GuestWorks® and DEFINITY® Enterprise Communications Server

Property Management System Interface Specifications

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This document was prepared by the DEFINITY Development group of Avaya University.

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About This Document

This document describes the Property Management System (PMS) data link interface for the GuestWorks® system, the DEFINITY® Business Communications System (BCS), and the DEFINITY Enterprise Communications Server (ECS). This interface allows a PMS to provide front office and back office hotel/motel management features with communications-related functions coordinated with the switch. Although this document is written for the hotel/motel environment, its specifications may also apply to hospitals and other extended-care facilities.

A PMS usually consists of a computer with one or more data terminals used to input data related to a guest's stay at the property. A PMS terminal provides an efficient way for hotel staff to check guests in and out of the hotel, move guest check-in information from one room to another, control long distance calling access for a guest room, view long distance billing charges as prescribed by a call accounting adjunct, and control other information related to the guest. Information concerning housekeeper-dialed status changes, Controlled Restrictions, and Message Waiting can also be obtained from the switch and sent to the PMS. The switch receives check-in and check-out messages and guest information changes from the PMS, and can also receive Controlled Restriction and Message Waiting data from the PMS as necessary.

Intended Audience

The primary audience for this specification is PMS vendors who wish to create PMS products that interface to Avaya systems. A secondary audience is installation and support personnel.

Reasons for Reissue

This document replaces Issue 3. Changes in this release include the following:

- PMS connectivity to the DEFINITY switches using TCP/IP over a local area network (LAN).
- Changes to hospitality administration for LAN printer connections.
- Adding an ASCII definition table to assist vendor developers.
- General updating and corrections.

Conventions

The following conventions are used in this document:

- The term “switch” is used to refer to GuestWorks and any DEFINITY switch that is optioned for hospitality.
- Specifications that are supported on only the DEFINITY ECS Release 8.1 and later and the GuestWorks and DEFINITY BCS Issue 6 and later are identified by “R8.”
- Specifications that are supported on only the GuestWorks, DEFINITY BCS, and DEFINITY ECS Release 9.1 and later are identified by “R9.”
- Specifications that are supported on only the GuestWorks, DEFINITY BCS, and DEFINITY ECS Release 9.5 and later are identified by “R9.5.”
- Specifications that are supported on only the GuestWorks, DEFINITY BCS, and DEFINITY ECS Release 10.1 and later are identified by “R10.”
- The designation “0x” in numbers such as “0x02” and “0xf” represents the term “Hexadecimal.” For these two examples, you should read them as “Hex 02” and “Hex f.”

- This interface supports three modes of hospitality data: Normal Mode, Transparent Mode, and ASCII Mode. The switch models that support each mode are as follows:

Switch Release	Mode		
	Normal	Transparent	ASCII
DEFINITY Generic 3 Versions 1-4 (G3V1-G3V4)	Yes	Yes	No
DEFINITY ECS (R5 and later), GuestWorks (all releases), and DEFINITY BCS (all releases; optional before R10, standard with R10)	Yes	Yes	Yes

  The normal mode gives you standard functionality; everything in the normal mode is also supported in the transparent mode and the ASCII mode. Feature codes and specifications that support only normal, transparent, or ASCII modes are identified with (N), (T), or (A), respectively.

- Administration command paths and options you enter in the administration fields are shown as follows:

  change system-parameters hospitality

- Field names referring to the administration screens are shown as follows:

  `Queue Length`

Related Documents

- 555-020-706 — *7400A Data Module User Guide*
- 555-020-707 — *7400B Data Module User Guide*
- 555-020-709 — *8400B Plus Data Module User's Guide*
- 555-231-742 — *GuestWorks* and *DEFINITY ECS Hospitality Operations*
- 555-231-743 — *GuestWorks and DEFINITY ECS Technician Handbook for Hospitality Installations*
- 555-233-506 — *DEFINITY ECS Administrator's Guide*
- 555-233-200 — *DEFINITY ECS System Description*
- 555-233-822 — *DEFINITY ECS Documentation Library* (CD)
- 585-310-234 — *INTUITY Lodging Property Management System Interface Specifications*

Link Interface

The PMS Interface is a data link that operates under specific message protocols and formats. The characteristics of the link, the protocols used, and the message text are described in detail in the “Feature Description” starting on page 23. The following figures show the various ways that a switch can link to a PMS.

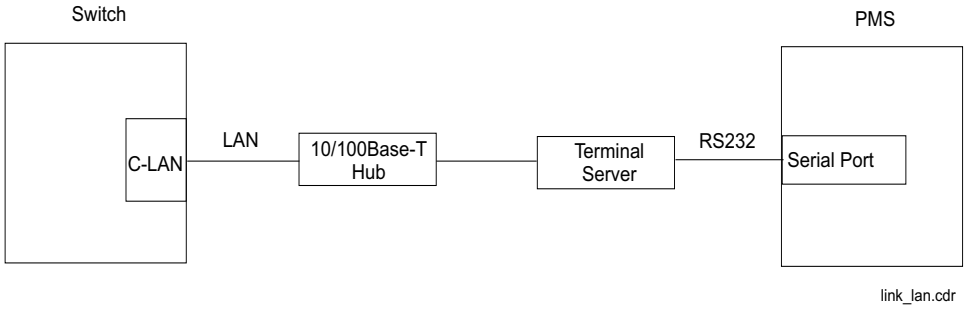


Figure 1. Switch-to-PMS LAN Terminal Server Connectivity (R9.5)

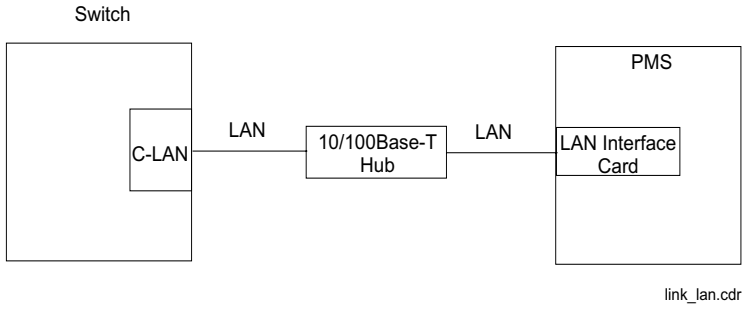


Figure 2. Switch-to-PMS LAN Direct Connectivity (R9.5)

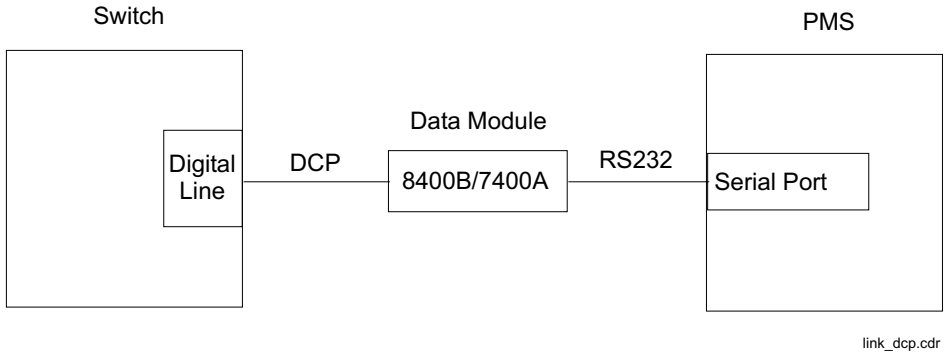


Figure 3. Switch-to-PMS Data Module Connectivity

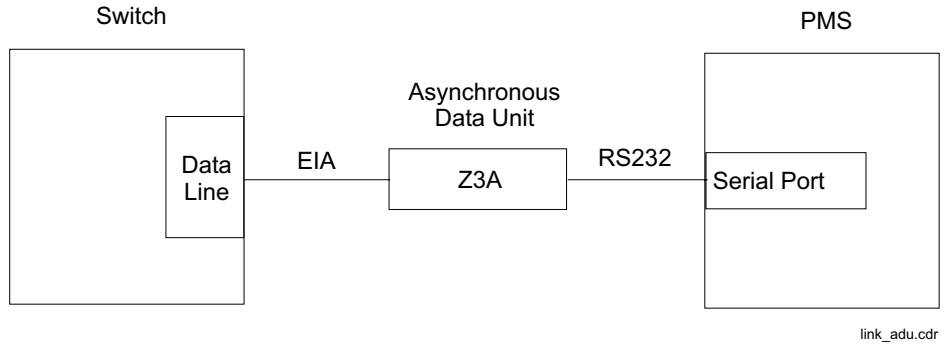


Figure 4. Switch-to-PMS ADU Connectivity

The PMS Interface feature permits a co-located PMS to request more sophisticated room status functions via the switch and communication of housekeeper status changes from the switch. In addition, the PMS may perform guest folio preparation and perform sophisticated message waiting and room telephone restriction functions utilizing the switch control capabilities. The PMS can communicate with the switch by sending and receiving specific messages associated with the functions to be performed.

The PMS can receive the following information from the switch:

- Housekeeper-dialed status changes from guest room and designated telephones.
- Telephone restriction status changes entered on telephones using the Controlled Restrictions feature.

- Message waiting lamp changes entered on telephones and changes in Message Waiting status.
- Status inquiry and room data image messages indicating failures, requests for database updates, requests or confirmation of impending link release for maintenance, and normal link operations.
- Names registration (which includes the guest name and coverage path number) via room data image request (T) (A). This is a response message to the PMS.

The PMS can send the following information to the switch:

- Room check-in and check-out messages. Check-in/check-out messages are required to support the data link since the PMS controls room status. Check-in messages may be sent with or without guest name information (T) (A). Check-ins may also include the coverage path number (T) (A) which correlates to the destination of an unanswered call to a guest's room (for example, hotel attendant, voice mail, and so on), the guest's language interface attribute (A), and the guest's voice messaging password (A).
- Requests for DID numbers (A). This message requests that a DID number be associated with a Room Station Number (RSN).
- Guest Information Input/Change messages (T) (A). This allows input or changes in guest information after check-in [guest name, coverage path, language interface attribute (A), and voice messaging password (A)].
- Room change or room swap messages specifying the "from" and "to" an RSN. These messages are required to support the data link so that the switch will always reflect the most current guest room status information.
- Telephone restriction changes entered on PMS terminals.
- Message waiting lamp changes entered on PMS terminals.
- Text or fax notations entered on a PMS terminal (A).
- Status inquiry and room data image messages indicating failures, requests for database updates, requests or confirmation of impending link release for maintenance, and normal link operations.

The messages to be sent and received depend on the functions required for the particular application. This is discussed in detail in "Administration Options" starting on page 4. The specific actions taken by the switch for each of the messages is discussed in "Feature Codes, Process Codes, and Operations" starting on page 59.

Administration Options

This section shows the switch administration screens used to administer the PMS Interface options and a description of those options. Screens are shown for the most recent version of the switch.

CAUTION:
The screens and options described here may differ slightly depending on the switch being used. Refer to the administration documents provided with your switch to verify which options you must administer. The values shown in these screens are for example only. Actual field values must be determined by the technician in consultation with the PMS vendor.

```
change system-parameters hospitality                            Page   1 of   3
                              HOSPITALITY

                      Message Waiting Configuration: act-nopms
                Controlled Restrictions Configuration: act-pms
                Housekeeper Information Configuration: act-pms
                     Number of Housekeeper ID Digits: 0
                                 PMS Log Endpoint:
                           Journal/Schedule Endpoint:
              Client Room Coverage Path Configuration: act-nopms
               Default Coverage Path for Client Rooms: 1
              Forward PMS Messages to Intuity Lodging? n

                              PMS LINK PARAMETERS
                                        PMS Endpoint: 7899
                                   PMS Protocol Mode: transparent ASCII mode? y
                  Seconds before PMS Link Idle Timeout: 20
Milliseconds before PMS Link Acknowledgement Timeout: 500
                        PMS Link Maximum Retransmissions: 5
              PMS Link Maximum Retransmission Requests: 5
                      Take Down Link for Lost Messages? y
```

```
change system-parameters hospitality                              Page   2 of   3
                            HOSPITALITY

           Dual Wakeups? y    Daily Wakeup? y    VIP Wakeup? y
                                  VIP Wakeups Per 5 Minutes: 5
                           Room Activated Wakeup With Tones? y
                    Time of Scheduled Wakeup Activity Report: 12:00:am
                     Time of Scheduled Wakeup Summary Report: 12:30:am
          Time of Scheduled Emergency Access Summary Report: 12:45:am
                                        Announcement Type: silence


         Length of Time to Remain Connected to Announcement: 30
            Extension to Receive Failed Wakeup LWC Messages: 399
           Routing Extension on Unavailable Voice Synthesis:
                   Display Room Information in Call Display? n
                         Automatic Selection of DID Numbers? y
                        Custom Selection of VIP DID Numbers? y
                                 Number of Digits from PMS:
                                       PMS Sends Prefix? n
                     Number of Digits in PMS Coverage Path: 3
                                   Digit to Insert/Delete:
```

```
change system-parameters hospitality                              Page   3 of   3
        ROOM STATES           HOSPITALITY


          Definition for Rooms in State 1: OCCUPIED/DIRTY
          Definition for Rooms in State 2: OCCUPIED/MAID IN ROOM
          Definition for Rooms in State 3: OCCUPIED/CLEAN
          Definition for Rooms in State 4: VACANT/CLEAN
          Definition for Rooms in State 5:
          Definition for Rooms in State 6:


HOSPITALITY FEATURES
                                    Suite Check-in? y
```

The following sections describe the administration options. The options are grouped as they are located on each page of the administration screens.

CAUTION:
Not all administration options are available for each release. Items marked with (T) apply only to the transparent mode, and items marked with (A) apply only to the ASCII mode.

Administration Options on Page 1

Message Waiting Configuration

This indicates whether message waiting notification requests and changes are being exchanged between the switch and the PMS.

Valid entries	Usage
act-nopms	The message is acknowledged (MESSAGE ACK), but no action is taken.
act-pms	Message waiting is active on the switch, and information between the PMS and switch is being transmitted. If the PMS vendor supports text message waiting, use **act-pms**.

Controlled Restrictions Configuration

This indicates whether controlled restriction information is being exchanged between the switch and the PMS.

Valid entries	Usage
act-nopms	The message is acknowledged (MESSAGE ACK), but no action is taken.
act-pms	The switch and the PMS exchange and accept controlled restriction information.

Housekeeper Information Configuration

This indicates whether housekeeper information is being exchanged between the switch and the PMS.

Valid entries	Usage
act-nopms	The message is acknowledged (MESSAGE ACK), but no action is taken.
act-pms	The switch and PMS exchange and accept housekeeper information.

Number of Housekeeper ID Digits

This is the number of digits that the housekeeper must dial for identification.

Valid entries	Usage
0 to **6**	

PMS Log Endpoint (R9.5), or Extension of PMS Log Printer

This is either a TCP/IP service type as defined on the IP Services form (R9.5), or a valid data extension number that is assigned to a data module connected to the PMS Log printer. The same printer can be used for both the PMS Log and Journal/Schedule print jobs.

Valid entries	Usage
PMS_LOG or PMS_JOURNAL	Use either PMS_LOG or PMS_JOURNAL as defined on the IP Services form.
Valid data module extension number	This extension is dialed by the switch to send housekeeping and PMS events to the printer.

Journal/Schedule Endpoint (R9.5), or Extension of Journal/Schedule Printer

This is either a TCP/IP service type as defined on the IP Services form (R9.5), or a valid data extension number assigned to the data module that is connected to the Journal/Schedule printer. The same printer can be used for both the PMS Log and Journal/Schedule print jobs.

Valid entries	Usage
PMS_JOURNAL or PMS_LOG	Use either PMS_JOURNAL or PMS_LOG as defined on the IP Services form.
Valid data module extension number	This extension is dialed by the switch to send journal information or to schedule reports to the printer.

Client Room Coverage Path Configuration (T) (A)

This indicates whether the switch and the PMS exchange coverage path information for guest telephones. This field does not apply to the normal mode. When upgrading from a release that does not support this feature, the field is set to **act-pms** if the PMS protocol mode is administered for the transparent or ASCII mode.

Valid entries	Usage
act-nopms	The message is acknowledged (MESSAGE ACK), but no action is taken. The last-administered coverage path is assigned to the RSN.
act-pms	The switch and PMS exchange and accept coverage path information. The coverage path defined in the `Default Coverage Path for Client Rooms` field is assigned to the RSN.

Default Coverage Path for Client Rooms (T) (A)

This indicates the coverage path assigned when the switch receives a check-out message for a valid extension or a new check-in. This applies only to RSNs with a “client room” class of service in the “occupied” mode. If this field is left blank, no coverage path is assigned to the RSN. This field does not apply to normal mode; it is used only for the transparent or ASCII mode. The value in this field is also used during a translation save as the coverage path for each RSN with “client room” class of service if the `Client Room Coverage Path Configuration` field is set to **act-pms**.

Valid entries	Usage
1 to system maximum	The number of Call Coverage paths depends on the system model.

Forward PMS Message to INTUITY Lodging (T) (A)

This field determines whether PMS messages destined for a voice mail system that supports lodging are transmitted through the switch (GuestWorks mode) or directly to the voice mail system (standalone mode).

Valid entries	Usage
y	Enter **y** if the PMS-to-voice mail messages will be sent through the switch (GuestWorks mode). With this mode, a separate hardware link from the PMS to the voice mail system is not used. The voice mail system must connect to the switch using TCP/IP over the CLAN circuit pack.
n	Enter **n** if the PMS-to-voice mail messages will be sent directly from the voice mail system to the PMS (standalone mode). With this mode, a separate hardware link from the PMS to the voice mail system is required.

PMS Endpoint (R9.5), or Extension of PMS

This is either a TCP/IP service type as defined on the IP Services form (R9.5), or a valid data extension number that is assigned to the data module connected to the PMS.

Valid entries	Usage
PMS	Use the PMS service type as defined on the IP Services form.
Valid data module extension number	When this extension is entered and PMS is ready, the switch brings up the link.

PMS Protocol Mode

This indicates the message protocol mode used between the switch and PMS.

Valid entries	Usage
normal	Normal mode.
transparent	Transparent mode. To enable the ASCII mode, transparent mode must be enabled.

ASCII mode (A)

This indicates whether the ASCII-only mode is being used for the PMS message set. The PMS Protocol Mode field must be set to **transparent**. This field does not apply to the normal mode.

Valid entries	Usage
y/n	

Seconds Before PMS Link Idle Timeout

This indicates the idle time, in seconds, that the switch waits for an acknowledgment from the PMS before the switch enters the link failure mode from the PMS transmission link.

Valid entries	Usage
5 to **20**	

Milliseconds Before PMS Link Acknowledgment Timeout

This indicates the amount of time, in milliseconds, that the system waits for an acknowledgment from the PMS indicating that it correctly received a message.

Valid entries	Usage
100 to **1500**	This regulates how quickly the system responds to a message from the PMS (also known as “pace timing”). This value is also used as the “inquiry message” (ENQ) time-out value. In most cases, keep this as short as possible. For normal mode, the recommended range is 100 to 300 ms. For transparent and ASCII modes, the recommended range is 100 to 500 ms.

PMS Link Maximum Retransmissions

This indicates the number of times that the switch will retransmit a message to the PMS in response to a negative acknowledgment or that the switch will send an inquiry for acknowledgment from the PMS before abandoning the message.

Valid entries	Usage
1 to **5**	

PMS Link Maximum Retransmission Requests

This indicates the number of times that the switch will allow the PMS to request acknowledgment for a message that it sent.

Valid entries	Usage
1 to **5**	

Take Down Link for Lost Messages

This indicates whether the link will be taken down if messages are being lost. The switch determines that messages are being lost if it receives a message that is out of sequence. When this occurs, the link is brought down momentarily, and the switch requests a database swap from the PMS.

Valid entries	Usage
y	Enter **y** to allow the PMS link to be brought down if messages are being lost.
n	Enter **n** to keep the link operating. Careful monitoring of the PMS error log is recommended when using this option.

Administration Options on Page 2

Dual Wakeup

This indicates whether the Dual Wakeup feature is enabled.

Valid entries	Usage
y/n	Enter **y** if each guest can request two wakeup calls within one 24-hour time period.

Daily Wakeup

This indicates whether the Daily Wakeup feature is enabled.

Valid entries	Usage
y/n	Enter **y** if each extension can request daily wakeup calls.

VIP Wakeup

This indicates whether the VIP Wakeup feature is enabled.

Valid entries	Usage
y/n	Enter **y** if the front desk is allowed to create VIP wakeup calls.

VIP Wakeups Per 5 Minutes

This field appears only if VIP Wakeup is set to **y**.

Valid entries	Usage
0 to **50**	Enter the number of VIP Wakeup calls that you want the system to allow in a 5-minute interval.

Room Activated Wakeup with Tones

This indicates whether the Room Activated Wakeup with Tones feature is enabled.

Valid entries	Usage
y/n	Enter **y** if guests are allowed to create their own wakeup calls. This allows room activated wakeup calls without the use of a speech synthesizer or a display telephone.

CAUTION:
Do not set the time for the following reports to coincide with the time when the system does its scheduled maintenance tests (the default is 1 a.m.). See the System-Parameters Maintenance screen to verify the time and to coordinate this administration so the times do not overlap.

Time of Scheduled Wakeup Activity Report

This indicates the time of day that the Wakeup Activity Report will be printed on the Journal/Schedule Printer. This report summarizes the wakeup activity for each extension that had wakeup activity for the past 24 hours.

Valid entries	Usage
hh:mm:am/pm	Enter the time using the format: hh=hour, mm=minute, am = a.m., pm = p.m.

Time of Scheduled Wakeup Summary Report

This indicates the time of day that the Wakeup Summary Report will be printed on the Journal/Schedule printer. This report gives an hour-by-hour summary of the number of scheduled wakeup calls and a list of extensions to which wakeup calls were attempted but to which the calls did not complete during the hour.

Valid entries	Usage
hh:mm:am/pm	Enter the time using the format: hh=hour, mm=minute, am = a.m., pm = p.m.

Time of Scheduled Emergency Access Summary Report

This indicates the time of day that the Emergency Access Summary Report will be printed on the Journal/ Schedule printer.

Valid entries	Usage
hh:mm:am/pm	Enter the time using the format: hh=hour, mm=minute, am = a.m., pm = p.m.

Announcement Type

This indicates the type of automatic wakeup announcement that the hotel guest will receive. Allowable entries are as follows:

Valid entries	Usage
external	Applicable when using an announcement adjunct. If **external** is used, complete the `Auxiliary Board for Announcement` field.
integrated	Applicable when using the TN750B, TN750C, or TN2501AP (R9.5) announcement circuit pack. If **integrated** is used, complete the `Integrated Announcement Extension` field. The extension you enter must be a valid integrated announcement extension (administered on the Recorded Announcements screen) or a vector directory number (VDN). If you enter an invalid extension, the switch displays an error message.
mult-integ	Multi-integrated; applicable when using the TN750B, TN750C, or TN2501AP (R9.5) announcement circuit pack. If **mult-integ** is used, complete the `Default Announcement Extension` field. The extension you enter must be a valid integrated announcement extension (administered on the Recorded Announcements screen) or a VDN. If you enter an invalid extension, the switch displays an error message.
voice- synthesis	If **voice-synthesis** is used, complete the `Announcement Ports` field.
music-on-hold	If **music-on-hold** is used, no other field appears.
silence	If **silence** is used, no other field appears.

Depending on what data is entered in the `Announcement Type` field, one of the following four fields appears:

- Auxiliary Board for Announcement
- Integrated Announcement Extension
- Default Announcement Extension
- Announcement Ports.

Auxiliary Board for Announcement

This field appears only when the **external** announcement type is used. This indicates the equipment location of an auxiliary trunk circuit that connects to the external announcement equipment. Enter a 5-character circuit pack number.

Valid entries	Usage
1 to **3**	cabinet
A to **E**	carrier
0 to **20**	slot

Integrated Announcement Extension

This field appears only when the **integrated** announcement type is used. This indicates the wakeup announcement extension when using the integrated announcement circuit pack.

Valid entries	Usage
valid extension or VDN	Enter the extension of the announcement that you want to use for wakeup calls.

Default Announcement Extension

This field appears only when the **mult-integ** announcement type is used. This indicates the default wakeup announcement extension when using the integrated announcement circuit pack.

Valid entries	Usage
valid extension or VDN	Enter the extension of the announcement that you want to use for default wakeup calls.

Announcement Ports

This field appears only when the **voice-synthesis** announcement type is used. For the **voice-synthesis** announcement type, this field indicates the equipment location of the two ports on the voice synthesizer circuit pack (TN725B).

Valid entries	Usage
1 to **3**	cabinet
A to **E**	carrier
0 to **20**	slot
01 to **04**	circuit

Length of Time to Remain Connected to Announcement

Enter the length of time, in seconds, that a hotel guest will be connected to an announcement. This applies only after the guest has heard the announcement completely one time, but continues to listen.

Valid entries	Usage
0 to **300**	

Extension to Receive Failed Wakeup LWC Messages

This field indicates where unsuccessful wakeup Leave Word Calling (LWC) messages will be stored. This is administered to an unassigned extension. An LWC lamp for that extension is then assigned to the attendant console as an indication of failed wakeup calls.

Valid entries	Usage
Unassigned extension	

Routing Extension on Unavailable Voice Synthesis

This field indicates where a wakeup call will be routed if both wakeup announcements on the Speech Synthesizer circuit pack are unavailable. This is usually administered to an assigned extension or to the attendant (attd).

Valid entries	Usage
Assigned extension or **attd**	

Display Room Information in Call Display

This indicates the type of guest room information displayed on phone displays.

Valid entries	Usage
y	If this field is set to **y**, the phones will display the name and room number as defined in the `Room` field of the Site Data on the station form. Only the first five characters of this field are displayed. Note that the extension number and room number are not always the same number.
n	If this field is set to **n**, the phones will display the name and extension number.

Automatic Selection of DID Numbers (R8)

Enabling this field allows you to assign an automatic DID number that is not associated with the guest's room number. This allows callers outside of the hotel to dial a guest directly without front desk intervention.

Valid entries	Usage
y/n	Enter **y** to use the Automatic Selection of DID Numbers for Guest Rooms feature. ASCII mode must be enabled to use this feature.

Custom Selection of VIP DID Numbers (R9)

Enabling this field allows you to reserve a block of DID numbers and to designate them for special guests at the hotel. For example, these DID numbers can be held in reserve for repeat guests so they have the same DID number every time they visit the hotel. Automatic Selection of DID Numbers must be enabled to use this feature.

Valid entries	Usage
y/n	Enter **y** to use the Custom Selection of VIP DID Numbers feature. ASCII mode must be enabled to use this feature.

Number of Digits from PMS

This field indicates the number of digits being sent from the PMS to the switch to identify room numbers.

NOTE:
If the `Number of Digits from PMS` field is blank, and the `PMS Sends Prefix` field is set to **n**, the switch will not support an extension that starts with 0.

Valid entries	Usage
1 to **4**	When using the normal mode, digits **1** through **4** are valid.
1 to **5**	When using the transparent or ASCII mode, digits **1** through **5** are valid.
blank	If using mixed numbering in the switch, leave this field blank.

PMS Sends Prefix

This field indicates whether the PMS sends a prefix digit to the switch as part of the room numbering plan.

NOTE:
If the `Number of Digits from PMS` field is blank, and the `PMS Sends Prefix` field is set to **n**, the switch will not support an extension that starts with 0.

Valid entries	Usage
y/n	

Number of Digits in PMS Coverage Path (T) (A)

This field indicates whether the coverage paths are three or four digits long. There can be up to 9999 coverage paths (1-999 for csi/si, 1-9999 for r).

Valid entries	Usage
3 or **4**	

Depending on the number of digits in the coverage path (CP1, CP2, CP3, and CP4), leading digits in the paths must be padded with zeros, and the final digit may be unused or defined as null (f). Coverage paths use “forward ordering.” The following table illustrates examples of how this must be designed:

N-Digit Coverage Paths	Path Number Examples	Digit Format (CP1 to CP4)
3-Digit	5 22 314	005f* 022f* 314f*
4-Digit	5 22 314 2133	0005 0022 0314 2133

* This is a nibble that is unused or filled out with a null (f). This value is ignored.

Digit to Insert/Delete

Enter the leading digit that may be deleted and re-inserted. The current PMS message set uses the extension number as the room identifier. In many customer configurations, the leading digit of the extension number is dropped to screen the room number. To accommodate PMS devices that are based on room number and not extension, this leading digit may be deleted on messages from the switch to the PMS, and then re-inserted on messages from the PMS.

NOTE:
The PMS interface supports three-digit, four-digit, or five-digit extensions, but prefixed extensions do not send the entire number across the interface. Only the assigned extension number is sent. Therefore, you should not use prefixed extensions for numbers that are also going to use the Digit to Insert/Delete function.

Valid entries	Usage
blank	No digit insertion or deletion is done.
0 to **9**	Selected digit is inserted or deleted.

Administration Options on Page 3

Definition for Rooms in State 1 - 6

Enter up to a 30-character definition for each room status. For example, you could define state 1 as Clean, Ready To Use, and state 2 as Occupied, Needs Cleaning. The status defined here must match the status defined in the PMS.

The definitions for room states are for Housekeeping Status only. If you are not using Housekeeping Status, you do not need to complete these fields.

Suite Check-in (R8)

This field allows attendants to have the system automatically check-in the primary extension and up to 29 related extensions with one check-in command.

Valid entries	Usage
y/n	Enter **y** to use the Suite Check-in feature.

Implementation Examples

Names Registration

When a guest in a hotel calls any hotel service, the attendant should be able to use the displayed name to address the caller appropriately. One way for the PMS vendor to implement this is to have an additional field on the check-in form to enter an “f” for a female guest, “m” for a male guest, or “x” for multiple guests. Using this field and the Last Name field, the PMS can then send appropriate name field content. For example, the name field could read “Mr. LastName” or “Ms. LastName” or “LastName” (multiple guests).

Coverage Path

The Call Coverage feature provides customized coverage for unanswered calls to guest rooms. For example, you can have calls routed to the front desk, to voice messaging, or to another room.

There are two requirements to implement this feature on the PMS:

- The PMS should provide a way to enter a “default coverage path number” as part of the setup of the PMS software. This field must be alterable by the hotel personnel.
- The PMS should add a field on the check-in form to enter a three-digit or four-digit Coverage Path number so that the front desk personnel will be able to enter a number if a guest desires a customized coverage path. If any number other than 0 or blank is entered, the selected coverage path is used. If 0 is entered, no coverage is used. If a blank is entered, the default coverage path on the PMS is used. If the PMS default coverage path field is also blank, then the PMS can send “0xbbb” or “0xbbbb” coverage path. This will cause the switch to use its default coverage path (see the Default Coverage Path for Client Rooms administration on page 8, and the Number of Digits in PMS Coverage Path administration on page 18).

Voice Mail Password (A)

This message is used to change the voice mail password for a room upon check-in. This operation applies only to the ASCII mode. Check-in is the only message that will change the INTUITY mailbox password. To use the INTUITY default password, send ASCII blanks. To change the password, it must conform to the following restrictions:

- It must be four digits long.
- It cannot be the same number as the room number.
- It cannot be the same digits (for example, 1111 or 9999).

- It cannot be a sequence of digits (for example, 1234 or 9876).
- The default password is defined by the type of interface link used with the INTUITY (GuestWorks or standalone). The default password for an INTUITY using the GuestWorks interface is a pound sign (#). The default password for an INTUITY using the standalone interface is an asterisk (*).

Voice Mail Languages (A)

When interfacing to the INTUITY Lodging voice messaging system, there is a two-digit encoding used to select the different guest language interfaces. To use the default, send ASCII blanks. The digits will be sent as ASCII digits. The following is a list of the different language encodes supported by INTUITY Lodging:

Language	Hex Value and Message Position		INTUITY Lodging Numbering
	Language 1	Language 2	
American English	0x32	0x30	00
Japanese	0x32	0x31	01
Latin American Spanish	0x32	0x32	02
Greek	0x32	0x33	03
Mandarin	0x32	0x34	04
Reserved for future use	0x32	0x35	05
UK English	0x32	0x36	06
Canadian French	0x32	0x37	07
Brazilian Portuguese	0x32	0x38	08
German	0x32	0x61	10
Parisian French	0x32	0x62	11
Arabic Female	0x32	0x64	13
Russian	0x33	0x34	20

NOTE:
Contact your Avaya representative for more information about language support.

Line Control Characteristics

The hardware data link consists of an EIA RS232C-D serial data electrical interface extended from a switch data channel. The link interface appears as a data communications equipment (DCE) unit (CCITT definition) with the attributes shown in Table 1. See Figure 1 and Table 2 for more details about the switch-to-PMS link.

Table 1. Link Interface Attributes

Item	Description
Data Rate - Serial Port	1200, 2400, 4800, 9600 bps (+1.0%, -2.5%) nominal asynchronous
Throughput - TCP/IP LAN Port	75 Kbps
Maximum Message Rate (two-way)*	Smallest message size — 20 msg/sec Largest message size — 2 msg/sec
Operating Mode	Full Duplex Only
Electrical Interface Signal Form (See Table 2)	EIA RS232C - Type D Electrical standard compatibility EIA RS404
Interface Distance - Serial Port	From switch to 8400B/7400A — 3500-5000 ft. From switch to ADU 1200 bps — 20000 ft. 2400 bps — 12000 ft. 4800 bps — 7000 ft. 9600 bps — 5000 ft. From 8400B/7400A/ADU to PMS — 50 ft.
Interface Distance - TCP/IP Port	Switch to 10BaseT Hub — 328 ft. Hub to Hub — 328 ft. Hub to Terminal Server/PMS — 328 ft. Terminal Server to PMS — 50 ft.
Word Framing (see Figure 5)	10 bits (1 start, 8 data bits, 1 stop)

Table 1. Link Interface Attributes (Continued)

Item	Description
Parity Options	No parity
Maximum Message Text†	13 Frames (N) 33 Frames (T) 47 Frames (A)

* The rate may vary with different values in the “Milliseconds Before PMS Link Acknowledgement Timeout” field.
† Data Link Escape (DLE) characters are not included.

CAUTION:
For the switch to recognize when the PMS link is down, the following interface leads must be valid controlled signals: Request to Send (CA), Clear to Send (CB), Data Set Ready (CC), Received Line Detect (CF), and Terminal Ready (CD).

Table 2. PMS Interface Lead Designations (Serial Interface)

Lead*	Pin Number	Function	Source
AA	1	Frame Ground	Common
BA	2	Transmitted Data	PMS
BB	3	Received Data	Interface
CA†	4	Request to Send	PMS
CB†	5	Clear to Send	Interface
CC†	6	Data Set Ready	Interface
AB	7	Signal Ground	Common
CF†	8	Received Line Detect	Interface
CD†	20	Terminal Ready	PMS

* An 8400B/7400A supports all of these leads. An ADU does not support Pin 4, and Pins 5, 6, and 8 are driven by one lead tied together.
† These must be valid controlled signals.

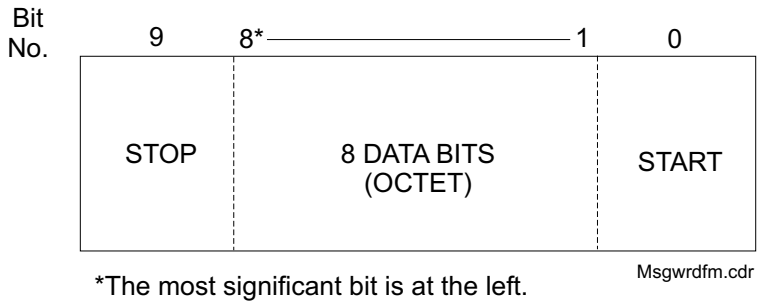


Figure 5. Message Word Frame

Message Envelope

The envelope for the message text uses the following ASCII-encoded characters:

- STX: Start of data text, 0x02 (Decimal 2)
- ETX: End of data text, 0x03 (Decimal 3)
- BCC: Block check code.

The character-oriented protocol used for communications exchange uses the following ASCII-encoded characters:

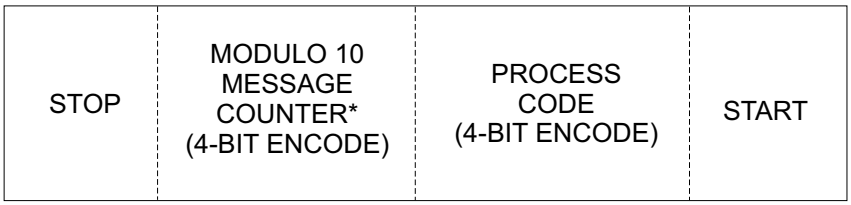
- ACK (Acknowledgement): Message acknowledged by receiver, 0x06 (Decimal 6)
- NAK (Negative Acknowledgement): Message not acknowledged by receiver, 0x15 (Decimal 21)
- ENQ: Sender request for the last ACK/NAK from receiver, 0x05 (Decimal 5).

An *octet* is the 8-bit text field of a 10-bit word frame which excludes Start and Stop (see Figure 5).

The control character frames use an entire octet for one ASCII encoded character (the most significant or eighth text bit is always a logical 0 - the STX is 0000 0010 in binary). The standard message text frames (not containing guest names) consist of two 4-bit characters, called nibbles, per frame. See Figure 6, Figure 7, Figure 8, and Table 3. Except for the control characters, the ASCII mode uses the standard ASCII character set.

Message text frames containing guest names (Check-in with Name, Guest Information Input/Change, and Room Image) will interpret the eight data bits as two 4-bit nibbles in all frames not containing ASCII-encoded name characters (T) (A).

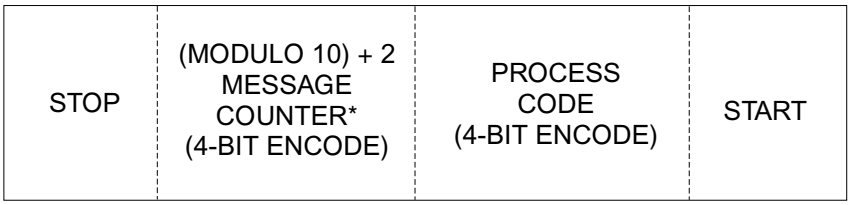
Every time you send a message (STX at the beginning), you increment the message counter by one. The message counter is relative to the sender; both the switch and the PMS have message counters, and they may be initialized to start at any value within the allowed range. For example, if you received message number five last time, you should expect to receive message number six the next time.



* In the Normal Mode, the message counter ranges from 0x0 to 0x9, restarting with 0x0. Thus, this nibble does not exactly follow the data encode as shown in Table 3.

The message counter is relative to the sender; both the switch and the PMS have message counters.

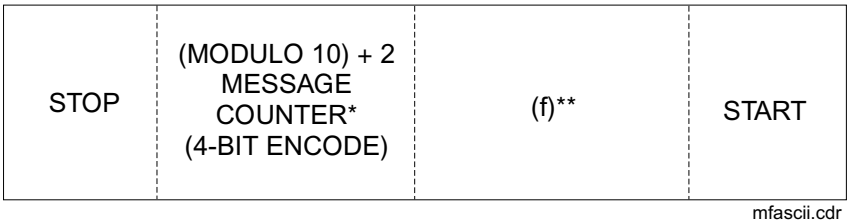
Figure 6. Message Format — Frame 2 (Normal Mode)



* In the Transparent Mode, the message counter ranges from 0x2 to 0xb, restarting with 0x2. Thus, this nibble does not exactly follow the data encode as shown in Table 3.

The message counter is relative to the sender; both the switch and the PMS have message counters.

Figure 7. Message Format — Frame 2 (Transparent Mode)



* In the ASCII Mode, the message counter ranges from 0x2f to 0xbf, restarting with 0x2f. Thus, this nibble does not exactly follow the data encode as shown in Table 3.

The message counter is relative to the sender; both the switch and the PMS have message counters.

** The Process Code resides in Frame 6 in the ASCII mode.

Figure 8. Message Format — Frame 2 (ASCII Mode)

Table 3. Data Encoding of Message Text Nibbles

Value	4-Bit Encode (Normal and Transparent)	8-Bit Encode (ASCII)
0	0000	0011 0000
1	0001	0011 0001
2	0010	0011 0010
3	0011	0011 0011
4	0100	0011 0100
5	0101	0011 0101
6	0110	0011 0110
7	0111	0011 0111
8	1000	0011 1000
9	1001	0011 1001
(Note 1)	1010 (Normal Only)	N/A
* (Note 2)	1011	0010 1010
# (Note 2)	1100	0010 0011
NULL	1111	0010 0000 (Note 3)

Note 1: The 0 encode is transmitted as “1010” in the normal mode and converted to “0000” by the receiver.
Note 2: The “1011” and “1100” encodes are used to represent the “*” and “#” characters on the telephone keypads.
Note 3: ASCII space is Hex 20.
N/A = Not applicable.

The general PMS message layout is shown in Figure 9.

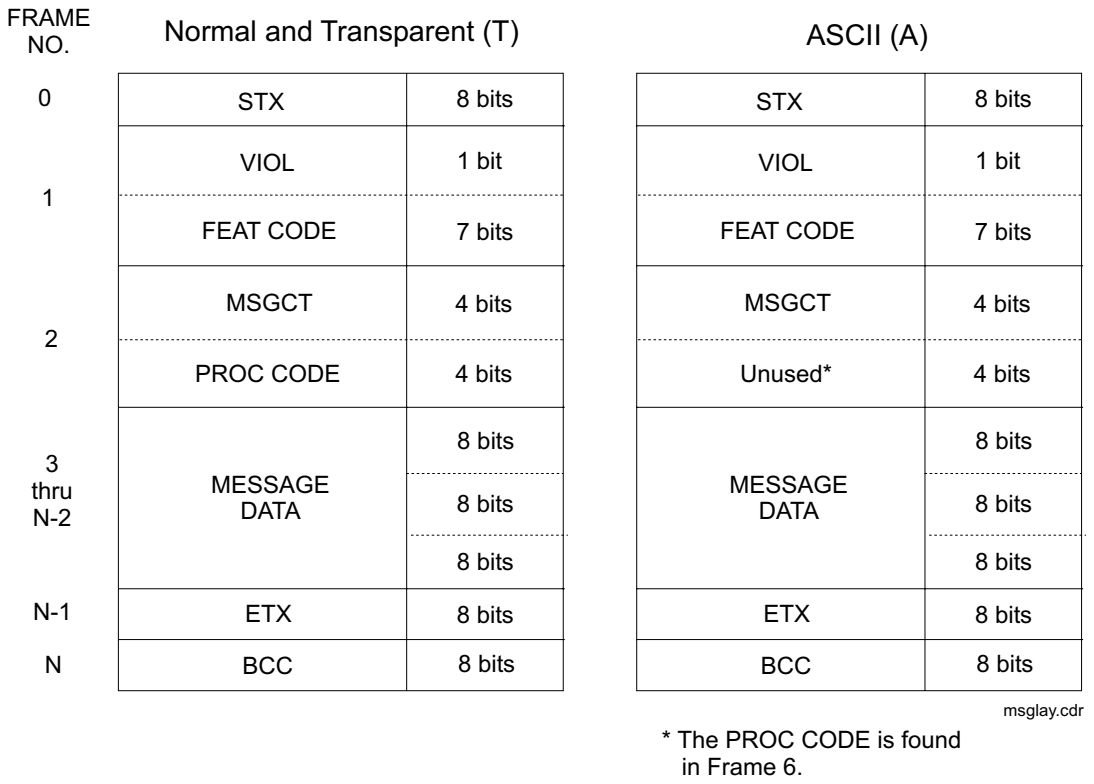


Figure 9. PMS Message Layout

Each message block will be terminated by a BCC octet. The BCC is an exclusive “OR” of all octets following the STX through, and including, the ETX (the STX is **not** included in the BCC calculation). Figure 10, Figure 11, and Figure 12 show examples of messages. The BCC is used to insure message integrity.

Condition: Check-in (16) Mr. John Smith, Room 302, no coverage

Feature Code: 16
MSG Count: 2
Process Code: 1
Station: 302

FRAME NO.	MESSAGE REGISTER MESSAGE FORMAT
0	STX
1	FEAT CODE
2	MSGCT PROC
3	STA2 STA1
4	STA4 STA3
5	NULL NULL
6	ETX
7	BCC

OCTET CONTENT OF ENCODED MESSAGE	
0	2
1	6
2	1
A*	2
A*	3
F	F
0	3
C	A

* "A" is the encode for 0 for transmission

MESSAGE FRAMES

STOP	OCTET									START
9	8	7	6	5	4	3	2	1	0	
1	0	0	0	0	0	0	1	0	0	
1	0	0	0	1	0	1	1	0	0	
1	0	0	1	0	0	0	0	1	0	
1	1	0	1	0	0	0	1	0	0	
1	1	0	1	0	0	0	1	1	0	
1	1	1	1	1	1	1	1	1	0	
1	0	0	0	0	0	0	1	1	0	
1	1	1	0	0	1	0	1	0	0	

normexm2.cdr

Figure 10. Example Message — Normal Mode

Condition: Check-in (36) Mr. John Smith, Room 22405, Coverage Path 157
(3-digit coverage path numbers)

Feature Code: 36 Coverage Path: 157
MSG Count: 2 Name: Mr. John Smith
Process Code: 1
Station: 22405

FRAME NO.	MESSAGE REGISTER MESSAGE FORMAT	OCTET CONTENT OF ENCODED MESSAGE		MESSAGE FRAMES STOP 9	8 5	4 1	START 0
0	STX	0	2	1	0 0 0 0	0 0 1 0	0
1	FEAT CODE	3	6	1	0 0 1 1	0 1 1 0	0
2	MSGCT PROC	2	1	1	0 0 1 0	0 0 0 1	0
3	DLE (Note 1)	1	0	1	0 0 0 1	0 0 0 0	0
4	STA2 STA1	0	5	1	0 0 0 0	0 1 0 1	0
5	STA4 STA3	2	4	1	0 0 1 0	0 1 0 0	0
6	NULL STA5	F	2	1	1 1 1 1	0 0 1 0	0
7	CP2 CP1	5	1	1	0 1 0 1	0 0 0 1	0
8	NULL CP3	F	7	1	1 1 1 1	0 1 1 1	0
9	NAME CHAR 1	S		1	0 1 0 1	0 0 1 1	0
10	2	M		1	0 1 0 0	1 1 0 1	0
11	3	I		1	0 1 0 0	1 0 0 1	0
12	4	T		1	0 1 0 1	0 1 0 0	0
13	5	H		1	0 1 0 0	1 0 0 0	0
14	6	,		1	0 0 1 0	1 1 0 0	0
15	7	M		1	0 1 0 0	1 1 0 1	0
16	8	R		1	0 1 0 1	0 0 1 0	0
17	9	.		1	0 0 1 0	1 1 1 0	0
18	10	J		1	0 1 0 0	1 0 1 0	0
19	11	.		1	0 0 1 0	1 1 1 0	0
20	12	SPACE		1	0 0 1 0	0 0 0 0	0
21	13	SPACE		1	0 0 1 0	0 0 0 0	0
22	14	SPACE		1	0 0 1 0	0 0 0 0	0
23	15	SPACE		1	0 0 1 0	0 0 0 0	0
24	NULL NULL	F	F	1	1 1 1 1	1 1 1 1	0
25	NULL NULL	F	F	1	1 1 1 1	1 1 1 1	0
26	NULL NULL	F	F	1	1 1 1 1	1 1 1 1	0
27	NULL NULL	F	F	1	1 1 1 1	1 1 1 1	0
28	NULL NULL	F	F	1	1 1 1 1	1 1 1 1	0
29	ETX	0	3	1	0 0 0 0	0 0 1 1	0
30	BCC	B	C	1	1 0 1 1	1 1 0 0	0

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Note 1: A DLE character (0x10) must precede any control character (0x00 to 0x1f) in the message text. Otherwise, a DLE is not required. In this example, the last two digits of the RSN (0x05) fall into the range of control characters.

Note 2: Ordering of Station Digits is the reverse of other fields. See the section on Message Text Ordering.

Figure 11. Example Message — Transparent Mode

Condition: Check-in (26) Mr. John Smith, Room 22415, Coverage Path 157 (3-digit coverage path numbers)

Feature Code: 26
MSG Count: 2
Process Code: 1
Station: 22415

Coverage Path: 157
Name: Mr. John Smith
VM Password: 7648
Language: American English
DID Request: Yes

FRAME NO.	MESSAGE REGISTER MESSAGE FORMAT	OCTET CONTENT OF ENCODED MESSAGE	STOP (9)	MESSAGE FRAMES OCTET (8–5)	MESSAGE FRAMES OCTET (4–1)	START (0)	HEX	ASCII
0	STX	0 2	1	0 0 0 0	0 0 1 0	0	02	☻
1	FEAT CODE	2 6	1	0 0 1 0	0 1 1 0	0	26	&
2	MSGCT Unused	2 f	1	0 0 1 0	1 1 1 1	0	2F	/
3	C	C	1	0 1 0 0	0 0 1 1	0	43	C
4	K	K	1	0 1 0 0	1 0 1 1	0	4B	K
5	I	I	1	0 1 0 0	1 0 0 1	0	49	I
6	PROC	1	1	0 0 1 1	0 0 0 1	0	31	1
7	STA1	2	1	0 0 1 1	0 0 1 0	0	32	2
8	STA2	2	1	0 0 1 1	0 0 1 0	0	32	2
9	STA3	4	1	0 0 1 1	0 1 0 0	0	34	4
10	STA4	1	1	0 0 1 1	0 0 0 1	0	31	1
11	STA5	5	1	0 0 1 1	0 1 0 1	0	35	5
12	CP1	1	1	0 0 1 1	0 0 0 1	0	31	1
13	CP2	5	1	0 0 1 1	0 1 0 1	0	35	5
14	CP3	7	1	0 0 1 1	0 1 1 1	0	37	7
15	CP4	SPACE	1	0 0 1 1	0 0 0 0	0	20	space
16	NAME CHAR 1	S	1	0 1 0 1	0 0 1 1	0	53	S
17	2	M	1	0 1 0 0	1 1 0 1	0	4D	M
18	3	I	1	0 1 0 0	1 0 0 1	0	49	I
19	4	T	1	0 1 0 1	0 1 0 0	0	54	T
20	5	H	1	0 1 0 0	1 0 0 0	0	48	H
21	6	,	1	0 0 1 0	1 1 0 0	0	2C	,
22	7	M	1	0 1 0 0	1 1 0 1	0	4D	M
23	8	R	1	0 1 0 1	0 0 1 0	0	52	R
24	9	.	1	0 0 1 0	1 1 1 0	0	2E	.
25	10	J	1	0 1 0 0	1 0 1 0	0	4A	J
26	11	.	1	0 0 1 0	1 1 1 0	0	2E	.
27	12	SPACE	1	0 0 1 0	0 0 0 0	0	20	space
28	13	SPACE	1	0 0 1 0	0 0 0 0	0	20	space
29	14	SPACE	1	0 0 1 0	0 0 0 0	0	20	space
30	15	SPACE	1	0 0 1 0	0 0 0 0	0	20	space
31	VM PASSWD 1	7	1	0 0 1 1	0 1 1 1	0	37	7
32	VM PASSWD 2	6	1	0 0 1 1	0 1 1 0	0	36	6
33	VM PASSWD 3	4	1	0 0 1 1	0 1 0 0	0	34	4
34	VM PASSWD 4	8	1	0 0 1 1	1 0 0 0	0	38	8
35	LANGUAGE 1	2	1	0 0 1 1	0 0 1 0	0	32	2
36	LANGUAGE 2	0	1	0 0 1 1	0 0 0 0	0	30	0
37	NULL/REQ DID	y	1	0 1 1 1	1 0 0 1	0	79	y
38	NULL	NULL	1	0 0 1 0	0 0 0 0	0	20	space
39	NULL	NULL	1	0 0 1 0	0 0 0 0	0	20	space
40	NULL	NULL	1	0 0 1 0	0 0 0 0	0	20	space
41	ETX	0 3	1	0 0 0 0	0 0 1 1	0	03	♥
42	BCC	3 D	1	0 0 1 1	1 1 0 1	0	3D	=

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Figure 12. Example Message — ASCII Mode

The ACK and NAK control characters are transmitted back to the sender by the receiver to indicate positive or negative acknowledgment, respectively, to the transmitted message. An ACK means that the message was received, and the sender can continue with another message. A NAK means that the message was not received and that the message should be resent. The ENQ control character is transmitted by the sender when the ACK or NAK acknowledgment of a transmitted message is not received by the sender, and is a request for a repeat of the ACK or NAK response. An ENQ is NOT required before sending a message package from the PMS to the switch. A sample sequence is shown in Figure 13.

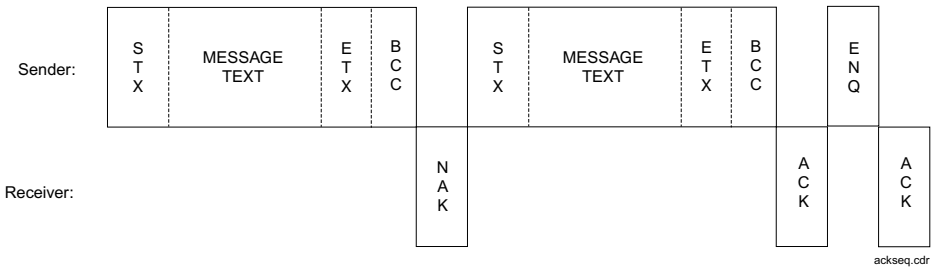

Figure 13. Sample Acknowledgment Sequence

Exchange Protocol and Message Responses

For the following discussions, the definition of sender and receiver is relative to the origination of the message because of full duplex operations.

The parameters shown in Table 4 can be administered. See "Administration Options" starting on page 4 for details. The acronyms shown in the table are used in this section when referring to the parameters.

Table 4. PMS Link Administration Parameters

Parameter	Entry
PMS Link Maximum Retransmission Requests (MRR)	1-5 retransmissions
PMS Link Maximum Retransmissions (MR)	1-5 retransmissions
Milliseconds before PMS Link Acknowledgment Timeout (LAT)	100-300 ms recommended (N) 100-500 ms recommended (T) 100-500 ms recommended (A) (+125ms tolerance)
Seconds Before PMS Link Idle Timeout (LIT)	5-20 seconds

Sending Rules

The sender **must** adhere to the following rules:

1. The BCC must be calculated for characters following the STX, including the ETX, and transmitted as the terminating character of a message packet. If the BCC is incorrect, the receiver will respond with a NAK.
2. The entire message (STX to BCC) must be transmitted within 200 ms (N) or within 350ms (T) (A). If the message is not completely transmitted within this time, the receiver will respond with a NAK, ignore the rest of the message (which is interpreted as characters received outside of the framework of a message), and log the errors.
3. The next message cannot be transmitted until the last message has been acknowledged as successfully transmitted or is flushed because of message failure (administered MRR of unanswered ENQs and/or NAK retransmissions). If this rule is violated, the receiver may accept and process messages, but message overflow is likely (which can possibly result in link tear down).
4. If neither an ACK or a NAK is received from the receiver within the LAT, after transmission of the BCC, the sender will transmit an ENQ requesting a repeat from the receiver of that ACK/NAK response. After the initial LAT delay with no response from the receiver, the sender will issue up to MRR-1 subsequent ENQs in intervals of LAT (for a total of up to MRR ENQs requesting a message acknowledgment), after which the sender will flush the message. If the sender does not send an ENQ within the LAT, the receiver assumes that the ACK/NAK has been received. Consequently, if the sender transmits an ENQ after the LAT, the receiver logs the event as an unsolicited ENQ and sends a NAK.
5. The sender must assume that an expected ACK or NAK response to a sent message or an ENQ response to a received message does not occur in a message packet (STX through BCC) being simultaneously received. If the sender embeds an ACK or ENQ in a message, the receiver ignores the ACK or ENQ (and does not include the ACK or ENQ in the BCC calculation), and logs an error*. If the sender embeds a NAK in a message (that is, it is really not a nibble with value 0x15 but a message response), the receiver transmits a NAK and logs an error since the NAK is considered part of the message text which causes the BCCs to be different.

* Since the normal mode requires 0x0-to-0xa conversion in the message text, the ACK and ENQ characters are not possible in the message text if the sender and receiver rules are followed. However, these values are possible in the transparent mode. The difference between interpreting these characters as control characters or message text is the presence of a DLE character before these characters. See the section “Timeout Control from the PMS” starting on page 38.

6. Upon receipt of a NAK from the receiver, the sender will retransmit the current message using the same message count (up to MRR attempts - see rule number 7); retransmission must be started within the LAT after receipt of the NAK. If the transmission is not started (or an ENQ received) within LAT, the switch will drop the link.
7. When MRR retransmission is made due to receiver NAKs, or MRR ENQs are sent to the receiver due to nonacknowledgement, the sender will flush the message and log the unsuccessful transmission. If the sender does not flush the message and keeps sending the message, the receiver treats the message as a new message.
8. Each time a new message is sent, the message count field must be incremented by one, modulo (10) (N), or modulo (10) + 2 (T) (A).
9. The priority among conflicting actions at a sender is as follows:
    a. Message currently being sent
    b. Responses to ENQ
    c. ACK or NAK to received message
    d. Retransmission in response to NAK
    e. Generic message.

Receiving Rules

The receiver **must** adhere to the following rules:

1. Verify that the entire message (STX through BCC) is received within 200 ms (N) or 350 ms (T) (A). Otherwise, corrupted messages could be processed.
2. Calculate a BCC for the received characters following the STX, including the ETX; compare the calculated BCC against the received BCC to insure message integrity. Otherwise, corrupted messages could be processed.
3. As soon as possible after the BCC verification (after 10 ms if receiver is not actively sending a message), the receiver must transmit a response. If the receiver waits longer than the LAT, the sender will send an ENQ.
4. The receiver must complete sending a message packet before transmitting an ACK or NAK response to a received message. If the receiver breaks this rule by embedding an ACK or ENQ in an outgoing message, the sender ignores the ACK (and does not include it in the BCC calculation), logs an error, and sends an ENQ after the LAT times out. If the receiver breaks this rule by embedding a NAK in an outgoing message (that is, it is not a nibble with value 0x15 but a message response), the sender transmits a NAK in response to the outgoing message since the NAK is considered part of the message text which causes the BCCs to be different. Also, the sender logs an error and sends an ENQ after the LAT times out.

5. After transmitting the ACK/NAK response, the receiver must repeat the previous reply if an ENQ is received within the LAT after the original transmission of the ACK/NAK; this may be repeated until the maximum MRR (for a total of MRR received ENQs at LAT intervals). If the receiver does not reply, the sender transmits another ENQ.
6. The receiver must respond with a NAK to a message transmission when the following occurs:
   - A period of 200 ms (N) or 350ms (T) (A) has expired since reception of an STX with no BCC received (incomplete message).
   - The BCC calculated for the received characters does not match the received character following the ETX.
   - The message text is less than three characters, or greater than 13 (N), 33 (T), or 47 (A) characters.
7. The receiver must respond with a NAK to a received ENQ when the following occurs:
   - The original ACK/NAK reply has been repeated up to MRR times in response to ENQs spaced LAT or less. After MRR retransmission of an ACK/NAK, the link will also be dropped.
   - The interval since the last response (to a message or to an ENQ) is greater than the LAT (assumed missed message).
8. The receiver must increment the expected message count of the sender by one after receiving a message modulo (10) (N) or modulo (10) +2 (T) (A).

Link Setup and Drop Conditions

Link Setup

If the PMS is operational, it must have the Data Terminal Ready EIA pin in the “on” state. The switch attempts to bring the link up by placing an internal call to the extension of the data module or ADU connected to the PMS. This call sets the Data Set Ready EIA pin to the “on” state which allows the PMS and the switch’s data module to “handshake.”

If the PMS is operational, it must have the Data Terminal Ready EIA pin in the “on” state. The switch attempts to bring the link up in one of two ways:

- For a data module or ADU, the switch places an internal call to the extension of the data module or ADU connected to the PMS. This call sets the Data Set Ready EIA pin to the “on” state which allows the PMS and the switch’s data module to “handshake.”
- For a LAN connection using a terminal server or connected directly through a hub, the switch initiates a TCP listen port on the terminal server IP address, which is connected to the PMS. This call simulates setting the Data Set Ready EIA pin to the “on” state which allows the PMS and the switch to “handshake.”

The switch will wait up to 12 Link Idle Timer (LIT) periods for the PMS to send a status inquiry message before dropping the link. However, if the PMS sends ten other messages before the status inquiry message, the switch will drop the link. Upon receipt of the status inquiry message, the switch sends a status inquiry response and restarts the LIT. Restarts (including power-up) cause the switch to attempt link setups within 5 minutes after switch recovery. The switch will immediately retry after most link errors, but will wait 5 minutes for further attempts if the first attempt fails. For protocol error-counter overflow and internal buffering overflow, the switch will wait 5 minutes before attempting link setup.

Link Drop

The switch drops the physical layer of the link by tearing down the call to the data module or ADU, which causes the data channel to change the Data Set Ready EIA pin to the “off” state. However, some data modules or ADUs may keep the Data Set Ready EIA pin “on,” which may give the appearance that the physical layer is still “up.”

The switch drops the physical layer of the link in one of two ways:

- For a data module or ADU, the switch tears down the call to the data module or ADU, which causes the data channel to change the Data Set Ready EIA pin to the “off” state. However, some data modules or ADUs may keep the Data Set Ready EIA pin “on,” which may give the appearance that the physical layer is still “up.”
- For a LAN connection using a terminal server, the switch tears down the call, which causes the data channel to simulate changing the Data Set Ready EIA pin to the “off” state.

Timeout Control from the PMS

To maintain normal link operations, the PMS must send the switch at least one message every LIT period. Otherwise, the LIT will expire, thereby causing the link to drop.

Message Text Format Structure and Encoding

Figure 14 shows the general format for a message packet. Information in the text is treated as 8-bit characters. However, these characters are interpreted as either two 4-bit encoded digits (nibbles) (N) or as ASCII characters (T) (A). Consequently, a zero-valued most significant bit is used to pad the ASCII character to eight bits. Table 3 on page 28 shows the encoding of the nibbles and the format of the ASCII characters (T) (A). Since ASCII characters are supported in some messages, the interface supports three modes of the protocol*:

- The first mode, normal, uses only nibbles and converts all 0x0 message text nibbles into 0xa.
- The second mode, transparent, uses both nibbles (without 0x0 to 0xa conversion) and ASCII characters in the message set.
- The third mode, ASCII, uses ASCII characters exclusively for the guest data (frames 3 through N-2).

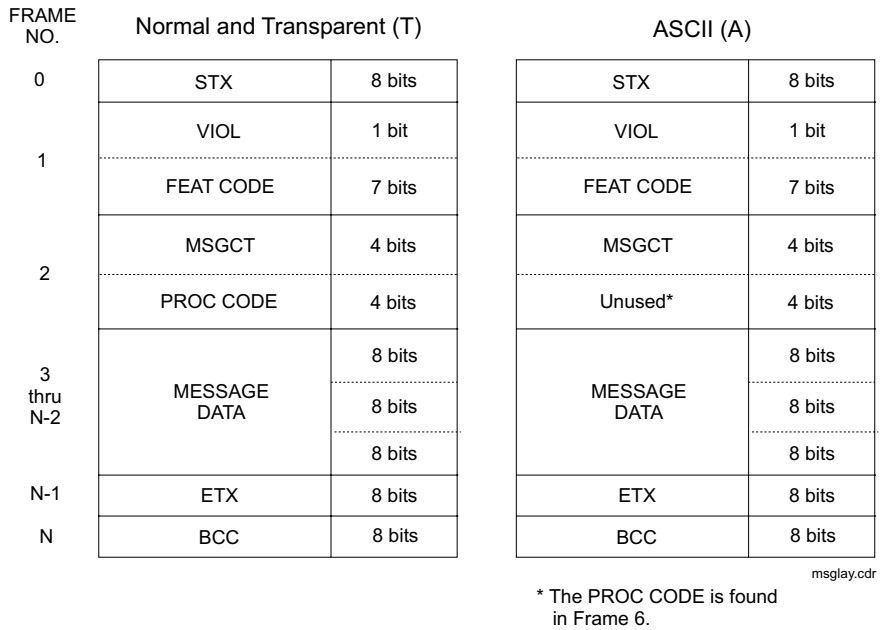

Figure 14. PMS Message Layout

* The Names Registration, Guest Input/Change, and five-digit RSN feature set require ASCII characters.

In the transparent mode, the Data Link Escape (DLE) character is used to precede any characters in the message text that have a value that is also used by “control characters” (0x00 to 0x1f) in order to distinguish message text from control characters (for example, STX), since 0x0 to 0xa conversion cannot be used. As an example, the character sequence “DLE STX” in the message text is interpreted as 0x02 character value whereas “STX” without the preceding DLE is interpreted as the STX control character. The transparent and ASCII modes can use both 4-bit encoded nibbles and ASCII characters.

The first two characters immediately following the STX are fixed in format and imply the format and length of the remaining message data characters. This varies for different message types.

The FEAT CODE character specifies which of the possible variable length feature message formats [for example, 11 (N), 31 (T), or 21 (A) for Housekeeper Status from Room] applies to the message data. The receiver sets the most significant bit of the FEAT CODE to a logical 1 when content errors such as invalid encoding for characters interpreted as nibbles, invalid characters for fields interpreted as ASCII, invalid coverage paths (T) (A), invalid RSNs (T) (A), and invalid feature and process codes exist in the message. Thus, this bit is the VIOL bit and indicates a message violation. The receiver returns the invalid message to the sender with the violation bit (VIOL) set after inserting its own correct message count into the message envelope. For example, a check-in message [FEAT CODE = 16 (N), 36 (T), or 26 (A)] from the PMS to the switch will be transmitted back to the PMS as a check-in violation message [FEAT CODE = 96 (N), B6 (T), or A6 (A)]. Usually, content errors will occur if the sender’s encoding algorithm fails or if an odd number of bit errors occur in the same position in different characters of the transmitted message.

The receiver of a violation message (that is, the original sender of the invalid feature message) has the responsibility to appropriately log the individual violation message(s) for later problem determination and correction.

Frame 2 in the normal and transparent mode [the message count (MSGCT) and PROC CODE nibbles] consists of two 4-bit encoded digits (see Figure 6, Figure 7, and Figure 14). Frame 2 in the ASCII mode contains only the MSGCT nibble (see Figure 8). The most significant four bits, the MSGCT field, represents a message counter. The counter is modulo (10) (N) or modulo (10) + 2 (T) (A). The message counter complements the ENQ in eliminating acceptance of duplicate messages. Such a situation could occur if an ACK was corrupted to a NAK, and the message was retransmitted; the receiver is expected to notice the immediate repeated message count and will ACK the message but will not act on the data. The message counter is incremented by the sender with each new message, and not incremented when retransmitting in response to a NAK from the receiver. If the message count is not what is expected by the switch, the switch logs an internal error and resets the message count to the received value. The message counter runs from 0 (encoded “A”) through 9 in the normal mode, or 2 through 11 in the transparent mode and is relative to the originator.

The PROC CODE nibble denotes a “process code.” This code represents a specific action or processing for that feature message. In the normal mode and transparent mode, the PROC CODE is in Frame 2. In the ASCII mode, the PROC CODE is found in Frame 6.

The (FEAT CODE, PROC CODE) notation is used throughout this document to denote a feature message (FEAT CODE) with processing actions (PROC CODE). For the ASCII Mode, the FEAT CODE designation (a two-digit number) is replaced by the ASCII equivalent of the feature code. For instance, (13,1) or (MSG,1) denotes a message waiting lamp feature, with PROC CODE 1 implying that the switch is to turn on the message waiting lamp for an indicated RSN. If only a process code is given, the feature code of the section you are in is implied.

The MESSAGE DATA fields, frames 3 through N-2 in the message layout, consist of two 4-bit encoded digits per 8-bit character (T) (A), called “nibbles,” with encodings or 8-bit ASCII characters. In all but one message feature, part of the MESSAGE DATA information is the switch RSN. Additional processing information may also be passed according to the message feature type.

Null characters are used to pad out message characters when no more data or name characters exist. Definitions of null characters used by the normal and transparent mode are explained below.

For the Normal Mode, the following encoding rules apply to all message frames (any frame between the STX and ETX):

- The binary nibble 1010 is the encode in MESSAGE DATA fields for the 0000 nibble; this prevents MESSAGE DATA octets such as 0x02, 0x03, 0x05, and 0x06 from being confused with STX, ETX, ENQ, and ACK, respectively (for example, a message text frame that has value 0x03 would be transmitted as 0xa3).
- The 0xff denotes a null character (not the standard ASCII null character 0x00) and will be used to pad out message characters. In a frame with only one 4-bit information digit, the null “0xf” nibble pads the most significant 4-bit field.
- Leading zeros (encoded 0xa) are used for nibbles of data items that are lower in value than the allotted space; for example, RSN 305 will be sent as a3a5.
- The BCC 8-bit octet does **not** follow the 0x0 -> 0xa encoding rule, and thus may be 0x02, 0x03, 0x15, etc. It may always be assumed that the character received immediately after an ETX is the BCC for the transmitted message.

For the Transparent Mode, the following encoding rules apply to all message frames (any frame between the STX and ETX):

- The DLE character must precede any control character (valued 0x00 to 0x1f) in the message text.
- Leading zeros are used for nibbles of data items that are lower in value than the allotted space; for example, RSN 305 will be sent as 00305.
- The 0xff denotes a null character (not the standard ASCII null character 0x00) and will be used to pad out frames. In a frame with only one 4-bit information digit, the null nibble pads the most significant 4-bit field.
- Name characters will be filled with ASCII space character 0x20 for padding the field.
- The BCC 8-bit octet always follows immediately after an ETX. Any transmitted DLE characters are included in the BCC.

For the ASCII Mode, the following encoding rules apply to all message frames (any frame between the STX and ETX):

- Leading zeros are used for nibbles of data items that are lower in value than the allotted space; for example, RSN 305 will be sent as 00305.
- The 0xf character denotes a null character and will be used to pad out frames (such as Frame 2). In a frame with only one 4-bit information digit, the null nibble pads the most significant 4-bit field.
- Name characters will be filled with ASCII space character 0x20 for padding the field.
- The BCC 8-bit octet always follows immediately after an ETX. Any transmitted DLE characters are included in the BCC.

Table 5 shows the message format key, and Figure 10, Figure 11, and Figure 12 show examples of messages using normal, transparent, and ASCII modes. Figure 15 through Figure 26 show the message formats for each of the feature codes (identified as normal, transparent, or ASCII).

Many of the feature messages require that an RSN be specified. This four-digit (N) or five-digit (T) (A) number is always the switch extension number and sometimes correlates identically with the hotel room number. For cases in which the hotel room and RSN do **not** correlate, the PMS has the responsibility to perform the room number-to-extension number mapping for all messages sent or received over the data link.

The use of various feature and process messages and responses is discussed in “Feature Codes, Process Codes, and Operations” starting on page 59.

Message Text Ordering

The RSN, housekeeper information digits, coverage path, name fields, and restriction level consist of several nibbles, or characters, which have a defined ordering.

- RSNs for the normal and transparent modes are mapped from the least significant digit to the most significant digit (backwards ordering). For example, RSN 72295 maps to the STA5, STA4, STA3, STA2, and STA1 symbols used in Figure 15 through Figure 26. In the normal mode, there is a maximum of four digits and four nibbles. In the transparent mode, there is a maximum of five digits and five nibbles.
- RSNs for the ASCII mode use forward mapping, with a maximum of five digits.
- All other strings of characters or numbers occur using “forward ordering.” Thus, if the user dials the housekeeper FAC followed by 926147, these digits map to the DIG1, DIG2, DIG3, DIG4, DIG5, and DIG6 symbols used in Figure 15 and Figure 16. Similarly, if coverage path 157 is used in a message, this number maps to the CP1, CP2, and CP3 symbols used in Figure 20, Figure 23, and Figure 25. Padding is done on the coverage path numbers and the housekeeper identification digits.
- The name characters are ordered as the name is spelled (forwards ordering) and are left-justified and padded with space characters as necessary. Thus, the name “abc” maps to the symbols used in Figure 20, Figure 23, and Figure 25 as follows: NAME CHAR1 = a, NAME CHAR2 = b, NAME CHAR3 = c, and NAME CHAR4 through NAME CHAR15 = (all blanks).
- In the ASCII Mode, the restriction level value is a two-digit field. When the restriction level is sent to the PMS, it is sent as “digit-blank.” The switch can receive the restriction level in several different ways: zero-digit, digit-blank, or blank-digit.
- DID number assignment digits are forward-ordered. If the DID assigned by the switch is 21207, the number maps to DID1, DID2, DID3, DID4, and DID5. This is shown in Figure 20 and Figure 22.

Summary of Message Formats

Message Formats

This section summarizes the PMS message formats. The message format definitions are given in Table 5. Figure 15 through Figure 26 show the supported message formats. Details for each message begin on page 59.

Table 5. Message Format Key

Message	Definition
ADD/REM	ASCII add or subtract from message count
BCC	Block Check Code
CP1 to CP4	Call Coverage path digits
DIG1 to DIG6	Information digits
DID1 to DID5	DID number (R8)
ETX	End of Text (0x03)
FEAT CODE	Feature code
LANGUAGE 1 to LANGUAGE 2	ASCII encoded voice mail language code
MSGCT	Message count
MW	Message waiting lamp status indication
NAME CHAR 1 to NAME CHAR 15*	Guest name characters (0x20 to 0x7E)
NULL	Padding character (do not use for any other function)
PROC	Process code
REQ DID	Request DID number from switch (R8)
RESTRICT LEV	Restriction level
RR	Data link Release Reason (RR) code
STA1 to STA5	Room Station Number (RSN) digits
STF1 to STF5	“From” RSN in room change/swap message
STX	Start of Text (0x02)
TEXT/FAX	ASCII identify text or Fax message
VIOL	Violation of message protocol

Table 5. Message Format Key (Continued)

Message	Definition
VM PASSWD 1 to VM PASSWD 4	Voice mail password
V/O	Vacant or occupied room status

* The switch supports 27-character names, but the PMS interface supports only 15-character names. Any characters beyond 15 will not be transmitted between the PMS and the switch.

FRAME NO.	(N) (11) HOUSEKEEPER STATUS FROM ROOM	(T) (31) HOUSEKEEPER STATUS FROM ROOM	(A) (21) HOUSEKEEPER STATUS FROM ROOM	FRAME NO.
0	STX	STX	STX	0
1	11	31	21	1
2	MSGCT PROC*	MSGCT PROC*	MSGCT x(f)	2
3	STA2 STA1	STA2 STA1	“H”	3
4	STA4 STA3	STA4 STA3	“K”	4
5	DIG2 DIG1	NULL STA5	“R”	5
6	DIG4 DIG3	DIG2 DIG1	PROC*	6
7	DIG6 DIG5	DIG4 DIG3	STA1	7
8	ETX	DIG6 DIG5	STA2	8
9	BCC	ETX	STA3	9
10		BCC	STA4	10
			STA5	11
			DIG1	12
			DIG2	13
			DIG3	14
			DIG4	15
			DIG5	16
			DIG6	17
			NULL	18
			NULL	19
			ETX	20
			BCC	21

*PROCESS CODES
1-6. The associated feature access code was dialed from the RSN indicated. Message may include up to six housekeeper ID digits in addition to the RSN. (to PMS)
8. PMS rejects the validity of the message text, or an invalid state change was indicated. (to switch)
9. PMS accepts the status change. (to switch)

Note: The optional additional information digits (DIG1-DIG6) are padded with nulls when not used.

Figure 15. Housekeeper Status from Room Message Formats

FRAME NO.	(N) (12) HOUSEKEEPER STATUS FROM DESIGNATED STATION	(T) (32) HOUSEKEEPER STATUS FROM DESIGNATED STATION	(A) (22) HOUSEKEEPER STATUS FROM DESIGNATED STATION	FRAME NO.
0	STX	STX	STX	0
1	12	32	22	1
2	MSGCT PROC*	MSGCT PROC*	MSGCT x(f)	2
3	STA2 STA1	STA2 STA1	“H”	3
4	STA4 STA3	STA4 STA3	“K”	4
5	DIG2 DIG1	NULL STA5	“S”	5
6	DIG4 DIG3	DIG2 DIG1	PROC*	6
7	DIG6 DIG5	DIG4 DIG3	STA1	7
8	ETX	DIG6 DIG5	STA2	8
9	BCC	ETX	STA3	9
10		BCC	STA4	10
			STA5	11
			DIG1	12
			DIG2	13
			DIG3	14
			DIG4	15
			DIG5	16
			DIG6	17
			NULL	18
			NULL	19
			ETX	20
			BCC	21

*PROCESS CODES
1-4. The associated feature access code and the indicated station number were dialed from a designated station. Message may include up to six housekeeper ID digits in addition to the RSN. (to PMS)
8. PMS rejects the message. (to switch)
9. PMS accepts the message. (to switch)

Note: The optional additional information digits (DIG1-DIG6) are padded with nulls when not used.

Figure 16. Housekeeper Status from Designated Station Message Formats

FRAME NO.	(N) (13) MESSAGE WAITING	(T) (33) MESSAGE WAITING	(A) (23) MESSAGE WAITING	FRAME NO.
0	STX	STX	STX	0
1	13	33	23	1
2	MSGCT PROC*	MSGCT PROC*	MSGCT x(f)	2
3	STA2 STA1	STA2 STA1	“M”	3
4	STA4 STA3	STA4 STA3	“S”	4
5	ETX	NULL STA5	“G”	5
6	BCC	ETX	PROC*	6
7		BCC	STA1	7
			STA2	8
			STA3	9
			STA4	10
			STA5	11
			ADD/REM	12
			TEXT/FAX	13
			NULL	14
			NULL	15
			ETX	16
			BCC	17

*PROCESS CODES
1. Turn on message lamp of room station indicated. (to switch)
2. Turn off message lamp of room station indicated. (to switch)
3. Message lamp of room station indicated has been turned on via Message Waiting Notification from the attendant console or a telephone. (to PMS)
4. Message lamp of room station indicated has been turned off via Message Waiting Notification from the attendant console or a telephone. (to PMS)
5. Lamp of room station indicated was already on or is still on due to another message type, such as LWC or AUDIX (T) (A). (to PMS)

ADD/REM (A)
2. Add one to message count.
3. Subtract one from message count.

TEXT/FAX (A)
2. This is a text message.
3. This is a fax message.

Figure 17. Message Waiting Message Formats

FRAME NO.	(N) (15) CONTROLLED RESTRICTION	(T) (35) CONTROLLED RESTRICTION	(A) (25) CONTROLLED RESTRICTION	FRAME NO.
0	STX	STX	STX	0
1	15	35	25	1
2	MSGCT PROC*	MSGCT PROC*	MSGCT x(f)	2
3	STA2 STA1	STA2 STA1	“C”	3
4	STA4 STA3	STA4 STA3	“R”	4
5	RESTRICT LEV	NULL STA5	“”	5
6	NULL NULL	RESTRICT LEV	PROC*	6
7	NULL NULL	ETX	STA1	7
8	ETX	BCC	STA2	8
9	BCC		STA3	9
			STA4	10
			STA5	11
			RESTRICT LEV1	12
			RESTRICT LEV2	13
			NULL	14
			NULL	15
			ETX	16
			BCC	17

*PROCESS CODES
1. Set restriction for indicated RSN. (to switch)
2. Restriction has been set for indicated RSN via the attendant console or a telephone. (to PMS)

Note 1: The restriction levels from the PMS are as follows (toll restriction can be substituted for station-to-station or outward restriction):
0 - No restriction
1 - Outward/toll restriction
2 - Station-to-station/toll restriction
3 - Outward/toll and station-to-station/toll restriction
4 - Total restriction
5 - Termination restriction
6 - Outward/toll and termination restriction
7 - Station-to-station/toll and termination restriction

Note 2: In ASCII Mode, the restriction level value is a two-digit field. When the restriction level is sent to the PMS, it is sent as “digit-blank.” The switch can receive the restriction level in several different ways: 0-digit, digit-blank, or blank-digit.

Figure 18. Controlled Restriction Message Formats

FRAME NO.	(N) (16) CHECK-IN/ CHECK-OUT
0	STX
1	16
2	MSGCT PROC*
3	STA2 STA1
4	STA4 STA3
5	NULL NULL
6	ETX
7	BCC

*PROCESS CODES
1. Switch is to perform the functions associated with check-in for the indicated RSN. (to switch)
2. Switch is to perform the functions associated with check-out for the indicated RSN. (to switch)
5. Check-out functions were completed for the indicated RSN, and the message waiting lamp was not on. (to PMS)
6. Check-out functions were completed for the indicated RSN, and the message waiting lamp was on. (to PMS)
7. Confirmation of receipt of check-out message: no action was taken because the indicated RSN was already vacant. (to PMS)
8. Confirmation of receipt of check-in message: no action was taken because the indicated RSN was already occupied. (to PMS)

Figure 19. Check-In/Check-Out Message Formats

FRAME NO.	(T) (36) CHECK-IN	(A) (26) CHECK-IN	FRAME NO.
0	STX	STX	0
1	36	26	1
2	MSGCT PROC*	MSGCT x(f)	2
3	STA2 STA1	“C”	3
4	STA4 STA3	“K”	4
5	NULL STA5	“I”	5
6	CP2 CP1	PROC*	6
7	CP4 CP3	STA1	7
8	NAME CHAR1	STA2	8
9	NAME CHAR2	STA3	9
10	NAME CHAR3	STA4	10
11	NAME CHAR4	STA5	11
12	NAME CHAR5	CP1	12
13	NAME CHAR 6	CP2	13
14	NAME CHAR 7	CP3	14
15	NAME CHAR 8	CP4	15
16	NAME CHAR 9	NAME CHAR 1/DID1	16
17	NAME CHAR 10	NAME CHAR 2/DID2	17
18	NAME CHAR 11	NAME CHAR 3/DID3	18
19	NAME CHAR 12	NAME CHAR 4/DID4	19
20	NAME CHAR 13	NAME CHAR 5/DID5	20
21	NAME CHAR 14	NAME CHAR 6	21
22	NAME CHAR 15	NAME CHAR 7	22
23	NULL NULL	NAME CHAR 8	23
24	NULL NULL	NAME CHAR 9	24
25	NULL NULL	NAME CHAR 10	25
26	NULL NULL	NAME CHAR 11	26
27	NULL NULL	NAME CHAR 12	27
28	ETX	NAME CHAR 13	28
29	BCC	NAME CHAR 14	29
		NAME CHAR 15	30
		VM PASSWD 1	31
		VM PASSWD 2	32
		VM PASSWD 3	33
		VM PASSWD 4	34
		LANGUAGE 1	35
		LANGUAGE 2	36
		NULL/REQ DID	37
		NULL	38
		NULL	39
		NULL	40
		ETX	41
		BCC	42

*PROCESS CODES
1. Switch is to perform the functions associated with check-in for the indicated RSN. If Frame 37 contains a “y” instead of NULL, the PMS requests the switch to select a DID number (R8). (to switch)
2. Confirmation of receipt of check-in message. No action was taken because the indicated RSN was already occupied. (to PMS)
3. Confirmation of receipt of check-in message. The DID assignment is in the name fields. If a DID number is not available or was not requested, the name fields return NULLs (0x20). This process code only occurs if the Automatic Selection of DID Numbers feature is enabled (R8). (to PMS)

The VM PASSWD frames are used to change the voice mail password when a guest checks in (A). To use the default password, send blanks. The default password is defined by the type of interface link used with the INTUITY (GuestWorks or stand-alone). The default password for an INTUITY using a GuestWorks interface is a pound sign (#). The default password for an INTUITY using a stand-alone interface is an asterisk (*).

LANGUAGE is used to select the guest language interface; to use default, send blanks.

REQ DID - If the switch has Automatic Selection of DID Numbers enabled, a DID number is reserved and sent unless “n” is specified in this frame.

Figure 20. Check-In Message Formats

FRAME NO.	(T) (46) CHECK-OUT
0	STX
1	46
2	MSGCT PROC*
3	STA2 STA1
4	STA4 STA3
5	NULL STA5
6	ETX
7	BCC

(A) (29) CHECK-OUT	FRAME NO.
STX	0
29	1
MSGCT x(f)	2
“C”	3
“K”	4
“O”	5
PROC*	6
STA1	7
STA2	8
STA3	9
STA4	10
STA5	11
NULL	12
NULL	13
ETX	14
BCC	15

*PROCESS CODES

1. Switch is to perform the functions associated with check-out for the indicated RSN. (to switch)
2. Check-out functions were completed for the indicated RSN, and the message waiting lamp was not on. (to PMS)
3. Check-out functions were completed for the indicated RSN, and the message waiting lamp was on. (to PMS)
4. Confirmation of receipt of check-out message: no action was taken because the indicated RSN was already vacant. (to PMS)
5. Check-out functions were completed for the indicated RSN, and message waiting lamp is still on due to another message type (for example, Leave Word Calling or INTUITY AUDIX). (to PMS)

Figure 21. Check-Out Message Formats

* PROCESS CODES
1. The PMS requests a custom DID number from the switch. (to switch)
2. The request was received, and the custom DID number was assigned to the RSN. (to PMS)
3. The request for a custom DID number was received, but no action was taken. This occurred because the RSN was not checked in when the VIP message request was received. (to PMS)
4. The request for a custom DID number was received, but no action was taken. This occurred because the requested custom DID number was not available. (to PMS)
5. The switch is notifying the PMS that the custom DID number specified in the message is no longer associated with the RSN. This occurs when someone manually changes the custom DID number assignment using the DID-Remove or DID-View features from an attendant console or front desk telephone. This message is only sent on change requests for custom DID numbers, not for automatic DID numbers. (to PMS)
6. The switch is notifying the PMS that the custom DID number specified in the message is now associated with the RSN. This occurs when someone manually changes the custom DID number assignment using the DID-View feature from an attendant console or front desk telephone. This message is only sent on change requests for custom DID numbers, not automatic DID numbers. (to PMS)

Note: Frames 17-40 are reserved for future expansion.

(A) (49) VIP	FRAME NO.
STX	0
49	1
MSGCT x(f)	2
“V”	3
“I”	4
“P”	5
PROC*	6
STA1	7
STA2	8
STA3	9
STA4	10
STA5	11
DID1	12
DID2	13
DID3	14
DID4	15
DID5	16
NULL	17
NULL	18
NULL	19
NULL	20
NULL	21
NULL	22
NULL	23
NULL	24
NULL	25
NULL	26
NULL	27
NULL	28
NULL	29
NULL	30
NULL	31
NULL	32
NULL	33
NULL	34
NULL	35
NULL	36
NULL	37
NULL	38
NULL	39
NULL	40
ETX	41
BCC	42

Figure 22. VIP Message Format (R9)

FRAME NO.	(N) (17) ROOM DATA IMAGE	(T) (37) ROOM DATA IMAGE	(A) (27) ROOM DATA IMAGE	FRAME NO.
0	STX	STX	STX	0
1	17	37	27	1
2	MSGCT PROC*	MSGCT PROC*	MSGCT x(f)	2
3	STA2 STA1	STA2 STA1	“R”	3
4	STA4 STA3	STA4 STA3	“M”	4
5	NULL V/O	NULL STA5	“I”	5
6	NULL MW	NULL V/O	PROC*	6
7	RESTRICT LEV	NULL MW	STA1	7
8	NULL	RESTRICT LEV	STA2	8
9	NULL	CP2 CP1	STA3	9
10	NULL	CP4 CP3	STA4	10
11	ETX	NAME CHAR 1	STA5	11
12	BCC	NAME CHAR 2	V/O	12
13		NAME CHAR 3	MW	13
14		NAME CHAR 4	RESTRICT LEV 1	14
15		NAME CHAR 5	RESTRICT LEV 2	15
16		NAME CHAR 6	CP1	16
17		NAME CHAR 7	CP2	17
18		NAME CHAR 8	CP3	18
19		NAME CHAR 9	CP4	19
20		NAME CHAR 10	NAME CHAR 1	20
21		NAME CHAR 11	NAME CHAR 2	21
22		NAME CHAR 12	NAME CHAR 3	22
23		NAME CHAR 13	NAME CHAR 4	23
24		NAME CHAR 14	NAME CHAR 5	24
25		NAME CHAR 15	NAME CHAR 6	25
26		NULL NULL	NAME CHAR 7	26
27		NULL NULL	NAME CHAR 8	27
28		NULL NULL	NAME CHAR 9	28
29		NULL NULL	NAME CHAR 10	29
30		NULL NULL	NAME CHAR 11	30
31		ETX	NAME CHAR 12	31
32		BCC	NAME CHAR 13	32
			NAME CHAR 14	33
			NAME CHAR 15	34
			VM PASSWD 1	35
			VM PASSWD 2	36
			VM PASSWD 3	37
			VM PASSWD 4	38
			LANGUAGE 1	39
			LANGUAGE 2	40
			NULL	41
			NULL	42
			NULL	43
			NULL	44
			ETX	45
			BCC	46

* PROCESS CODES
1. Request to send the data image for indicated room for informational purposes only. (to switch)
2. Response to received process code 1 message. (to PMS)
3. Database update status information and/or request for switch status. (to switch)
4. Database update switch status response to process code 3. (to PMS)

In the ASCII Mode, the restriction level is a 2-digit field. When the restriction level is sent to the PMS, it is sent as “digit-blank.” The switch can receive the restriction level in several different ways: 0-digit, digit-blank, or blank-digit.

The VM PASSWD frames are used to change the voice mail password when a guest checks in (A). To use the default password, send blanks. The default password is defined by the type of interface link used with the INTUITY (GuestWorks or stand-alone). The default password for an INTUITY using a GuestWorks interface is a pound sign (#). The default password for an INTUITY using a stand-alone interface is an asterisk (*).

LANGUAGE is used to select the guest language interface; to use default, send blanks.

Figure 23. Room Data Image Message Formats

FRAME NO.	(N) (20) ROOM CHANGE/SWAP	(T) (30) ROOM CHANGE/SWAP	(A) (24) ROOM CHANGE/SWAP	FRAME NO.
0	STX	STX	STX	0
1	20	30	24	1
2	MSGCT PROC*	MSGCT PROC*	MSGCT x(f)	2
3	STA2 STA1	STA2 STA1	“R”	3
4	STA4 STA3	STA4 STA3	“M”	4
5	STF2 STF1	NULL STA5	“C”	5
6	STF4 STF3	STF2 STF1	PROC*	6
7	ETX	STF4 STF3	STA1	7
8	BCC	NULL STF5	STA2	8
9		ETX	STA3	9
10		BCC	STA4	10
			STA5	11
			STF1	12
			STF2	13
			STF3	14
			STF4	15
			STF5	16
			NULL	17
			NULL	18
			ETX	19
			BCC	20

* PROCESS CODES
1. Room change to STAx from STFx. (to switch)
2. Room swap between STAx and STFx. (to switch)
3. Room change/swap was performed, but an error was detected in room status. (to PMS)

Note 1: STA represents “change to” RSN; STF represents “change from” RSN; x=1-4 (N), or 1-5 (T) (A).

Note 2: Room change is from occupied to vacant; room swap is from occupied to occupied.

Figure 24. Room Change/Swap Message Formats

FRAME NO.	(T) (38) GUEST INFORMATION INPUT/CHANGE	(A) (28) GUEST INFORMATION INPUT/CHANGE	FRAME NO.
0	STX	STX	0
1	38	28	1
2	MSGCT PROC*	MSGCT x(f)	2
3	STA2 STA1	"G"	3
4	STA4 STA3	"I"	4
5	NULL STA5	"C"	5
6	CP2 CP1	PROC*	6
7	CP4 CP3	STA1	7
8	NAME CHAR 1	STA2	8
9	NAME CHAR 2	STA3	9
10	NAME CHAR 3	STA4	10
11	NAME CHAR 4	STA5	11
12	NAME CHAR 5	CP1	12
13	NAME CHAR 6	CP2	13
14	NAME CHAR 7	CP3	14
15	NAME CHAR 8	CP4	15
16	NAME CHAR 9	NAME CHAR 1	16
17	NAME CHAR 10	NAME CHAR 2	17
18	NAME CHAR 11	NAME CHAR 3	18
19	NAME CHAR 12	NAME CHAR 4	19
20	NAME CHAR 13	NAME CHAR 5	20
21	NAME CHAR 14	NAME CHAR 6	21
22	NAME CHAR 15	NAME CHAR 7	22
23	NULL NULL	NAME CHAR 8	23
24	NULL NULL	NAME CHAR 9	24
25	NULL NULL	NAME CHAR 10	25
26	NULL NULL	NAME CHAR 11	26
27	NULL NULL	NAME CHAR 12	27
28	ETX	NAME CHAR 13	28
29	BCC	NAME CHAR 14	29
		NAME CHAR 15	30
		VM PASSWD 1	31
		VM PASSWD 2	32
		VM PASSWD 3	33
		VM PASSWD 4	34
		LANGUAGE 1	35
		LANGUAGE 2	36
		NULL	37
		NULL	38
		NULL	39
		NULL	40
		ETX	41
		BCC	42

* PROCESS CODES

1. Change/Input the following guest name and coverage Path Number for RSN. (to switch)
2. Change/Input complete as requested for RSN. (to PMS)
3. Change/Input received, no action taken, RSN vacant. (to PMS)
4. Change/Input received, no action taken, information the same as that stored for RSN. (to PMS)

The VM PASSWD frames are used to change the voice mail password when a guest checks in (A). To use the default password, send blanks. The default password is defined by the type of interface link used with the INTUITY (GuestWorks or stand-alone). The default password for an INTUITY using a GuestWorks interface is a pound sign (#). The default password for an INTUITY using a stand-alone interface is an asterisk (*).

LANGUAGE is used to select the guest language interface; to use default, send blanks.

Figure 25. Guest Information Input/Change Message Formats

FRAME NO.	(N) (70) STATUS INQUIRY	(T) (70) STATUS INQUIRY	(A) (71) STATUS INQUIRY	FRAME NO.
0	STX	STX	STX	0
1	70	70	71	1
2	MSGCT PROC*	MSGCT PROC*	MSGCT x(f)	2
3	NULL RR	NULL RR	“S”	3
4	ETX	ETX	“T”	4
5	BCC	BCC	“S”	5
			PROC*	6
			RR	7
			NULL	8
			NULL	9
			ETX	10
			BCC	11

* PROCESS CODES
F. Heartbeat message; must be issued by the PMS within every LIT interval and no more often than every 500 ms. (to switch)
0. Acknowledgment of no operation (NOP) “are you there” message from the PMS, indicating that the switch has had no changes that were not communicated to the PMS and that the switch has not initialized. Note that while in the “normal mode” the process code 0 is encoded as an A in the message frame sent to PMS (see Figure 10). This message will be sent **only** in response to a (70,F) (N) (T) or (71,F) (A) message from the PMS. (to PMS)
1. NOP acknowledgment indicating that at least one non-communicated change in the switch has occurred during a communications failure; the PMS must initiate a database exchange. (to PMS)
2. NOP acknowledgment indicating that the switch had failed, and the status memory has been initialized; the PMS must initiate a database exchange. (to PMS)
3. Start of database room exchange; the PMS will be sending a room image message for each room requiring status synchronization. (to switch)
4. End of database exchange. (to switch)
5. Release of the data link is requested for maintenance activity; process code 6 is confirmation. (both)
6. Release of the data link confirmed; all necessary actions have been taken. (both)

DATA LINK RELEASE REASON (RR) CODES
1. One flushed message
2. Excessive protocol violations
3. Excessive violation messages
4. Cannot receive messages
5. Craft-demanded maintenance
6. System-demanded maintenance
7. Ten protocol startup violations
F. Reason code not provided/supported

Figure 26. Status Inquiry Message Formats

Feature Codes, Process Codes, and Operations

This section discusses the operations associated with each feature message. The set of feature messages used may vary among various PMS system applications. General operation, summaries and uses of the defined process codes, and considerations will be discussed for each feature message.

Feature Code Summary

The feature codes are summarized in Table 6. The feature codes shown apply to the normal mode (N), the transparent mode (T), and the ASCII mode (A).

Table 6. Feature Code Summary

Feature/Page Number	Feature Code*	Purpose
Housekeeper Status-Room - page 61	11 (N) 31 (T) 21/HKR (A)	Communicate housekeeper-dialed status changes originated from room
Housekeeper Status-Remote Status Designated Station - page 61	12 (N) 32 (T) 22/HKS (A)	Communicate housekeeper-dialed changes originated from a designated station
Message Waiting - page 67	13 (N) 33 (T) 23/MSG (A)	Communicate message waiting lamp status changes
Controlled Restriction - page 70	15 (N) 35 (T) 25/CR (A)	Communicate changes in room telephone calling restrictions placed on RSN
Check-in/check-out - page 73	16 (N)	Communicate room check-ins and check-outs
Check-in - page 73	36 (T) 26/CKI (A)	Check-in when using guest name display
Check-out - page 73	46 (T) 29/CKO (A)	Check-out when using guest name display
VIP (R9) - page 81	49/VIP (A)	Assign a custom DID number for a frequent guest

Table 6. Feature Code Summary (Continued)

Feature/Page Number	Feature Code*	Purpose
Room Data Image - page 84	17 (N) 37 (T) 27/RMI (A)	Exchange status information for an RSN
Room Change/Swap - page 91	20 (N) 30 (T) 24/RMC (A)	Perform room change or swap operations between two rooms
Guest Information Input/Change - page 94	38 (T) 28/GIC (A)	Communicate guest name or coverage path information changes
Status Inquiry and Failure Management - page 96	70 (N) (T) 71/STS (A)	Data link maintenance

* The ASCII Mode feature codes also show the ASCII representations of the feature codes.

Housekeeper Status

The Housekeeper Status feature enables on-line tracking of the housekeeper services and room state changes using the following:

- Six process codes for dialing from room telephones
- Four process codes for dialing from designated station lines
- Each process code may include up to six additional information digits, available for room state changes and/or auxiliary processing such as housekeeper ID tracking.

The Housekeeper Status feature capability is an optional switch feature available through administration.

Feature Codes

The Housekeeper Status from Room feature codes are as follows:

- 11 — Normal mode
- 31 — Transparent mode
- 21/HKR — ASCII mode.

The Housekeeper Status from Designated Station feature codes are as follows:

- 12 — Normal mode
- 32 — Transparent mode
- 22/HKS — ASCII mode.

These feature message formats are shown in Figure 15 on page 47 and Figure 16 on page 48.

Process Codes

The process codes for the Housekeeper Status from Room feature are shown in Table 7.

Table 7. Housekeeper Status from Room Process Codes [Feature Codes 11 (N), 31 (T), or 21/HKR (A)]

Process Code	Message Direction	Indications
1 through 6	Switch to PMS	The associated feature access code was dialed from the indicated RSN. The message may include up to six housekeeper ID digits in addition to the RSN.
8	PMS to Switch	PMS rejects the validity of the message text, or an invalid state change was indicated.
9	PMS to Switch	PMS accepts the status change.

The process codes for the Housekeeper Status from Designated Station feature are shown in Table 8.

Table 8. Housekeeper Status from Designated Station Process Codes [Feature Codes 12 (N), 32 (T), or 22/HKS (A)]

Process Code	Message Direction	Indications
1 through 4	Switch to PMS	The associated feature access code and the indicated station number were dialed from a designated station. The message may include up to six housekeeper ID digits in addition to the RSN.
8	PMS to Switch	PMS rejects the message.
9	PMS to Switch	PMS accepts the message.

Operational Considerations (act-pms)

The following sections describe the Housekeeper Status operational considerations when the feature is active in the switch, and the PMS is active.

Feature Access Code/Message Process Code Correlation

The feature access code (FAC) determines the process code used when the call originates from the room or from a designated station. The correlation between an FAC and the process code is specified by the relative numbering of the FAC in the switch installation translation. The meanings of the process codes (for example, process code 21 could mean “housekeeper in room”) are assigned by the PMS. For further clarification, refer to the implementation or administration manuals for your switch. Table 9 and Table 10 show some example feature access codes.

NOTE:
The definitions administered in the switch must match the definitions administered on the PMS.

Table 9. Housekeeper Status from Room Feature Access Code Examples

FAC	Process Code	Definition
21	1	Housekeeper in Room
22	2	Room Clean - Vacant
23	3	Room Clean - Occupied
24	4	Room Not Clean - Vacant
25	5	Room Not Clean - Occupied
26	6	Room Clean - Needs Inspection

Table 10. Housekeeper Status from Designated Station Feature Access Code Examples

FAC	Process Code	Definition
31	1	Housekeeper in Room
32	2	Room Clean - Vacant
33	3	Room Clean - Occupied
34	4	Room Not Clean - Vacant

Switch Originating Dialing Procedures

The dialing procedures for the housekeepers are determined by the switch installation translation. The assignable items are as follows:

- Feature access codes (six possible for room-originated updates, four possible for designated station-originated updates) which correlate with PMS feature message process codes
- Telephones capable of remote housekeeper status change [designated station(s)]
- Number of additional information digits (for example, number of Housekeeper ID digits) to be dialed and transmitted to the PMS (the same number of ID digits is used for either room or remote designation station).

The Housekeeper Status messages can carry, in addition to the affected station number, up to six arbitrary variable digits entered by the caller via the touch-tone or rotary dial. With no additional information digits specified in switch translation, the dialing sequences are as follows:

- Room originated — FAC only
- Designated station — FAC + (dial tone) + affected station

If the number of additional digits specified in switch translation is 1 to 6, another dial tone is returned to the caller after the standard dialing sequence. The caller can then dial up to the number of digits specified (extra dialed digits are ignored). For a call originated from a room, the dialing sequences are as follows:

- Housekeeper in Room — FAC + (dial tone) + 1 to 6 additional digits + (confirmation tone)
- Designated Station — FAC + (dial tone) + digits of affected station + (dial tone) + 1 to 6 additional digits + (confirmation tone)

These additional digits can represent a Housekeeper ID number and/or a dialed status of the room or special request to the PMS. The dialed digits will be entered in the DIG1 through DIG6 fields of the transmitted Housekeeper Status feature message for interpretation by the PMS (see Figure 15 on page 47 or Figure 16 on page 48).

If the switch's translation defines the number of additional digits to be less than six, the digits will be placed, starting at nibble DIG1, and the unused nibbles of the fixed length message will be padded out. If no additional digits are specified, all six DIG fields will be transmitted as nulls.

If an incomplete dial time-out occurs, no message will be sent to the PMS, and intercept tone will be returned to the caller. If an incomplete sequence is dialed and the Housekeeper hangs up, no message will be sent to the PMS.

PMS Response to Housekeeper Status Feature Message

After the housekeeper dialing sequence is completed, the feature message (process codes 1-6 or 1-4) formatted with the affected RSN and any additional dialed digits is sent to the PMS.

The PMS must interpret the received message information and then return the message to the switch within a 4-second interval. The message text returned to the switch must be identical to the message received, with the exception of the message count and process code. The process code returned must be 8 (signifying rejection of the received message) or 9 (signifying acceptance of the received message information).

Switch Response to PMS Returned Messages

After the initial originating dialing sequence and message transmission to the PMS, the switch awaits the PMS returned message for a 4-second interval. The switch will return one of the following tones to signify the completion status of the status update (provided the caller remains off-hook):

- Reorder tone: if a valid process code 8 or 9 message response is not received from the PMS before the 4-second interval
- Confirmation tone: if a content valid (process code 9) message response is received from the PMS before the 4-second interval
- Intercept tone: if a reject (process code 8) message response is received from the PMS before the 4-second interval.

If the caller goes on-hook (hangs up) before the time-out period or before the housekeeper status response message is received from the PMS, the received response message is ignored by the switch.

Failure Considerations

In the case of a data link or PMS failure (communication is severed), the switch will internally log message data, which would have been sent to the PMS for that call, using the **list pms-down** (or **list maintenance pms-down**) report available from the administration terminal. The message will have one of the following formats:

Extension	Event	Reason	Date/Time
XXXX	from room, code x*	PMS link-out	xx:yy A
XXXXX	from station, code y*	PMS link-out	xx:yy P

Messages can also be routed to the optional PMS Log printer in the following format:

```
PMS dd/mm/yy   hh:mm   xxxx FROM ROOM:Code x* PMS link out of service
            or
PMS dd/mm/yy   hh:mm   xxxx FROM STATION:Code y* PMS link out of service
```

The caller is always given confirmation tone if the printer is up, assuming that later on immediate or manual entry into the PMS can be done from the printed copy or through use of the **list pms-down** (or **list maintenance pms-down**) log command. The caller is given reorder tone if the printer is unavailable.

For a DEFINITY G3V1 system, Housekeeper Status data will not be stored in the switch. Therefore, during switch failure, room status information is not included in the database update procedure. Upon PMS failure, the data backups are the internal switch logging (**list pms-down** or **list maintenance pms-down**) and the optional printer output (PMS Log).

The Maid Status button is used to determine the room status even when the link to the PMS is down.

Operational Considerations (act-nopms)

With the feature inactive, the switch will not send housekeeper information to the PMS. However, this information will be logged on the PMS Log printer if a printer is available. The message will be printed as “Feature active nopms.” The switch will ACK messages from the PMS for Housekeeper status; however, the switch will send a violation message to the PMS and will not act on the received message.

* In this example, “x” is a number from 1 to 6, and “y” is a number from 1 to 4.

Message Waiting

The Message Waiting feature turns on and turns off message waiting lamps in a room under two conditions:

- When the switch receives a message from the PMS
- When a user presses the Message Waiting Notification button on the attendant console or a telephone (with notification to the PMS).

This feature controls only message status controlled by the PMS. Leave Word Calling or INTUITY AUDIX® messages that activate message waiting lamps are not communicated to the PMS from the switch.

Feature Codes

The Message Waiting feature codes are as follows:

- 13 — Normal mode
- 33 — Transparent mode
- 23/MSG — ASCII mode.

The message format for this feature is shown in Figure 17 on page 49.

Process Codes

The process codes for the Message Waiting feature are shown in Table 11.

Table 11. Message Waiting Process Codes [Feature Codes 13 (N), 33 (T), or 23/MSG (A)]

Process Code	Message Direction	Indications
1	PMS to Switch	Turn on message lamp of room telephone indicated.
2	PMS to Switch	Turn off message lamp of room telephone indicated.
3	Switch to PMS	Message lamp of room telephone indicated has been turned on via Message Waiting Notification activation from the attendant console or telephone.
4	Switch to PMS	Message lamp of room telephone indicated has been turned off via Message Waiting Notification deactivation from the attendant console or telephone.
5 (T) (A)	Switch to PMS	Message lamp of room telephone indicated was already on or is still on due to another message type (for example, Leave Word Calling or INTUITY AUDIX).

Operational Considerations

The Message Waiting feature message(s) will be sent and/or received and interpreted based on whether the Message Waiting Configuration option on the switch is enabled for PMS support. The possibilities are as follows:

- Feature active in switch with communication enabled on switch changes and active on valid PMS change requests (**act-pms**).
- Feature active in switch with no PMS communication (**act-nopms**).

Feature Active with PMS

With the Message Waiting Configuration option enabled (**act-pms**), the operational considerations are as follows:

- The message waiting status for each RSN will be stored in switch memory.
- When a change in message waiting state for an RSN is entered via an attendant console or telephone (process code 3 to turn the lamp on or process code 4 to turn the lamp off), the message will be sent to the PMS with the RSN indicated.
- Upon receipt in the switch of process code 1 to turn the lamp on or process code 2 to turn the lamp off, the appropriate lamp status change will be made by the switch.

  If the lamp is on due to another message type and process code 1 or 2 is sent to the switch, the switch will return process code 5 (T) (A).

- When a (16,2) (N), (46,1) (T), or (29,1) (A) room check-out message is received from the PMS, a (16,6) (N), (46,2) (T), or (29,2) (A) check-out complete message will be sent to the PMS if the room telephone had the lamp on due to the PMS component of the message waiting lamp. A (16,5) (N), (46,3) (T), or (29,3) (A) message will be sent to the PMS if the message waiting lamp is off. A (46,5) (T) or (29,5) (A) is sent if the message waiting lamp is on due to another message type (for example, LWC). The PMS component of the message waiting lamp for the RSN will always be in the off state after the (16,2) (N), (46,1) (T), or (29,1) (A) message has been processed. Subsequent status inquiries will report that the lamp is off (that is, the PMS component is off), even if the lamp is on due to INTUITY AUDIX or Leave Word Calling, which are not supported through this interface.

Feature Active Without PMS

With the Message Waiting Configuration option disabled (**act-nopms**), the switch does not send message waiting messages to the PMS. If the PMS sends message waiting messages to the switch, the switch will ACK the messages. However, the switch will send a violation message to the PMS and will not act on the received message. This information will be logged on the PMS Log printer if a printer is available. The message will be printed as “Feature active nopms.”

PMS Considerations

If the PMS does not store message waiting data, the Room Data Image for the RSN can be requested to obtain the current status as discussed in “Room Data Image” starting on page 84. However, if the switch reinitializes after a failure, this information may be incorrect.

Other Considerations

The ASCII mode has two frames to support text and fax messages to the INTUITY (A). See Figure 17 on page 49 for more information.

Controlled Restriction

The Controlled Restriction feature enables an RSN to be restricted using selected origination and/or termination capabilities either from switch terminals (with communication to the PMS), or on receipt of feature messages from the PMS.

NOTE:
The switch also has the capability to apply controlled restrictions to a group of rooms at one time. This capability is not supported on the PMS interface. Modification of user-controlled restrictions does not affect the values of group-controlled restrictions.

Feature Codes

The Controlled Restriction feature codes are as follows:

- 15 — Normal mode
- 35 — Transparent mode
- 25/CR — ASCII mode.

This feature message format is shown in Figure 18 on page 50.

Process Codes

The process codes for the Controlled Restriction message are shown in Table 12.

Table 12. Controlled Restriction Process Codes [Feature Codes 15 (N), 35 (T), or 25/CR (A)]

Process Code	Message Direction	Indications
1	PMS to Switch	Set restriction for indicated RSN.
2	Switch to PMS	Restriction has been set for indicated RSN via the attendant console or a telephone.

Operational Considerations

The controlled restriction message communication with the PMS is based on the switch installation parameters. The possibilities are as follows:

- The feature is active in the switch with no communication with the PMS (**act-nopms**).
- The feature is active in the switch, and communication with the PMS is active. In this configuration, the change can be initiated from either an attendant console or a telephone with console permissions on the switch (with notification of the change to the PMS), or from the PMS (with a request sent to the switch to impose the specified restriction level) (**act-pms**).

Switch Operations (act-pms)

The RSN and new restriction level will be sent to the PMS for changes to single user-controlled restriction levels.

When a (15,1) (N), (35,1) (T), or (25,1) (A) message is received from the PMS, the restriction change indicated will be implemented on the indicated RSN, overriding any previous single user-controlled restriction.

The controlled restriction level codes and the actions indicated are shown in Table 13.

Table 13. Controlled Restriction Level Codes and Actions

Level	Action
00	No restrictions placed on RSN.
01	Outward restriction, which denies all local and toll calling from the room telephone, or toll* restriction, which denies all toll calls.
02	Station-to-station restriction, which denies all calls to or from other telephones (both administrative and guest rooms), or toll* restriction, which denies all toll calls.
03	Outward* and station-to-station* restriction (both levels 01 and 02 above in effect).
04	Total restriction, which denies all calls to and from the room telephone (effectively cuts off the room telephone service).
05	Termination restriction, which denies all calls to the room telephone.
06	Outward* and termination restriction (both levels 01 and 05 in effect).
07	Station-to-station* and termination restriction (both levels 02 and 05 in effect).

* Toll restriction can be substituted for either outward restriction or station-to-station restriction. Toll restriction allows guests to place free outgoing calls.

When a controlled restriction is set on an RSN, the denied outward/toll, termination, station-to-station/toll, and origination calls are routed to the translated intercept treatment.

The switch automatically removes previous single user-controlled restrictions, imposes controlled outward restriction on room check-out, and removes controlled outward restriction on room check-in. No (15,2) (N), (35,2) (T), or (25,2) (A) message is sent from the switch to the PMS for the automatic change.

NOTE:
If the Controlled Restriction Communication feature is active for the PMS, only manual changes made from a telephone for a **single** room will be sent to the PMS. Group-controlled restrictions will not be communicated to the PMS. Modification of user-controlled restrictions do not affect the values of group-controlled restrictions.

PMS Considerations

If the PMS stores controlled restrictions and sends a restriction message altering the level of restriction on an RSN, the PMS must also change its stored restriction level.

Switch Operations (act-nopms)

With the feature translated as **act-nopms**, the switch will not send controlled restriction messages to the PMS. If the PMS sends control restriction messages to the switch, the switch will acknowledge the messages. However, the switch will send a violation message to the PMS and will not act on the received message. This information will be logged on the PMS Log printer if a printer is available. The message will be printed as “Feature active nopms.”

Other Considerations

In the ASCII Mode, the restriction level value is a two-digit field. When the restriction level is sent to the PMS, it is sent as “digit-blank.” The switch can receive the restriction level in several different ways: zero-digit, digit-blank, or blank-digit.

Check-In/Check-Out

The Check-in/Check-out messages do not represent a unique feature, but rather are a convenient way for invoking a sequence of functions commonly performed when a guest checks in or checks out of a room. It is expected that each check-in or check-out performed in the PMS will immediately be transmitted to the switch*. Upon reception of the check-in/check-out message, the switch performs a sequence of operations based on its feature definitions.

The transmission of the check-in/check-out feature messages from the PMS is not an optional switch installation parameter, but is assumed to be a standard feature for switch operational integrity if the PMS is controlling room status.

The switch requires the check-in/check-out notification from the PMS so that the switch can perform the appropriate internal status changes for that guest room for message waiting lamp status, wakeup request, and controlled restriction level. The switch also performs changes to the guest name and coverage path numbers (T) (A). Failure to communicate check-in or check-out information could result in invalid message waiting lamp status, the guest being unable to originate room telephone calls, the guest receiving an unrequested wakeup call (or no wakeup call at all), and erroneous guest names and coverage paths (T) (A). Immediate notification to the switch from the PMS is necessary to prevent these sources of guest dissatisfaction.

Feature Codes

The Check-In/Check-Out feature codes are as follows:

- 16 — Normal mode (combined check-in/check-out message)
- 36 — Transparent mode (check-in message)
- 46 — Transparent mode (check-out message)
- 26/CKI — ASCII mode (check-in message)
- 29/CKO — ASCII mode (check-out message).

These feature message formats are shown in Figure 19 on page 51, Figure 20 on page 52, and Figure 21 on page 53.

* The check-in message should also be sent if a guest is reinstated after having checked out initially.

Process Codes

The process codes for the Check-In/Check-Out features are shown in Table 14.

Table 14. Check-In/Check-Out Process Codes [Feature Code 16 (N)]

Process Code	Message Direction	Indications
1	PMS to Switch	Switch is to perform the functions associated with check-in for the indicated RSN.
2	PMS to Switch	Switch is to perform the functions associated with check-out for the indicated RSN.
5	Switch to PMS	Check-out functions were completed for the indicated RSN, and the message waiting lamp was not on.
6	Switch to PMS	Check-out functions were completed for the indicated RSN, and the message waiting lamp was on.
7	Switch to PMS	Confirmation of receipt of check-out message: no action was taken because the indicated RSN was already vacant.
8	Switch to PMS	Confirmation of receipt of check-in message: no action was taken because the indicated RSN was already occupied.

The process codes for the Check-In feature are shown in Table 15 and Table 16.

Table 15. Check-In Process Codes [Feature Code 36 (T)]

Process Code	Message Direction	Indications
1	PMS to Switch	Switch is to perform the functions associated with check-in for the indicated RSN.
2	Switch to PMS	Confirmation of receipt of check-in message: no action was taken because the indicated RSN was already occupied.

Table 16. Check-In Process Codes [Feature Code 26/CKI (A)]

Process Code	Message Direction	Indications
1	PMS to Switch	Switch is to perform the functions associated with check-in for the indicated RSN. If Frame 37 contains a “y” instead of NULL, the PMS requests the switch to select a DID number (R8).
2	Switch to PMS	Confirmation of receipt of check-in message. No action was taken because the indicated RSN was already occupied.
3	Switch to PMS	Confirmation of receipt of check-in message. The DID assignment is in the name fields. If a DID number is not available or was not requested, the name fields return NULLs (0x20). This process code only occurs if the Automatic Selection of DID Numbers feature is enabled. (R8)

The process codes for the Check-Out feature are shown in Table 17

Table 17. Check-Out Process Codes [Feature Codes 46 (T) or 29/CKO (A)]

Process Code	Message Direction	Indications
1	PMS to Switch	Switch is to perform the functions associated with check-out for the indicated RSN.
2	Switch to PMS	Check-out functions were completed for the indicated RSN, and the message waiting lamp was not on.
3	Switch to PMS	Check-out functions were completed for the indicated RSN, and the message waiting lamp was on.
4	Switch to PMS	Confirmation of receipt of check-out message: no action was taken because the indicated RSN was already vacant.
5	Switch to PMS	Check-out functions were completed for the indicated RSN, and message waiting lamp is still on due to another message type (for example, Leave Word Calling or INTUITY AUDIX).

Operational Considerations

The switch will maintain a vacant/occupied status for each RSN. The two possible states for a room are vacant or occupied. These two switch states will be updated by the receipt of the check-in and check-out messages from the PMS. Under normal circumstances when the PMS link to the switch is operational, check-in and check-out cannot be performed at the switch attendant console or telephones. These functions can only be done at the PMS terminals. The PMS is required to immediately send each check-in/check-out to the switch to support the PMS data link and associated switch operations.

If the PMS link is down, check-in and check-out must be done at both the PMS terminal and at the attendant console or telephones. This procedure must continue until the PMS link is up again. You can use the Occupd Rooms button at the attendant console to determine the room status when the link to the PMS is down.

Switch Actions

When a room check-in message (process code 1) is received from the PMS, the status of that room will be set to Occupied. This change does the following (if the associated function is active in the switch):

- Deactivates Controlled Restriction
- Stores guest name (T) (A)
- Stores coverage path (T) (A)
- Removes Leave Word Calling (LWC) messages (T) (A).

If Frame 37 contains a lower-case “y” (0x79) instead of NULL, the PMS is requesting that the switch select an automatic DID number for the guest room (not a custom VIP DID number). If Automatic Selection of DID Numbers is enabled on the switch, the switch returns the selected DID number to the PMS with Process Code 3. This DID process code applies only to Feature Code 26 on DEFINITY R8 and later and GuestWorks Issue 6 and later.

If Frame 37 contains a lower-case “n” (0x6e), and Automatic Selection of DID Numbers is enabled on the switch, a DID number is not sent. If the Custom Selection of VIP DID Numbers message is being used with a check-in, Frame 37 should be set to “n.”

If Frame 37 contains a NULL, and Automatic Selection of DID Numbers is enabled on the switch, a DID number is sent anyway. This will assign unwanted DID numbers, so send an “n” if a DID number is not required.

When a room check-out message (16,2) (N), (46,1) (T), or (29,1) (A) is received from the PMS, the status of that room will be set to Vacant. This change also does the following (if the associated function is active in the switch):

- Turns off the message waiting lamp PMS component for the indicated RSN
- Clears any existing wakeup entry for the room
- Cancels any current controlled restriction and activates Controlled Outward/Toll Restriction
- Removes guest name (T) (A)
- Sets coverage path to “Default Coverage Path for Client Rooms” field value (T) (A)
- Checks for other message types and returns (46,5) or (29,5) if found (T) (A).

Other Considerations

The Check-Out Confirmed-Room Already Vacant (16,7) (N), (36,4) (T), or (26,4) (A) and the Check-In Confirmed-Room Already Occupied (16,8) (N), (36,2) (T), or (26,2) (A) messages will be sent to the PMS when a check-out request is received for a vacant room, and a check-in request is received for an occupied room, respectively. A Check-Out Confirmed-Other message type (46,5) (T) or (29,5) (A) will be sent to the PMS if the room’s message lamp is on due to a non-PMS message. These are not counted as error or invalid conditions by the switch.

The name characters are ASCII and must be between 0x20 (space character) and 0x7e (tilde character) in value. If the name consists of less than 15 characters, the name field must be left-justified by padding the remaining characters with the space (0x20) character.

The data portion of the coverage path field in the check-in message for the transparent PMS protocol consists of three or four Binary Coded Decimal (BCD) characters representing the thousands, hundreds, tens, and unit digits with the following valid values:

- 0 — No coverage is provided for the RSN
- 1-xxxx — Coverage path used (see the coverage path values on page 18)
- 0xbbb or 0xbbbb— Coverage path value of the “Default Coverage Path for Client Rooms” field on the switch is used.

The LANGUAGE frames identify which language is used for the INTUITY Lodging voice messaging for the guest rooms (A). To use the default language, send blanks. To use a particular language, send the language number as defined in the *INTUITY Lodging Property Management System Interface Specifications*, (585-310-234). At the time of publication, the following is a list of the different language encodes supported by INTUITY Lodging.

Language	Hex Value and Message Position		INTUITY Lodging Numbering
	Language 1	Language 2	
American English	0x32	0x30	00
Japanese	0x32	0x31	01
Latin American Spanish	0x32	0x32	02
Greek	0x32	0x33	03
Mandarin	0x32	0x34	04
Reserved for future use	0x32	0x35	05
UK English	0x32	0x36	06
Canadian French	0x32	0x37	07
Brazilian Portuguese	0x32	0x38	08
German	0x32	0x61	10
Parisian French	0x32	0x62	11
Arabic Female	0x32	0x64	13
Russian	0x33	0x34	20

The VM PASSWD frames are used to change the voice mail password when a guest checks in (A). To use the default password, send blanks. The default password is defined by the type of interface link used with the INTUITY (GuestWorks or standalone). The default password for an INTUITY using a GuestWorks interface is a pound sign (#). The default password for an INTUITY using a standalone interface is an asterisk (*).

In a Suite Check-in environment, check-in requests sent from the PMS to the switch activate all of the pre-administered suite telephones. However, on the PMS, you may have to check in more than one room, depending on how the suites have been administered on the PMS.

Failure Considerations

When loss of communication with the PMS occurs due to failure of the data link or the PMS, the switch will enable the Check In and Check Out buttons so that a switch terminal (attendant console or display telephone with console permissions) can be used for check-in and check-out. Check-in and check-out on the switch terminal will perform the functions outlined above except for guest name and coverage path information which can be entered later using Guest Information Input/Change messages from the PMS, or the database swap can fill in. Manual check-in/check-out always sets the coverage path to “Default Coverage Path for Client Rooms.”

During the recovery procedure, the RSN’s occupancy status specified by the PMS in the (17,3) (N), (37,3) (T), or (27,3) (A) room image message may be different from the switch status for the indicated room, implying a check-in or check-out should be performed for synchronization on that RSN in the switch.

Management of DID Numbers

Management of DID numbers is the responsibility of hotel personnel. The switch only keeps track of which numbers are administered for custom DID numbers, which numbers are administered for automatic DID numbers, and which DID numbers are currently assigned to an RSN. As the numbers are assigned by the PMS, the PMS could be programmed to keep track of usage, if desired.

Examples of Check-In Message Activity

The following diagram shows an example of check-in message activity for the Normal, Transparent, and ASCII modes. These examples match the data shown in Figure 10, Figure 11, and Figure 12, respectively.

Examples of Check-In Message Activity

Mode	Source	Feat Code, Proc Code	Format	Message	Explanation
Normal	PMS	16,1	Hex	02 16 21 A2 A3 FF 03 CA	Check-in request from PMS
			Decimal	02 22 33 162 163 255 03 202	
	Switch	ACK	Hex	06	Acknowledged receipt of check-in message; check-in done.
			Decimal	06	
Transparent	PMS	36,1	Hex	02 36 21 10 05 24 F2 51 F7 53 4D 49 54 48 2C 4D 52 2E 4A 2E 20 20 20 20 FF FF FF FF FF 03 BC	Check-in request from PMS
			Decimal	02 54 33 10 05 36 242 81 247 83 77 73 84 72 44 77 82 46 74 46 32 32 32 32 255 255 255 255 255 03 186	
	Switch	ACK	Hex	06	Acknowledged receipt of check-in message; check-in done.
			Decimal	06	
ASCII	PMS	CKI,1	Hex	02 26 2F 43 4B 49 31 32 32 34 31 35 31 35 37 20 53 4D 49 54 48 2C 4D 52 2E 4A 2E 20 20 20 20 37 36 34 38 32 30 79 20 20 20 03 3D	Check-in request from PMS
			ASCII	☻ & / C K I 1 2 2 4 1 5 1 5 7 sp S M I T H , M R . J . sp sp sp sp 7 6 4 8 2 0 y sp sp sp ♥ =	
			Decimal	02 38 47 67 75 73 49 50 50 52 49 53 49 53 55 32 83 77 73 84 72 44 77 82 46 74 46 32 32 32 32 55 54 52 56 50 48 121 32 32 32 03 61	
	Switch	ACK	Hex	06	Acknowledged receipt of check-in message; check-in done.
			ASCII	♠	
			Decimal	06	

checkin_tbl.cdr

VIP (R9)

The VIP feature (R9) uses the Custom Selection of VIP DID Number feature to assign a DID number to a frequent guest when requested by the PMS. The custom DID numbers are kept in a pool of reserved DID numbers. This pool of numbers is separate from the pool of DID numbers used with the Automatic Selection of DID Numbers feature that was introduced in R8.

The differences between the new features are as follows:

- Automatic Selection of DID Numbers — The request for an automatic DID number is sent as part of the check-in message (feature code 26, ASCII mode only).
- Custom Selection of VIP DID Numbers — The request for a specific DID number is sent as a separate message only *after* a successful check-in has occurred. If the check-in fails, the request for the DID number is never sent to the switch.

Feature Codes

The VIP feature codes are as follows:

- 49/VIP — ASCII mode.

The message format for this feature is shown in Figure 22 on page 54.

Process Codes

The process codes for the Custom Selection of VIP DID Number feature are shown in Table 18.

Table 18. Custom Selection of VIP DID Number Process Codes [Feature Code 49/VIP (A)]

Process Code	Message Direction	Indications
1	PMS to Switch	The PMS requests a custom DID number from the switch.
2	Switch to PMS	The request was received, and the custom DID number was assigned to the RSN.
3	Switch to PMS	The request for a custom DID number was received, but no action was taken. This occurred because the RSN was not checked in when the VIP message request was received.

Table 18. Custom Selection of VIP DID Number Process Codes [Feature Code 49/VIP (A)] (Continued)

Process Code	Message Direction	Indications
4	Switch to PMS	The request for a custom DID number was received, but no action was taken. This occurred because the requested custom DID number was not available.
5	Switch to PMS	The switch is notifying the PMS that the custom DID number specified in the message is no longer associated with the RSN. This occurs when someone manually changes the custom DID number assignment using the DID-Remove or DID-View features from an attendant console or front desk telephone. This message is only sent on change requests for custom DID numbers, not for automatic DID numbers.
6	Switch to PMS	The switch is notifying the PMS that the custom DID number specified in the message is now associated with the RSN. This occurs when someone manually changes the custom DID number assignment using the DID-View feature from an attendant console or front desk telephone. This message is only sent on change requests for custom DID numbers, not automatic DID numbers.

Operational Considerations

The Custom Selection of VIP DID Numbers feature takes a DID number from a special pool of reserved DID numbers (a separate pool of numbers than the Automatic Selection of DID numbers), and assigns the number to an RSN. This allows a frequent guest to have the same reserved DID number every time that guest checks into the hotel.

The VIP feature message can be sent any time after a successful check-in message (26/CKI) and before a successful check-out message (29/CKO). If the selected DID number cannot be assigned by the switch, a different DID number can be requested. This can be another custom DID number, or an automatic DID number.

The switch will respond to the VIP feature message with a failure if any of the following errors are detected:

- The RSN is not a valid extension, or is an extension that does not have Client Room COS.
- The DID number specified from the PMS is not a valid extension, or is an extension that does not have an “xdidvip” station type.

- The message is received by the switch, but the Custom Selection of VIP DID Numbers field is not enabled on the Hospitality features form.
- The message is received by the switch with a process code other than 1.

PMS Considerations

When using the VIP feature message during a check-in session to request a custom DID number, frame 37 of the check-in message (26/CKI) must be set to “n” so that the switch does not attempt to assign an automatic DID number.

Other Considerations

When front desk personnel decide to manually change a guest’s custom DID number using an attendant console or front desk telephone, the following will occur:

- If the person is removing the custom DID number and not reassigning a new custom DID number, a message is sent to the PMS noting that the custom DID number is no longer associated with the RSN. This message is only sent on change requests for custom DID numbers, not for automatic DID numbers.
- If the person is assigning a different custom DID number, two messages are sent to the PMS. One message identifies that the old custom DID number is no longer associated with the RSN, and the second message contains the new custom DID assignment. These messages are only sent on change requests for custom DID numbers, not for automatic DID numbers.

Management of DID Numbers

Management of DID numbers is the responsibility of hotel personnel. The switch only keeps track of which numbers are administered for custom DID numbers, which numbers are administered for automatic DID numbers, and which DID numbers are currently assigned to an RSN. As the numbers are assigned by the PMS, the PMS could be programmed to keep track of usage, if desired.

Room Data Image

The Room Data Image feature provides a means for sending and receiving the set of pertinent status items for a particular RSN to or from each system (the PMS or the switch). Two of the process codes are provided for “informational exchange” about the other system’s status and do not imply that status changes are to be performed. The other two process codes are provided for the “database exchange” recovery procedure and can imply status changes in either or both systems.

Feature Codes

The Room Data Image feature codes are as follows:

- 17 — Normal mode
- 37 — Transparent mode
- 27/RMI — ASCII mode

This feature message format is shown in Figure 23 on page 55.

Process Codes

The process codes for the Room Data Image feature are shown in Table 19.

Table 19. Room Data Image Process Codes [Feature Codes 17 (N), 37 (T), or 27/RMI (A)]

Process Code	Message Direction	Indications
1	PMS to Switch	Request to send the data image for indicated room for informational purposes only.
2	Switch to PMS	Response to received process code 1 message.
3	PMS to Switch	Database update status information and/or request for switch status.
4	Switch to PMS	Database update switch status response to process code 3.

Operational Considerations

Process codes 1 and 2 are used in the informational exchange mode. The PMS will request status items from the switch by sending process code 1; the switch will reply with pertinent data by returning process code 2. Process code 1 does not imply or dictate any status change to the receiving system. The PMS may initiate a process code 1 request at any time.

Process codes 3 and 4 are reserved for the database exchange procedure only. The switch will acknowledge but not process the messages and will return violation messages if process codes 3 and 4 are sent at any other time. The database “swap” procedure is defined as the message sequence between, and including, the transmission of the (70,3) (N) (T) or (71,3) (A) database exchange “start” message and the transmission of the (70,4) (N) (T) or (71,4) (A) database exchange “end” message (both originated by the PMS). The (70,3) (N) (T) or (71,3) (A) message signals the start of database synchronization. Then, for each room, a process code 3 message is sent by the PMS specifying current PMS status data and/or requesting switch status data. The switch will process the process code 3 message and return a process code 4 message containing any requested switch status. The exchange constitutes a synchronization of the two systems’ databases for a particular room. After the process code 3 and 4 exchange for all rooms, the (70,4) (N) (T) or (71,4) (A) message from the PMS signals the end of the database synchronization procedure.

The Room Data Image feature message item fields are shown in Table 20.

Table 20. Room Data Image Feature Message Item Fields

Fields	Values
Room Station Number (RSN)	Extension number
*Occupied/Vacant Status	0=Vacant, 1=Occupied
Message Waiting Lamp Status	0=Off, 1=On
Controlled Restriction Level Code	See Table 13
Guest Name (T) (A)	Name string
Coverage Path Number (T) (A)	1-xxxx*, 0xbbb or 0xbbbb
Voice Mail Password (future)	FFFF (transparent) sp sp sp sp (ASCII)
Voice Mail Language (future)	FF (transparent) sp sp (ASCII)
* Can also take null values as described below.	

The name characters are ASCII and must be between 0x20 (space character) and 0x7e (tilde character) in value. If the name consists of less than 15 characters, the name field must be left-justified by padding the remaining characters with the space (0x20) character.

The coverage path field in the room data image message for the transparent and ASCII PMS protocols consists of three or four BCD characters representing the thousands, hundreds, tens, and unit digits with the following valid values:

- 0 — No coverage is provided for the RSN
- 1-xxxx — Coverage path used (see the coverage path values on page 18)
- 0xbbb or 0xbbbb — Coverage path value of the “Default Coverage Path for Client Rooms” field on the switch is used
- 0xfff or 0xffff — “Null” coverage path value used in room data image message only to request coverage path value stored on the switch for an RSN.

There are two types of room messages: status request (process codes 1 and 3) and status response (process codes 2 and 4). If the switch receives a status request message, it appropriately processes the message and returns a status response message. Appropriate processing depends on the values received in the status fields of the status request message.

If a status request message with process code 1 is received at the switch for any field that is null (0xf in non-ASCII fields and 0x3f in all bytes of ASCII fields), the switch fills in the corresponding field in the status response message with the internal data associated with that field, or fills in a null if the status is unavailable. For all fields that are non-null, the non-null value that was received is ignored, but is returned in the corresponding field of the response message. The status response message with process code 2 is then transmitted to the PMS.

If a status request message with process code 3 is received at the switch for any field that is null, the switch fills in the corresponding field in the status response with the data associated with that field, or fills in a null if the status is unavailable. For all fields that are non-null, the switch will update its internal data with the received values, place a null in the corresponding field in the status response message, and transmit the response message with process code 4.

NOTE:
A field is reserved in the room image message for each status item possible in a data link configuration, even though not all the feature messages may be activated. The switch will ignore any request for status or implied change for any field for which normal status changes are not communicated. For instance, if the controlled restriction (15,x) (N), (35,x) (T), or (25,x) (A) feature message is not enabled in a particular data link configuration, the controlled restriction field in the room image message is likewise inactive.

Table 21 provides a listing of room image messages, and the examples which follow show the typical use of the room image exchange.

Table 21. Data Field Interpretations for Room Data Image Messages

Message	Direction	Status Field Specification	
		Null	Non-Null
(17,1) (N) (37,1) (T) (27,1) (A)	PMS to Switch	Status request	Ignored
(17,2) (N) (37,2) (T) (27,2) (A)	Switch to PMS	No status available	Returned status
(17,3) (N) (37,3) (T) (27,3) (A)	PMS to Switch	Status request	PMS status: switch should set its status
(17,4) (N) (37,4) (T) (27,4) (A)	Switch to PMS	Either no status available or status has been updated	Switch status returned

Examples

Table 22 shows a sample informational request for a room originated by the PMS. The switch shows the room with no message waiting, guest name “Smith,J” and coverage path 1. All feature messages except the controlled restriction communication are active.

Table 22. Informational Exchange

Originator	Message	Occupied /Vacant	Message Waiting	Controlled Restriction	Guest Name	Call Coverage Path
PMS	(37,1) (T) (27,1) (A)	1*	Null	Null	Null†	Null
Switch	(37,2) (T) (27,2) (A)	1	0	Null‡	Smith,J§	001

* The PMS must always provide the occupied/vacant status.
† A Null for a guest name field is 15 question mark characters (0x3f).
‡ The Controlled Restriction Communication was not enabled. Therefore, the switch has no information available for the request.
§ Remaining characters in this field will be padded with an ASCII space (0x20).

Using the same system configuration as in the above example, the process code 3/process code 4 exchange for database update purposes would look like Table 23.

Table 23. Room Synchronization Exchange

Originator	Message	Occupied /Vacant	Message Waiting	Controlled Restriction	Guest Name	Call Coverage Path
PMS	(37,3) (T) (27,3) (A)	1*	1	Null	Smith,J	001
Switch	(37,4) (T) (27,4) (A)	Null	Null	Null†	Null‡	Null

* The PMS must always provide the occupied/vacant status.
† The Controlled Restriction Communication was not enabled. Therefore, the switch has no information available for request.
‡ A Null for a guest name field is 15 question mark characters (0x3f).

The switch will set the status of the room to “occupied,” with the message waiting lamp on.

PMS Considerations for Process Code 3

Process code 3 sent from the PMS, and the associated process code 4 sent from the switch, constitutes an individual “room database exchange” for the purpose of updating a database after a detected failure.

Process code 3 provides a way for the PMS to send the switch the current valid data stored in the PMS, and for requesting the current valid data stored in the switch. This is done to force a database update during the recovery procedure after a failure.

The PMS should insert its current status values in the occupied/vacant field because the PMS is considered the “master.” The PMS is always considered the source for room occupied/vacant status. The master source for message waiting lamp status, controlled restriction status, guest names, and coverage path number may vary based on a particular operating environment (T) (A). If the PMS wishes to receive the current switch data for message waiting lamp status, controlled restriction, and guest name or coverage path number (T) (A), the PMS must place nulls in the appropriate positional fields of the process code 3 message requesting switch response, if applicable.

Switch Actions Upon Receipt of Room Image with Process Code 3

The switch will change its database to the passed values in the process code 3 message from the PMS for non-null, active fields. Switch status will be returned in the null, active fields.

Switch processing is done in the following sequence:

1. Perform any implied occupied/vacant status change (see detailed description below).
2. Process individual status fields for message waiting lamp status, controlled restriction status, coverage path (T) (A), and guest name (T) (A).
3. Return status for any requested active fields.

Vacant-to-occupied or occupied-to-vacant transitions as implied in the received process code 3 message will perform the corresponding check-in or check-out operations in the switch as follows:

- Vacant-to-Occupied (PMS has occupied, switch has vacant)
  1. The standard check-in operations for controlled restriction, with no status change of either the message waiting lamp status or wakeup status; the status of the RSN in the switch is set to Occupied; active fields in the process code 3 message for status items from the PMS will then override the switch status (for example, a non-null message lamp field will override switch status if the message waiting message feature is active).
  2. The process code 4 (room image recovery response) will then be sent to the PMS with switch status items supplied for the null fields (and '?' fields for guest name characters) in the received process code 3 message (T) (A), and nulls in the received active fields.
- Occupied-to-Vacant (PMS Vacant, Switch Occupied)
  1. The status of the RSN in the switch is set to Vacant.
  2. Outward (or Toll) Restriction will be placed on the RSN.
  3. Since the possibility exists that a manual check-in was done through the switch and that it may not yet have been entered in the PMS after a PMS failure, the wakeup and message waiting lamp status settings are **not** reset in the switch.
  4. Any active fields in the received process code 3 message from the PMS for the indicated RSN will override the switch status.
  5. The process code 4 message is returned to the PMS with nulls in the received active fields, and with data supplied in received null fields.

PMS Actions for Room Image Complement Message (Process Code 4)

Process code 4 is sent from the switch to the PMS and provides the complement data image in response to the process code 3 image sent from the PMS. It is assumed that the PMS will update its status accordingly for the active fields returned from the switch.

Other Considerations

In the ASCII Mode, the restriction level value is a two-digit field. When the restriction level is sent to the PMS, the value is sent as "digit-blank." The switch can receive the restriction level in several different ways: zero-digit, digit-blank, or blank-digit.

Room Change/Room Swap

The Room Change/Room Swap feature is used by the PMS to notify the switch that a Room Change or a Room Swap has been made between two rooms. A room change message will be transmitted to the switch when a guest in an occupied room wishes to be moved to a different vacant room. A room swap message will be transmitted when guest status information is to be exchanged between two occupied rooms. It is expected that each Room Change/Room Swap performed in the PMS will immediately be transmitted to the switch. This feature message is provided to allow automatic wakeup entries, message waiting indicators for PMS activation, controlled restrictions, and room status to be assigned to the correct room. Also, guest names and coverage information will be assigned to the correct room (T) (A).

Although feature operations (for example, check-in and check-out) could be used to partially simulate this operation, the functions performed on the switch will not be exactly the same. For example, an Automatic Wakeup request is canceled automatically if a check-out/check-in sequence is used.

Feature Codes

The Room Change/Room Swap feature codes are as follows:

- 20 — Normal mode
- 30 — Transparent mode
- 24/RMC — ASCII mode.

This feature message format is shown in Figure 24 on page 56.

Process Codes

The process codes for the Room Change/Room Swap feature are shown in Table 24.

Table 24. Room Change/Room Swap Process Codes [Feature Codes 20 (N), 30 (T), or 24/RMC (A)]

Process Code	Message Direction	Indications
1	PMS to Switch	Room change to STAx from STFx [x=1-4 (N), or 1-5 (T) (A)].
2	PMS to Switch	Room swap between STAx and STFx [x=1-4 (N), or 1-5 (T) (A)].
3	Switch to PMS	Room change/swap performed, but an error was detected in room status.

Operational Considerations

Process code 1 is used for the room change message. When the message is received, the switch will transfer the automatic wakeup entry, do not disturb, PMS type message waiting, controlled restrictions, as well as guest name (T) (A), coverage path, and voice mail from the old room to the new room. If the new room is not vacant (switch status “vacant”), or the old room is not occupied (switch status “occupied”), the switch will return the message with a process code of 3 indicating that the change was performed, but the status states were inconsistent. The room change will affect the following status states:

- Room Status - Change the old room in the switch to vacant and the new room to occupied.
- Wakeup - Move the old room wakeup entry to the new room, canceling any existing entry. If the old room has no entry, leave any existing entry for the new room intact.
- Message Waiting - Turn on the message waiting for the new room if the old room or the new room has a message waiting on.
- Controlled Restriction - Move the old room controlled restriction to the new room. If the old room is vacant with outward restriction (and Controlled Outward Restriction active), the new room should have no restriction.
- Replace the coverage path number of the new room with the guest’s coverage path number, and change the old room to the default path (T) (A). However, if the room state of the old and new rooms is not occupied and vacant, respectively, the coverage path is swapped instead. Thus, in the event of an error, repeating the operation returns the room to its original state.

- Change the guest name in the old room to the new room, and blank out the guest name in the old room (T) (A). However, if the room state of the old and new rooms is not occupied and vacant, respectively, the name information is swapped. Thus, in the event of an error, repeating the operation returns the room to its original state.

Process code 2 is used for the room swap message. When the message is received, the switch will swap the automatic wakeup entry, do not disturb, PMS type message waiting, controlled restrictions, as well as guest name (T) (A), coverage path, and voice mail between room 1 and room 2. Since normal change is from an occupied room to an occupied room, both rooms should be occupied. If other status states are present, the swap will be performed changing both rooms to the occupied state, with the exception that outward restriction in a vacant room will be changed to no restriction. The switch will also return the message with the process code of 3, indicating that the swap was done, but that the status states were inconsistent.

Guest Information Input/Change

The Guest Information Input/Change feature allows changes to or inputs of guest information (guest name and coverage path) after the check-in of the associated RSN has been completed. The message can be used to input a name and coverage path subsequent to check-in, change an incorrect guest name, and/or alter the coverage path number. See "Implementation Examples" starting on page 20.

Feature Codes

The Guest Information Input/Change feature codes are as follows:

- This feature code is not supported in normal mode
- 38 — Transparent mode
- 28/GIC — ASCII mode.

This feature message format is shown in Figure 25 on page 57.

Process Codes

The process codes for the Guest Information Input/Change feature are shown in Table 25.

Table 25. Guest Information Input/Charge Process Codes [Feature Codes 38 (T) or 28/GIC (A)]

Process Code	Message Direction	Indications
1	PMS to Switch	Change/Input the following guest name and coverage Path Number for RSN.
2	Switch to PMS	Change/Input complete as requested for RSN.
3	Switch to PMS	Change/Input received, no action taken, RSN vacant.
4	Switch to PMS	Change/Input received, no action taken, information the same as that stored for RSN.

Operational Considerations

The name characters are ASCII and must be between 0x20 (space character) and 0x7e (tilde character) in value. If the name consists of less than 15 characters, the name field must be left-justified by padding the remaining characters with the space (0x20) character. These characters may consist of "Unknown" or "To Be Decided" if the name is not known.* When sending the Guest Information Input/Change 38 (T) or 28 (A) message to alter a guest name or coverage path number, the PMS must send both the name and coverage number even if only one or the other is being changed/inputted.

One of three responses will be returned when the PMS sends a GI message to update or input the guest information. When the PMS sends the switch a process code 1 message, the switch will try to perform the input or change the information. If the change/input is successful, the switch will return a process code 2 message to the PMS. If the PMS sends a process code 1 message for an RSN that is vacant, the switch will acknowledge the receipt of the message with process code 3 to the PMS, but will not change any data for that RSN. If the PMS sends a process code 1 message for an RSN but the data stored within the switch for that RSN is the same as sent, the switch will return a process code 4 message acknowledging the receipt of the message without changes.

The coverage path field in the guest information input/change message for the transparent PMS protocol mode consists of three or four BCD characters representing the thousands, hundreds, tens, and unit digits with the following valid values:

- 0 — No coverage is provided for the RSN.
- 1-xxxx — Coverage path used (see the coverage path values on page 18).
- 0xbbb or 0xbbbb — Coverage path value of the "Default Coverage Path for Client Rooms" field on the switch is used.

* This feature allows a property to preregister a guest without having to know the guest name. This is useful in those situations when a business (for example, an airline or a sports team) reserves rooms for employees without providing the actual employee names.

Status Inquiry and Failure Management

The Status Inquiry and Failure Management feature provides general data link maintenance activity.

NOTE:
See *INTUITY Lodging Property Management System Interface Specifications*, (585-310-234) for information about troubleshooting the data link between the PMS and the INTUITY Lodging system.

Feature Codes

The Status Inquiry and Failure Management feature codes are as follows:

- 70 (7A)— Normal mode

NOTE:
In the Normal mode, feature code 70 is transmitted as 7A.

- 70 — Transparent mode
- 71/STS — ASCII mode.

This feature message format is shown in Figure 26 on page 58.

Process Codes

The process codes for the Status Inquiry and Failure Management feature are shown in Table 26.

Table 26. Status Inquiry and Failure Management Process Codes [Feature Codes 70 (N) (T) or 71/STS (A)]

Process Code	Message Direction	Indications
F	PMS to Switch	Heartbeat message; must be issued by the PMS within every LIT interval and no more often than every 500 ms.
0	Switch to PMS	Acknowledgment of no operation (NOP) “are you there” message from the PMS, indicating that the switch has had no changes that were not communicated to the PMS and that the switch has not initialized. Note that while in the “normal mode” the process code 0 is encoded as an A in the message frame sent to PMS (see Figure 10). This message will be sent **only** in response to a (70,F) (N) (T) or (71,F) (A) message from the PMS.
1	Switch to PMS	NOP acknowledgment indicating that at least one non-communicated change in the switch has occurred during a communications failure; the PMS must initiate a database exchange.
2	Switch to PMS	NOP acknowledgment indicating that the switch had failed, and the status memory has been initialized; the PMS must initiate a database exchange.
3	PMS to Switch	Start of database room exchange; the PMS will be sending a room image message for each room requiring status synchronization.
4	PMS to Switch	End of database exchange.
5	Switch to PMS or PMS to Switch	Release of the data link is requested for maintenance activity; process code 6 is confirmation.
6	Switch to PMS or PMS to Switch	Release of the data link confirmed; all necessary actions have been taken.

Operational Considerations

The primary purpose of the Status Inquiry messages is to indicate to both systems whether the data link interface is “up” (capable of normal communications) or “down” (not capable of normal communications).

The general philosophy of data link failure recognition and subsequent recovery is based on the following points:

- Either system may recognize a failure as defined below, and the switch may request, or the PMS may initiate, a database synchronization procedure (the room image exchange) once the physical link is reestablished.
- The PMS system has control of when a database exchange will be initiated, which RSNs will be included in the exchange, and which status items will be supplied to the switch for update for each room. However, after the switch requests a Database Swap (process code 1 or process code 2), the switch will not process other messages, except Status Inquiry process code F, until a process code 3 data swap begin message is sent by the PMS. The switch will acknowledge the message, but will not change any stored information. Also, the switch will continue to use process code 1 or process code 2 status inquiry messages until the PMS sends a process code 3 database message.
- The NOP Status Inquiry process code F message must be sent to the switch at an interval no sooner than every 500 ms and no more than the administered LIT parameter; the receipt of this message informs the switch that the PMS is operational in case no other traffic has been received, and also provides the switch the stimulus to inform the PMS if the switch has detected a failure (via returned process codes 1 or 2).
- The LIT must be administered consistently between the PMS and the switch.

Recognition of Data Link Failure

Either system may recognize a loss of communication by one or more of the following occurrences:

- Lack of traffic within the LIT interval. The switch recognizes this by lack of any message received from the PMS within the period. The PMS recognizes the lack of traffic when the PMS does not receive a process code 1, process code 2, or process code 3 message within the LIT immediately following the PMS's transmittal of a process code F message.
- When the PMS drops DTR.
- When the switch drops DSR.
- Other conditions, such as unavailability of buffers or queuing capability, which result in an inability to communicate the status change message.
- Dropping of the data link for maintenance that was requested and confirmed.

A data link failure will necessitate a database room exchange recovery procedure if any implied status change cannot be communicated to the other system and cannot be queued for later transmission. Note that even with a detected data link failure, a database recovery exchange is not necessarily needed if there have been no implied status changes lost (not transmitted or queued).

In addition to the above data link failures, the switch keeps track of erroneous events and drops the link if the internal switch counter goes over 50. The counter is incremented by one for any of the following events and decremented by one whenever a good message is received from the PMS.

- A control character was received without a DLE in front of it.
- A noncontrol character was received outside of the STX/ETX frame.
- An ETX was received when a message was not being received.
- An ACK, ENQ, NAK, or STX was detected in the middle of a message.
- An unexpected ACK, or NAK was received.
- The PMS sent an STX before the switch acknowledged the last message.
- The message text of an incoming message was less than two bytes.
- The message count for a message was the same as for the last message.
- An ACK/NAK was never received after ENQs were transmitted (and retransmitted).
- The switch exceeded the maximum number of retransmissions of a message.
- The BCC timer expired.

Release of Data Link for Maintenance (Process Codes 5, 6)

Either system may request a temporary release of the data link for maintenance purposes by transmitting a process code 5 Data Link Release Reason (RR) request message to the other system. The receiving system should perform any processing required and return the process code 6 Data Link Release Confirmed message as soon as possible. If process code 6 is not returned within 5 seconds, the sender will stop the protocol or bring down the link.

During switch maintenance, the PMS may continue to send process code F Status Inquiry messages, provided that EIA pin 6 (Data Set Ready) from the switch is in the “on” state. The switch will turn EIA pin 6 on and respond to process code F messages when maintenance is completed.

While the data link is released on request of the PMS, the switch will continue to attempt to read process code F messages from the PMS. EIA pin number 20 (Data Terminal Ready) in the “off” state from the PMS will indicate that reads should not be attempted. When EIA pin 20 is on, and a process code F message is received from the PMS, the switch will assume that PMS maintenance is over and communication can be resumed. However, if messages other than status inquiry messages are transmitted, the switch will ignore the messages and bring down the link if ten or more such messages are recorded.

The switch will attempt to send a process code 5 message when the **test pms-link long** or **busyout pms-link** commands are issued on the administration terminal. If either the PMS or switch sends the message with a process code 5 to request the release of the data link, the release reason field is filled in as shown in Table 27.

Table 27. Data Link Release Reason (RR) Codes

Reason Code	Indication
1	One flushed message
2	Excessive protocol violations
3	Excessive violation messages
4	Cannot receive messages
5	Craft-demanded maintenance
6	System-demanded maintenance
7	Ten protocol startup violations
F	Reason code not provided/supported

Switch Operations During Loss of Communication

The switch will continue to support the basic telecommunications functions if the data link or PMS becomes unavailable. Upon detection of a data link failure, the switch will automatically switch to the “Link Failed Mode” to perform the following tasks:

- Enable the Check In and Check Out buttons so that an attendant console or display telephone with console permissions can be used for check-in and check-out.
- Send any dialed housekeeper/status information to the optional PMS log printer for manual entry (either now or later) into the PMS system (or return reorder tone to housekeeper status calls if the housekeeper PMS Log Printer is not available).
- Log events normally sent to the PMS in an audit trail, accessed by the **list pms-down** command.
- Continue to support basic telecommunications.
- Continue to support message waiting and/or controlled restriction.

The switch will continue to attempt to receive messages from the PMS during data link failure. If a message is received from the PMS with no missed status change communications within the switch, data link operation will resume normally with no database exchange requested by the switch. If during data link failure the switch processes a status change which normally would have been sent to the PMS, the switch sets itself to return a process code 1 response (process code 2 if the link failure was due to a switch restart) to all process code F messages received from the PMS until a process code 3 message is received (T) (A). The receipt of a process code 1 response from the switch to a process code F will indicate to the PMS that a database image exchange should be initiated for database synchronization (T) (A).

PMS Operations During Loss of Communication

During the loss of communication, it is expected that the PMS will continue to operate normally, accepting check-ins and check-outs, etc. The PMS can queue the changes which normally would be sent to the switch in anticipation of resuming communication. These changes should be queued in such a way that order of receipt in the PMS will be maintained.

In the case in which the PMS remains operational during a data link failure, the PMS should continue sending the process code F Status Inquiry message as long as the PMS is ready to resume communication.

Recovery from Loss of Communication

In the case of a PMS failure, it is assumed that check-in/check-outs may need to be done manually and entered into the PMS system at a later time when the system is again operational. The PMS should not resume transmission of the process code F Status Inquiry message to reestablish communication until the database has been brought to as current a status as possible. This is necessary to prevent the premature transmission of incorrect data to the switch via the database exchange update procedure.

In the case in which the PMS has remained operational during a data link failure, the PMS should continue to attempt to send the Status Inquiry process code F messages. A Status Inquiry response (one of process codes 0, 1, or 2) from the switch will indicate that communication has been reestablished.

A process code 0 response indicates that the switch has had no status changes during the data link failure period and that the switch has automatically switched back to the normal operating mode “data link active” (switch-activated check-in/check-out disabled).

A switch response of process code 1 indicates that the switch has had at least one uncommunicated status change and that the PMS should initiate a database room image exchange to synchronize the databases.

A switch response of process code 2 indicates that the switch has failed and that status memory has been initialized with each RSN in the following status:

Option	Status
Room status	occupied
Controlled restriction level	nonrestricted state
Message Waiting lamp	off
Guest name (T) (A)	blank
Coverage path (T) (A)	Depends on the `Default Coverage Path for Client Room` administration. If **act-nopms**, the last-administered coverage path is assigned to the RSN. If **act-pms**, The coverage path defined in the `Default Coverage Path for Client Rooms` field is assigned to the RSN.

In response to the receipt of a status inquiry message that has a process code of 1 or 2, the PMS must immediately initiate a database swap. The database swap must include either of the following:

- All rooms
- Vacant rooms plus occupied rooms with:
  - Message Waiting
  - Restrictions
  - Populated name fields (T) (A)
  - Coverage paths (T) (A)

The Database Exchange Procedure

If the switch has recognized the reestablishment of communication and responded to the PMS with a process code 1 or process code 2 message, the switch will not process any message type received from the PMS, **except** Status Inquiry messages, until the PMS initiates the database exchange procedure.

The PMS has control of when a database exchange will be initiated, which RSNs will be included in the exchange, and which status items will be supplied to the switch for update for each room. However, after the switch requests a Database Swap (process code 1 or process code 2), the switch expects the database swap to start. For DEFINITY, if the PMS sends ten messages that are not status inquiry messages before sending the process code 3 message, the switch will log an error, attempt to send a process code 5 message, and eventually tear down the link. The switch will continue to use process code 1 or process code 2 status inquiry messages until the PMS sends a process code 3 database message.

The PMS indicates the start of the database room exchange by transmitting a process code 3 Status Inquiry message to the switch. The receipt of the process code 3 message in the switch indicates the following to the switch:

- A database room exchange will commence, and
- Transmission of normal status changes can be reinitiated.

After transmission of the process code 3 message, the PMS should then transmit the room data exchange image message (17,3) (N), (37,3) (T), or (27,3) (A) for each room for which synchronization is required. Note that some time delay may be necessary between each room data image message so that the maximum message rate for the data link is not exceeded, and to provide “space” for normal status change feature messages.

For telephones that are part of a suite check-in group, the database swap will update the status of all telephones in the switch, regardless of their current state (occupied or vacant).

The switch will process each room data image (17,3) (N), (37,3) (T), or (27,3) (A) message and return the complement room data image message (17,4) (N), (37,4) (T), or (27,4) (A) in response as soon as the LAT occurs. This allows the PMS to use ENQ characters as described in “Room Data Image” starting on page 84. “Check-In/Check-Out” starting on page 73, “Room Change/Room Swap” starting on page 91, and “Guest Information Input/Change” starting on page 94 also describe switch handling.

As mentioned previously, normal feature messages may be sent or received during the database room image exchange procedure. Care should be taken to insure that the **most current** status is always presented via message sequence for a particular room to the switch. For example, a status change done at a PMS terminal may occur simultaneously with the access of the data for the room data image message for that particular room. If the switch were to receive the “new” individual feature message, followed by the room data image with the “old” status value, the switch would set the switch’s status to the “old” status value, leaving the two databases out of synchronization. Correct message sequencing and data access should be done to eliminate this possibility. The PMS can assume that the switch will send the most current individual status change or most current data in the (17,4) (N), (37,4) (T), or (27,4) (A) message response.

When the database exchange room image (17,3) (N), (37,3) (T), or (27,3) (A) messages have been sent and returned with (17,4) (N), (37,4) (T), or (27,4) (A) messages processed by the PMS for all rooms requiring synchronization, the PMS indicates the end of the database update procedure by transmitting a process code 4 message to the switch.

The receipt of a process code message is necessary for the switch since the switch has a threshold of three database synchronization procedures that are started but were unable to complete due to succeeding data link failures. This may be the case when intermittent, yet persistent, problems exist which preclude the basic database update procedure from ever completing, leaving the data link in a continual failure/recovery (thrashing) state. After a link drop causes the count to be exceeded, the switch logs an error. Two test commands that try to establish the link are as follows:

- **test pms-link** — tries to bring the link back up.
- **test pms-link long** — tries to bring the link down then back up.

The PMS may initiate a database exchange procedure at any time, provided that a database update procedure is not currently active. If such a situation arises (either by error detection within the PMS or by receipt of a process code 1 or process code 2 Status Inquiry response from the switch), the PMS should send a process code 4 Database Exchange Complete message before restarting the procedure.

Examples of Status Inquiry Message Activity

Table 28 is an example of the status inquiry message activity that might occur during normal traffic to initialize the data link communication when a database swap is requested by the switch (the process code follows the status inquiry).

Table 28. Example of Status Inquiry Message Activity

Originator	Message	Explanation
PMS	(70, F) (N) (T) (null) or (71,F) (A) (null)	"Are you there" message from the PMS.
Switch	ACK	Acknowledgment from the switch.
Switch	(70, 1) (N) (T) or (71,1) (A) or (70, 2) (N) (T) or (71,2) (A)	Message indicating that database swap should begin.
PMS	ACK	Acknowledgment from the PMS.
PMS	(70, 3) (N) (T) or (71,3) (A)	Start database exchange message from the PMS.
Switch	ACK	Acknowledgment from the switch.
PMS	(37,3) (N) (T) or (27,3) (A)	Room image message from the PMS.
Switch	ACK	Acknowledgment from the switch.
Switch	(37,4) (N) (T) or (27,4) (A)	Database update status message from the switch.
PMS	ACK	Acknowledgement from the PMS.
PMS	(70, 4) (N) (T) or (71,4) (A)	End of database exchange.
Switch	ACK	Acknowledgment from the switch.

The following diagram shows an example of status inquiry message activity for the Normal, Transparent, and ASCII modes.

Examples of Status Inquiry Message Activity

Mode	Source	Feat Code, Proc Code	Format	Message	Explanation
Normal	PMS	7A,f	Hex	02 7A 8F FF 03 09	Status inquiry
			Decimal	02 122 143 255 03 09	
	Switch	ACK	Hex	06	Acknowledged receipt of status inquiry receipt
			Decimal	06	
	Switch	7A,0	Hex	02 7A 30 FF 03 B6	Response message to status inquiry
			Decimal	02 122 48 255 03 182	
	PMS	ACK	Hex	06	Acknowledged receipt
			Decimal	06	
Transparent	PMS	70,f	Hex	02 70 8F FF 03 03	Status inquiry
			Decimal	02 112 143 255 03 03	
	Switch	ACK	Hex	06	Acknowledged receipt of status inquiry
			Decimal	06	
	Switch	70,0	Hex	02 70 30 FF 03 BC	Response message to status inquiry receipt
			Decimal	02 112 48 255 03 188	
	PMS	ACK	Hex	06	Acknowledged receipt
			Decimal	06	
ASCII	PMS	STS,ff	Hex	02 71 8F 53 54 53 46 46 20 20 03 A9	Status inquiry
			ASCII	☻ q Ȧ S T S F F sp sp ♥ ©	
			Decimal	02 71 232 83 84 83 70 70 32 32 03 169	
	Switch	ACK	Hex	06	Acknowledged receipt of status inquiry
			ASCII	♠	
			Decimal	06	
	Switch	STS,0f	Hex	02 71 2F 53 54 53 30 46 20 20 03 7F	Response message to status inquiry receipt
			ASCII	☻ q / S T S 0 F sp sp ♥ <DEL>	
			Decimal	02 71 47 83 84 83 48 70 32 32 03 127	
	PMS	ACK	Hex	06	Acknowledged receipt
			ASCII	♠	
			Decimal	06	

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ASCII character definitions

Decimal	Octal	Hex	Binary	ASCII Value	Definition
000	000	000	00000000	NUL	Null char.
001	001	001	00000001	SOH	Start of Header
002	002	002	00000010	STX	Start of Text
003	003	003	00000011	ETX	End of Text
004	004	004	00000100	EOT	End of Transmission
005	005	005	00000101	ENQ	Enquiry
006	006	006	00000110	ACK	Acknowledgment
007	007	007	00000111	BEL	Bell
008	010	008	00001000	BS	Backspace
009	011	009	00001001	HT	Horizontal Tab
010	012	00A	00001010	LF	Line Feed
011	013	00B	00001011	VT	Vertical Tab
012	014	00C	00001100	FF	Form Feed
013	015	00D	00001101	CR	Carriage Return
014	016	00E	00001110	SO	Shift Out
015	017	00F	00001111	SI	Shift In
016	020	010	00010000	DLE	Data Link Escape
017	021	011	00010001	DC1 (XON)	Device Control 1
018	022	012	00010010	DC2	Device Control 2
019	023	013	00010011	DC3 (XOFF)	Device Control 3
020	024	014	00010100	DC4	Device Control 4
021	025	015	00010101	NAK	Negative Acknowledgement
022	026	016	00010110	SYN	Synchronous Idle
023	027	017	00010111	ETB	End of Trans. Block
024	030	018	00011000	CAN	Cancel
025	031	019	00011001	EM	End of Medium
026	032	01A	00011010	SUB	Substitute
027	033	01B	00011011	ESC	Escape
028	034	01C	00011100	FS	File Separator

Decimal	Octal	Hex	Binary	ASCII Value	Definition
029	035	01D	00011101	GS	Group Separator
030	036	01E	00011110	RS	Request to Send or Record Separator
031	037	01F	00011111	US	Unit Separator
032	040	020	00100000	SP	Space
033	041	021	00100001	!	
034	042	022	00100010	"	
035	043	023	00100011	#	
036	044	024	00100100	$	
037	045	025	00100101	%	
038	046	026	00100110	&	
039	047	027	00100111	’	
040	050	028	00101000	(	
041	051	029	00101001	)	
042	052	02A	00101010	*	
043	053	02B	00101011	+	
044	054	02C	00101100	,	
045	055	02D	00101101	-	
046	056	02E	00101110	.	
047	057	02F	00101111	/	
048	060	030	00110000	0	
049	061	031	00110001	1	
050	062	032	00110010	2	
051	063	033	00110011	3	
052	064	034	00110100	4	
053	065	035	00110101	5	
054	066	036	00110110	6	
055	067	037	00110111	7	
056	070	038	00111000	8	
057	071	039	00111001	9	
058	072	03A	00111010	:	
059	073	03B	00111011	;	
060	074	03C	00111100	<	
061	075	03D	00111101	=	
062	076	03E	00111110	>	
063	077	03F	00111111	?	
064	100	040	01000000	@	

Decimal	Octal	Hex	Binary	ASCII Value	Definition
065	101	041	01000001	A	
066	102	042	01000010	B	
067	103	043	01000011	C	
068	104	044	01000100	D	
069	105	045	01000101	E	
070	106	046	01000110	F	
071	107	047	01000111	G	
072	110	048	01001000	H	
073	111	049	01001001	I	
074	112	04A	01001010	J	
075	113	04B	01001011	K	
076	114	04C	01001100	L	
077	115	04D	01001101	M	
078	116	04E	01001110	N	
079	117	04F	01001111	O	
080	120	050	01010000	P	
081	121	051	01010001	Q	
082	122	052	01010010	R	
083	123	053	01010011	S	
084	124	054	01010100	T	
085	125	055	01010101	U	
086	126	056	01010110	V	
087	127	057	01010111	W	
088	130	058	01011000	X	
089	131	059	01011001	Y	
090	132	05A	01011010	Z	
091	133	05B	01011011	[	
092	134	05C	01011100	\	
093	135	05D	01011101	]	
094	136	05E	01011110	^	
095	137	05F	01011111	_	
096	140	060	01100000	‘	
097	141	061	01100001	a	
098	142	062	01100010	b	
099	143	063	01100011	c	
100	144	064	01100100	d	

Decimal	Octal	Hex	Binary	ASCII Value	Definition
101	145	065	01100101	e	
102	146	066	01100110	f	
103	147	067	01100111	g	
104	150	068	01101000	h	
105	151	069	01101001	i	
106	152	06A	01101010	j	
107	153	06B	01101011	k	
108	154	06C	01101100	l	
109	155	06D	01101101	m	
110	156	06E	01101110	n	
111	157	06F	01101111	o	
112	160	070	01110000	p	
113	161	071	01110001	q	
114	162	072	01110010	r	
115	163	073	01110011	s	
116	164	074	01110100	t	
117	165	075	01110101	u	
118	166	076	01110110	v	
119	167	077	01110111	w	
120	170	078	01111000	x	
121	171	079	01111001	y	
122	172	07A	01111010	z	
123	173	07B	01111011	{	
124	174	07C	01111100	|	
125	175	07D	01111101	}	
126	176	07E	01111110	~	
127	177	07F	01111111	DEL	

Acronyms and Glossary

Acronyms

This section contains acronym expansions related to the PMS interface specification.

- ACK — Acknowledge message (0x06)
- ASCII — American Standard Code for Information Interchange
- BCC — Block check code
- BCD — Binary coded decimal
- CKI — Check-in (ASCII)
- CKO — Check-out (ASCII)
- CR — Controlled restriction (ASCII)
- DID — Direct Inward Dialing
- DLE — Data link escape (0x10)
- ENQ — Inquiry message (0x05)
- ETX — End of text message (0x03)
- GIC — Guest information input/change (ASCII)
- HKR — Housekeeper status from room (ASCII)
- HKS — Housekeeper status from designated station (ASCII)
- ID — Identifier
- LAT — Link acknowledgment timer
- LIT — Link idle timer
- MR — Maximum retransmissions
- MRR — Maximum retransmissions request
- MSG — Message Waiting (ASCII)
- MSGCT — Message count
- NAK — Negative acknowledgment message (0x15)
- NOP — No operation

- RMC — Room change/room swap (ASCII)
- RMI — Room data image (ASCII)
- RR — Data Link Release Reason Code
- RSN — Room station number
- STS — Status inquiry (ASCII)
- STX — Start of text message (0x02)
- V/O — Vacant/Occupied
- VIP — Very Important Person

Glossary

This section contains glossary terms related to the PMS interface specification.

- Attendant Console — Telephone equipment usually used at the front desk to answer calls and perform services such as wakeup calls.
- Backup Telephone — A switch telephone that is administered with console permissions, usually has a display, is used to answer calls at the front desk, and is used to access features such as Automatic Wakeup and Do Not Disturb.
- Block Check Code — An exclusive “OR” of all octets following the STX through and including the ETX (the STX is not included in the calculation).
- NULL — In the normal or transparent mode, NULL is defined as Hex f (Octet 1111) for all fields except the name field. For the name field, NULL is defined as Hex 3f (Octet 0011 1111).

  In the ASCII mode, NULL is defined as Hex 20 (Octet 0010 0000) for all fields.

  In the transparent and ASCII modes, NULL in the name field of the room data image message is defined as Hex 3f (Octet 0011 1111).

  See page 18 for an explanation of how NULLs are used in coverage paths.
- Octet — The 8-bit text field of a 10-bit word frame. This does not include the Stop and Start bits.
- Padding Characters — The characters used to fill out empty spaces in a data field when the required number of characters is not transmitted. Room station numbers, which are right-justified, are padded out with 0s (zeros). For transparent and ASCII mode, the Name field (left-justified) is padded with spaces (Hex 20), and the Coverage Path field (left-justified) is padded with Hex f.
- PMS Terminal — Data terminal usually kept at the front desk where guests are checked in and checked out.
- Room Numbering Plan — The numbering plan for the rooms and how they relate to the telephone extension numbers assigned for those rooms.

  For example, in a hotel that has more than nine floors and no more than 99 rooms on each floor, floors one through nine would use a prefix digit (for example, 3) prepended for each room extension number. For example, to call Room 405, a user would dial 3405.

  For floors ten and higher, the actual room number would match the extension number since the room numbers are four digits long. For example, Room 1235 uses extension 1235.

- Room Station Number — Room Station Number (or RSN) is equivalent to the room extension number or room telephone number. However, the actual room number will not necessarily match the extension number of the telephone in the room. See Room Numbering Plan.
- Space — In Normal mode, Space is not used.

  In transparent and ASCII modes, Space is defined as Hex 20 (Octet 0010 0000).

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