

NEC KTS

Hotel/Motel PMS Developer's Guide

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Introduction

1

Introduction

SECTION 1 PURPOSE OF THIS DEVELOPER'S GUIDE

The purpose of this document is to detail the PMS integration interface available on the CPU of NEC KTS via the PMS-U10 Unit. This document details the KTS-i protocol messages.

SECTION 2 SYSTEM SPECIFICATIONS

The PMS integration on the NEC KTS system is achieved with the help of the PMS-U10 hardware unit. This unit provides a single interface point for the PMS system. The PMS-U10 unit will then interface with the CPU and the compatible voice mail platforms to provide a comprehensive telephone system interface for the PMS.

The PMS-U10 Unit provides two types of connectivity to a PMS system. The PMS system can communicate with the telephone system either by an Ethernet (TCP/IP) connection, or via the serial port (9600 baud rate). When the PMS application requires KTSi ENQ, the serial connection **must** be used (the LAN connection does not provide). Refer to [Figure 1-1 System Overview](#).

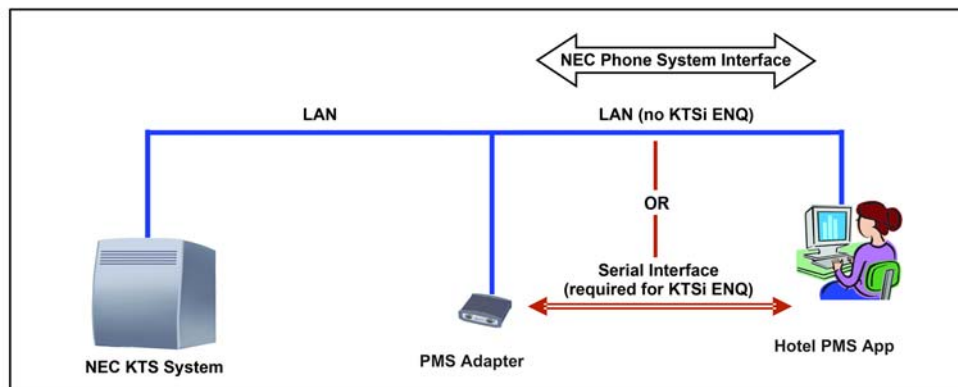


Figure 1-1 System Overview

In broader functional terms, the PMS system can check-in and check-out guests, initialize names for the checked-in guests, manage message waiting indications and wakeup calls for the guests. The protocol also provides for additional database synchronization controls.

This document describes the support protocol on the NEC KTS PMS integration indicated by bidirectional arrows in [Figure 1-1 System Overview](#).

KTS-i With ENQ Protocol

SECTION 1 KTS-I WITH ENQ PROTOCOL

The KTS-i messages are formatted in ASCII text, wedged between a start text (STX::0x02) and end text (ETX::0x03) characters.

The minimum length of the command is 10 characters long excluding the STX and ETX bytes. Any unused bytes in a command must be inserted with a space character (ASCII value of hex 20). The message body is always left justified (i.e. padding characters before the start of the command is NOT allowed).

STX	Message Body	ETX
------------	---------------------	------------

Figure 2-1 General Message Format

Each of the messages exchanged between the telephone system (PMS-U10 Unit) and the PMS system need to be acknowledged if acceptable, or negative acknowledged if not acceptable. These messages are single byte control characters. Refer to [Table 2-1 Message Description](#).

Table 2-1 Message Description

Name	Value	Description
<ENQ>	05 Hex	Enquiry
<ACK>	06 Hex	Acknowledge
<NAK>	15 Hex	Negative Acknowledge

SECTION 2 INTERFACE MESSAGES

The interface messages can be grouped into three categories: Link Control, Status Synchronization and Room Activity Messages. This section describes the categories individually. Throughout this document, the symbol □ is used to indicate a blank space (ASCII value of hex 20).

2.1 PMS Link Control Messages

Enquiry (ENQ) Message

This message can be sent at anytime from either the telephone system or the PMS system side. The receiver of this message must acknowledge the receipt of enquiry. If not acknowledged for a predefined number of times, the telephone system will consider the connection to PMS system lost. For the exact number of tries, refer to NEC KTS Hotel/Motel Manual. Enquiry messages require a **serial** connection to the PMS-U10.

Table 2-2 Enquiry Message

Direction	NEC KTS ↔ PMS
Format	0x05

The sequence of the ENQ usage is shown in the example scenario of an ENQ message initiated by the telephone system in [Figure 2-2 Example of an ENQ Message Initiated by Telephone System](#).

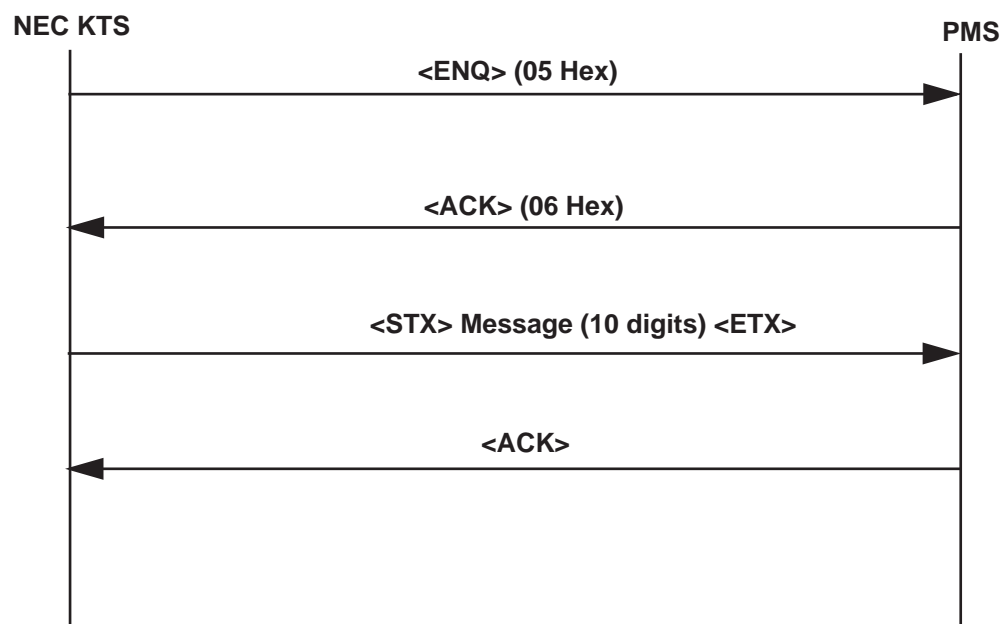


Figure 2-2 Example of an ENQ Message Initiated by Telephone System

AREYUTHERE Message

The AREYUTHERE message may be sent by either side of the PMS interface. This message is sent if there is no activity on the link for a certain programmable time (PRG 42-06-05) to determine if the link is still operational. The receiving system should respond with an <ACK> to indicate that the link is still functioning.

Table 2-3 AREYUTHERE Message

Direction	NEC KTS \leftrightarrow PMS
Format	<STX>AREYUTHERE<ETX>

If no response is received, the system retries for the number of times defined in (PRG 42-06-05). If there is still no response, the system marks the PMS as OFFLINE.

The PMS system can also send this message with the same purpose – to determine if the connectivity still exists with the telephone system. The telephone system will respond positively with an <ACK> message to indicate the connection is active.

Should a PMS decide to change the connection status to “NOT-CONNECTED”, then it must not respond to the incoming AREYUTHERE requests from the telephone system.

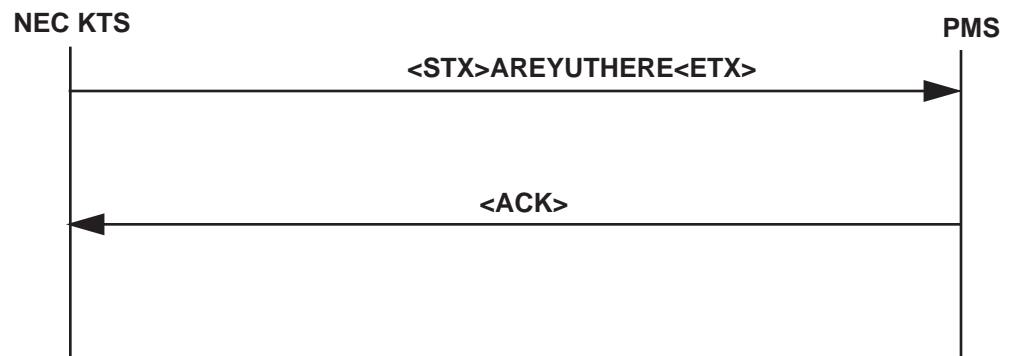


Figure 2-3 NEC KTS Initiated Heart Beat Message

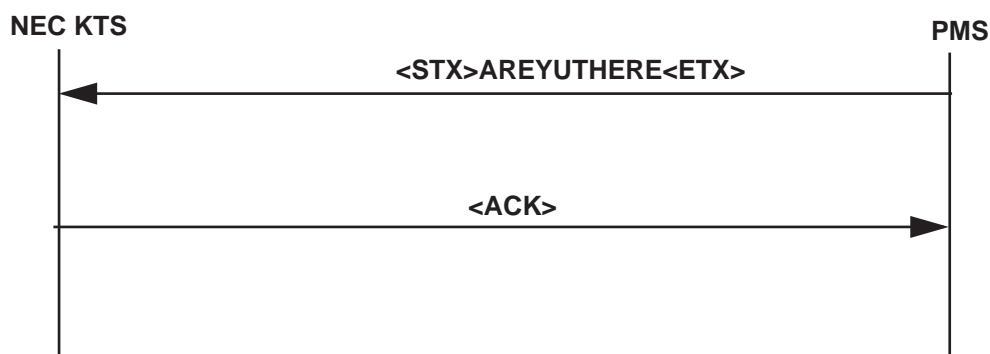


Figure 2-4 PMS Initiated Heart Beat Message

LINETEST Message

This message is sent from NEC KTS system when the system starts up or when the PMS link is turned on by the NEC KTS system. This message is used to determine if the PMS link is operational. The PMS should respond with an <ACK> to indicate that the link is functioning.

Table 2-4 LINETEST Message

Direction	NEC KTS → PMS
Format	<STX>LINETEST□□<ETX> (note: □ indicates a blank space)

If no response is received, the system retries for the number of times defined by PRG 42-06-06. If there is still no response received after the number of trials, the system marks the PMS as OFFLINE.

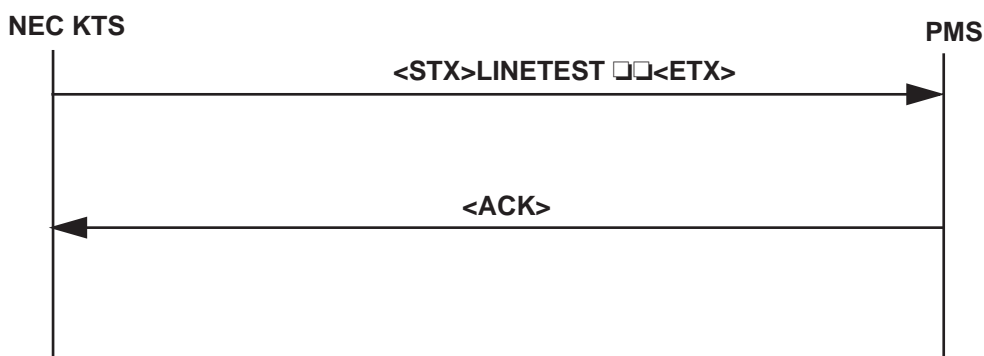


Figure 2-5 NEC KTS LINETEST Message

2.2 Status Synchronization Messages

RQINZ Message

In order to synchronize room status, a request to initialize, RQINZ message, may be sent by either the telephone system or the PMS system. This is to request a transfer of the most current room status from the other side.

Table 2-5 RQINZ Message

Direction	NEC KTS ↔ PMS
Format	<STX>RQINZ □□□□□<ETX> (note: □ indicates a blank space)

This may also be done periodically to ensure that the PMS and the telephone system stay synchronized.

Upon receipt of this message, the receiving system must acknowledge with an <ACK> message, followed by room data. The room data is sent using General Reset Message (see sections to follow).

For more details on the initialization sequence, refer to [Section 3 Room Status Initialization Sequence on page 2-6](#).

GRS Message

A Group Report Start (GRS) message may be sent by either the telephone system or the PMS system. This is sent in response to a prior receipt of a RQINZ message.

Table 2-6 GRS Message

Direction	NEC KTS ↔ PMS
Format	<STX>GRS □□□□□□□<ETX> (note: □ indicates a blank space)

A GRS message is used to indicate the start of complete room status synchronization as described in the initialization procedures elsewhere in this document.

IMPORTANT! – Upon reception of a GRS message from the PMS system, the telephone system will automatically put all rooms in “Checked In” state. So, if the PMS does not update any specific room status, that room has a potential to stay occupied on the telephone system – causing synchronization problem. It is **strongly** suggested to account for all the rooms when sending room status synchronization data to the telephone system.

For additional details on the initialization sequence, refer to [Section 3 Room Status Initialization Sequence](#).

END Message

The END message signals the end of room status synchronization. This is required so that the receiving system is aware that the room status data transfer has been completed.

Table 2-7 END Message

Direction	NEC KTS ↔ PMS
Format	<STX>END □□□□□□<ETX> (note: □ indicates a blank space)

If the link is disconnected before room status data transfer is complete, corrective action may be taken by either side. The telephone system will discard any updates to the status after receiving a GRS message, if the PMS status changes to OFFLINE before receiving the END message.

SECTION 3 ROOM STATUS INITIALIZATION SEQUENCE

Room Status initialization may be started in two ways.

- Initialization may be started by an Initialization Request, RQINZ, from either the PMS or NEC KTS (Initialization Sequence 1 and Initialization Sequence 2).
- Forced initialization may be started by the PMS by sending a GRS. (Initialization Sequence 3).

For the telephone system to recognize the PMS status as online, one of the initialization methods mentioned in this section must be completed. Upon completion of one of these sequences, the telephone system will change the PMS status to ONLINE.

3.1 Initialization Sequence 1

When the NEC KTS system is reset or turned ON with the PMS-U10 Unit already switched ON, it starts Initialization Sequence 1. In this procedure, the telephone system starts by sending a RQINZ message for room data synchronization.

The PMS system will update the telephone system with the latest room data using the messages described elsewhere in this document.

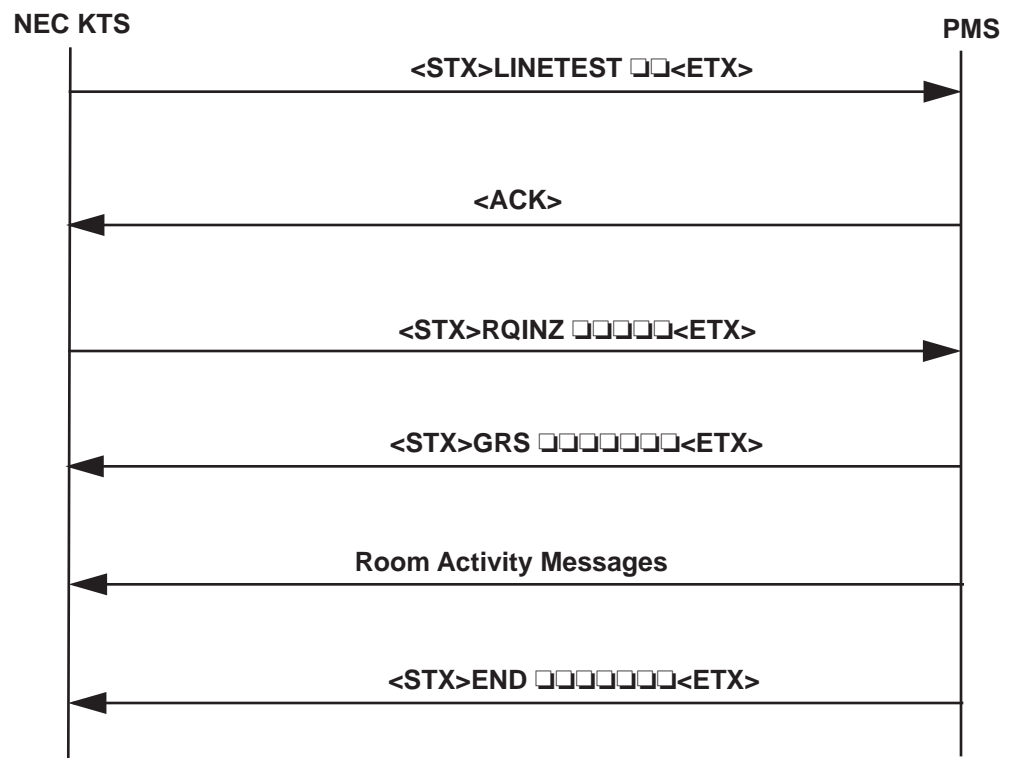


Figure 2-6 Initialization Sequence 1

3.2 Initialization Sequence 2

When PMS recognizes that service on the interface link has been interrupted and restored, or otherwise wants to synchronize status, it can start the Initialization Sequence 2. This can be done at any time when a connection to the telephone system is active.

The telephone system will respond with the current status of all extensions programmed as a "Hotel Room" that have a physical telephone connected.

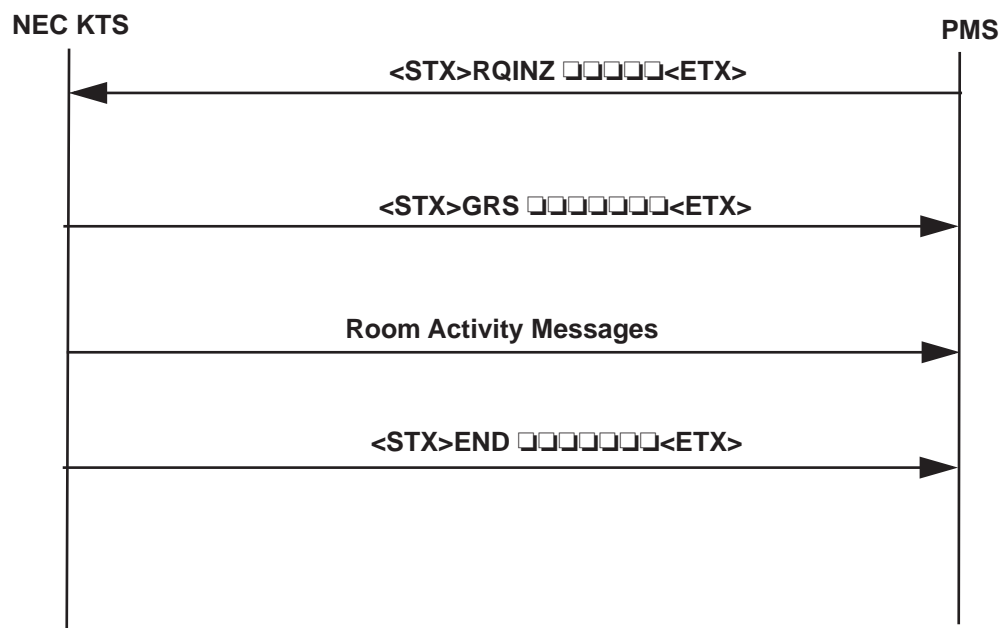


Figure 2-7 Initialization Sequence 2

3.3 Database Initialization Sequence 3

A PMS system can force the room data to be synchronized to the telephone system. It can do so by sending a GRS message followed by its own state of rooms.

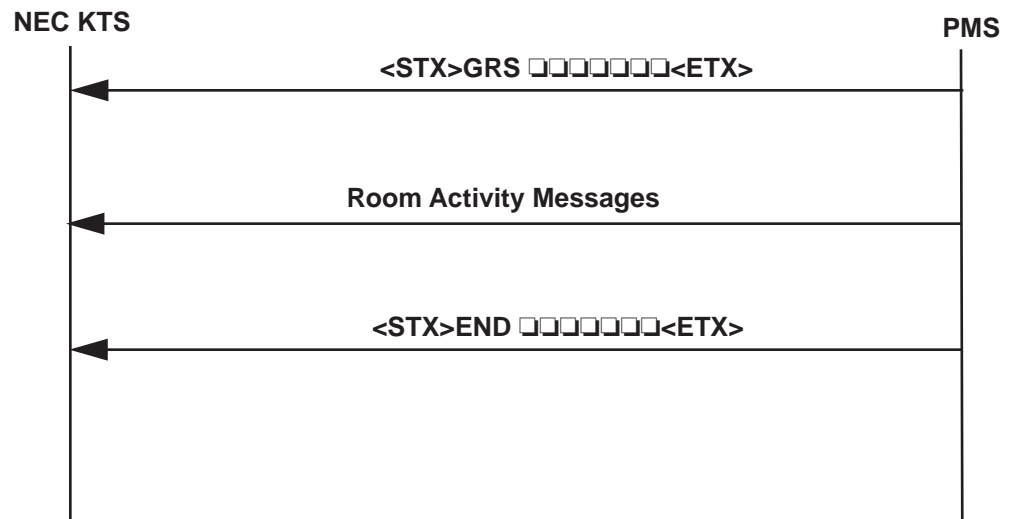


Figure 2-8 Initialization Sequence 3

3.4 Initialization Mode on the Telephone System

When the GRS message is received by forced initialization, the system acknowledges the message and enters the Initialization Mode and will place all room in the “occupied” state. While in the Initialization Mode, all new messages are stored in the message buffer. At the termination of the Initialization Mode, the message in the buffer will be exchanged. The NEC KTS message buffer will hold 500 messages. The system remains in the Initialization Mode until an END message is received, or until there is no activity on the interface for one continuous minute.

SECTION 4 ROOM ACTIVITY MESSAGES

This section provides definitions for the messages involved in room activity such as checking in and out, setting a wakeup call, etc.

4.1 Check-in/Check-out Message

The NEC KTS system can allow designated extensions to perform Check-in and Check-out using service codes. These service codes can be programmed on feature keys and, when used in combination with a DSS console, can perform rapid check-in and check-out. The NEC KTS system has the option of either sending a CHECK-IN message to the PMS interface to advise it when a room is manually checked-in/out from a telephone.

Table 2-8 Check-in/Check-out Message

Direction	NEC KTS \longleftrightarrow PMS
Format	<STX>CHKy □xxxxxxxx<ETX> (note: □ indicates a blank space)
Definitions	y: 1 = Check-in 0 = Check-out xxxxxxxx : Extension number (8 digits)
Example	0x02CHK1 301 0x03 {check-in extension 301 (Room 301)}

4.2 Check-in Message with Guest Information

Check-in message with Guest Information can be sent in the two formats shown in [Table 2-9 Check-in Message with Guest Information](#) and [Table 2-10 Alternate Format of Check-in Message](#). Functionally, both formats are the same within the telephone system. A telephone extension will be checked-in with the guest name information. The guest name will appear in Voice Mail mailboxes and when the telephone calls any display telephone in the system.

When a guest makes a call to the hotel attendant, the name of the guest is displayed as soon as the telephone is answered by the attendant. This requires that the attendant has an NEC keyset with LCD display.

Table 2-9 Check-in Message with Guest Information

Direction	NEC KTS ← PMS
Format	<STX>CHKy□xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx<ETX> (note: □ indicates a blank space)
Definitions	y: 1 = Check-in 0 = Check-out xxxxxxx : Extension number (8 digits) s : Name (up to 20 characters and first character must be an alpha character)
Example	0x02CHK1 301 John Smith 0x03 {check-in extension 301, guest name John Smith (Room 301)}

Table 2-10 Alternate Format of Check-in Message

Direction	NEC KTS ← PMS
Format	<p><STX>CHKy □xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx nnnnnnnnnnnnnnnnnnnnnnnnnnnnnn gggggggggggggggggggggggggggg hhhhhhhhhhhhhhhhhhhhhhhhhh aaaaaaaa ccccccccccccccc<ETX></p> <p>(note: □ indicates a blank space)</p>
Definitions	<p>y : 1 = Check-in 0 = Check-out xxxxxxxx : Extension number (8 digits) s, n, d, g, and h : Name (up to 20 characters each and first character must be an alpha character) a : Company name (up to 8 characters) c : Additional comment field (up to 15 characters)</p>
Example	<p>0x02CHK1 301 John Smith Acme Co. Hold for late check-in 0x03 {check-in extension 301, guest name John Smith(Room 301), Company name, Additional comments}</p>

The NEC KTS system will accept a Check-in Message with Guest Information which includes a guest name (up to five names can be included), company information and comment field. On NEC KTS, only the first guest name will be used for display and voice mail box identification (The other four names, if sent to the telephone system, are not used.)

4.3 Edit Message (Directory Information)

This message allows the PMS system to update the name stored in the telephone system for the room telephone. The format and usage of data is similar to the Check-in with Guest Information.

Table 2-11 Edit Message with Guest Information

Direction	NEC KTS ← PMS
Format	<STX>EDTy □xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx<ETX> (note: □ indicates a blank space)
Definitions	y : 1 = Check-in 0 = Not used xxxxxxxx : Extension number (8 digits) s : Name (up to 20 characters and first character must be an alpha character)
Example	0x02EDT1 201 Jeff James 0x03 {check-in extension 201, guest name Jeff James (Room 201)}

Table 2-12 Alternate Format of Edit Message

Direction	NEC KTS ← PMS
Format	<STX>EDTy □xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx nnnnnnnnnnnnnnnnnnnnnn gggggggggggggggggggggg hhhhhhhhhhhhhhhhhhhhh aaaaaaaa cccccccccccccccc<ETX> (note: □ indicates a blank space)
Definitions	y : 1 = Check-in 0 = Not used xxxxxxxx : Extension number (8 digits) s, n, d, g, and h : Name (up to 20 characters each and first character must be an alpha character) a : Company name (up to 8 characters) c : Additional comment field (up to 15 characters)
Example	0x02CHK1 201 Jeff James Acme Co. Hold for late check-in 0x03 {check-in extension 201, guest name Jeff James (Room 201), Company name, Additional comments}

The NEC KTS system will accept the Edit message with Guest Information which includes a guest name (up to five names can be included), company information and comment field. On the NEC KTS, only the first guest name will be used for display and voice mail box identification (The other four names, if sent to the telephone system, are not used.)

4.4 Room Status Message

The Room Status message is used to update the house cleaning status of a room (i.e. Maid Required or Maid in Room). Manual Room status messages are sent to the PMS from the telephone system when the hotel staff dial a code from a telephone (example, by a maid or housekeeping staff in the room).

The NEC KTS system may be programmed to automatically change the room status of all checked-in rooms to a room status of 2 (maid required) at 3:00 AM each morning.

If a room is checked-out after it has been cleaned (status 1), the room status can be configured to be automatically changed to status 4 (inspection required).

The PMS can also request the room status be changed during any state of the room, whether checked-in or not.

Room status data is used by NEC KTS system to display room housekeeping and/or occupancy status for each room on a lamp array at the operator's position, or at the front desk telephone with a DSS/BLF console.

Table 2-13 Room Status Message

Direction	NEC KTS ←→ PMS
Format	<STX>STSy□xxxxxxx<ETX> (note: □ indicates a blank space)
Definitions	y : Room Status Code 1 = Room Clean 2 = Maid Required 3 = Maid in room 4 = Inspection Required 5 = Maintenance Required 6 = Out of order 7 = Reserved 8 = (not defined) 9 = (not defined) 0 = (used internally to indicate vacant and clean) # = (not defined) Q = (not defined) xxxxxxxx : Extension number (8 digits)
Example	0x02STS4 301 0x03 (Room 301 is in Inspection Required status – checked-out after having been cleaned, so inspection is required.)

4.5 Message Waiting Indication Message

The Message Waiting Indication message updates the Message Waiting status of a room telephone. This message can be sent or received by either the telephone system or the PMS system.

The telephone system may send this message when the message waiting lamp on a guest's phone is lit either by the voice mail system or by an attendant.

When sent from the PMS system to the telephone system, the telephone system will update the Message Waiting of the room telephone.

Table 2-14 Message Waiting Indication Message

Direction	NEC KTS ← PMS
Format	<STX>MW□y□xxxxxxxx<ETX> (note: □ indicates a blank space)
Definitions	y: 1 = Message Waiting Lamp ON 0 = Message Waiting Lamp OFF xxxxxxxx : Extension number (8 digits)
Example	0x02MW 1 301 0x03 (Message waiting for Room 301)

4.6 Extension Restriction Message

The Extension Restriction message is used to control the Toll Restriction Class of Service of room telephones. This message can be sent from the PMS at any time, when a room is checked-in, to the telephone system. The telephone system will not send this message even if the class of service for a given phone is changed to different restrictions.

The NEC KTS system imposes a different Toll Restriction Class for occupied rooms and for vacant rooms. The NEC KTS system has four levels of toll restriction for rooms that are occupied.

The Extension Restriction message allows the PMS to impose different Toll Restriction levels when required.

Table 2-15 Extension Restriction Message

Direction	NEC KTS ← PMS
Format	<STX>RSTy □xxxxxxxx<ETX> (note: □ indicates a blank space)
Definitions	y: Restriction Class 0~3 – Toll Restriction Class 0 through 3 xxxxxxxx : Extension number (8 digits)
Example	0x02RST1 301 0x03 (Room 301 is toll restriction class 1)

4.7 Room-to-Room Call Blocking

The NEC KTS system has a feature that allows the hotel staff to set a telephone to block room-to-room calls. This prevents the room telephone from making calls to another guest room, but still able to receive calls from other rooms or from the hotel staff. This feature uses the Extension Restriction message (since this is just another type of call restriction) with different status codes.

This feature will automatically be turned off when the room is checked-out, and restrictions are removed when a phone/room status changes to the checked-out state.

Table 2-16 Room-to-Room Call Blocking Message

Direction	NEC KTS ← PMS
Format	<STX>RSTy □xxxxxxxx<ETX> (note: □ indicates a blank space)
Definitions	y: Restriction Class 6 – Room-to-Room Restriction RESET 7 – Room-to-Room Restriction SET xxxxxxxx : Extension number (8 digits)
Example	0x02RST7 301 0x03 (Room 301 is restricted from making calls to other rooms, but can receive calls from other rooms)

4.8 Do Not Disturb Message

The Do-Not-Disturb (DND) feature can be activated by a guest from their room telephone, or by the hotel staff from a front desk telephone.

This provides only a single level of DND that blocks all calls to the room.

The operator and selected hotel staff may have the option to override this DND condition set by a telephone.

This DND state is automatically RESET when the room is checked-out.

Table 2-17 Do Not Disturb Message

Direction	NEC KTS ← PMS
Format	<STX>DNDy□xxxxxxxx<ETX> (note: □ indicates a blank space)
Definitions	y : Restriction Class 0 – Do Not Disturb OFF 1 – Do Not Disturb ON xxxxxxxx : Extension number (8 digits)
Example	0x02DND1 301 0x03 (Room 301 is in DND mode. Calls will not ring on this telephone, but may be programmed to be routed to the voice mail system.)

4.9 Wake-up Call Message

This message is used to set or reset a wake-up call from the PMS.

The message is sent from the telephone system if a guest answers, or does not answer a wake-up call. If the guest does not answer a wake-up call, the telephone system tries multiple times periodically. Each time the call is not answered, the telephone system will send a WAK message with unanswered status to the PMS system.

When an operator sets/resets a wake-up call. or if the guest sets or resets a wake-up call using the telephone with access codes, the telephone system will send this message to the PMS with appropriate indication.

Table 2-18 Wake-up Call Message

Direction	NEC KTS ←→ PMS
Format	<STX>WAKy □xxxxxxxxttt<ETX> (note: □ indicates a blank space)
Definitions	y : Wake-up Call Event 0 = Not used 1 = Set wake-up call at the given time 2 = Reset the wake-up call for a telephone 3 = Called telephone and was answered 4 = Called telephone and was not answered xxxxxxxx : Extension number (8 digits) tttt : Wake-up time in 24-hour format
Example	0x02WAK1 301 13250x03 (Set wake-up time for Room 301 to 1:25PM)

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