

# Using ROSE X.25 Packet Networks

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## *Radio Amateur Telecommunications Society*

Some find ROSE X.25 Packet Network operation a mystery. This is likely due to simply a lack of information and/or experience with this approach to packet networking.

This paper is a slightly modified version of the Users Guide distributed by the Radio Amateur Telecommunications Society (RATS) to users of the RATS-operated ROSE X.25 Packet Network. It is presented here to help familiarize others with ROSE X.25 Packet Network features and operations.

### 0.1 History

Tom Moulton, W2VY, wrote generic user instructions for ROSE X.25 Packet Networks which are distributed along with Switch code. As part of his efforts constructing and operating the ROSE X.25 Packet Network covering Northwestern New Jersey, Eastern Pennsylvania and Southern New York, Bill Slack, NX2P, created an excellent User Guide based upon Tom's work.

Don Rotolo, N2IRZ, expanded and modified the guide to cover the entire RATS ROSE Network. Andrew Funk, KB7UV, took this work and modified it for presentation to this conference.

[Any errors or omissions are mine. —kb7uv]

## 1. The ROSE X.25 Packet Network

The ROSE X.25 Network provides short and long distance connectivity, all initiated by a simple connect command at your TNC. To connect to another station, you only need to know:

The other station's **callsign**

The **callsign** of your local switch

The address of the other station's local **switch**<sup>1</sup>

This information is typed into your TNC as a normal connect command. ROSE X.25 Packet Networks "look like" a pair of intelligent digipeaters, with a **callsign** specifying the point you enter the network and an address specifying the point you exit the network. All of the routing from switch to switch is handled by the network, just like the telephone system.

All connects using the ROSE network are done from your TNC's **cmd: prompt**, by issuing a connect command of the following form:

C **callsign** Via [**entry digi**],[**switch callsign**],[**DNIC**],[**exit address**],[**exit digi**]

where:

**callsign** is the **callsign** of the station you want to connect to. This is usually an **Amateur callsign**, but may take other forms (such as HEARD or CROWD), and may include an SSID.

**entry digi** (Optional) is the **callsign** of a digipeater required to access your local ROSE Switch.

**switchcallsign** is the **callsign** of your local ROSE Switch. ROSE switches do not beacon, but you may see it in use. Generally, ports for USER access to the RATS ROSE Network are on the 2m band, with a-3 SSID. Other networks may use different conventions.

**DAK** (Optional) is the four-digit **Data Network Identification Code** for the ROSE Switch local to the other station. This is only used when connecting into another country. A list of ROSE Data Network ID Codes is provided later in this Users Guide.

**exit address** is the six-digit\* address of the ROSE Switch local to the station you want to connect to. (In the RATS ROSE Network, addresses for a particular area code may be found by connecting to the INFO application at that area code and exchange 555. For example: 201555 for area code 201.)

**exit digi** (Optional) is the callsign of a digipeater required between the station you want to connect to and their local ROSE Switch. Also see entry **digi**.

## 1.1 Some Examples

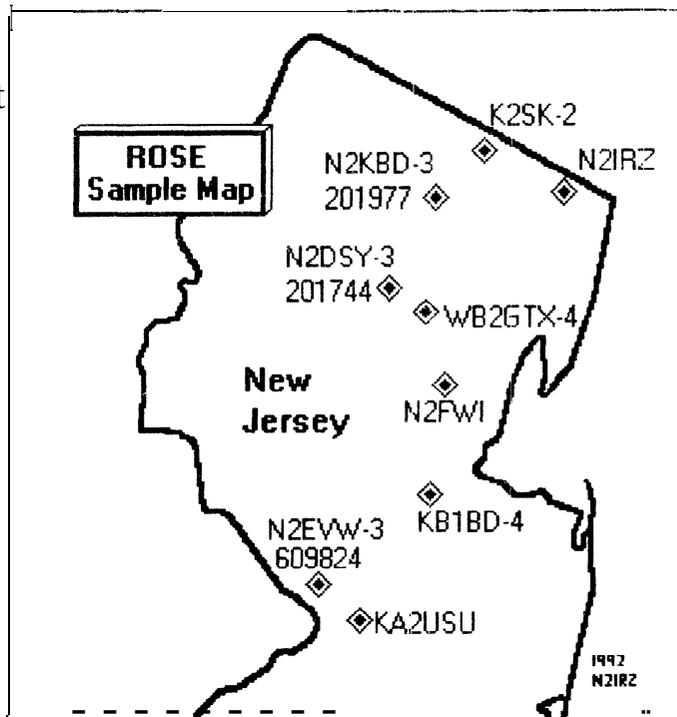
As an example, we will look at how a basic connect command is made and then try a few variations. To help with these examples, we've created a **make-believe network map**<sup>1</sup>. Normally, such a map is unnecessary with ROSE networks, but in this case it will help to visualize switch locations.

My callsign is N2IRZ. Suppose I **wanted** to connect to my local BBS, WB2GTX-4. From the map, I see that the N2DSY-3 (201744) switch is nearest to WB2GTX-4, and on the same frequency. My local switch is N2KBD-3—I know this because I see it on the air often. Alternately, I could have found my local switch using the User Port listing that is available from RATS. So, to connect to the BBS, at my TNC's **cmd**: prompt I would issue this connect command:

```
C WB2GTX-4 v N2KBD-3,201744
```

Once N2KBD-3 acknowledged my connection, my TNC would say:

```
*** Connected to WB2GTX-4.
```



Immediately after that, the **network** would acknowledge my connect request by sending the message **Call being Setup**. I would then wait a few moments while the network set up the connection. When the connection is established, the network would tell me by sending the message:

```
Call Complete to WB2GTX-4 @ 31002017442
```

At this point, I am connected to the BBS, and everything operates as if I were connected directly. If the connection attempt had failed for any reason, the network would inform me and provide the reason for the failure by sending a disconnect code<sup>3</sup>. Refer to Section 3 for more details.

Now a few variations. Suppose I was visiting a friend in Trenton, where the local ROSE Switch's **callsign** is N2EVW-3. To connect to WB2GTX-4, I would type:

```
C WB2GTX-4 V N2EVW-3,201744
```

at my TNC's **cmd:** prompt. Note that the only change is my entry point into the network, in this case N2EVW-3 instead of N2KBD-3. My exit point from the network (201744) as well as the **callsign** of the BBS both remain the same.

Now suppose that when I came back from Philadelphia, I wanted to connect to my friend for a keyboard-to-keyboard "conversation." Knowing that my friend's **callsign** is KA2USU, that N2EVW-3 is his local ROSE Switch, and that N2EVW-3's ROSE address is 609824, I would type:

```
C KA2USU V N2KBD-3,609824
```

Of course, my local ROSE Switch in this case is N2KBD-3.

Now suppose I wanted to connect to another friend, who lives near the N2DSY-3 (201744) ROSE Switch. I would type:

```
C N2FWI V N2KBD-3,201744
```

Compare this with the first example.

As a final example, If I again wanted to connect to WB2GTX-4, and I couldn't reach N2KBD-3 directly, I could use the K2SK-2 digipeater as an entry digipeater. In this case, I would type:

```
C WB2GTX-4 V K2SK-2,N2KBD-3,201744
```

Once again, the basic **form** of the connect command remains the same.

Refer to Section 1 above for the detailed syntax of a ROSE X.25 Network connect command, and remember **that all connect commands to the ROSE network are made while DISCONNECTED from the local switch.**

## 1.2 The ROSE Address

Every ROSE Switch has a unique **callsign** and address. The **callsign** is the same as any other **Amateur** Radio **callsign** as used on packet, and usually has an **SSID**. The address consists of ten digits (in North America), which is broken into two parts. The first four digits are the X.121 Data Network Identification Code (DNIC), which is an internationally recognized standard? The last six digits are uniquely assigned to each ROSE Switch based upon location. In North America, the 3-digit telephone area code and the 3-digit telephone exchange are combined for six digits. Other countries may use different addressing

schemes, perhaps with different length addresses, as required by national standards or regulations.

If the user does not specify the DNIC when making the connect request, the network assumes that the exit address is within the country of origin. The DNIC portion of the address is not shown on the maps, since it is the same for all switches in the USA. For example, the full address of the N2DSY-3 ROSE Switch is 3 100201744, where 3100 is the DNIC for the USA. If you are attempting an international connection<sup>7</sup> you must specify the DNIC. Note that the DNIC uses its own digipeater field, because a TNC will not allow more than 6 digits in any one field.

Now you know how the addressing works in a ROSE Switch. You may ask why an address is used at all, when the callsign is also a unique identifier. The answer is ROUTING. If callsigns were used, then each switch in the network would have to know about every other switch in the network. This addressing scheme allows a ROSE Switch to route the connect request based upon standardized information, thereby allowing for routing to a practically unlimited number of switches, locally, regionally, nationally and worldwide”.

### 1.3 Entry and Exit digipeaters

The ROSE Switch allows for the optional use of one digipeater at each end of a ROSE Network connection. Both, one or neither digi may be used, as necessary. For example, say I could only reach the N2KBD-3 ROSE Switch via a digipeater, K2SK-2, and KA2USU needed the K2GL-2 digi to reach N2EVW-3. The connect command to my TNC would look like:

```
C KA2USU via K2SK-2,N2KBD-3,609824,K2GL-2
```

As another example, suppose I wanted to connect to TIØPAQ (Chuck) in Costa Rica, again using a digipeater at each end:

```
C TIØPAQ v K2SK-2,N2KBD-3,7120,100110,TI2CES-2
```

That represents a real example of the longest possible connect command you may have to make using a ROSE X.25 Network. 7120 is Costa Rica's DMC, 100110 is the ROSE address local to TIØPAQ, and TI2CES-2 is the digi he needs to use.

## 1.4 Call Progress Messages and Disconnect Codes

When you issue a connect command using the ROSE Network, messages indicating the progress of your call are sent so you know something is happening. For example, if you were to issue the following command:

```
C WB2GTX-4 Via N2DSY-3, 201744
```

N2DSY-3 would send you an acknowledgement of your connect request on behalf of WB2GTX-4. At this point your TNC's connected status LED lights, and your TNC generates the familiar **\*\*\* Connected to...** message, but this doesn't indicate that your connection to WB2GTX-4 is complete. Along with the connect acknowledgement, N2DSY-3 also sends you a message **Call being Setup**, indicating that your call has been accepted by the network and is being routed. Once the call has been completed to WB2GTX-4, N2DSY-3 sends you another message:

```
Call Complete to WB2GTX-4 @ 3100201744.
```

You are now connected to WB2GTX-4.

If for some reason the connection to the destination station cannot be made, or a disconnection occurs, your local ROSE Switch will "clear the call" and send you a code explaining the reason before actually disconnecting. One reason for a call clearing is if the other station is busy. Another reason would be a normal disconnect, such as sending "b" ("bye") to a PBBS.

These code takes the form:

```
*** Call Clearing *** #### XXXYYYYYYY
```

where **####** is a four digit Hexadecimal **number**<sup>9</sup> explaining the reason, and **XXXXYYYYYY** is the DNIC and ROSE address of the Switch originating the message. Some common codes are listed here—a complete list appears later in

0000 Remote Station disconnected	Normal disconnect from other station, such as sending "b" to a PBBS
0100 Remote Station is Busy	The other station is either busy or has CONOK set OFF
0900 Link is Out if Order	One of the switches used by your connection has failed in some way and there is no alternate route available. Or, you may have entered an invalid address—check for a typo! If you think a Switch has failed please tell the Network Sysop—Often network users are the first to detect problems.
0D00 Route not Known	Either you have entered an invalid address or the Switch is not configured properly. After verifying the address, if the failure repeats alert the Network Sysop.
3900 Remote Station Not Responding	Either the station you are trying to reach is not on the air, is not hearing the Switch you specified in the exit address

**Common ROSE X.25 Disconnect Codes**

this Users Guide. A switch can be configured to also provide a plain-text explanation of each code, in various languages. Refer to Section 3.3.

## 2. Call Traceability and Accountability

One unique advantage of ROSE X.25 Packet Networks is the traceability of connections. For example, I have connected to KA2USU using this connect command: `C KA2USU Via N2KBD-3, 609824`. If I were to type the text "Hello Ted", someone monitoring 223.4 would see N2EVW-3 transmit the following frame:

```
N2IRZ>KA2USU,201977,N2EVW-3*: Hello Ted
```

First, note that the ROSE Switch always identifies its transmissions with its own callsign—never the callsign of any user. While this is a legal requirement in some countries, it also makes ID beacons (and the resultant waste of channel time) unnecessary. Second, note that each frame carries all of the information required to connect back to me. Just like any digipeater connection, you would simply reverse the order of the digipeater fields. Thus, to connect back to me after I disconnect, you could use the command:

```
C N2IRZ Via N2EVW-3, 201977
```

With the ROSE network there is never any question as to who is connected to whom, which station is transmitting, or how to reach the remote station—all that information is included with every transmitted frame.

## 3. ROSE Applications

The ROSE Switch supports three<sup>10</sup> user-accessible applications: INFO, USERS and HEARD. These applications can be optionally uploaded by the ROSE Switch sysop to provide functions which are not built into the standard ROSE Switch software. To use an application, simply connect to it. For example, to get the heard list from the Trenton, NJ ROSE Switch, you might type (assuming your local switch is N2KBD-3): `C HEARD Via N2KBD-3, 609824`. After receiving the "Call Complete" message you will receive the application's output<sup>11</sup>. Please see the HEARD, USERS and INFO Application instructions following for more details.

Note that, since these applications are uploadable at the sysop's option, they may not be in all Switches. If the application you are trying to connect to is not loaded into the ROSE Switch at the address you specify, you will receive a call clearing code of 3900. If you would like a particular application loaded into a switch, send a message to the ROSE network sysop.

### 3.1 The HEARD Application

The HEARD application is very useful when looking for stations to connect with at a remote network address. “Last Heard” lets you know how recently a station was heard, and “RXCnt” gives some insight into how reliable a path is going to be (higher RXCnts mean better paths), as well **as the other station’s** activity level. This information makes it much easier to select a station to connect to than a simple list. To connect to HEARD, issue a command like:

```
C HEARD v Localswitch, Address
```

where Localswitch is the call of your local switch, and Address is the address of the switch you want a HEARD list from.

A sample HEARD session is shown below:

```
cmd: c heard v kb7uv-3 201744
*** CONNECTED to HEARD VIA KB7UV-3,201744
Call being Setup
Call Complete to HEARD-O @ 3100201744
ROSE X.25 Packet Switch Version 3.1 (920911) by Thomas A. Moulton, W2VY
Heard List for N2DSY-3 3100201744
      Last   First (How long ago)
Port  Station  Destination Heard   Heard  RXCnt  FType Path
  0  KB7UV-3  N2DSY-3    00:00  25:56   3498   I
  0  N2IRZ-3  N2DSY-3    00:00  10:27    522  RR
  1  N2DSY-6  N2DSY-3    00:00  25:59   2304  RR
  1  N2DSY-12 N2DSY-3    00:00  25:53   1952  RR
  0  KB7UV-1  HEARD      00:01  00:09    18   RR  KB7UV-3,201744
  0  HEARD    KB7UV-1    00:01  00:01    2    I  201744,KB7UV-3*
  0  N2KZH-12 WA2ERD-12  00:01  18:29   684  RR
  0  WB2GTX-4 RATS      00:02  25:56   1109  UI  N2DSY-2
  0  KB2BBW   CQ        00:03  21:00    28   UI
  0  KA2VLP-3 N2DSY-3    00:04  23:19   4940  RR
  0  N2KZH-4  PBBS      00:04  21:22   1101  UI
  0  KA2YKC-4 BEACON     00:04  25:43   1896  UI
  0  WA2ERD   BBS       00:04  04:43    7    UI

Type H to redisplay or * for ALL or Disconnect now
END>
```

Port: 0 means the Radio port, 1 means the RS-232 port (direct link to co-located switches on other frequencies)

Station: The station that sent the packet

Destination: The station that the packet is sent to

Last Heard: Hours and Minutes ago that the most recent packet from station was heard

First Heard: Hours and Minutes ago that first packet from station was heard

RXCnt: Total number of frames received from station

FType: (Frame Type) Last frame type monitored from station

Path: Lists digipeater fields used between station and destination

### 3.2 The USERS Application

The USERS application is useful for determining who is connected to a remote station or server (i.e., what Virtual Circuits (VCs) are passing through a switch). There are several other functions which are mainly of interest to the network sysop: the total amount of memory available and the amount in use; the connect status of each switch in a cluster; the status of each VC passing through the switch (e.g., Pending, Connected, etc.); and links status. A more detailed explanation of these parameters may be found in the ROSE System Manager's Manual<sup>12</sup>. To connect to USERS, issue a command like:

```
C USERS v Localswitch, Address
```

Where Localswitch is the call of your local switch, and Address is the address of the switch you want a USERS list from.

A Sample USERS list is shown below:

```
cmd: C users v n2kbd-3,201977
*** CONNECTED to USERS VIA N2KBD-3,201977
Call being Setup
Call Complete to USERS-0 @ 3100201977
ROSE X.25 Packet Switch Version 3.1 (920911) by Thomas A. Moulton, W2VY

User List far N2KBD-3 3100201977
Memory size is: 27788 Bytes
Memory Used is: 18528 Bytes
EPROM Checksum: 26h

N2IRZ-9 X.25 Trunk (R1) with the following connections:
N2IRZ @ 3100201790 ( 1 P4 D1) -> USERS @ 3100201977
NX2P-10 X.25 Trunk (R1) with no connections.
N2IRZ-12 X.25 Trunk (R1) with no connections.
N2KBD-6 X.25 Trunk (R1) with no connections.

There are no calls Pending.

The Following X.25 Trunks are listed as Out of Order:
<None> - All Links Operational

Type U to redisplay or Disconnect now
END>
```

The USERS list above shows only one user —N2IRZ— who is connected from the Switch at address 201790 to the USERS application at this Switch (Address 201977). The VC passes on to the N2IRZ-9 Switch. To find out where it goes

from there, connect to USERS at that Switch. The three other Switches in this cluster (NX2P-10, N2IRZ-12 and N2KBD-6) have no VCs from this Switch (201977). It is possible, however, that they are carrying VCs from **other** Switches — to determine that, connect to USERS at the Switch. Please note that most backbone Switches do not have applications loaded, and therefore their addresses are not shown in the User Ports and Services listing. Contact your local network sysop for more information about backbone switches.

### 3.3 The INFO Application

The INFO application has three functions:

- Allow users to remotely obtain a brief text file describing a particular switch, which can otherwise be obtained (without INFO) only by *directly* connecting to the Switch and pressing .
- Provide Network Services ("555") and Users ("411") Directory Servers. These services, described in detail below, help users find their way around the network.
- Adds clear-text descriptions to "Call clearing" codes (See section 3), making them easier to understand. The text descriptions are presently available in English, Spanish, and German.

Using INFO, you can retrieve text from a remote switch, in order to learn a little about it. In many cases the INFO text from a distant switch will contain information about the distant area that might otherwise be unknown

Connecting to the INFO application is just like any other ROSE **connection**:

**C INFO v Localswitch, Address**

where Localswitch is the call of your local switch, and Address is the address of the switch you want the INFO text from.

#### 3.3.1 The 555 Server

Every Area Code served by the RATS ROSE Network has an INFO Server providing a complete list of all User-Access ROSE Switches within that Area Code. Also listed are all locally available network services. This special INFO server responds to the address **XXX555**, where **XXX** is the 3-digit Area Code.

**For example,, to get** the list for the 201 Area Code, issue the command:

**C INFO via Localswitch, 201555**

Where Localswitch is the call of your local switch.

### **3.3.2 The 411 Server**

Similar in nature to the 555 Server, each Area Code also has a 411 Server. This application contains a list of local users and where they can be found. Stations are only listed by request, so contact your local Network Sysop to be added to the list.

For some Area Codes the 555 and 411 lists are combined into a single listing. In these cases connections to INFO at ROSE Address XXX411 and XXX555 will both respond with the combined list.

If you encounter problems accessing either of these servers, or have updated information, please contact the network sysop.

This is an example of a combined 411 and 555 listing:

```
cmd:c info v kb7uv-3, 718555
```

```
*** CONNECTED to INFO VIA KB7UV-3,718555
```

```
Call being Setup
```

```
Call Complete to INFO-O @ 3100718555
```

```
ROSE X.25 Packet Switch Version 3.1 (920911) by Thomas A. Moulton,  
W2VY
```

```
ROSE Network Backbone --Astoria, Queens-- KB7UV & RATS
```

```
*** ROSE DIRECTORY BULLETIN ***
```

```
Area Codes 718 and 212
```

```
Update 02/21/92
```

```
Note: Link to POLI/NOAA/NWS 212 switch not yet in place. . . Stay tuned!
```

Callsign	Address	Type	Name	Alias	Hours
-----	-----	e-81111---	-1--911111	-----	-----
KB7UV-4	718956	BBS	Andy Funk	BBS	24 Hrs
WB2GTK-4	718204	BBS	PARC		24 Hrs
K2ULR-15	718204	BBS	CBS SFX ARC		24 Hrs

```
For INFO on other AREA Codes in the Network (currently  
201,908,609,914,215)
```

```
use ROSE output destination 201411, 908411, 609411, etc.
```

```
If you wish to be added to this (718) list please contact Andy, KB7UV.
```

Switches Available for User Access  
in the 718 Area Code As of 01/14/92 are:

Address	Callsign	Location	User Port	Freq
-1-m---	-1-1111-	-----	-----	-----
718204	<b>KB7UV-3</b>	Astoria, NY	145.07	<b>Mhz</b>

Services Available for User Access  
in the 718 Area Code As of 06/17/92 are:

Address	Callsign	Alias	Location	Service
-----	-----	-m-m-	-----111---	
718204	<b>WB2GTX-4</b>		Secaucus, NJ	<b>ROSErver/PRMBS BBS</b>
718956	<b>KB7UV-4</b>	<b>BBS</b>	Astoria, NY	<b>ROSErver/PRMBS BBS,</b>
<b>Multi-User</b>				

For Info on Switches and Services Available in other Area Codes in the Network, currently 609,908,201 use ROSE output destination 609555, 908555, or 201555

Address questions about the **KB7UV** Packet Services, via packet radio mail, to **KB7UV@KB7UV.#NLI.NY.USA**

This switch brought to you courtesy of the Radio Amateur Telecommunications Society (RATS). For information on RATS address packet mail to "**ASKRAT@KB4CYC.NJ.USA**".

73, Andy, **KB7UV**

Please Disconnect now

#### 4. Further Information

Additional information on ROSE X.25 Packet Networking can be found in:

- ROSE X.25 Packet Switch System Managers Manual
- ROSE X.25 Packet Switch Resource Manual

These documents, and the executable files for the ROSE X25 Packet Switch, ROSErver/PRMBS Packet Radio MailBox System, ROSErver/OCS Online Callbook Server, ROSE/RZ network maintenance utility, ROSE/STS Station Traffic System for managing NTS traffic, and ROSE/RMAILer PBBS Remote Mail Server, are all available from the Radio Amateur Telecommunications Society (RATS). Please include an SASE with all inquires.

Correspondence may be sent to:

RATS  
PO Box 93  
Park Ridge, NJ 07656-0093

Via the Internet, RATS can be reached at address:

`rats@kb2ear.ampr.org`

Packet inquires may be sent to:

`askrat@kb4cyc.nj.usa`

Voice inquires can be directed to Nancy, N2FWI, and Gordon, N2DSY, Beattie. Their number is 201-387-8896.

Software and support is available on the RATS KB7UV Landline ROSErver/PRMBS. The system supports data rates of 1200 to 9600 bps (V.32), and J-, X-, Y-, and Zmodem binary protocols. It can be reached at 718-956-7133. Callers should wait for the "login:" prompt (don't even press ) and follow the instructions provided.

## 5.0 ROSE X.25 Call Clearing Codes

Every time a call is cleared, the ROSE X.25 Packet Network provides a code indicating the reason. The code is a La-digit hexadecimal number, where the last two digits are always 00. These codes are the universally accepted X.25 Cause Codes standardized by CCITT.

Number	CCITT X.25 Name	Explanation (ROSE X.25 Usage)
0000	DTE Originated	The other station disconnected (normal disconnect)
0100	Number Busy	The other station is busy, or has CONOK set OFF
0300	Invalid Facility	Internal network error—notify Network Sysop!
0500	Network Congestion	Retry count exceeded
0900	Out of Order	Network link not operating
0B00	Access Barred	Cannot connect to a network trunk
0D00	Not Obtainable	No known path for address specified
1100	Remote Procedure	Internal network error
1300	Local Procedure	internal network error
1500*	RPOA Out of Order	(not used)
1900*	Reverse Charge	(not used)
2100*	Incompatible Dest.	(not used)
2900*	Fast Select	(not used)
3900	Ship Absent	No response from other station
C100*	Gateway Proc. Error	(not used)
C500*	Gateway Congestion	(not used)

\* Currently not used, should not be seen.

## 6. X.121 Data Network Identification Codes (DNIC)

### Zone 2

2020	Greece
2040	Netherlands
2060	Belgium
2080	France
2120	Monaco
2140	Spain
2160	Hungary
2180	E. Germany*
2200	Yugoslavia
2220	Italy
2260	Romania
2280	Switzerland
2300	Czechoslovakia
2320	Austria
2340	Great Britain and Northern Ireland
2380	Denmark
2400	Sweden
2420	Norway
2440	Finland
2500	USSR*
2600	Poland
2620	Germany (W)*
2660	Gibraltar
2680	Portugal
2700	Luxembourg
2720	Ireland
2740	Iceland
2760	Albania
2780	Malta
2800	<b>Cyprus</b>
2840	Bulgaria
2860	Turkey

### Zone 3

3020	Canada
3080	St. Pierre and Miqueion
3100	United States
3300	Puerto Rico
3320	US Virgin Islands
3340	Mexico
3380	Jamaica
3400	French Antilles
3420	Barbados
3440	Antigua
3460	<b>Cayman Islands</b>
3480	British Virgin Islands
3500	Bermuda
3520	Grenada
3540	<b>Montserrat</b>
3560	St. Kitts
3580	St. Lucia
3600	St. Vincent
3620	Netherlands Antilles

3640	Bahamas
3660	Dominica
3680	Cuba
3700	Dominican Republic
3720	Haiti
3740	Trinidad & Tobago
3760	Turks & Caicos Is.

### Zone 4

4040	India
4100	Pakistan
4120	Afghanistan
4130	Sri Lanka
4140	Burma
4150	Lebanon
4160	Jordan
4170	<b>Syrian Arab Rep.</b>
4180	Iraq
4190	Kuwait
4200	Saudi Arabia
4210	Yemen (Arab Rep.)*
4220	Oman
4230	Yemen (Dem Rep.)*
4240	United Arab Emirates
4250	Israel
4260	Bahrain
4270	Qatar
4280	Mongolia
4300	UAE (Abu Dhabi)
4310	UAE (Dubai)
4320	Iran
4400	Japan
4500	Korea
4520	Vietnam
4540	Hong Kong
4550	<b>Macao</b>
4560	Democratic Kampuchea
4570	Laos
4600	China
4700	Bangladesh
4720	Maldives

### Zone 5

5020	Malaysia
5050	Australia
5100	Indonesia
5150	Phillipines
5200	Thailand
5250	Singapore
5280	Brunei
5300	New Zealand
5350	Guam
5360	Nauru
5370	Papua New Guinea
5390	<b>Tonga</b>
5400	Solomon Islands

5410	New Hebrides
5420	Fiji
5430	<b>Wallis &amp; Futuna Is.</b>
5440	American Samoa
5450	Gilbert and Ellice Is.
5460	New Caledonia & Dep.
5470	French Polynesia
5480	Cook Islands
5490	Western Samoa

### Zone 6

6020	<b>Egypt</b>
6030	Algeria
6040	Morocco
6050	Tunisia
6060	Libya
6070	Gambia
6080	Senegal
6090	Mauritania
6100	Mali
6110	Guinea
6120	Ivory coast
6130	upper Volta
6140	Niger
6150	Togolese Republic
6160	Benin
6170	Mauritius
6180	Liberia
6190	Sierra Leone
6200	Ghana
6210	Nigeria
6220	Chad
6230	Central African Republic
6240	Cameroon
6250	cape Verde
6260	Sao Tome and Principe
6270	Equatorial Guinea
6280	Gabon <b>Republic</b>
6290	Congo
6300	Zaire
6310	Angola

6320	Guinea-Bissau
6330	Seychelles
6340	Sudan
6350	Rwanda
6360	Ethiopia
6370	Somali Dem. Rep..
6380	Rep. of Djibouti
6390	Kenya
6400	Tanzania
6410	Uganda
6420	Burundi
6430	Mozambique
6450	Zambia
6460	Madagascar
6470	Reunion
6480	Zim babwe
6490	Namibia
6500	Malawi
6510	Lesotho
6520	Botswana
6530	Swaziland
6540	Comoros

### Zone 7

7020	Belize
7040	Guatemala
7060	El Salvador
7080	Honduras
7100	Nicaragua
7120	Costa Rica
7140	Panama
7160	Peru
7220	Argentina
7240	Brazil
7300	Chile
7320	Columbia
7340	Venezuela
7360	Bolivia
7380	Guyana
7400	Ecuador
7440	Paraguay
7460	Suriname
7480	<b>Uruguay</b>

\* Given recent political changes, it is advised to confirm the proper DNIC with local authorities.

## 7. Notes:

1. In a properly configured ROSE X.25 Packet Network, the address of the other station's local ROSE Switch is likely to be the other station's telephone Area Code and exchange.
2. In North America, switch addresses consist of six digits-the telephone area code and 3-digit exchange. In other countries the addressing; scheme may differ. Some TNCs, as well as some other networking systems, will not accept an all-numeric digipeater field. The ROSE Switch permits you to substitute the letter O for a zero and either L or I for a one in the address.
3. The sample map is used only for this example. Contact RATS for accurate network maps.
4. The 3 100 part of the address shown is the X.12 I Data Network Identification Code (DNIC) for the United States. Please refer to Section 1.2 for more information about the DNPC
5. This will appear in the form of a 4 digit number in Hexadecimal. A properly configured ROSE Switch will also give you a brief text explanation. A complete listing of the codes, which are internationally standardized CCITT X.25 disconnect codes, is given later in this User Guide.
6. A complete listing of standard X.12 I Data Network Identification Codes is given in Section 6 of this User Guide.
7. Not possible at this time, but soon, as Central America and Australia both have extensive ROSE Networks.
8. This may be expanded to the known universe, when necessary.
9. These codes are standard CCITT X.25 Cause Codes. The last two digits are always zero,
10. As of this writing. Other applications are being developed.
11. Prior to version 2.8, HEARD and USERS waited for the user to press  before sending their data.
12. The ROSE System Manager's Manual is being rewritten at this time (9/92). Release is expected 10/92.