

PROTOCOL MANUAL

MODEL

DEST.

VPL-FX50

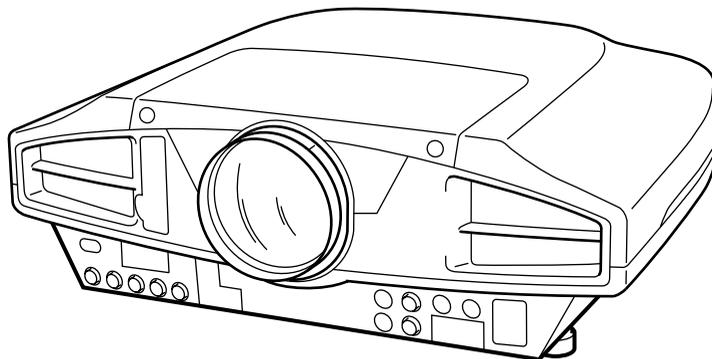
WORLD

MODEL

DEST.

RM-PJM50

WORLD



VERSION 2.0

Network Version 1.0

REVISED-1

LCD DATA PROJECTOR

SONY[®]

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危険をさけるため、サービストレーニングを受けた技術者のみご使用ください。

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This manual is intended for qualified service personnel only.

To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

⚠ WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.

Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegebenen Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

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Ce manuel est destiné uniquement aux personnes compétentes en charge de l'entretien. Afin de réduire les risques de décharge électrique, d'incendie ou de blessure n'effectuer que les réparations indiquées dans le mode d'emploi à moins d'être qualifié pour effectuer d'autres. Pour toute réparation faire appel à une personne compétente uniquement.

WARNING!!

AN INSULATED TRANSFORMER SHOULD BE USED DURING ANY SERVICE TO AVOID POSSIBLE SHOCK HAZARD, BECAUSE OF LIVE CHASSIS. THE CHASSIS OF THIS RECEIVER IS DIRECTLY CONNECTED TO THE AC POWER LINE.

SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY A Δ MARK ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION!!

AFIN D'ÉVITER TOUT RISQUE D'ÉLECTROCUTION PROVENANT D'UN CHÂSSIS SOUS TENSION, UN TRANSFORMATEUR D'ISOLEMENT DOIT ÊTRE UTILISÉ LORS DE TOUT DÉPANNAGE. LE CHÂSSIS DE CE RÉCEPTEUR EST DIRECTEMENT RACCORDÉ À L'ALIMENTATION SECTEUR.

ATTENTION AUX COMPOSANTS RELATIFS À LA SÉCURITÉ!!

LES COMPOSANTS IDENTIFIÉS PAR UNE MAPQUE Δ SUR LES SCHÉMAS DE PRINCIPE, LES VUES EXPLOSÉES ET LES LISTES DE PIÈCES SONT D'UNE IMPORTANCE CRITIQUE POUR LA SÉCURITÉ DU FONCTIONNEMENT. NE LES REMPLACER QUE PAR DES COMPOSANTS SONY DONT LE NUMÉRO DE PIÈCE EST INDIQUÉ DANS LE PRÉSENT MANUEL OU DANS DES SUPPLÉMENTS PUBLIÉS PAR SONY.

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1. Introduction

This protocol manual describes the basic configuration and basic operations of various commands used for projector. Projector can be controlled using the commands in the List of Commands provided in Section 4 “Appendix”. Using an external CONTROLLER , etc., inputs can be switched and the power can also be turned on and off. In the following paragraphs, “CONTROLLER” means an external device such as a PC which controls projector using these commands.

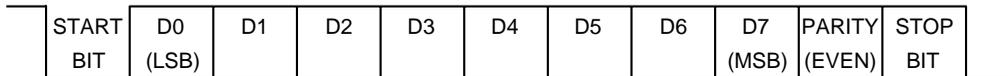
2. RS-232C

2-1. Communication Specifications

<RS-232C Communication Signal>

- Full duplex communication channels (Flow control not performed.)
- Start-stop synchronism system
- Baud rate: 38.4 kbps (bits per second)
- The bit configuration is defined as follows.

1 START Bit + 8 DATA Bits + 1 PARITY Bit + 1 STOP Bit



EVEN Parity.....Total number of “1”s from D0 to D7 is an even number.

2-2. Command Block Format

The code from B0 to B7 as described below are transmitted.

	Transmission from the Master side	Transmission from the Master side	Reception in the Master side (With Data)
B0	START CODE : 0 × A9		
B1	ITEM NUMBER	ACK / NAK	ITEM NUMBER
B2			
B3	SET / GET	ACK	REPLY
B4	DATA	DUMMY DATA	DATA
B5			
B6	CHECK SUM		
B7	END CODE : 0 × 9A		

B0 START CORD

Common in the all FORMAT

B6 CHECK SUM

B1 to B5 are calculated by OR;

<Example of Calculation>

0 × A9	1010	1001	0 × A9	1010	1001
0 × A9	1010	1001	0 × 9A	1001	1010
Answer	1010	1001	Answer	1011	1011
		0 × A9			0 × BB

B7 END CODE

Common in the all FORMAT

2-3. Block Format

Transmission from the Master side

B0	START CODE
B1	ITEM NUMBER
B2	
B3	SET / GET
B4	DATA
B5	
B6	CHECK SUM
B7	END CODE

Data transmission to the Projector

Start of Command

Set the Data Category Value desired.
Refer to the Table 1 for details.

SET: 0 x 00 (Set data)
GET: 0 x 01 (Get data)

SET: Data to be set (Refer to the Table 2)
GET: Unused. Set Dummy data [0 x 00, 0 x 00]

Check Sum

End of Command

Reception in the Master side

B0	START CODE
B1	ACK / NAK
B2	
B3	ACK
B4	DUMMY DATA
B5	
B6	CHECK SUM
B7	END CODE

Receive results of the data transmission from the Projector.

Start of Command

Results correspond with the data transmission
Refer to the Table 3 for the data in detail.

[0 x 03]
Express Reply data either of ACK, or NAK

This data does not mean any senses.
Dummy Data [0 x 00, 0 x 00] is stored.

Check Sum

End of Command

Reception in the Master side (With Data)

B0	START CODE
B1	ITEM NUMBER
B2	
B3	REPLY
B4	DATA
B5	
B6	CHECK SUM
B7	END CODE

Receive data from the Projector

Start of Command

Received data
Refer to the Table 1 in detail.

[0 x 02]
Express data to be Reply data

Received data
Refer to the Table 2 in detail.

Check Sum

End of Command

2-4. Connection

<RS-232C Connection>

Communication is enabled by the use of a D-Sub 9 Pin cross (reverse) cable.
The pin assignment of D-Sub 9 Pin and D-Sub 25 Pin is as follows.

D-Sub 9 Pin	D-Sub 25 Pin	Name	
Shell = FG	1	FG	Grounding for safety protection or cable shield
3	2	TxD	Transmission data
2	3	RxD	Reception data
7	4	RTS	Transmission request
8	5	CTS	Transmission permission
6	6	DSR	Data set ready
5	7	SG	GND for signal
1	8	DCD	Data channel signal carrier detection
4	20	DTR	Data terminal ready
9	22	RI	Calling display (Presence/absence of calling signal)

Pins indicated as D-Sub 25 Pin are not used.

Assured cable length: 15 m (However, assurance may not be applicable for some cables.)

The software for controlling the projector from a PC is intended for performing transmission and reception for only the TxD and RxD lines.

Therefore there is no handshake normally performed by RS-232C.

2-5. Communication Procedure

2-5-1. Outline of Communication

All communication between CONTROLLER (PC, etc.) and DEVICE (PROJECTOR) is performed by the command block format. Communication is started by the issue of a command at CONTROLLER and ended when the return data is sent to CONTROLLER after DEVICE receives the command.

CONTROLLER is prohibited from sending several commands at one time. This means that after CONTROLLER sends one command, it cannot send other commands until DEVICE returns the return data.

DEVICE sends the return data after processing the command. The time from when CONTROLLER sends the command until the return data is returned differs according to the contents of the command.

In some cases, CONTROLLER may receive data from DEVICE even though it has not sent a command. (For example, during SYS setting, SIRCS command, and switcher information when switcher is selected.)

Note: When Sircs Direct Command is sent, return data may not be returned in some cases.

2-6. Communication Rules

- When sending a command from CONTROLLER, the return data from PROJECTOR should be received first before sending the next command. Even if the next command is sent before receiving the return data, since PROJECTOR will not be able to receive that command, it does not return a response to CONTROLLER. Consequently, no error code is also sent.
The following lists the approximate waiting times for PROJECTOR to return the return data after CONTROLLER sends the command.
- When a communication error occurs, PROJECTOR ignores the data received until now, and set into the reception standby state.
- For undefined commands or commands determined as invalid by PROJECTOR, PROJECTOR will send the “NAK” return data to CONTROLLER .
- Take note that when data is written when the input signal of PROJECTOR is unstable, that data (value) will not be incorporated.
- When INDEX specified SIRCS direct command is transmitted, leave an interval of 45 mSec until the next transmission. (Do not return the return data (ACK, NAK) when the SIRCS direct command is received.)

2-7. Approximate Return Waiting Times

The await-return time is approx. 30 msec.

Note: This is the case, unless the communications are interfered anyway.

3. NETWORK

3-1. Introduction

This is the manual to control the projector from the network (LAN) using the PJ Talk.

3-2. PJCP

This manual describes the PJCP (Projector Control Protocol) that the PJ Talk supports.

3-2-1. Communication Procedure

Network version 1 does not support the user authentication. Therefore, the TCP connection can be opened immediately and command can also be sent immediately. The desired port number can be specified. (Default port number is 53484.) For setting the projector port number, refer to Section 3-2-2.

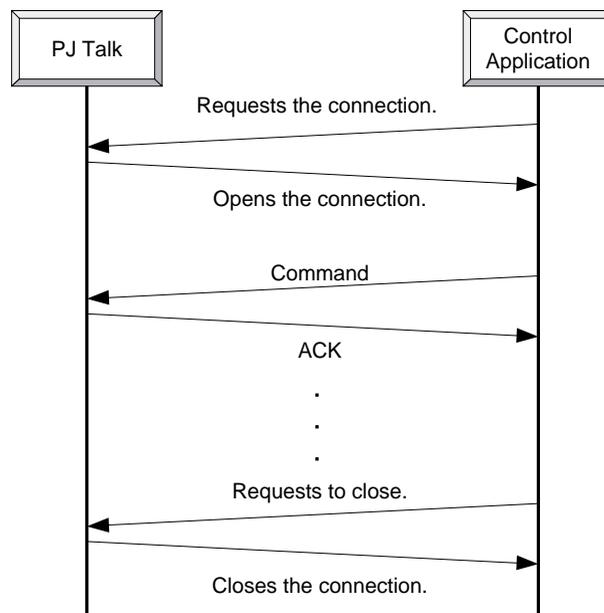


Fig. 1 Communication procedure

3-2-1-1. Time-out Processing

Connection

The PJ Talk closes the connection if it does not receive any command for a set time. Duration of the time-out is 60 seconds.

ACK

If ACK is not returned within 30 seconds or longer for the command that has been sent, the control application executes the time-out processing and closes the connection with the PJ Talk.

3-2-2. Format

The PJCP is installed in the TCP. Datagram of the PJCP consists of the Internet (IP) header, the datagram (TCP) header and the PJCP header. Construction of the PJCP headers is shown below. The PJCP header is followed by the PJCP data.

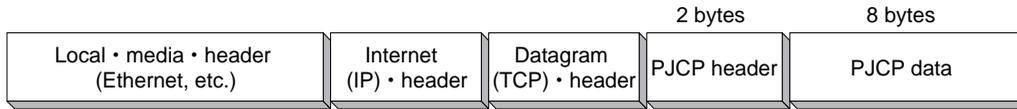


Fig. 2 Sequence in the structure of the PJCP headers

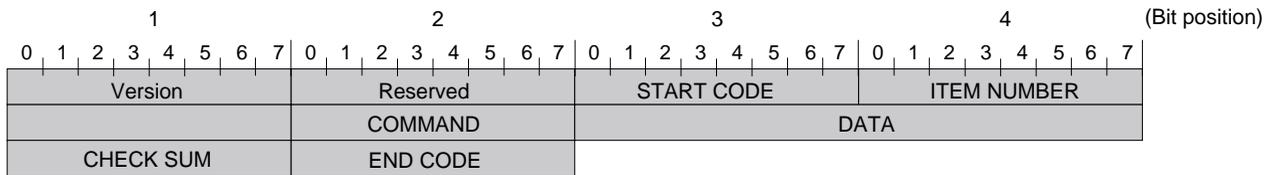


Fig. 3 PJCP format

3-2-2-1. PJCP Header

The PJCP header consists of 2 bytes of the version (8 bits) and reserved (8 bits).

Version

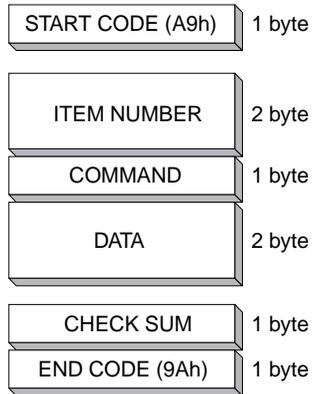
This means the PJCP version. Set 01h (version 1).

Reserved

This area is not used in version 1. Set 00h.

3-2-2-2. PJCP Data

The PJCP data is the fixed length of 8 bytes. The PJCP data has the same format as the transfer block format that is described in the PROTOCOL MANUAL for the VPL-FX50. For details, refer to Appendix.



START CODE

This is fixed to A9h

ITEM NUMBER

When the command is either SET or GET or REPLY, the ITEM NUMBER is set.

In the ACK, the ACK/NAK is set. For details, refer to Appendix of the PROTOCOL MANUAL.

For ACK

Value	Description
ACK (0000h)	Result of the command execution
NAK	Error code

COMMAND

There are two command ; SET and GET. When response is returned from the PJ Talk, ACK/REPLY is included.

COMMAND

Value	Description
SET (00h)	Changes the value of the specified item.
GET (01h)	Acquire the value of the specified item.

RESPONSE

Value	Description
ACK (03h)	Result of the command execution
REPLY (02h)	Value of the specified item

DATA

When the command is SET or REPLY, value of the specified item is set. When the command is GET or ACK, 0000h is set. For details, refer to Appendix of the PROTOCOL MANUAL.

CHECKSUM

CHECKSUM is the logical OR of ITEM NUMBER, COMMAND and DATA.

END CODE

This is fixed to 9Ah.

3-2-3. Data Flow

Data flow of the PJCP is shown below.

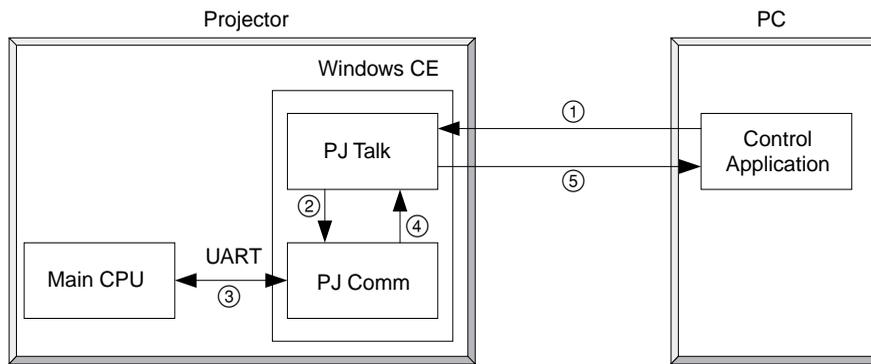


Fig. 4 Processing procedure of the command

- ① Command is sent from the control application.
- ② The PJ Talk sends the received command to PJ Comm.
- ③ The PJ Comm sends the command to the main CPU and receives the execution result.
If no response is returned for 30 seconds or more from the main CPU, the PJ Comm executes the time-out processing.
- ④ The PJ Comm sends the received command to the PJ Talk.
- ⑤ The PJ Talk sends the execution result of the command.

3-2-3-1. Note on Installation

When using the control application, it must send the next command after receiving the response from the PJ Talk for the previous command.

3-3. PJ Talk

The PJ Talk that is the network service of projector, is the application program that enables communication control of the projector from the network (LAN) that has been provided by RS-232C/485. Vendor can create the control application easily in a short time by using the PJCP protocol (projector Control Protocol) that is compatible with the existing RS-232C/485.

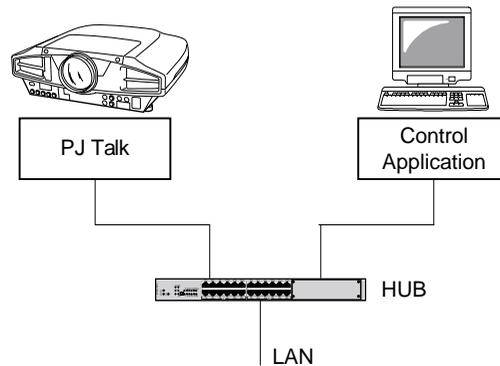


Fig. 5 Relationship with the control software

3-3-1. Features

This section describes the main features of the PJ Talk.

Remote control

The controls such as turning on/off the power and selecting inputs can be performed from a personal computer or the control device at the remote location on the same LAN network.

PJCP

The PJCP uses the same format and command systems as those of the serial protocol of the VPL-FX50.

Port number

The desired port number can be used. Therefore, the port numbers that are unique to the SI vendor can be supported.. Default is 53484.

3-3-2. Functions

3-3-2-1. PJCP Installation

The PJ Talk is the service that supports the PJCP protocol (projector Control Protocol) to control the projector from remote location on network. For details, refer to Section 2 PJCP.

3-3-2-2. Port Number

The desired port number can be specified. Select the PJ Talk using the Service Manager and press the Properties button. Then the setup display appears. Note that the port number cannot be changed while the Service is in operation.

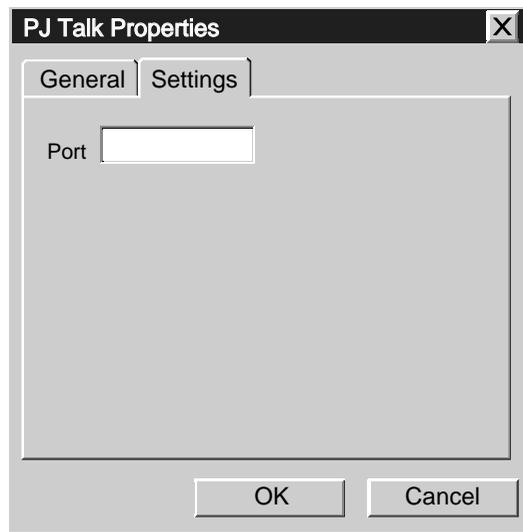


Fig. 6 Properties display

3-3-2-3. Restrictions

The operations cannot be guaranteed when the program is accessed from the two or more control applications at the same time.

4. Appendix

< Table 1 >			<Table 2>			Remarks
Item Number			Data			
Item	Upper byte	Lower byte	Data	Upper byte	Lower byte	
INPUT	00h	01h	VIDEO	00h		Set/Get
			S VIDEO	01h		
			INPUT A	02h		
			INPUT B	03h		
			INPUT C	04h		
CONTRAST	00h	10h		00h ~ 64h (0 ~ 100)		
BRIGHTNESS	00h	11h		00h ~ 64h (0 ~ 100)		
COLOR	00h	12h		00h ~ 64h (0 ~ 100)		
HUE	00h	13h		00h ~ 64h (0 ~ 100)		
SHARPNESS	00h	14h		00h ~ 64h (0 ~ 100)		
RGBENHANCER	00h	15h		00h ~ 64h (0 ~ 100)		
VOLUME	00h	16h		00h ~ 64h (0 ~ 100)		
COLTEMP	00h	17h	LOW	00h		
			HIGH	01h		
DDE	00h	18h	OFF	00h		
			PROGRESSIVE	01h		
			FILM	02h		
ASPECT	00h	20h	16 : 9	00h		
			4 : 3	01h		
SCANCONV	00h	21h	OFF	00h		
			ON	01h		
PICTUREMUTING	00h	30h	OFF	00h		
			ON	01h		
INPUTA	00h	32h	COMPUTER	00h		
			COMPONENT	01h		
			VIDEO GBR	02h		
LAMP MODE	00h	40h	STANDARD	00h		
			LOW	01h		
GAINRED	00h	80h		00h ~ FFh (0 ~ 255)		
GAINGREEN	00h	81h		00h ~ FFh (0 ~ 255)		
GAINBLUE	00h	82h		00h ~ FFh (0 ~ 255)		
BIASRED	00h	83h		00h ~ FFh (0 ~ 255)		
BIASGREEN	00h	84h		00h ~ FFh (0 ~ 255)		
BIASBLUE	00h	85h		00h ~ FFh (0 ~ 255)		
STATUSERROR	01h	01h	NO ERROR	00h		Get only
			LAMP ERROR	01h		
			FAN ERROR	02h		
			COVER ERROR	04h		
			TEMP ERROR	08h		
			D5V ERROR	10h		
			POWER ERROR	20h		
			WARNING ERROR	40h		

< Table 1 >			<Table 2>			Remarks
Item Number			Data			
Item	Upper byte	Lower byte	Data	Upper byte	Lower byte	
STATUSPOWER	01h	02h	STANBY	00h		
			START UP	01h		
			STARTUP LAMP	02h		
			POWER ON	03h		
			COOLING1	04h		
			COOLING2	05h		
			SAVING COOLING1	06h		
			SAVING COOLING2	07h		
			SAVING STABY	08h		
CONTROLMODESEL	01h	05h	USER	00h		
			SERVICE	01h		
LAMPTIMER	01h	13h	USE TIME	00h-ffffh		
ROM VERSION	01h	1Dh	ROM VER			
SC ROM VERSION	01h	1Eh	SC VER			
Channel Memory Reset	03h	01h		0000h		Set only
Status Memory Reset		02h				
Set Memory Reset		03h				
W/B All Save		04h				
W/B Low Save		05h				
W/B High Save		06h				
Sircs (15bit category)	17h	Refer to the Table4		0000h		Set only (Subject to the command only)
Sircs (20bit category)	19h					

< Table 3 >			
Item Number			
Item		Upper byte	Lower byte
ACK		00h	00h
NAK	Undefined Command	01h	01h
	Size Error		04h
	Select Error		05h
	Range Over		06h
	Not Applicable		0Ah
	Check Sum Error	F0h	10h
	Framing Error		20h
	Parity Error		30h
	Over Rub Error		40h
	Other Comm Error		50h

List of SIRCS CODE

(1) 15BIT Category

	x0	x1	x2	x3	x4	x5	x6	x7	x8	x9	xA	xB	xC	xD	xE	xF
0x																
1x						POWER ON/OF			CONTRAST + HIGH	CONTRAST - LOW	COLOR + HIGH	COLOR - LOW			BRITNESS + BRIGHT	BRITNESS - DARK
2x	HUE + PURPLISH	HUE - GREENISH	SHARPNESS + SHARP	SHARPNESS - SOFT	PICTURE MUTING	STATUS ON	STATUS OFF			MENU	VIDEO	INPUT A	INPUT B		POWER ON	POWER OFF
3x				CURSOR →	CURSOR ←	CURSOR ↑	CURSOR ↓									
4x								RGB SIZE	RGB SHIFT							
5x								INPUT SELECT	BLANKING		ENTER				MEMORY	S VIDEO
6x																INPUT C
7x			LENS SHIFT ↑	LENS SHIFT ↓	FOCUS F	FOCUS N		ZOOM L	ZOOM S			RESET			PATTERN	

(2) 20BIT Category

	x0	x1	x2	x3	x4	x5	x6	x7	x8	x9	xA	xB	xC	xD	xE	xF
0x																
1x																
2x																
3x											KEYSTONE					
4x																
5x																
6x	APA	DOT PHASE	LENS ZOOM	LENS SHIFT	LENS FOCUS			FREEZE			DIGITAL ZOOM +	DIGITAL ZOOM -				
7x																

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