



## ***Mobile Communications***

---



**EDACS™ Jessica  
PBX Gateway**

---

**MD110 Configuration Manual**

## TABLE OF CONTENTS

1. INTRODUCTION .....	3
2. INTERFACES AND REQUIREMENTS .....	5
2.1. EDACS INTERFACE .....	5
2.2. PSTN/PBX INTERFACE.....	5
2.3. EXTENSION INTERFACE.....	6
2.4. SYSTEM ADMINISTRATOR INTERFACE.....	6
2.5. HARDWARE REQUIREMENTS.....	6
2.6. SOFTWARE REQUIREMENTS .....	7
3. LIM CONFIGURATION FOR PUBLIC NETWORK CONNECTION .....	8
3.1. NUMBER ANALYSIS.....	15
3.2. TRAFFIC MATRIX .....	18
3.3. PUBLIC NETWORK LCR .....	20
3.4. ANALOG TEST EXTENSIONS .....	21
3.5. COMMON ABBREVIATED DIALING NUMBERS .....	22
3.6. AUTHORIZATION CODES .....	23
3.7. T1 MARKET ROUTES .....	24
3.8. E1 MARKET ROUTES .....	36
4. LIM CONFIGURATIONS FOR PRIVATE NETWORK CONNECTIONS .....	39
4.1. PRIVATE NETWORK ROUTES .....	39
5. DIRECT INBOUND RADIO CALLS IN A PBX NETWORK .....	43
6. INDIRECT INBOUND RADIO CALLS IN A PBX NETWORK.....	45
7. DID TO ALL EDACS RADIOS.....	49
8. MANUAL DTMF DIALING BY RADIOS .....	50
APPENDIX A MD110 QUESTIONNAIRE .....	A-1

This manual is published by **Ericsson GE Mobile Communications Inc.**, without any warranty. Improvements and changes to this manual necessitated by typographical errors, inaccuracies of current information, or improvements to programs and/or equipment, may be made by **Ericsson GE Mobile Communications Inc.**, at any time and without notice. Such changes will be incorporated into new editions of this manual. No part of this manual may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, for any purpose, without the express written permission of **Ericsson GE Mobile Communications Inc.**

## 1. INTRODUCTION

This manual contains configuration information for the Ericsson MD110 Private Branch Exchange (PBX) when used in the Jessica PBX Gateway. The MD110 is configured via FIOL, which is provided by Ericsson.

This manual includes references to both T1 and E1 (digital telephone signaling). In some places the notation 23/30 is used; the 23 indicates the number of T1 voice channels and the 30 indicates the number of E1 voice channels. The configuration and installation of the MD110 are covered in the Ericsson documentation. Ericsson GE provides a section on configuration guidelines in this document and also provides a sample configuration disk. Jessica is not a local interconnect system associated with single-site EDACS systems. For information on local interconnect, refer to LBI-38513.

Additional information for Jessica can be found in the following publications:

- LBI-39000, EDACS Jessica PBX Gateway Systems Manual
- LBI-39001, EDACS Jessica PBX Gateway Operator's Manual
- LBI-39040, EDACS Jessica PBX Gateway PBX Interface User's Manual
- LBI-39080, EDACS Jessica PBX Gateway Operator's Manual (Quick Reference Guide)

For background information on the MD110 please reference the following Ericsson MD110 Documentation:

- LZTU 106 1250, MD110 Technical Product Description, BC6
- LZBU 106 100, MD110 Customer Library -- Small Basic, BC6

Basic knowledge of PBXs, and the MD110 in particular, is assumed.

The MD110 PBX is a subsystem of Jessica. The MD110 PBX is the interface to the public switched telephone network (PSTN). It provides analog or digital trunks to the PSTN or to another PBX. Digital and analog PBX extensions can be connected to the MD110. An E1/T1 ISDN trunk, from the MD110 to the PBX Interface (PI), provides connection to EDACS. The Direct Inward System Access (DISA) feature allows PSTN users to call the MD110, receive a second dial tone, enter an authorization code, and then dial a radio much like a PBX extension places an external call.

### NOTE

To bypass DISA, the customer must sign a waiver to obtain a software patch from Ericsson. These arrangements can be made through an Ericsson GE sales representative.

EDACS radio to PSTN calls are direct inward dial (DID) calls into the MD110, which are routed to the PSTN. EDACS radio to PBX extension calls are DID calls into the MD110, which are connected to an extension. A Least-Cost Routing (LCR) code is used to direct calls out of the PBX to the PSTN. The LCR code precedes the dialed number, such as the "9" typically used in North America to access an outside line. The LCR code is used by both radio and PBX users. LCR provides for routing based on the number dialed. It can modify numbers when necessary by inserting or deleting digits. It will wait for sufficient digits before passing them to a route, and will intercept invalid called numbers. In some cases, LCR will route manually entered digits from the PSTN callers that represent a radio ID. In many cases, External Destination codes are used instead of LCR codes to route calls to a radio.

The MD110 provides the following features:

- Analog or digital interfaces to the PSTN or another PBX.
- Routing of PSTN-originated calls to EDACS or to MD110 extensions.
- Routing of EDACS-originated calls to the PSTN or to MD110 extensions.
- The ability to dial any radio ID from the PSTN with analog end-to-end signaling.
- Dialing restrictions on calls from EDACS or MD110 extensions.
- Direct inward dialing to radios.

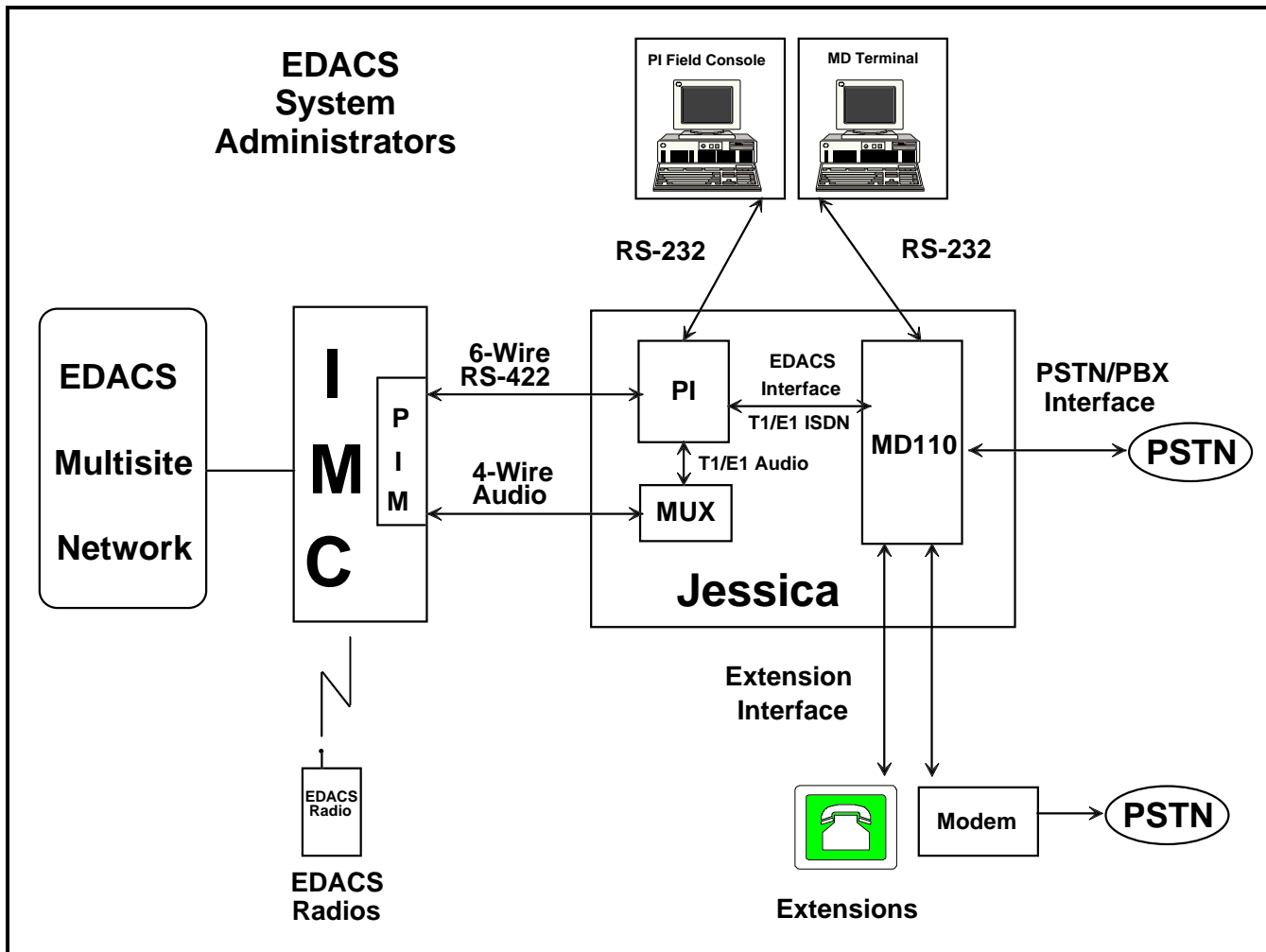


Figure 1 - MD110 used in Jessica Application

## 2. INTERFACES AND REQUIREMENTS

### 2.1. EDACS INTERFACE

An EDACS-originated call appears to the MD110 as an incoming DID call from an external T1/E1 ISDN trunk. One external T1/E1 ISDN trunk is dedicated to EDACS; it is a TLU-63/1 (T1) or TLU-64/1 (E1) board in the MD110. This allows 23/30 simultaneous calls.

- For calls to the PSTN, the number begins with an LCR code.
- For calls to MD110 extensions, the number is the extension number.

### 2.2. PSTN/PBX INTERFACE

A PSTN-originated call appears to the MD110 as an incoming trunk call. This interface can be analog or digital, and it can be a CO, DID, or a tie trunk. A PBX-originated call appears to the MD110 as an incoming trunk call. This interface can be analog or digital, and it can be a tie trunk.

#### Minimum Requirements for the PSTN/PBX Trunks

- The ability to perform end-to-end tone signaling while in the connected state.
- The ability to properly send and receive call clearing signals.
- DID to radios requires trunks capable of passing dialed digits to the MD110.

Trunks or lines with forward and backward line clearing are highly recommended. See the explanation below.

With Line Clearing	Without Line Clearing
When the Network hangs up, the interconnect call will clear and free interconnect and radio resources.	When the Network hangs up, the radio must clear the interconnect call or let it clear due to hang-time expiration or conversation limit expiration to free interconnect and radio resources. This problem would be very significant for full duplex calls, since the user must clear the call or the call will clear only after the conversation limit expiration.

With B-Answer	Without B-Answer
<ul style="list-style-type: none"> <li>• Radios will hear IMC-generated ringback for outbound calls.</li> <li>• Ringing duration on outbound calls will be limited to 30 seconds by the PI.</li> <li>• In applications where billing is performed, the customer will not be billed unless the called party answers.</li> </ul>	<ul style="list-style-type: none"> <li>• Radios will hear MD110 or Network ringback for outbound calls.</li> <li>• Ringing duration on outbound calls will not be limited by the PI.</li> <li>• In applications where billing is performed, the customer will be billed for calls even if the called party does not answer.</li> </ul>

T1 or E1 tie trunks are highly recommended for connecting the MD110 to another PBX.

Calls to EDACS require DISA access and the radio ID, and may require an LCR code. Calls to MD110 extensions require an extension number.

## 2.3. EXTENSION INTERFACE

An extension-originated call appears to the MD110 as a local extension call. This interface can be analog or digital.

Call requirements are as follows:

- Calls to EDACS may require an LCR code followed by the radio ID.
- Calls to the PSTN require an LCR code followed by the PSTN number.
- Calls to MD110 extensions require an extension number.

## 2.4. SYSTEM ADMINISTRATOR INTERFACE

The system administrator is an RS-232 serial communication port; the PC or terminal can configure, test, troubleshoot, and monitor alarm conditions in the MD110.

Ericsson's standard PC-based communications software is FIOL. It is a DOS-based program included with PC Softdisk (PCSD) software. PCSD is an Ericsson MD110 file structure emulator for a PC. It allows the MD110 to utilize a PC's hard drive through a small computer systems interface (SCSI).

## 2.5. HARDWARE REQUIREMENTS

The MD110 requires a minimum hardware configuration, which is modified according to customer requirements. The MD110 is ordered by defining the number and type of trunks, extensions, etc. The Jessica MD110 requires one ISDN trunk interface for connecting to the PI. The customer determines the PSTN interface requirements and voice/data extension requirements. The following configuration is for an MD110 model /50, less PSTN trunk interfaces.

### 2.5.1. Minimum Configuration

The minimum configuration for the MD110 is as follows:

Item	Quantity	Description
LPU-4	1	LIM Processor Unit
MEU-5/1	1	Memory Equipment Unit
LSU	1	LIM Switch Unit
DSU	3	Distributed Switch Unit
TSU-T	1	Tone Sender Unit
TRU-3	1	Tone Receiver Unit
REU	1	Ringling Equipment Unit
IPU	1	Input Unit
HDU2/2	1	Hard Drive Unit
SCU	1	SCSI Controller Unit for external PC
TLU-63/1 or TLU-64/1	1	T1/E1 ISDN Trunk Board
ELU23	1	Extension Line Unit
MPU	1	Multi-Party Unit
ALU-1	1	Alarm Unit
SIU	1	Serial Interface Unit
LFU	1	Line Filter Unit for ALU-1
LFU-7	1	Line Filter Unit for TLU-63/1 or TLU-64/1
LFU-12	1	Line Filter Unit for ELU23

Item	Quantity	Description
SFU	2	Serial Filter Unit for IPU and SIU
PFU4	1	Power Filter Unit
PFU4DC	3	Power Filter Unit
Rectifier and Power Converters	1	Set of items
Battery Backup	1	Lead acid batteries
System Specification	1	LIM HW and SW configuration
Basic Customer Library	1	Documentation
MD110 Technician Training	1	Provided by EBC
Software Support Contract	1	Provided by EBC

### **2.5.2. Redundancy/Fault Tolerance**

Since the MD110 provides a redundant control system option, the following information could be added for increased reliability:

Item	Quantity	Description
LPU-4	1	LIM Processor Unit
MEU-5/1	1	Memory Equipment Unit
LSU	1	LIM Switch Unit
DSU	3	Distributed Switch Unit

### **2.5.3. Application-Specific Hardware**

Items are added based on requirements for the PSTN trunks, SMDR (call information logging reports), voice mail, operators, etc. The MD110 Technical Product Description contains information on the many possibilities.

## **2.6. SOFTWARE REQUIREMENTS**

The MD110 requires the use of BC 6.2.1G software or later. This software includes the country-specific program units that are provided when ordered for the appropriate country. PC Softdisk software is required for external system backup and software updates. An alternative to PC Softdisk is a second hard drive unit (HDU) which is used for software backup, but it does not provide for software updates. There are two patches to the basic software that pertain to Jessica.

Item	Quantity	Description
BC 6.2.1G	1	LIM system software.
PCSD	1	PC Softdisk software for the external PC. This includes FIOL for MD110 configuration.
Patch 34180	1	EZDISA - eliminates Authorization Code requirement for inbound interconnect calls.
Patch 34745	1	Necessary if T1 Bothway Ground Start trunks are used for inbound interconnect calls.

### 3. LIM CONFIGURATION FOR PUBLIC NETWORK CONNECTION

This Jessica configuration provides telephone interconnect between EDACS and the PSTN. It includes a minimum number of analog extensions for testing. If the customer requires connection of Jessica to another PBX, or wishes to use the MD110 as the business PBX, this configuration may be significantly altered. Pointers for customizing the MD110 for these cases are in a later section.

The following organization is used for the Public Network configuration and the PBX Network configuration described in a later section. The rationale is to make the Trunk Call Discrimination (TCD), Traffic Matrix Group (TMG) and Common Abbreviated Dialing (CAD) categories the same number for particular groups in the system. This simplifies the MD110 administrator's task. These are explained in detail later along with the Route and LCR choices.

#### TCD, TMG, and CAD CATEGORY

	<b>TCD</b>	<b>TMG</b>	<b>CAD</b>
Extensions	0	0	0
EDACS Routes	1	1	1
Private Network Routes	2	2	2
Public Network Routes	3	3	3

#### NOTE

- Inserting entries into TCD or TMG Category 15 allows maximum privileges, which can result in telephone fraud.
- If any extension groups with different calling privileges are added, it is recommended that their TCD or TMG category should begin at 5 and use 6, 7, 8, ...
- If any additional EDACS, Private Network, or Public Network Routes (trunk groups) with different calling privileges are added, begin at 14 and use 13, 12, 11, ...
- It is unlikely that many of these options will be added, and minimizing the number of these categories will simplify the MD110 administrator's task.
- CAD only contains 4 classes.

#### ROUTES

	<b>Route Number</b>	<b>External Destination Code</b>
EDACS	10-19	670-679
Private Network	20-29	680-689
Public Network	30-39	690-699

#### LCR

	<b>Number</b>
EDACS	7
Private Network	8
Public Network	9

#### EDACS Number Plan

00001-16382	LID	
20000-22047	GID	"2" prefix indicates GID
300001-316382	Digital LID	"3" prefix indicates digital
320000-322047	Digital GID	"3" prefix indicates digital "2" prefix indicates GID

The following script file is meant to be a basis for configuring the MD110. This script file must be customized for your application. FIOLE can send a completed script file to a LIM with a clean software load (no configuration).

After the file is sent and a dump (save) to the MD110's Hard Drive Unit (HDU) is performed, the script file can not be used to change the configuration. If the dump has not been performed, a power cycle of the MD110 will clear the configuration from RAM and another updated script file can be sent.

Once the MD110 configuration has been dumped (saved), MD110 commands must be entered to end (erase) configuration information and initiate (enter) configuration. These commands are order-sensitive and require the use of the MD110 Operation and Maintenance ACS, MD110 Operation and Maintenance SES, Documents for Applications Systems "Whatever Country," and Least-Cost Routing manuals.

Configuring the MD110 is not recommended for someone with no PBX configuration experience or MD110 training. The recommended training includes an MD110 Introduction, Extension Programming, Trunk Programming, and Traffic Management courses. Ericsson provides condensed manuals to attendees of these training courses.

```

/*****
/*   Description:      JESSICA MD110 Configuration Script File           */
/*   File Name:       JESS_MD.TXT                                       */
/*   Version:         0.02                                             */
/*   Date:            10-December-93                                    */
/*****

/*****
/*   NUMBER ANALYSIS                                             */
/*****
/*****
/*   Least Cost Routing                                         */
/*****
NANSI:NUMTYP=LC, NUMSE=9;

/*****
/*   External Destination                                       */
/*****
NANSI:NUMTYP=ED, NUMSE=0&&3&&670&&699;

/*****
/*   DISA                                                         */
/*****
NANSI:NUMTYP=DI, NUMSE=5000;

/*****
/*   Extensions                                                 */
/*****
NANSI:NUMTYP=EX, NUMSE=4000&&4099;

/*****
/*   Common Abbreviated Dialing                                  */
/*****
NANSI:NUMTYP=AC, NUMSE=4100&&4999;

```

```
/*
Number Analysis TCD
*/
NACDS:NUM=0,CDCAT=0&2&3;
NACDS:NUM=1,CDCAT=0&2&3;
NACDS:NUM=2,CDCAT=0&2&3;
NACDS:NUM=3,CDCAT=0&2&3;
NACDS:NUM=4,CDCAT=0&1&2&3;
NACDS:NUM=500,CDCAT=2&3;
NACDS:NUM=9,CDCAT=0&1;
```

```
/*
Number Analysis External Number Length
*/
NANLS:EXL=0,MIN=5,MAX=5;
NANLS:EXL=1,MIN=5,MAX=5;
NANLS:EXL=2,MIN=5,MAX=5;
NANLS:EXL=3,MIN=6,MAX=6;
NANLS:EXL=690911,MIN=6,MAX=6;
```

```
/*
TRAFFIC MATRIX
*/
Traffic
TCMAS:CON=T,A=0,B=0&1&2&3;
TCMAS:CON=T,A=1,B=0&2&3;
TCMAS:CON=T,A=2,B=0&1;
TCMAS:CON=T,A=3,B=0&1;
```

```
/*
Conference
*/
TCMAS:CON=C,A=0,B=0&1&2&3;
TCMAS:CON=C,A=1,B=0&2&3;
TCMAS:CON=C,A=2,B=0&1;
TCMAS:CON=C,A=3,B=0&1;
```

```
/*
PUBLIC NETWORK LCR
*/
Public Network LCR ENT Table
LCDDI:TAB=ENT,ENTRY=911,PRE=690,CONF=N;
LCDDI:TAB=ENT,ENTRY=9911,TRC=1,PRE=690,CONF=N;
```

```

/*****
/*   Public Network LCR NLT Table                               */
/*****

/*****
/*   Public Network LCR FDT Table                               */
/*****
LCDDI:TAB=FDT,FRCT=30,PRE=690,TZONE=1;

/*****
/*   Public Network LCR DNT1 Table                             */
/*****

/*****
/*   Public Network LCR DNT2 Table                             */
/*****

/*****
/*   LCR Default Routing                                       */
/*****
LCLDI:LIM=1,AC=XXX,DEST=690;

/*****
/*   ANALOG EXTENSIONS                                         */
/*****
/*****
/*   Common Class of Service Categories                         */
/*****
EXCCS:CAT=0,TRAF=00000000,SERV=00021207,CDIV=00000,ROC=0230;

/*****
/*   Analog Extension Equipment                               */
/*****
EXTEI:DIR=4001&&4008,CAT=0,EQU=1-X-XX-0,TYPE=EL6,TRM=0,ICAT=0000,ADC=000000000;

/*****
/*   COMMON ABBREVIATED DIALING                               */
/*****
/*****
/*   Extensions & EDACS to Public Network                     */
/*****
ADCOI:ABB=4XXX,TRA=9XXXX,CLASS=0&1;

/*****
/*   Extensions & Public Network to EDACS                     */
/*****
ADCOI:ABB=4XXX,TRA=XXXXX,CLASS=0&3;

```

```
/* AUTHORIZATION CODE */
AUCOI:AUTH=XXXX,CILCOD=XXXX,CAT=XX,CHECK=NO;
```

```
/* PI-MD110 ISDN ROUTE T1 */
/* Class */
ROCAI:ROU=10,SEL=011000010000,TRM=7,SERV=3100030010,TRAF=01010101,SIG=111110100031,B
CAP=1111;
```

```
/* Data */
RODAI:ROU=10,TYPE=SL63,VARC=00000000,VARI=00000003,VARO=000000B7;
```

```
/* Equipment */
ROEQI:ROU=10,TRU=1-1&&1-23,EQU=1-X-XX-0,INDDAT=000000000000;
```

```
/* External Destination Code */
RODDI:DEST=0,ROU=10,ADC=1000000000025,SRT=1;
RODDI:DEST=1,ROU=10,ADC=1000000000025,SRT=1;
RODDI:DEST=2,ROU=10,ADC=1000000000025,SRT=1;
RODDI:DEST=3,ROU=10,ADC=1000000000025,SRT=1;
```

```
/* PI-MD110 ISDN ROUTE E1 ECMA/ETSI */
/* Class */
ROCAI:ROU=10,SEL=011000010000,TRM=7,SERV=3100030010,TRAF=01010101,SIG=111110100031,B
CAP=1111;
```

```
/* Data */
RODAI:ROU=10,TYPE=SL60,VARC=00000000,VARI=00000000,VARO=003F0000;
```

```

/*****
/*      Equipment                                          */
/*****
ROEQI:ROU=10,TRU=1-1&&1-15,EQU=1-X-XX-1;
ROEQI:ROU=10,TRU=1-16&&1-30,EQU=1-X-XX-17;

/*****
/*      External Destination Code                          */
/*****
RODDI:DEST=0,ROU=10,ADC=1000000000025,SRT=1;
RODDI:DEST=1,ROU=10,ADC=1000000000025,SRT=1;
RODDI:DEST=2,ROU=10,ADC=1000000000025,SRT=1;
RODDI:DEST=3,ROU=10,ADC=1000000000025,SRT=1;

/*****
/*      Public Network T1 DID Trunk without B-answer supervision  */
/*      NORTH AMERICA                                          */
/*****
/*      Class                                                */
/*****
ROCAI:ROU=3X,SEL=010000010000,TRM=7,SERV=3000030100,TRAF=03030303,SIG=011010000000,B
CAP=0011;

/*****
/*      Data                                                  */
/*****
RODAI:ROU=3X,TYPE=TL45,VARC=00000001,VARI=00000006;

/*****
/*      Equipment                                          */
/*****
ROEQI:ROU=3X,TRU=1-1&1-X,EQU=1-X-XX-X,INDDAT=00000000000E;

/*****
/*      Public Network T1 Bothway Ground Start Trunk without B-answer  */
/*      NORTH AMERICA                                          */
/*****
/*      Class                                                */
/*****
ROCAI:ROU=3X,SEL=011000010000,TRM=7,SERV=3100030100,TRAF=03030303,SIG=111010000000,B
CAP=0011;

/*****
/*      Data                                                  */
/*****
RODAI:ROU=3X,TYPE=TL45,VARC=00000002,VARI=00000006,VARO=00000003;

```

```

/*****
/*      Equipment                                          */
/*****
ROEQI:ROU=3X,TRU=1-1&&1-X,EQU=1-X-XX-X,INDDAT=0000000000E;

```

```

/*****
/*      External Destination Code                          */
/*****
RODDI:DEST=690,ROU=3X,ADC=0000000000025,SRT=4;

```

```

/*****
/*      Inbound Call Routing                              */
/*****
RODNI:ROU=3X,DAY=5000,NIG=5000;

```

```

/*****
/*      Public Network Analog CO Trunks without B-answer  */
/*      NORTH AMERICA                                    */
/*****
/*      Class                                             */
/*****
ROCAI:ROU=3X,SEL=011000010000,TRM=6,SERV=3100030100,TRAF=03030303,SIG=111010000000,B
CAP=0011;

```

```

/*****
/*      Data                                              */
/*****
RODAI:ROU=3X,TYPE=TL1,VARC=00000006,VARI=00000002,VARO=0000000D;

```

```

/*****
/*      Equipment                                          */
/*****
ROEQI:ROU=3X,TRU=1-1&&1-X,EQU=1-X-XX-0;

```

```

/*****
/*      External Destination Code                          */
/*****
RODDI:DEST=690,ROU=3X,ADC=0000000000025,SRT=4;

```

```

/*****
/*      Inbound Call Routing                              */
/*****
RODNI:ROU=3X,DAY=5000,NIG=5000;

```

### 3.1. NUMBER ANALYSIS

NANSI reserves number series within the MD110.

#### 3.1.1. Least-Cost Routing Code

The LCR code for calls to the PSTN is defined as “9” in the MD110.

- Outbound radio calls prefix the Public Network number with this digit.
- MD110 extension calls to the Public Network prefix the Public Network number with this digit.

#### NANSI

NUMTYP	LC	Least-Cost Routing Code
NUMSE	9	

#### 3.1.2. External Destination Code

External destination codes are defined in the MD110.

#### NANSI

NUMTYP	EX	External Destination Code
NUMSE	0&&3& 670&&699	0-3 route calls to EDACS. 670-699 are used by LCR for EDACS, Private Network, or Public Network call routing.

#### 3.1.3. Direct Inward System Access Code

The Direct Inward System Access (DISA) feature allows Public Network users to call the MD110 with a common public number, receive a second dial tone, and dial an EDACS radio.

DISA requires analog end-to-end signaling from the caller and across the Public Network. The trunks or lines connecting to DISA should provide line clearing.

#### NANSI

NUMTYP	DI	Direct Inward System Access
NUMSE	5000	

#### 3.1.4. Extension Numbers

Extension numbers are defined as the range from 4000 to 4099.

#### NANSI

NUMTYP	EX	Extension
NUMSE	4000&&4099	Numbers 4000-4099 are for extension use

#### 3.1.5. Common Abbreviated Dialing

Common Abbreviated Dialing (CAD) numbers are defined as the range from 4100 to 4999.

#### NANSI

NUMTYP	AC	Abbreviated Calling
NUMSE	4100&&4999	Numbers 4100-4999 are for CAD use

**3.1.6. TCD Category**

**TCD CATEGORY**

Extensions	0
EDACS Routes	1
Private Network Routes	2
Public Network Routes	3

**EDACS Number Plan**

00001-16382	LID	
20000-22047	GID	"2" prefix indicates GID
300001-316382	Digital LID	"3" prefix indicates digital
320000-322047	Digital GID	"3" prefix indicates digital "2" prefix indicates GID

These entries allow TCD Categories to dial certain numbers.

**NACDS**

<b>NUM</b> Number	0	Possible first digit of inbound radio call
<b>CDCAT</b> TCD Category allowed to dial NUM	0&2&3	Extension, Private Network, and Public Network

This entry is repeated for 1, 2, and 3.

**NACDS**

<b>NUM</b> Number	4	Possible first digit of extension or CAD number
<b>CDCAT</b> TCD Category allowed to dial NUM	0&1&2&3	Extension, EDACS, Private Network, and Public Network

**NACDS**

<b>NUM</b> Number	500	First digits of DISA number used for inbound radio call
<b>CDCAT</b> TCD Category allowed to dial NUM	2&3	Private Network and Public Network

**NACDS**

<b>NUM</b> Number	9	LCR code for Public Network
<b>CDCAT</b> TCD Category allowed to dial NUM	0&1	Extension and EDACS

**3.1.7. External Number Length**

These entries allow dialing the EDACS radio ID directly after receiving EZDISA dial tone during inbound calls.

**NANLS**

<b>EXL</b> External Number	0	First Digit of EDACS LID
<b>MIN</b> Minimum length	5	
<b>MAX</b> Maximum Length	5	

**NANLS**

<b>EXL</b> External Number	1	First Digit of EDACS LID
<b>MIN</b> Minimum length	5	
<b>MAX</b> Maximum Length	5	

**NANLS**

<b>EXL</b> External Number	2	Prefix for EDACS GID
<b>MIN</b> Minimum length	5	
<b>MAX</b> Maximum Length	5	

**NANLS**

<b>EXL</b> External Number	3	Prefix for Digital EDACS LID or GID
<b>MIN</b> Minimum length	6	
<b>MAX</b> Maximum Length	6	

This entry is used in North America for 911, which the LCR ENT table exits from LCR and forwards to Number Analysis.

**NANLS**

<b>EXL</b> External Number	690911	Public Network Destination code + 911
<b>MIN</b> Minimum length	6	
<b>MAX</b> Maximum Length	6	

**3.2. TRAFFIC MATRIX**

**TMG CATEGORY**

Extensions	0
EDACS Routes	1
Private Network Routes	2
Public Network Routes	3

**NOTE**

- Inserting entries in TMG 15 allows unrestricted connections and may result in telephone fraud.
- Allowing the Public Network or the Private Network to connect to themselves or each other may result in telephone fraud.
- Ericsson assumes no responsibility for telephone fraud resulting from the actions described above.

**3.2.1. Traffic Connections**

**TCMAS**

<b>CON</b> Connection Type	T	Traffic
<b>A</b> A-Party	0	Extensions
<b>B</b> B-Party	0&1&2&3	Extensions, EDACS, Private Network, and Public Network

**TCMAS**

<b>CON</b> Connection Type	T	Traffic
<b>A</b> A-Party	1	EDACS
<b>B</b> B-Party	0&2&3	Extensions, Private Network, and Public Network

**TCMAS**

<b>CON</b> Connection Type	T	Traffic
<b>A</b> A-Party	2	Private Network
<b>B</b> B-Party	0&1	Extensions and EDACS

**TCMAS**

<b>CON</b> Connection Type	T	Traffic
<b>A</b> A-Party	3	Public Network
<b>B</b> B-Party	0&1	Extensions and EDACS

**3.2.2. Conference Connections**

Only MD110 extensions can initiate a conference call.

**TCMAS**

<b>CON</b> Connection Type	C	Conference
<b>A</b> A-Party	0	Extensions
<b>B</b> B-Party	0&1&2&3	Extensions, EDACS, Private Network, and Public Network

**TCMAS**

<b>CON</b> Connection Type	C	Conference
<b>A</b> A-Party	1	EDACS
<b>B</b> B-Party	0&2&3	Extensions, Private Network, and Public Network

**TCMAS**

<b>CON</b> Connection Type	C	Conference
<b>A</b> A-Party	2	Private Network
<b>B</b> B-Party	0&1	Extensions and EDACS

**TCMAS**

<b>CON</b> Connection Type	C	Conference
<b>A</b> A-Party	3	Public Network
<b>B</b> B-Party	0&1	Extensions and EDACS

**3.3. PUBLIC NETWORK LCR**

The first two entries apply only in North America and may not apply at all locations.

**LCDDI**

<b>TAB</b> Table	ENT	External Number Table
<b>ENTRY</b> Number	911	911
<b>PRE</b> Prefix	690	Public Network External Destination Code
<b>CONF</b> Conflict Number	NO	

**LCDDI**

<b>TAB</b> Table	ENT	External Number Table
<b>ENTRY</b> Number	9911	Public Network LCR + 911
<b>TRC</b> Truncate	1	One digit
<b>PRE</b> Prefix	690	Public Network External Destination Code
<b>CONF</b> Conflict Number	NO	

This entry is for normal Public Network call routing.

**LCDDI**

<b>TAB</b> Table	FDT	Fictitious Destination Table
<b>FRCT</b> Fictitious Route Choice	30	
<b>PRE</b> Prefix	690	Public Network External Destination Code
<b>TZONE</b> Time Zone	1	

This entry is for default LCR call routing -- calls that LCR does not know how to route.

**LCLDI**

<b>LIM</b>	1	
<b>AC</b> LIM 1 Area Code	XXX	XXX must be entered in the script file
<b>DEST</b> External Destination Code	6XX	Public Network External Destination Code for numbers for which LCR has no entries. XX must be entered in the script file and will be 90 if these numbers should go to the Public Network. If these numbers should be blocked, enter a number between 91 and 99 (691-699) which has no routes (trunk groups) assigned.

This entry is for default LCR call routing -- calls that LCR does not know how to route.

**LCLDI**

<b>LIM</b>	1	
<b>AC</b> LIM 1 Area Code	XXX	XXX must be entered in the script file
<b>DEST</b> External Destination Code	6XX	Public Network External Destination Code for numbers for which LCR has no entries. XX must be entered in the script file and will be 90 if these numbers should go to the Public Network. If these numbers should be blocked, enter a number between 91 and 99 (691-699) which has no routes (trunk groups) assigned.

The remainder of the entries are customer-specific. A text file to edit should be available from Ericsson in any county in which it is present.

**3.4. ANALOG TEST EXTENSIONS****3.4.1. Common Class of Service Categories**

Common Class of Service 0 is used for the MD110 test extensions.

Setting TCD or TMG to 15 results in maximum dialing privileges for the category of service.

**EXCCS**

<b>CAT</b>	0	
<b>TRAF</b>		
CAD Class	00	
TCD Category Night Mode	00	
TCD Category Day Mode	00	
Traffic Matrix Group	00	
<b>SERV</b>		
ACD Supervisor	0	No
Emergency Switching	0	No
Intrusion	02	Reception of call waiting tone allowed
DID	1	Can be a DID extension
Automatic Callback	2	Allowed toward extensions and trunks
Call Waiting Tone	07	Permitted to send CWT Can receive CWT from extension, operator, or DID trunk
<b>CDIV</b>		
Rerouting	0	Permitted on incoming calls
Do Not Disturb	0	Not allowed
External Call Forwarding	0	Not allowed
Diversion	00	All calls (Individual answer point required)
<b>ROC</b>		
FRL/TCM	0	Default level
Account Code	2	Never required
LCR Threshold	3	All routes allowed
Priority Routing	0	Normal extension

**3.4.2. Extension Equipment**

Extensions are initiated with the command EXTEI, and 4001 through 4008 are initialized.

**EXTEI**

<b>DIR</b>	4001&&4008	
<b>CAT</b>	0	
<b>EQU</b>		
<b>LIM</b>	1	
Magazine	X	X must be entered in the script file
Board Position	XX	XX must be entered in the script file
Board Individual	0	
<b>TYPE</b>		EL6
<b>TRM</b>		
Transmission Category	0	No attenuation or amplification
<b>ICAT</b>		
Instrument Class	000	EL6 analog
Instrument type	0	Hookflash capable, normal intercept tone and normal ringing
<b>ADC</b>		
Bearer services	0	Speech and 3.1 KHz
CLI request	0	Not requested
CLI presentation	0	Allowed
Call metering	0	Not in US (Per route)
Malicious call trace	0	Not in US
Manual message waiting	0	Not allowed
Transfer outgoing calls	0	Not allowed to accept transferred or to transfer outgoing external calls
Authorization code	0	Does not need to match extensions
Network affiliation	0	Common public number sent to network

**3.5. COMMON ABBREVIATED DIALING NUMBERS**

Common Abbreviated Dialing (CAD) numbers are common speed dial numbers. An extension's or route's CAD class determines which CAD numbers it may use. The CAD classes are assigned as follows:

**CAD CLASS**

Extensions	0
EDACS Routes	1
Private Network Routes	2
Public Network Routes	3

**3.5.1. Extensions and EDACS to Public Network**

**ADCOI**

<b>ABB</b> Abbreviated number	4XXX	XXX must be entered in the script file and will be between 100 and 999
<b>TRA</b> Translated number	9XXXX	XXXX must be entered in the script file and will be between 1 and 19 digits
<b>CLASS</b>	0&1	Allowed for Extensions and EDACS to Public Network

### 3.5.2. Extensions and Public Network to EDACS

These CAD numbers may be used to provide DID to up to 1000 radios. The maximum number of CAD numbers in a system is 1000. Any CAD numbers used for extensions and EDACS to the Public Network reduce the number available for DID to EDACS. The Public Network must DID the number defined by ABB (Abbreviated number). The number defined by TRA is the radio number. Another method to provide DID to all radios without using CAD is described herein.

#### EDACS Number Plan

00001-16382	LID	
20000-22047	GID	"2" prefix indicates GID
300001-316382	Digital LID	"3" prefix indicates digital
320000-322047	Digital GID	"3" prefix indicates digital "2" prefix indicates GID

#### ADCOI

<b>ABB</b> Abbreviated number	4XXX	XXX must be entered in the script file and will be between 100 and 999
<b>TRA</b> Translated number	XXXXX	XXXXX must be entered in the script file and will be between 5 and 6 digits
<b>CLASS</b>	0&3	Allowed for Extensions and Public Network to EDACS

### 3.6. AUTHORIZATION CODES

#### EZDISA Access

- Requires software patch 34180.
- Inbound interconnect calls to the DISA number allow dialing a radio without entering an Authorization Code.
- An Authorization Code can allow greater calling privileges. Normally, this feature is not used.

#### DISA Access

- Inbound interconnect calls to the DISA number require an Authorization Code before dialing a radio.

#### Creating Authorization Codes that have a Common Class of Service

1. Allow CAD numbers to the Public Network.
2. Have TMG that allow connection to the Public Network.
3. Have TCD Category that allows dialing of Public Network LCR codes or Public Network External Destination codes.
4. May result in telephone fraud if the codes are used by unauthorized callers.

#### AUCOI

<b>AUTH</b> Authorization Code	XXXX	XXXX must be entered in the script file and will be 1 to 7 digits in length, with the first digits being other than 0
<b>CILCOD</b> Call Information Logging Number	XXXX	XXXX must be entered in the script file and will be 1 to 6 digits
<b>CAT</b> Common Class of Service Category	XX	XX must be entered in the script file and will be 0 to 63; the Common Class of Service category must be defined
<b>CHECK</b>	NO	Code does not have to match extension

**3.7. T1 MARKET ROUTES**

**3.7.1. PI-MD110 ISDN Route T1**

**3.7.1.1. Route Class**

**ROCAI**

<b>ROU</b>	10	
<b>SEL</b>		
DID characteristics	0	No intercept
Incoming calls	1	Allowed
Outgoing trunk selection	1	Even load distribution
Terminal route characteristics (outgoing)	0	Normal route
Alternate Route Selection (incoming)	0	Permitted
Customer affiliation	00	No tenant group
Virtual network calls	1	No
Malicious call tracing	0	No
Default FRL category	0	Lowest level
Default CSI category	0	Normal extension
Receipt of FRL	0	No TCM received
<b>TRM</b>		
Transmission Category	7	Digital CO or DID trunk
<b>SERV</b>		
Call waiting and intrusion	3	CWT sent/received and intrudable
Automatic callback	1	Allowed
Type of trunks	0	CO or DID
Call metering	0	No
Paging	0	No
LCR threshold	3	Unrestricted
Release line trunk	0	No
CLI presentation	0	Controlled by extension COS
Request of CLI	1	Controlled by extension COS
Number conversion	0	No
<b>TRAF</b>		
CAD Class	01	
TCD Category Night Mode	01	
TCD Category Day Mode	01	
Traffic Matrix Group	01	

**ROCAI (Cont.)**

<b>SIG</b>		
Dial tone	1	Dial tone is provided by the CO
Line clearing forward	1	Received
Line clearing back	1	Received
Answer supervision	1	Yes
Ringing supervision	1	Yes
Operator supervision	0	No
Ringback tone	1	Generated by PBX
Through-connection	0	Through-connection after minimum digits End-of-selection after time-out, LCR number length or called party answers
Tandem call control	0	Controlled in every PBX (ARS allowed)
Tandem call digit transmission	0	Through-connection and end-of-selection after line seizure
Signal type	3	ISDN
NET services	1	Tie line with COS for net service facilities
<b>BCAP</b>		
64 Kbits unrestricted	1	Yes
64 Kbits restricted	1	Yes
3.1 KHz audio	1	Yes
Speech	1	Yes

**3.7.1.2. Route Data****RODAI**

<b>ROU</b>	10	
<b>TYPE</b>	SL63	TLU-63 board
<b>VARC</b>		
Constant	00000	
Characteristics	0	Does not send ring tone No overlap receiving Trunk with signaling No reanswer service for incoming traffic
Constant	0	
Type	0	PRI ISDN
<b>VARI</b>		
Constant	0000000	
Type	3	AT&T 5ESS ISDN
<b>VARO</b>		
Constant	000000	
Characteristics	B	Restart interface one channel at a time No fixed connection between B-channel and trunk line Outgoing call has priority at collision Acting as network side
User Services	7	User info service 3 (in active state) User info service 2 (before active state) User info service 1 (user-user info element)

**3.7.1.3. Route Equipment****ROEQI**

<b>ROU</b>	10	
<b>TRU</b>		
LIM-Trunk	1-1&&1-23	
<b>EQU</b>		
LIM	1	
Magazine	X	This information must be entered in the script file.
Board position	XX	This information must be entered in the script file.
Board Individual	0	
<b>INDDAT</b>		
Constant	0000000000	
Characteristics	0	B8ZS, ESF, LAPD

**3.7.1.4. External Destination Codes****RODDI**

<b>DEST</b>	0	Destination code
<b>ROU</b>	10	
<b>ADC</b>		
Trunk seizure	1	After minimum number length
Number type	0	Unknown
Number series	0	Variable length
Network	0	Not fiber optic or TNS
Release	0	First party release
Backward signaling	0	Send from first digit
Terminating and transit seizure	0	Send terminate seizure signal
Off-hook Queuing threshold	0	No threshold
Expensive route warning tone	0	No ERWT
LCR accessibility	0	Accessible by all callers
Traveling Class Mark	0	Not sent
Return block	25	Limit on transit exchanges
<b>SRT</b>	1	Start digit for outgoing calls

External Destination Codes 1, 2, and 3 are identical to 0.

### 3.7.2. Public Network Routes

Trunks or lines with forward and backward line clearing are highly recommended. See the explanation below.

With Line Clearing	Without Line Clearing
When the Network hangs up, the interconnect call will clear and free interconnect and radio resources.	When the Network hangs up, the radio must clear the interconnect call or let it clear due to hang-time expiration or conversation limit expiration to free interconnect and radio resources. This problem would be very significant for full duplex calls, since the user must clear the call or the call will clear only after the conversation limit expiration.

With B-Answer	Without B-Answer
<ul style="list-style-type: none"> <li>Radios will hear IMC-generated ringback for outbound calls.</li> <li>Ringling duration on outbound calls will be limited to 30 seconds by the PI.</li> <li>In applications where billing is performed, the customer will not be billed unless the called party answers.</li> </ul>	<ul style="list-style-type: none"> <li>Radios will hear MD110 or Network ringback for outbound calls.</li> <li>Ringling duration on outbound calls will not be limited by the PI.</li> <li>In applications where billing is performed, the customer will be billed for calls even if the called party does not answer</li> </ul>

Following are configurations for trunks connecting the MD110 to the Public Network. Complete and use if applicable; otherwise delete them.

#### 3.7.2.1. North America T1 DID Trunk

##### With Line Clearing and Without B-Answer

A DID trunk can connect the caller to DISA, provided a DID number is the MD110 DISA number. Other DID numbers can be used to provide direct dialing to a radio with a public network number. The DID number must be translated to a radio LID or GID with Common Abbreviated Dialing (CAD). CAD entries are limited to 1000.

##### 3.7.2.1.1. Route Class

###### ROCAI

<b>ROU</b>	3X	This information must be added to the script file and X will be 0-9. Make the first Public Network route 30.
<b>SEL</b>		
DID characteristics	0	No intercept
Incoming calls	1	Allowed
Outgoing trunk selection	0	Blocked for outgoing calls
Terminal route characteristics (outgoing)	0	Normal route
Alternate Route Selection (incoming)	0	Permitted
Customer affiliation	00	No tenant group
Virtual network calls	1	No
Malicious call tracing	0	No
Default FRL category	0	Lowest level
Default CSI category	0	Normal extension
Receipt of FRL	0	No TCM received

**ROCAI (Cont.)**

<b>TRM</b>		
Transmission Category	7	Digital CO or DID trunk
<b>SERV</b>		
Call waiting and intrusion	3	CWT sent/received and intrudable
Automatic callback	0	Not allowed
Type of trunks	0	CO or DID
Call metering	0	No
Paging	0	No
LCR threshold	3	Unrestricted
Release line trunk	0	No
CLI presentation	1	Not allowed
Request of CLI	0	Not allowed
Number conversion	0	No
<b>TRAF</b>		
CAD Class	03	
TCD Category Night Mode	03	
TCD Category Day Mode	03	
Traffic Matrix Group	03	
<b>SIG</b>		
Dial tone	0	Dial tone not sent
Line clearing forward	1	Received
Line clearing back	1	Received
Answer supervision	0	No
Ringing supervision	1	Yes
Operator supervision	0	No
Ringback tone	0	A-party receives from B-party
Through-connection	0	Through-connection after minimum digits End-of-selection after time-out, LCR number length or called party answers
Tandem call control	0	Controlled in every PBX (ARS allowed)
Tandem call digit transmission	0	Through-connection and end-of-selection after line seizure
Signal type	0	Dial pulse or DTMF
NET services	0	No net service facilities
<b>BCAP</b>		
64 Kbits unrestricted	0	No
64 Kbits restricted	0	No
3.1 KHz audio	1	Yes
Speech	1	Yes

### 3.7.2.1.2. Route Data

#### RODAI

<b>ROU</b>	3X	This information will match the entry under ROCAI.
<b>TYPE</b>	TL45	BTU-45 trunk
<b>VARC</b>		
Constant	0000000	
Characteristics	1	Common Control CO DID
<b>VARI</b>		
Constant	0000000	
Characteristics	6	DTMF Wink PTS

### 3.7.2.1.3. Route Equipment

#### ROEQI

<b>ROU</b>	3X	This information will match the entry under ROCAI.
<b>TRU</b>		
LIM-Trunk	1-1&&1-X	This information must be added to the script file. X is a function of the number of DID channels in the T1.
<b>EQU</b>		
LIM	1	
Magazine	X	This information must be added to the script file.
Board position	XX	This information must be added to the script file.
Board Individual	X	This information must be added to the script file. It is a function of the DID channel position in the T1.
<b>INDDAT</b>		
Constant	0000000000	
	0	No block on excessive slip
	E	CCS B8ZS ESF No DMI

### 3.7.2.2. North America T1 Bothway Ground Start Trunk

#### With Line Clearing and Without B-Answer

The Public Network should place all Ground Start channels in the T1 into a hunt group so that inbound callers need only remember one public number.

**3.7.2.2.1. Route Class**

**ROCAI**

<b>ROU</b>	3X	This information must be added to the script file. X will be 0-9. Make the first Public Network route 30.
<b>SEL</b>		
DID characteristics	0	No intercept
Incoming calls	1	Allowed
Outgoing trunk selection	1	Even load distribution
Terminal route characteristics (outgoing)	0	Normal route
Alternate Route Selection (incoming)	0	Permitted
Customer affiliation	00	No tenant group
Virtual network calls	1	No
Malicious call tracing	0	No
Default FRL category	0	Lowest level
Default CSI category	0	Normal extension
Receipt of FRL	0	No TCM received
<b>TRM</b>		
Transmission Category	7	Digital CO or DID trunk
<b>SERV</b>		
Call waiting and intrusion	3	CWT sent/received and intrudable
Automatic callback	1	Allowed
Type of trunks	0	CO or DID
Call metering	0	No
Paging	0	No
LCR threshold	3	Unrestricted
Release line trunk	0	No
CLI presentation	1	Not allowed
Request of CLI	0	Not allowed
Number conversion	0	No
<b>TRAF</b>		
CAD Class	03	
TCD Category Night Mode	03	
TCD Category Day Mode	03	
Traffic Matrix Group	03	
<b>SIG</b>		
Dial tone	1	Dial tone provided by CO
Line clearing forward	1	Received
Line clearing back	1	Received
Answer supervision	0	No
Ringin g supervision	1	Yes
Operator supervision	0	No
Ringback tone	0	A-party receives from B-party
Through-connection	0	Through-connection after minimum digits End-of-selection after time-out, LCR number length or called party answers

**ROCAI (Cont.)**

Tandem call control	0	Controlled in every PBX (ARS allowed)
Tandem call digit transmission	0	Through-connection and end-of-selection after line seizure
Signal type	0	Dial pulse or DTMF
NET services	0	No net service facilities
<b>BCAP</b>		
64 Kbits unrestricted	0	No
64 Kbits restricted	0	No
3.1 KHz audio	1	Yes
Speech	1	Yes

**3.7.2.2.2. Route Data****RODAI**

<b>ROU</b>	3X	This information will match the entry under ROCAI.
<b>TYPE</b>	TL45	BTU-45 trunk
<b>VARC</b>		
Constant	0000000	
Characteristics	2	Common Control CO Ground start
<b>VARI</b>		
Constant	0000000	
Characteristics	6	DTMF Wink PTS
<b>VARO</b>		
Constant	0000000	
Characteristics	3	No B-answer supervision DTMF Wink PTS

**3.7.2.2.3. Route Equipment****ROEQI**

<b>ROU</b>	3X	This information will match the entry under ROCAI.
<b>TRU</b>		
LIM-Trunk	1-1&&1-X	This information must be added to the script file and X is a function of the number of DID channels in the T1.
<b>EQU</b>		
LIM	1	
Magazine	X	This information must be added to the script file.
Board position	XX	This information must be added to the script file.
Board Individual	X	This information must be added to the script file. It is a function of the trunk channel in the T1.

**ROEQI (Cont.)**

<b>INDDAT</b>		
Constant	0000000000	
	0	No block on excessive slip
	E	CCS B8ZS ESF No DMI

**3.7.2.2.4. External Destination Codes**

If there are multiple routes for outbound calls, an External Destination Code containing T1 and Analog CO trunk routes should place the T1 route before the Analog route. CHO=1 as a parameter for RODDI will make the route the first alternate choice (5 alternates allowed). Leaving this parameter out will make the route the primary choice.

**RODDI**

<b>DEST</b>	690	
<b>ROU</b>	3X	This information will match the entry under ROCAI.
<b>ADC</b>		
Trunk seizure	0	Immediate
Number type	0	Unknown
Number series	0	Variable length
Network	0	Not fiber optic or TNS
Release	0	First party release
Backward signaling	0	Send from first digit
Terminating and transit seizure	0	Send terminating seizure signal
Off-hook Queuing threshold	0	No threshold
Expensive route earning tone	0	No ERWT
LCR accessibility	0	Accessible by all callers
Traveling Class Mark	0	Not sent
Return block	25	Limit on transit exchanges
<b>SRT</b>	4	Start digit for outgoing calls

**3.7.2.2.5. Inbound Call Routing**

This directs calls to DISA.

**RODNI**

<b>ROU</b>	3X	This information will match the entry under ROCAI.
<b>DAY</b>	5000	Route incoming calls to DISA during day
<b>NIG</b>	5000	Route incoming calls to DISA during night

### 3.7.2.3. North America Analog CO Trunk

#### With Line Clearing and Without B-Answer

##### 3.7.2.3.1. Route Class

###### ROCAI

<b>ROU</b>	3X	This information must be added to the script file. X will be 0-9. Make the first Public Network route 30.
<b>SEL</b>		
DID characteristics	0	No intercept
Incoming calls	1	Allowed
Outgoing trunk selection	1	Even load distribution
Terminal route characteristics (outgoing)	0	Normal route
Alternate Route Selection (incoming)	0	Permitted
Customer affiliation	00	No tenant group
Virtual network calls	1	No
Malicious call tracing	0	No
Default FRL category	0	Lowest level
Default CSI category	0	Normal extension
Receipt of FRL	0	No TCM received
<b>TRM</b>		
Transmission Category	6	Analog CO or DID trunk
<b>SERV</b>		
Call waiting and intrusion	3	CWT sent/received and intrudable
Automatic callback	1	Allowed
Type of trunks	0	CO or DID
Call metering	0	No
Paging	0	No
LCR threshold	3	Unrestricted
Release line trunk	0	No
CLI presentation	1	Not allowed
Request of CLI	0	Not allowed
Number conversion	0	No
<b>TRAF</b>		
CAD Class	03	
TCD Category Night Mode	03	
TCD Category Day Mode	03	
Traffic Matrix Group	03	

**ROCAI (Cont.)**

<b>SIG</b>		
Dial tone	1	Dial tone provided by CO
Line clearing forward	1	Received
Line clearing back	1	Received
Answer supervision	0	No
Ringing supervision	1	Yes
Operator supervision	0	No
Ringback tone	0	A-party receives from B-party
Through-connection	0	Through-connection after minimum digits
End-of-selection after time-out, LCR number length or called party answers		
Tandem call control	0	Controlled in every PBX (ARS allowed)
Tandem call digit transmission	0	Through-connection and end-of-selection after line seizure
Signal type	0	Dial pulse or DTMF
NET services	0	No net service facilities
<b>BCAP</b>		
64 Kbits unrestricted	0	No
64 Kbits restricted	0	No
3.1 KHz audio	1	Yes
Speech	1	Yes

**3.7.2.3.2. Route Data**

**RODAI**

<b>ROU</b>	3X	This information will match the entry under ROCAI.
<b>TYPE</b>	TL1	TLU-41 trunk
<b>VARC</b>		
Constant	0000000	
Characteristics	6	Common Control CO Loop start
<b>VARI</b>		
Constant	0000000	
Characteristics	2	Loop start Clear signal incoming
<b>VARO</b>		
Constant	0000000	
Characteristics	D	Dial tone from public exchange DTMF Clear signal outgoing No B-answer signal

### 3.7.2.3.3. Route Equipment

#### ROEQI

<b>ROU</b>	3X	This information will match the entry under ROCAI.
<b>TRU</b>		
LIM-Trunk	1-1&&1-X	X is a function of the number of trunks and can not be greater than 4.
<b>EQU</b>		
LIM	1	
Magazine	X	This information must be added to the script file.
Board position	XX	This information must be added to the script file.
Board Individual	0	

### 3.7.2.3.4. External Destination Codes

If there are multiple routes for outbound calls, an External Destination Code containing T1 and Analog CO trunk routes should place the T1 route before the Analog route. CHO=1 as a parameter for RODDI will make the route the first alternate choice (5 alternates allowed). Leaving this parameter out will make the route the primary choice.

#### RODDI

<b>DEST</b>	690	
<b>ROU</b>	3X	This information will match the entry under ROCAI.
<b>ADC</b>		
Trunk seizure	0	Immediate
Number type	0	Unknown
Number series	0	Variable length
Network	0	Not fiber optic or TNS
Release	0	First party release
Backward signaling	0	Send from first digit
Terminating and transit seizure	0	Send terminating seizure signal
Off-hook Queuing threshold	0	No threshold
Expensive route earning tone	0	No ERWT
LCR accessibility	0	Accessible by all callers
Traveling Class Mark	0	Not sent
Return block	25	Limit on transit exchanges
<b>SRT</b>	4	Start digit for outgoing calls

### 3.7.2.3.5. Inbound Call Routing

This directs calls to DISA.

#### RODNI

<b>ROU</b>	3X	This information will match the entry under ROCAI.
<b>DAY</b>	5000	Route incoming calls to DISA during day
<b>NIG</b>	5000	Route incoming calls to DISA during night

**3.8. E1 MARKET ROUTES**

**3.8.1. PI-MD110 ISDN Route E1**

**3.8.1.1. Route Class**

**ROCAI**

<b>ROU</b>	10	
<b>SEL</b>		
DID characteristics	0	No intercept
Incoming calls	1	Allowed
Outgoing trunk selection	1	Even load distribution
Terminal route characteristics (outgoing)	0	Normal route
Alternate Route Selection (incoming)	0	Permitted
Customer affiliation	00	No tenant group
Virtual network calls	1	No
Malicious call tracing	0	No
Default FRL category	0	Lowest level
Default CSI category	0	Normal extension
Receipt of FRL	0	No TCM received
<b>TRM</b>		
Transmission Category	7	Digital CO or DID trunk
<b>SERV</b>		
Call waiting and intrusion	3	CWT sent/received and intrudable
Automatic callback	1	Allowed
Type of trunks	0	CO or DID
Call metering	0	No
Paging	0	No
LCR threshold	3	Unrestricted
Release line trunk	0	No
CLI presentation	0	Controlled by extension COS
Request of CLI	1	Controlled by extension COS
Number conversion	0	No
<b>TRAF</b>		
CAD Class	01	
TCD Category Night Mode	01	
TCD Category Day Mode	01	
Traffic Matrix Group	01	
<b>SIG</b>		
Dial tone	1	Dial tone is provided by the CO
Line clearing forward	1	Received
Line clearing back	1	Received
Answer supervision	1	Yes
Ringing supervision	1	Yes
Operator supervision	0	No
Ringback tone	1	Generated by PBX

**ROCAI (Cont.)**

Through-connection	0	Through-connection after minimum digits End-of-selection after time-out, LCR number length or called party answers
Tandem call control	0	Controlled in every PBX (ARS allowed)
Tandem call digit transmission	0	Through-connection and end-of-selection after line seizure
Signal type	3	ISDN
NET services	1	Tie line with COS for net service facilities
<b>BCAP</b>		
64 Kbits unrestricted	1	Yes
64 Kbits restricted	1	Yes
3.1 KHz audio	1	Yes
Speech	1	Yes

**3.8.1.2. Route Data****RODAI**

<b>ROU</b>	10	
<b>TYPE</b>	SL60	TLU-64 board
<b>VARC</b>		
Constant	00000	
Characteristics	0	Does not send ring tone No overlap receiving Trunk with signaling No reanswer service for incoming traffic
Constant	0	
Type	0	PRI ISDN
<b>VARI</b>		
Constant	00000000	
<b>VARO</b>		
Protocol	0	ECMA/ETSI
	0	No Blocking on slip No connected number IE in connect message No user-user information in Alerting message No semipermanent connection
	3	No fixed connection between B-channel and trunk line Layer 1 is Master Layer 2 is NT1 Layer 3 is Network
	F	User info service 3 (in active state) User info service 2 (before active state) User info service 1 (user-user info element) Public trunk line
Constant	00	
	0	No charging request at call setup Continuos charging No CUG sent to Network
	0	Service Code + CUG CUG Index 0

**3.8.1.3. Route Equipment**

**ROEQI**

<b>ROU</b>	10	
<b>TRU</b>		
LIM-Trunk	1-1&&1-15	
<b>EQU</b>		
LIM	1	
Magazine	X	This information must be entered in the script file.
Board position	XX	This information must be entered in the script file.
Board Individual	1	
<b>ROU</b>	1	
<b>TRU</b>		
LIM-Trunk	1-16&&1-30	
<b>EQU</b>		
LIM	1	
Magazine	X	This information must be entered in the script file.
Board position	XX	This information must be entered in the script file.
Board Individual	17	

**3.8.1.4. External Destination Codes**

**RODDI**

<b>DEST</b>	0	Destination code
<b>ROU</b>	10	
<b>ADC</b>		
Trunk seizure	1	After minimum number length
Number type	0	Unknown
Number series	0	Variable length
Network	0	Not fiber optic or TNS
Release	0	First party release
Backward signaling	0	Send from first digit
Terminating and transit seizure	0	Send terminate seizure signal
Off-hook Queuing threshold	0	No threshold
Expensive route warning tone	0	No ERWT
LCR accessibility	0	Accessible by all callers
Traveling Class Mark	0	Not sent
Return block	25	Limit on transit exchanges
<b>SRT</b>	1	Start digit for outgoing calls

External Destination Codes 1, 2, and 3 are identical to 0.

## 4. LIM CONFIGURATIONS FOR PRIVATE NETWORK CONNECTIONS

### 4.1. PRIVATE NETWORK ROUTES

The Private Network is considered to be another PBX to which the MD110 connects, as well as a true Private Network the customer may own or lease. When connecting to another PBX, number conflicts may occur. The following codes are recommended for directing calls out of the MD110. If "8" is used for access to the PBX for outbound calls and the basic configuration script is followed, then the "7" for EDACS inbound calls is not necessary and direct dialing of the LID after DISA dial tone will still be used.

#### LCR

	Number
EDACS	7
Private Network	8
Public Network	9

- Tie lines are used between the MD110 and the other PBX, not CO type trunks or lines.
- If the other PBX allows connection to lines without line clearing, the information below should be considered.

Trunks or lines with forward and backward line clearing are highly recommended. See the explanation below.

With Line Clearing	Without Line Clearing
When the Network hangs up, the interconnect call will clear and free interconnect and radio resources.	When the Network hangs up, the radio must clear the interconnect call or let it clear due to hang-time expiration or conversation limit expiration to free interconnect and radio resources. This problem would be very significant for full duplex calls, since the user must clear the call or the call will clear only after the conversation limit expiration.

With B-Answer	Without B-Answer
<ul style="list-style-type: none"> <li>• Radios will hear IMC-generated ringback for outbound calls.</li> <li>• Ringing duration on outbound calls will be limited to 30 seconds by the PI.</li> <li>• In applications where billing is performed, the customer will not be billed unless the called party answers.</li> </ul>	<ul style="list-style-type: none"> <li>• Radios will hear MD110 or Network ringback for outbound calls.</li> <li>• Ringing duration on outbound calls will not be limited by the PI.</li> <li>• In applications where billing is performed, the customer will be billed for calls even if the called party does not answer</li> </ul>

**4.1.1. North America T1 Tie Lines****With Line Clearing and Without B-Answer**

The following information is not in the basic script file and must be added if used.

**4.1.1.1. Route Class****ROCAI**

<b>ROU</b>	2X	This information must be added to the script file. X will be 0-9. Make the first Private Network route 20.
<b>SEL</b>		
DID characteristics	0	No intercept
Incoming calls	1	Allowed
Outgoing trunk selection	1	Even load distribution
Terminal route characteristics (outgoing)	0	Normal route
Alternate Route Selection (incoming)	0	Permitted
Customer affiliation	00	No tenant group
Virtual network calls	1	No
Malicious call tracing	0	No
Default FRL category	0	Lowest level
Default CSI category	0	Normal extension
Receipt of FRL	0	No TCM received
<b>TRM</b>		
Transmission Category	5	Digital Tie trunk
<b>SERV</b>		
Call waiting and intrusion	3	CWT sent/received and intrudable
Automatic callback	1	Allowed
Type of trunks	1	Tie
Call metering	0	No
Paging	0	No
LCR threshold	3	Unrestricted
Release line trunk	0	No
CLI presentation	1	Not allowed
Request of CLI	0	Not allowed
Number conversion	0	No
<b>TRAF</b>		
CAD Class	02	
TCD Category Night Mode	02	
TCD Category Day Mode	02	
Traffic Matrix Group	02	

**ROCAI (Cont.)**

<b>SIG</b>		
Dial tone	1	Dial tone provided by CO
Line clearing forward	1	Received
Line clearing back	1	Received
Answer supervision	0	No
Ringing supervision	1	Yes
Operator supervision	0	No
Ringback tone	0	A-party receives from B-party
Through-connection	0	Through-connection after minimum digits End-of-selection after time-out, LCR number length or called party answers
Tandem call control	0	Controlled in every PBX (ARS allowed)
Tandem call digit transmission	0	Through-connection and end-of-selection after line seizure
Signal type	0	Dial pulse or DTMF
NET services	0	No net service facilities
<b>BCAP</b>		
64 Kbits unrestricted	0	No
64 Kbits restricted	0	No
3.1 KHz audio	1	Yes
Speech	1	Yes

**4.1.1.2. Route Data****RODAI**

<b>ROU</b>	2X	This information will match the entry under ROCAI.
<b>TYPE</b>	TL45	BTU-45 trunk
<b>VARC</b>		
Constant	0000000	
Characteristics	3	Common Control Tie Line
<b>VARI</b>		
Constant	0000000	
Characteristics	6	DTMF Wink PTS
<b>VARO</b>		
Constant	0000000	
Characteristics	3	No B-answer supervision DTMF Wink PTS

**4.1.1.3. Route Equipment**

**ROEQI**

<b>ROU</b>	2X	This information will match the entry under ROCAI.
<b>TRU</b>		
LIM-Trunk	1-1&&1-23	
<b>EQU</b>		
LIM	1	
Magazine	X	This information must be added to the script file.
Board position	XX	This information must be added to the script file.
Board Individual	0	
<b>INDDAT</b>		
Constant	0000000000	
	0	No block on excessive slip
	E	CCS B8ZS ESF No DMI

**4.1.1.4. External Destination Codes**

**RODDI**

<b>DEST</b>	680	
<b>ROU</b>	2X	This information will match the entry under ROCAI.
<b>ADC</b>		
Trunk seizure	0	Immediate
Number type	0	Unknown
Number series	0	Variable length
Network	0	Not fiber optic or TNS
Release	0	First party release
Backward signaling	0	Send from first digit
Terminating and transit seizure	0	Send terminating seizure signal
Off-hook Queuing threshold	0	No threshold
Expensive route earning tone	0	No ERWT
LCR accessibility	0	Accessible by all callers
Traveling Class Mark	0	Not sent
Return block	25	Limit on transit exchanges
<b>SRT</b>	4	Start digit for outgoing calls

**4.1.1.5. Inbound Call Routing**

The other PBX dials the DISA number for inbound calls to radios.

**4.1.2. Private Network LCR**

- The "8" LCR code will be initialized in the same manner as the "9" for the Public Network LCR.
- The LCR tables for "8" is installation-dependent.
- Radios and MD110 extensions will use "8" to access the Private Network.

## 5. DIRECT INBOUND RADIO CALLS IN A PBX NETWORK

This example shows how to retain direct inbound EDACS dialing and provide direct outbound dialing. No access code is needed to select EDACS for inbound Private Network calls, and no access code is needed by the radios to reach the Private Network. This is possible since the customer did not require that the MD110 extension have the same ease of function. They may direct dial an EDACS radio, but must use an "8" to call extensions on the other PBX. It is possible to provide direct dialing to the MD110 extensions from EDACS or the other PBX extensions since the MD110 and other PBX number series do not overlap.

Direct inbound dialing and Direct outbound dialing are possible when MD110 extensions are not used or their operating characteristics are not important.

### Requirements

- Customer will only have test extensions on the MD110 and will use the "8" access code to call from the MD110 extension to the other PBX.
- Customer wants direct outbound radio dialing to the other PBX extensions that are 4-digit numbers in the range 1000-4999. Dialing an "8" before the extension number is not acceptable.
- Customer wants "9+" dialing routed to the other PBX which it will route to the Public Network.
- Customer wants "8+" dialing routed to the other PBX which it will route to the Private Network.
- MD110 extensions are in 5000-5999 range.

### Implementation

The basic script file is used with the following changes:

- The "8" LCR code is initialized.
- The "8" LCR code routes calls to the other PBX.
- All outbound radio calls are prefixed with "8" by the MD110.
- MD110 extensions and EDACS routes are enabled with NACDS to dial "8+" numbers.
- The script file is changed to move extensions from the 4000-4099 range to the 5000-5999 range.

A step-by-step process is not presented; the information is provided for someone with basic MD110 programming skills.

This entry creates the automatic "8" prefix for all outbound radio calls.

### RONDI

<b>ROU</b>	1	EDACS Route
<b>PRE</b> Prefix	8	Inserted in front of digits sent from EDACS to the MD110

This command causes outbound radio calls to 9911 to be passed to the other PBX as 9911.

### LCDDI

<b>TAB</b> Table	ENT	External Number Table
<b>ENTRY</b> Number	89911	9+911
<b>TRC</b> Truncate	1	One digit
<b>PRE</b> Prefix	680	Private Network External Destination Code
<b>CONF</b> Conflict Number	N	

**LCDDI**

<b>TAB</b> Table	FDT	Fictitious Destination Table
<b>FRCT</b> Fictitious Route Choice	20	
<b>PRE</b> Prefix	680	Public Network External Destination Code
<b>TZONE</b> Time Zone	1	

**LCLDI**

<b>LIM</b>	1	
<b>AC</b> LIM 1 Area Code	XXX	XXX must be entered in the script file
<b>DEST</b> External Destination Code	6XX	Private Network External Destination Code for numbers for which LCR has no entries. XX must be entered in the script file and will be 80 if these numbers should go to the Private Network. If these numbers should be blocked, enter a number between 81 and 89 (681-689) which has no routes (trunk groups) assigned.

This entry is for direct 4-digit outbound radio dialing to extension range 1000-1999 on the other PBX.

**LCDDI**

<b>TAB</b> Table	NLT	Number Length Table
<b>ENTRY</b>	81	
<b>CONF</b>	Y	
<b>MIN</b>	5	
<b>MAX</b>	5	

- Similar entries will be made for extension series 2000-4999.
- All “8+” dialing entries will have an “8” in front of the “8,” and the appropriate MIN and MAX.
- All “9+” dialing entries will have an “8” in front of the “9,” and the appropriate MIN and MAX.

Direct dialing to MD110 extensions from the other PBX extensions is accomplished by simply dialing the MD110 extension number.

Direct dialing by radios to MD110 extensions is accomplished with this entry.

**LCDDI**

<b>TAB</b> Table	NLT	Number Length Table
<b>ENTRY</b>	85	
<b>TRC</b>	1	One digit
<b>CONF</b>	Y	
<b>MIN</b>	5	
<b>MAX</b>	5	

## 6. INDIRECT INBOUND RADIO CALLS IN A PBX NETWORK

This scenario emphasizes the number conflicts that can arise when **using the MD110 as a PBX and as an EDACS telephone interconnect**. Since the customer wants direct dial to extensions 1000-1999 on the other PBX, direct dial to EDACS radios could not be provided.

- The number conflict cannot be resolved for the MD110 extension, since both the EDACS radio number and other PBX extensions both start with a "1." Therefore, a "7" EDACS LCR code is used.
- If the tie line dialed the DISA number plus the EDACS LCR code for inbound calls to the DISA number, direct inbound calls should be possible. The caller would not have to enter the "7" EDACS LCR Code.

### Requirements

- Customer will have extensions on the MD110 and requires direct 4-digit dialing to the other PBX extensions; dialing an "8" is not acceptable.
- Customer wants direct outbound radio dialing to the other PBX extensions that are 4-digit numbers in the range 1000-2999 and 6000-6999. Dialing an "8" before the extension number is not acceptable.
- Customer wants direct radio outbound dialing to MD110 extensions in the range 4000-4999.
- Customer wants "9+" dialing routed to the other PBX which it will route to the Public Network.
- Customer wants direct 4-digit dialing from the other PBX to the MD110.

### Implementation

The basic script file is used with the following changes:

- The "7" LCR code is initialized for inbound EDACS calls by MD110 extensions or the Private Network. The "7" LCR code routes calls to EDACS.
- MD110 extensions and the Private Network are enabled to dial "7+" numbers; enabled with NACDS.
- The "8" LCR code is not initialized.
- The External Destination Codes are moved from the 670-699 range to the 570-599 range.
- The NACDS, NANLS, and RODDI entries for 0, 1, 2, and 3 are deleted and new entries are made.

A step-by-step process is not presented; information is provided for someone with MD110 programming skills.

### EDACS LCR

The following two entries are for valid radio calls.

#### LCDDI

TAB Table	NLT	Number Length Table
ENTRY	70	
CONF	Y	
MIN	6	
MAX	6	

This entry is repeated for 71 and 72.

#### LCDDI

TAB Table	NLT	Number Length Table
ENTRY	73	
CONF	Y	
MIN	7	
MAX	7	

The following entry is for invalid radio calls.

**LCDDI**

<b>TAB</b> Table	NLT	Number Length Table
<b>ENTRY</b>	74	
<b>CONF</b>	Y	
<b>MIN</b>	2	
<b>MAX</b>	2	

This entry is repeated for 75, 76, 77, 78, and 79.

**LCDDI**

<b>TAB</b> Table	FDT	Fictitious Destination Table
<b>FRCT</b> Fictitious Route Choice	10	
<b>PRE</b> Prefix	570	EDACS External Destination Code
<b>TZONE</b> Time Zone	1	

**LCDDI**

<b>TAB</b> Table	DNT2	Destination Number Table 2
<b>ENTRY</b>	70	
<b>TRC</b> Truncate	1	One digit
<b>FRCT</b> <b>Fictitious Route Choice</b>	10	
<b>TOLL</b> TCD Category 14-0	000000000001101	MD110 Extensions, the Private Network, and the Public Network may call these numbers; TCD 0, 2, and 3 are allowed
<b>TYPE</b>	2	National Number Plan

This entry is repeated for 71, 72, and 73.

**LCDDI**

<b>TAB</b> Table	DNT2	Destination Number Table 2
<b>ENTRY</b>	74	
<b>TRC</b> Truncate	1	One digit
<b>FRCT</b> <b>Fictitious Route Choice</b>	10	
<b>TOLL</b> TCD Category 14-0	000000000000000	Calls is denied for all TCD except 15
<b>TYPE</b>	2	National Number Plan

This entry is repeated for 75, 76, 77, 78, and 79.

This sets the External Destination Code for calls to EDACS.

**RODDI**

<b>DEST</b>	570	Destination code
<b>ROU</b>	1	
<b>ADC</b>		
Trunk seizure	0	Immediate
Number type	0	Unknown
Number series	0	Variable length
Network	0	Not fiber optic or TNS
Release	0	First party release
Backward signaling	0	Send from first digit
Terminating and transit seizure	0	Send terminate seizure signal
Off-hook Queuing threshold	0	No threshold
Expensive route warning tone	0	No ERWT
LCR accessibility	0	Accessible by all callers
Traveling Class Mark	0	Not sent
Return block	25	Limit on transit exchanges
<b>SRT</b>	4	Start digit for outgoing calls

**Other PBX Extensions**

The following three entries will provide for direct dialing to the other PBX extensions for numbers in the 1000-1999 range.

**NACDS**

<b>NUM</b> Number	1	Possible first digit of outbound radio call or MD110 extension call to other PBX extension
<b>CDCAT</b> TCD Category allowed to dial NUM	0&1	Extension and EDACS allowed

**NANLS**

<b>EXL</b> External Number	1	First digit of other PBX extension
<b>MIN</b> Minimum length	4	
<b>MAX</b> Maximum Length	4	

**RODDI**

<b>DEST</b>	1	Destination code
<b>ROU</b>	20	
<b>ADC</b>		
Trunk seizure	0	Immediate
Number type	0	Unknown
Number series	0	Variable length
Network	0	Not fiber optic or TNS
Release	0	First party release
Backward signaling	0	Send from first digit
Terminating and transit seizure	0	Send terminate seizure signal
Off-hook Queuing threshold	0	No threshold
Expensive route warning tone	0	No ERWT
LCR accessibility	0	Accessible by all callers
Traveling Class Mark	0	Not sent
Return block	25	Limit on transit exchanges
<b>SRT</b>	1	Start digit for outgoing calls

The preceding three entries must be made for 2 and 6 (extensions 2000-2999 and 6000-6999).

LCR Code 9 tables must be generated per the customer's requirements.

## **7. DID TO ALL EDACS RADIOS**

With tie lines and another PBX, it is possible to provide DID calling to all radios.

- The other PBX will have its access code for EDACS.
- After the access code, the caller will dial the radio number. The other PBX sends the radio number across the tie line. In some cases, the other PBX will prefix the dialed radio number with the MD110 EDACS LCR code (only if EDACS LCR is used).
- If the other PBX extension numbers are four-digit numbers and the called party's phone number is the same as the last four digits of his radio LID, then remembering the person's DID number becomes simple. Dial an EDACS access code followed by the person's extension number, which the PBX routes to the MD110. The other PBX will need to prefix the four-digit number dialed with a "0" or "1" (first digit of LID) and an EDACS LCR code if used.

Common Abbreviated Dialing is used in the basic script configuration to provide DID for up to 1000 radios. It maps numbers in the 4100-4999 range to arbitrary radio numbers. The LCR ENT table can be used to translate numbers into EDACS radio numbers also. It requires that the first digit of the DID number be an LCR code in the MD110.

## 8. MANUAL DTMF DIALING BY RADIOS

Most radios will digitally dial a phone number with EDACS signaling. Some radios do not have a numeric keypad, but do possess a DTMF microphone. The radio can be programmed to send a fixed number for interconnect calls. This number will result in dial tone returned to the radio, after which the radio will send DTMF tones.

- The number the radio sends initially will be an MD110 External Destination number for a CO trunk or PBX tie line.
- The CO trunk or PBX will return dial tone, then accept DTMF digits from the radio.
- This results in unrestricted calling, except in the case where another PBX toll restricts the call.
- An External Destination Code, to the CO trunk or PBX tie line, must be defined with RODDI.
- The External Destination Code must have MIN and MAX set to its length with NANLS.
- EDACS radios must be enabled to dial the External Destination Code; NACDS is used with NUM = "External Destination Code" and CDCAT = 1.



**Ericsson GE Mobile Communications Inc.**  
Mountain View Road • Lynchburg Virginia 24502

Printed in U.S.A.

**APPENDIX A  
MD110 QUESTIONNAIRE**

This appendix presents a copy of Ericsson's MD110 questionnaire.

### **TRUNK AND LEAST-COST ROUTING QUESTIONNAIRE**

The following information is required for all lines and trunks. The attached form may be used to provide this information.

#### ANALOG LINES/TRUNKS

- Which lines/trunks will be through the switch?
- Which of the lines that are to be used in the switch are Incoming only, which are Outgoing only, and which are used Bothways (INC, OUT, or BWT)?
- Which lines are in a hunting arrangement (CO provided) with each other, and in which order?
- Where should each incoming trunk group and individual trunk terminate (consoles, extensions, hunt groups)?
- Are any of the lines which are to be used through the MD110 Loop Start versus Ground Start? If Loop Start lines are used, then convert to Ground Start prior to cutover.

(Reminder: Need to have (1) dedicated Loop Start line for the MD110 modem; used for remote diagnostics and programming. Phone Number: \_\_\_\_\_ )

#### TIE LINES

- Are there any Tie lines? If so, list the existing access code(s) and the circuit ID(s).
- Should the tie line(s) be used in Least-Cost Routing for the area served by the outbound terminating end? If so, what calls should be placed over the tie lines? Provide a list of area and local office codes and the outgoing access code for the far end system(s), if applicable.
- What are the specifications of the tie lines (E&M, Wink Start, 2-Wire, or 4-Wire)?
- Are the lines Analog or Digital?

#### DIGITAL TRUNKS

- Please list each T1, the circuit ID(s), and how the channels are to be used; Incoming traffic, outgoing traffic, DID, Flexpath, etc.
- Please indicate which of the following apply:
  - \_\_\_\_\_ DTMF Signaling
  - \_\_\_\_\_ Wink Start (for DID over Flexpath (like Tie Lines))
  - \_\_\_\_\_ Ground Start
  - \_\_\_\_\_ Common Channel Interchange Signaling (used with PRI)

Line Coding:

\_\_\_\_\_ AMI (Alternate Mark Inversion)  
 or  
 \_\_\_\_\_ B8ZS

Framing Format: (Depending on CSU)

\_\_\_\_\_ D4  
 or  
 \_\_\_\_\_ ESF

- Please list any 800 numbers that will be coming in over each T1, the DNIS Code, where the calls should be routed, the number of calls that should be allowed, and if and where calls should be rerouted if busy.

**T1:** \_\_\_\_\_

<u>800 NO.</u>	<u>DNIS CODE</u>	<u>ROUTE TO:</u>	<u>TOTAL NO. CALLS</u>	<u>REROUTE BUSY TO:</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

**T1:** \_\_\_\_\_

<u>800 NO.</u>	<u>DNIS CODE</u>	<u>ROUTE TO:</u>	<u>TOTAL NO. CALLS</u>	<u>REROUTE BUSY TO:</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

DID TRUNKS

- Will DID service be provided? \_\_\_\_\_
- How is this service being provided (analog, dedicated T1, Flexpath)? \_\_\_\_\_
- What is the DID number range? \_\_\_\_\_ through \_\_\_\_\_
- How many digits are being sent by the Central Office? \_\_\_\_\_
- Should vacant numbers be intercepted? \_\_\_\_\_  
Where? \_\_\_\_\_
- Are the DID trunks Rotary (Dial Pulse) or DTMF? \_\_\_\_\_

LEAST-COST ROUTING

Please specify all Long Distance Carriers being used.

<u>Carrier Name</u>	<u>Dedicated or with Local Trunks</u>	<u>Do They Require "1" ?</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

A) Which trunks should be used for local 7-digit calls, 800 No. calls, and 900 No. calls?

- 1st Choice: \_\_\_\_\_
- 2nd Choice: \_\_\_\_\_
- 3rd Choice: \_\_\_\_\_

B) Which trunks should be used for toll or 1 + 7-digit calls in the local Area Code? Is 1 + 7-digit calling used?

- \_\_\_\_\_
- 1st Choice: \_\_\_\_\_
- 2nd Choice: \_\_\_\_\_
- 3rd Choice: \_\_\_\_\_

C) Which trunks should be used for external "0" (operator) calls?

1st Choice: \_\_\_\_\_

2nd Choice: \_\_\_\_\_

3rd Choice: \_\_\_\_\_

D) Which trunks should be used for other in-state Area Codes?

1st Choice: \_\_\_\_\_

2nd Choice: \_\_\_\_\_

3rd Choice: \_\_\_\_\_

E) Which trunks should be used for all other Area Code calls?

1st Choice: \_\_\_\_\_

2nd Choice: \_\_\_\_\_

3rd Choice: \_\_\_\_\_

Are Alaska, Hawaii, Puerto Rico and other islands (AC 809), and Canada calls excluded from any of these routes?

If so, which ones? \_\_\_\_\_

F) Which trunks should be used for International Calling (other than Area Code calls)?

1st Choice: \_\_\_\_\_

2nd Choice: \_\_\_\_\_

3rd Choice: \_\_\_\_\_

G) Which trunks should be used for Information Calls?

411

1st Choice: \_\_\_\_\_

2nd Choice: \_\_\_\_\_

3rd Choice: \_\_\_\_\_

555-1212, AC + 555-1212

1st Choice: \_\_\_\_\_

2nd Choice: \_\_\_\_\_

3rd Choice: \_\_\_\_\_

H) Which trunks should be used for Equal Access Calls (10XXX)?

1st Choice: \_\_\_\_\_

2nd Choice: \_\_\_\_\_

3rd Choice: \_\_\_\_\_

I) How should "911" be treated (internal to extension number or external)?

---

---

200 205 210 215 220 225 230 235 240 245 250 255 260 265 270 275 280 285 290 295  
 201 206 211 216 221 226 231 236 241 246 251 256 261 266 271 276 281 286 291 296  
 202 207 212 217 222 227 232 237 242 247 252 257 262 267 272 277 282 287 292 297  
 203 208 213 218 223 228 233 238 243 248 253 258 263 268 273 278 283 288 293 298  
 204 209 214 219 224 229 234 239 244 249 254 259 264 269 274 279 284 289 294 299

300 305 310 315 320 325 330 335 340 345 350 355 360 365 370 375 380 385 390 395  
 301 306 311 316 321 326 331 336 341 346 351 356 361 366 371 376 381 386 391 396  
 302 307 312 317 322 327 332 337 342 347 352 357 362 367 372 377 382 387 392 397  
 303 308 313 318 323 328 333 338 343 348 353 358 363 368 373 378 383 388 393 398  
 304 309 314 319 324 329 334 339 344 349 354 359 364 369 374 379 384 389 394 399

400 405 410 415 420 425 430 435 440 445 450 455 460 465 470 475 480 485 490 495  
 401 406 411 416 421 426 431 436 441 446 451 456 461 466 471 476 481 486 491 496  
 402 407 412 417 422 427 432 437 442 447 452 457 462 467 472 477 482 487 492 497  
 403 408 413 418 423 428 433 438 443 448 453 458 463 468 473 478 483 488 493 498  
 404 409 414 419 424 429 434 439 444 449 454 459 464 469 474 479 484 489 494 499

500 505 510 515 520 525 530 535 540 545 550 555 560 565 570 575 580 585 590 595  
 501 506 511 516 521 526 531 536 541 546 551 556 561 566 571 576 581 586 591 596  
 502 507 512 517 522 527 532 537 542 547 552 557 562 567 572 577 582 587 592 597  
 503 508 513 518 523 528 533 538 543 548 553 558 563 568 573 578 583 588 593 598  
 504 509 514 519 524 529 534 539 544 549 554 559 564 569 574 579 584 589 594 599

600 605 610 615 620 625 630 635 640 645 650 655 660 665 670 675 680 685 690 695  
 601 606 611 616 621 626 631 636 641 646 651 656 661 666 671 676 681 686 691 696  
 602 607 612 617 622 627 632 637 642 647 652 657 662 667 672 677 682 687 692 697  
 603 608 613 618 623 628 633 638 643 648 653 658 663 668 673 678 683 688 693 698  
 604 609 614 619 624 629 634 639 644 649 654 659 664 669 674 679 684 689 694 699

700 705 710 715 720 725 730 735 740 745 750 755 760 765 770 775 780 785 790 795  
 701 706 711 716 721 726 731 736 741 746 751 756 761 766 771 776 781 786 791 796  
 702 707 712 717 722 727 732 737 742 747 752 757 762 767 772 777 782 787 792 797  
 703 708 713 718 723 728 733 738 743 748 753 758 763 768 773 778 783 788 793 798  
 704 709 714 719 724 729 734 739 744 749 754 759 764 769 774 779 784 789 794 799

800 805 810 815 820 825 830 835 840 845 850 855 860 865 870 875 880 885 890 895  
 801 806 811 816 821 826 831 836 841 846 851 856 861 866 871 876 881 886 891 896  
 802 807 812 817 822 827 832 837 842 847 852 857 862 867 872 877 882 887 892 897  
 803 808 813 818 823 828 833 838 843 848 853 858 863 868 873 878 883 888 893 898  
 804 809 814 819 824 829 834 839 844 849 854 859 864 869 874 879 884 889 894 899

900 905 910 915 920 925 930 935 940 945 950 955 960 965 970 975 980 985 990 995  
 901 906 911 916 921 926 931 936 941 946 951 956 961 966 971 976 981 986 991 996  
 902 907 912 917 922 927 932 937 942 947 952 957 962 967 972 977 982 987 992 997  
 903 908 913 918 923 928 933 938 943 948 953 958 963 968 973 978 983 988 993 998  
 904 909 914 919 924 929 934 939 944 949 954 959 964 969 974 979 984 989 994 999

AREA CODE: \_\_\_\_\_ *Use a separate sheet for 7 digits, 1+7 digits*

PRE-DIGITS: \_\_\_\_\_

ROUTE NO.: \_\_\_\_\_

