Route Data, RO

OPERATIONAL DIRECTIONS

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TRADEMARKS

1 GENERAL

For more information about administration of routes, see the operational directions for *ADMINISTRATION OF ROUTES*. For more information on administration of number data, see the operational directions for *NUMBERING*.

1.1 FUNCTIONS

Traffic between an MX-ONE Telephony System and a public or inter-working exchange requires a line. This line is initiated, or assigned, to a free equipment position in the system. A number of lines with the same characteristics together forms a route. A number of routes leading to the same external destination may be used to form a direction.

Routes can be initiated with different categories, such as signaling, service, and traffic characteristics, to suit different types of external lines.

To each route or direction that permits outgoing traffic one or more external destinations shall be affiliated. It is possible to initiate up to seven alternative route choices to one external destination.

A day service and a night service position can be initiated to each incoming route or line, that is, a common answering position for the route or individual for the line during day service and night service, respectively. An answering position for vacant numbers, to be used at incoming calls to vacant numbers, can also be initiated for each route.

For restrictive route selection there is an Application System (AS) parameter which indicates if the restrictive category check is done for calls originated in the own exchange. This AS can be changed by the command ASPAC, *PARNUM=106*.

If the customer group function is used in the PBX, different customers can be assigned their own route choices. Furthermore, it is possible to assign each customer their own day and night switching positions (customer-dependent rerouting positions).

1.2 GLOSSARY

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

2 PREREQUISITES

Depending on what is to be done, number series of specific number types may have to be initiated.

Since many of the legacy trunk lines are regarded as optional functions, the relevant SW program(s) TLPxx, must be manually loaded before initiating the trunk function.

See the operational directions ADMINISTRATOR USER'S GUIDE, the parameter description for UNIT in TECHNICAL REFERENCE GUIDE, MML PARAMETERS, and the installation instruction INSTALLING AND CONFIGURING MIVOICE MX-ONE, section Optional programs.

3 PROCEDURE

The following work-flow shall be used for route administration:

1. Initiate the route
2. Initiate route choices to the external destination
3. Initiate equipment positions as external lines for the route
4. Perform other activities

Note: IP additional information must be provided to completely initiate the route as an H.323 route. See the operational directions for *IP NETWORKING*.

4 EXECUTION

4.1 ROUTE

4.1.1 INITIATE A SIP ROUTE

General

The sip_route command defines the external SIP communication. This is followed by an ordinary route setup.

In the delivery there are a number of SIP trunk profiles available,

The sip trunk profile is often part of a solution described in a solution document. This is the case for the profiles MXONE-tie-line, AMCC, InAttend, Lync_*.

CPI does not contain solution documents for SIP trunk providers. However, the service Remote Extension over SIP, explained in “Operational Directions, *REMOTE EXTENSION OVER SIP*”.

Use *sip_route -print -profile* get a complete list.

Print the selected profile to by *sip_route -print -profile <PROFILE>*. The printout has the following headings:

- Profile include parameters

  sip_route parameters with hinted values (parameter = value) that must be set for sip_route to be executed.

Note: Additional parameters can be set, except for parameters in Profile exclude parameters.

- Profile exclude parameters

  sip_route parameters with fixed values (parameter = value) or excluded parameters (parameter with no value) which are set as Profile line protocol parameters instead. The mapping between the excluded parameters and the more elaborate protocol parameters are listed in /etc/opt/eri_sn/sip_trunk_profiles/trunk_profile.template

- Profile line protocol parameters

  Fixed SIP protocol related parameters. These parameters extends and replaces RODAI parameters. The mapping between RODAI and these parameters are listed in /etc/opt/eri_sn/sip_trunk_profiles/trunk_profile.template

  For backward compatibility, the profile Default, allows ‘RODAI variables VARI,VARC,VARO not equal zeroes’ to override these values. *sip_route* without -profile set is using profile Default.

- Profile route THH initiation commands

  Recommended settings for the commands, ROCAI, RODAI, ROEQI and optionally RODDI commands. The settings has been used in verification tests. There might be additional information in the profile file, /etc/opt/eri_sn/sip_trunk_profiles/<profile_repository>.conf

Execution

Initiate the SIP route data towards the external network. Use the command *sip_route*.

1. sip_route -set [-profile XXX] -route Y -uristring0 “sip:?@<SIP reqURI>”,[other sip_route parameters needed or required by the profile -Profile include parameters-]
2. ROCAI:ROU=Y, SIG={D11=A for SIP route}, other service parameters
3. If sip_route -profile is set (except for Default which is available for backward compatibility), then VARI,VARC,VARO must have zeroes as the profile parameters, -Profile line protocol parameters- is the replacement for these settings.

   RODAI:ROU=Y,TYPE=TL66,VARI=00000000,VARC=00000000,VARO=00000000;
4. TRU parameter defines which servers (lim) that shall be used for SIP signaling for this route and the call capacity.
   ROEQI:ROU=Y,TRU=<lim>-<first sequence number>&&<lim> -<last sequence number>

   Example: Set route which limit the route to only use lim 3 for signaling with the max capacity of 60 concurrent calls.

   ROEQI:ROU=Y,TRU=3-1&&3-60
5. Define access code that shall trigger this route

   RODDI:ROU=Y,DEST=<dest-number>

Note: The sip_route command must be executed before the ROEQI command that ties equipment to the route.

Also, see chapter 4.4 Lines on page 22.

4.1.1.1 Public SIP route with enterprise SBC

General

The service provider may offer SIP trunk as part of a WAN corporate solution. If the public SIP trunk access is part of this WAN network it can be accessed directly from MX-ONE.In this case no proxy needs be configured in sip_route.

This description is referring to the case when a SIP trunk provider just offers an access over the internet, The customer must have an internet service in order to setup a SIP trunk connection.

In order to protect MX-ONE and the corporate network, a firewall is needed. For SIP traffic a SIP aware firewall is needed and is called Session Border Controller (SBC).

Execution

Example:

MX-ONE: 192.168.10.10
SBC:192.168.10.11
SIP trunk service provider access: trunkservice.com

For outbound settings:

sip_route -set -route 250 -protocol tcp -service PUBLIC -proxyip 192.168.10.11 -proxyport 5060 -uristring0 ‘sip:?@trunkservice.com’ -remoteport 5060

For inbound settings:

sip_route -set -route 250 -accept FROM_DOMAIN
-match ’trunkservice.com’

Note: The will match the host part of the SIP from header in the sip request arrived from trunkservice.com via the defined proxy (SBC).

Also use the commands ROCAI and RODAI to set the basic route data, for example:

ROCAI:ROU=250,SEL=7110000000000010,SIG=0111110000A0, TRAF=03151515,TRM=4,SERV=3100000001,BCAP=000100;

RODAI:ROU=250,TYPE=TL66,VARI=00000011,VARC=00001000, / VARO=00000900;

Finally associate the route to one or several MX-ONE server which will be used as SIP access point for the SBC. for example:

ROEQI:ROU=250,TRU=1-1&&1-60;

The TRU value corresponds to lim 1, with capacity of 60 concurrent calls.

4.1.2 INITIATE THE ROUTE

General

An arbitrary number of routes can be defined as call-metering routes, see the operational directions for *CHARGING*. All call-metering routes can be reached by the PBX operator.

The bearer capability of a route can be set to SPEECH, 3.1-kHz audio, 64 kbps restricted digital, 64 kbps unrestricted digital, 7-kHz audio (UDI-TA), or 16 kbps unrestricted digital. One or several of the capabilities must be set in order to allow for outgoing telephony on the route. If setting of the bearer capability is omitted for a route, the default value SPEECH and 3.1-kHz audio is assumed.

Execution

1. Initiate the route by first keying command *ROCAI* followed by command *RODAI*.

Note: Both of the commands must be keyed for the route to be completely initiated.

2. Key the commands *ROCAP* and *RODAP* to verify that the initiations were successful.

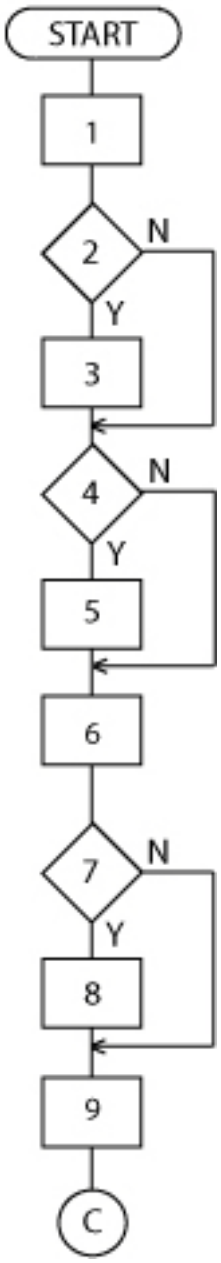
4.1.3 REMOVE A ROUTE

Prerequisites

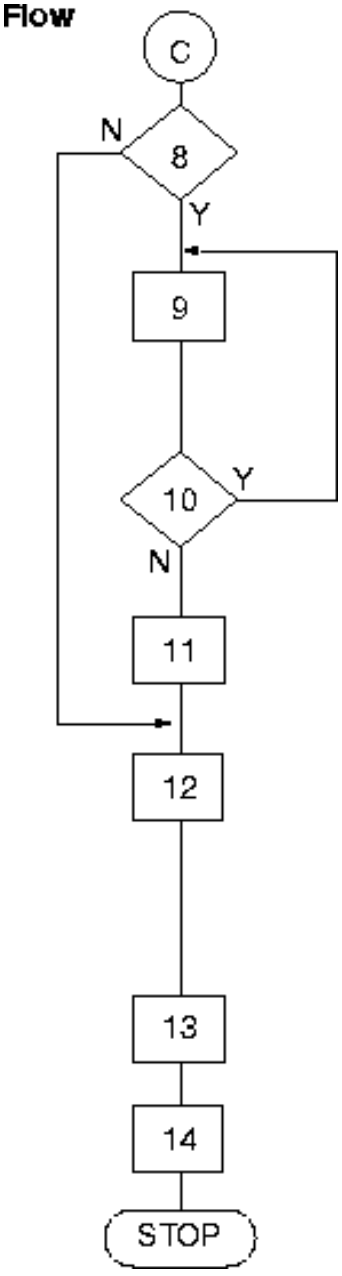
No lines shall be affiliated to the route. Neither shall there be any call origin group for PBX operators nor external destination affiliated to the route. Any existing call-metering equipment must be removed first. Also, no Least Cost Routing (LCR) data pointing to the route shall exist.

Note: The route can be utilized for common and individual abbreviated numbers.

Execution



	Measure/Question	Observation/ Comment
1	Key the command *ROEDP* to verify that the route exists and that no lines are affiliated to the route.	
2	Are there any lines affiliated to the route?	If NO, proceed to step 4.
3	Key the command *ROEQE* to remove the lines.	See 4.4.2 Remove Lines on page 27.
4	Is the route a SIP route?	
5	Remove the route. Use the command *sip_route* -remove.	
6	Key the command *RODDP* to check if any external destinations are affiliated to the route.	
7	Are there any external destination affiliated to the route?	If NO, proceed to step 7.
8	Remove all external destinations that are affiliated to the route.	See 4.3.2 Remove the Ordinary Route Choice to an External Destination on page 17.
9	Key the command *OPCTP* to check if the route is part in any call origin group.	

Flow		Measure/Question	Observation/Comment
	8	Is the route part in any call origin group?	If NO, proceed to step 12.
	9	Key the command *OPCTR* to remove the route from a call origin group.	See the operational directions for *PBX OPERATOR TRAFFIC*.
	10	Are there more call origin groups to be removed from?	If YES, return to step 9.
	11	Key the command *OPCTP* to verify that the route is no longer part in any call origin group.	
	12	Check if the route has individual metering. If any type of metering exists save the metering results on file.	See the operational directions for *CHARGING*.
	13	Key the command *ROUTE* to remove the route.	
	14	Key the command *ROCAP* to verify the result.	

4.1.4 E1 - T1 CHANGE

If an E1 trunk line is to be reconfigured to a T1 trunk line or the other way round, it is necessary to restart the used virtual board in the process. Use the *board_restart* command.

4.1.5 PRINT THE ROUTE CATEGORIES

General

Route categories initiated with command *ROCAI* are printed by keying command *ROCAP*. Route categories initiated with command *RODAI* are printed by keying command *RODAP*.

Execution

Key the command *ROCAP* and *RODAP* to obtain printouts.

4.1.6 ALTER THE ROUTE CATEGORIES

General

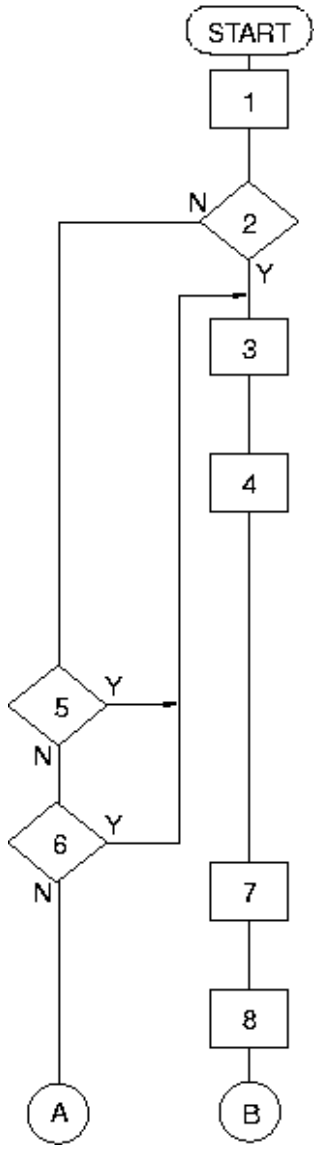
Route categories initiated with command *ROCAI* can be altered with command *ROCAC*. Route categories initiated with command *RODAI* can be altered with command *RODAI*.

Note: All parameters must be stated in the RODAI command and not only the ones that are to be changed.

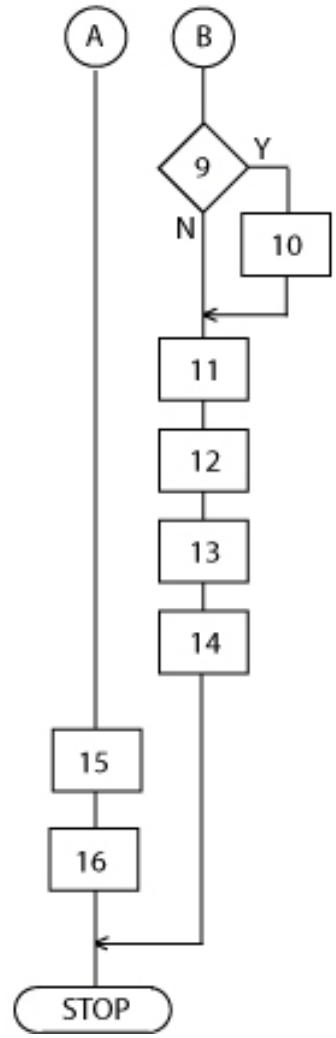
When using command RODAI or when altering call-metering information or traffic direction with command ROCAC, all external lines must be removed before keying the command.

Execution

Flow



	Measure/Question	Observation /Comment
1	Key the command *ROCAP* and *RODAP* to print out the current route categories.	
2	Shall any route categories initiated with command *RODAI* be altered?	If NO, proceed to step 5.
3	Key the command *ROEDP* to print out the external lines belonging to the route.	
4	Block all boards with external lines belonging to the route. Use the command *block*.	Note: The command can lead to spontaneous printouts. Proceed to step 7.
5	Shall the route be altered to a metering route?	If YES, return to step 3.
6	Shall the traffic direction be altered?	If YES, return to step 3. If NO, proceed to step 13.
7	Key the command *ROEQE* to remove all lines belonging to the route.	
8	Key the command *RODAI* or *ROCAC* to alter the route categories.	

Flow		Measure/Question	Observation/ Comment
	9	Will the route be a SIP route?	
	10	Key the command *sip_route* to initiate the SIP route data.	
	11	Key the command *ROEQI* to re-initiate lines to the route.	
	12	Key the command *RODAP* and *ROCAP* to verify the result.	
	13	Key the command *alarm* to print (list) alarms in the alarm log.	
	14	Key the command *alarm* to erase (reset) alarms in the alarm log.	Proceed to STOP.
	15	Key the command *ROCAC* to alter the route categories.	
	16	Key the command *ROCAP* to verify the result.	

4.2 DIRECTION

4.2.1 INITIATE A DIRECTION

General

Up to four routes with the same or different characteristics form a direction to a destination. See the figure below.

Up to 100 directions are permitted.

Selection of a route within the direction depends on the authorization category of the calling party. For example, one category can be allowed to use all routes, while another is allowed to use one route only.

The authorization categories can consist of different types of calling parties, such as a PBX operator or normal extension. These categories have fixed positions in an authorization table. Other types of users can be assigned one of the classes A, B, C, D, or E in the authorization table.

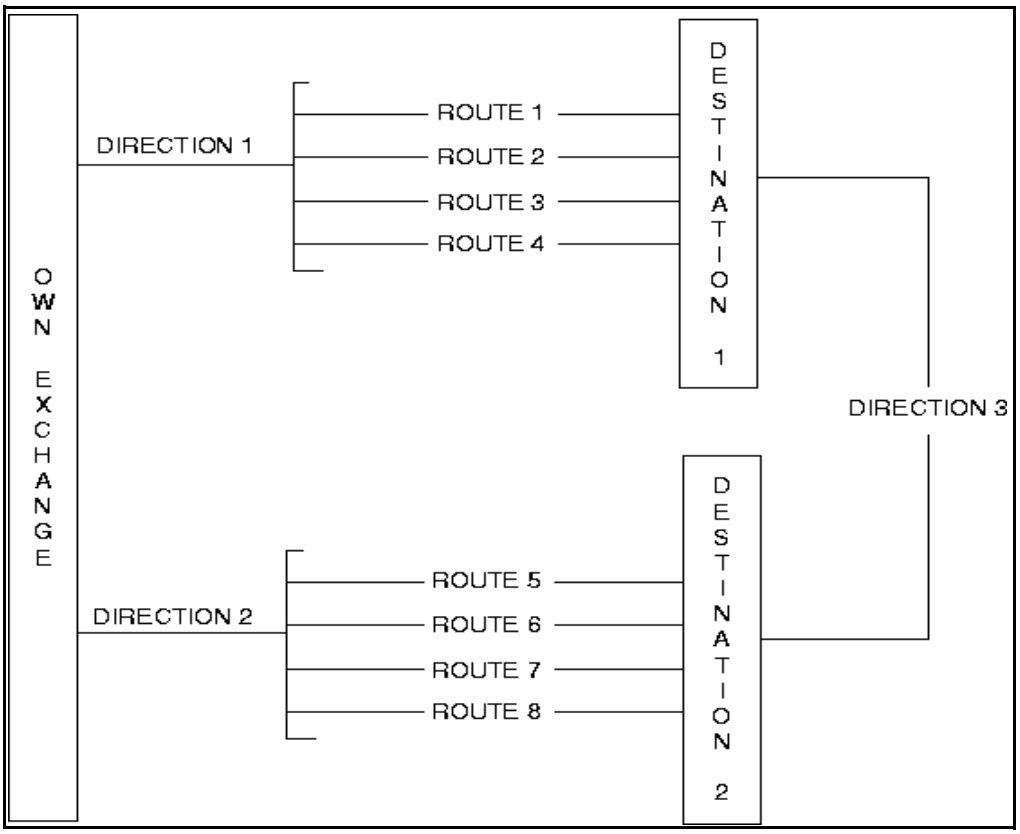
An H.323 route defined in a direction (RODII) must be previously initiated with a remote destination IP address (RIANI). Since a direction could be formed by different types of routes, remote destination IP address could not be assigned linked to the destination (RODDI).

Overflow

When all external lines within a route are busy or blocked, a call wishing to use the route tries to overflow to another route within the direction. The overflow route must be of the same or lower authorization category as the first route.

Overflow within the direction also depends on the **order** in which the routes were initiated in the direction (RODII). For a call to overflow to another route, the overflow route must have been initiated **after** the first tried route. A call can never overflow to a route that was initiated before the route that was first tried, even if that earlier initiated route has a lower authorization category.

This means that special care has to be taken concerning the order of initiating routes in a direction.



Prerequisites

Routes must be initiated.

Execution

1. Key the command *RODII* to initiate the direction.
2. Key the command *RODIP* to verify that the initiation was successful.

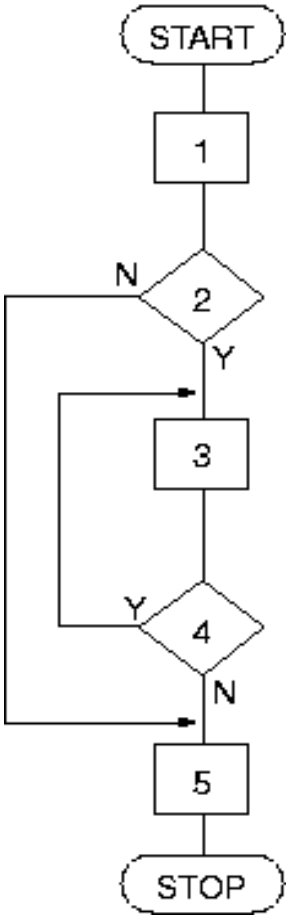
4.2.2 REMOVE A DIRECTION

Prerequisites

The direction must exist.

Execution

Flow



	Measure/Question	Observation/ Comment
1	Key the command *RODDP* to see the current external destination route data.	
2	Is the direction used as route choice to any of the external destinations?	If NO, proceed to step 5.
3	Remove this route choice to the external destination.	See 4.3.2 Remove the Ordinary Route Choice to an External Destination on page 17.
4	Is the direction used to any other external destination?	If YES, return to step 3.
5	Key the command *RODIE* to remove the direction.	

4.2.3 PRINT THE DIRECTION

General

RODIP provides a printout of the direction and its authorization tables (initiated with command *RODII*).

Execution

Key the command *RODIP* to obtain a printout.

4.3 EXTERNAL DESTINATION AND ALTERNATIVE ROUTING

4.3.1 INITIATE THE ORDINARY ROUTE CHOICE TO AN EXTERNAL DESTINATION

General

The way a call to an external destination finds the route to use is through a route access code. One route access code is used for each external destination. One ordinary route choice, and up to seven alternative route choices (= alternative routing), may be initiated to an external destination.

Note: When programming a route access code, a market dependent parameter controls whether the access code must be defined in number analysis as an external destination (number type = ED). In most markets the parameter is set to not check number analysis meaning any number can be programmed even if it is not defined as an external destination.

The idea is to make it possible to use a single number within a series as the route access code, where the number series itself is not an external destination in number analysis. This can be used when migrating a user from one system to another as it removes the requirement to specify individual numbers as route access codes. For example, a system has extensions 41xxx and some of the users will migrate to another exchange due to an office relocation but will keep the same number. It is possible to configure 4 as a route access code to the other exchange. Then when the directory move should happen, the individual numbers (e.g. 41002) only need to be changed in number analysis from number type extension to number type external destination, with no need to program individual route access codes for each user.

If a private network configuration is not properly done, a call may be routed back to an already passed exchange (using alternative routing). A call entering this kind of loop will eventually use all available lines and cause network congestion. The return block function, loop avoidance, and transit counter prevent this from happening in a private network.

These functions enable a maximum number of allowed transit PBXes for a call to pass in order to reach an external destination to be defined. A call exceeding the maximum number of allowed transit PBXes will be cleared down.

See also the command description for ROUTE DATA, command *RODDI*.

Prerequisites

The route or direction used to reach the external destination must be initiated.

For H.323:

- If parameter ROU is used, initiating the H.323 route data is a prerequisite, see the operational directions for *IP NETWORKING, RI*. If no remote IP address was provided when initiating the H.323-specific route data, a remote IP address shall be stated now.
- If parameter DRN is used, no IP address may be stated now. Data of the routes associated to the chosen direction must have been previously initiated including their own remote IP address, see the operational directions for *IP NETWORKING, RI*.

Execution

1. Key the command *RODDI* to initiate an ordinary route choice to the external destination
2. Key the command *RODDP* and *RODRP* and verify that the initiation was successful.

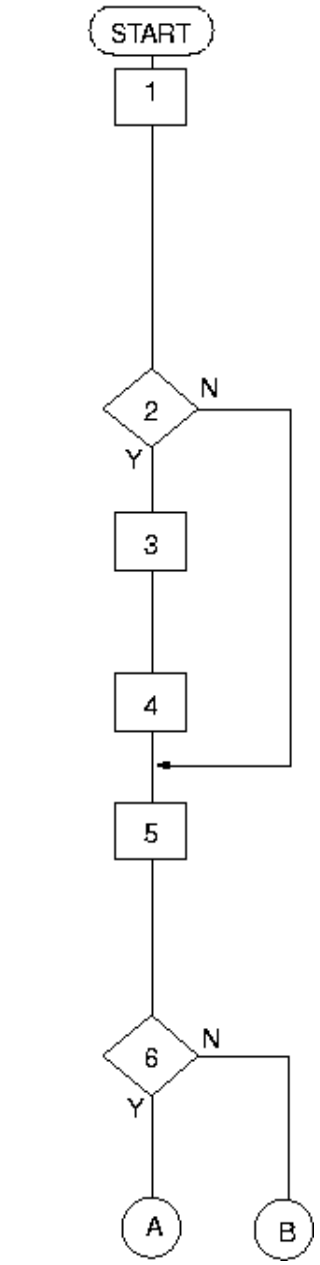
4.3.2 REMOVE THE ORDINARY ROUTE CHOICE TO AN EXTERNAL DESTINATION

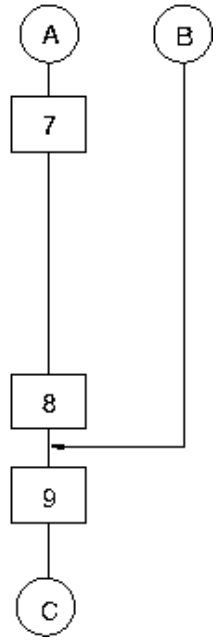
General

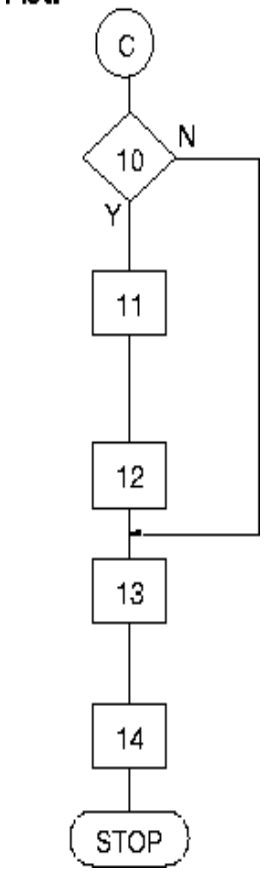
The ordinary route choice to an external destination can be removed without having to remove any alternative route choices to this destination. Any alternative route choices will be removed together with the ordinary route choice.

Since Least Cost Routing (LCR) destinations might use the external destinations that are to be removed, it is required to check existing LCR data and, if a match is found, rearrange the LCR data.

Execution

Flow		Measure/Question	Observation/ Comment
	1	Key the command *LCDDP* to verify that no LCR destination points exist to the external destination that shall be removed. Repeat the procedure for all FDT subtables if the Time/Day function is used in the LCR configuration.	See the operational directions for *LEAST COST ROUTING, LC*.
	2	Was the external destination to remove found in any FDT table?	If NO, proceed to step 5.
	3	Key the command *LCDDE* for all tables in LCR to remove data which points to the external destination.	See the operational directions for *LEAST COST ROUTING, LC*.
	4	Key the command *LCDDP* to verify the result.	
	5	Key the command *LCLDP* to check if the external destination to remove is defined as the default external destination for LCR.	See the operational directions for *LEAST COST ROUTING, LC*.
	6	Was the external destination found to be the default external destination for LCR?	If NO, proceed to step 9.

Flow		Measure/Question	Observation/ Comment
	7	Key the command *LCLDI* to change default external destination for LCR.	See the operational directions for *LEAST COST ROUTING, LC*.
	8	Key the command *LCLDP* to verify the result.	
	9	Key the command *LCOPP* to verify that no OCPT subtable is affiliated to the route.	See the operational directions for *LEAST COST ROUTING, LC*.

Flow		Measure/Question	Observation/ Comment
	10	Is any OCPT subtable affiliated to the route?	If NO, proceed to step 13.
	11	Key the command *LCOPE* to remove the affiliation between the route and the subtable.	See the operational directions for *LEAST COST ROUTING, LC*.
	12	Key the command *LCOPP* to verify the result.	
	13	Key the command *RODDE* to remove the ordinary route (direction) choice to the external destination(s).	
	14	Key the command *RODDP* to verify the result.	

4.3.3 INITIATE ALTERNATIVE ROUTE CHOICES TO AN EXTERNAL DESTINATION

General

Up to seven alternative route choices can be initiated to an external destination. When no free and selectable lines are available in the ordinary route choice, the lines of the alternative route are used in order to access the desired destination.

In case of IP networking, it is possible to define different alternative paths for the same H.323 route choice. It is enough to provide different IP addresses for the different choices (alternative addressing).

See also the command description for ROUTE DATA, command *RODDI*.

Prerequisites

The ordinary route choice to the external destination must be initiated.

For H.323:

- If parameter ROU is used, initiating the H.323 route data is a prerequisite see the operational directions for *IP NETWORKING, RI*. If no remote IP address was provided when initiating the H.323-specific route data, a remote IP address shall be stated now.
- If parameter DRN is used, no IP address may be stated now. Data of the routes associated to the chosen direction must have been previously initiated including their own remote IP address, see the operational directions for *IP NETWORKING, RI*.

Execution

1. Key the command *RODDI* to initiate an alternative route choice to an external destination.
2. Key the command *RODDP* to verify that the initiation was successful.

4.3.4 REMOVE AN ALTERNATIVE ROUTE CHOICE TO AN EXTERNAL DESTINATION

Execution

1. Key the command *RODDE* to remove an alternative route choice to an external destination.
2. Key the command *RODDP* to verify that the removal was successful.

4.3.5 INITIATE CUSTOMER ROUTE CHOICES TO AN EXTERNAL DESTINATION

General

Customers are permitted to have one or more of their own routes. It is also possible for customers to share routes. Customers are allowed to have alternative route choices.

Prerequisites

The ordinary route choice to the external destination must be initiated.

Execution

1. Key the command *RODDI* to initiate a customer route choice to an external destination.
2. Key the command *RODDP* and verify that the initiation was successful.

4.3.6 REMOVE CUSTOMER ROUTE CHOICES TO AN EXTERNAL DESTINATION

1. Key the command *RODDE* to remove a customer route choice to an external destination.
2. Key the command *RODDP* to verify that the removal was successful.

4.3.7 PRINT EXTERNAL DESTINATION DATA AND ALTERNATIVE ROUTING DATA

Key the commands *RODDP* and *RODRP* to obtain printouts of the external destination data and the alternative routing data, respectively.

4.4 LINES

4.4.1 INITIATE LINES

General

The line initiation command only supports initiation of lines in one LIM at the time. The number of lines supported by a LIM and the number of lines per LIM supported by a route are limited. However, a route can stretch over a number of LIMs and thus consist of a larger number of trunk lines. For more information, see the description for *CAPACITIES*.

For ISDN there is a software limitation for the number of ISDN boards (PRA, BRA, or both of them) per LIM. The practical limitation is often lower, because of limitations in the number of time slots in a LIM, and also depending on the type of magazine that is used for the board positions. There is also a limitation for the maximum number of ISDN lines in a LIM, which corresponds to eight fully initiated PRAs. For more information, see the description for *CAPACITIES*.

Prerequisites

The route must be initiated.

Order of selecting lines

Before initiating the lines, the order in which to initiate the lines must be considered. This is necessary as it is the initiation order of the lines, together with the value of the parameter SEL in the command *ROCAI*, that controls the selection of lines at an outgoing call.

For lines within a LIM the numbering of the lines are used to control the selection.

Three selection principles exist:

1) Even load, see Figure . This method means that the traffic load on the lines in a route is distributed equally between the lines in the route within a LIM (or originator gateway when possible). The line that is selected shall not be selected again until all other lines in the LIM (or originator gateway when possible) have been selected. The own LIM (or originator gateway when possible) is always searched first for a free line, using the principle described above. If no free line exists in the own LIM, the next LIM is searched in the same way.

2) Sequential selection within the own LIM, see Figure . The principle for this method of selection is that the search for a free line always starts with the route's line of the lowest order that is situated in the own LIM (or originator gateway when possible).

   When no free lines are available in the own LIM the search continues to the next LIM, which is searched in the same way. The lines of a route in a LIM shall form a continuous chain, from the lowest order line up to the highest order line. This chain is connected to the respective chain of the next LIM where the route is represented, and so on. Search for a free line always starts from the beginning of the own LIM chain and continues to the line of the highest order in the last LIM.

3) Sequential selection within a route, see Figure . The principle for this method of selection is that the search for a free line always starts with the route's first line (*First line* denotes the line of the lowest order in a route, for example, TRU=5-1). What LIM a line is situated in is not considered at selection (as in principle 1 and 2 above), so this must be considered at the initiation of the lines. All lines within the route shall form one continuous chain, from the lowest order line up to the highest order line, where search for a free line always starts from the beginning of the chain.

The principle for both-way routes shall be that the public or interworking exchange selects free lines starting from the opposite end of the chain. In this way the risk for call collision is minimized.

When a sequence order for selecting lines within a route has been decided, the lines shall be initiated into the system in the order they are to be selected at an outgoing call. The lines within a route can be divided over a number of different LIMs. The order of selection between the LIMs is controlled by the order of initiation.

The lines need not to be initiated in sequence within each LIM. By, for example, initiating the lines 24-1, 24-3, and 24-5 in LIM 24, it is possible afterwards to squeeze lines into the order of selecting lines.

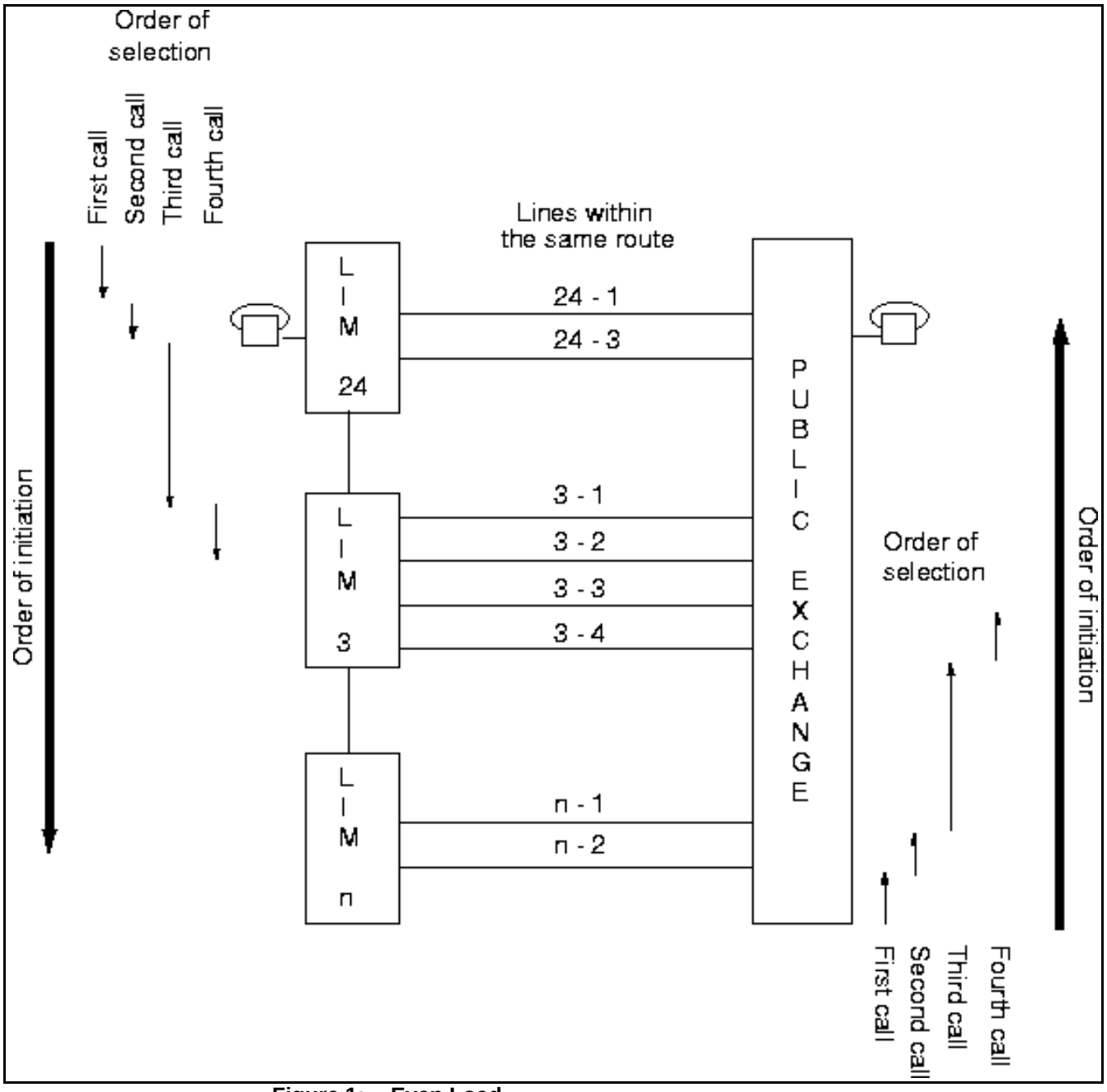


Figure 1: Even Load

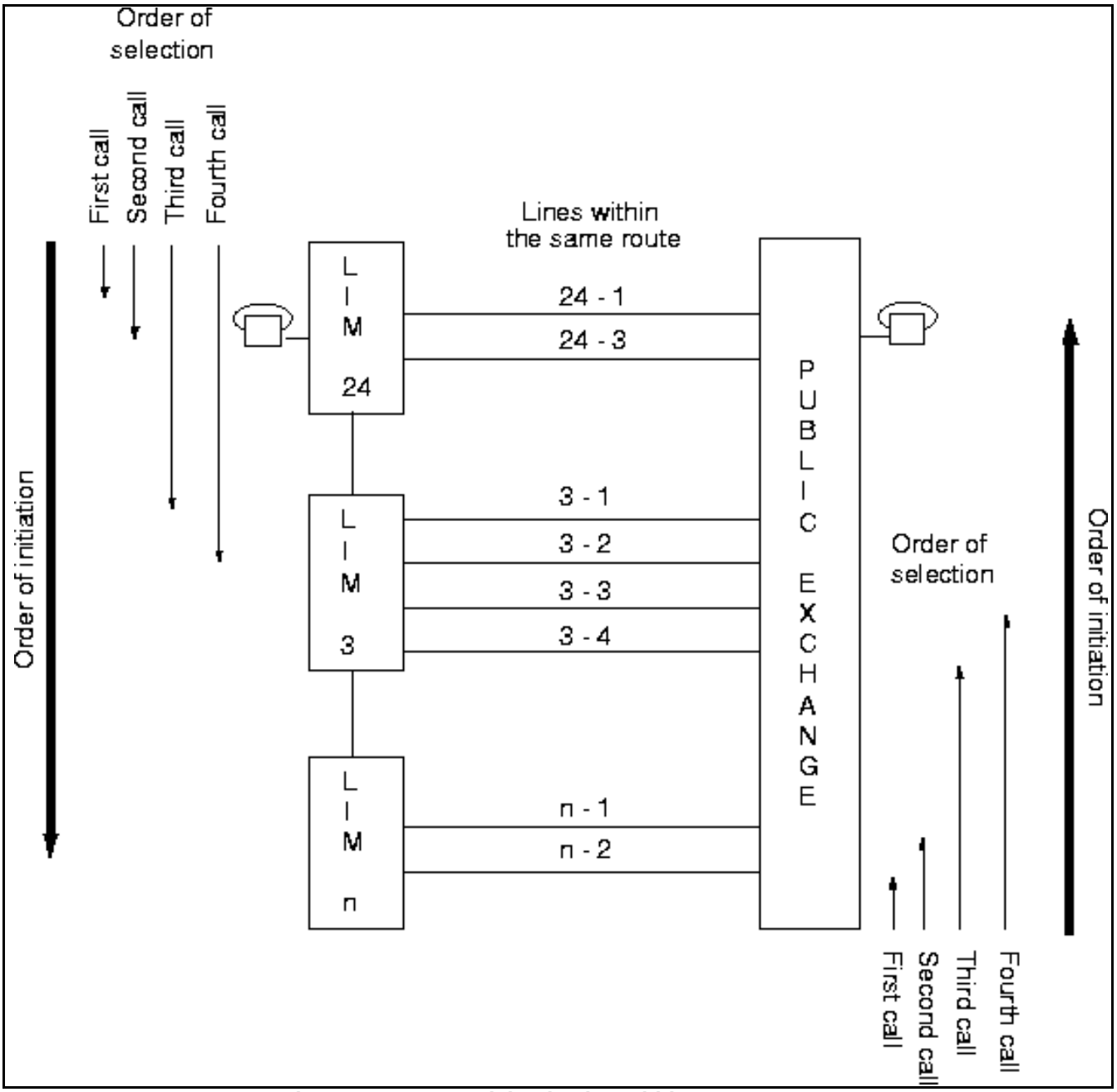


Figure 2: Sequential Selection within Own LIM

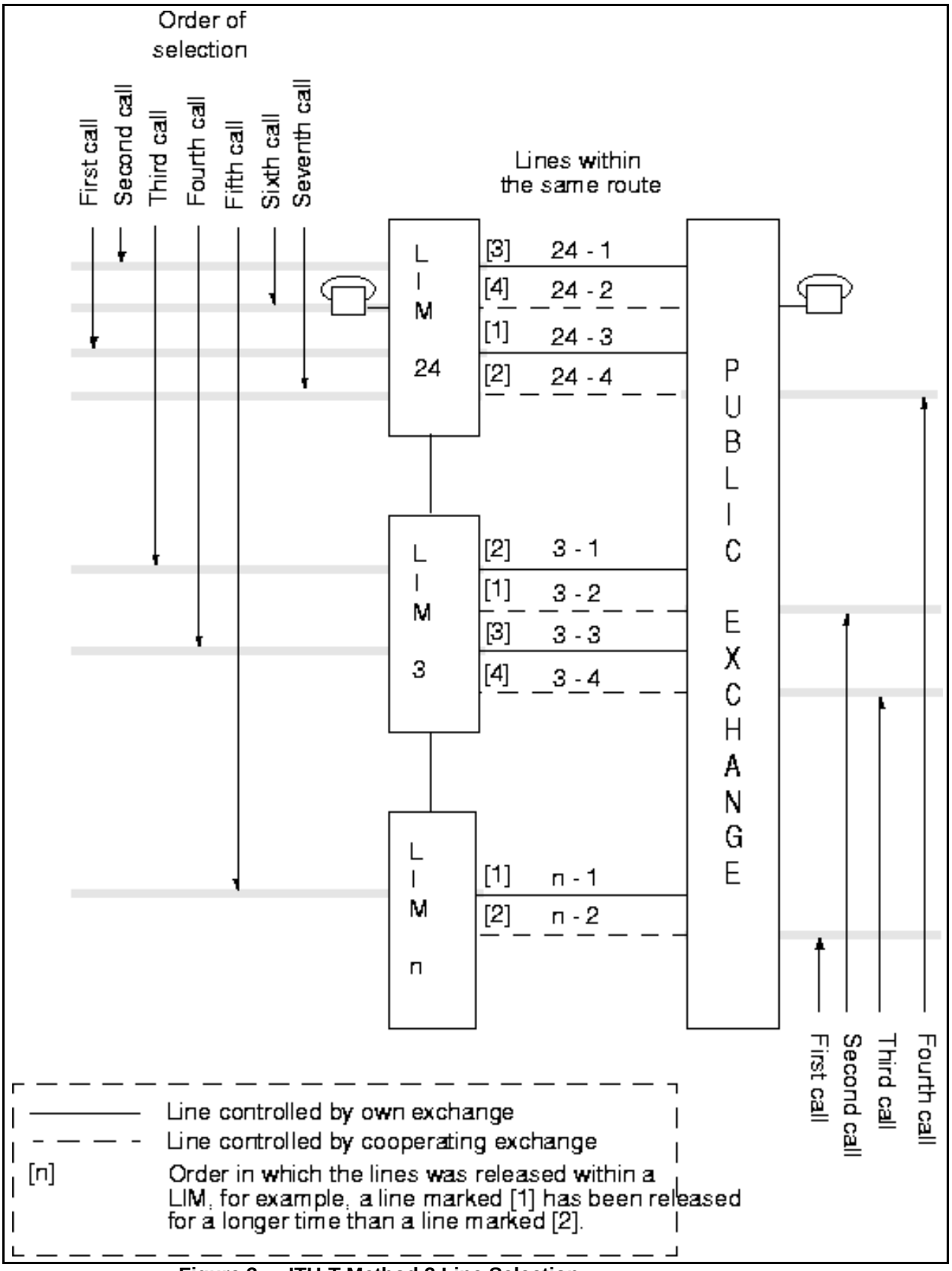


Figure 3: ITU-T Method 2 Line Selection

Execution

4.4.1.1 *H.323*

1. Key the command *ROEQI* to initiate the line.

   If the initiated lines belong to an H.323 route:

   - no EQU may be provided
   - a remote IP address may be provided, but only if a remote IP address has been provided when initiating the associated route, too

2. Key the command *ROEDP* to verify the result.

   See operational directions for *IP NETWORKING, RI*.

4.4.1.2 *SIP*

1. Key the command *ROEQI* to initiate the line.

   If the initiated lines belong to an SIP route:

   - no EQU may be provided
   - the command *sip_route* has to be entered prior to *ROEQI*

2. Key the command *ROEDP* to verify the result.

Note: Check if prefix data exists for the route, by using the ROAPP command. If prefix data exists, perform the following step after initiating the lines. If lines are initiated in a LIM where no line individuals exists for that route, the ROAPI command should be executed after ROEQI to update the prefix data for the route in that LIM.

4.4.2 REMOVE LINES

Check if the line is digital and is included in the synchronization configuration. If this is the case, see the operational directions for *ADMINISTRATOR USER'S GUIDE*.

1. Block the individual on the board to which the line is connected. Use command *block* -help.
2. Key the command *ROEQE* to remove the line.
3. Key the command *ROEDP* to verify that the removal was successful.

4.4.3 PRINT LINE DATA

Key the command *ROEDP* to obtain a printout.

4.5 DAY AND NIGHT SERVICE POSITIONS

4.5.1 INITIATE DAY AND NIGHT SERVICE POSITIONS

General

Internal day and night service position means that the answer positions that are affiliated to a route or line shall be situated in the same exchange as the answering position.

Note: When the exchange uses customer number facility and the route is defined as DID route, only customer group-dependent day and night service positions shall be stated.

Prerequisites

Route and lines must be initiated. Depending on whether an extension, PBX operator, or internal group hunting group number is to be day or night service position, these must already be initiated.

Execution

1. Key the command *RODNI* to initiate day and night service positions.
2. Key the command *RODNP* to verify that the initiation was successful.

4.5.2 REMOVE DAY AND NIGHT SERVICE POSITIONS

1. Key the command *RODNE* to remove day and night service positions.
2. Key the command *RODNP* to verify that the removal was successful.

4.5.3 ALTER DAY AND NIGHT SERVICE POSITIONS

Previously initiated day or night service positions are altered by keying command *RODNI* once again.

Key the command *RODNP* to verify that the change was successful.

4.5.4 PRINT DAY AND NIGHT SERVICE POSITIONS

Key the command *RODNP* to obtain a printout.

4.6 CALL METERING EQUIPMENT

Call metering information received from the public exchange can be available at outgoing calls both on digital and analog routes.

On digital routes, this information is transmitted over the signalling channel, there is no need for external call metering equipment.

On analog routes, the call metering information is transmitted as pulses where the frequency is either 50 Hz, 12 kHz or 16 kHz. To be able to detect these pulses, an external call metering equipment has to be connected. This is either one or several daughter boards mounted on the TLU75 board, one or several CDU boards (discontinued), or by using the TLU83/2 board that supports 12 kHz and 16 kHz metering. The commands *ROECP*, *ROECI* and *ROECE* are only valid to use together with old CDU boards.

4.6.1 INITIATION OF CALL METERING EQUIPMENT FOR EXTERNAL LINE

General

Observe that the system does not verify that all lines within a call metering route are affiliated to the call metering equipment, that is the system accepts the fact that lines

lacking call metering equipment exist despite the fact that the route is a call metering route.

Prerequisites

Route and line must be initiated. The call metering equipment and the line must be situated in the same LIM.

Execution

1. Key the command *ROCAP* to verify that the route is categorized as call metering route.
2. Verify that the relevant function block TL can use the call metering equipment.

Note: Parameter CDU will be found in the parameter description for the relevant TL function block, that will be found under Route Data, RO.

3. Connect a cable between the call metering equipment and the line.
4. Key the command *ROECI* to initiate the affiliation between the call metering equipment and the line.
5. Key the command *ROECP* to verify the result.

4.6.2 MOVING OF CALL METERING EQUIPMENT TO ANOTHER EXTERNAL LINE

1. Key the command *ROECE* to erase the call metering equipment from the previous line.
2. Move the connection cable to the new line.
3. Key the command *ROECI* to affiliate the call metering equipment to the new line.
4. Key the command *ROECP* to verify the result.

4.6.3 REMOVAL OF CALL METERING EQUIPMENT FOR AN EXTERNAL LINE

1. Key the command *ROECE* to erase the affiliation between the call metering equipment and the line.
2. Remove the connection cable between the line and the call metering equipment.
3. Key the command *ROECP* to verify the result.

4.6.4 PRINTOUT OF CALL METERING EQUIPMENT DATA

Key the command *ROECP* to obtain a printout of the equipment positions of the line and the call metering equipment.

4.7 CENTRAL ANSWERING POSITION IN NETWORK WITH ISDN/H.323 (OR SIP WITHOUT NOTIFICATION)

General

A central answering position in a network can only be initiated if the centralized operator function exists in the exchange. The order of priority between the rerouting positions for a specific route are as follows:

1. Internal day service position
2. Central, external answering positions (up to three)
3. Internal night service position

Prerequisites

Routes and lines must be initiated. The rerouting position is accessed via a common abbreviated number. The abbreviated number contains the external number of the rerouting position. The exchange numbers of all exchanges in the private network must be initiated as external destinations.

Day or night service position for a specific external line must not be initiated, as it would always have higher priority and could not be external.

4.7.1 INITIATE CENTRAL ANSWERING POSITION IN A NETWORK

1. Key *ADCOI* (command for a common abbreviated number) to initiate the number of the external rerouting position.
2. Key the command *RORNI* to initiate the external rerouting position.
3. Key the command *RORNP* to verify the result.

4.7.2 REMOVE A CENTRAL ANSWERING POSITION FROM A NETWORK

1. Key the command *RORNE* to remove the central rerouting position.

   If the last external rerouting position is to be removed, the route is released from the centralized operator function.
2. Key the command *RORNP* to verify the result.
3. Key the command *ADCOE* to remove the number of the external rerouting position.

4.7.3 CHANGE THE CENTRAL ANSWERING POSITION IN THE NETWORK

1. Key the command *RORNE* to remove the previous external rerouting position.
2. Key ADCOE to remove the number of the previous external rerouting position.
3. Key ADCOI (command for a common abbreviated number) to initiate the number of the new external rerouting position.
4. Key the command *RORNI* to initiate the new external rerouting position.
5. Key the command *RORNP* to verify the result.

4.7.4 PRINT A CENTRAL ANSWER POSITION IN A NETWORK

1. Key the command *RORNP* to obtain a printout of those central answer positions initiated for a specific route.
2. Key the command *ADCDP* for a printout of the affiliation between the numbers of external answer positions and corresponding abbreviated numbers.

4.8 CUSTOMER-CENTRALIZED OPERATOR IN AN ISDN/H.323 NETWORK (OR SIP WITHOUT NOTIFICATION)

General

Rerouting calls to the customer-centralized operator is supported only in an ISDN/H.323/SIP network and the incoming route shall have customer affiliation. Two customer-centralized operators can be specified for each customer in an exchange.

The order of priority between the rerouting positions for a specific route is as follows:

1. Internal day service position
2. Customer-centralized operators (up to two)
3. Central, external answering positions
4. Internal night service position

Note: In a VPN scenario, the number of customer-centralized operators supported depends on the number of USER INFO messages that can be sent in Service 2. If two USER INFO messages are allowed in Service 2, then only one customer-centralized operator is supported. When more than two USER INFO messages are allowed, both customer-centralized operator 1 and 2 are supported.

Prerequisites

Routes and lines must be initiated and the routes must have customer affiliation. The customer-centralized operator number is defined by a common abbreviated number. The abbreviated number contains the external number of the customer-centralized operator.

Day or night service position for a specific external line must not be initiated, as it would always have higher priority and could not be external.

4.8.1 INITIATE A CUSTOMER-CENTRALIZED OPERATOR IN A NETWORK

1. Key ADCOI (command for a common abbreviated number) to initiate the number of the customer-centralized operator.
2. Key the command *RORNI* and state parameter CUST to initiate the customer-centralized operator.
3. Key the command *RORNP* and state parameter CUST to verify the result.

4.8.2 REMOVE A CUSTOMER-CENTRALIZED OPERATOR FROM A NETWORK

1. Key the command *RORNE* and state parameter CUST to remove the customer-centralized operator.

2. Key the command *RORNP* and state parameter CUST to verify the result.
3. Key the command *ADCOE* to remove the number of the customer-centralized operator.

4.8.3 CHANGE THE CUSTOMER-CENTRALIZED OPERATOR IN THE NETWORK

1. Key the command *RORNE* and state parameter CUST to remove the previous customer-centralized operator.
2. Key ADCOE to remove the number of the previous customer-centralized operator.
3. Key ADCOI (command for a common abbreviated number) to initiate the number of the new customer-centralized operator.
4. Key the command *RORNI* and state parameter CUST to initiate the new customer-centralized operator.
5. Key the command *RORNP* to verify the result.

4.8.4 PRINT A CUSTOMER-CENTRALIZED OPERATOR IN A NETWORK

1. Key the command *RORNP* and state parameter CUST to obtain a printout of the customer-centralized operators initiated for a specific customer.
2. Key the command *ADCDP* for a printout of the affiliation between the numbers of customer-centralized operators and corresponding abbreviated numbers.

4.9 ROUTE OPTIMIZATION (PATH REPLACEMENT)

General

Route optimization between exchanges can be executed when a direct route with free lines exists between two exchanges, but when the original call is set up through another route passing a third exchange.

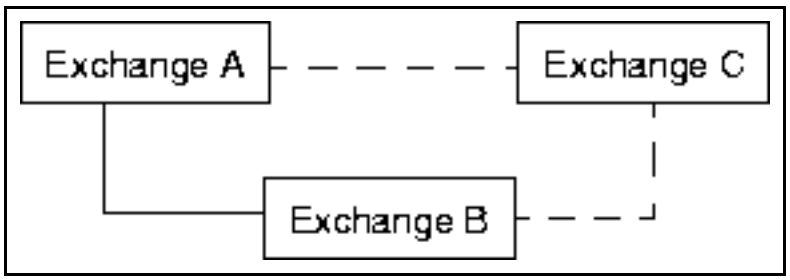
Events that can lead to route optimization:

- Extending or transfer has occurred in a third exchange
- Alternative routing
- Conference terminated with two external parties remaining.
- Extending or transfer has occurred in a third exchange

Route optimization between the exchanges means that a call from exchange A that is answered by exchange B and thereafter extended to exchange C shall utilize a direct route. In other words, the connection shall be set up directly between exchanges A and C. The route to exchange B is cleared down.

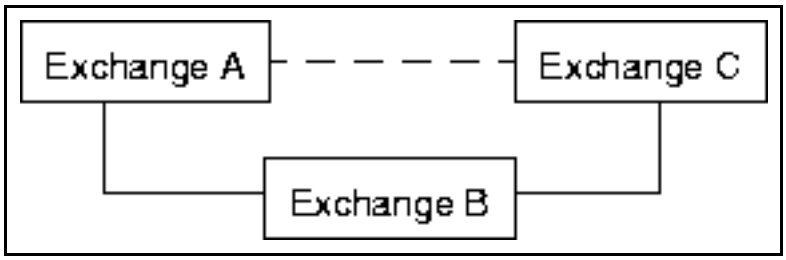
Phase 1

A connection is set up between exchanges A and B.



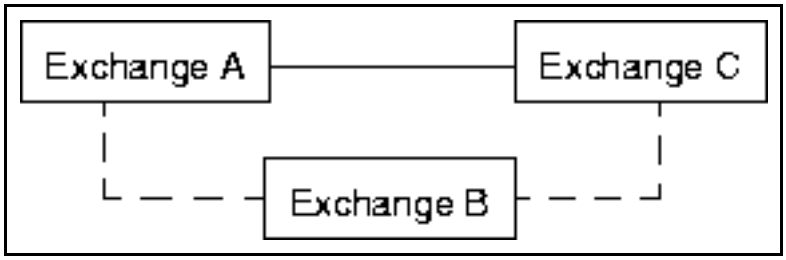
Phase 2

Exchange B calls exchange C.



Phase 3

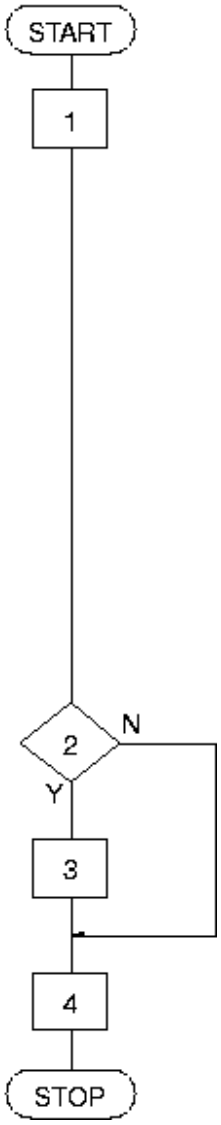
Exchange B extends the call to exchange C. A new connection is set up between exchanges A and C, and the previous connection via exchange B is cleared down.



Prerequisites

- Direct route between the exchanges.
- The exchanges belong to the same network.
- The route optimization function has been opened with the help of AS parameters.
- Conference feature exists in the exchanges. The conference hardware is located in the Media Gateway.
- The routes have been assigned categories for Common Channel Signaling (CCS).

Execution

Flow		Measure/Question	Observation/ Comment
	1	Key the command *ASPAP* to verify existing values for the following application system parameters: - Route optimization permitted/not permitted - Time delay for start of route optimization (10 s recommended) - Time delay for start of-route optimization after alternative routing. (60 s recommended) - Limit value for number of attempts after rejection (3 attempts recommended)	Initial values have been set according to the parameter list. *PARNUM=66 PARNUM=71 PARNUM=70 PARNUM=73*
	2	Are alteration(s) necessary?	If NO, proceed to step 4.
	3	Actual values of parameters are altered with command *ASPAC*.	
	4	Key the command *ASPAP* to verify the result.	

The lines are initiated in accordance with route data without any particular affiliation to route optimization.

4.10 CUSTOMER-DEPENDENT REROUTING POSITION

4.10.1 INITIATE A CUSTOMER-DEPENDENT REROUTING POSITION

General

This rerouting position is neither route nor line dependent. One rerouting position per customer for a day switched PBX and one per night switched PBX can exist. When the exchange uses customer group facility and the route is defined as DID route, only customer group dependent day and/or night service positions shall be stated.

Prerequisites

Depending on whether an extension, a PBX operator, or an internal group hunting group number is to be a day or night service position, these must be initiated.

Execution

1. Key the command *ROCDI* to initiate a customer-dependent rerouting position.
2. Key the command *ROCDP* to verify the result.

4.10.2 REMOVE A CUSTOMER-DEPENDENT REROUTING POSITION

1. Key the command *ROCDE* to remove the day and night service position.
2. Key the command *ROCDP* to verify the result.

4.10.3 ALTER A CUSTOMER-DEPENDENT REROUTING POSITION

1. Key the command *ROCDI* to alter the day and night service position.
2. Key the command *ROCDP* to verify the result.

4.10.4 PRINT A CUSTOMER-DEPENDENT REROUTING POSITION

Key the command *ROCDP* to obtain a printout.

4.11 ANSWERING POSITION FOR VACANT NUMBERS

4.11.1 INITIATE AN ANSWERING POSITION FOR VACANT NUMBERS

General

Answering position for vacant numbers is used when an incoming external call to a vacant number is to be rerouted to a common answering position. It is possible to define if B-answer signal shall be sent at rerouting due to call to a vacant number, see the command *ASPAC*, *PARNUM=146*.

Prerequisites

The route must be initiated and defined for direct in-dialling traffic. Depending on whether an extension or internal group hunting group number is to be an answering position for vacant numbers, these must already be initiated.

Execution

1. Key the command *ROVNI* to initiate the answering position for vacant numbers.
2. Key the command *ROVNP* to verify the result.

4.11.2 REMOVE AN ANSWERING POSITION FOR VACANT NUMBERS

1. Key the command *ROVNE* to remove the answering position for vacant numbers.
2. Key the command *ROVNP* to verify the result.

4.11.3 ALTER AN ANSWERING POSITION FOR VACANT NUMBERS

1. Key the command *ROVNI* to initiate the new answering position for vacant numbers.
2. Key the command *ROVNP* to verify the result.

4.11.4 PRINT AN ANSWERING POSITION FOR VACANT NUMBERS

Key the command *ROVNP* to obtain a printout.

4.12 REROUTING NUMBER FOR AN ISOLATED LIM

4.12.1 INITIATE A REROUTING NUMBER FOR AN ISOLATED LIM

General

A rerouting number for calls, receiving congestion due to isolated LIM, can be initiated in each LIM when the inter-LIM media connection is faulty. The initiated number is placed in front of the dialled number.

This feature makes it possible to call between a remote isolated LIM and the main part of the exchange or between isolated LIMs when a fault has occurred in the inter-LIM media connection. By defining the rerouting number as a route access code, the call can be routed either through the private or the public network.

A suitable configuration for this feature can be a system with remote sites with several LIMs at each site. If the remote site consists of three LIMs, the rerouting number can be a route access code to the second LIM at the remote site.

This means that the exchange can cover up to a maximum of nine LIMs using alternative route selection, because the exchange can handle up to seven alternatives to each destination. This means that to get full accessibility (reach all extensions within the remote site) the following number of tie lines are needed.

LIMs	Number of tie lines
2	1
3	3
4	6
5	10
6	15
7	21
8	28
9	36

The number of tie lines can be decreased to the cost of lower accessibility.

Prerequisites

The ordinary and alternative route to the external destination must be initiated.

Execution

1. Key the command *RORII* to initiate the rerouting number for an isolated LIM.
2. Key the command *RORIP* to verify the result.

4.12.2 REMOVE THE REROUTING NUMBER FOR AN ISOLATED LIM

1. Key the command *RORIE* to remove the rerouting number for an isolated LIM.
2. Key the command *RORIP* to verify the result.

4.12.3 ALTER THE REROUTING NUMBER FOR AN ISOLATED LIM

1. Key the command *RORIE* to remove the rerouting number for an isolated LIM.
2. Key the command *RORII* to initiate the new rerouting number for an isolated LIM.
3. Key the command *RORIP* to verify the result.

4.12.4 PRINT THE REROUTING NUMBER FOR AN ISOLATED LIM

Key the command *RORIP* to obtain a printout.

4.13 NUMBER DATA FOR THE ROUTE

4.13.1 INITIATE NUMBER DATA FOR THE ROUTE

General

The following number data can be defined for incoming routes:

- Predigits (parameter PRE). Defined per incoming route, in cases where the public or interworking exchange only can send a limited number of digits over the incoming route.
- Identity of the incoming route (parameter ROUDIR).

The following number data can be defined for outgoing routes:

- Terminating area code (parameter TERAC).
- TON, Type of **called** number (B-number). (D_2 and D_{19} in parameter ADC.) Used instead of prefix digits to indicate to the closest following exchange or network, the type of called public or private number (of the call using this destination).
- Normally, D_2 and D_{19} are set to the same value. But, if the route is used for MX-ONE Telephony System VPN (Virtual Private Network without Intelligent Network) and the public network cannot handle private TONs, the private TON shall be set in D_2 (in order to have net services) and a public TON shall be set in D_{19} (the TON to send to the public network that does not accept private TONs).

The following number data can be defined for incoming and outgoing routes:

- Exchange numbers of own exchange (parameters EXNOPU and EXNOPR). Used together with the directory number to compose the complete identity of a party in a private or public network. This complete identity is sent to the cooperating exchange at external calls.

  For **incoming** routes it is the received TON of the calling number (A-number) that determine what exchange numbers to use, when composing the complete calling identity to send to the cooperating exchange. For **outgoing** routes it is the TON of the calling number (A-number) in own exchange that determine what exchange numbers to use (D_3 and D_4 in parameter ADC). Calls to a destination with calling parties of a specific type of number, shall have a dedicated destination data record in the route choice table (parameter DEST, command RODDI) where the TON of the calling party is set. This TON both regulates what exchange numbers to use, and is sent to the cooperating exchange as TON of the calling party.

  It is important to coordinate the setting of exchange numbers in the RONDI command (EXNOPU and EXNOPR) with the setting of TON in the RODDI command (parameter ADC).

  Eight different exchange numbers may be defined, each consisting of up to five digits. Each one of the eight exchange numbers corresponds to a different Type of number (TON). The complete exchange identity is composed by adding the relevant exchange numbers to the directory number. What exchange number(s) to add is determined by the TON of the call.

Examples:

- An International number (TON=1) is composed of: Country code + Trunk code + Local code + Directory number, and can have a maximum length of 20 digits (5+5+5+5).
- A Local private number (TON=6) is composed of: Location code + Directory number, and can have a maximum length of 10 digits.
- A Level 1 Regional number (TON=7) is composed of: Location code + Directory number, and can have a maximum length of 10 digits.

Prerequisites

Routes must be initiated.

All external destinations must be initiated with the right type of number (TON) using command *RODDI*.

Execution

1. Key the command *RONDI* to initiate the number data for the route. To initiate many exchange numbers for the public network for one route, *RONDI* must be repeated for each exchange number. The same procedure applies to exchange numbers for the private network.
2. Key the command *RONDP* to verify that the initiation was successful.

4.13.2 ALTER NUMBER OF DATA FOR THE ROUTE

1. Key the command *RONDI* to alter the previously initiated number data.
2. Key the command *RONDP* to verify that the alteration was successful.

Note: Number data initiated with command RODDI cannot be altered by only use the command RODDI. First, the previous number data must be removed with command RODDE, then command RODDI is used to initiate the new number data.

4.13.3 REMOVE NUMBER DATA FOR THE ROUTE

1. Key the command *RONDE* to remove the number data for the route.
2. Key the command *RONDP* to verify that the removal was successful.

4.13.4 PRINT NUMBER DATA FOR THE ROUTE

Key the command *RONDP* to obtain a printout of the number data for the route.

4.14 PUBLIC EXCHANGE NUMBER PER LIM

4.14.1 INITIATION OF PUBLIC EXCHANGE NUMBER PER LIM

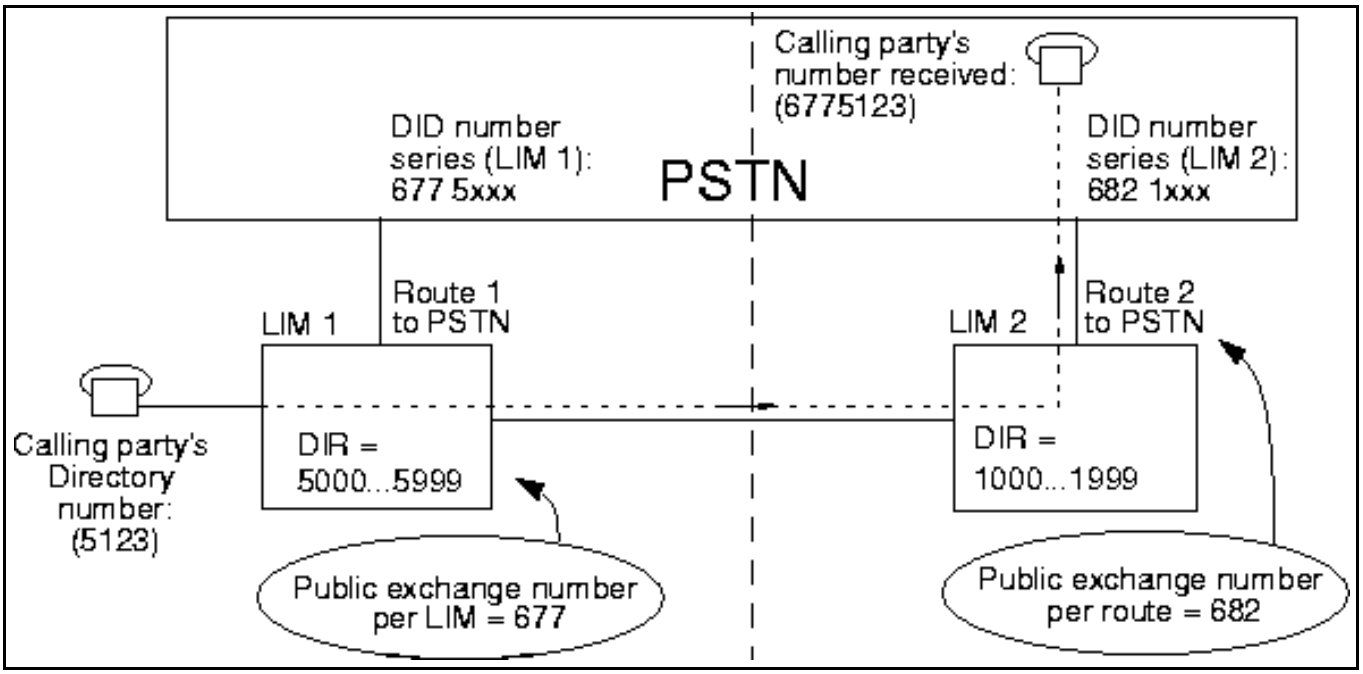
General

Public exchange numbers are used to prefix the directory number of a calling party. Together, these numbers compose a complete identity of the calling party in the public network. This calling party identity is sent to the public exchange at external calls.

The exchange numbers to add to the directory number are normally the exchange numbers that have been initiated for the public route (RONDI) used for the external call, **but** for a call that originates in a LIM situated in another geographical area than the route to the PSTN, the public exchange numbers initiated for the route will not be correct. When these are used a faulty calling party identity (the correct directory number but prefixed with for example a faulty area and location code) will be forwarded to the called party.

As a solution to this situation there is the possibility to initiate public exchange numbers per LIM (*route_data_common*) for the calling party remote LIM. At an external call the route will first check if there are any public exchange numbers per LIM initiated for the calling party, if there are these will override the public exchange numbers per route initiated for the public route.

Example



- When calling from extension 5123 to a subscriber in the PSTN, the calling party number forwarded to the called party is 6775123.
- In this example, the call is routed via LIM 2 where it uses public route 2 to the PSTN.
- If no public exchange number per LIM is initiated for LIM 1, the public exchange number per route (682) initiated for route 2 will be used. The result will be that the faulty calling party number 6825123 is forwarded.
- If the public exchange number per LIM (677) is initiated for LIM 1, this will override the public exchange number per route (682) initiated for route 2. The result will be that the correct calling party number 6775123 is forwarded.

Prerequisites

Routes must be initiated.

Execution

1. Key the command *route_data_common -i* to initiate a public exchange number for a LIM.

Note: To initiate many exchange numbers for one LIM, *route_data_common -i* must be repeated for each exchange number.

2. Key the command *route_data_common -p* to verify the result.

4.14.2 DELETION OF A PUBLIC EXCHANGE NUMBER PER LIM

1. Initiated public exchange number per LIM can be removed by keying the command *route_data_common -e*.
2. Key the command *route_data_common -p* to verify the result.

4.14.3 PRINTOUT OF PUBLIC EXCHANGE NUMBER PER LIM

Key the command *route_data_common -p* to obtain a printout.

4.15 PREFIXING OF RECEIVED CALLING NUMBER

4.15.1 INITIATE A CALLING NUMBER PREFIX

General

It is possible to initiate prefixes to be used for calling numbers received on specific routes. The function is only used in transit or gateway exchanges.

This functionality is required when the incoming calling number shall be transited to some kind of backbone network where identical calling numbers might be received from different exchanges. Here it is necessary to use prefixes so that the backbone network can distinguish otherwise identical calling numbers from each other. A unique calling number is necessary for billing and for further routing purposes.

The prefixes are applicable for both public and private calling numbers.

Prerequisites

Routes must be initiated.

Execution

1. Key the command *ROAPI* to initiate calling number prefixes.
2. Key the command *ROAPP* to verify that the initiation was successful.

4.15.2 ALTER THE PREFIXES OF A RECEIVED CALLING NUMBER

1. Initiated prefixes are altered by keying command *ROAPI* once again.
2. Key the command *ROAPP* to verify that the change was successful.

4.15.3 REMOVE THE PREFIXES OF A RECEIVED CALLING NUMBER

1. Key the command *ROAPE* to remove calling number prefixes.
2. Key the command *ROAPP* to verify that the removal was successful.

4.15.4 PRINT THE PREFIXES OF A RECEIVED CALLING NUMBER

Key the command *ROAPP* to obtain a printout of initiated calling number prefixes.

4.16 FACILITIES RESTRICTION LEVEL/TRAVELLING CLASS MARK

4.16.1 INITIATE FRL ON OUTGOING ROUTES

General

The FRL/TCM feature makes it possible to selectively restrict use of the private network as well as overflow to the public network. Each calling party (for example, a voice or data extension or incoming route) is assigned a Facilities Restriction Level (FRL) which is passed through the private network from one node to another as the user's Travelling Class Mark (TCM). In addition, each route choice within a direction to a given external destination in the private network is also assigned an FRL when initiated.

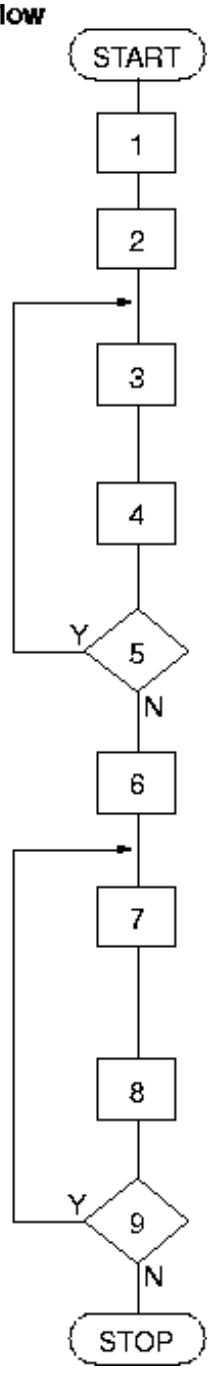
To be permitted to use a specific route choice, the FRL of the calling party must be higher or equal to the FRL assigned to the route choice.

Note: FRL/TCM is not used for restriction purposes in the originating exchange, as opposed to Priority routing. Apart from this, the two features are very much alike. See also the parameter description for APPLICATION SYSTEM parameter PARNUM=106.

FRL/TCM is available for H.323 and ISDN.

Execution

Flow



	Measure/Question	Observation/ Comment
1	Key the commands *EXCAP*, *extension_profile -p* and *ROCAP* to print the FRLs of the calling parties.	See parameter *--ext-roc* in the command *extension_profile -p*.
2	Key the command *RODIP* to print out the existing directions.	
3	Key the command *RODII* to set an FRL on an outgoing route within a direction.	
4	Key the command *RODIP* to verify the result.	
5	Are there any more outgoing routes to set FRL on?	If YES, return to step 3.
6	Key the command *RODDP* to print out existing external destinations.	
7	Key the command *RODDI* to initiate the direction with defined FRLs as route choice to a destination.	Use the parameter DRN in command *RODDI*.
8	Key the command *RODDP* to verify the result.	
9	Are there any more direction with defined FRLs to initiate as route choice to a destination?	If YES, return to step 7.

4.16.2 REMOVE FRL FROM AN OUTGOING ROUTE

General

Consider that the direction with FRL routes can be initiated as route choice to more than one external destination. If this is the case, the influence on these other external destinations has to be taken care of.

Prerequisites

A direction must be initiated as route choice to an external destination.

Execution

1. Key the command *RODDP* to see if the direction with FRL routes is initiated as route choice to more than one external destination.
2. Key the command *RODDE* to remove the direction as route choice to an external destination.
3. Key the command *RODIE* to remove the direction.
4. Key the commands *RODDP* and *RODIP* to verify the result.

4.16.3 ALTER FRL ON AN OUTGOING ROUTE

General

Consider that the direction with FRL routes can be initiated as route choice to more than one external destination. If this is the case the influence on these other external destinations has to be taken care of.

Prerequisites

A direction must be initiated as route choice to an external destination.

Execution

1. Key the command *RODDP* to see if the direction with FRL routes is initiated as route choice to more than one external destination.
2. Key the command *RODIE* to remove the previous FRL value.
3. Key the command *RODII* to set a new FRL value for the route in the direction.
4. Key the command *RODIP* to verify the result.

4.16.4 PRINT FRL ON OUTGOING ROUTES

Prerequisites

A direction must be initiated as route choice to an external destination.

Execution

1. Key the command *RODDP* to see which direction an external destination uses as route choice.
2. Key the command *RODIP* to print out the FRL values of the routes in the direction.

4.17 PRIORITY DISCONNECT OF TRUNK CALLS

4.17.1 INITIATE THE PRIORITY DISCONNECT FEATURE

General

The Priority Disconnect feature makes it possible to automatically let prioritized calls disconnect lower priority calls in case of trunk resource congestion, and thus succeed despite a congestion situation. The function will of course affect other calls, that will be forced to disconnect, and the users of those disconnected calls will experience it as a malfunction of the voice telephony, if not informed of the function.

Each call (primarily from voice extensions or incoming routes) is assigned a priority routing category called FRL/TCM (see previous section), which will be interpreted as a Call Service Information (CSI), with three levels; Emergency, Priority and Routine. In addition there are “Normal/Administrator calls”, without CSI.

The call priority can be set either by CoS for the originator, or be assigned on per call basis, if that function is activated by O&M personnel. The later option requires the AS parameter 74 to be appropriately set, and also requires dedicated common abbreviated numbers to be initiated.

The CSI is used in a single node, but also passed through the private network (specific MFC tie-lines, DPNSS, ISDN, H.323 or SIP) from one node to another. The CSI is conveyed as FRL/TCM values via tie-lines.

When a call with CSI is attempted, and meets congestion, the CSI of the new call is checked towards the CSI of an ongoing call, in order to determine if a Priority Disconnect can be done. A call with lowest priority will be disconnected.

A call with CSI Emergency is allowed to do priority disconnect on all other trunk calls, except on other Emergency class calls.

A call with CSI Priority is allowed to do Priority Disconnect on Priority, Routine and Normal calls.

A call with CSI Routine is allowed to do Priority Disconnect on other Routine and on Normal calls.

Note: The CSI is in this case used as a kind of “forced release” CoS, and not as a restriction to access trunk resources, as the CSIU described below.

Execution

1. Key the command *ASPAC* parameter 74 to enable the Priority Disconnect function. There is also in the same parameter an option to change the ring cadence for analog extensions, see the operational directions for *APPLICATION SYSTEM PARAMETERS*.
2. Key the command *ASPAP* to verify the change.
3. Initiate common abbreviated numbers that match the three CSI levels, if the dynamic CSI on per call basis is wanted. For details, see operational directions for *ABBREVIATED DIALLING*.

   ## (H'BB) equals FRL/TCM value 7, and CSI Emergency. (Highest priority)

   *# (H'AB) equals FRL/TCM value 6, and CSI Priority.

   ** (H'AA) equals FRL/TCM value 5, and CSI Routine. (Lowest priority)

4.17.2 REMOVE THE PRIORITY DISCONNECT FEATURE

General

As described for Initiate the Priority Disconnect feature.

Prerequisites

Priority Disconnect is enabled, but should be disabled/removed.

Execution

1. Key the command *ASPAC* parameter 74 to disable the Priority Disconnect function.
2. Key the command *ASPAP* to verify the removal.

4.17.3 PRINT PRIORITY DISCONNECT SETTINGS

Prerequisites

The Priority Disconnect feature is supported by the system, but may be either enabled or not.

Execution

1. Key the command *ASPAP* with parameter 74 to check the Priority Disconnect settings.

4.18 PRIORITY ROUTING

4.18.1 INITIATE CSIU ON OUTGOING ROUTES

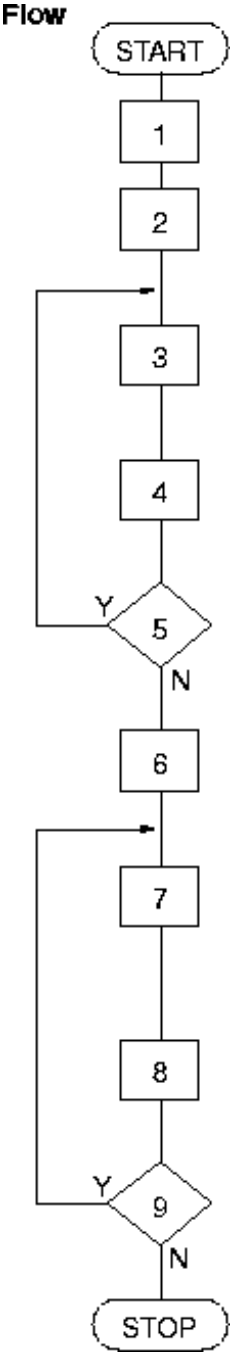
General

The priority routing feature makes it possible to selectively restrict use of the private network as well as overflow to the public network. Each calling party (for example, voice extension or incoming route) is assigned a priority routing category called Call Service Information (CSI) which is passed through the private network from one node to another. In addition, each route choice defined for a given destination in the private network is assigned an authorization list called Call Service Information Users (CSIU).

When a call over a given route is attempted, the CSI of the calling party is checked towards the CSIU of the selected route in order to deny or allow access to the selected route.

Note: CSI is used for restriction purposes in the originating exchange, as opposed to FRL/TCM. Apart from this, the two features are very much alike.

Execution

Flow		Measure/Question	Observation/ Comment
	1	Key the commands *EXCAP*, and *ROCAP* to print out the CSIs of the calling parties.	
	2	Key the command *RODIP* to print out the existing directions.	
	3	Key the command *RODII* to set a CSIU on an outgoing route within a direction.	
	4	Key the command *RODIP* to verify the result.	
	5	Are there any more outgoing routes to set CSIU on?	If YES, return to step 3.
	6	Key the command *RODDP* to print out existing external destinations.	
	7	Key the command *RODDI* to initiate the direction with defined CSIUs as route choice to a destination.	Use the parameter DRN in command *RODDI*.
	8	Key the command *RODDP* to verify the result.	
	9	Are there any more direction with defined CSIUs to initiate as route choice to a destination?	If YES, return to step 7.

4.18.2 REMOVE CSIU FROM AN OUTGOING ROUTE

General

Consider that the direction with CSIU routes can be initiated as route choice to more than one external destination. If this is the case the influence on these other external destinations has to be taken care of.

Prerequisites

A direction with CSIU routes must be initiated as route choice to an external destination.

Execution

1. Key the command *RODDP* to see if the direction with CSIU routes is initiated as route choice to more than one external destination.
2. Key the command *RODDE* to remove the direction as route choice to an external destination.
3. Key the command *RODIE* to remove the direction.
4. Key the commands *RODDP* and *RODIP* to verify the result.

4.18.3 ALTER CSIU FOR AN OUTGOING ROUTE

General

Consider that the direction with CSIU routes can be initiated as route choice to more than one external destination. If this is the case the influence on these other external destinations has to be taken care of.

Prerequisites

A direction with CSIU routes must be initiated as route choice to an external destination.

Execution

1. Key the command *RODDP* to see if the direction with CSIU routes is initiated as route choice to more than one external destination.
2. Key the command *RODIE* to remove the previous CSIU value.
3. Key the command *RODII* to set a new CSIU value for the route in the direction.
4. Key the command *RODIP* to verify the result.

4.18.4 PRINT CSIU FOR OUTGOING ROUTES

Prerequisites

A direction with CSIU routes must be initiated as route choice to an external destination.

Execution

1. Key the command *RODDP* to see which direction an external destination uses as route choice.
2. Key the command *RODIP* to print out the CSIU values of the routes in the direction.

4.19 FAULT STATISTICS ON DIGITAL EXTERNAL LINES

Faults that occur during transmission on a digital external line board can be collected for statistical purposes.

Only boards with the fault counter services can be used in this command, namely: TLU76 (DPNSS/DASS indexes /2 and /12 only) and TLU77 (ISDN T1).

4.19.1 CHANGE OF FAULT COUNTERS BY ZERO SETTING

General

Before starting a new fault collection of a digital board, all the fault counters on that board should be set to zero. The zero setting time is stored as a reference.

Prerequisites

-

Execution

Key command ROFCC to reset the fault counters of a digital board.

4.19.2 PRINTOUT OF FAULT COUNTER DATA

General

The behavior of a digital board can be verified by printing out its fault counters which are accumulated from the last reset. The resetting time is also printed for reference.

Prerequisites

-

Execution

Key command ROFCP to print the fault counters of a digital board.

4.20 PRINT THE VACANT NUMBERS

General

Before initiating external destinations, a printout of all vacant numbers (of a specified number type and within specified limits) can be obtained. Numbers that may be of interest are numbers initiated as -numbertype = ed, ec, and pd (in the *number_initate* command).

Execution

Key the command *vacant_number* to obtain a printout of all vacant numbers of a specified number type.

4.21 PRINT THE FREE EQUIPMENT POSITIONS

General

Before initiating external lines to a route, a list of available equipment positions for the required type of line (TL type) should be printed out.

Prerequisites

The relevant TL type must exist in the system.

Execution

Key the command *resource_status* to obtain a printout of free equipment positions for a specific TL type.

4.22 PRINT THE INITIATED EQUIPMENT POSITIONS

General

The command *resource_status* can be used to find all TL boards in a LIM. The printout will show the type of board that is initiated for each equipment position in the LIM. The printout can be reduced to only show TL boards of a specific type.

The command resource_status can also be used to look at a specific equipment position, to find out what external lines (and the routes they belong to) that are affiliated to that equipment position.

Execution

Key the command *resource_status* to obtain a printout of initiated equipment positions.

4.23 NAME ON ROUTE

General

-

4.23.1 INITIATE NAME ON ROUTE

1. Key the command *name -i* to initiate name on routes.
2. Key the command name -p to verify that the initiation was successful.

4.23.2 REMOVE NAME ON ROUTE

1. Key the command *name -e* to remove name on routes.
2. Key the command name -p to verify that the initiation was successful.

4.23.3 PRINT NAME ON ROUTE

Key the command *name -p* to obtain a printout.

5 TERMINATION

If a route access code for external traffic is altered then the instance (person) responsible for the PBX is to be informed.

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