Centralized Answer Position

OPERATIONAL DIRECTIONS

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1 GENERAL

These operational directions give a concise, summarized overview of the Operation and Maintenance (O&M) handling of Centralized Operator (COP) and central answer position (CAP) data. More detailed information can be found in the referred documents.

1.1 FUNCTIONS

COP/CAP is a general concept for the idea of having operators or other common answer positions in one MX-ONE that serve several other MX-ONE systems, here called satellite- or sub-nodes.

In order to achieve this, the exchange must be able to reroute and night-service-divert calls over to another MX-ONE or other system. That is, another system than the MX-ONE where the terminating party is located, but still within the same homogeneous (Integrated Services Digital Network) ISDN or H.323 net work (or combination of both), or homogeneous SIP network.

For full functionality, the exchange where the answer position is located must also be able to notify the status (day/night mode of operation) of the Central operator or operators across the network. Some of the functionality also works without Notification function, and then also with SIP tie-lines. Note however that SIP does not support a specific Night-service-diversion service, but instead uses the ordinary Diversion service.

The central operator (or other central answer position) must also be able to execute various supplementary services across the network, like Intrusion, Transfer or Supervision (Call Back). The supplementary services for the PBX operator are not described here. For more information, see the description for *FEATURE LIST*.

In order to utilize the network functions described in this document, the support for network services is required for the tie-lines. For further information, 2 Prerequisites on page 6.

If the central answer position does not support notification (for example if it is an extension or an InAttend client), that will cause some functional limitations.

When the Customer group function is used, rerouted calls can be redirected to the Customer Centralized Operator (CCOP) which is defined per customer. It is also possible to night-service-divert an operator call to the CCOP, which is defined per PBX operator group, when the called operator group has no present operator in service. The CCOP supports all operator features as the COP does.

Redirecting of a call to the CCOP is possible within a homogeneous ISDN network, a homogeneous H.323 network, a mix of ISDN and H.323 network, or in a homogeneous SIP network.

The day/night status notification function is not applied to the CCOP, that is, a call is redirected to a CCOP regardless of the CCOP exchange's day/night switch status.

This document mainly describes the number plan prerequisites and the functions: Private Network Rerouting, Night Service Diversion, and Day/Night Status Notification (if supported).

1.1.1 PRIVATE NETWORK REROUTING

Route access codes and central answer position numbers, or in other words, day service and/or night service answer positions, can be initiated to each route, that is, a common answering position for the route, or individual answering position for the line

during day service and night service, respectively. The individual day/night service numbers (in *RODNI*) for an external line **cannot** be an external number. The decision to reroute is primarily taken by the terminating MX-ONE, which must also provide the destination number to reroute to, that is, the central answer position number.

1.1.2 NIGHT SERVICE DIVERSION

Night service diversion (re-direction) of common PBX operator calls, that is, when all PBX operators serving the origin group are absent.

1.1.3 DAY/NIGHT STATUS NOTIFICATION

Day/night status notification or Night Service Notification, means that a central operator's MX-ONE can inform a number of other MX-ONE about its mode of operation. The notification is supported by the ISDN and H.323 tie-lines.

Note that this feature does not convey whether the node is actually day switched or night switched, but if there are any present operators or not.

Night switched here means that all PBX operators are absent, and the calls should for example be rerouted to a local night-answer position in the satellite exchange.

No status notification is done in the case of a Customer Centralized Operator, nor if the answer position is an extension or extension group.

1.2 NETWORK CONFIGURATIONS AND CONCEPTS

The figure in Example 1 below shows one possible network configuration, where all involved parties are located in different MX-ONE, but of course, the parties can be co-located in the same exchange in any combination. If all parties are located in the same MX-ONE, it is an internal case.

When the customer group function is used, the following descriptions apply to the CCOP with differences:

- Central operator's MX-ONE is replaced by Customer Centralized Operator's MX-ONE.
- Common Channel Signaling (CCS) network is replaced by ISDN network or H.323 network.

Originating MX-ONE

The exchange where the incoming public call enters the ISDN or H.323 network, that is, the signaling protocol changes, so it is also a gateway exchange. If the call originates from an internal party in the ISDN network, the originating MX-ONE is where that party is located. If the call originates from an internal party in the ISDN or H.323 network, it must **never** be rerouted.

Terminating MX-ONE

The exchange where the wanted party is located, and where the rerouting is initiated. The wanted party corresponds to the dialed number, or to the called number if, for example, a prior diversion has occurred. This MX-ONE also normally provides the rerouting destination number. The actual rerouting is however executed or controlled by the originating exchange, by setting up a new call from there.

The MX-ONE of a Central Operator

The exchange where the central operator (group) is located.

Private Telephone Network Internal Call

A call which originates and terminates in the Private Telephone Network (PTN), in this context an ISDN, H.323 or (with certain limitations) a SIP network.

Location Example 1

The wanted party is in an MX-ONE of its own, the terminating MX-ONE, and the Central operator is also in a separate MX-ONE:

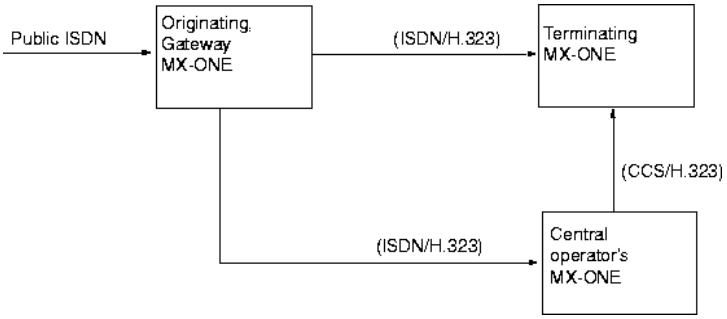


Figure 1:

Location Example 2

The Central operator is in the gateway exchange:

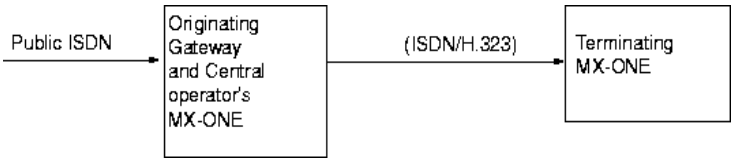


Figure 2:

Location Example 3

The wanted party is in the gateway exchange:

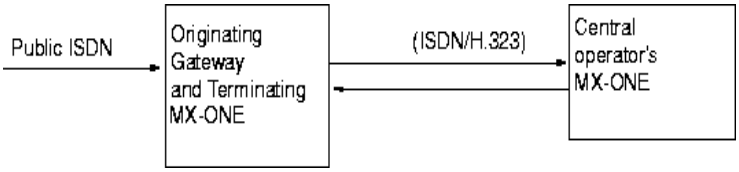


Figure 3:

Virtual Private Network

A Virtual Private Network (VPN) consists of MX-ONE systems or ASB 501 04 exchanges connected via the public transparent ISDN network. Closed numbering plan (Coordinated numbering plan) is required for VPN.

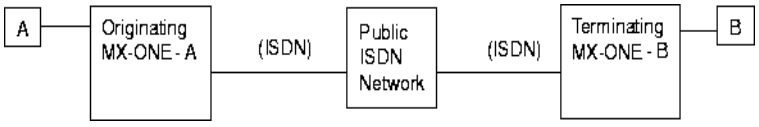


Figure 4:

VPN is a service within the public network that makes it possible to establish private calls between the MX-ONE systems that are connected to the public network. For private calls that use the VPN service, the service level is almost the same as for a

private network. The network services can be used as in the private network, but the public network may inflict some restrictions.

1.3 INTER-WORKING WITH OTHER SYSTEMS

With ISDN there is no inter-working with ASB 501 releases older than ASB 501 04 R4 (BC8), since Rerouting, Night service diversion to COP, and Night service notification are not supported by releases with earlier revisions than ASB 501 04 R4.

With H.323 there is no backward compatibility, since Rerouting, Night service diversion to COP, and Night service Notification are not supported by releases with earlier revisions than ASB 501 04 R11.

Night service diversion to CCOP is not supported by releases with earlier revisions than ASB 501 04 R7. When a request for Night service diversion is rejected by the cooperating exchange due to earlier releases, then

- if alternative routing is possible, night service diversion is executed via alternative routes.
- if alternative routing is not allowed or no suitable route to the CCOP exchange is found, the next option in the priority list is searched to answer the call.

If the cooperating exchange has ASB 501 04 R2/4 (BC7) or earlier releases, the SIG parameter in the command ROCAI must be set to NO net service facilities.

If the cooperating exchange, inter-working over ISDN, has the release earlier than ASB 501 04 R4, the VARC parameter for full ISDN functionality must be set to NO. If ASB 501 04 R4 or later are cooperating, the VARC can be set to YES.

Note: If SIP tie-line is used, there is no support for the Notification function, nor any inter-working with ASB 501 systems. Note also that there is no support for specific Night-service-diversion or Rerouting services, but instead the ordinary Diversion service will be used.

1.4 ABBREVIATION

For a complete list of acronyms and abbreviations, see the description for *ACRONYMS, ABBREVIATIONS AND GLOSSARY*.

2 PREREQUISITES

The system number series for extension numbers, PBX operator numbers, and route access codes must be initiated in advance.

The individuals for the line types; extensions, external lines (and routes), and PBX operators, must be initiated, that is, basic calls must be possible involving these.

In order to get the network services required for Centralized answer position, the private routes must be configured for network services.

3 PROCEDURE

The following procedures must be used for administration of the data for centralized answer position in a CCS network:

In Central Operator Exchanges

1) Initiate number series (types EN, OD, OC, (if sub-exchange to other COP: AC, ED))
2) Initiate common abbreviated numbers (if acting sub-exchange to other COP)
3) Initiate notification destinations (exchange numbers)
4) Initiate rerouting numbers per route
5) Initiate PBX operator call origin groups
6) Initiate Night Service Diversion numbers for common operator calls (if this exchange is a sub-exchange to some C-AP in another exchange).
7) Other activities

In All Other Exchanges (Sub-Exchanges)

1) Initiate number series (types AC, EN, ED)
2) Initiate common abbreviated numbers
3) Initiate external destinations (to the central operator's MX-ONE)
4) Initiate rerouting numbers per route
5) Initiate the PBX operator call origin groups (optionally)
6) Initiate Night Service Diversion numbers for common operator calls
7) Other activities

In Central Non-Operator Answer Position Exchanges

1) Initiate number series (type EX, EN)
2) Initiate number series (types AC, ED) if other central answer position exists.
3) Initiate common abbreviated numbers if other central answer position exists.
4) Initiate rerouting numbers per route
5) Other activities

To administrate the data for a CCOP in an ISDN or H.323 network, the procedures above can also be applied with the following exceptions:

- Initiate number series for EN
- Initiate notification destinations

These procedures are not relevant for a CCOP and can be ignored.

4 EXECUTION, NUMBER SERIES AND COMMON ABBREVIATED NUMBER INITIATION

The maximum number of digits in the different numbers sent to COP, that is, the calling party number if available, the called party number if applicable, and the dialed number, is 10 digits.

Own exchange numbers must be initiated in all exchanges, also when closed numbering plan (coordinated numbering plan) is used, in order to make it possible to identify the destination of the Day/night status notification information.

Three common abbreviated numbers will be utilized for the private network rerouting numbers.

The common abbreviated numbers will also be used as Night Service Diversion numbers for internal and other calls to common operator numbers in a sub-exchange without any present local PBX operators.

Another requirement is that in the COP exchanges one DID number (for external calls to the common operator), not necessarily the same as the normal DID common operator number of the route, **must** be set equal to an internal common operator number.

Refer to the *Number Analysis* documents for detailed descriptions.

4.1 INITIATION OF NUMBER SERIES AND ABBREVIATED NUMBERS IN TERMINATING MX-ONE

In the terminating exchange, that is, in all MX-ONE systems that are to be served by any central operator, initiate the own exchange number, initiate number series for common abbreviated numbers, and initiate common abbreviated numbers. Also initiate the central exchange's own exchange numbers as external destination numbers.

Execution

Key ***number_print*** to check which numbers that are initiated. In the terminating exchange, that is, in all MX-ONE systems that are to be served by any central operator, initiate the own exchange number, using the command:

number_initiate **-numbertype en -number xx**

Initiate the external destination numbers, using the command:

number_initiate **-numbertype ed -number xx**

This external destination number will be used as part of an external rerouting number. The other part is the central operator's common number. Those numbers can be maximum ten digits together.

If there is a local operator, initiate the common operator numbers for DID calls, using the command:

number_initiate **-numbertype od -number xx**

Initiate the number series for common abbreviated numbers using:

number_initiate **-numbertype ac -number xxx..xxx**

Key *number_print* to check that the numbers are initiated.

Initiate common abbreviated numbers using:

***ADCOI*:ABB=xxx,TRA=xxxx,CLASS=0&1&2&3;**

This abbreviated number will be used as the private network rerouting number in the *RORNI* command, and in the *OPCEI* command for night service diversion. By using an abbreviated number, the Trunk Call Discrimination (TCD) check can be avoided in these cases. The translated (expanded) number consists of two numbers, the COP-exchange's own exchange number, plus the common operator number in the COP's exchange.

The translated (expanded) number can alternatively consist of the Central answer position exchange's own exchange number, plus the directory number of the non-operator Central answer position.

The common abbreviated numbers used for rerouting to the Central answer position should belong to all traffic classes (that is, CLASS=0&1&2&3 is recommended), in order to avoid barring due to inappropriate class.

4.2 INITIATION OF NUMBERS IN THE MX-ONE OF A CENTRAL OPERATOR

In the COP's exchange, initiate the number series for Direct In-Dialing (DID) to the PBX operator.

For the day/night status notification, initiate external destination numbers for each route that can be used for notification.

Note: The external destination number must correspond with the own exchange number of the notified MX-ONE, which means that a route may need several different external destination numbers.

If there are central operators located in more than one exchange in the network, and one COP's MX-ONE can be served by some other MX-ONE system's central operators in case all local PBX operators become absent, also initiate number series for common abbreviated numbers, and initiate common abbreviated numbers, according to the previous section.

Prerequisites

Common operator number series (OC) must be initiated with the command *number_initiate*. The OC numbers must not be too long, preferably 1-3 digits.

Initiate common operator numbers for internal calls, using the command:

***number_initiate* -numbertype oc -number xx**

The OC number, which could be a ’dummy’ number, is used by the Rerouting service.

Execution

Initiate the number series for DID to the PBX operator by using the command:

***number_initiate* -numbertype od -number xx**

The OD number must be equal to the OC number mentioned above.

Initiate the external destination number series for the notification using the command:

***number_initiate* -numbertype ed -number xxxxx**

4.3 INITIATION OF NUMBERS IN THE MX-ONE OF A CENTRAL ANSWER POSITION

In the Central answer position's exchange, initiate the number series for DID to the extension. (When initiating the extension, it must of course be allowed to receive DID calls).

Prerequisites

Extension number series (EX) must be initiated with the command *number_initiate*.

Execution

Initiate the number series for DID to the extension using the command:

***number_initiate* -numbertype ex -number xxxxx**

4.4 INITIATION OF NUMBER SERIES IN ORIGINATING MX-ONE

In the originating exchange, that is, in all MX-ONE that are to be served by any central operator, initiate number series as for the terminating exchange. In other words, already done.

5 EXECUTION, THE DAY/NIGHT STATUS OF THE SYSTEM

The COP exchange's day/night status affects the selection of the answer position when redirection of a call is to be executed to a central answer position.

For the CCOP function, the CCOP exchange's status is not relevant. Redirecting calls to a CCOP is executed regardless of the CCOP exchange's day/night status.

5.1 DAY/NIGHT STATUS CONTROL

The day/night class of service is controlled by the data called exchange day/night status. This status can be changed using the following criteria: day/night switch feature code, time-of-day table (*OPDNC*), and PBX operator presence or absence.

The Feature code controlled change and the Time-of-day change can only be executed internally. The exchange day/night status is used to give some services or features different characteristics in a night switched exchange from that in a day switched, for example, toll restriction/TCD category. The user can enter the Feature Code from any PBX operator console. The Feature Code function overrides whatever data has been set up by command *OPDNC*.

Presence or absence only affects the PBX operator's own exchange directly, but by the notification, described in the section 5.2 Day/Night Status Notification Between Exchanges on page 12 Day/Night Status Notification Between Exchanges, may affect other exchange's operation.

PBX operator presence or absence controls a number of features, like, for example, Rerouting numbers, Night service diversion numbers, and Temporary night switching of external lines.

5.1.1 DAY/NIGHT STATUS FEATURE CODE CRITERIA

Key the procedure *FC*status# where

FC = Feature Code (Market Dependent Parameter (MDP))

Status:

0 = change to night

1 = change to day

The result should be visible on the PBX Operator Instrument (OPI), or key the command *OPDNP* to verify the result, if an I/O-terminal is available. This criteria affects the TCD (call discrimination function) only.

5.1.2 TIME OF DAY CRITERIA

Also called automatic on time criteria.

Key the command *OPDNC* to set up the night-to-day change-over time, and the day-to-night change-over time.

Key the command *OPDNP* to verify the result. This criteria affects the TCD only.

5.1.3 PBX OPERATOR PRESENCE OR ABSENCE CRITERIA

If the exchange status is not specified by a procedure (Feature Code entered) or automatic on time (the day/night time thresholds have not been initiated in the system) has not been set, the PBX operator presence/absence status will determine the system's day/night status.

To know the user procedure for absence/presence, see the directions for use for the Operator Workstation or the directions for use for the *DBC 224 Operator Console for MX-ONE*.

5.2 DAY/NIGHT STATUS NOTIFICATION BETWEEN EXCHANGES

This function is only valid when the central answer position is a PBX operator. The function will not apply in the case of a CCOP. The most simple configuration using status notification would be according to the figure below, where one COP's MX-ONE, with own exchange number 719, notifies one sub-exchange, 742, of the day/night status.

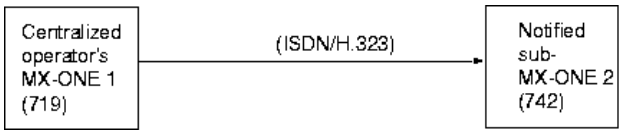


Figure 5:

A private exchange network can have one or several centralized PBX operators. A centralized PBX operator's exchange can notify a maximum of 64 different other exchanges in the network of the status for day/night service. This is done, with a delay of about 15 seconds, when the status for day/night service is changed and also repeatedly, when the status is day, with a time interval of approximately 5 minutes.

A notified exchange can be notified by **three** different central exchanges.

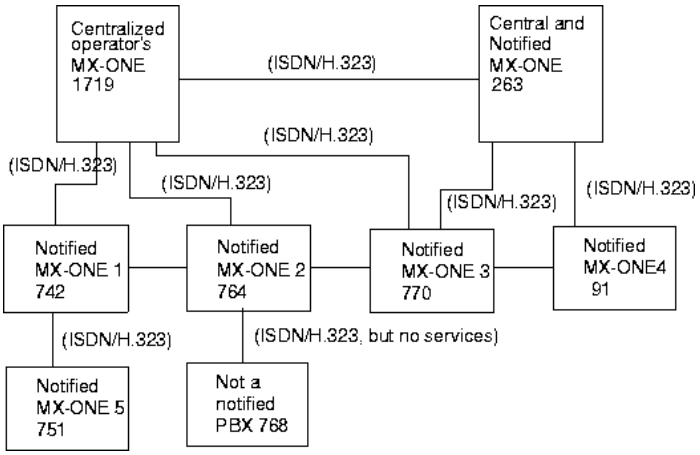


Figure 6:

In the figure above, there are two exchanges which are central operator exchanges, and five sub-exchanges, plus one exchange (768) which is not part of the ISDN or H.323 network regarding services. The numbers 742, 63 etc. indicate the own exchange numbers. Any of the exchanges may have incoming public external lines.

The central MX-ONE with the own exchange number 719 notifies five other exchanges of its day/night status, namely the MX-ONE systems (PBXes) with numbers 742, 751, 764, 770 and 63. Exchange 63 notifies 770, 91 and 719, that is, three others. So a

central operator's exchange can at the same time be a notified exchange. Exchange 770 is controlled by both 719 and 63. Exchange 768 is not controlled by any central operators.

Note: For the VPN scenarios, the exchange number of a notifying node must be included in the DID number series, or else the public network may reject the notification call.

The day/night status of an exchange can be controlled by different criteria, as described in the Day/night status control clause, but it is always the PBX operator presence or absence, not the exchange's day/night status, that controls what is sent in the notification messages between MX-ONE systems.

Sub-Exchange Day/Night Status Control

The status of a notified sub-exchange is controlled by its central exchange(s) in the way described below.

There is an AS parameter which is changeable by command *ASPAC*, *PARNUM=64*, which must be used in the notified exchange.

If *PARNUM=64* is set equal to 0 in the notified exchange, this exchange's day/night status is ONLY controlled by local criteria, that is, the central operator's status does not matter. See the table below, where COP's MX-ONE means Central operator's exchange.

DAY/NIGHT-STATUS IN THE NOTIFIED PBX (*PARNUM=64* set equal to 0)

Table 1 Local Presence Control

COP's MX-ONE state	TCD check = Notified MX-ONE state	Rerouting mode (external lines)
NIG	NIG	NIG
NIG	DAY	DAY
DAY	DAY	DAY
DAY	NIG	NIG

If *PARNUM=64* is set to 1 in the notified exchange, this exchange's status is controlled by the local **and** the central operator's status in the way described in the table below.

Note: Exchange status means its mode of operation, that is, if the call discrimination check is the one used at day-time or the one used at night-time. PARNUM=64 controls the external/network Rerouting function, but not the Call Discrimination function, like this:

Table 2 Combined Presence Control

COP's MX-ONE state	TCD check = Notified MX-ONE state	Rerouting mode (external lines)	Comment
NIG	NIG	NIG	
NIG	DAY	NIG	
DAY	DAY	DAY	

COP's MX-ONE state	TCD check = Notified MX-ONE state	Rerouting mode (external lines)	Comment
DAY	NIG*	NIG*	* Only possible if notification does not work, or during the delay before notification.

With PARNUM=64 set equal to 1, in a notified exchange, the OPIs will show day switched as long as there is at least one day switched central exchange, even if all local PBX operators in the notified exchange are absent, and the PBX operator absence/presence criteria is used.

Note: The notified exchange cannot be night switched, while there is at least one day switched central operator (except if notification has failed due to an error case, or in the time interval before Notification has been executed).

Prerequisites

Homogeneous ISDN/H.323 networks must be used, and network facilities must be available.

The exchanges included in the private network, must have their own exchange numbers initiated even if closed (coordinated) numbering plan is used. These exchange numbers can be specific numbers used only for the day/night status notification. See the operational directions for *NUMBER ANALYSIS, NA*, and see the operational directions for *NUMBERING*.

5.2.1 INITIATION OF DAY/NIGHT STATUS NOTIFICATION IN AN MX-ONE OF A CENTRAL OPERATOR

Initiate PBX operators according to the operational directions. A table stating which other exchanges that are served, and due to this are to be notified of the day/night status of the central PBX operator, is initiated, if a centralized PBX operator is to be used, that is, the PBX operators are to serve several exchanges. An own exchange number must also be set.

This is all done with the command *OPNEI*.

Prerequisites

One or more external destination numbers, corresponding to the own exchange numbers of the notified exchanges, must be initiated for each route and each sub-node to be notified. See the previous chapter for initiation of the number series. Then the *RODDI* command must be executed to initiate the external destination and start position for digit sending.

Execution

Key the command *OPNEP* to order a printout of existing sub-exchange numbers in the table, and of the own exchange number.

Initiate the notified exchange's number with the command *OPNEI*:

***OPNEI*:OWNID=xxx,NEXGNO=xxx;**

where the parameters must be included in the previously initiated numbers series for the own exchange number and external destination number (= notified exchange's number).

Check the result with command *OPNEP*.

Note: For a Coordinated Numbering plan, NEXGNO cannot be equal to number series defined for external destination number (EC).

5.2.2 REMOVAL OF DESTINATION FOR DAY/NIGHT STATUS NOTIFICATION

Key the command *OPNEP* to order a printout of the existing sub-exchange numbers in the table, and of the own exchange number.

Remove with command *OPNEE*.

Check the result with command *OPNEP*.

5.2.3 PRINTOUT OF DESTINATION FOR DAY/NIGHT STATUS NOTIFICATION

Key the command *OPNEP* to obtain a printout.

5.2.4 INITIATION IN A NOTIFIED EXCHANGE

External rerouting positions must be initiated for routes in this exchange, according to the section dealing with that. If wanted, also Night service diversion numbers must be initiated for the common operator number. Which external rerouting position that is active will be controlled by the notification information. Initially, *PARNUM=64* should be set to 0, and when all initiation of central operator data is ready, be changed to 1 if COP is utilized.

An own exchange number must also be set, even if a closed (coordinated) numbering plan is used.

6 EXECUTION, REROUTING DESTINATION NUMBER INITIATION

6.1 INTERNAL DAY/NIGHT SERVICE POSITIONS

Internal day/night service position means that those answer positions that are affiliated to a route or line must be in the same exchange as the answer position.

A customer dependent internal rerouting position can exist. See the Customer-dependent rerouting position in the operational directions for *ROUTE DATA*.

None of this is relevant for the COP functionality. See the operational directions for *ROUTE DATA* for details.

6.2 CENTRAL ANSWERING POSITION IN NETWORK WITH ISDN, H.323 OR SIP

A central answering position in an ISDN, H.323 or SIP network can only be initiated if the CAP functionality exists in the exchange and is supported by all nodes in the network.

Rerouting of incoming external calls is controlled by a route category, the same as for internal rerouting. The rerouting destination numbers are initiated with RO commands. It is possible to initiate up to 6 different rerouting numbers per route. The order of priority between the rerouting numbers for a specific route is:

1) Vacant or incomplete number rerouting position (internal)
2) Internal day service position
3) Central, private network answering position 1
4) Central, private network answering position 2
5) Central, private network answering position 3
6) Internal night service position

One of the private network rerouting numbers can be used for a central answer position which is not a PBX operator number (for example extension-, group number, or voice mail equipment), but that alternative will be permanently active. Thus, if alternative 3 is used for such a non-operator position, alternatives 4 and 5 will not be accessible.

Prerequisites

Route and lines must be initiated. The rerouting position is reached via a common abbreviated number. The abbreviated number contains the private network number of the rerouting position. When expanded, the number must consist of the own exchange number of the central operator's MX-ONE, and the common operator number in the central operator's MX-ONE.

The own exchange numbers of all exchanges in the private network must be initiated as external destinations, and preferably with SRT (start position for digit sending) equal to 1, with command *RODDI*.

Internal rerouting numbers, set by the command *RODNI* can have been initiated earlier, but the day/night service position for a specific external line must not have been initiated, as it would always have higher priority. It cannot be external, and due to its higher priority it would over-rule any central operator rerouting number.

The *number_initiate* command must be entered to initiate the required common abbreviated numbers in the number plan, or erase them if not used for other reasons.

6.2.1 INITIATION OF REROUTING TO A CENTRAL ANSWERING POSITION IN THE NETWORK

In a Sub-Exchange

ADCOI, the command for a common abbreviated number, must be executed, to initiate the complete number of the external rerouting position.

Key the command *RORNI* and state parameter ROU to initiate the external rerouting number. Repeat if several external rerouting numbers must exist for the route.

Key the command *RORNP* to verify the result.

In an Exchange of a Central Answer Position

If the answer position is a PBX operator, then the common number for DID to the PBX operator must be initiated equal to an internal common operator number, so the same common operator access number can be used in the whole PTN.

If the answer position is not a PBX operator, then the DID number to the answer position must be initiated.

6.2.2 REMOVAL OF REROUTING TO A CENTRAL ANSWERING POSITION IN THE NETWORK

Key the command *RORNE* and state the parameters ROU and NCA to erase the central rerouting position.

If the last private network rerouting position is to be erased, the route is released from the COP function, that is, incoming traffic on the route can no longer be rerouted to the private network answer position.

Key the command *RORNP* to verify the result by printout.

Key the command *ADCOE* to erase the abbreviated number of the private network rerouting position, if not used for any other route.

Key the command *number_end* to remove the common abbreviated number from the numbering plan, if not used for something else.

6.2.3 CHANGING THE REROUTING NUMBER TO A CENTRAL ANSWERING POSITION IN THE NETWORK

Key the command *RORNE* and state the parameters ROU and NCA to erase the previous private network rerouting position.

Key *ADCOE*, the command for erasure of a common abbreviated number. Use *number_end* to remove the previous common abbreviated number from the number plan, if not used for other reasons.

Then key *ADCOI*, the command for initiation of a new common abbreviated number.

Key the command *RORNI* and state the parameter ROU to initiate the new number of the private network rerouting position.

Key the command *RORNP* to verify the result.

6.2.4 PRINTOUT OF REROUTING NUMBER OF A CENTRAL ANSWER POSITION IN THE NETWORK

Key the command *RORNP* to obtain a printout of those central answer position numbers initiated for a specific route.

Key the command *ADCDP* for a printout of the affiliation between the numbers of the private network answer positions and corresponding common abbreviated numbers.

6.3 CUSTOMER CENTRALIZED OPERATOR IN A NETWORK USING ISDN, H.323 OR SIP

The CCOPs for answering rerouted calls are initiated per customer in an exchange within an ISDN, H.323 or SIP network. Rerouting of incoming external calls is controlled by a route category, the same as for internal rerouting. The CCOP numbers are initiated with RO commands. It is possible to initiate up to 2 different CCOP numbers per customer. The order of priority between possible rerouting numbers for a specific customer is:

In a Day Switched Exchange

1) Vacant number rerouting position (specific to route)
2) Customer's local day answer position (specific to customer)
3) External line's local day answer position (specific to one external line)
4) Route's local day answer position (specific to route)
5) CCOP 1 (specific to customer)
6) CCOP 2 (specific to customer) (Note)
7) Private network answer position 1 (specific to route)
8) Private network answer position 2 (specific to route)
9) Private network answer position 3 (specific to route)
10) Any local operator in the exchange

In a Night Switched Exchange

1) Vacant number rerouting position (specific to route)
2) External line's temporary night answer position (specific to one external line)
3) CCOP 1 (specific to customer)
4) CCOP 2 (specific to customer) (Note)
5) Private network answer position 1 (specific to route)
6) Private network answer position 2 (specific to route)
7) Private network answer position 3 (specific to route)
8) Customer's local night answer position (specific to customer)
9) External line's local night answer position (specific to one external line)
10) Route's local night answer position (specific to route)

Note: In an ISDN VPN scenario, the number of CCOPs supported depends on the number of USER INFO messages that can be sent in Service 2 (during alerting). If two USER INFO messages are allowed in Service 2, then only one CCOP is

supported. When more than two USER INFO messages are allowed, both CCOP 1 and 2 are supported. Notice that in an H.323 VPN scenario the USER INFO messages are embedded in H.225 FACILITY messages.

Prerequisites

Route and lines must be initiated. The rerouting position is reached via a common abbreviated number. The abbreviated number contains the private network number of the rerouting position. When expanded, the number must consist of the exchange number of the CCOP's MX-ONE and the common operator number in the CCOP's MX-ONE.

The exchange numbers of all CCOP exchanges in the ISDN/H.323SIP network must be initiated as external destinations, and preferably with SRT (start position for digit sending) equal to 1, with command *RODDI*.

The *number_initiate* commands must be entered to initiate the required common abbreviated numbers in the numbering plan, or erase them if not used for other reasons.

6.3.1 INITIATION OF A CUSTOMER CENTRALIZED OPERATOR IN THE NETWORK

ADCOI, the command for a common abbreviated number, must have been executed, to initiate the complete number of the CCOP.

Key the command *RORNI* and state parameter CUST to initiate the CCOP.

Key the command *RORNP* and state parameter CUST to verify the result.

6.3.2 REMOVAL OF A CUSTOMER CENTRALIZED OPERATOR IN THE NETWORK

Key the command *RORNE* and state parameter CUST to erase the CCOP.

Key the command *RORNP* and state parameter CUST to verify the result by printout.

Key the command *ADCOE* to erase the abbreviated number of the CCOP, if not used for any other route.

Key the command *number_end* to remove the common abbreviated number from the numbering plan, if not used for something else.

6.3.3 CHANGING OF A CUSTOMER CENTRALIZED OPERATOR IN THE NETWORK

Key the command *RORNE* and state parameter CUST to erase the previous CCOP.

Key *ADCOE*, the command for erasure of a common abbreviated number. Use *number_end* to remove the previous common abbreviated number from the number plan, if not used for other reasons.

Then key *ADCOI*, the command for initiation of a new common abbreviated number.

Key the command *RORNI* and state parameter CUST to initiate the new number of the CCOP.

Key the command *RORNP* and state parameter CUST to verify the result.

6.3.4 PRINTOUT OF A CUSTOMER CENTRALIZED OPERATOR IN THE NETWORK

Key the command *RORNP* and state parameter CUST to obtain a printout of the CCOP numbers initiated for a specific customer.

Key the command *ADCDP* for a printout of the affiliation between the numbers of the CCOPs and corresponding common abbreviated numbers.

6.4 CENTRAL ANSWERING POSITION IN NETWORK WITH A PBX THAT CANNOT BE NOTIFIED OF STATUS

There can be scenarios where a node in a network lacks ISDN, H.323 or SIP tie-line connection, or where the maximum number of notifiable exchanges is exceeded, so some nodes cannot be notified.

In such cases it is possible to configure, similar to the customer group cases, so rerouting and night service diversion can still be achieved. A central answering position in an ISDN, H.323 or SIP network can only be initiated if the COP/CAP functionality exists in the exchange and is supported by all nodes in the network.

Note: One example of a configuration using SIP tie-line is the InAttend application, which must be initiated as a central answering position (without notification).

Rerouting of incoming external calls is controlled by a route category, the same as for internal rerouting. The rerouting destination numbers are initiated with RO commands. It is possible to initiate up to 6 different rerouting numbers per route. The order of priority between the rerouting numbers for a specific route is:

1) Vacant or incomplete number rerouting position (internal)
2) Internal day service position
3) Central, private network answering position 1
4) Central, private network answering position 2
5) Central, private network answering position 3
6) Internal night service position

One of the private network rerouting numbers can be used for a central answer position which is not a PBX operator number (for example extension-, group number, or voice mail equipment, but it can also be an operator without notification), but that alternative will be permanently active. Thus, if alternative 3 is used for such a non-operator position, alternatives 4 and 5 will not be accessible.

Prerequisites

Route and lines must be initiated. The rerouting position is reached via a common abbreviated number. The abbreviated number contains the private network number of the rerouting position. When expanded, the number must consist of the own exchange number of the central answering position's MX-ONE, and the common operator number in case of operator, in the central operator's MX-ONE.

The own exchange numbers of all exchanges in the private network must be initiated as external destinations, and preferably with SRT (start position for digit sending) equal to 1, with command *RODDI*.

Internal rerouting numbers, set by the command *RODNI* can have been initiated earlier, but the day/night service position for a specific external line must not have been

initiated, as it would always have higher priority. It cannot be external, and due to its higher priority it would over-rule any central operator rerouting number.

The *number_initiate* command must be entered to initiate the required common abbreviated numbers in the number plan, or erase them if not used for other reasons.

6.4.1 INITIATION OF REROUTING TO A CENTRAL ANSWERING POSITION IN THE NETWORK

In a Sub-Exchange

ADCOI, the command for a common abbreviated number, must be executed, to initiate the complete number of the external rerouting position.

Key the command *RORNI* and state parameter ROU to initiate the external rerouting number, and either set NCA=NIG, which means ‘the central answer position shall be addressed regardless if day or night switched’, or use NCA=CCOP and a dummy customer number. Repeat if several external rerouting numbers must exist for the route.

Key the command *RORNP* to verify the result.

In an Exchange of a Central Answer Position

If the answer position is a PBX operator, then the common number for DID to the PBX operator must be initiated equal to an internal common operator number, so the same common operator access number can be used in the whole PTN.

If the answer position is not a PBX operator, then the DID number to the answer position must be initiated.

6.4.2 REMOVAL OF REROUTING TO A CENTRAL ANSWERING POSITION IN THE NETWORK

See section 6.3.2 Removal of a Customer Centralized Operator in the Network on page 19.

6.4.3 CHANGING THE REROUTING NUMBER TO A CENTRAL ANSWERING POSITION IN THE NETWORK

See section 6.3.3 Changing of a Customer Centralized Operator in the Network on page 19

6.4.4 PRINTOUT OF REROUTING NUMBER OF A CENTRAL ANSWER POSITION IN THE NETWORK

See section 6.3.4 Printout of a Customer Centralized Operator in the Network on page 20

7 EXECUTION, PBX OPERATOR CALL ORIGIN GROUP AND CALL TYPE INITIATION

7.1 INITIATION OF CALL ORIGIN GROUP FOR PBX OPERATOR CALLS

In the COP's or CCOP's exchange, initiate PBX operator Call ORigin Group (CORG), using *OPCTS*. Especially origin groups for the call types DID calls, internal calls, rerouted calls, and diverted calls, must be initiated and tied to the right routes when applicable.

If the call origin group is new, also tie the PBX operator to the call origin group, use the command *OPCGS*. See the operational directions for *PBX OPERATOR TRAFFIC* for details.

8 EXECUTION, NIGHT SERVICE DIVERSION NUMBER FOR COMMON OPERATOR CALLS

8.1 CENTRAL OPERATOR OR EXTERNAL CENTRAL ANSWER POSITION IN A NETWORK WITH ISDN OR H.323

Calls to a common operator number, originating in a sub-node which is night switched, or has no present local PBX operator, and calls which are internal in the private network, or originate outside the PTN, can be Night Service-diverted to a central operator MX-ONE. Note that SIP tie-lines do not support a specific Night-service-diversion service, but maps it to ordinary Diversion.

In addition to the internal day/night switching destinations, it is possible to initiate three different central external destination numbers, common to the entire MX-ONE.

The five possible destination numbers have the following order of priority:

1) Local common operator number/local day answer position
2) Central operator/private network answer position 1
3) Central operator/private network answer position 2
4) Central operator/private network answer position 3
5) Local answer position for call origin group without any present operator

Alternatives 2 - 4 can only be used when the exchange has no present local PBX operator to serve the call.

One of the private network Night Service numbers can be used for a central answer position which is not a PBX operator number (for example extension-, group number, or voice mail equipment), but that alternative will be permanently active, and not notified. This alternative can be initiated per customer in a Customer Group. If alternative 2 is used for such a non-operator position, alternatives 3 and 4 will not be accessible.

Calls previously rerouted in a network, are **not** allowed to be Night Service Diverted to a private network number, that is, alternatives 2 - 4 are not available to rerouted calls.

Prerequisites

Common operator numbers must be initiated. The Night Service diversion position is reached via a common abbreviated number. The abbreviated number contains the private network number of the central operator. When expanded, the number must consist of the own exchange number of the central operator's MX-ONE, and a common operator number (number type OD and OC) in the central operator's MX-ONE.

The own exchange numbers of all exchanges in the private network must be initiated as external destinations, with command *RODDI* and preferably SRT (start position for digit sending) = 1.

8.1.1 INITIATION OF COMMON OPERATOR NIGHT SERVICE DIVERSION NUMBERS TO A CENTRAL ANSWERING POSITION

In a Sub-Exchange

number_initate must be keyed, to initiate the common abbreviated number's translated number. *ADCOI*, the command for a common abbreviated number, must be executed, to initiate the number of the external Night Service Diversion destination. Routes must be initiated, and *OPCTS* must be executed, to define origin groups.

Note: If a sub-exchange has no local PBX operators at all, it is recommended to initiate a dummy call origin group and common operator number.

Key the command *OPCTP* to see if a central answering position is initiated for the call origin group. Indicated by the CEN parameter.

Key the command *OPCEI* to initiate the private network Night Service Diversion number used for internal and PTN internal calls to the common operator number.

***OPCEI*:CORG=x,NCA=xx,CENUM=xxx,PRIO=x;**

Repeat if several private network Night Service Diversion numbers of different priority must exist for the origin group.

Key the command *OPCTP* and/or *OPCEP* to verify the result.

8.1.2 REMOVAL OF COMMON OPERATOR NIGHT SERVICE DIVERSION NUMBERS TO A CENTRAL ANSWERING POSITION

Key the command *OPCEE* to remove the private network Night Service Diversion number used for internal and PTN internal calls to the common operator number.

OPCEE:**CORG=x,PRIO=x;**

Repeat if several private network Night Service Diversion numbers of different priority must be removed for the call origin group.

Key the command *OPCTP* to verify the result.

Key the command *ADCOE* to erase the common abbreviated number of the external Night Service Diversion position, if not used for any other call origin group or route. Remove the translated number with *number_end* if it is not used for other reasons.

8.1.3 PRINTOUT OF COMMON OPERATOR NIGHT SERVICE DIVERSION NUMBERS TO A CENTRAL ANSWERING POSITION

Key the command *OPCEP* to print, among other things, the private network Night Service Diversion number used for internal and other calls to the common operator number.

8.2 CUSTOMER CENTRALIZED OPERATOR IN A NETWORK WITH ISDN, H.323 OR SIP

When the customer group function is used, in addition to the central operator or private network answer positions, described in the previous section, calls to a common operator number can be Night Service-diverted to a customer central operator MX-ONE if the called PBX operator group has no present local PBX operator in service. Up to 2 different CCOP numbers can be defined per PBX operator group.

The possible destination numbers have the following order of priority:

1) Local common operator number or local day answer position
2) CCOP 1
3) CCOP 2 (Note)
4) Central operator or private network answer position 1
5) Central operator or private network answer position 2
6) Central operator or private network answer position 3
7) Local answer position for call origin group without any present operator

Note: In an ISDN VPN scenario, the number of CCOPs supported depends on the number of USER INFO messages that can be sent in Service 2 (during alerting). If two USER INFO messages are allowed in Service 2, then only one CCOP is supported. When more than two USER INFO messages are allowed, both CCOP 1 and 2 are supported. Notice that in an H.323 VPN scenario the USER INFO messages are embedded in H.225 FACILITY messages.

Prerequisites

Common operator numbers must be initiated. The CCOP is reached via a common abbreviated number. The abbreviated number contains the private network number of the customer central operator. When expanded, the number must consist of the own exchange number of the customer central operator's MX-ONE, and a common operator number (number type OD and OC) in the customer central operator's MX-ONE.

8.2.1 INITIATION OF A CUSTOMER CENTRALIZED OPERATOR IN THE NETWORK

number_initiate must be keyed, to initiate the common abbreviated number's translated number. *ADCOI*, the command for a common abbreviated number, must be executed, to initiate the number of the CCOP.

Routes must be initiated, and *OPCTS* must be executed to define origin groups.

Key the command *OPCTP* to see if customer central answering position(s) is initiated for the call origin group. Indicated by the CCOP field.

Key the command *OPCEI* to initiate the CCOP number used for internal and PTN internal calls to the common operator number.

***OPCEI*:CORG=x,NCA=CCOP,CENUM=xxx,PRIO=x;**

Key the command *OPCTP* and/or *OPCEP* to verify the result.

8.2.2 REMOVAL OF A CUSTOMER CENTRALIZED OPERATOR IN THE NETWORK

Key the command *OPCEE* to remove the CCOP number used for internal and PTN internal calls to the common operator number.

***OPCEE*:CORG=x,NCA=CCOP,PRIO=x;**

Key the command *OPCTP* and/or *OPCEP* to verify the result.

Key the command *ADCOE* to erase the common abbreviated number of the CCOP, if not used for any other call origin group or route. Remove the translated number with *number_end* if it is not used for other reasons.

8.2.3 PRINTOUT OF A CUSTOMER CENTRALIZED OPERATOR IN THE NETWORK

Key commands *OPCTP* and *OPCEP* to obtain a printout of the CCOPs initiated for a specific call origin group.

Key the command *ADCDP* for a printout of the affiliation between the numbers of CCOPs and corresponding abbreviated numbers.

8.3 CENTRAL OPERATOR OR EXTERNAL CENTRAL ANSWER POSITION IN A PBX THAT CANNOT BE NOTIFIED OF STATUS

It is possible to configure, similar to the customer group cases above, so that calls to a common operator number, originating in a sub-node which is night switched, or has no present local PBX operator, and calls which are internal in the private network, or originate outside the PTN, can be Night Service-diverted to a central operator MX-ONE.

In addition to the internal day/night switching destinations, it is possible to initiate three different central external destination numbers, common to the entire MX-ONE.

The five possible destination numbers have the following order of priority:

1) Local common operator number/local day answer position
2) Central operator/private network answer position 1
3) Central operator/private network answer position 2
4) Central operator/private network answer position 3
5) Local answer position for call origin group without any present operator

Alternatives 2 - 4 can only be used when the CORG has no present local PBX operator to serve the call.

One of the private network Night Service numbers can be used for a central answer position which is not a PBX operator number (for example extension-, group number, or voice mail equipment, but it can also be an operator without notification), but that alternative will be permanently active, and not notified. This alternative can be initiated per customer in a Customer Group, or utilize default customer number if customer group is not used. If alternative 2 is used for such a non-operator position, alternatives 3 and 4 will not be accessible.

Calls previously rerouted in a network, are **not** allowed to be Night Service Diverted to a private network number, that is, alternatives 2 - 4 are not available to previously rerouted calls.

Prerequisites

Common operator number(s) must be initiated. The Night Service diversion position is reached via a common abbreviated number. The abbreviated number contains the private network number of the central answer position. When expanded, the number must consist of the own exchange number of the central answer position's MX-ONE, and if the central answer position is an operator, a common operator number (number type OD and OC) in the central operator's MX-ONE.

The own exchange numbers of all exchanges in the private network must be initiated as external destinations, with command *RODDI* and preferably SRT (start position for digit sending) = 1.

8.3.1 INITIATION OF COMMON OPERATOR NIGHT SERVICE DIVERSION NUMBERS TO A CENTRAL ANSWERING POSITION

In a Sub-Exchange

number_initate must be keyed, to initiate the common abbreviated number's translated number. *ADCOI*, the command for a common abbreviated number, must be executed, to initiate the number of the external Night Service Diversion destination. Routes must be initiated, and *OPCTS* must be executed, to define origin groups.

Note: If a sub-exchange has no local PBX operators at all, it is a must to initiate a dummy call origin group and common operator number.

Key the command *OPCTP* to see if a central answering position is initiated for the call origin group. Indicated by the CEN parameter.

Key the command *OPCEI* to initiate the private network Night Service Diversion number used for internal and PTN internal calls to the common operator number.

***OPCEI*:CORG=x,NCA=CCOP,CENUM=xxx,PRIO=x;**

Repeat if several private network Night Service Diversion numbers of different priority must exist for the origin group.

Key the command *OPCTP* and/or *OPCEP* to verify the result .

8.3.2 REMOVAL OF COMMON OPERATOR NIGHT SERVICE DIVERSION NUMBERS TO A CENTRAL ANSWERING POSITION

See section 8.2.2 Removal of a Customer Centralized Operator in the Network on page 25

8.3.3 PRINTOUT OF COMMON OPERATOR NIGHT SERVICE DIVERSION NUMBERS TO A CENTRAL ANSWERING POSITION

See section 8.2.3 Printout of a Customer Centralized Operator in the Network on page 25.

9 EXECUTION, CERTAIN CONGESTION CASES WHERE NO C-AP CAN BE REACHED

It is recommended that an extension or group number with voice message should be initiated as night answer position, to provide some kind of appropriate progress message to the caller in certain congestion cases. In particular if there is no local Night Bell or Common Bell initiated in a sub-node.

10 EXECUTION, APPLICATION SYSTEM PARAMETERS

The COP basic network features, that is, Rerouting in network, and the Day/night status notification, are controlled by the following AS parameters:

- *PARNUM=64*: Day/night status control type (local/network)
- *PARNUM=44*: Recall in gateway or transit exchange

Parameter 44 is only indirectly involved.

For Day/night switching controlled by Feature Code dialed by the PBX operator, there is an MDP which determines the FC digits.

There are no other parameters specific to the CAP/COP functions.

11 EXAMPLES OF NETWORKS WITH CENTRALIZED OPERATOR

11.1 A SMALL MX-ONE NETWORK WITH ONE CENTRAL OPERATOR

A call which originates in the Public ISDN, enters a private ISDN, H.323 or SIP network in MX-ONE 721, reaches a terminating party in MX-ONE 731, but gets Rerouted to Central Operator in MX-ONE 711. Node 711 notifies 721 and 731 of its Night Service status.

Only certain commands directly relevant to COP are shown below, and the commands are not always complete. Initiation of routes, call origin groups (partly), night answer positions, and so on, is excluded.

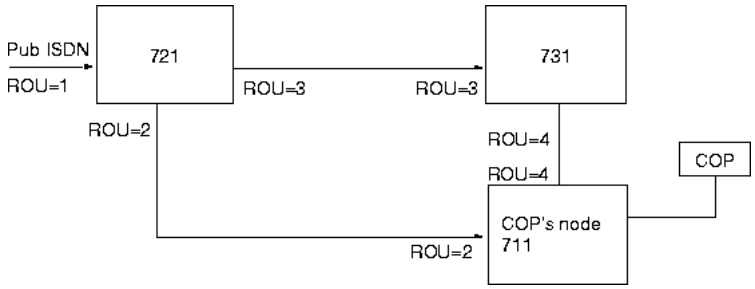


Figure 7:

In the node 711, the MX-ONE of the Central Operator

Number analysis data, common operator numbers, own exchange number and external destination numbers:

- *number_initiate* -numbertype od -number 09
- *number_initiate* -numbertype oc -number 09
- *number_initiate* -numbertype en -number 711
- *number_initiate* -numbertype ed -number 721,731

PBX operator call origin groups, for example:

- *OPCTS*:CORG=1,CALT=1,OACC=09;
- *OPCTS*:CORG=2,CALT=2,OACC=09;
- *OPCTS*:CORG=3,CALT=3,OACC=09;
- *OPCTS*:CORG=4,CALT=6,ROU=4,OACC=09;
- *OPCTS*:CORG=4,CALT=6,ROU=2,OACC=09;

Night service notification numbers, external destination numbers, digit sending start positions and local day numbers:

- *OPNEI*:OWNID=711,NEXGNO=721&731;
- *RODDI*:DEST=721,ROU=2,SRT=1,...
- *RODDI*:DEST=731,ROU=4,SRT=1,...
- *RODNI*:ROU=4,DAY=09;

- *RODNI*:ROU=2,DAY=09;

Application system parameters:

- *ASPAC*:PARNUM=64,PARVAL=0;
- *ASPAC*:PARNUM=44,PARVAL=1; Recall when B-party is tie-line.

In the node 721:

Number analysis data, common operator numbers, own exchange number, external destination numbers and common abbreviated numbers:

- *number_initiate* -numbertype en -number 721
- *number_initiate* -numbertype ed -number 711
- *number_initiate* -numbertype ac -number 500
- *ADCOI*:ABB=500,TRA=71109,CLASS=0&1&2&3;

Central Night Service numbers, external destination numbers, digit sending start positions, local day numbers and Central operator rerouting numbers:

- *OPCEI*:CORG=10,CENUM=500,PRIO=1, NCA=711;
- *RODDI*:DEST=711,ROU=2,SRT=1,...
- *RODNI*:ROU=1,DAY=09;
- *RORNI*:ROU=1,NCA=711,NUM=500,PRIO=1;
- (*RODNI*:ROU=2,DAY=09;)
- *RORNI*:ROU=2,NCA=711,NUM=500,PRIO=1;
- *RODNI*:ROU=3,DAY=09;
- *RORNI*:ROU=3,NCA=711,NUM=500,PRIO=1;

Application system parameters:

- *ASPAC*:PARNUM=64, PARVAL=1;
- *ASPAC*:PARNUM=44, PARVAL=0;

In the node 731:

Number analysis data, common operator numbers, own exchange number, external destination numbers and common abbreviated numbers:

- *number_initiate* -numbertype en -number 731
- *number_initiate* -numbertype ed -number 711
- *number_initiate* -numbertype ac -number 500
- *ADCOI*:ABB=500,TRA=71109,CLASS=0&1&2&3;
- *RODNI*:ROU=3,DAY=09; RODNI:ROU=4,DAY=09;

Central Night Service numbers, external destination numbers, digit sending start positions, local day numbers and Central operator rerouting numbers:

- *OPCEI*:CORG=10,CENUM=500,PRIO=1,NCA=711;
- *RODDI*:DEST=711,ROU=1,SRT=1,...
- *RODNI*:ROU=3,DAY=09;
- *RORNI*:ROU=3,NCA=711,NUM=500,PRIO=1;
- (*RODNI*:ROU=4,DAY=09)

- *RORNI*:ROU=4,NCA=711,NUM=500,PRIO=1;

Application system parameters:

- *ASPAC*:PARNUM=64,PARVAL=1;
- *ASPAC*:PARNUM=44,PARVAL=0;

11.2 A NETWORK WITH TWO CENTRAL OPERATOR POSITIONS IN DIFFERENT NODES

A call which originates in the Public ISDN, enters a private ISDN network in MX-ONE 721, reaches a terminating party in MX-ONE 731, but gets Rerouted to Central Operator in MX-ONE 711 primarily, to 731 secondarily. MX-ONE 711 notifies 721 and 731 of its Night Service status. MX-ONE 731 notifies 711 and 721 of its Night Service status.

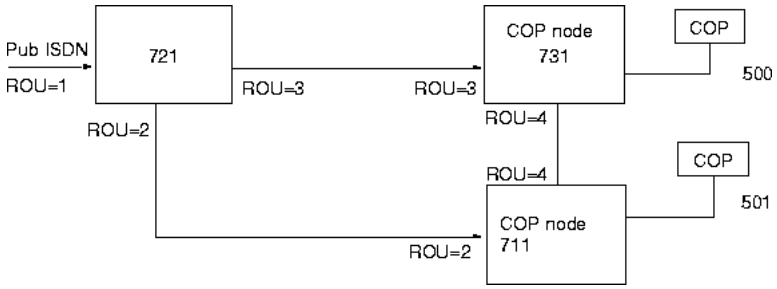


Figure 8:

In the Node 711, the First MX-ONE of the Central Operator:

Number analysis data, common operator numbers, own exchange number, external destination numbers and common abbreviated numbers:

- *number_initiate* -numbertype od -number 09
- *number_initiate* -numbertype oc -number 09
- *number_initiate* -numbertype en -number 711
- *number_initiate* -numbertype ed -number 721,731
- *number_initiate* -numbertype ac -number 500
- *ADCOI*:ABB=500,TRA=73109,CLASS=0&1&2&3;

PBX operator call origin groups, for example:

- *OPCTS*:CORG=1,CALT=1,OACC=09;
- *OPCTS*:CORG=2,CALT=2,OACC=09;
- *OPCTS*:CORG=3,CALT=3,OACC=09;
- *OPCTS*:CORG=4,CALT=6,ROU=2,OACC=09;

  OPCTS:CORG=4,CALT=6,ROU=4,OACC=09;

Night service notification numbers, Central Night Service numbers, external destination numbers, digit sending start positions, local day numbers, and Central operator rerouting numbers:

- *OPNEI*:OWNID=711,NEXGNO=721&731;
- *OPCEI*:CORG=10,NCA=731,CENUM=500,PRIO=1;

RODDI:DEST=721,ROU=2,SRT=1,...

- *RODDI*:DEST=731,ROU=4,SRT=1,...
- *RODNI*:ROU=4,DAY=09,NIG=12345;
- *RODNI*:ROU=2,DAY=09;
- *RORNI*:ROU=4,NCA=731,NUM=500,PRIO=1;
- *RORNI*:ROU=2,NCA=731,NUM=500,PRIO=1;

Application system parameters:

- *ASPAC*:PARNUM=64,PARVAL=1;
- *ASPAC*:PARNUM=44,PARVAL=1;

In the Node 731, the Second MX-ONE of the Central Operator:

Number analysis data, common operator numbers, own exchange number, external destination numbers and Common abbreviated numbers:

- *number_initiate* -numbertype od -number 09
- *number_initiate* -numbertype oc -number 09
- *number_initiate* -numbertype en -number 731
- *number_initiate* -numbertype ed -number 711,721
- *number_initiate* -numbertype ac -number 501
- *ADCOI*:ABB=501,TRA=71109,CLASS=0&1&2&3;

PBX operator call origin groups, for example:

- *OPCTS*:CORG=1,CALT=1,OACC=09;
- *OPCTS*:CORG=2,CALT=2,OACC=09;
- *OPCTS*:CORG=3,CALT=3,OACC=09;
- *OPCTS*:CORG=4,CALT=6,ROU=3,OACC=09;

OPCTS:CORG=4,CALT=6,ROU=4,OACC=09;

Night service notification numbers, Central Night Service numbers, external destination numbers, digit sending start positions, local day/night numbers and Central operator (in 711) rerouting numbers:

- *OPNEI*:OWNID=731,NEXGNO=721&711;
- *OPCEI*:CORG=10,NCA=711,CENUM=501,PRIO=1;
- *RODDI*:DEST=711,ROU=4,SRT=1,...
- *RODNI*:ROU=4,DAY=09,NIG=43210;
- *RODNI*:ROU=3,DAY=09;
- *RORNI*:ROU=4,NCA=711,NUM=501,PRIO=1;
- *RORNI*:ROU=3,NCA=711,NUM=501,PRIO=1;

Application system parameters:

- *ASPAC*:PARNUM=64,PARVAL=1;
- *ASPAC*:PARNUM=44,PARVAL=1;

In the node 721:

Number analysis data, common operator numbers, own exchange number, external destination numbers and common abbreviated numbers:

- *number_initiate* -numbertype od -number 09
- *number_initiate* -numbertype oc -number 09
- *number_initiate* -numbertype en -number 721
- *number_initiate* -numbertype ed -number 711,731
- *number_initiate* -numbertype ac -number 500
- *ADCOI*:ABB=500,TRA=71109,CLASS=0&1&2&3;
- *ADCOI*:ABB=501,TRA=73109,CLASS=0&1&2&3;

(*OPCTS*:CORG=...)

Central Night Service numbers, external destination numbers, digit sending start positions, local day numbers and Central operator rerouting numbers:

- *OPCEI*:CORG=10,NCA=711,CENUM=501,PRIO=1;
- *OPCEI*:CORG=10,NCA=731,CENUM=500,PRIO=2;
- *RODDI*:DEST=711,ROU=2,SRT=1,...
- *RODDI*:DEST=731,ROU=3,SRT=1,...
- *RODNI*:ROU=1,DAY=09;
- *RORNI*:ROU=1,NCA=711,NUM=501,PRIO=1;
- *RORNI*:ROU=1,NCA=731,NUM=500,PRIO=2;
- (*RODNI*:ROU=2,DAY=09;
- *RORNI*:ROU=2,NCA=711,NUM=501,PRIO=1;
- *RORNI*:ROU=2,NCA=731,NUM=500,PRIO=2;)

Application system parameters:

- *ASPAC*:PARNUM=64,PARVAL=1;
- *ASPAC*:PARNUM=44,PARVAL=0;

11.3 ONE CENTRAL ANSWER POSITION WHICH IS NOT A PBX OPERATOR

A call which originates in the Public ISDN, enters an ISDN QSIG network in MX-ONE 721, reaches a terminating party in MX-ONE 731, but gets Rerouted to Central Answer Position (AP) in MX-ONE 711. No notification of Night Service status occurs, so all MX-ONE systems are probably in night mode. No central operator is used.

Only certain commands directly relevant to Central answer position are shown below, and the commands are not always complete. Initiation of routes, local night answer positions etc. is excluded.

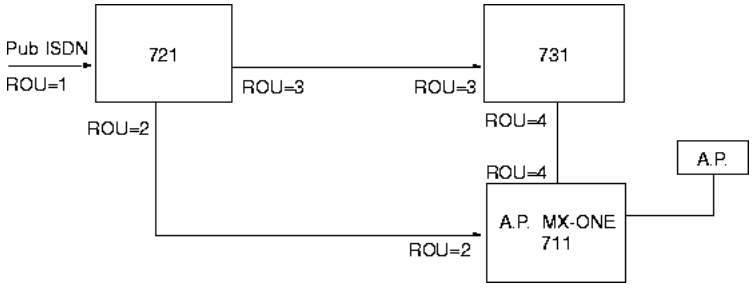


Figure 9:

In the Node 711, the MX-ONE of the Central Answer Position:

Number analysis data, own exchange number and external destination numbers:

- *number_initiate* -numbertype ex -number 54321
- *number_initiate* -numbertype en -number 711
- *number_initiate* -numbertype ed -number 721,731

External destination numbers, digit sending start positions and local day numbers:

- *RODDI*:DEST=721,ROU=2,SRT=1,...
- *RODDI*:DEST=731,ROU=4,SRT=1,...
- *RODNI*:ROU=4,DAY=09; for example
- *RODNI*:ROU=2,DAY=09; RODNI:ROU=4,DAY=09;

Application system parameters:

- *ASPAC*:PARNUM=64,PARVAL=0;
- *ASPAC*:PARNUM=44,PARVAL=0;

In the node 721:

Number analysis data, own exchange number, external destination numbers and common abbreviated numbers:

- *number_initiate* -numbertype en -number 721
- *number_initiate* -numbertype ed -number 711
- *number_initiate* -numbertype ac -number 502
- *ADCOI*:ABB=502,TRA=71154321,CLASS=0&1&2&3;

Central Night Service numbers, external destination numbers, digit sending start positions, local day numbers and Central answer position's rerouting numbers:

- *RODDI*:DEST=711,ROU=2,SRT=1,...
- *RODNI*:ROU=1,DAY=09;
- *RORNI*:ROU=1,NCA=NIG,NUM=502,PRIO=1;
- (*RODNI*:ROU=2,DAY=09;
- *RORNI*:ROU=2,NCA=NIG,NUM=502,PRIO=1;
- *RODNI*:ROU=3,DAY=09;
- *RORNI*:ROU=3,NCA=NIG,NUM=502,PRIO=1;)

Application system parameters:

- *ASPAC*:PARNUM=64,PARVAL=1;

- *ASPAC*:PARNUM=44,PARVAL=0;

In the node 731:

Number analysis data, own exchange number, external destination numbers and common abbreviated numbers:

- *number_initiate* -numbertype en -number 731
- *number_initiate* -numbertype ed -number 711
- *number_initiate* -numbertype ac -number 502
- *ADCOI*:ABB=502,TRA=71154321,CLASS=0&1&2&3;

Central Night Service numbers, external destination numbers, digit sending start positions, local day numbers and Central answer position's rerouting numbers:

- *RODDI*:DEST=711,ROU=1,SRT=1,...
- *RODNI*:ROU=3,DAY=09;
- *RORNI*:ROU=3,NCA=NIG,NUM=502,PRIO=1;
- (*RODNI*:ROU=4,DAY=09;
- *RORNI*:ROU=4,NCA=NIG,NUM=502,PRIO=1;)

Application system parameters:

- *ASPAC*:PARNUM=64,PARVAL=1;
- *ASPAC*:PARNUM=44,PARVAL=0;

11.4 A NETWORK WITH CUSTOMER CENTRALIZED OPERATORS

MX-ONE 731 has two customers, 5 and 21. Customer 5 has two customer central operators initiated: 601 in MX-ONE 711 and 701 in MX-ONE T741. Customer 21 has one CCOP initiated: 602 in MX-ONE 711. There is also a central answer position 502 in MX-ONE 711.

A call which originates in the PSTN, enters a private ISDN/H.323 network in MX-ONE 721, reaches a terminating party in MX-ONE 731, gets rerouted to the customer's local operator in MX-ONE 731. If the customer's local operator is not present, the following can happen:

In the case of customer 5 the call can be Night service diverted to CCOP 601. If CCOP 601 is not present, the call can be Night service diverted to the second choice, that is, CCOP 701. If CCOP 701 is not present either, then the call can be Night service diverted to the central answering position 502.

In the case of customer 21 the call can be Night service diverted to CCOP 602. If CCOP 602 is not present, the call can be Night service diverted to the central answering position 502.

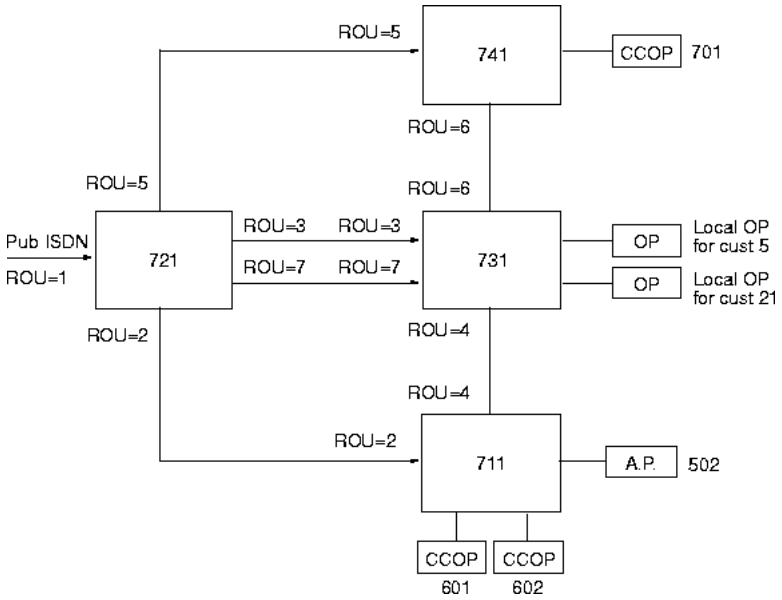


Figure 10:

In the node 711:

Number analysis data and external destination data:

- *number_initiate* -numbertype en -number 711
- *number_initiate* -numbertype ex -number 54321
- *number_initiate* -numbertype ed -number 721,731,741
- *number_initiate* -numbertype od -number 091,092
- *number_initiate* -numbertype oc -number 091,092

- *RODDI*:DEST=721,ROU=2,SRT=1,...
- *RODDI*:DEST=731,ROU=4,SRT=1,...

Call origin group data for Customer 5:

- *OPCTS*:CORG=1,CALT=1,OACC=091,CUST=5;
- *OPCTS*:CORG=1,CALT=2,OACC=091,CUST=5;
- *OPCTS*:CORG=1,CALT=3,OACC=091,CUST=5;
- *OPCTS*:CORG=1,CALT=7,ROU=4,OACC=091;
- *OPCTS*:CORG=1,CALT=7,ROU=2,OACC=091;

Call origin group data for Customer 21:

- *OPCTS*:CORG=2,CALT=1,OACC=092,CUST=5;
- *OPCTS*:CORG=2,CALT=2,OACC=092,CUST=5;
- *OPCTS*:CORG=2,CALT=3,OACC=092,CUST=5;
- *OPCTS*:CORG=2,CALT=7,ROU=4,OACC=092;
- *OPCTS*:CORG=2,CALT=7,ROU=2,OACC=092;

In the node 721:

Number analysis data and external destination numbers:

- *number_initiate* -numbertype en -number 721
- *number_initiate* -numbertype ed -number 711,731,741

- *RODDI*:DEST=711,ROU=2,SRT=1,...
- *RODDI*:DEST=731,ROU=3,SRT=1,...
- *RODDI*:DEST=731,ROU=7,SRT=1,...
- *RODDI*:DEST=741,ROU=5,SRT=1,...

In the node 731:

Number analysis data, external destination data and common abbreviated numbers:

- *number_initiate* -numbertype en -number 731
- *number_initiate* -numbertype ed -number 711,721,741
- *number_initiate* -numbertype ac -number 502,601,602,701
- *number_initiate* -numbertype oc -number 090
- *number_initiate* -numbertype od -number 090

- *RODDI*:DEST=711,ROU=4,SRT=1,...
- *RODDI*:DEST=741,ROU=6,SRT=1,...

  RODDI:DEST=721,ROU=7,SRT=1,...

- *ADCOI*:ABB=502,TRA=71154321,CLASS=0&1&2&3;
- *ADCOI*:ABB=601,TRA=711091,CLASS=0&1&2&3;
- *ADCOI*:ABB=602,TRA=711092,CLASS=0&1&2&3;
- *ADCOI*:ABB=701,TRA=741093,CLASS=0&1&2&3;

PBX operator call origin groups, for customer number 5:

- *OPCTS*:CORG=1,CALT=1,OACC=090,CUST=5;
- *OPCTS*:CORG=1,CALT=2,OACC=090,CUST=5;
- *OPCTS*:CORG=1,CALT=3,OACC=090,CUST=5;
- *OPCTS*:CORG=1,CALT=7,OACC=090,ROU=3,CUST=5;

- *OPADC*:CORG=1,NDIR=Y,RERNUM=....;

PBX operator call origin groups, for customer number 21:

- *OPCTS*:CORG=2,CALT=1,OACC=090,CUST=21;
- *OPCTS*:CORG=2,CALT=2,OACC=090,CUST=21;
- *OPCTS*:CORG=2,CALT=3,OACC=090,CUST=21;
- *OPCTS*:CORG=2,CALT=7,OACC=090,ROU=4,CUST=21;

- *OPADC*:CORG=2,NDIR=Y,RERNUM=....;

Route's customer affiliation:

- *ROCAC*:ROU=3,SEL=7110000500000010;
- *ROCAC*:ROU=7,SEL=7110002100000010;

CCOP numbers for rerouting per customer:

- *RORNI*:CUST=5,NCA=CCOP,NUM=601,PRIO=1;
- *RORNI*:CUST=5,NCA=CCOP,NUM=701,PRIO=2;
- *RORNI*:CUST=21,NCA=CCOP,NUM=602,PRIO=1;

Central answer position for rerouting per route:

- *RORNI*:ROU=3,NCA=711,NUM=502,PRIO=1;
- *RORNI*:ROU=7,NCA=711,NUM=502,PRIO=1;

CCOP numbers, per call origin group:

- *OPCEI*:CORG=1,NCA=CCOP,CENUM=601,PRIO=1;
- *OPCEI*:CORG=1,NCA=CCOP,CENUM=701,PRIO=2;
- *OPCEI*:CORG=2,NCA=CCOP,CENUM=602,PRIO=1;

Central answer position number, per call origin group:

- *OPCEI*:CORG=1,NCA=711,CENUM=502,PRIO=1;
- *OPCEI*:CORG=2,NCA=711,CENUM=502,PRIO=1;

In the node 741:

Number analysis data and external destination data:

- *number_initiate* -numbertype en -number 741
- *number_initiate* -numbertype ed -number 711,721,731
- *number_initiate* -numbertype oc -number 093
- *number_initiate* -numbertype od -number 093
- *RODDI*:DEST=721,ROU=5,SRT=1,...
- *RODDI*:DEST=731,ROU=6,SRT=1,...

Call origin group data for Customer 5:

- *OPCTS*:CORG=1,CALT=1,OACC=093,CUST=5;
- *OPCTS*:CORG=1,CALT=2,OACC=093,CUST=5;
- *OPCTS*:CORG=1,CALT=3,OACC=093,CUST=5;
- *OPCTS*:CORG=1,CALT=7,ROU=5,OACC=093;
- *OPCTS*:CORG=1,CALT=7,ROU=6,OACC=093;

12 EXECUTION, GRAPHIC SUMMARY

12.1 INITIATION OF CENTRAL ANSWER POSITION

The flows below assume a PBX operator as central answer position. If the answer position is not a PBX operator, the flows can be somewhat simplified by omitting the OP-commands.

12.1.1 EXECUTION IN A SATELLITE MX-ONE

Table 3

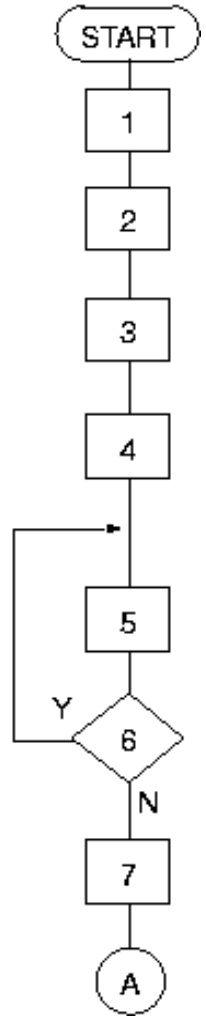
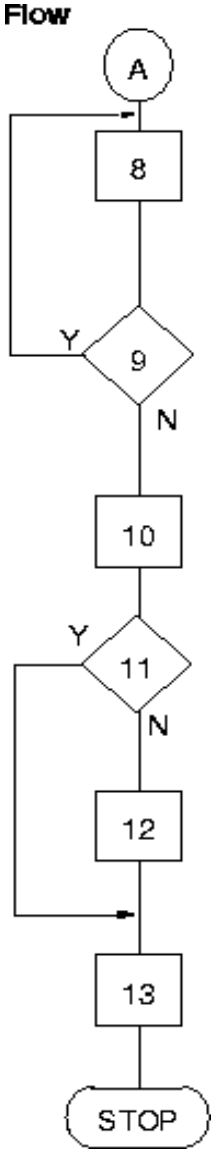
		Measure/Question	Observation/Comment
Flow 			
	1	Key the command *number_initiate* with number type EN and ED to initiate own exchange number and destinations .	EN necessary for status notification. ED for routing.
	2	Key the command *number_initiate* with number type AC, common abbreviated numbers.	
	3	Key the command *number_print* to verify the result .	
	4	Key the command *ADCOI* to initiate common abbreviated numbers . Key ADCDP to verify the result.	Will be used as rerouting numbers.
	5	Key the command *RORNI* to initiate external rerouting number.	*RODDI*, destination assumed already set.
	6	Are there more than one external rerouting number to be initiated for this route? If YES go to step 5, otherwise continue.	
	7	Key the command *RORNP* to verify the result.	

Table 4

		Measure/Question	Observation/Comment
Flow 			
	8	Key the command *OPCEI* to initiate external Night Service Diversion number for calls to common operator.	Call origin groups assumed initiated.
	9	Are there more than one external NS-Diversion number to be initiated for this origin group? If YES go to step 8, otherwise continue.	
	10	Key the command *OPCEP* to verify the result .	
	11	Must day/night status be controlled by the local exchange's status only? If YES go to step 13, otherwise continue.	This is optional.
	12	Key the command *ASPAC* to set *PARNUM=64* equal to 1, controlled by the central and local exchange.	
	13	Key the command *ASPAP* to verify the result.	

12.1.2 EXECUTION IN AN MX-ONE OF A CENTRAL OPERATOR

Table 5

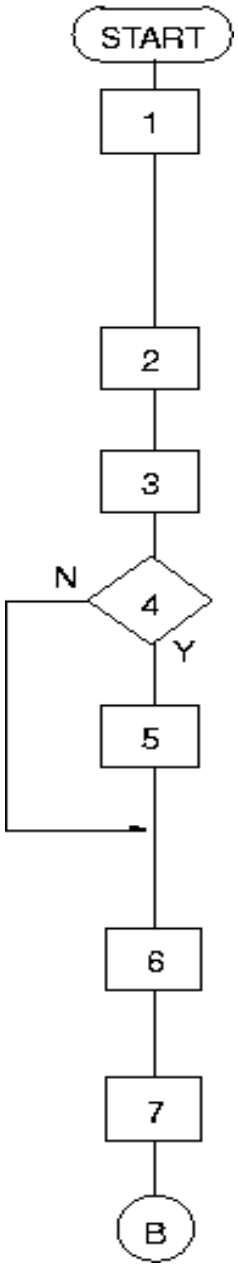
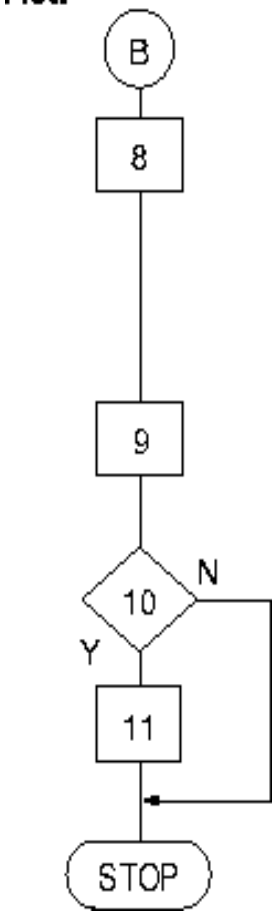
		Measure/Question	Observation/Comment
Flow 			
	1	Key the command *number_initiate* with number type EN to initiate own exchange number, and also number type OD and OC, common operator number for DID .	
	2	Key the command *number_initiate* with number type ED, external destination numbers .	To be used for notification. Must be equal to notified MX-ONE system's own exchange number.
	3	Key the command *number_print* to verify the result .	
	4	Is this central MX-ONE served by any other central exchange? If YES go to step 6, otherwise continue.	
	5	Key the command *number_initiate* with number type AC, and key command *ADCOI* to initiate common abbreviated number. Key *ADCDP* to verify the result.	Will be used as rerouting numbers *RODDI*, *RODNI*, *RORNI* etc., excluded in this flow.
	6	Check day/night status control mode by command *OPDNP*, and change with *OPDNC* if required.	
	7	Key the command *OPNEP* to print notified exchange numbers, if any.	

Table 6

		Measure/Question	Observation/Comment
Flow 			
	8	Key the command *OPNEI* to initiate notification destination numbers and own exchange number. Verify with command *OPNEP*.	If this MX-ONE is satellite to some other central operator, also *OPCEI* must be keyed.
	9	Key the command *OPCTS* to initiate call origin group.	
	10	Is this a new call origin group, which is not yet affiliated to any operator? If NO stop, otherwise continue.	
	11	Key the command *OPCGS* to affiliate operators to the call origin group.	

12.2 INITIATION OF CUSTOMER CENTRALIZED OPERATORS

12.2.1 EXECUTION IN A SATELLITE MX-ONE

Table 7

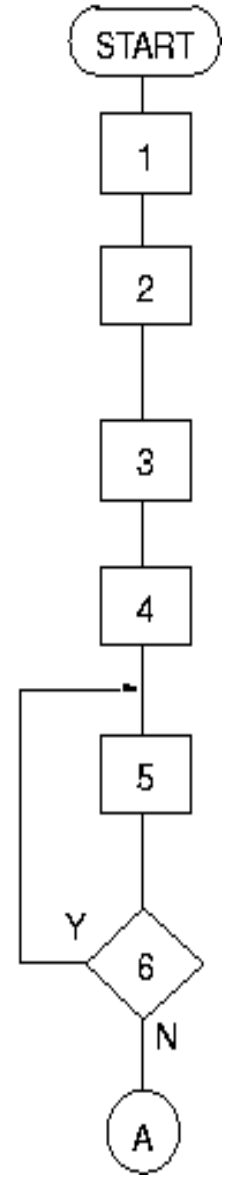
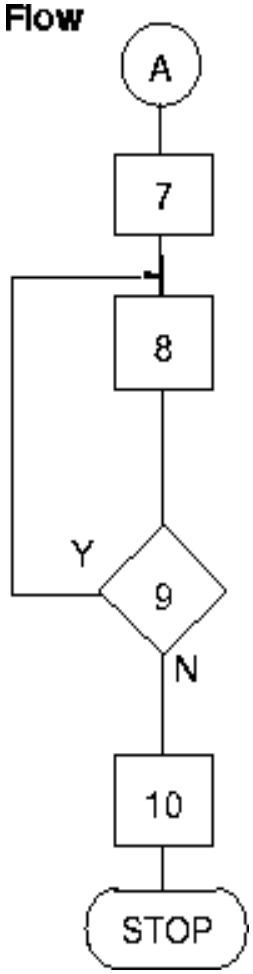
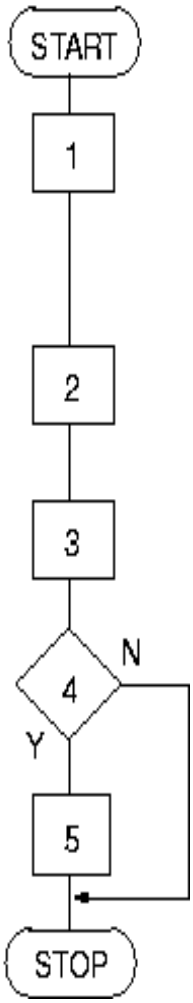
		Measure/Question	Observation/Comment
Flow 			
	1	Key the command *number_initiate* with number type ED to initiate external destination .	ED is for routing.
	2	Key the command *number_initiate* with number type AC, common abbreviated numbers .	
	3	Key the command *number_print* to verify the result .	
	4	Key the command *ADCOI* to initiate common abbreviated numbers . Key *ADCDP* to verify the result.	Will be used as rerouting numbers.
	5	Key the command *RORNI* to initiate CCOP numbers for rerouted calls.	*RODDI*, destination assumed already set.
	6	Are there more than one CCOP number to be initiated for this customer? If YES go to step 5, otherwise continue.	

Table 8

		Measure/Question	Observation/Comment
Flow 			
	7	Key the command *RORNP* to verify the result.	
	8	Key the command *OPCEI* to initiate CCOP number for calls to common operator.	Call origin groups assumed initiated.
	9	Are there more than one CCOP number to be initiated for this origin group? If YES go to step 8, otherwise continue.	
	10	Key the command *OPCEP* to verify the result.	

12.2.2 EXECUTION IN AN MX-ONE OF A CUSTOMER CENTRALIZED OPERATOR

Table 9

		Measure/Question	Observation/Comment
Flow 			
	1	Key the command *number_initiate* with number type OD and OC, common operator number for DID.	
	2	Key the command *number_print* to verify the result.	
	3	Key the command *OPCTS* to initiate call origin group.	
	4	Is this a new call origin group, which is not yet affiliated to any operator? If NO stop, otherwise continue.	
	5	Key the command *OPCGS* to affiliate operators to the call origin group.	

13 TERMINATION

If exchange data have been altered and no more commands are to be keyed a dump to backup media must be initiated.