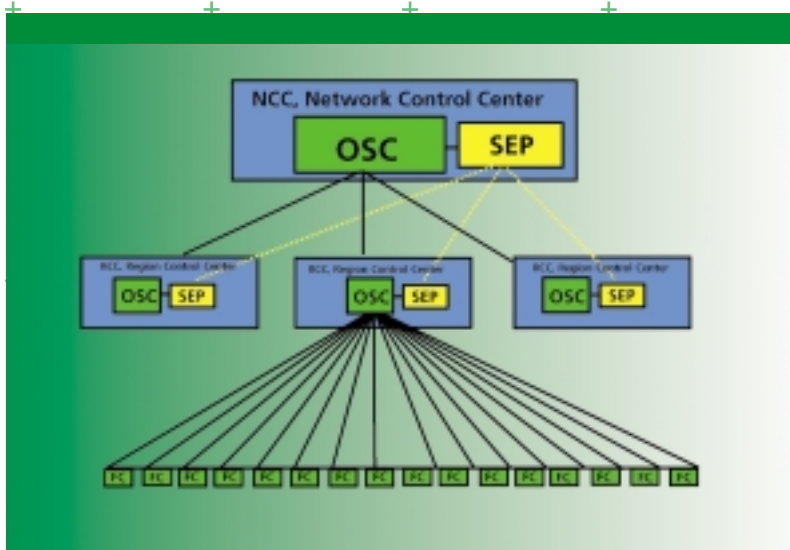
Hierachy

The SYSCOM architecture is based on a hierarchical structure, where the functions performed are defined according to the Eurocom definition. Dependent on network complexity, the hierachy can be two or three level.

System Executive and Planning (SEP) is a planning function under Signal Staff responsibility, located in association with the formation HQ. SEP issues communication directives and exercises control through the Operational System Control.

Operational System Control (OSC) is a systems management function responsible for tactical and technical control of the deployed network. OSC implements SEP directives and controls the underlying Facilities Controls. The OSC will normally be part of the Signal Company in charge of a network.

Facilities Control (FC) is responsible for technical control of an autonomous communications installation. These installations are access and trunk nodes as well as radio access points. FC controls the nodes and equipment and receives status information.



TNC300

Mobility

As many as possible of the functions are integrated as automatic functions in the switches in order not to be dependent on centralised control where not needed. But on the other hand, complete status and control can be achieved at a central position when required. The TNC300 automatic detects changes in network topology and subscriber reaffiliations.

Compatibility

This means that TNC300 follows the basic structure outlined by EUROCOM. In such a way that the necessary control and management operations can be performed at the level where the knowledge is. That orders and directives can be given, and information gathered where necessary to support the military line of command.

Survivability

The node operators for increased survivability will normally handle control of nodes, equipment and subscribers. However, all operations can also be done at the higher level.

A powerful feature of TNC300 is automated standby functionality, which makes the network management system highly survivable. One network management centre can be configured automatically or manually to take over for another centre if necessary.

The OSC operators can perform a controlled take-over (step-up) of a management responsibility (control function). This implies manual transfer of control from the main centre to the standby centre. As this is a manual function it does not rely on continuous communication between the master and the standby. This function is specialised for the step-up HQ to take over control from main HQ.

Ease of operation

TNC300 has implemented an X-Window based user interface at all levels, which follows standards used by commercial computer systems in wide use. A combination of dialogue boxes, lists and graphics presentation is used. In addition, the on-line help functions reduce the requirement for training of the operators.

TNC300



File Control Edit View Options

Subscribers

Active Alarms

Alarm Log

PS / CS



CS trunks

PS trunks

THOMSON-CSF
NORCOM

Number	Type	Symbolic name	Category	CS profile no.	PS profile no.	Last level slp.	Network status	Start SPS	CS conn. (S)	CS conn. status	PS conn. (S)	PS conn. status	St code	
1001130	SINGLE		PERMANENT	NONE	INDEX	SBS	CONNEC.				1001	PS	UPDATED	1011
1001140	SINGLE		MOVABLE	1	2	FC	CONNEC.	1040	3	UPDATED	1041	3	UPDATED	1011
1001141	SINGLE		MOVABLE	1	NONE	FC	CONNEC.	1040	1	UPDATED				1011
1001142	SINGLE		MOVABLE	1	NONE	FC	CONNEC.	1040	2	UPDATED				1011
1001144	SINGLE		MOVABLE	1	NONE	FC	CONNEC.	1040	4	UPDATED				1011
1001145	SINGLE	TEST	MOVABLE	1	NONE	RCC	CONNEC.				1041	PS	UPDATED	1011
1001131	SINGLE	COMBDEF	MOVABLE	2	NONE	RCC	CONNEC.	1020	6	UPDATED				1011
1001132	SINGLE	TEST	MOVABLE	2	NONE	RCC	CONNEC.	1020	7	UPDATED				1011
1001133	SINGLE	TEST	MOVABLE	2	NONE	RCC	CONNEC.	1020	7	UPDATED				1011

Subscriber Number		Modify Code	Symbolic Info
1001134		1111	IS 47
Standard CS Profile		CS-MDC	Chained
2		1221	?
Standard PS Profile		PS-MDC	Chained
NONE		NONE	0
Deactivated SPS			

Buttons: EscAPE, Close, Cancel, Help

Subscriber handling

For subscribers connected by wire or radio, the operator has access to the following subscriber handling functions, in a specific subscriber presentation mode:

- Subscriber directions presentation and manipulation
- Subscriber profiles management
- Subscriber services handling
- Define, delete and move subscribers

Equip	ID	Sub-ID	Time	Type	Severity	Probable Cause	Additional Text
TRC	::FC24001		1999-2-17 10:36:3	Equipment	Critical	HCI: disk overflow	The disk status is c
TMTR000210	HO0C_726-126A	HO0C_06-1066-7	1999-2-17 14:54:2	Communics	Major	Port: slp: monitoring	The slp rate is clea
TMTR000210	HO0C_04-1046	HO0C_02-1026-2	1999-2-17 13:23:6	Communics	Major	Port: slp: monitoring	The slp rate is clea
TMTR000210	HO0C_726-126A	HO0C_06-1066-2	1999-2-17 11:58:4	Communics	Major	Port: slp: monitoring	The slp rate is clea
TMTR000210	HO0C_04-1046	HO0C_06-1066-3	1999-2-17 13:25:3	Communics	Major	Port: slp: monitoring	The slp rate is clea
TMTR000210	HO0C_02-1026	HO0C_04-1046-2	1999-2-17 15:18:3	Communics	Major	Port: slp: monitoring	The slp rate is clea
TMTR000210	HO0C_06-1066	HO0C-05-1066-4	1999-2-17 13:25:1	Communics	Major	Port: slp: monitoring	The slp rate is clea
SWTCH	HO0C_722-122A		1999-2-17 15:24:2	Communics	Minor	Comms: voice/ring tone	A voice/ring tone

Alarm handling

The FC collects alarms related to circuit switch, packet switch, MUX, trunks and gateways from the TAS.

The alarm is displayed as colour coded indicators in the graphical views and in tables. The FC forwards the alarms to the OSC (RCC and NCC).

The alarms can be of three levels of severity:

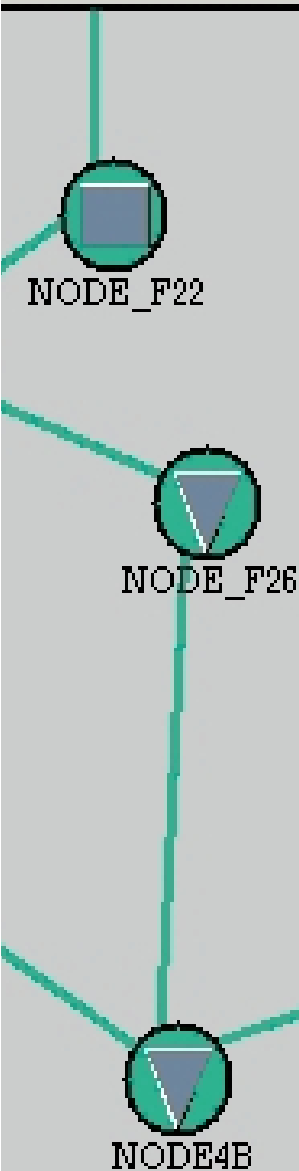
Critical alarms, Major alarms, Minor alarms

To avoid flooding the network with minor alarms a filter can be defined. It is possible to define what alarm severity on each object class (equipment type) that shall be reported to the level above.

NODE_F24

NODE_04

NODE_02



OSC and FC functions

- Management of TAS300/350 tactical switch
- Management of multiplexers
- Management of trunks and gateways
- Management of subscriber and services
- Management of Radio Access Point (RAP) equipment
- Management of Multi Channel Radio (MCR) equipment
- Management of network segment (node, region)
- Statistics and registration
- Operator Assistance Position

All management functions are integrated in the same management system, with a common MMI. TNC300 has MMI and functions for network supervision at network and region level, i.e. status overview screen showing nodes and trunks. The operator can go «down-one-level» to see the next lower level screen showing switches, trunks etc.

File	Ctrl	View	Help
Trunk id	Start/End	Start/End	Trunk id
Node1:1000.5	4010-5000.5	4010-5000.5	T3M70000
Node1:1000.6	5000.0A-5000.2	5000.0A-5000.2	T3M70000
Node1:1000.9	5000.1-5000.9	5000.1-5000.9	Strapband
Node1:1000.6	4010-5000.5	4010-5000.5	T3M70000
Node1:1000.7	4010-5000.5	4010-5000.5	Down
Node2A:6000.6	6000.0B-6000.2	6000.0B-6000.2	T3M70000
Node2B:6000.6	6000.0B-6000.5	6000.0B-6000.5	T3M70000
Node2A:5000.8	5000.0B-5000.9	5000.0B-5000.9	T3M70000
Node2B:5000.8	5000.0A-5000.5	5000.0A-5000.5	T3M70000

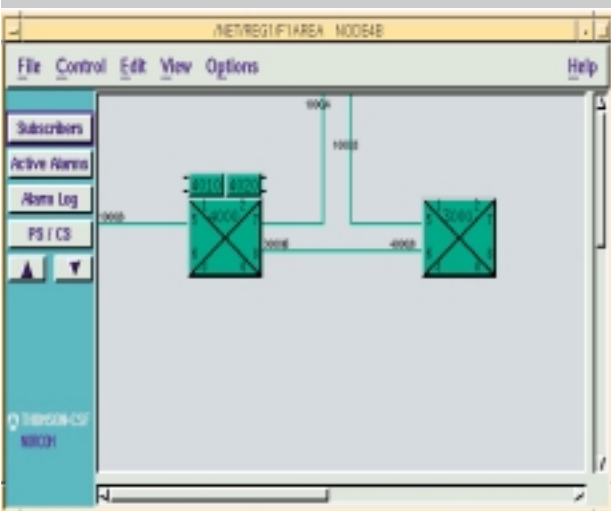
Trunk Dialog

Trunk id: [Node2A:6000.6-Node2B:6000.2]

No. of	Working	Security	Normal	Connection
trunks	status	status	status	status
Trunk id:	<input type="text" value="Not checked"/>	<input type="text" value="Down"/>	<input type="text" value="Up"/>	<input type="text" value="Up"/>
Detail:	<input type="text" value="Not checked"/>	<input type="text" value="Down"/>	<input type="text" value="Up"/>	<input type="text" value="Up"/>

No. Error	Reg.	Port	TRM	Other	Last
status	status	status	status	status	status
Trunk id:	10E-8	1-BAV	Automatic	104-010-010	0
Detail:	10E-8	1-BAV	Automatic	104-010-010	0

Details Close Help



Equipment Supervision

The most used presentation for the FC operators is the equipment view showing switches, multiplexers, trunks and radio access points. In addition to the two main presentation forms, node view and equipment view, tables and dialogue windows for the different equipment types are available.

TNC300

Operator Assistant Positions

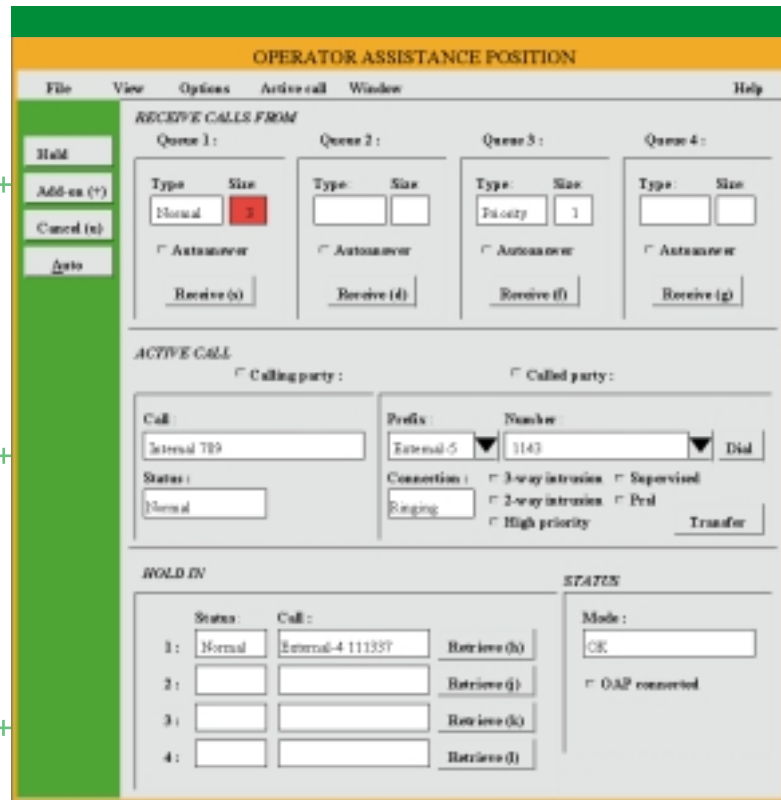
Switchboard operator services are available in the Operator Assistance Positions (OAP) SW that can be activated on any FC or OSC. In addition the operator use a telephone or headset connected to the switch. A network may have one or more OAP activated. The OAP have the following main functions:

- Answering incoming operator calls, queuing and hold are available
- Transfer incoming calls to network external or internal lines
- Intrude or supervise an active call
- Assist the subscribers with setting up conferences and broadcast calls
- Chain calls

Remote operation

The OSC at NCC and RCC levels have built in functions for remote control of the TNC300 units at the levels below in the hierarchy.

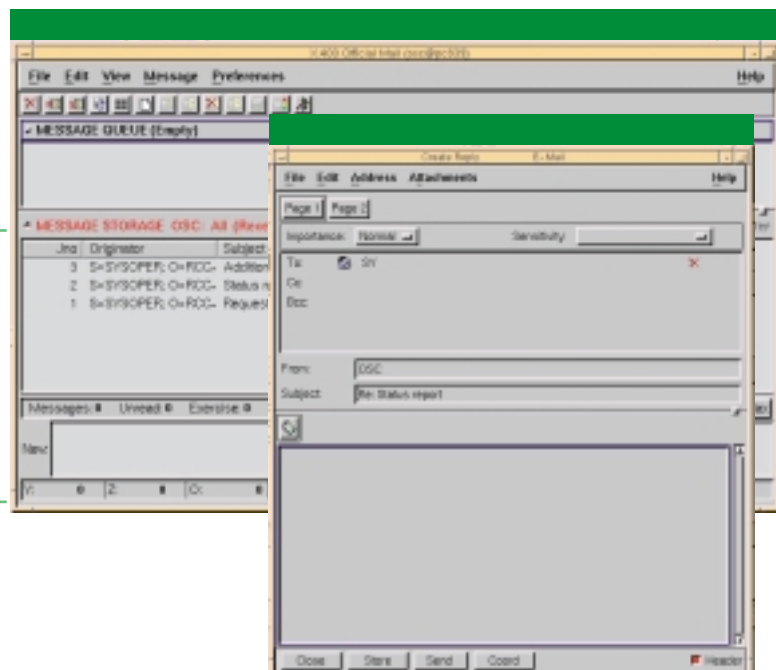
The remote operation feature at e.g. RCC level implies that the OSC operator may gain access to a remote FC at the Node level, and thereby performs required function at this level



Electronic Mail Facility

An electronic mail facility is provided based on X.400. This can be used to transfer orders from SEP operator to the OSC and FC operators and reports in the opposite direction. Other free text messages between the SYSCOM operators in different centres can also be transferred.

Signals Orders containing the planned node configurations including MCR parameters will be sent by electronic mail from the SEP or OSC to the FC operators.



TNC300

Transmission Management

MCR, Multi Channel Radio management (radio relay) may be performed from an integrated application on the TNC300. The MCR management SW can be used independent of the switch management or it can be launched from the switch management topology views. Collected alarms are reported into the same alarm system as used for switching management. Output from the deployment planning on the SEP (e.g. transmit power, frequencies and data rate) can be received as a file and forwarded to the radios by operator commands. To be able to do remote management, communication between TNC300 and the MCR equipment goes through the X.25 network and via the integrated PAD in the TAS300/TAS350.

OLTU, Optical Line Transmission Unit management and other management of other transmission systems may be integrated on the TNC300 in the same way as the MCR management.

Security Management

The crypto management functions are intended to control the crypto mechanisms in the network.

Key Generation Centre
Key Generation Centre (KGC) is an off-line centre for generation of COMSEC keys. The equipment IDs of Bulk Encryption Devices (BED) must be input, and crypto key groups can be defined. The keys can be distributed to the individual BEDs by using fill device or bar ooder reader.

Bulk Crypto management

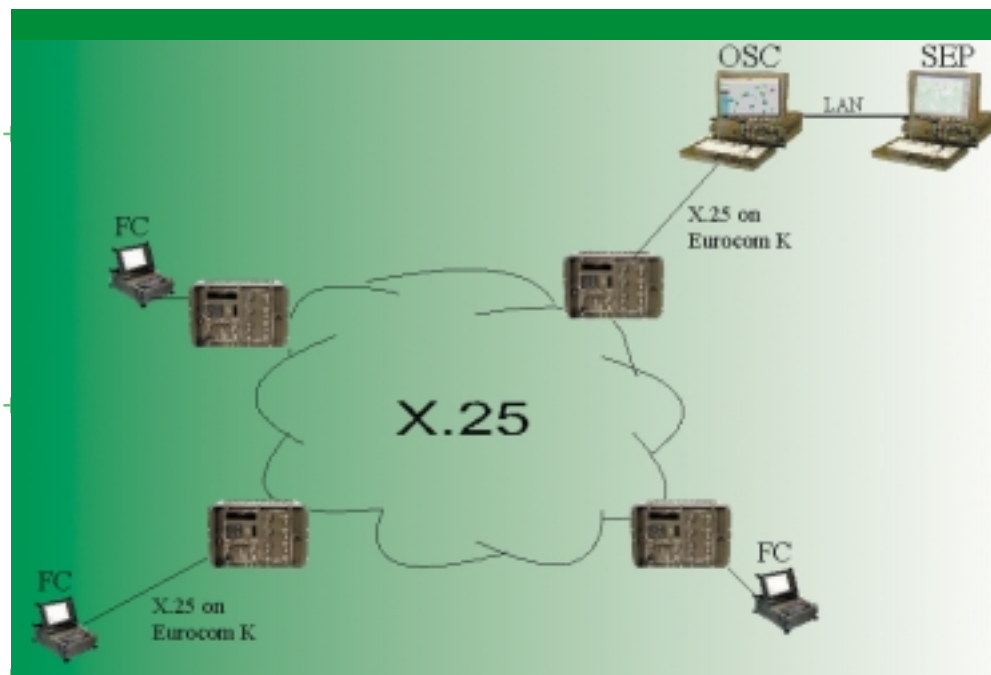
The security status of each trunk is presented on the TNC300 with different colours on the trunks in the graphical views and in table form.

Communications

The TNC300 centres communicate over the integrated packet switched network of TAS switches.

Each TNC300 centre is defined as an X.25 packet switch subscriber and connected to the network via an X.25 interface adapter in the PC, and a digital subscriber line to the subscriber access unit.

Communications between the OSC and SEP workstations at the NCC and RCC levels use the TCP/IP communications protocol over a standard Ethernet.



Technical specifications

Tactical Network Control TNC300

Management functions

- The TNC300 have built in management functionalities for all services and interfaces of the TAS300 Tactical Switch family.
- The TNC300 is well suited for integration of management of any communication or transmission equipment used in a tactical network such as:
 - Radio access point (RAP) management for SCRA and CNR radios Multi Channel Radio (MCR)
 - Optical Transmission Systems
 - Internet Routers

TNC300 hardware

The TNC300 is based on standard type PC hardware. Depending on the installation, the degree of ruggedization can vary substantially. From a full rugged computer designed for the extended temperature range and with EMC protection intended for outdoor use, use on tracked vehicles or gun platforms to the indoor office type used in a protected environment.

Typical TNC300 hardware specification:

- Intel Pentium MMX 200 MHz CPU
- PCI/ISA bus structure
- 64 MByte RAM
- 12" - 16" colour display TFT active matrix (LCD)
- 3 GByte hard disk drive
- CD-ROM
- Printer and serial ports

Special communication cards:

- X.25 interface board (PCP, full length ISA)
- Eurocom K interface board (KIF, half length ISA)

TNC300 Software

- The application SW is a set of well integrated modules giving the operator a self-explanatory and user-friendly interface to the system.
- Object oriented approach both in SW development and in operator dialogue.
- Industrial and Telecom standard development tools and programming languages
- SCO Open Server operating system
- X-Window / Motif graphical user interface

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