

6 Operation and maintenance

6.1 Network supervision

The status of the system is controlled permanently by the supervision function provided by the 7390LT software. This function is described in § 4.4 *Supervision Principles* and 4.5 *Base Station Supervision*. It offers the following operational help tools:

- a **log of all the events** taking place between the Agent (NE) and the Manager (7390 LT) from the connection (see § 4.8 *NE management*),
- a **historical event log** (see § 4.8.3 *Historical Event log*)
- an **alarms list** (see § 4.10.1 *Alarms*).

6.2 Operation

The configuration operations relating to current operations are as follows:

- Time setting (see § *The operator is advised of any inappropriate commands by error messages (see Appendix 6 – Error messages and corrective actions).*),
- Configuration of frequencies (see § 6.2.2 *Configuration of frequencies*),
- Configuration of transmit power level (see § 6.2.3 *Configuration of transmit power level*)
- Configuration of RBS (see § 6.2.4 *Configuration of the RBS*),
- Activation of upstream (see § 6.2.5 *Activation of upstream*),
- Validation of upstream for IP data traffic (see § 6.2.6 *Validation of upstream for IP data traffic*),
- Radio resources management (see § 6.2.7 *On-demand Service Management*),
- Configuration of IP addresses (see § 6.2.8 *Configuration of IP addresses*),
- Configuration of the NFS server (see § 6.2.9 *Configuration of the NFS Server*),
- Configuration of ATM interface (see § 6.2.10 *Configuration of ATM interface*),
- Configuration of TNT board for circuit emulation (see § 6.2.11 *Configuration of TNT board for circuit emulation*),
- Creation of ASAP table for NT (see § 6.2.12 *Creation of ASAP table for NT*),
- Suppression of ASAP table for NT (see § 6.2.13 *Suppression of ASAP table for NT*),
- Change of alarm severity profile (see § 6.2.14 *Change of alarm severity profile*),
- Service creation: leased lines, data and/or VoIP (Voice over IP), IP, CES, ISDN (see § 6.2.15 *Service creation leased lines, IP, CES, ISDN*),
- Service suppression: leased lines, data and/or VoIP, CES, ISDN (see § 6.2.16 *Service suppression leased lines, IP, CES, ISDN*),
- Start radio performance for NT (see § 6.2.17 *Start radio performance for NT*),
- Stop radio performance for NT (see § 6.2.18 *Stop radio performance for NT*),
- Start radio performance for radio link (see § 6.2.19 *Start radio performance for Radio Link*),
- Stop radio performance for radio link (see § 6.2.20 *Stop radio performance for Radio Link*)
- Stop NE supervision (see § 6.2.21 *Stop NE Supervision*)
- Start NE supervision (see § 6.2.22 *Start NE Supervision*)
- Stop NT supervision (see § 6.2.23 *Stop NT Supervision*)

- Start NT supervision (see § 6.2.24 Start NT Supervision)
- Stop BS supervision (see § 6.2.25 Stop BS Supervision)
- Start BS supervision (see § 6.2.26 Start BS Supervision)
- Backup (see § 6.2.27 Backup),
- Restore (see § 6.2.28 Restore).

Note: The operator is advised of any inappropriate commands by error messages (see Appendix 6 – Error messages and corrective actions).

6.2.1 Time setting

6.2.1.1 Manual time setting

Time setting is carried out from the **BS Details** screen (see § 4.5 Base Station Supervision) by clicking on the «Set Agent time» button (see § 4.5.5 Sending time to the Agent). The system updates its time only when manual time setting is done.

Note: Manual time setting is not allowed when SNTP server is configured.



6.2.1.2 Automatic Time Setting by SNTP

Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Configuration of the IP address of SNTP server.	Go to the Time Management screen and configure an IP address time server.	4.14.4
II	Check that SNTP server is available.	Check that the time server loss alarm has disappeared.	4.10.1.3

Note: Once the automatic time setting is set, the system updates its time every fifteen minutes with the SNTP server time.

6.2.2 Configuration of frequencies

Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Access to the Radio Configuration screen.	Go to the Radio Configuration screen from the BS Details screen.	4.5
II	Definition of the radio parameters.	In the Radio Configuration screen: - select the radio link tab, - define the channelization type - define the frequency of the uplink channel, - define the frequency of the downlink channel, - validate.	4.7

	CHECK THAT THE FREQUENCIES ENTERED CORRESPOND TO THE DATA OF THE IMPLEMENTATION SHEET (SEE Appendix 1 – Installation sheet).
	THE SECTOR REBOOTS, FOR THIS SECTOR, THE SERVICES ARE TEMPORARILY UNAVAILABLE.

6.2.3 Configuration of transmit power level

Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Access to the Radio Configuration screen.	Go to the Radio Configuration screen from the BS Details screen.	4.5
II	Selection of the transmit power level.	In the Radio Configuration screen: - select the radio link tab, - select the radio transmit power level, - validate.	4.7.1

6.2.4 Configuration of the RBS

Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Access to the configuration of an RBS.	In the BS Details screen, double-click on the RBS whose radio parameters are being configured. The RBS Details screen appears.	4.5 4.5.7
II	Definition of the DBS / RBS link.	In the RBS Details screen: - define the cable type, - define the cable length, - validate and return to the BS supervision screen.	4.5.7
III	Checking absence of alarm	In the Alarm List screen: - check that there is no "board_configerror" alarm linked to this RBS.	4.10.1.3

6.2.5 Activation of upstream

The upstream activation allows to be able to create NT.

Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Access to the radio screen.	Go to the Radio Configuration screen from the BS Details screen.	4.7.1
II	Activation of the upstream.	In the Radio Configuration screen: - select the upstream to be activated and apply.	4.7.1

6.2.6 Validation of upstream for IP data traffic

The validation of upstream for IP data traffic allows to be able to create IP services (cf. § 4.7.2 *Dynamic Traffic Configuration*).

Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Edit the IP data traffic configuration.	Go to IP Data Traffic Configuration screen from the BS Details screen.	4.7.2
II	Validate on the upstream.	- click on the data traffic field for the right upstream and select "YES" to repeat the same for the other upstreams to be validated, - validate the modification by clicking on «Apply».	4.7.2
III	Check configured bandwidth.	Check on the IP Data Traffic Configuration screen that the configured bandwidth has been correctly decreased.	4.7.2

6.2.7 On-demand Service Management

Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Access the On-demand Service Management screen	From the BS Details screen, access the On-demand Service Management screen.	4.5
II	Overbooking configuration	In the On-demand Service Management screen: - choose the radio link to manage. The different possible actions are: - for the downstream channels: - define the overbooking factor limits, - select or no the policing. - for each upstream channel: - define the overbooking factor limits, - select the Guaranteed MCR or allow a degraded MCR. - validate by pressing the «Apply» button.	4.7.3.2
III	Display of allocated radio resources	From the BS Details screen, access to the used On-demand Service Management screen. - consult the radio resources reserved for the traffic	4.5 4.7.3

Note: When a service is created, the operator can check bandwidth use by displaying the use radio resource (see stage III).

6.2.8 Configuration of IP addresses

IP configuration consists in defining:

- the IP addresses of the BS, corresponding to each of the ATM and Ethernet interfaces,
- the sub-nets of 7390 LT managers associated with the ATM and / or Ethernet interfaces.

6.2.8.1 IP addresses of the ATM and Ethernet interfaces of the BS

	BOTH IP ADDRESSES MUST BELONG TO DIFFERENT SUB-NETS.
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Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Access to the IP address parameters of the BS.	Go to BS's Local Networks screen from the «Change IP address» button.	4.5 4.9.2

Order number of steps	Designation	Comments	Refer to paragraph concerned
II	Allocation of an IP address to the ATM interface.	In the "ATM Network" part of the BS's Local Networks screen: - enter the Pvi/Vci parameters, - select the bit rate, - validate. Nota: This stage can be not performed. In this case the IP interface remains not configured.	4.9.2
III	Allocation of an IP address to the Ethernet port.	In the "Ethernet Network" part of the BS's Local Networks screen: - define the IP address, - define the sub-net mask, - enter the IP address of the router associated with the Ethernet input, - validate. Nota: This stage can be not performed. In this case the IP interface is configured with default IP address of the BS (192 168 99.1).	4.9.2

Note: IP address 0.0.0.0. is not rejected but the system remains with the former IP address.



IT IS RECOMMENDED TO CHANGE THE ADDRESSES OF THE BS WITH A LT CONNECTED LOCALLY TO THE BS.

6.2.8.2 Sub-net of Manager (7390 LT)

Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Access to "Network address" settings	Go to the Target Network screen from the «Change Network address» button.	4.5 4.9.3
II	Definition of the manager sub-net associated with interface 1.	In the "Interface 1" part: - define the IP address, - define the sub-net mask, - define the interface associated with manager 1 (ATM or Ethernet), - validate.	4.9.3
III	Definition of the manager sub-net associated with interface 2.	In the "Interface 2" part: - define the IP address, - define the sub-net mask, - define the interface associated with manager 2 (ATM or Ethernet), - validate.	4.9.3

Note: The two sub-nets can be associated with the same interface.

6.2.9 Configuration of the NFS Server

In order to keep a connection between a DBS and a NFS server (even after a DBS reset), it is possible to configure the access to a NFS server. Once done, any board or NT with a wrong software version will be automatically updated..

Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Selection of a File Server Type.	Go to the NFS Server screen: - select the File Server Type. In case of 7390 LT Server, perform step II. In case of External Server, perform step III.	4.14.1
II	Selection of the file which describes the software configuration (7390 LT server).	In the NFS Server screen: - click on the «Browse...» button, - select the File descriptor in the File Browser screen, - click on the «Apply» button, - then, close the File Browser screen. Nota: In the NFS Server screen, Package Location and File descriptor parameters are automatically updated. Do not perform step III and go to step IV.	4.14.1
III	Configuration of the file which describes the software configuration (external server).	In the NFS Server screen: - assign an IP address to the external server, - select Network Type (LAN or WAN), - give a Package Location, Nota: Be cautious of the upper and lower cases. - give a File descriptor name.	4.14.1
IV	Validate the NFS Server configuration.	- click on the «Connect» button to take into account the NFS Server Configuration. Nota: An error message can appear (cf: Appendix 6 – Error messages and corrective actions)	4.14.1

6.2.10 Configuration of ATM interface

The 155 MBPS interfaces must be configured. The 34 Mbps interface is not configurable.

6.2.10.1 Configuration of the 155 MBPS interface I

Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Configuration of the Medium Type.	Go to the ATM Ports Details screen: - select the Medium Type (sdh or sonet), - click on «Apply».	4.9.1

6.2.11 Configuration of TNT board for circuit emulation

Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Lock all TNT Ports	Go to the E1 cross-connection screen and open the TNT port configuration screen Lock all the ports	4.5.3.2
II	Change the input type of the TNT board	Go to the TNT Details screen: - select ATM, - and «Apply». Nota: This change will make the TNT board reset	4.5.3.2
III	Check TNT configuration	- Check the TNT board becomes green again,	4.5.3.2
IV	Configure parameters for circuit emulation	- Change parameters, (Buf Max Size) and (Cdv Rx T)	4.5.3.2



FOR T1 «Cdv RxT» AND «Buf Max Size» PARAMETER MUST NOT BE SET TO RESPECTIVELY 250 μs AND 375 μs (THE LOWEST VALUE).

6.2.12 Creation of ASAP table for NT

Note: The new ASAP table is created with severities equal to the severities of the NT default table.

Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Access to ASAP List screen.	From the menu bar, open ASAP List screen.	4.10.2
II	Create a new ASAP.	- click on the «New ASAP» button, - enter the new ASAP name. - validate	4.10.2.1
III	Change the alarm severity profile.	- click on the severity to be changed to make appear scroll down list. - click on the «Modify ASAP» button - select the new severity. - repeat this action for the severities to be changed. - finally, validate by clicking on «Apply».	4.10.2.2

Order number of steps	Designation	Comments	Refer to paragraph concerned
IV	Association of these ASAPs to NTs.	Go to NT List screen. - double click on the first NT in the NT Details screen. - select wanted ASAP and validate by clicking on « <i>Apply</i> ». - repeat these actions for the NT whose ASAP table has to be changed.	4.6

6.2.13 Suppression of ASAP table for NT

Note: No NT must reference the ASAP table to be suppressed.

Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Select the ASAP.	Go to the ASAP List screen, select the ASAP.	4.10.2
II	Remove suppression.	- click on the « <i>delete ASAP</i> » button and confirm the suppression by clicking on the « <i>OK</i> » button.	4.10.2.3

6.2.14 Change of alarm severity profile

Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Select the ASAP	- Go to the ASAP List screen, select the ASAP. - Click on « <i>Modify ASAP</i> » button.	4.10.2
II	Change severity of a label.	- Click on the severity to be changed to make appear scroll down list. - Select the new severity. Repeat this action for the severities to be changed. - Finally, validate by clicking on « <i>Apply</i> ».	4.10.2.2

6.2.15 Service creation leased lines, IP, CES, ISDN

Several cases may be distinguished according to whether leased lines (E1, X21, T1, CES) or IP cross-connect creation is involved.

6.2.15.1 Creating an E1 cross-connection

Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Configuration of TNT port on BS	Go to the E1 cross-connections screen: - select the TNT board, - access the configuration of the TNT board ports, - select a port from the list, - configure the port: . select structured or unstructured, . validate by clicking on «Apply». - unlock the administrative status of the port, . validate by clicking on «Apply».	4.12.1.2 4.12.1.3 4.12.1.4
II	Configuration of port on NT	Go to the E1 cross-connections screen: - select the NT, - access the configuration of the NT ports, . select structured or unstructured, . validate by clicking on «Apply». - unlock the administrative status of the port, . validate by clicking on «Apply».	4.12.1.3 4.12.1.5
III	Cross-connection of timeslots of selected ports	In the E1 cross-connections screen: - two cross-connect modes are available depending on whether the cross-connection ports are structured or unstructured. - validate the cross-connection by creating the E1 cross-connection (following step).	4.12.1.6
IV	Creation of an E1 link	In the E1 cross-connections screen: - click on the cross-connection creation button. In the Create a cross-connection screen: - assign a designation to the cross-connection if you want to modify the default designation. - click on «OK» to create the link.	4.12.5.3
V	Unlocking and activating the cross-connection	In the E1 cross-connections screen: - click on the «Unlock» button.	4.12.5.5

Note: When a E1 port or E1 cross-connection is locked or unlocked a SIA alarm can appear temporarily.

6.2.15.2 Creating an X21 cross-connection

Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Configuration of TNT port on BS	Go to the E1 cross-connections screen: - select the TNT board, - access the configuration of the TNT board ports - select a port from the list, - configure the port: . select structured or unstructured, . validate by clicking on «Apply» . unlock the administrative status of the port, . validate by clicking on «Apply».	4.12.2.3 4.12.2.4
II	Configuration of port on NT	Go to the E1 cross-connections screen: - select the NT, - access the configuration of the NT ports, . unlock the administrative status of the port, . validate by clicking on «Apply».	4.12.2.3 4.12.2.5
III	Cross-connection of time slots of selected ports	In the E1 cross-connections screen: - two cross-connect modes are available depending on whether the cross-connection ports are structured or unstructured. - validate the cross-connection by creating the X21 cross-connection (following step).	4.12.2.6
IV	Creation of an X21 link	In the E1 cross-connections screen: - click on the cross-connection creation button. In the Create a cross-connection screen: - assign a designation to the cross-connection if you want to modify the default designation. - click on «OK» to create the link.	4.12.5.3
V	Unlocking and activating the cross-connection	In the E1 cross-connections screen: - click on the «Unlock» button.	4.12.5.5

6.2.15.3 Creating a T1 cross-connection

Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Configuration of TNT port on BS	Go to the T1 cross-connections screen: - select the TNT board, - access the configuration of the TNT board ports, - select a port from the list, - configure the port: . unlock the administrative status of the port, . validate by clicking on « <i>Apply</i> ».	4.12.3.3 4.12.3.4
II	Configuration of port on NT	Go to the T1 cross-connections screen: - select the NT, - access the configuration of the NT ports, - go to the Ports Configuration screen, . select structured or unstructured, . validate by clicking on « <i>Apply</i> ». . unlock the administrative status of the port, . validate by clicking on « <i>Apply</i> ».	4.12.3.3 4.12.3.5
III	Cross-connection of time slots of selected ports	In the T1 cross-connections screen: - two cross-connect modes are available depending on whether the cross-connection ports are structured or unstructured. - validate the cross-connection by creating the T1 cross-connection (following step).	4.12.3.6
IV	Creation of a T1 link	In the T1 cross-connections screen: - click on the cross-connection creation button. In the Create a cross-connection window: - assign a designation to the cross-connection if you want to modify the default designation. - click on « <i>OK</i> » to create the link.	4.12.5.3
V	Unlocking and activating the cross-connection	In the T1 cross-connections screen: - click on the « <i>Unlock</i> » button.	4.12.5.5

6.2.15.4 Creating a CES cross-connection

Note: The TNT board must be configured for circuit emulation.

Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Creation of LL cross-connection	See step I, II, III, IV of section 6.2.15.1 (E1), 6.2.15.2 (X21) and 6.2.15.3 (T1)	
II	Check if the TNT port is locked	Go to the E1 cross-connections screen: - select the TNT board, - access the configuration of the TNT board ports, - select a port from the list, - lock the administrative status of the port, - validate by clicking on «Apply».	4.12.6.3
III	Creation of a CES link	- select the TNT board, - select a TNT port from the list. - choose the Vci of ATM link - click on the «Cross-connection Creation» button.	4.12.6.3
IV	Unlock the TNT port	Go to the E1 cross-connections screen: - select the TNT board, - access the configuration of the TNT board ports, - select a port from the list, - unlock the administrative status of the port, - validate by clicking on «Apply».	4.12.4.3
V	Unlock the LL cross-connection or unlock NT port	In the E1 cross-connections screen: - click on the «unlock» button. Go to the E1 cross-connections screen: - select the NT, - access the configuration of the NT ports, - unlock the administrative status of the NT ports, - validate by clicking on «Apply»	4.12.5.5 4.12.3.5(E1) 4.11.2.5 (X21) 4.12.3.5 (T1)

6.2.15.5 Creating an IP cross-connection

Note: Before creating an IP cross-connection, check if upstream is validated for data traffic.

Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Configuration of Ethernet ports on NT	Go to IP screen from main screen. - go to NT Ethernet Ports Management screen from the IP screen, - select the NT, - select the Configuration State (half or full duplex),, - unlock the port, - validate by clicking on «Apply».	4.13 4.13.2.2
II	Creation of an IP link	Go to New IP Cross-connection screen from the IP screen, - select the NT involved in the IP link, - select the Ethernet port involved in the link, - select the IP service type (dynamic or static), - define the flow in transmission and reception, - select the traffic type (Only Data or Both Data & Voice), - enter the VCL parameters(Vpi, Vci) for Data traffic and for Voice over IP if needed.,	4.13.2.1 and 4.13.2.3 4.13.2.3 table
III	Unlocking and activating the IP cross-connection	In the IP screen, click on the «Unlock» button.	4.13.2.6

6.2.15.6 Creating an ISDN Service.

Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Configuration of TNT port on BS	Go to the ISDN cross-connections screen: - select the TNT board, - access the configuration of the TNT board ports, - go to the ISDN ports Configuration screen: - select a port from the list, - configure the port with ISDN: . validate by clicking on «Apply», . unlock the administrative status of the port, . validate by clicking on «Apply».	4.12.2.3 4.12.4.3
II	Creation of an ISDN signaling Link (for D channels)	Go to the ISDN cross-connections screen: - select signaling, - select one TS of TNT port, - assign the TS to the signaling TS, - click on the cross connection creation button.	4.12.4.2 4.12.1.6
III	Activation the cross-connection	In the ISDN cross-connections screen: - click on the «Unlock» button.	4.12.4.3
IV	Configuration of TNT port on BS	Go to the ISDN cross-connections screen: - select the TNT board, - access the configuration of the TNT board ports, - select a port from the list, - configure the port with ISDN: . validate by clicking on «Apply», . unlock the administrative status of the port, . validate by clicking on «Apply».	
V	Creation of an ISDN Link (for B channels)	Go to the E1 cross-connections screen: - select the NT, - select the NT ISDN port - select one opr two TS of TNT port, <i>Nota: If only one B channel is involved in the ISDN link, select only one TS if both B channels or involved, select two TSs.</i> - assign the TS to the B channel TS, - click on the «Cross-connection Creation» button.	4.12.4.2
VI	Activation of the ISDN Link	In the E1 cross-connections screen: - select the ISDN Link - click on the «Unlock» button.	4.12.4.2
VII	Creation of an ISDN Link over another ISDN port	- repeat step IV to VI for the following ISDN port,	4.12.4.2



- One free time slot of the selected TNT port in ISDN configuration can be cross-connected to the signalling time-slot on the NT side.
- It is not possible to create a B-channel ISDN cross-connection if there is not created first a signalling cross-connection.
- It is possible to cross-connect up to 8 free time-slots of the selected port and up to 8 B-channels of the 4 ISDN-BA user port, but just 1 cross-connection by NT port. Then, it is possible to have 4 B-channel cross-connections by port.
- 2 cross-connections cannot coexist over the same NT port. So, if there is a B1 cross-connection and the user wants to do a B1+B2 cross-connection, he has to remove the B1 cross-connection before creating the B1+B2 cross-connection.

Note: *In the case of modifying the amount of enabled BRA-ISDN port at any WW-NTVSDN, its existing cross-connection for B-channels transport has to be removed and a new one has to be created according to the new condition. This could even cause other cross-connections to be re-allocated (removed-created) in order to provide for enough bearer capacity in consecutive time slots at a certain GXDI E1 link.*

Note: *A 7390 platform identifies n*64 Kbits/s transport services, not presenting any link with ISDN related resources (i.e. OWSA-channels, B channels).*

6.2.16 Service suppression leased lines, IP, CES, ISDN

Several cases may be distinguished according to whether leased lines (E1, X21, T1, CES) or IP cross-connect suppression is involved.

6.2.16.1 Suppression of an E1 cross-connection

Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Locking the cross-connection	In the E1 cross-connection screen: - select the cross-connection to suppress - click on the «Lock» button.	4.12.5.5
II	Locking the ports used in the cross-connection	In the Board TNT x : ISDN ports configuration : - lock the relevant TNT port - click on «Apply». In the NT Board: E1 ports configuration : - lock the relevant NT port, - click on «Apply».	4.12.4.3 4.12.1.5
III	Suppression of E1 cross-connection	Once the "cross-connection" is selected in the "cross-connections" list: - click on the «Suppress» button of the toolbar - validate the confirmation screen - check that the suppressed "cross-connection" no longer appears in the "cross-connections" list.	4.12.5.6


6.2.16.2 Suppression of an X21 cross-connection

Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Locking the cross-connection	In the E1 cross-connection screen: - select the X21 "cross-connection" to be suppressed - click on the «Lock» button	4.12.5.5
II	Locking the ports used in the cross-connection	In the Board TNT x : ISDN ports configuration : - lock the relevant TNT board port - click on «Apply». In the NT Board: X21 ports configuration : - lock the relevant NT port - click on «Apply».	4.12.4.3 4.12.1.5
III	Suppression of X21 cross-connection	Once the "cross-connection" is selected in the "cross-connections" list: - click on the «Suppress» button of the toolbar - validate the confirmation screen - check that the suppressed "cross-connection" no longer appears in the "cross-connections" list.	4.12.5.6


6.2.16.3 Suppression of a T1 cross-connection

Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Locking the cross-connection	In the T1 cross-connection screen: - select the cross-connection to suppress - click on the « <i>Lock</i> » button.	4.12.5.5
II	Locking the ports implemented in the cross-connection	In the Board TNT x : ISDN ports configuration : - lock the relevant TNT board port - click on « <i>Apply</i> ». In the NT Board: T1 ports configuration : - lock the relevant NT port - click on « <i>Apply</i> ».	4.12.4.3 4.12.1.5
III	Suppression of T1 cross-connection	Once the "cross-connection" is selected in the "cross-connections" list: - click on the « <i>Suppress</i> » button of the toolbar - validate the Confirmation screen - check that the suppressed "cross-connection" no longer appears in the "cross-connections" list.	4.12.5.6

6.2.16.4 Suppression of a CES cross-connection

	DO NOT UNLOCK A PORT OF A TNT CONFIGURED FOR CES WITHOUT HAVING ASSOCIATED E1 CROSS-CONNECTION TO THE PORT AND WITHOUT HAVING UNLOCKED THIS E1 CROSS-CONNECTION BEFORE.		
Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Lock the TNT port (Necessary before suppressing the CES cross-connection)	In the Board TNT x : ISDN ports configuration : - lock the relevant TNT board port - click on « <i>Apply</i> ».	4.12.4.3
II	Suppression of the CES cross-connection	In the Circuit Emulation Service screen: - select the "cross-connection" to be suppressed - click on the « <i>Suppress</i> » button - validate the Confirmation screen - check that the suppressed "cross-connection" no longer appears in the "cross-connections" list.	4.12.6.3 4.12.6.4
III	Lock of NT ports lock of LL cross-connection	In the NT Board: xx ports configuration : - lock the relevant NT port - click on « <i>Apply</i> ». In the xx Cross-connection screen:- select the cross-connection to suppress - click on the « <i>Lock</i> » button.	4.12.1.5 4.12.5.5
IV	Suppression of LL cross-connection	Once the "cross-connection" is selected in the "cross-connections" list: - click on the « <i>Suppress</i> » button of the toolbar - validate the Confirmation screen - check that the suppressed "cross-connection" no longer appears in the "cross-connections" list.	4.12.5.6

6.2.16.5 Suppression of an IP cross-connection

	DO NOT UNLOCK A PORT OF A TNT CONFIGURED FOR CES WITHOUT HAVING ASSOCIATED E1 CROSS-CONNECTION TO THE PORT AND WITHOUT HAVING UNLOCKED THIS E1 CROSS-CONNECTION BEFORE.		
Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Locking the cross-connection	In the IP screen: - select the cross-connection to suppress - click on the « <i>Lock</i> » button.	4.13.2.6
II	Locking the NT Ethernet ports	In the NT Ethernet Ports Management screen: - check the «locked» box for each port concerned, - then, click on « <i>Apply</i> ».	4.13.2.2
III	Suppression of IP cross-connection	Once the "cross-connection" is selected in the "cross-connections" list: - click on the « <i>Suppress</i> » button of the toolbar - validate the Confirmation screen - check that the suppressed "cross-connection" no longer appears in the "cross-connections" list.	4.13.2.2

6.2.16.6 Suppression of an ISDN service

Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Locking the ISDN link using B channels	In the ISDN cross-connection screen: - select the cross-connection using B channel, - click on the « <i>Lock</i> » button.	4.13.2.6
II	Locking the ports used in the cross-connection	In the TNT board: Ports configuration screen: - lock the relevant TNT port, - click on « <i>Apply</i> ».	4.13.2.2
III	Suppression of the ISDN link	Once the first "cross-connection" is selected in the "cross-connections" list: - click on the « <i>Suppress</i> » button of the toolbar - validate the Confirmation screen - check that the suppressed "cross-connection" no longer appears in the "cross-connections" list.	4.13.2.7
IV	Locking the ISDN link for signaling	In the ISDN cross-connection screen: - select the cross-connection involving signaling - click on the « <i>Lock</i> » button.	4.13.2.6
V	Locking the ports used in the cross-connection	In the TNT board: Ports configuration screen: - lock the relevant TNT port, - click on « <i>Apply</i> ».	4.13.2.2

Order number of steps	Designation	Comments	Refer to paragraph concerned
VI	Suppression of the ISDN link	<ul style="list-style-type: none"> - select the cross-connection involving signaling - click on the «<i>Suppress</i>» button of the toolbar - validate the Confirmation screen - check that the suppressed "cross-connection" no longer appears in the "cross-connections" list. 	4.13.2.7

6.2.17 Start radio performance for NT

Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Selection of the NT	Go to the Radio Performance screen: <ul style="list-style-type: none"> - select the NT in the NT List screen, - click on «<i>Apply</i>». <i>Nota: Up to 4 NT per Radio link can be monitored</i>	4.11.1.1
II	Monitor the NT	<ul style="list-style-type: none"> - check that NT Monitoring and Maintenance screen appear in the Radio Performance screen 	4.11.1.2



RADIO PERFORMANCES CAN BE MONITORED ONLY FOR 4 NTs ON A SAME RADIO LINK (SO, UP TO 16 NTs FOR ONE BS.

6.2.18 Stop radio performance for NT

Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Selection of the NT	Go to the Radio Performance screen: <ul style="list-style-type: none"> - click on the «<i>Radio Link</i>» tab associated on the NT, - click on the NT tab. 	4.11.1.2
II	Stop the performance	<ul style="list-style-type: none"> - click on the stop monitoring icon, - click on the Stop Performance Monitoring screen: you have selected the right NT. 	4.11.1.2

6.2.19 Start radio performance for Radio Link

Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Selection of the radio link	Go to the Radio Performance screen, - select the radio link in the radio link list, - click on the «Apply» button.	4.11.1.1
II	Monitor the radio link	- check that the monitoring screen appears in the Radio Performance screen.	4.11.1.2

6.2.20 Stop radio performance for Radio Link

Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Selection of the radio link	Go to the Radio Performance screen, - click on the «global» tab of the Radio Link you want to stop, - click on the global tab.	4.11.1.2
II	Stop the performance	- click on the stop monitoring icon, - click on the Stop Performance Monitoring screen: you have selected the right Radio link.	4.11.1.2

6.2.21 Stop NE Supervision

Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Stop supervision	Go to the main screen - click on the icon to stop NE supervision - click on «Yes» to confirm	4.8.1
II	Checking	Check that the supervision states have changed in the BS Details screen and in the NT List screen.	4.8.1

*Note: The **Current Alarms Synthesis** screen disappears and no more configuration is possible*

6.2.22 Start NE Supervision

Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Start supervision	Go to the main screen - click on the icon to start NE supervision - click on «Yes» to confirm	4.8.1

Order number of steps	Designation	Comments	Refer to paragraph concerned
II	Checking	Check that the supervision state has changed in the BS Details screen and in the NT List screen.	4.8.1

6.2.23 Stop NT Supervision

Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Stop supervision	Go to the NT List screen - select the desired NT - click on the icon to stop the supervision of the NT	4.6.1
II	Checking	Check that the supervision state has changed in the NT List screen.	4.6

6.2.24 Start NT Supervision

Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Start supervision	Go to the NT List screen - select the desired NT - click on the icon to start the supervision of the NT Nota: The icon is active only if the BS is already supervised.	4.6.1
II	Checking	Check that the supervision state has changed in the NT List screen.	4.6



6.2.25 Stop BS Supervision

Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Stop supervision	Go to the BS Details screen - click on the icon to stop the supervision of the BS Nota: The icon is not active if at least one NT is supervised (check in the NT List screen).	4.5.1
II	Checking	Check that the supervision state has changed.	4.5

6.2.26 Start BS Supervision

Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Start supervision	Go to the BS Details screen - click on the icon to start the supervision of the BS	4.5.1
II	Checking	Check that the supervision state has changed.	4.5

6.2.27 Backup

	THE DESTINATION PATH OF THE BACKUP FILE MUST BE CONFIGURED IN R/W IN THE NFS SERVER.
	NON STANDARD ASCII (INCLUDING «-» AND «_») OR SPACE CHARACTERS ARE NOT ALLOWED FOR THE DESTINATION PATH OF THE BACKUP FILE

Note: A time out may appear if the back up function is launched under a severe flow of alarms.

Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Check the BS name	In the BS Details screen: - check that the BS name is not empty. Nota: The name will be used for restore operation.	4.5
II	Selection of the destination path of the backup file	From the Backup / Restore Management screen: - select the «Backup» tab - click on the «select» button	4.14.2
III	Modification of the transfer file name	In the Enter the name of the File to be transfered by the agent screen: - click on the arrow to select the destination disk - open the destination directory by double-clicking on it - enter the name of the backup file - click on «Apply» to take into account the path - click on «Close» to return to the Backup / Restore Management screen	4.14.2.1
IV	Backup	- click on the «Start» button of the Backup / Restore Management screen - once the operation is complete: exit this function by clicking on «Close».	4.14.2

6.2.28 Restore

	THE INTEGRITY OF THE FILE TO BE RESTORED IS UNDER THE OPERATOR'S RESPONSIBILITY. THE SYSTEM DOES NOT MANAGE ANY INTEGRITY LOSS.
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Order number of steps	Designation	Comments	Refer to paragraph concerned
I	Check the BS name	Check that the BS station name has not changed since the backup operation. Nota: <i>If BS name is empty, restoration is possible but the risk of restoring a wrong configuration is high.</i>	
II	Selection of the restore file path	Make sure that the restore directory is exported in R/W to the NFS server. From the Backup / Restore Management screen: - select the «Restore» tab - click on the «Select» button	4.14.2
III	Modification of the transfer file name	In the Enter the name of the File to be transfered by the agent screen: - click on the arrow to select the LT source disk - select the LT source directory by double-clicking on it - select the file that you wish to restore in the files list of the selected directory. - click on «Apply» to take into account the path - click on «Close» to return to the Backup / Restore Management screen	4.14.2.1
IV	File transfer	- click on the «Start» button of the Backup / Restore Management screen - once the operation is complete: exit this function by clicking on «Close».	4.14.2
V	Checking activated and referenced fields in the software management screen	After NE is restarted, both fields must be filled, otherwise carry out an entire download. (see § 7.3.12)	4.14.3

6.3 Preventive maintenance

Preventive maintenance is carried out by:

- permanent monitoring of the system provided by the supervision function,
- periodic inspection of the equipment to ensure that:
 - the link cables between the NE elements are not damaged,
 - the external equipment is properly assembled,
 - the internal equipment is correctly in place.



After stopping the **BS** or **resetting** an **ANT** board (deliberately or not), **DO NOT** forget to download again the same software on the available package (1 or 2) without activating nor referencing it, to re-create the NFS assembly point so as the new NTs that come in the network can perform automatic download.

6.4 Corrective maintenance

6.4.1 Alarms processing

Knowledge of the implicitly induced alarms may be necessary for the operator to be able to carry out maintenance and estimate the quality of the services offered by the 7390NE. This is why the present document offers, in this chapter, a basic knowledge to the operator of the alarm correlation.

6.4.1.1 Checking alarms for each equipment management function

The "alarms control" functions of each board's equipment management for a given type of element are responsible for supervision, clearing and masking of alarms for this element. Each of its functions is responsible for notification to the SNMP agent of the starts and ends of alarms that it controls.

The ANT board is in addition responsible for the processing of alarm indicators ("Critical", "Major" and "Minor" indicators).

The AMD board implements an equipment management function for each of the following types of element:

- the AMD itself
- the IBS
- the RBS
- the NT
- the static cross-connects on the radio link.

The TNT board implements an equipment management function for each of the following types of element:

- the TNT itself
- the E1-G703 port of the TNT

The NT implements an equipment management function for each of the following types of element:

- the E1-G703 port of the NT
- the E1-G704 port of the NT
- the Ethernet port of the NT

6.4.1.2 Terminology relating to the alarms

Active alarm: an alarm is active as soon as the start of this alarm is notified to the ANT board, and remains so as long as its end is not notified

Anomaly: discrepancy between the intended and real characteristics of an item. An anomaly may or may not affect the capacity of this item to carry out a required function. Several successive anomalies of the same type are generally considered a fault.

Defect: limited interruption of the capacity of an item to carry out the required function. A defect may or may not necessitate maintenance action.

Alarm clearance: clearing an alarm initiation by notifying its end.

Board alarm function: for AMD, TNT, IBS, RBS or NT boards, the alarm function is the totality of the "Alarms control" functions of the elements that they manage.

Alarm masking: Storage of an alarm without immediate notification of alarm initiation. Masking allows the seriousness of the alarms for a given element to be hierarchically ordered: masking is carried out when a higher order alarm appears. If on unmasking (carried out at the end of the higher order alarm) the alarm which was masked is still present, an alarm initiation **must be notified**.

6.4.2 Definition of 7390NE alarms

6.4.2.1 Alarms relating to boards

The actions described are not necessarily controlled by the management software (they can be controlled by the equipment itself).

In the tables below, the term "board" may related to any part of the DBS (ANT, TNT, AMD, IBS, CPL, RBS, PSU, Fans), or to an NT.

List of the alarms relating to the boards of 7390NE:

Probable cause	Alarm name	Definition	Actions
Board missing	Board_missing	<p>1. One of the boards (AMD, ANT, TNT, IBS, CPL), already known to the agent, is physically absent from the 7390NE.</p> <p>2. When the alarm object is the BS, it means that a load module (i.e.: a bus adaptative board, connected at the bottom of the rack) is physically absent.</p> <p>3. This alarm also occurs for NT creation, when the radio link is not established with the BS.</p>	<p>Internal NE actions: depends on the functionalities and use of this board in the 7390NE.</p> <p>Operator actions:</p> <ol style="list-style-type: none"> 1. Install the missing board (see § 6.5). If the board is intentionally withdrawn, its suppression will make the alarm disappear (see 4.5.3) 2. Contact the TAC (see page 3) 3. No action

Probable cause	Alarm name	Definition	Actions
Communication Sub-system Failure	Comm_loss	The connection (for management link set-up) between the active ANT board and the "Board" element (redundant ANT; TNT, AMD, IBS, CPL, cooling unit, power supply unit) is not set up or is lost. When the alarm object is an NT, it may mean a durable loss of radio link.	Internal NE actions: reset (automatic or controlled) of the "Board" element if the board is a TNT or AMD board or an NT. No impact if the Board is an IBS or RBS board: these two elements can continue to function without their management link. The setup or re-establishment of the connection requires the complete (re)configuration of this element. This procedure of (re)configuration is automatic and internal to the BS (as long as all the element configuration parameters are valid). Operator action: no action.
Type mismatch	Board_type_error	1. Alarm on TNT board. Alarm on TNT board after changing a board (replacement of board by another type of board). 2. Alarm on NT board. Alarm on NT unit after changing a board (replacement of a unit by another type of NT). 3. Alarm on CPL board. Alarm on CPL board after changing the board (replacement of a board by another type of board). 4. Alarm on ANT board. Alarm on ANT board after changing a board (replacement of a board by another type of board).	Internal NE actions: the "cross-connections" are not in service. Operator actions: 1. Change the board (see § 6.5). 2. Change the board or suppress the NT and recreate it. 3. Check type of the ANT and CPL boards. Change the ANT or CPL board (see § 6.5). 4. Check the type of the ANT board and change the board (see § 6.5).

Probable cause	Alarm name	Definition	Actions
Configuration error	Board_config. error	The Board (AMD or RBS) element configuration parameters list that must be completed by the manager is incomplete.	<p>Internal NE actions: some parameters being reported missing, the " Board " element configuration by the ANT board did not succeed and the system is waiting for a complete configuration.</p> <p>Operator action: achievement of the configuration. In the case of the RBS, check that the type of cable allocated is one supported by the system (see § 4.5.7). Check that the frequencies set for this RBS correspond to the data in appendix A.1 for the corresponding radio link.</p> <p>A configuration error alarm on RBS may indicate also a hardware failure of the RBS.</p>
Hardware failure	HW_failure	Hardware failure detected by a board (ANT, TNT, AMD, cooling unit).	<p>Internal NE actions: No action Operator action: replacement of the faulty board (see § 6.5).</p>
Power supply problem	Power_problem	Power supply failure	<p>Internal NE actions: No action Operator action: replacement of the power supply unit.</p>
Cooling system problem	FAN_degraded	The fans of an element function in degraded mode, i.e., a single fan is faulty.	<p>Internal NE actions: no action. Operator action: replacement of the cooling unit</p>
Synthesizer problem	Synth	Synthesiser problem (IBS or RBS).	<p>Internal NE actions: for the RBS, automatic cut-out of the transceiver For the IBS, no action Operator action: replacement of the faulty component.</p>
Transmit power problem	TX_power	Power problem during transmission	<p>Internal NE actions: automatic cut-out of the transmitter Operator action: replacement of the RBS</p>

Probable cause	Alarm name	Definition	Actions
Software version mismatch	Version_mismatch	The software version of the inserted board does not comply with the software package of the NE.	Operator action: check if it is the good software version (state of the software is set to downloading, cf. § 4.5.3.x) - if not, click on the "download" button of the software management screen toolbar to allow automatic update of the board (activation and referencing must not be done).
Storage problem	Storage_Pb	Storage capacity is not compliant with transmitted traffic that implies the loss of data (only for ANT, AMD)	Operator action: Check the synchronisation of the system.
Time server loss alarm	Time_server_loss	The BS cannot access to SNTP server either: - just after the automatic time setting if SNTP server is not available - twelve hours after the BS has lost its SNTP link or - when the SNTP server address is not configured.	Internal NE actions: If SNTP server address is configured, the BS continues polling the SNTP server. Operator actions: If SNTP server unavailable, check that the BS can address SNTP server (see § 4.9.2 and 4.9.3) and check the network link between BS and SNTP server. If loss of SNTP link, check server process if SNTP. If wanted, configure SNTP server address (see § 6.2.1.2).

6.4.2.2 Alarms relating to ports

The table below provides the list of alarms specific to the 7390NE **ports**, along with their definition and describes the automatic actions internal to the 7390NE-NR2.1 caused by the presence of each of these alarms. The actions described are not necessarily controlled by the management software (they may be controlled by the equipment itself).

List of the alarms relating to 7390NE ports:

Probable cause	Alarm name	Definition
Alarm indicator signal	Ais	Detection of "all-1" signal in the useful data (either in the data transported in the G.704 frame or in the SDH frame container).
Line Alarm Indicator signal	L-AIS	Detection of "all-1" ATM signal received on line (i.e., before unframing; this alarm only exists for the ATM port (ATM over SDH)).
Errored CRC	CRC (*)	Detection of errored blocks in the received frame.
Frame alignment signal	FAS (*)	Detection of frame alignment word of errored frame.
Loss of multiframe alignment	Lmfa (*)	Loss of multi-frame alignment.
Loss Of Frame	LOF (*)	Detection of loss of frame alignment word.
Loss of pointer	LOP (*)	Detection of the reception of a pointer not valid for a STM-N signal (bytes H1,H2 and H3).
Loss Of Signal	LOS	Absence of received signal: detection of the absence of transition in the received signal ("frame" level).
Remote Alarm Indicator	RAI (*)	Alarm indication on the transmitted signal, signalled by remote.
RemoteErrorIndicator	REI (*)	Error indication on the transmitted signal, signalled by remote.
ATMPathRemoteDefectIndicator	P-RDI (*)	Fault indication on the transmitted and unframed signal, signalled by remote (either for the G.704 frame or in the SDH container).
ATMLineRemoteDefectIndicator	L-RDI (*)	Fault indication on the ATM signal transmitted on line.
ATMPathAlarmIndicatorSignal	P-AIS	Detection of the "All 1" signal in the virtual container.
(*) : this alarm can only exist if the signal transmitted/received by the port is framed.		

Note: For these type of alarms, there is no action to be carried out (either from NE nor by the operator).

Note: If a «LOS» appears while a «LOF» alarm is active, a «LOS» alarm will be indicated until both alarms disappear (only on ATM interface).

6.4.2.3 Functional alarms

The 7390NE functions, for which the "Alarm" function of the ANT board manages the alarms, are as follows:

- Time management of the 7390NE
- Synchronization of the 7390NE
- Security
- Activation of leased line cross-connects.

The table below provides the list of alarms specific to the **functions** of the 7390NE, along with their definition. It also describes two types of actions:

- the **automatic internal actions to the 7390NE** - NR2.1, caused by the presence of each of these alarms. The actions described are not necessarily controlled by the management software (they may be controlled by the equipment itself).
- the actions to be done by the **operator** when necessary.

List of the functional alarms:

Probable cause	Alarm name	Definition	Actions
Synchronization clock missing	Clock_missing	Loss of BS internal clock used for slaving PLL of the ANT board.	Internal NE actions: no direct immediate impact. Operator action: no action.
Loss of synchronization priority clock	Priority	Absence or loss of priority reference clock for 7390NE synchronization.	Internal NE actions: fallback to next priority clock. Operator action: no action.
PLL unlocked	Synchronization	Sync roll of the ANT board PLL.	Internal NE actions: no action. Operator action: no action.
Round trip delay minimization	Alloc_error	Impossible to allocate resources to set up a Leased Line cross-connection, since the Round Trip Delay minimisation requirement cannot be respected (and yet the number of resources required for setting up this cross-connection are sufficient => Defragmentation).	Internal NE actions: No resource allocated to the "cross-connection": rejection of the cross-connection set-up request by the AMD board. Operator action: locking, then unlocking all the leased lines (see § 4.12.1.4).

6.5 Replacing a DBS board



AFTER THE FAN MODULE IS REMOVED, BE CAREFUL WITH THE FAN BLADES.

Note: To proceed with the extraction / insertion of a board, it is not necessary to cut the BS power supply. Do not forget to tighten the screws of the board with a screwdriver.

Note: Each time you insert or replace any board in the DBS, you must download again the same software (click on "download" button without activating nor referencing it) This will occur the newly inserted or replaced boards of the BS to be updated.

6.5.1 Boards other than the ANT

To change any board, other than the ANT, follow the steps below:

Order number of steps	Designation of linked steps	Comments	Refer to screens or paragraphs concerned
I	Extraction of the board manifesting a fault	For the AMD, TNT, IBS and CPL boards , the color of their graphic representation in the BS supervision screen changes from white to grayed-out . However, in the case of a module or ventilation block, the color of the graphic representation remains unchanged. In the alarms list, the extracted board appears with " Board_missing " alarm (for the AMD, TNT, IBS and CPL boards), or " Comm_loss " alarm. In the specific case of the AMD board , the IBS and RBS boards associated with it give rise to a " Comm_loss " alarm.	4.5 6.4.2.1
II	Insertion of the new board	The red "F" LED on the front edge of the board remains lit throughout the initialization and self-configuration phase of the board, then is extinguished. The alarms then disappear from the alarms table. In the specific case of the AMD board , not only do the alarms relating to it disappear, but those of its associated IBS and RBS boards can also appear. In addition, the NTs attached to it are automatically (re)integrated in the network and the E1 or IP services become automatically accessible.	4.10.1.3
III	Checking the software version of the re-inserted board	In the current Alarm table, check that there is no Version mismatch alarm for the re-inserted board; otherwise, restart a download with neither referencing nor activation (see § 7.3.12).	4.10.1.3

Order number of steps	Designation of linked steps	Comments	Refer to screens or paragraphs concerned
IV	Checking the board operational status	The board is operational if the green "ON" LED is lit and if the red "F" LED is extinguished . <i>Nota: In the case of a redundant AMD board: if the green "ON LINE" LED is extinguished and the red "F" LED is lit, this means that the board is in stand-by.</i>	5.1.2
V	Checking the operational status of the NTs and the restoration of cross-connections.	Only in the case of an AMD or IBS board.	4.6 4.13.2.1 4.12.5.1

6.5.2 Replacement of an ANT board

To change an ANT board, follow the steps below:

6.5.2.1 Rack with only one ANT

Order number of steps	Designation of linked steps	Comments	Refer to screens or paragraphs concerned
I	Backup	Note the activated and referenced software in the screen (see § 4.5.3.1). Before extracting the board to change, perform a backup of the system in accordance with the procedures seen in the "Backup" section.	6.2.27
II	Extraction of the board manifesting a fault	Extraction of the board causes the loss of the management link and services. The system is no longer in operational status.	
III	Insertion of the new board	The red "F" LED on the front edge of the board remains lit throughout the initialization and self-configuration phase of the board, then is extinguished. Recommissioning and complete configuration of the system are required.	5.1.2
IV	Checking the software version of the re-inserted board	In the screen related to the new ANT board, check the insert board is at the right version. In the software item ANT Details screen, the activated and referenced software must be the same as for the board previously removed, otherwise carry out an entire download.	4.5.3.1 4.14.3.1 7.3.12
V	Restoring	To restore data, restore the system configuration in accordance with the procedures seen in the "Restore" section.	6.2.28

6.5.2.2 Rack with 2 ANT boards: replacement of the active board

	THE NEW ANT BOARD MUST NOT COMPRISE A NR2.0 SOFTWARE (A NR2.0 ANT BOARD MUST BE UPDATED ON ANOTHER TEST RACK).
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Order number of steps	Designation of linked steps	Comments	Refer to screens or paragraphs concerned
I	Extraction of the active board to replace.	Extracting the active board implies switching to the redundant board. Check the transfer on the BS Details screen.	4.5.8 4.5
II	Insertion of the new board	The red "F" LED on the front edge of the board remains lit throughout the initialization and self-configuration phase of the board, then is extinguished. A transfer is performed on the active board. Check on the Redundancy screen.	5.1.2 4.5.8
III	Checking the software version of the re-inserted board	In the current Alarm table, check that there is no. Version mismatch alarm for the re-inserted board; otherwise, restart a download with neither referencing nor activation (see § 7.3.12).	4.10.1.3

6.5.2.3 Rack with 2 ANT boards: replacement of the redundant board

Order number of steps	Designation of linked steps	Comments	Refer to screens or paragraphs concerned
I	Extraction of the redundant board to replace.	In the BS Details screen: - check that the extracted ANT board is with critical alarm (alarms list).	4.10.1.3
II	Insertion of the new board	The red "F" LED on the front edge of the board remains lit throughout the initialization and self-configuration phase of the board, then is extinguished. The board remains in stand-by: check on the Redundancy screen.	5.1.2 4.5.8
III	Checking the software version of the re-inserted board	In the current Alarm table, check that there is no. Version mismatch alarm for the re-inserted board; otherwise, restart a download with neither referencing nor activation (see § 7.3.12).	4.10.1.3

6.5.3 Replacement of ventilation module

Wait for complete stop of the fans when extracting the module.

6.5.4 Replacement of a fuse

Shutdown power supply using the switch.

6.6 Replacement of the RBS

Replacement of an RBS has no impact on alignment. To replace the RBS:

- disconnect the grounding cable (see *Figure 34 – Grounding the outdoor equipment with the 9900UX1102 pole mounting*),
- disconnect the RBS/ DBS connection cable,
- release the snap-locks starting with those on the side , then those on top and finally those at the bottom,
- remove the RBS,
- put in place the new RBS in accordance with the procedure described in § 3.3.5 *Installation of the RBS Unit*,
- reconfigure the radio settings in accordance with the procedure described in § 4.5.7 *RBS*.
- verify RBS configuration, no config error alarm and RBS is enable.

6.7 Replacement of a NT

Note: A NT unit can be replaced by another NT unit of the same type without suppressing services.

Order number of steps	Designation of linked steps	Comments	Refer to screens or paragraphs concerned
I	Access to the configuration of NT.	Go to NT List screen from the main button bar: - select the NT to be replaced and open NT details screen, - check if it is the right NT.	4.6 4.6.3
II	Change the serial number.	Go to the Substitute NT Serial number screen and enter the serial number of the new NT unit. - validate by clicking on «Apply» and confirm the substitution.	4.6.6
III	Replacement of NT unit.	On the site, change the NT unit and check the new unit enters into the network (cf. User Manual of the Terminal Station, Ref. 3CC12423Axxx TQBJA).	4.10.1.3
IV	Check the radio link NT.	Check that there is no comm_loss alarm on the NT.	
V	Check the NT hardware.	Check that there is no board_type_error.	4.6.3
VI	Check the NT software.	Check that there is no version mismatch alarm on the NT. - Restart download only (no referencing and no activating), - Check that the NT becomes unable.	4.14.3

Note: NT unit cannot be replaced by another NT unit of a different type. If wanted, the services on this NT must be suppressed then created again when the NT has been declared and has been entered into the network.

6.8 Malfunctions

6.8.1 Malfunctions on installation

The A7390 is a reliable and easy-to-install system. By following the procedures described in the documentation, no problem should occur. However, if these procedures have been poorly applied, here is a list of the possible problems that may arise.

Manifestation of the problem	Possible causes	Solution
The equipment cannot be powered up.	Wrong 48 V polarity	Restore correct polarity by following the instructions in § 3.5.2.
Poor reception	1. Problem of polarization at RBS 2. Problem of alignment at RT	1. Check the right installation of the antenna on the RBS (see § 3.3.5) 2. Check alignment at RT.

6.8.2 In-service system malfunctions

Manifestation of the problem	Possible causes	Solution
On system start-up, the red "F" LED remains lit following initialization.	1. Bad contact 2. Faulty board	1. Check that the board is properly inserted. 2. Extract and re-insert the board (see § 6.5). If reinserting the board has not resolved the problem, change the board.
With the system in service, the "F" LED changes to red.	Faulty board or redundant board	If it is redundant AMD board, check if there is a hardware failure on the 7390LT. Change the board. (see § 6.5)
Loss of all NTs on the same upstream.	Bad ground connection	Wire the ground connection following the instructions in § 3.5.2.
Sync loss on the E1 frame.	The client equipment is not synchronized with the NT clock.	Switch equipment synchronization from internal clock to clock signal received from NT (see § 4.5.4).

6.8.3 Management malfunctions

Manifestation of the problem	Possible causes	Solution
The LT session will not run.	A session is underway on the OS.	Contact the OS operator to request handover.

