

# ROSE X.25 Packet Switch Status Update

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### INTRODUCTION

The ROSE X.25 Packet Switch has been under development for over six years. In this time, we have developed an implementation which encompasses the original design objectives, as well as requirements raised by the evolving needs of the Amateur Radio packet community. This paper describes several unique and interesting features of the Switch and introduces new features implemented in the latest release of the software.

The past two years we have seen much growth in the popularity and support for the ROSE X.25 Switch. Much of the southeastern United States, from Florida to Texas, Oklahoma to Tennessee, and on to Georgia is running ROSE. In this network, connections spanning 400 miles are not uncommon.

### UPLOADABLE APPLICATIONS

The system manager may, from any point in the network, access the password protected LOADER Application. The LOADER Application allows the system manager to upload and execute a network management application program or user feature into the switch. This single concept has given the Switch the ability to support a wide range of optional features tailored to the needs of the local network environment. These include a friendly, plain-language user interface (INFO), heard list (HEARD),

network connection status (USERS), Switch configuration (CONFIG), remote Switch restart (BOOTER), connection status diagnostic (UDUMP) and a CW identification which is included in the INFO Application (INFOCWID).

These applications may be loaded and deleted dynamically. For example, the CONFIG Application only needs to be loaded and present in the Switch while the configuration is being updated. After the changes to the Switch configuration have been completed, the CONFIG Application may be deleted leaving additional Switch memory free for other applications or packet buffers.

The INFO Application is provided with several optional components. These include plain-language text messages which supplement the terse status codes resident in the Switch EPROM. The messages are available in English (INFO), Spanish (INFOSP) and German (INFODE). Other languages will be offered as people volunteer to provide translations.

The INFO Application also provides a place for user accessible text which is provided by the system manager. This text may assist users with network resource information including the network addresses; and callsigns of BBSs, callsign and file servers, DX Clusters and network gateways.

The newest component is an optional CWID which may be included where local regulation or custom may require its use.

## HARDWARE INTERFACING

The ROSE X.25 Packet Switch may be interfaced to other ROSE Switches via Diode Matrix boards, RS-232 LAN Cards or through wire-line modems supporting standard RS-232 signals. This allows several TNCs to be grouped at a site to provide multiple ports on several RF channels.

The ROSE X.25 Packet Switch has been designed as an International Packet Network supporting a mixture of radio and **landline** backbone links. This is especially true when you consider the Worm-Holes that people have come up with over time. Some are simple point-to-point lease-line channels borrowed from benefactors, or X.25based Public Data Networks or dial-up telephone connections. It is also interesting to note that with a ROSE X.25 Network, users need not know the internal network structure, so they won't really know when/if they are using a Worm-Hole!

## NETWORK FAILURES

When a connection between two stations is lost (disconnected or cleared), the network sends a Clear packet to each station. This packet contains the reason for the clear and the network address that originated the clearing procedure. Most of the time the cause will be "0000", indicating that the other station requested the clear. In this case the address will be that of the other end point.

There will be times of network congestion, or network outage where the reported address will be that of an intermediate switch. If an address of a

Switch is frequently reported as detecting the failure, then it can be investigated and remedial changes may be made to the Switch or its neighbor.

A Clear packet may also occur when a connection is being set up and no operational path to the requested network end-point exists. In this case, the user will receive the network address of the primary connection setup failure.

## COVERAGE

Each Switch can provide coverage to any and all local exchanges within the RF coverage of the site. What this means is that a single Switch can act as if it has many different network addresses.

## CALL REDIRECTION

The Switch can be configured to trap a Call Request to a **CALL @ ADDRESS** and change it to a new **CALL @ ADDRESS**. This is useful in the case where a BBS or other network facility goes down for an extended period.

## TRANSPARENT PID SUPPORT

The ROSE X.25 Packet Switch can now transparently handle ANY protocol that operates across an AX.25 connection. This means that a ROSE X.25 network connection is FULLY TRANSPARENT to the data and AX.25 PID. Specifically:

Two NOS users can establish a connection through a ROSE X.25 Network.

Two G8BPQ node users can establish a connection between them through a ROSE X.25 Network.

Two TheNET nodes can nail up a connection through a ROSE X.25 Network.

The ROSE X.25 Network doesn't care what the protocol is, it just carries the data!

When a ROSE X.25 Packet Switch receives a frame (AX.25 packet) on a user link, the PID is checked, and if it is not a regular AX.25 user (PID = F0), the PID is saved and a flag is set, The PID and data are then relayed through the network in a standard X.25 Qualified Data Packet. This Qualified Data Packet has a one byte identifier signifying that the PID is stored with the data, followed by the PID and the user data. When the frame reaches the destination Switch, it will recognize that the Data Packet contains the PID and it will use that PID when the frame is transmitted to the destination user.

## CONCLUSION

The ROSE X.25 Packet Switch has undergone a significant number of enhancements that set it apart from other networking schemes. It offers flexibility for both users and system managers while simplifying the connection setup process for all. It can carry any protocol from keyboard users, BBS forwarding, TCP/IP and any new protocols that may be developed using AX.25 as the underlying Link Level protocol. Current work on an MS-DOS driver is progressing nicely. This will be a valuable extension to the network tool kit. It will allow for simplified implementation of network user and management application programmes.