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Control Commands for NEC Projector (Basic) Rev 3.4.09b

Updated on April 6, 2009

This file contains information about NEC projector control commands.

Model Name		
GT60	:	GT5000/GT6000 Series
GT50	:	GT1150/GT2150 Series
HT	:	HT1000/HT1100 Series
HT10	:	HT410/HT510 Series
LT180		LT180
LT30	:	LT25/LT30/LT35 Series
LT	:	LT220/LT240/LT240K/LT260/LT260K/LT245/LT265 Series
LT80	:	LT280/LT380 Series
MT70	:	MT860/MT1060/MT1065/MT1075 Series
NP60	:	NP40/NP50/NP60 Series
NP62	:	NP41/NP61/NP62 Series
NP1000	:	NP1000/NP2000 Series
NP3150	:	NP1150/NP2150/NP3150/NP3151W Series
NP4000	:	NP4000/NP4001 Series
NP905	:	NP905/NP901W/VT800 Series
NP600	:	NP300/NP400/NP500/NP500W/NP500WS/NP600/NP600S Series
VT	:	VT770 Series
VT70	:	VT37/VT47/VT480/VT57/VT570/VT575/VT670/VT676 Series
VT80	:	VT48/VT480/VT580 Series
VT90	:	VT49/VT490/VT590/VT595/VT695 Series
VT700	:	VT700
WT	:	WT600/WT610/WT615 Series

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Contents

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1. Projector Control

NEC projectors make use of control commands that control the functions of the projector via connection with a personal computer or another device.

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2. Connection Method

The following 3 kinds of connection methods are available for sending and receiving control commands.

1. Serial connection using the serial port on the projector
   A serial cable is required.
2. USB connection using the USB port on the projector
   A USB cable is required.
3. LAN connection
   - 3-1. LAN connection using a wired LAN card
     A wired LAN card and LAN cable are required.
   - 3-2. LAN connection using a wireless LAN card
     A wireless LAN card is required.
   - 3-3.LAN connection using the LAN port on the projector
     A LAN cable is required.
   - 3-4. LAN connection using a wireless LAN unit
     A wireless LAN unit is required

Status of supported connection

	(1)	(2)	(3-1)	(3-2)	(3-3)	(3-4)
	Serial Port	USB Port	Wired LAN Card	Wireless LAN Card	Wired LAN Port	Wireless LAN Port
GT5000/GT6000	Yes	Yes	Yes	Yes	Yes	No
GT1150/GT2150	Yes	No	Yes	Yes	Yes	No
HT410/HT510	Yes	No	No	No	No	No
HT1000/HT1100	Yes	No	No	No	No	No
LT180	Yes	No	No	No	No	No
LT25/LT30/LT35	Yes	No	No	No	No	No
LT220/LT240/LT260	Yes	No	Yes	Yes	No	No
LT240K/LT260K	Yes	Yes	Yes	Yes	No	No
LT245/LT265/LT280/LT380	Yes	No	No	Yes	Yes	No
MT860/MT1060/MT1065/MT1075	Yes	Yes	Yes	Yes	No	No
NP40/NP50/NP60	Yes	No	No	No	No	No
NP41/NP61/NP62	Yes	No	No	No	No	No
NP1000/NP2000	Yes	No	No	Yes	Yes	No
NP1150/NP2150/NP3150/NP3151W	Yes	No	No	Yes	Yes	Yes
NP4000/NP4001	Yes	No	No	No	No	No
NP905/NP901W	Yes	No	No	No	Yes	Yes
NP300/NP400/NP500/NP500W/NP500WS/NP600/NP600S	Yes	No	No	No	Yes	No
VT770	Yes	No	No	No	No	No
VT37/VT47/VT470/VT57/VT570/VT575VT/670/VT676	Yes	No	No	No	No	No
VT48/VT480/VT580	Yes	No	No	No	No	No
VT49/VT490/VT590/VT595/VT695/VT700	Yes	No	No	No	No	No
VT700	Yes	No	No	No	No	No
VT800	Yes	No	No	No	Yes	No
WT600WT/610/WT615	Yes	Yes	Yes	Yes	No	No

Yes: Supported
No: Not Supported

* A USB cable is supplied as standard with the MT860/1060/1065/1075.
* The GT5000/6000 does not come with a USB cable.
* Note that a connection method using the supplied USB cable is not supported for the LT220/240/260.
* The serial cable, LAN card and LAN cable are separately sold.
* The WT610 replaced the WT610 and uses the same command set.

(CAUTION)
Before making connections, be sure to invalidate the standby mode of the projector and set the "idle mode".
The projector cannot use the control commands in the standby mode.
Setting method: Under projector [Projector Options] --> [Setup], enter a check for [Idle Mode] on Page 4.

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3. Interface Conditions

Serial connection

The communications method conforms to the RS-232C standard.

Baud rate:	38400 bps (NP600 series, VT60/VT70/VT80/VT90 series, VT700: 19200bps)
Data length:	8 bits
Parity bit:	No parity
Stop bits:	1 bit
Communications mode:	Full duplex

The control connector is described below.

[HT/LT/NP40/VT70/VT80/VT90/WT]

The PC CONTROL connector is a mini DIN 8-pin connector.

1 To TxD of PC
2
3
4 To GND of PC
5
6
7 To RxD of PC
8

* 2, 3, 5, 6, and 8 are used inside the projector.

[GT/LT80/MT/NP1000/VT (except VT70/VT80/VT90)]

The PC CONTROL connector is a D-SUB 9-pin connector.

1
2 To TxD of PC
3 To RxD of PC
4
5 To GND of PC
6
7 To CTS of PC
8 To RTS of PC
9

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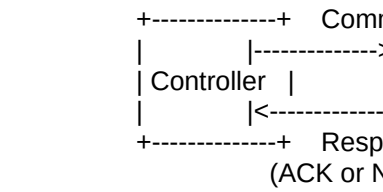
4. Communication Frame

On the LT/MT/SX/GT series projectors communication is done in a frame composed of header, data, and checksum.
The frame sent from the controller to the projector is referred to as a command, and the one sent from the projector to the command as an reply is referred to as a response.
The response has two types; Acknowledge (hereafter referred to as ACK) that recognizes a command and Negative Acknowledge (hereafter referred to as NAK) that fails to recognize a command.



4-1. Frame Format

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One frame comprises a header, a data portion, and a checksum.

Frame Format:

Header portion						Data portion (Max. 4095 Bytes)		Checksum
1	2	3	4	5	6	~	n	m
8 Bit	8 Bit	8 Bit	4 Bit	8 Bit	8 Bit	~	8 Bit	8 Bit

- 1: ID2
- 2: Projector ID
- 3: Model code
- 4: Data length
- 5: ID1

* ID1: (8 Bit)
This is an identification data assigned to each command.

Command :
This sets an identification data assigned to each command to send it.
(See each command description.)

Response :
This returns the 6th bit of received ID1 as HIGH.
For ACK it sends the 8th bit back as LOW (recognized); for NAK it sends the 8th bit back as HIGH (not recognized).

* ID2: (8 Bit)
This is an identification data assigned to each command.

Command :
This sets an identification data assigned to each command to send it.
(See each command description.)

Response :
This returns the value of received ID2 as is.

* Projector ID : (8 Bit)
This is a projector ID for the projector that sends and receives frames.

Command :
This specifies a projector ID for the projector that sends and receives commands. (individual notification)
Entering 00H or FFH becomes a common command for all the projectors. (broadcast notification)
This is convenient for controlling multiple projectors at the same time.

* When the controller is connected with the projector on a one-to-one basis Broadcast notification is recommended.
* When the controller is connected with multiple projectors
To control a certain projector, use "individual notification".
For all others "broadcast notification" is recommended.

Response :
This returns the projector ID for a projector received regardless of individual notification or broadcast notification.

CAUTION :
To notify individually, specifying a model code from the following model codes is required.

* Model code: (4 Bit)
This is a model code for the projector that sends and receives frames.

Command :
This specifies a model code for the projector that sends commands. (individual notification)
Entering 0000B or 1111B becomes a common command for all the projectors. (broadcast notification)
This is convenient for controlling multiple projectors at the same time.

* When the controller is connected with the projector on a one-to-one basis Broadcast notification is recommended.
* When the controller is connected with multiple projectors
To control a certain projector, use "individual notification".
For all others "broadcast notification" is recommended.

Response :
This returns the model code for a projector received regardless of individual notification or broadcast notification.

Table of Model codes

0000B : (broadcast notification)
0001B : MT Series
0010B : LT Series
0011B : SX Series
0101B : GT Series
1111B : (broadcast notification)

CAUTION :
* When the model code is set to "broadcast notification", the command becomes broadcast notification command, regardless of values of the projector ID.
* Model code is specified using upper ranking 4 bits of data length. The lower ranking 4 bits becomes the upper bits of data length.

* Data length : (12 Bit)
This is data length of data portion (unit:: byte).

Command :
This sets data length of data added to a command to send it.
(See each command description.)

Response :
This sets data length of data added to a response to send it.
(See each command description.)

CAUTION :
Data length is specified using total of 12 bits (0 - 4095) of 4 bits of the 4th byte and 8 bits of the 5th byte.* The upper ranking 4 bits of the 4th byte is model code.

* Data portion
This becomes data of data lenght specified in the data length portion.

Command :
This sets data added to a command to send it.
(See each command description.)

Response :
This sets data added to a response to send it.
(See each command description.)

* Checksum
This is lower ranking 8 bits of the sum total of the header and data portions of one transmit and receive data frame.

4-2. Data portion of response
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For ACK

This returns ACK without adding data portion to the command that does not request data.
This returns ACK with adding data to the data portion for the command that requests data.

For NAK

This adds a cause of not accepting the command to data portion to return it.

(Example) Power On

Command:
02H 00H FFH F0H 00H CKS

NAK:
A2H 00H 01H 20H 02H DATA01 DATA02 CKS

Data Contents

DATA01 Error types
- 00H : Not supported
- 01H : Parameter error
- 02H : Operation mode error
- 03H : Gain-related error
- 04H : Logo transfer error

DATA02 Error description

* When not supported
  - 00H : Unknown command
  - 01H : The current model does not support this function.
  - 02H : This model is not compatible with the Switcher.
  - 03H : This model is not compatible with the PC Viewer.
* When a parameter error occurs
  - 00H : Unvalid values specified.
  - 01H : Specified terminal is unavailable or cannot be selected
  - 02H : Selected language is not available.
* When an operation mode error occurs
  - 00H : Available memory reservation error
  - 01H : External control working
  - 02H : Operating memory
  - 03H : Standby
  - 04H : On Forced on-screen mute mode
  - 05H : Link mode working
  - 06H : Displaying a signal other than PC Viewer
  - 07H : -No signal-
  - 08H : Displaying a test pattern or PC Card Files screen.
  - 09H : No PC card is inserted-
  - 0AH : Memory operation failed
  - 0BH : Switcher mode working
  - 0CH : Displaying the Entry List
* When a gain adjustment error occurs

00H : Group number / sub category number is not correct.
01H : Selected gain is not available.
02H : Adjustment failed
* When a logo transfer error occurs
00H : Start is not requested
01H : Cannot process due to storing
02H : Exceeds the total number of blocks required
at the time of start
03H : The block number of transferred data is not consecutive.

USB connection

This conforms to the USB1.1 standard.

Transfer speed: All speeds (supported)
Endpoint: Control transfer Endpoint 0
Device class: HID class (Ver1.1)

USB1.1 Standard: Universal Serial Bus Specification Revision 1.1
HID : Human Interface Device

Connector Specifications

1 VBUS (Power supply)
2 D- (- Signal)
3 D+ (+ Signal)
4 GND (Ground)

* Depending on the USB host controller in the personal computer, the USB connection may fail to operate. When using a USB hub, please use a self-powered type, not a bus-powered type. When using a USB hub, connection to the first stage of the USB hub is recommended.

LAN connection

[Wired LAN port]

LAN interface
Communication speed: Auto setting (10/100Mbps)
Certified standard: IEEE802.3 (10BASE-T)
IEEE802.3u (100BASE-TX, Auto-Negotiation)

A LAN connector (8 male RJ-45 connector)

1	TD+	Transmit data (+)
2	TD-	Transmit data (-)
3	RD+	Receive data (+)
4		Not used
5		Not used
6	RD-	Receive data (-)
7		Not used
8		Not used

[Wired/wireless LAN card]

The LAN connections will differ depending on the commercial LAN card that is used.
- For information on supported LAN cards, visit:

Global: http://www.nec-pj.com/

[Port Number]

The TCP port number used is "7142".

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4. List of Commands

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* Example for command

Command name	Example
006. RUNNING SENSE	00H 81H 00H 00H 00H 81H
007. COMMON DATA REQUEST	00H C0H 00H 00H 00H C0H
009. ERROR STATUS REQUEST	00H 88H 00H 00H 00H 88H
015. POWER ON	02H 00H 00H 00H 00H 02H
016. POWER OFF	02H 01H 00H 00H 00H 03H
018. INPUT SW CHANGE	02H 03H 00H 00H 02H <DATA> CKS
020. PICTURE MUTE ON	02H 10H 00H 00H 00H 12H
021. PICTURE MUTE OFF	02H 11H 00H 00H 00H 13H
022. SOUND MUTE ON	02H 12H 00H 00H 00H 14H
023. SOUND MUTE OFF	02H 13H 00H 00H 00H 15H
024. ONSCREEN MUTE ON	02H 14H 00H 00H 00H 16H
025. ONSCREEN MUTE OFF	02H 15H 00H 00H 00H 17H
030. GAIN ADJUST	03H 10H 00H 00H 05H <DATA> CKS
030-2. VOLUME ADJUST	03H 10H 00H 00H 05H 05H <DATA> CKS
030-12. IMAGE MODE ADJUST	03H 10H 00H 00H 05H <DATA> CKS
037. INFORMATION REQUEST	03H 8AH 00H 00H 00H 8DH
037-1. LAMP INFORMATION REQUEST	03H 8CH 00H 00H 00H 8FH
037-2. LAMP INFORMATION REQUEST 2	03H 94H 00H 00H 00H 97H
037-4. LAMP INFORMATION REQUEST 3	03H 96H 00H 00H 02H <DATA> CKS
038. LAMP MODE REQUEST	03H B0H 00H 00H 01H 07H BBH
039. LAMP MODE SET	03H B1H 00H 00H 02H 07H 00H BDH
046. WXGA MODE SETTING REQUEST	03H B0H 00H 00H 01H DATA1 CKS
049. WXGA MODE SETTING SET	03H B1H 00H 00H 02H DATA1 DATA2 CKS
050. REMOTE KEY CODE	02H 0FH 00H 00H 02H 00H 00H 13H
060. GAIN PARAMETER REQUEST 2	03H 04H 00H 00H 03H <DATA> CKS
077. MUTE CONTROL	02H 1AH 00H 00H 02H <DATA> CKS
078-1. SETTING REQUEST	00H 85H 00H 00H 01H 00H CKS
078-2. RUNNING STATUS REQUEST	00H 85H 00H 00H 01H 01H CKS
078-3. INPUT STATUS REQUEST	00H 85H 00H 00H 01H 02H CKS
078-4. MUTE STATUS REQUEST	00H 85H 00H 00H 01H 03H CKS
078-5. MODEL NAME REQUEST	00H 85H 00H 00H 01H 04H CKS
078-6. MIRROR COVER STATUS REQUEST	00H 85H 00H 00H 01H 05H CKS
079. FREEZE CONROL	01H 98H 00H 00H 01H DATA01 CKS
097-198. PIP/SIDE BY SIDE REQUEST	03H B0H 00H 00H 02H C5H DATA CKS
098-198. PIP/SIDE BY SIDE SET	03H B1H 00H 00H 03H C5H <DATA> CKS
110. AUTO FUNCTIONS EXECUTE	03H B6H 00H 00H 01H <DATA> CKS
111. AUTO ADJUST EXECUTE2	03H BAH 00H 00H 01H <DATA> CKS
305-1. BASE MODEL TYPE REQUEST	00H BFH 00H 00H 01H <DATA> CKS
305-3. PROJECTOR INFORMATION REQUEST	00H BFH 00H 00H 01H <DATA> CKS

* Availability by Model

Model No.

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01 : LT240/LT260
02 : MT1060/MT1065/MT1075
03 : HT1000
04 : LT220
05 : MT860
06 : WT600/WT610/WT615
07 : GT5000
08 : LT240K/LT260K
09 : GT6000
10 : HT1100
11 : VT770
12: HT410/HT510 (HT10 Series)
13 : LT245/LT265
14 : LT280/LT380
15 : LT180
16 : VT37/VT47/VT470/VT57/VT570/VT575/VT670/VT676 (VT70 series)
17 : VT48/VT480/VT580 (VT80 Series)
18 : NP1000/NP2000 (NP1000 Series)
19 : NP1150/NP2150/NP3150/NP3151W (3150 Series)
20 : LT25/LT30/LT35 (LT30 Series)
21 : NP40/NP50/NP60 (NP60 Series)
22 : VT49/VT490/VT590/VT595/VT695 (VT90 Series)
23 : VT700
24: NP4000/NP4001 (NP4000 Series)
25: NP905/NP901W/VT800 (NP900 Series)
26: NP41/NP61/NP62 (NP62 Series)
27: NP300/NP400/NP500/NP500W/NP500WS/NP600/NP600S (NP600 Series)
28: GT1150/GT2150 (GT50 Series)

Meaning of Symbols

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* Supported
! Is available depending on model's version
- Not Supported

Availability by Model																											
Command Name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
006. RUNNING SENSE	*	*	*	*	*	*	*	*	*	*	*	-	*	*	-	-	-	*	*	-	-	-	*	*	*	*	*	*
007. COMMON DATA REQUEST	*	*	*	*	*	*	*	*	*	*	*	-	*	*	-	-	-	*	*	-	-	-	*	*	*	*	*	*
009. ERROR STATUS REQUEST	*	*	*	*	*	*	*	*	*	*	*	*	*	*	-	-	-	*	*	*	*	*	*	*	*	*	*	*
015. POWER ON	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
016. POWER OFF	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
018. INPUT SW CHANGE	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
020. PICTURE MUTE ON	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
021. PICTURE MUTE OFF	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
022. SOUND MUTE ON	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	-	*	*	*	*	-	*	*
023. SOUND MUTE OFF	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	-	*	*	*	*	-	*	*
024. ONSCREEN MUTE ON	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
025. ONSCREEN MUTE OFF	*	*	*	*	*	*	*	*	*	*	*	*	*	*	-	-	-	*	*	*	*	-	*	-	*	*	-	*
030. GAIN ADJUST	*	*	*	*	*	*	*	*	*	*	*	-	*	*	*	-	-	*	*	-	-	-	-	-	*	-	-	*
030-2. VOLUME ADJUST																												
Volume	*	*	*	*	*	*	*	*	*	*	*	-	*	*	-	-	*	*	*	*	-	*	*	*	*	*	*	-
Bass	-	*	-	-	*	-	*	-	*	-	*	-	-	*	-	-	-	*	*	-	-	-	-	-	*	-	-	-
Treble	-	*	-	-	*	-	*	-	*	-	*	-	-	*	-	-	-	*	*	-	-	-	-	-	*	-	-	-
Balance	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-	-	-	*	*	-	-	-	-	-	*	-	-	-
030-12. IMAGE MODE ADJUST																												
Aspect Ratio Input Signal	*	*	*	*	*	*	*	*	*	*	*	-	*	*	-	-	-	*	*	-	-	-	*	*	*	!	*	*
037. INFORMATION REQUEST	*	*	*	*	*	*	*	*	*	*	*	*	*	*	-	-	-	*	*	*	*	*	!	*	*	!	*	*
037-1. LAMP INFORMATION REQUEST	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	-	*	*	*	*
037-2. LAMP INFORMATION REQUEST 2	*	*	*	*	*	*	*	*	*	*	*	-	*	*	-	-	-	*	*	-	-	-	*	-	*	*	*	-
037-4. LAMP INFORMATION REQUEST 3	!	!	!	!	!	!	*	*	*	*	*	-	*	*	-	-	-	*	*	-	*	*	*	*	*	*	*	-
038. LAMP MODE REQUEST	*	*	*	*	*	*	*	*	*	*	*	-	*	*	-	-	-	*	*	-	-	-	-	!	*	*	*	*
039. LAMP MODE SET	*	*	*	*	*	*	*	*	*	*	*	-	*	*	-	-	-	*	*	-	-	-	-	!	*	*	*	*
046. WXGA MODE SETTING REQUEST	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-
049. WXGA MODE SETTING SET	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*	-
050. REMOTE KEY CODE	*	*	*	*	*	*	*	*	*	*	*	*	*	*	-	-	*	*	*	*	*	*	*	*	*	*	*	*
060. GAIN PARAMETER REQUEST 2	*	*	*	*	*	*	*	*	*	*	*	-	*	*	-	-	-	*	*	-	-	-	*	*	*	*	*	*
077. MUTE CONTROL	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
078-1. SETTING REQUEST	*	*	*	*	*	*	*	*	*	*	*	-	*	*	-	-	-	*	*	-	-	-	*	*	*	*	*	*
078-2. RUNNING STATUS REQUEST	*	*	*	*	*	*	*	*	*	*	*	-	*	*	-	-	-	*	*	-	-	-	*	*	*	*	*	*
078-3. INPUT STATUS REQUEST	*	*	*	*	*	*	*	*	*	*	*	-	*	*	-	-	-	*	*	-	-	-	*	*	*	*	*	*
078-4. MUTE STATUS REQUEST	*	*	*	*	*	*	*	*	*	*	*	-	*	*	-	-	-	*	*	-	-	-	*	*	*	*	*	*
078-5. MODEL NAME REQUEST	*	*	*	*	*	*	*	*	*	*	*	-	*	*	-	-	-	*	*	-	-	-	*	*	*	*	*	-
078-6. MIRROR COVER STATUS REQUEST	-	-	-	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
079. FREEZE CONTROL	*	*	*	*	*	*	*	*	*	*	*	-	*	-	-	-	!	-	-	-	-	*	-	*	-	*	*	-
110. AUTO FUNCTIONS EXECUTE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	!	*	-	-	*	-	*	-	-
111. AUTO ADJUST EXECUTE2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	!	-	*	-	-	*	-
097-198. PIP/SIDE BY SIDE REQUEST	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	!	-	-	-	-	-	*	-	-	-
098-198. PIP/SIDE BY SIDE SET	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	!	-	-	-	-	-	*	-	-	-
305.1 BASE MODEL TYPE REQUEST	-	-	-	-	-	-	-	-	-	-	-	*	*	*	*	-	*	*	*	*	*	*	*	*	*	*	*	-
305.3 PROJECTOR INFORMATION REQUEST	-	-	-	-	-	-	-	-	-	-	-	*	*	*	*	-	*	*	*	*	*	*	*	*	*	*	*	-

(!)
LT30 : firmware version 1.03 or later
NP4000: firmware version 1.04 or later
NP4001: firmware version 1.01 or later
NP62 : firmware version 1.02 or later

==========

5. Command Descriptions

Precautions with Inscriptions:

(*1) Projector ID
It is the value when forwarding a factory.
This reflects the "Projector ID" that has been set to the projector.

(*2) Model code: "xxH" inscription
This will differ depending on the projector.
In case of MT/NP1000/1050 series 10H
In case of LT/LT80 series 20H
In case of NP62 series 20H
In case of VT series 40H

In case of NP600 series	40H
In case of GT series	50H
In case of HT series	60H
In case of WT series	70H
In case of HT10 series	D0H
In case of LT180 series	D0H
In case of LT30 series	D0H
In case of NP60 series	D0H
In case of NP4000 series	80H
In case of NP905/NP901W/VT800	90H

(*3) Checksum: "CKS" inscription
This is the value of the lower 8 bits of the results calculated in byte units from all of the data up to the immediately preceding data.

Example:

```
20H  81H  01H  60H  01H  00H  03H
+    +    +    +    +    +  = CKS
```

(*4) Response error number
This is the value of the error number at the time of an error.
See "NAK" of "6-2. Data portion of response".

(*5) Term “RGB” and “COMPUTER”
On the HT1100, VT770, LT245/ LT265/ LT280/ LT380, NP1000/NP2000, NP1150/NP2150/NP3150/NP3151W, NP4000/NP4001, NP905/NP901W/VT800, LT25/LT30/LT35, VT48/VT480/VT580, VT49/VT490/VT590/VT595/VT695/VT700, NP300/NP400/NP500/NP500W/NP500WS/NP600/NP600S and NP40/NP50/NP60/NP41/NP61/NP62, the term "RGB connector" has been changed to "COMPUTER".

(*6) Term “DVI” and “COMPUTER”
On the LT380, NP1000/NP2000, NP1150/NP2150/NP3150/NP3151W, NP4000/NP4001, NP300/NP400/NP500/NP500W/NP500WS/NP600/NP600S and VT595/VT695/VT700, the term "DVI connector" has been changed to "COMPUTER".

006. RUNNING SENSE

****

Function:
This command acquires the operation mode of the projector.

Command:

```
00H  81H  00H  00H  00H  81H
```

Response: At the time of a success

```
20H  81H  01H  xxH  01H  DATA01  CKS
          (*1)  (*2)             (*3)
```

Data Portion Contents

DATA01 Status of operation

Bit 7: Power On/Off processing
- 0 = No execution (Normal condition)
- 1 = During execution

Bit 6: Selecting signal processing
- 0 = No execution (Normal condition)
- 1 = During execution

Bit 5: Cooling processing
0 = No execution (Normal condition)
1 = During execution

Bit 4: External control mode
0 = OFF
1 = ON
Bit 3: Reserved
Bit 2: Reserved

Bit 1: Projector status
0 = Idling
1 = Power On
Bit 0: Reserved

Response: At the time of a failure

A0H	81H	01H	xxH	02H	DATA1H	DATA02	CKS
		(*1)	(*2)		(*4)	(*3)	

007. COMMON DATA REQUEST

****

Function:
This command acquires all of the detailed conditions of the projector.

Command:

00H	C0H	00H	00H	00H	C0H

Response: At the time of a success

20H	C0H	01H	xxH	80H	DATA01 .. DATA128	CKS
		(*1)	(*2)			(*3)

Data Portion Contents

DATA01 Projector type
See DATA70..71
08H : NP4000 Projector
11H : NP62 Projector

DATA02 Projector ID
1 .. 64

DATA03 Reserved

DATA04 Projector status
00H: Idling
01H: Power On

DATA05 Cooling processing
00H: No execution (Normal condition)
01H: During execution

DATA06 Indication signal number (Entry list number - 1)
0 .. 199

DATA07 Type 1 of input terminal to be selected (!1)
01H : 1
02H : 2
03H : 3
04H : 4
05H : 5

DATA08 Type 2 of input terminal to be selected (!1)
01H : RGB (*5)
02H : VIDEO
03H : S-VIDEO
04H : COMPONENT
05H : Reserved
06H : DIGITAL (*6)
07H : VIEWER
08H : SLOT1
09H : SLOT2

DATA09 Indication signal type
* Valid only when Type 2 of input terminal is 02H or 03H
x0H : NTSC3.58
x1H : NTSC4.43
x2H : PAL
x3H : PAL60
x4H : SECAM
x5H : B/W60
x6H : B/W50
x7H : PALNM
x8H : NTSC3.58 LBX
x9H : NTSC3.58 SQZ
xDH : NTSC
xEH : PAL-M
xFH : PAL-N
* x: undefined

DATA10 .. 12 Reserved (undefined)

DATA13 .. 20 Horizontal frequency of the indication signal(string)
("000.00" kHz + NULL(0)+ NULL(0))

DATA21 .. 28 Vertical frequency of the indication signal(string)
("000.00" Hz + NULL(0)+ NULL(0))

DATA29 Picture mute
00H : OFF
01H : ON

DATA30 Sound mute
00H : OFF
01H : ON

DATA31 .. Reserved

DATA32 Freeze Status (!2)
00H : OFF
01H : ON
FFH : Not Supported

DATA33 Test pattern display 1

00H : No display (Normal condition)

00H Other : Displaying (Pattern ID)

Pattern ID	Pattern Name	MT	LT	LT180	LT80	HT	GT	WT	VT	NP1000	NP3150	NP905	NP4000	NP62
02H	Cross Hatch	x	*	*	x	*	x	x	x	x	*	*	*	*
03H	Gray Bars	*	*	*	*	*	*	*	*	*	*	*	x	x
04H	Raster(0%)	*	*	*	*	*	*	*	*	*	*	*	*	*
05H	Raster(25%)	*	*	*	*	*	*	*	*	*	*	*	*	x
06H	Raster(50%)	*	*	*	*	*	*	*	*	*	*	*	*	x
07H	Raster(100%)	*	*	*	*	*	*	*	*	*	*	*	*	*
08H	Focus	*	*	*	*	*	*	*	*	*	x	x	x	x
09H	Raster Blue	*	x	x	*	x	*	x	*	*	*	*	*	*
0AH	Gray Raster 30	*	*	*	*	*	*	*	*	*	*	*	*	*
17H	Gray Raster 10	*	*	*	*	*	*	*	*	*	*	*	*	*
18H	RAMP WBRG	x	*	*	x	*	x	*	x	x	x	x	x	*
19H	Blue Raster 60	x	*	*	x	*	x	*	x	x	x	x	*	*
1DH	Cross Hatch 3	*	*1	*	*	x	*	*	*	*	x	x	x	x

* : Supported

x : Not supported

*1: Only LT240K/260K

DATA34 Test pattern display 2

FFH: No display (Normal condition)

FFH Other: Displaying

Bit 2: BLUE pattern

0 = OFF

1 = ON

Bit 1: GREEN pattern

0 = OFF

1 = ON

Bit 0: RED pattern

0 = OFF

1 = ON

DATA35 .. 50 Reserved

DATA51 .. 65 User registration name (14 characters + NULL)

DATA66 Forced On-screen mute

00H : OFF

01H : ON

DATA67 On-screen display

00H : No display

01H : Displaying

DATA68 Selecting signal processing

00H : No execution (Normal condition)

01H : During execution

DATA69 Status of operation

00H : Idling

04H : Power On

05H : Cooling

06H : Idling (Error occurrence)
Other than above: (nondisclosure)
Internal use of code during a state transition period

DATA70 .. 71 Projector type

Data01	Data70	Data71	
01H	00H	03H	MT1060/MT1065
01H	01H	03H	MT860
01H	02H	03H	MT1075
01H	00H	06H	NP1000/NP2000
02H	00H	03H	LT240/LT260
02H	01H	03H	LT220
02H	02H	03H	LT240K/LT260K
02H	00H	05H	LT245/LT265
02H	00H	06H	LT380
02H	01H	06H	LT280
03H	00H	04H	VT770
03H	00H	06H	VT80 Series
03H	00H	07H	VT90 Series
04H	00H	01H	GT1150
04H	01H	01H	GT2150
04H	00H	03H	GT5000
04H	01H	03H	GT6000
05H	00H	03H	HT1000
05H	00H	04H	HT1100
06H	00H	03H	WT600
06H	00H	05H	WT610/WT615
08H	00H	07H	NP4000/NP4001
10H	00H	08H	VT700
10H	00H	09H	NP600
10H	01H	09H	NP500
10H	02H	09H	NP500 W
10H	03H	09H	NP400
10H	04H	09H	NP300
11H	00H	00H	NP41/61
11H	01H	00H	NP62
12H	00H	08H	NP1150/NP2150/NP3150
12H	01H	08H	NP3151W
12H	00H	09H	NP905
12H	01H	09H	NP901W
12H	02H	09H	VT800

DATA72 PC Card insertion
00H : Not inserted
01H : Inserted

DATA73 USB Mouse connection
00H : Not connected
01H : Connected

DATA74 Entry list type
01H : Default

02H : User

DATA75 .. 82 Reserved

DATA83 On-screen mute
00H : OFF
01H : ON

DATA84 Reserved

DATA85 Indicate Contents
00H = Picture signal displaying
01H = No signal
02H = Viewer displaying
03H = Test pattern displaying
04H = LAN displaying

DATA86 .. 128 Reserved

Response: At the time of a failure

A0H	C0H	01H	xxH	02H	DATA01	DATA02	CKS
		(*1)	(*2)		(*4)	(*3)	

(!1) VT700/NP600 series

Selected input terminal	Data 07	Data08	
RGB or RGB1 (*5)	1 (01H)	RGB	(01H)
RGB2 (*5)	2 (02H)	RGB	(01H)
Video	1 (01H)	VIDEO	(02H)
S-Video	1 (01H)	S-VIDEO	(03H)
Component	2 (02H)	COMPONENT	(04H)
Component	3 (03H)	COMPONENT	(04H)
DVI or DVI(Digital) (*6)	1 (01H)	DIGITAL	(06H)
HDMI	1 (01H)	DIGITAL	(06H)
Viewer	1 (01H)	VIEWER	(07H)
LAN	2 (02H)	VIEWER	(07H)
Slot1-1	1 (01H)	SLOT1	(08H)
Slot1-2	2 (02H)	SLOT1	(08H)
Slot2-1	1 (01H)	SLOT2	(09H)
Slot2-2	2 (02H)	SLOT2	(09H)
RGB(Video)	2 (02H)	VIDEO	(02H)
RGB(S-Video)	2 (02H)	S-VIDEO	(03H)

Supplement:
(!2) only the NP600 series is compatible.

009. ERROR STATUS REQUEST
****

Function:
This command acquires the error information occurring with the projector.

Command:
00H 88H 00H 00H 00H 88H

Response: At the time of a success
20H 88H 01H xxH 0CH DATA01 .. DATA12 CKS

(*1) (*2) (*3)

Data Portion Contents

---

* The various bits are normal is "0" and error is "1".
* "None" is "0" fixation.

DATA01 Error Status (1)
- bit0 : Lamp cover error
- bit1 : Temperature error(Bimetal)
- bit2 : None
- bit3 : None
- bit4 : Fan error
- bit5 : Power error
- bit6 : Lamp(or Lamp1) error
- bit7 : Lamp(or Lamp1) has reached its end of life

DATA02 Error Status (2)
- bit0 : Lamp(or Lamp1) has been used beyond its limit
- bit1 : Formatter error
- bit2 : Lamp2 error
- bit3 : None
- bit4 : None
- bit5 : None
- bit6 : None
- bit7 : None

DATA03 Error Status (3)
- bit0 : None
- bit1 : FPGA error
- bit2 : Temperature error(Sensor)
- bit3 : Lamp(or Lamp1) housing error (!)
- bit4 : Lamp(or Lamp1) data error (!)
- bit5 : Mirror cover error
- bit6 : Lamp2 has reached its end of life
- bit7 : Lamp2 has been used beyond its limit

DATA03 Error Status (4)
- bit0 : Lamp2 housing error
- bit1 : Lamp2 data error
- bit2 : High temperature due to dust pile-up
- bit3 : A foreign object sensor error
- bit4 : Pump error
- bit5 : None
- bit6 : None
- bit7 : None

DATA05 .. 12 Reserved

Response: At the time of a failure

A0H	88H	01H	xxH	02H	DATA01	DATA02	CKS
		(*1)	(*2)		(*4)	(*3)	

Supplement:
(!) LT/LT80/HT: "None"

015. POWER ON

****

Function:
This command switches on the main power of the projector.
Command:

02H	00H	00H	00H	00H	02H

Response: At the time of a success

22H	00H	01H	xxH	00H	CKS
		(*1)	(*2)		(*3)

Response: At the time of a failure

A2H	00H	01H	xxH	02H	DATA01	DATA02	CKS
		(*1)	(*2)		(*4)		(*3)

Supplement:
The projector does not accept the other command during power on processing.

016. POWER OFF

****

Function:
This command switches off the main power of the projector.

Command:

02H	01H	00H	00H	00H	03H

Response: At the time of a success

22H	01H	01H	xxH	00H	CKS
		(*1)	(*2)		(*3)

Response: At the time of a failure

A2H	01H	01H	xxH	02H	DATA01	DATA02	CKS
		(*1)	(*2)		(*4)		(*3)

Supplement:
The projector doesn't accept the other command during power off processing. (It contains a cooling period.)

018. INPUT SW CHANGE

****

Function:
This command switches the input terminal or the entry list.

Command:

02H	03H	00H	00H	02H	DATA01	DATA02	CKS
							(*3)

Data Portion Contents

DATA01 Switching object
00H : Entry List
01H : Input terminal

DATA02 Switching number

When the switching object is the "Signal list", the signal list number is specified. (0…99)

When the switching object is the "Input connector", the input connector number is specified.

Terminal Number	Terminal Name	MT	LT	LT180	LT80	HT	GT	WT	VT	NP1000/3150	HT10	LT30	NP40	NP4000	NP905	NP600	NP62	
01H	RGB1(RGB)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
02H	RGB2 (!1)	*	*	x	*	x	*	x	*	*	x	x	x	*	*	x	x	
02H	DVI(ANALOG) (!2)	x	x	x	x	x	x	*	x	x	x	x	x	x	x	*	x	
06H	Video	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
0BH	S-Video	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
10H	Component	x	x	*	*	*	x	x	x	*	x	x	x	*	x	x	x	(!!)
11H	Component	x	x	*	x	*	x	x	x	x	*	x	x	x	x	x	x	(!!!)
12H	Component	x	x	x	x	x	x	x	*	x	x	x	x	x	x	*	x	(!!!!)
1AH	DVI (*6) (!2)	*	x	*	x	*	x	x	*	x	x	x	x	*	x	*	x	(!)
1AH	DVI(DIGITAL)(*6)	x	x	x	*	x	*	*	x	*	x	x	x	x	x	x	x	(!)
1AH	HDMI	x	x	x	x	x	x	x	x	x	x	x	x	x	*	x	x	
1FH	Viewer	*	*	*	*	*	*	*	*	*	x	x	x	x	*	*	* (!3)	(!!!!)
20H	LAN	*	*	x	*	x	*	*	x	*	x	x	x	x	*	x	x	
07H	RGB(Video)	x	x	x	x	x	*	x	x	x	x	x	x	x	x	x	x	
0CH	RGB(S-Video)	x	x	x	x	x	*	x	x	x	x	x	x	x	x	x	x	
24H	SLOT1-1	x	x	x	x	x	*	x	x	x	x	x	x	x	x	x	x	
25H	SLOT1-2	x	x	x	x	x	*	x	x	x	x	x	x	x	x	x	x	
29H	SLOT2-1	x	x	x	x	x	*	x	x	x	x	x	x	x	x	x	x	
2AH	SLOT2-2	x	x	x	x	x	*	x	x	x	x	x	x	x	x	x	x	

* : Supported
x : Not supported
(!): The MT860/LT280 does not support a DVI connector.
(!!) HT1000
(!!!) HT410/HT510/HT1100
(!!!!) VT770 support Component and Viewer
(!1) VT470/VT470JY/VT570/VT670/VT575/VT676/VT480/VT580
(!2) VT595/VT695/VT700/NP300/NP400/NP500/NP500W/NP600/NP500WS/NP600S
(!3) NP62 only (not available on NP41/NP61

Response: At the time of a success

22H 03H 01H xxH 01H DATA01 CKS
(*1) (*2) (*3)

Data Portion Contents

DATA01 Results
00H : Normal
FFH : Error

Response: At the time of a failure

A2H 03H 01H xxH 02H DATA01 DATA02 CKS
(*1) (*2) (*4) (*3)

Command example:

* When switch to the Video connector

02H 03H 00H 00H 02H 01H 06H 0EH

020. PICTURE MUTE ON

****

Function:
This command blanks the picture.
Command:

02H 10H 00H 00H 00H 12H
Response: At the time of a success
22H 10H 01H xxH 00H CKS
(*1) (*2) (*3)

Response: At the time of a failure
A2H 10H 01H xxH 02H DATA01 DATA02 CKS
(*1) (*2) (*4) (*3)

Supplement:
* Picture mute is cancelled for the following:
Input connector switching
Video signal switching

021. PICTURE MUTE OFF
****
Function:
This command cancels the blank picture condition.

Command:
02H 11H 00H 00H 00H 13H

Response: At the time of a success
22H 11H 01H xxH 00H CKS
(*1) (*2) (*3)

Response: At the time of a failure
A2H 11H 01H xxH 02H DATA01 DATA02 CKS
(*1) (*2) (*4) (*3)

022. SOUND MUTE ON
****
Function:
This command mutes the sound.

Command:
02H 12H 00H 00H 00H 14H

Response: At the time of a success
22H 12H 01H xxH 00H CKS
(*1) (*2) (*3)

Response: At the time of a failure
A2H 12H 01H xxH 02H DATA01 DATA02 CKS
(*1) (*2) (*4) (*3)
Supplement:
* Sound mute is cancelled for the following:
Input connector switching
Video signal switching
Volume adjustment

023. SOUND MUTE OFF

****
Function:
This command cancels the sound muting.

Command:
02H 13H 00H 00H 00H 15H

Response: At the time of a success
22H 13H 01H xxH 00H CKS
(*1) (*2) (*3)

Response: At the time of a failure
A2H 13H 01H xxH 02H DATA01 DATA02 CKS
(*1) (*2) (*4) (*3)

024. ONSCREEN MUTE ON
****
Function:
This command blanks the on-screen display.

Command:
02H 14H 00H 00H 00H 16H

Response: At the time of a success
22H 14H 01H xxH 00H CKS
(*1) (*2) (*3)

Response: At the time of a failure
A2H 14H 01H xxH 02H DATA01 DATA02 CKS
(*1) (*2) (*4) (*3)

Supplement:
* Onscreen mute is cancelled for the following:
Input connector switching
Video signal switching

025. ONSCREEN MUTE OFF
****
Function:
This command cancels the blanking of the on-screen display.

Command:
02H 15H 00H 00H 00H 17H

Response: At the time of a success
22H 15H 01H xxH 00H CKS
(*1) (*2) (*3)

Response: At the time of a failure
A2H 15H 01H xxH 02H DATA01 DATA02 CKS
(*1) (*2) (*4) (*3)

[030. GAIN ADJUST]
****

*direct setting of volume
*volume increment/decrement
*direct setting of brightness
*brightness increment/decrement
*direct setting of color
*color increment/decrement
*direct setting of contrast
*contrast increment/decrement
*direct setting of sharpness
*sharpness increment/decrement
*direct setting of tint
*tint increment/decrement

brightness
contrast
color
tint<hue>
sharpness
Not supported "LT170","VT60 series","VT70 series","VT80 series", “VT90 series"
Not supported "HT410/HT510","LT180/LT25/LT30/LT35"

volume
Not supported "LT170","VT60 series","VT70 series" (except "VT80 series, VT90 series")
Not supported "HT410/HT510","LT180/LT25/LT30/LT35"

Command:
03H 10H 00H 00H 05H DATA01 .. DATA05 CKS

DATA01 : 00H (Brightness)
01H (Contrast)
02H (Color)
03H (Tint<Hue>)
04H (Sharpness)
05H (Volume)

DATA02 : FFH (except "Volume")
00H ("Volume" only)

DATA03 : 00H (direct settings)
01H (increment/decrement)

DATA04 : lower data (8bit)
DATA05 : upper data (8bit)

ex.1) volume direct setting (value = 20)

DATA01 : 05H (Volume)
DATA02 : 00H ("Volume" only)
DATA03 : 00H (direct setting)
DATA04 : 14H (lower data : 20 = 0014<Hex>)
DATA05 : 00H (upper data : 20 = 0014<Hex>)

ex.2) brightness increment (value = +1)

DATA01 : 00H (Brightness)
DATA02 : FFH (except "Volume")
DATA03 : 01H (increment/decrement)
DATA04 : 01H (lower data : +1 = 0001<Hex>)
DATA05 : 00H (upper data : +1 = 0001<Hex>)

ex.3) contrast decrement (value = -1)
DATA01 : 01H (Contrast)
DATA02 : FFH (except "Volume")
DATA03 : 01H (increment/decrement)
DATA04 : FFH (lower data : -1 = FFFF<Hex>)
DATA05 : FFH (upper data : -1 = FFFF<Hex>)

030-2. VOLUME ADJUST

****

Function:
This command sets the volume.

Command:

03H	10H	00H	00H	05H	DATA01 .. DATA05	CKS
						(*3)

Data Portion Contents

DATA01	05H fixed
DATA02	Setting items 00H : Volume 01H : Bass 02H : Treble 03H : Balance
DATA03	Setting mode 00H : Absolute value specification 01H : Relative value specification
DATA04	Setting Value (Lower ranking 8 bits)
DATA05	Setting Value (Upper ranking 8 bits)

Response: At the time of a success

23H	10H	01H	xxH	02H	DATA01	DATA02	CKS
		(*1)	(*2)				(*3)

Data Portion Contents

DATA01 .. 02	Results 0000H : Normal 0000H Other : Error

Response: At the time of a failure

A3H	10H	01H	xxH	02H	DATA01	DATA02	CKS
		(*1)	(*2)		(*4)		(*3)

Command example:
* Setting Volume to "10"

03H 10H 00H 00H 05H 05H 00H 00H 0AH 00H 27H

030-12. IMAGE MODE ADJUST

****

Function:
This command adjusts the Image Mode.

Command:
03H 10H 00H 00H 05H DATA01 .. DATA05 CKS
(*3)

Data Portion Contents

DATA01 .. 02 Adjustment items

DATA01	DATA02	Adjustment items
18H	00H	Aspect Ratio Input (!)

DATA03 Adjustment mode
00H : Absolute value specification
01H : Relative value specification

DATA04 Adjustment value (Lower ranking 8 bits)
DATA05 Adjustment value (Upper ranking 8 bits)

Response: At the time of a success
23H 10H 01H xxH 02H DATA01 DATA02 CKS
(*1) (*2) (*3)

Data Portion Contents

DATA01 .. 02 Results
0000H : Normal
0000H Other : Error

Response: At the time of a failure
A3H 10H 01H xxH 02H DATA01 DATA02 CKS
(*1) (*2) (*4) (*3)

Command example:
* Setting the Aspect Ratio to Letter Box (Wide Zoom)
03H 10H 00H 00H 05H 18H 00H 00H 01H 00H 31H

(!) Method of Specifying the Absolute Value of Special Adjustment Values

	DATA04	DATA05
Aspect Ratio 4:3 (Window)	00H	00H
Aspect Ratio Normal / Auto (NP600 Series) (NP62 Series)	00H	00H
Aspect Ratio 1.25:1(5:4)	00H	00H
Aspect Ratio Letter Box	01H	00H
Aspect Ratio 1.33:1(4:3)	01H	00H
Aspect Ratio Wide Zoom (NP600 Series) (NP62 Series)	01H	00H
Aspect Ratio Wide Screen	02H	00H
Aspect Ratio 1.78:1(16:9)	02H	00H
Aspect Ratio Cinema / 16:9 (NP600 Series) (NP62 Series)	02H	00H
Aspect Ratio Crop	03H	00H
Aspect Ratio Wide Zoom (NP4000 Series)	03H	00H
Aspect Ratio Native (NP600 Series) (NP62 Series)	03H	00H
Aspect Ratio 1.85:1	03H	00H
Aspect Ratio Zoom	03H	00H
Aspect Ratio 4:3 Fill	04H	00H
Aspect Ratio 4:3 (NP600 Series)	04H	00H
Aspect Ratio 2.35:1	04H	00H
Aspect Ratio Normal	05H	00H
Aspect Ratio Auto (NP4000 Series)	05H	00H
Aspect Ratio 15:9 (NP600 Series)	05H	00H
Aspect Ratio Full	06H	00H
Aspect Ratio 16:10 (NP600 Series)	06H	00H
Aspect Ratio Zoom	07H	00H
Aspect Ratio Letter Box (NP600 Series)	07H	00H
Aspect Ratio Cinema	08H	00H
Aspect Ratio V-Zoom	09H	00H
Aspect Ratio Stadium	0AH	00H
Aspect Ratio 5:4	0BH	00H
Aspect Ratio 16:10	0CH	00H
Aspect Ratio 15:9	0DH	00H
Aspect Ratio Native (NP4000 Series)	0EH	00H

037. INFORMATION REQUEST

****

Function:

This command acquires the projector information.

Command:

03H 8AH 00H 00H 00H 8DH

Response: At the time of a success

23H 8AH 01H xxH 62H DATA01 .. DATA98 CKS

(*1) (*2) (*3)

Data Portion Contents

DATA01 .. 49 : Projector name (NULL termination character string)
DATA50 .. 82 : Reserved
DATA83 .. 86 : Lamp Hour Meter (second) (!)
DATA87 .. 90 : Filter Usage (second)
DATA91 .. 94 : Panel Usage (second)
DATA95 .. 98 : Projector Usage (second)

Response: At the time of a failure

A3H	8AH	01H	xxH	02H	DATA01	DATA02	CKS
		(*1)	(*2)		(*4)	(*3)	

Supplement:
(!) Lamp Hour Meter
This is the timer for normal lamp mode conversion.
Lamp Timer Acquisition Examples

DATA83	DATA84	DATA85	DATA86	: Lamp Timer
00H	00H	00H	00H	: Total 0 seconds
C0H	65H	52H	00H	: Total 5400000 seconds/3600 = 1500 hours
00H	E4H	57H	00H	: Total 5760000 seconds/3600 = 1600 hours

Calculator Procedure
1) Set calculator to HEX
2) Punch in DATA86 DATA85 DATA84 DATA83 (005265C0)
3) Change from HEX to Decimal - value will change to 5400000 seconds

* The projector's hours of use is displayed in terms of Normal mode values.
It is also displayed with truncated a number after decimal point.

037-1. LAMP INFORMATION REQUEST

****

Function:
This command acquires the lamp information (in terms of Normal mode (values) of projector.

Command:

03H	8CH	00H	00H	00H	8FH

Response: At the time of a success

23H	8CH	01H	xxH	10H	DATA01 .. DATA16	CKS
		(*1)	(*2)		(*3)	

Data Portion Contents

DATA01 .. 04 : Lamp Hour Meter(Normal mode) (second)
DATA05 .. 08 : Reserved
DATA09 .. 12 : Lamp Use Warning Starting Time(Normal mode) (second)
DATA13 .. 16 : Lamp Use Prohibited Time(Normal mode) (second)

Response: At the time of a failure

A3H	8CH	01H	xxH	02H	DATA01	DATA02	CKS
		(*1)	(*2)		(*4)	(*3)	

Supplement:

Example for acquiring remaining lamp time (in terms of Normal mode values)

: Lamp Hour Meter (Normal mode)
DATA01 DATA02 DATA03 DATA04
30H 2AH 00H 00H : 10800 seconds

Calculator Procedure
1) Set calculator to HEX
2) Punch in DATA04 DATA03 DATA02 DATA01 (00002A30)
3) Change from HEX to Decimal - value will change to 10800 seconds

: Starting time for lamp usage warning message (in terms of Normal mode values)
DATA09 DATA10 DATA11 DATA12
00H DDH 6DH 00H : 7200000 second

Calculator Procedure
1) Set calculator to HEX
2) Punch in DATA12 DATA11 DATA10 DATA09 (006DDD00)
3) Change from HEX to Decimal - value will change to 7200000 seconds

Lamp remaining time (in terms of Normal mode values)
= (7200000 - 10800) / 3600 = 1997 hour

037-2. LAMP INFORMATION REQUEST 2
****

Function:
This command acquires lamp remaining amount.

Command:
03H 94H 00H 00H 00H 97H

Response: At the time of a success
23H 94H 01H xxH 05H DATA01 .. DATA05 CKS
(*1) (*2) (*3)

Data Portion Contents

DATA01 .. 04 Reserved
DATA05 lamp remaining amount (100% to -10%)

Response: At the time of a failure
A3H 94H 01H xxH 02H DATA01 DATA02 CKS
(*1) (*2) (*4) (*3)

037-4. LAMP INFORMATION REQUEST 3
****

Function:
This command acquires the information on the projector lamp in Eco mode.

Command:
03H 96H 00H 00H 02H DATA01 DATA02 CKS

(*3)

Data Portion Contents

DATA01 Target

00H : Lamp1

01H : Lamp2

DATA02 item

01H : Lamp usage time (second)

04H : lamp remaining amount until lamp warning message (100% to -10%)

08H : Remaining time until lamp warning message starts to appear (in terms of specified values)

09H : Remaining time until lamp warning message starts to appear (in terms of Normal mode values)

0AH : Remaining time until lamp warning message starts to appear (in terms of Eco mode values)

10H : Remaining time until inhibition of lamp usage (in terms of specified values)

11H : Remaining time until inhibition of lamp usage (in terms of Normal mode values)

12H : Remaining time until inhibition of lamp usage (in terms of Eco mode values)

Response: At the time of a success

23H 96H 01H xxH 06H DATA01 .. DATA06 CKS

(*1) (*2) (*3)

Data Portion Contents

DATA01 same values as DATA01 of the command

DATA02 same values as DATA02 of the command

DATA03 .. 06 Acquired information

Response: At the time of a failure

A3H 96H 01H xxH 02H DATA01 DATA02 CKS

(*1) (*2) (*4) (*3)

Supplement:

* In case of acquiring lamp's use of hours

03H 96H 00H 00H 02H 00H 01H 9CH

Example of acquisition

DATA03 DATA04 DATA05 DATA06: lamp's use of hours

50H 46H 00H 00H: 18000 seconds

Calculator Procedure

1) Set calculator to HEX

2) Punch in DATA06 DATA05 DATA04 DATA03 (00004650)

3) Change from HEX to Decimal - value will change to 18000 seconds

Lamp's use of hours = 18000/3600 = 5 hours

* In case of acquiring the remaining time until lamp warning message starts to appear (in terms of specified values)

03H 96H 00H 00H 02H 00H 08H A3H

Example of acquisition
DATA03 DATA04 DATA05 DATA06: Remaining time
40H 7EH 05H 00H: 360000 seconds

Calculator Procedure
1) Set calculator to HEX
2) Punch in DATA06 DATA05 DATA04 DATA03 (00057E40)
3) Change from HEX to Decimal - value will change to 360000 seconds

Remaining time until lamp warning message starts to appear
= 360000/ 3600= 100 hours

038. LAMP MODE REQUEST

****

Function:
This command acquires the setting of the lamp mode of projector.

Command:

03H	B0H	00H	00H	01H	07H	BBH

Response: At the time of a success

23H	B0H	01H	xxH	02H	DATA01	DATA02	CKS
		(*1)	(*2)				(*3)

Data Portion	Contents
DATA01	07H fixed
DATA02	Setting Value 00H : Normal 01H : Eco

Response: At the time of a failure

A3H	B0H	01H	xxH	02H	DATA01	DATA02	CKS
		(*1)	(*2)		(*4)		(*3)

039. LAMP MODE SET

****

Function:
This command sets the lamp mode of projector.

Command:

03H	B1H	00H	00H	02H	DATA01	DATA02	CKS
							(*3)

Data Portion	Contents
DATA01	07H fixed
DATA02	Setting Value 00H : Normal 01H : Eco

Response: At the time of a success

```
  23H  B1H  01H  xxH  02H  DATA01  DATA02  CKS
               (*1)   (*2)                  (*3)

  Data Portion     Contents
  ------------------------------------------------------------
  DATA01           07H fixed
  DATA02           Results
                   00H : Normal
                   01H : Error
```

Response: At the time of a failure

```
  A3H  B1H  01H  xxH  02H  DATA01  DATA02  CKS
               (*1)   (*2)          (*4)      (*3)
```

046. WXGA MODE SETTING REQUEST

****

Function:
This command acquires the setting of the WXGA Mode of projector.

Command:

```
  03H  B0H  00H  00H  01H  C3H  77H
```

Response: At the time of a success

```
  23H  B0H  01H  xxH  02H  DATA01  DATA02  CKS
               (*1)   (*2)                  (*3)

  Data Portion     Contents
  ------------------------------------------------------------
  DATA01            C3H fixed
  DATA02           Setting Value
                   00H : OFF
                   01H : ON
```

Response: At the time of a failure

```
  A3H  B0H  01H  xxH  02H  DATA01  DATA02  CKS
               (*1)   (*2)          (*4)      (*3)
```

049. WXGA MODE SETTING SET

****

Function:
This command sets the WXGA Mode of projector.

Command:

```
  03H  B1H  00H  00H  02H  DATA01  DATA02  CKS
                                           (*3)

  Data Portion     Contents
  ------------------------------------------------------------
  DATA01            C3H fixed
  DATA02           Setting Value
                   00H : OFF
```

01H : ON

Response: At the time of a success

23H	B1H	01H	xxH	02H	DATA01	DATA02	CKS
		(*1)	(*2)				(*3)

Data Portion	Contents
DATA01	C3H fixed
DATA02	Results 00H : Normal 01H : Error

Response: At the time of a failure

A3H	B1H	01H	xxH	02H	DATA01	DATA02	CKS
		(*1)	(*2)		(*4)		(*3)

==========

6. Response

---

* At the time of a success(ACK)

This returns ACK without adding data portion to the command that does not request data.
This returns ACK with adding data to the data portion for the command that requests data.

* At the time of a failure(NAK)

This adds a cause of not accepting the command to data portion to return it.

(Example) Power On

Command:

02H	00H	00H	00H	00H	CKS

Response:

A2H	00H	01H	40H	02H	DATA01	DATA02	CKS

==========

7. Table of Response Error Codes

DATA01	DATA2	
Error Types	Error description	Error contents
00H	00H	Unknown command.
00H	01H	This current model does not support this function.
01H	00H	Invalid values specified.
01H	01H	Specified terminal is unavailable or cannot be selected.
02H	03H	Setting not possible.
02H	0DH	Power Off inhibited.

050. REMOTE KEY CODE

****

Function:

This command sends remote control key codes of projector.

Command:

02H 0FH 00H 00H 02H DATA01 DATA02 CKS

(*3)

Data Portion Contents

DATA01 .. 02 : Remote control key code (Word type)

Key number	DATA01	DATA02	Key name
1	01H	00H	POWER
2	02H	00H	POWER ON (!!)
3	03H	00H	POWER OFF (!!)
4	04H	00H	SOURCE (AUTO) (!!)
5	05H	00H	AUTO (!) (!!)
6	06H	00H	MENU (!!) (!!!)
7	07H	00H	UP (!!) (!!!)
8	08H	00H	DOWN (!!) (!!!)
9	09H	00H	RIGHT (!!) (!!!)
10	0AH	00H	LEFT (!!) (!!!)
11	0BH	00H	ENTER (!!) (!!!)
12	0CH	00H	CANCEL (!!) (!!!)
13	0DH	00H	HELP (!!) (!!!)
14	0EH	00H	POINTER
15	0FH	00H	MAGNIFY UP
16	10H	00H	MAGNIFY DOWN
17	11H	00H	PICTURE MUTE
18	12H	00H	SOUND MUTE
19	13H	00H	MUTE (!!)
20	14H	00H	FOCUS UP
21	15H	00H	FOCUS DOWN
22	16H	00H	ZOOM UP
23	17H	00H	ZOOM DOWN
30	1EH	00H	STORE
31	1FH	00H	MUTE ALL OFF
37	25H	00H	R
38	26H	00H	G
39	27H	00H	B
40	28H	00H	OSD MUTE
41	29H	00H	PICTURE
42	2AH	00H	WHITE BAL
43	2BH	00H	IMAGE
44	2CH	00H	TEST
45	2DH	00H	UNDO
46	2EH	00H	1
47	2FH	00H	2
48	30H	00H	3
49	31H	00H	4
50	32H	00H	5
51	33H	00H	6
52	34H	00H	7

53	35H	00H	8
54	36H	00H	9
55	37H	00H	0
56	38H	00H	POSITION
57	39H	00H	INFO.
58	3AH	00H	PIXEL
59	3BH	00H	KEYSTONE
60	3CH	00H	AMPLITUDE
61	3DH	00H	INPUT LIST
71	47H	00H	PICMUTE ON (!!)
72	48H	00H	PICMUTE OFF (!!)
73	49H	00H	SNDMUTE ON (!!)
74	4AH	00H	SNDMUTE OFF (!!)
75	4BH	00H	RGB1(*5) (!!)
76	4CH	00H	RGB2(*5)
77	4DH	00H	RGB3
78	4EH	00H	YCBCR
79	4FH	00H	VIDEO1 (!!)
80	50H	00H	VIDEO2
81	51H	00H	S-VIDEO1 (!!)
82	52H	00H	S-VIDEO2
83	53H	00H	DIGITAL1
84	54H	00H	DIGITAL2
85	55H	00H	PC CARD
96	60H	00H	BS
132	84H	00H	VOLUME UP (!!)
133	85H	00H	VOLUME DOWN (!!)
134	86H	00H	KEYSTONE UP (!!)
135	87H	00H	KEYSTONE DOWN (!!)
136	88H	00H	SLIDE UP
137	89H	00H	SLIDE DOWN
138	8AH	00H	FREEZE (!!)
158	9EH	00H	FILE
159	9FH	00H	PAGE
163	A3H	00H	ASPECT (!!)
164	A4H	00H	VIDEO3
165	A5H	00H	VIDEO4
166	A6H	00H	S-VIDEO3
167	A7H	00H	S-VIDEO4
200	C8H	00H	ZOOM
201	C9H	00H	FOCUS
214	D6H	00H	3D REFORM
215	D7H	00H	SOURCE (!!)
216	D8H	00H	RGB(*5) oggle (!!)
217	D9H	00H	VIDEO Toggle (!!)
218	DAH	00H	3D REFORM RESET
221	DDH	00H	AUTO (SHORT)
222	DEH	00H	AUTO (LONG)
223	DFH	00H	PICTURE MANAGEMENT (!!)
225	E1H	00H	COMPONENT (!!)
226	E2H	00H	ZOOM POS UP (HT)
227	E3H	00H	ZOOM POS DOWN (HT)
228	E4H	00H	DVI/DVI (DIGITAL) (*6) (!!)
229	E5H	00H	LAN
232	E8H	00H	D ZOOM UP (WT)
233	E9H	00H	D ZOOM DOWN (WT)
237	EDH	00H	PSCODE(Passcode screen will be displayed at once)
238	EEH	00H	LAMP MODE (!!!)

Response: At the time of a success

22H	0FH	01H	xxH	01H	DATA01	CKS
		(*1)	(*2)		(*3)	

Data Portion Contents

DATA01	Results
	00H : Normal
	FFH : Error

Response: At the time of a failure

A2H	0FH	01H	xxH	02H	DATA01	DATA02	CKS
		(*1)	(*2)		(*4)		(*3)

(!) About AUTO key
The MT series model with the built-in image sensor does not support the AUTO key. Use the AUTO (SHORT) key.

(!!) HT10 series, LT180, LT30 series, NP40 series and NP4000 series
(!!!) VT60 series, VT70 series, VT80 series, and VT90 series

Command example:

* Sending the AUTO key code
  02H 0FH 00H 00H 02H 05H 00H 18H

* Sending the AUTO (SHORT) key code
  02H 0FH 00H 00H 02H DDH 00H F0H

---

* cycle/toggle volume mute
* cycle/toggle picture mute
* cycle/toggle picture freeze

02H 0FH 00H 00H 02H DATA01 DATA02 CKS

Data Portion Contents

DATA01/DATA02	12H/00H : Volume mute
DATA01/DATA02	11H/00H : Picture mute
DATA01/DATA02	8AH/00H : Picture freeze

---

* cycle aspect ratio

02H 0FH 00H 00H 02H DATA01 DATA02 CKS

Data Portion Contents

DATA01/DATA02	A3H/00H : Aspect Ratio

---

* all menu functionality (digits 0-9, cursor movement, enter, select, return, back, clear, etc)

02H 0FH 00H 00H 02H DATA01 DATA02 CKS

060. GAIN PARAMETER REQUEST 2

****

Function:

This command acquires the adjustment values.

Command:

03H	04H	00H	00H	03H	DATA01 .. DATA03	CKS
						(*3)

Data Portion	Contents
DATA01 .. 02	Acquirement items (!)
DATA03	00H fixed

Response: At the time of a success

23H	04H	01H	xxH	0DH	DATA01 .. DATA13	CKS
		(*1)	(*2)			(*3)

Data Portion	Contents
DATA01	Adjustment status 00H : Displaying impossible 01H : Adjustment impossible 02H : Adjustment possible FFH : Selected gain is not available.
DATA02	Maximum adjustment value (Lower ranking 8 bits)
DATA03	Maximum adjustment value (Upper ranking 8 bits)
DATA04	Minimum adjustment value (Lower ranking 8 bits)
DATA05	Minimum adjustment value (Upper ranking 8 bits)
DATA06	Default adjustment value (Lower ranking 8 bits)
DATA07	Default adjustment value (Upper ranking 8 bits)
DATA08	Current value (Lower ranking 8 bits)
DATA09	Current value (Upper ranking 8 bits)
DATA10 .. 13	Reserved

Response: At the time of a failure

A3H	04H	01H	xxH	02H	DATA01	DATA02	CKS
		(*1)	(*2)		(*4)		(*3)

(!) Acquirement items		
DATA01	DATA02	Acquirement name
00H	00H	Picture / Brightness
01H	00H	Picture / Contrast
02H	00H	Picture / Color
03H	00H	Picture / Hue
04H	00H	Picture / Sharpness
05H	00H	Volume
05H	01H	Sound / Bass
05H	02H	Sound / Treble
06H	00H	Blanking / Top
06H	01H	Blanking / Bottom
06H	02H	Blanking / Left
06H	03H	Blanking / Right
06H	04H	Blanking / On/Off
07H	00H	Image / Auto Adjust
08H	00H	Image / Position H
08H	01H	Image / Position V
09H	00H	Image / Pixel Adjust Clock
09H	01H	Image / Pixel Adjust Phase
0AH	00H	Image / Video Filter
0BH	00H	Image / Resolution
0CH	00H	Image / Amplitude H
0CH	01H	Image / Amplitude V
0DH	00H	Image / Input Signal Size H
0DH	01H	Image / Input Signal Size V
0EH	00H	Image / Output Signal Size H
0EH	01H	Image / Output Signal Size V
0FH	00H	Image / Output Position H
0FH	01H	Image / Output Position V
10H	00H	Image / Sync Protection Upper
10H	01H	Image / Sync Protection Lower
13H	00H	Color Temperature
14H	00H	White Balance / Brightness R
14H	01H	White Balance / Brightness G
14H	02H	White Balance / Brightness B
14H	03H	White Balance / Contrast R
14H	04H	White Balance / Contrast G
14H	05H	White Balance / Contrast B
15H	00H	Keystone H
15H	01H	Keystone V
16H	00H	Video Mode Gamma
18H	00H	Aspect Ratio / Input Signal
18H	01H	Aspect Ratio / Display Area
19H	00H	Motion Level
1AH	00H	Noise Reduction / Luminance
1BH	00H	Noise Reduction / Chrominance
1CH	00H	Select Color Matrix
1DH	00H	V-Aperture / Vertical Detail
21H	00H	W/B Compress White
21H	01H	W/B Compress Black / Black Expansion
22H	00H	Telecine
23H	00H	Y/C Delay
24H	00H	Dithering
25H	00H	VD Delay / Adjustment
25H	01H	VD Delay / Field Invert
25H	02H	VD Delay / Offset
26H	00H	Motion Select
27H	00H	Select Color Matrix Type
28H	00H	YTR Adjustment / Gain
28H	01H	YTR Adjustment / Tap
28H	02H	YTR Adjustment / Gain2
28H	03H	YTR Adjustment / Tap2
29H	00H	CTR Adjustment / Gain
29H	01H	CTR Adjustment / Tap
29H	02H	CTR Adjustment / Gain2
29H	03H	CTR Adjustment / Tap2
2AH	00H	Sharpness Tap
2BH	00H	White Correct / Position
2BH	01H	White Correct / Gain
2CH	00H	Black Correct / Position
2CH	01H	Black Correct / Gain
2CH	02H	Black Correct / Inv Gain
2DH	00H	Lamp Output
2EH	00H	Signal Level / Auto Control
2FH	00H	Signal Level / R/G/B Gain R
2FH	01H	Signal Level / R/G/B Gain G
2FH	02H	Signal Level / R/G/B Gain B
30H	00H	Signal Level / Y/Cb/Cr Gain Y
30H	01H	Signal Level / Y/Cb/Cr Gain Cb
30H	02H	Signal Level / Y/Cb/Cr Gain Cr
31H	00H	Signal Level / Y/Pb/Pr Gain Y
31H	01H	Signal Level / Y/Pb/Pr Gain Pb
31H	02H	Signal Level / Y/Pb/Pr Gain Pr
33H	00H	Clamp Timing
33H	01H	Clamp Timing / Adjust
34H	00H	Convergence / Red H
34H	01H	Convergence / Red V
34H	02H	Convergence / Green H
34H	03H	Convergence / Green V
34H	04H	Convergence / Blue H
34H	05H	Convergence / Blue V
35H	00H	Switcher Gain / R
35H	01H	Switcher Gain / G
35H	02H	Switcher Gain / B
36H	00H	Switcher Gain / Volume
37H	00H	Panel Size / H
37H	01H	Panel Size / V
38H	00H	Panel Position / H
38H	01H	Panel Position / V
39H	00H	Signal Level / White Gain
3AH	00H	Ref. White Bal. / Brightness R
3AH	01H	Ref. White Bal. / Brightness G
3AH	02H	Ref. White Bal. / Brightness B
3AH	03H	Ref. White Bal. / Contrast R
3AH	04H	Ref. White Bal. / Contrast G
3AH	05H	Ref. White Bal. / Contrast B
3BH	00H	Overscan
3CH	00H	Edge
3DH	00H	Synchronize / Off/On
3DH	01H	Synchronize / Adjust
3EH	00H	Input Signal Position / H
3EH	01H	Input Signal Position / V
3FH	00H	Signal Type
40H	00H	Color Correct / On/Off
40H	01H	Color Correct / G-R Gain
40H	02H	Color Correct / G-B Gain
40H	03H	Color Correct / B-R Gain
40H	04H	Color Correct / B-G Gain
40H	05H	Color Correct / R-G Gain
40H	06H	Color Correct / R-B Gain
40H	07H	Color Correct / U Gain
40H	08H	Color Correct / V Gain
41H	00H	HD Delay
42H	00H	Ref. Pedestal Level / U Level
42H	01H	Ref. Pedestal Level / V Level
43H	00H	Stack Clock
44H	00H	Sub Brightness / R
44H	01H	Sub Brightness / G
44H	02H	Sub Brightness / B
45H	00H	Y Contrast
46H	00H	Y Gamma Correction
47H	00H	Setup Level
47H	01H	Setup Level / Adjust
47H	02H	Setup Level / Correction
48H	00H	DCL
49H	00H	Color Space
4AH	00H	RGB Sharpness
4BH	00H	F-CLK Phase
4CH	00H	Color Correction / Mode
4CH	01H	Color Correction / Color Tune
4CH	02H	Color Correction / Yellow
4CH	03H	Color Correction / Magenta
4CH	04H	Color Correction / Cyan
4CH	05H	Color Correction / White
4CH	06H	Color Correction / Color Tune

4CH	07H	Color Correction / Yellow
4CH	08H	Color Correction / Magenta
4CH	09H	Color Correction / Cyan
4CH	0AH	Color Correction / White
4DH	00H	Through
4EH	00H	Ref. Auto White / Color Temp R
4EH	01H	Ref. Auto White / Color Temp G
4EH	02H	Ref. Auto White / Color Temp B
4FH	00H	Position
50H	00H	Screen Position
51H	00H	Sweet Vision
51H	01H	Sweet Vision / Split
52H	00H	Sub Color / R
52H	01H	Sub Color / G
52H	02H	Sub Color / B
53H	00H	Picture Management
54H	00H	Color Correction 2 Red
54H	01H	Color Correction 2 Green
54H	02H	Color Correction 2 Blue
54H	03H	Color Correction 2 Yellow
54H	04H	Color Correction 2 Magenta
54H	05H	Color Correction 2 Cyan
54H	06H	Color Correction 2 Color Gain
55H	00H	Color Temperature(Enable)
56H	00H	White Peaking
57H	00H	3D Y/C Separation
58H	00H	Deinterlace
59H	00H	Base Setting
5AH	00H	Cornerstone T-Left H
5AH	01H	Cornerstone T-Left V
5AH	02H	Cornerstone T-Right H
5AH	03H	Cornerstone T-Right V
5AH	04H	Cornerstone B-Right H
5AH	05H	Cornerstone B-Right V
5AH	06H	Cornerstone B-Left H
5AH	07H	Cornerstone B-Left V
5AH	08H	Cornerstone Execute
5BH	00H	Contrast Enhancement
5CH	00H	Variable Y/C Delay
5DH	00H	Tint Correction
5EH	00H	Y Gamma
5FH	00H	Ref. Color Cor. / Red
5FH	01H	Ref. Color Cor. / Green
5FH	02H	Ref. Color Cor. / Blue
5FH	03H	Ref. Color Cor. / Yellow
5FH	04H	Ref. Color Cor. / Magenta
5FH	05H	Ref. Color Cor. / Cyan
5FH	06H	Ref. Color Cor. / Color Gain
60H	00H	Saturation
61H	00H	Pincushion / Horizontal
61H	01H	Pincushion / Vertical
61H	02H	Pincushion / Balance
62H	00H	Digital Zoom / Zoom
62H	01H	Digital Zoom / Horizontal Position
62H	02H	Digital Zoom / Vertical Position
63H	00H	White Bal. Dual / Brightness R
63H	01H	White Bal. Dual / Brightness G
63H	02H	White Bal. Dual / Brightness B
63H	03H	White Bal. Dual / Contrast R
63H	04H	White Bal. Dual / Contrast G
63H	05H	White Bal. Dual / Contrast B
64H	00H	White Bal. Lamp1 / Brightness R
64H	01H	White Bal. Lamp1 / Brightness G
64H	02H	White Bal. Lamp1 / Brightness B
64H	03H	White Bal. Lamp1 / Contrast R
64H	04H	White Bal. Lamp1 / Contrast G
64H	05H	White Bal. Lamp1 / Contrast B
65H	00H	White Bal. Lamp2 / Brightness R
65H	01H	White Bal. Lamp2 / Brightness G
65H	02H	White Bal. Lamp2 / Brightness B
65H	03H	White Bal. Lamp2 / Contrast R
65H	04H	White Bal. Lamp2 / Contrast G
65H	05H	White Bal. Lamp2 / Contrast B
66H	00H	Color Cor. Dual / Red
66H	01H	Color Cor. Dual / Green
66H	02H	Color Cor. Dual / Blue
66H	03H	Color Cor. Dual / Yellow
66H	04H	Color Cor. Dual / Magenta
66H	05H	Color Cor. Dual / Cyan
66H	06H	Color Cor. Dual / Color Gain
67H	00H	Color Cor. Lamp1 / Red
67H	01H	Color Cor. Lamp1 / Green
67H	02H	Color Cor. Lamp1 / Blue
67H	03H	Color Cor. Lamp1 / Yellow
67H	04H	Color Cor. Lamp1 / Magenta
67H	05H	Color Cor. Lamp1 / Cyan
67H	06H	Color Cor. Lamp1 / Color Gain
68H	00H	Color Cor. Lamp2 / Red
68H	01H	Color Cor. Lamp2 / Green
68H	02H	Color Cor. Lamp2 / Blue
68H	03H	Color Cor. Lamp2 / Yellow
68H	04H	Color Cor. Lamp2 / Magenta
68H	05H	Color Cor. Lamp2 / Cyan
68H	06H	Color Cor. Lamp2 / Color Gain
90H	00H	Picture Preset
91H	00H	SweetVision Mode
92H	00H	SweetVision Level
94H	00H	Vertical Enhancer
95H	00H	I/P Converter
96H	00H	Lamp Mode Adjust
97H	00H	Wall Color
Command example:		
* In case of acquiring Picture Brightness		
03H 04H 00H 00H 03H 00H 00H 00H 0AH		

077. MUTE CONTROL

****

Function:
This command controls the mute of picture, sound and on-screen.

Command:

02H	1AH	00H	00H	02H	DATA01	DATA02	CKS
							(*3)

Data Portion	Contents
DATA01	Setting items 00H : Picture 01H : Sound 02H : On-Screen
DATA02	Setting Value 00H : OFF 01H : ON

Response: At the time of a success

22H	1AH	01H	xxH	01H	DATA01	CKS
		(*1)	(*2)			(*3)

Data Portion	Contents
DATA01	Results 00H : Normal 01H : Error

Response: At the time of a failure

A2H	1AH	01H	xxH	02H	DATA01	DATA02	CKS
		(*1)	(*2)		(*4)		(*3)

Supplement:
* Sound mute is cancelled in the following cases:
  Input connector switching
  Video signal switching
  Volume adjustment

078-1. SETTING REQUEST

****

Function:
This command acquires the function information of projector.

Command:

00H	85H	00H	00H	01H	00H	86H

Response: At the time of a success

20H	85H	01H	xxH	20H	DATA01 ..	DATA32	CKS
		(*1)	(*2)				(*3)

Data Portion Contents

DATA01 .. 03 Projector type

DATA01	DATA02	DATA03	
01H	00H	03H	MT1060/MT1065
01H	01H	03H	MT860
01H	02H	03H	MT1075
01H	00H	06H	NP1000/NP2000
02H	00H	03H	LT240/LT260
02H	01H	03H	LT220
02H	02H	03H	LT240K/LT260K
02H	00H	05H	LT245/LT265
02H	00H	06H	LT380
02H	01H	06H	LT280
03H	00H	06H	VT80 Series
03H	00H	07H	VT90 Series
04H	00H	01H	GT1150
04H	01H	01H	GT2150
04H	00H	03H	GT5000
04H	01H	03H	GT6000
05H	00H	03H	HT1000
06H	00H	03H	WT600
06H	00H	05H	WT610/WT615
08H	00H	07H	NP4000/NP4001
10H	00H	08H	VT700
10H	00H	09H	NP600
10H	01H	09H	NP500
10H	02H	09H	NP500 W
10H	03H	09H	NP400
10H	04H	09H	NP300
11H	00H	00H	NP41/61
11H	01H	00H	NP62
12H	00H	08H	NP1150/NP2150/NP3150
12H	01H	08H	NP3151W
12H	00H	09H	NP905
12H	01H	09H	NP901W
12H	02H	09H	VT800

DATA04 Sound function

00H : Not available

01H : Available

DATA05 Calendar function

00H : No function

01H or 03H : Timer function, sleep timer function

02H : Sleep timer function

DATA06 .. 32 Reserved

Response: At the time of a failure

A0H 85H 01H xxH 02H DATA01 DATA02 CKS
(*1) (*2) (*4) (*3)

078-2. RUNNING STATUS REQUEST

****

Function:
This command acquires the status of the projector operation.

Command:
00H 85H 00H 00H 01H 01H 87H

Response: At the time of a success
20H 85H 01H xxH 10H DATA01 .. DATA16 CKS
(*1) (*2) (*3)

Data Portion Contents

DATA01 .. 02 Reserved
DATA03 Projector status
00H : Idling
01H : Power On

DATA04 Cooling processing
00H : No execution(Normal condition)
01H : During execution

DATA05 Power On/Off processing
00H : No execution(Normal condition)
01H : During execution

DATA06 Status of operation
00H : Idling
04H : Power On
05H : Cooling
06H : Idling(Error occurrence)
Other than above : (nondisclosure)
Internal use of code during a state transition period

DATA07 PC Card insertion
00H : Not inserted
01H : Inserted

DATA08 USB Mouse connection
00H : Not connected
01H : Connected

DATA09 .. 16 Reserved

Response: At the time of a failure
A0H 85H 01H xxH 02H DATA01 DATA02 CKS
(*1) (*2) (*4) (*3)

078-3. INPUT STATUS REQUEST

****

Function:
This command acquires the status of input signal of the projector.

Command:
00H 85H 00H 00H 01H 02H 88H

Response: At the time of a success
20H 85H 01H xxH 10H DATA01 .. DATA16 CKS
(*1) (*2) (*3)

Data Portion Contents

DATA01 Selecting signal processing
00H : No execution(Normal condition)
01H : During execution

DATA02 Signal number(Entry list number - 1)
0 .. 199

DATA03 .. 04 Selected input terminal

Terminal name	DATA03	DATA04
RGB1(RGB)(*5)	01H	01H
RGB2(*5)	02H	01H
DVI(Analog)	02H	01H
Video	01H	02H
S-Video	01H	03H
Component	02H	04H
Component	03H	04H
DVI(*6)	01H	06H
DVI(DIGITAL)(*6)	01H	06H
HDMI	01H	06H
Viewer	01H	07H
LAN	02H	07H
Slot1-1	01H	08H
Slot1-2	02H	08H
Slot2-1	01H	09H
Slot2-2	02H	09H
RGB(Video)	02H	02H
RGB(S-Video)	02H	03H

DATA05 Entry list type
01H : Default
02H : User

DATA06 Test pattern display
00H : No display(Normal condition)
01H : Displaying

DATA07 ..08 Reserved

DATA09 Indicate Contents

00H = Picture signal displaying
01H = No signal
02H = Viewer displaying
03H = Test pattern displaying
04H = LAN displaying

DATA10 .. 16 Reserved

Response: At the time of a failure

A0H	85H	01H	xxH	02H	DATA01	DATA02	CKS
		(*1)	(*2)		(*4)		(*3)

078-4. MUTE STATUS REQUEST

****

Function:
This command acquires the status of the mute of projector.

Command:

00H	85H	00H	00H	01H	03H	89H

Response: At the time of a success

20H	85H	01H	xxH	10H	DATA01 ..	DATA16	CKS
		(*1)	(*2)				(*3)

Data Portion Contents

DATA01 Picture mute
00H : OFF
01H : ON

DATA02 Sound mute
00H : OFF
01H : ON

DATA03 On-screen mute
00H : OFF
01H : ON

DATA04 Forced on-screen mute
00H : OFF
01H : ON

DATA05 On-screen display
00H : No display
01H : Displaying

DATA06 .. 16 Reserved

Response: At the time of a failure

A0H	85H	01H	xxH	02H	DATA01	DATA02	CKS
		(*1)	(*2)		(*4)		(*3)

078-5. MODEL NAME REQUEST

****

Function:

This command acquires the model name of the projector.

Command:

00H 85H 00H 00H 01H 04H 8AH

Response: At the time of a success

20H 85H 01H xxH 20H DATA01 .. DATA32 CKS

(*1) (*2) (*3)

Data Portion Contents

DATA01 .. 32 Model name (NULL termination character string)

Response: At the time of a failure

A0H 85H 01H xxH 02H DATA01 DATA02 CKS

(*1) (*2) (*4) (*3)

==========

6. Table of Response Error Codes

DATA01	DATA02	
Error types	Error descriptio	Error contents
00H	00H	Unknown command
00H	01H	The current model does not support this function.
01H	00H	Unvalid values specified.
01H	01H	Specified terminal is unavailable or cannot be selected.
01H	02H	Selected language is not available.
02H	00H	Available memory reservation error
02H	02H	Operating memory
02H	03H	Setting not possible
02H	04H	On Forced on-screen mute mode
02H	06H	Displaying a signal other than PC Viewer
02H	07H	-No signal-
02H	08H	Displaying a test pattern or PC Card files screen.
02H	09H	No PC card is inserted
02H	0AH	Memory operation failed
02H	0CH	Displaying the Entry List
02H	0DH	Power Off inhibited
02H	0EH	Execution error
02H	0FH	No operation authority
03H	00H	Specified gain number is wrong
03H	01H	Selected gain is not available.
03H	02H	Adjustment failed

[079. FREEZE CONTROL]
****

Function:
This command controls the freeze.

Command:
01H 98H 00H 00H 01H DATA01 CKS

Operation types
DATA01: 00H : Reserved
01H : Freeze start
02H : Freeze cancel

Response: At the time of a success
21H 98H ID *0H 01H DATA01 CKS

Data Portion Contents

DATA01	Results
	00H : Normal
	01H : Error

Response: At the time of a failure

A1H	98H	01H	xxH	02H	DATA01	DATA02	CKS
		(*1)	(*2)		(*4)	(*3)	

097-198. PIP/SIDE BY SIDE REQUEST
****

Function:
This command acquires the setting of the PIP/SIDE BY SIDE of projector.

Command:
03H B0H 00H 00H 02H DATA01 DATA02 CKS

Data Portion Contents

DATA01	C5H fixed
DATA02	Acquisition Object
	00H : MODE
	01H : POSITION
	02H : SOURCE

Response: At the time of a success

23H	B0H	01H	xxH	03H	DATA01	DATA02	DATA03	CKS
		(*1)	(*2)				(*3)	

Data Portion Contents

DATA01	C5H fixed
DATA02	Acquisition item(Same as DATA02 of the transmit data)
DATA03	Setting Value

if DATA02 is MODE(00H)
00H : PIP
01H : SIDE BY SIDE
if DATA02 is POSITION(01H)
00H : TOP-LEFT
01H : TOP-RIGHT
02H : BOTTOM-LEFT
03H : BOTTOM-RIGHT
if DATA02 is SOURCE(02H)
00H : OFF
01H : VIDEO
02H : S-VIDEO

Response: At the time of a failure

A3H	B0H	01H	xxH	02H	DATA01	DATA02	CKS
		(*1)	(*2)		(*4)	(*3)	

098-198. PIP/SIDE BY SIDE SET

****

Function:
This command sets the PIP/SIDE BY SIDE of projector.

Command:

03H	B1H	00H	00H	03H	DATA01	DATA02	DATA03	CKS

Data Portion	Contents
DATA01	C5H fixed
DATA02	Update target 00H : MODE 01H : POSITION 02H : SOURCE
DATA03	Setting Value if DATA02 is MODE(00H) 00H : PIP 01H : SIDE BY SIDE if DATA02 is POSITION(01H) 00H : TOP-LEFT 01H : TOP-RIGHT 02H : BOTTOM-LEFT 03H : BOTTOM-RIGHT if DATA02 is SOURCE(02H) 00H : OFF 01H : VIDEO 02H : S-VIDEO

Response: At the time of a success

23H	B1H	01H	xxH	03H	DATA01	DATA02	DATA03	CKS
		(*1)	(*2)				(*3)	

Data Portion	Contents
DATA01	00H fixed
DATA02	Update target (Same as DATA02 of the transmit data)

DATA03 Results
00H : Normal
01H : Error

Response: At the time of a failure

A3H	B1H	01H	xxH	02H	DATA01	DATA02	CKS
		(*1)	(*2)		(*4)		(*3)

110. AUTO FUNCTIONS EXECUTE

****

Function:
This command executes the auto functions.

Command:

03H	B6H	00H	00H	01H	DATA01	CKS
						(*3)

Data Portion Contents

DATA01 Execution items

	Focus
00H	!
01H	*

!: According to projector setting
*: Executing

Response: At the time of a success

23H	B6H	01H	xxH	02H	DATA01	DATA02	CKS
		(*1)	(*2)				(*3)

Data Portion Contents

DATA01 Execution items (Same as DATA01 of the transmit data)
DATA02 Results
00H : Normal
01H : Error

Response: At the time of a failure

A3H	B6H	01H	xxH	02H	DATA01	DATA02	CKS
		(*1)	(*2)		(*4)		(*3)

111. AUTO ADJUST EXECUTE2

****

Function:
This command executes the Auto Adjust.

Command:
  03H BAH 00H 00H 01H 00H BEH

Response: At the time of a success
  23H BAH 01H xxH 01H 00H CKS
               (*1) (*2)   (*3)

Response: At the time of a failure
  A3H BAH 01H xxH 02H DATA01 DATA02 CKS
               (*1) (*2)   (*4)   (*3)

305-1. BASE MODEL TYPE REQUEST
****

Function:
This command acquires the projector type.

Command:
  00H BFH 00H 00H 01H 00H C0H

Response: At the time of a success
  20H BFH 01H xxH 10H DATA01 ... DATA16 CKS
               (*1) (*2)   (*3)

  Data Portion Contents

  DATA01   00H fixed
  DATA02 ... 03   Projector type
                  See DATA13...14
  DATA04 ... 12   Model name (NULL termination character string)
  DATA13 ... 14   Projector type

DATA02	DATA03	DATA13	DATA14	
00H	01H	00H	03H	MT1060/1065
00H	01H	02H	03H	MT860
00H	01H	02H	03H	MT1075
00H	01H	00H	06H	NP1000/NP2000
00H	02H	00H	03H	LT240/LT260
00H	02H	01H	03H	LT220
00H	02H	02H	03H	LT260K
00H	02H	00H	05H	LT245/LT265
00H	02H	00H	06H	LT380
00H	02H	01H	06H	LT280
02H	02H	00H	05H	LT180
02H	02H	00H	06H	LT25/LT30/LT35
02H	02H	00H	07H	NP40/NP50/NP60
00H	03H	00H	04H	VT770
01H	03H	00H	06H	VT80 Series
01H	03H	00H	07H	VT90 Series
00H	04H	00H	03H	GT5000
00H	04H	01H	03H	GT6000
00H	04H	02H	03H	GT6000R
00H	05H	00H	03H	HT1000
00H	05H	00H	04H	HT1100
02H	05H	00H	05H	HT410
02H	05H	00H	05H	HT510
00H	06H	00H	03H	WT600
00H	06H	00H	05H	WT610/WT615
03H	08H	00H	07H	NP4000/NP4001
01H	10H	00H	08H	VT700
FFH	10H	00H	09H	NP600
FFH	10H	01H	09H	NP500
FFH	10H	02H	09H	NP500W
FFH	10H	03H	09H	NP400
FFH	10H	04H	09H	NP300
FFH	11H	00H	00H	NP41/61
FFH	11H	01H	00H	NP62
FFH	12H	00H	08H	NP1150/NP2150/NP3150
FFH	12H	01H	08H	NP3151W
FFH	12H	00H	09H	NP905
FFH	12H	01H	09H	NP901W
FFH	12H	02H	09H	VT800

DATA15 ... 16 Reserved

Response: At the time of a failure

A0H	BFH	01H	xxH	02H	DATA01	DATA02	CKS
		(*1)	(*2)		(*4)		(*3)

305-3. PROJECTOR INFORMATION REQUEST

****

Function:
This command acquires basic operation states of projector.

Command:
00H BFH 00H 00H 01H 02H C2H

Response: At the time of a success

20H	BFH	01H	xxH	10H	DATA01	...	DATA16	CKS
		(*1)	(*2)				(*3)	

Data Portion Contents

DATA01 02H fixed

DATA02 Projector Processing Status
- 00H : Idle
- 04H : Power On
- 05H : Cooling
- 06H : Idle(Error Standby)
- Other : Not Support

Other than above : (nondisclosure)
Internal use of code during a state transition period

DATA03 Indicate Contents
- 00H : Picture signal displaying
- 01H : No Signal
- 02H : Viewer displaying
- 03H : Test Pattern displaying
- 04H : LAN displaying
- 05H : Test Pattern (User) displaying
- 10H : Signal selection in progress
- Other : Not Support

DATA04 Select source input type 1
- 01H : 1
- 02H : 2
- 03H : 3
- 04H : 4
- 05H : 5
- Other : Not Support

DATA05 Select source input type 2
- 01H : COMPUTER (RGB)
- 02H : VIDEO
- 03H : S-VIDEO
- 04H : COMPONENT
- 05H : Reserved
- 06H : DIGITAL
- 07H : VIEWER
- 08H : SLOT1
- 09H : SLOT2
- 0AH : SLOT3
- 0BH : SLOT4
- 0CH : DIGITAL2
- 0DH : SCART
- 10H : AUTO

FFH : Not Source Input
Other : Not Support

DATA06 Indication signal type
(Effective only when Select source input type 2 is 02H or 03H)
x0H : NTSC3.58
x1H : NTSC4.43
x2H : PAL
x3H : PAL60
x4H : SECAM
x5H : B/W60
x6H : B/W50
x7H : PALNM
x8H : NTSC3.58 LBX
x9H : NTSC3.58 SQZ
xAH : COMPONENT(60Hz)
xBH : COMPONENT(50Hz)
xCH : Un known
xDH : NTSC
xEH : PAL-M
xFH : PAL-N
FFH : Not Video Input
Other : Not Support

DATA07 Picture Mute
00H : OFF
01H : ON

DATA08 Sound Mute
00H : OFF
01H : ON

DATA09 On-screen mute
00H : OFF
01H : ON

DATA10...DATA16 Reserved

Response: At the time of a failure

A0H	BFH	01H	xxH	02H	DATA01	DATA02	CKS
		(*1)	(*2)		(*4)		(*3)

==========

6.1. Response

---

* At the time of a success (ACK)

This returns ACK without adding data portion to the command that does not request data.
This returns ACK with adding data to the data portion for the command that requests data.

* At the time of a failure (NAK)

This adds a cause of not accepting the command to data portion to return it.

(Example) Power On

Command:

02H	00H	FFH	F0H	00H	CKS

NAK:

A2H	00H	01H	20H	02H	DATA01	DATA02	CKS

==========

6. Data Portion of Response

DATA01	DATA02	
Error types	Error description	Error contents
00H	00H	Unknown command
00H	01H	The current model does not support this function.
01H	00H	Unvalid values specified.
01H	01H	Specified terminal is unavailable or cannot be selected.
01H	02H	Selected language is not available.
02H	00H	Available memory reservation error
02H	02H	Operating memory
02H	03H	Setting not possible
02H	04H	On Forced on-screen mute mode
02H	07H	-No signal-
02H	08H	Displaying a test pattern or PC Card Fills screen.
02H	0AH	Memory operation failed
02H	0DH	Power Off inhibited
02H	0EH	Execution error
02H	0FH	No operation authority
03H	00H	Specified gain number is wrong
03H	01H	Selected gain is not available.
03H	02H	Adjustment failed