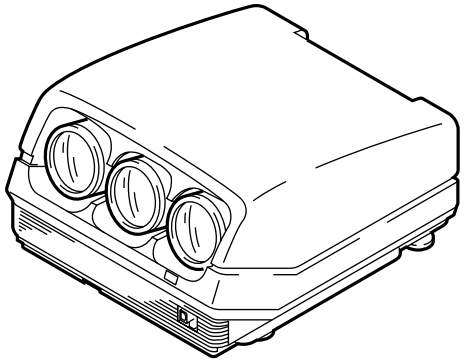
PROTOCOL MANUAL

For General Release

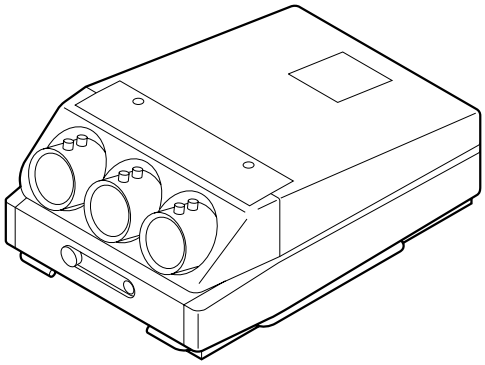
MODEL	DEST.	CHASSIS NO.
VPH-D50Q	US Canadian	SCC-K78A-A
VPH-D50QM	AEP	SCC-K79A-A

MODEL	DEST.	CHASSIS NO.
VPH-G70Q	US Canadian	SCC-K81A-A
VPH-G70QM	AEP	SCC-K82A-A
VPH-G70QMG	AEP	SCC-K89C-A

REVISED-1



VPH-D50Q/D50QM



VPH-G70Q/G70QM/G70QMG

MULTISCAN PROJECTOR

SONY

1. INTRODUCTION

This protocol manual describes various commands provided for projectors VPH-G70 and VPH-D50. Using these commands, an external computer is able to control VPH-G70 and VPH-D50. In the following paragraphs, CONTROLLER means an external device such as a PC which controls VPH-G70 and VPH-D50 using these commands.

2. PROTOCOL SPECIFICATION

2-1. Communication Signal

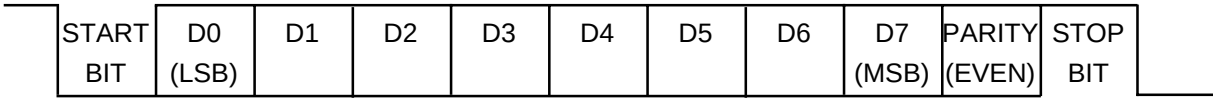
- Standard (4 Wire) communication channel
- Unsynchronous bit serial, word serial digital signal
- Baud rate : 38.4K, 19.2K, 9600, 4800 bits per second (bps)

  <Note>

  1: Baud rate of PROJECTOR is originally set to 38.4Kbps for the standard at the factory.

  2: Baud rate of PROJECTOR is able to be changed in the item of 'Service Setting for RS422A' of OSD Menu of PROJECTOR.
- 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 even number

2-2. Command Block Format

Code from B0 up to Bn+2 as described bellow shall be transmitted.

< Note > n = 16 + the number of bytes of Data transmitted

①

B0
Start Code

②

B1	B2	B3	B4	B5
RECEIVER (To) Index				
Peripheral Index	Group Index		Device Index	

B6	B7	B8	B9	B10
SENDER (From) Index				
Peripheral Index	Group Index		Device Index	

B11	B12	B13
COMMAND		
CMD1	CMD2	CMD3

③ ④ ⑤ ⑥ ⑦

B14	B15	B16	B17	~	Bn	Bn+1
Data Size of ④~⑥	Sub Command	Data Size of ⑥	Data (TOP)		Data (END)	Check SUM

B1 ~ Bn XOR

⑧

Bn+2
End Code

2-3. Data of Code

① Start Condition

Bn	NAME	DATA	NOTE
B0	Start Code	A5	

② Index Header

/*-- RECEIVER INDEX --*/

B1	PERIPHERAL INDEX	01	Projector
B2	GROUP INDEX UPPER BYTE	00	
B3	GROUP INDEX LOWER BYTE	01	Group Index = 0001 hex
B4	DEVICE INDEX UPPER BYTE	00	
B5	DEVICE INDEX LOWER BYTE	01	Device Index = 0001 hex

/*-- SENDER INDEX --*/

B6	PERIPHERAL INDEX	03	CONTROLLER
B7	GROUP INDEX UPPER BYTE	00	
B8	GROUP INDEX LOWER BYTE	01	Group Index = 0001 hex
B9	DEVICE INDEX UPPER BYTE	00	
B10	DEVICE INDEX LOWER BYTE	01	Device Index = 0001 hex

/*-- COMMAND --*/

B11	CMD1	Refer to attached	
B12	CMD2	Refer to attached	
B13	CMD3	10	CRT Projector
		80	LCD Projector
		B0	DMD Projector

③ Data Size

B14	Data Size	xx	Total Data Size of ④~⑥

④ Sub Command

B15	Sub Command	00	I am stationary in 00.

⑤ Data Size

B16	Data Size	xx	Data Size of ⑥

⑥ Data

B17~Bn	Data	xx	Bytes of Data depend on a COMMAND

⑦ Check SUM

Bn+1	Check Sum	xx	Check SUM of Data of ②~⑥ (XOR of Data of ②~⑥)

⑧ End Condition

Bn+2	END Code	5A	

Place Data for a Command Block as follows for VPH-G70 / D50.

B0	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13
A5	01	00	01	00	01	03	00	01	00	01	CMD1	CMD2	10

B14	B15	B16	B17	~	Bn	Bn+1	Bn+2
SIZE of 4 ~6	00	SIZE of 6	DATA			Check SUM	5A

¥ Command Blocks from B0 up to Bn+2 shall be transmitted continuously. Transfer interval between bytes within a Command Block sent from CONTROLLER shall not exceed 4 ms.

COMMAND is composed of 3 part commands CMD1, CMD2 and CMD3 as shown on the section 3rd.

<CMD1> CMD1 is the first part command represents the basic operation of COMMAND, and classified into as follows.

CMD1	FUNCTION	DIRECTION
10	RETURN DATA FROM PJ	CONTROLLER <-- PROJECTOR
11	STATUS SENSE	CONTROLLER --> PROJECTOR
13	SYSTEM SELECT	CONTROLLER --> PROJECTOR
15	INTERNAL TEST SIGNAL GEN.	CONTROLLER --> PROJECTOR
16	SIRCS CODE DIRECT	CONTROLLER --> PROJECTOR
30	ACTIVE MEMORY READ	CONTROLLER --> PROJECTOR
32	ACTIVE MEMORY WRITE	CONTROLLER --> PROJECTOR

<CMD2> CMD2 is the second part command and shall be used with CMD1 for the real operation of COMMAND. Its role depends on a CMD1 combined.

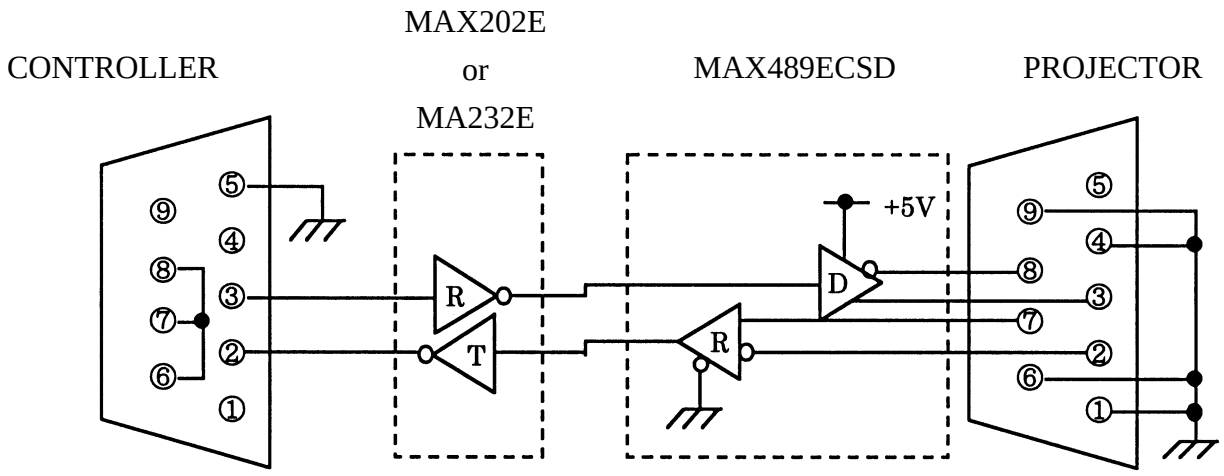
<CMD3> CMD3 is the third part command which clarifies a category of PROJECTOR. This shall be set to 10 hex for VPH-G70 and D50.

2-4. Connection

Connector : 9 Pin D-subminiature female(D-9S)

If CONTROLLER is wired with RS-232C and PROJECTOR is with RS-422A, the following connection is recommended.

signal / pin	CONTROLLER	PROJECTOR
1	NC	GND
2	RXDA	$\overline{TX}$
3	TXDA	RX
4	NC	GND
5	GND	NC
6	DSR	GND
7	RTS	TX
8	CTS	$\overline{RX}$
9	NC	GND



2-5. Communication Procedure

Communication between CONTROLLER (such as a PC) and DEVICE (such as a PROJECTOR) shall be performed with transmission of a Command Block format.

Communication starts with a Command transmitted by CONTROLLER, and ends with a Return Data from DEVICE to CONTROLLER, if DEVICE receives a Command and deal with it correctly.

CONTROLLER is prohibited to send plural Commands simultaneously, so that after transmission of a Command to DEVICE, CONTROLLER shall not transmit the next Command before receiving a Return Data from DEVICE.

Required time between transmission of a Command from CONTROLLER and that of Return Data from DEVICE depends on a Command transmitted, since DEVICE needs some time for dealing with it and then send back a Return Data

2-6. Communication Rules

- INDEX NUMBER of PROJECTOR shall be set to '01'.
- After transmission of a Command to PROJECTOR, CONTROLLER shall not send the next Command before receiving Return Data (CMD1=10 hex) from PROJECTOR. If not, any Data is not transmitted from PROJECTOR, neither any Error Code.
- In case of a communication error, PROJECTOR ignores all Data sent so far, and transmits 'NAK' to CONTROLLER as a Return Data.
- If unidentified Command is transmitted or Data is not acknowledged by PROJECTOR, PROJECTOR transmits 'NAK' to CONTROLLER as a Return Data.
- While a signal inputted to PROJECTOR is not stable (where 7 SEG LED indicates '10'), Data transmitted to PROJECTOR is not recognised.
- In case of USER mode on PROJECTOR, a picture displayed might disappear accidentally and also might come out of any status to the normal, when a Command, especially DATA WRITE COMMAND is transmitted.
- In both cases of USER and SERVICEMAN mode, if PROJECTOR receives DATA WRITE COMMAND such as SYSTEM SELECT COMMAND and ACTIVE MEMORY WRITE COMMAND, PROJECTOR needs some more time to check its Data as explained bellow before sending back the Return Data to CONTROLLER. It takes around 800 ms totally between transmission of a Command from CONTROLLER and that of a Return Data from PROJECTOR.
- When SYSTEM SELECT COMMAND (CMD1=13hex) or ACTIVE MEMORY WRITE COMMAND (CMD1=32hex) is transmitted, its Data is checked by PROJECTOR firstly whether it is out of range or not. In case of out of range of Data, the followings are implemented by PROJECTOR.
  a) In case of SYSTEM SELECT COMMAND (CMD1=13hex)
     - 'NAK' is sent back from PROJECTOR to CONTROLLER. It takes around 800 ms until 'NAK' is sent back.
  b) In case of ACTIVE MEMORY COMMAND (CMD1=32hex)
     - Data is replaced automatically into appropriate one as it is just within a range, and 'NAK (RANGE OVER / Data = 06hex)' is transmitted to CONTROLLER. It takes also around 800 ms until 'NAK' is sent back.
  - Range of Data for SYSTEM SELECT COMMAND is described on Protocol Table attached.
  - Range of Data for ACTIVE MEMORY WRITE COMMAND is not available as Table, since its Data is justified automatically as mentioned above.
  - Range of Data for ACTIVE MEMORY WRITE COMMAND depends on the horizontal frequency of a signal inputted, either a product model (G70/D50) itself.
- After transmission of SIRCS DIRECT COMMAND (CMD1=16hex) and that of a Return Data (CMD1=10hex) from PROJECTOR , CONTROLLER shall not send the next SIRCS DIRECT COMMAND immediately. More than 180 ms is required for its interval.

Please pay special attention to the following ERROR Data, when SIRCS DIRECT COMMAND is transmitted.

04 : SIZE ERROR — The value of Data is not ‘2’.

05 : SELECT ERROR — The value of the first Data is not ‘0’, neither ‘1’.

- ‘0’ : simulation to press a key of the remote commander once
- ‘1’ : simulation to keep pressing a key of theremote commander

07 : SIRCS BUSY ERROR — SIRCS Encoder inside PROJECTOR is busy.

3. Command Block Table

The following is one of examples about a Command Block, which intends to set the green data of COLOR UNIFORMITY adjustment as HG=0, VG=0 and V=0.

B11	B12	B13	B14	B15	B16	B17	B18	B19
CMD1	CMD2	CND3	Data Size	Sub Command	Data Size	Data1	Data2	Data3
32	08	10	07	00	05	01	01	00

B20	B21	B22
Data4	Data5	Check SUM
00	00	2A

FUNCTION	COMMAND	DIRECTION	CMD1	CMD2	DATA
RETURN DATA FROM PJ	ACK(ACKNOWLEDGE)	CONTROLLER ← PROJECTOR	10	10	00
<CMD1=10 HEX>	ACK WITH DATA	CONTROLLER ← PROJECTOR	10	20	DATA 1 DATA 2 ~ DATA N
	NAK(NOT ANKNOWLEDGE)	CONTROLLER ← PROJECTOR	10	F0	ERROR DATA
					COMMAND ERROR
					01 UNDEFINED COMMAND
					02 PROJECTOR HEAD IS NOT POWER ON
					03 ANY PROTECT IS ON
					04 SIZE ERROR
					05 SELECT ERROR
					06 RANGE OVER
					07 SIRCS BUSY
					08 DATA NOT STABILIZED
					COMMUNICATION ERROR
					10 CHECK SUM ERROR
					20 FRAMING ERROR
					30 PARITY ERROR
					40 OVER ERROR
					50 OTHER ERROR
STATUS SENSE	DEVICE TYPE REQUEST	CONTROLLER → PROJECTOR	11	00	XX
<CMD1=11 HEX>					
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	SET NAME SET SERIAL
					32BYTES(MAX) 4BYTES
					ASCII CHARACTOR 32BITS CODE
	SOFTWARE VER. REQUEST	CONTROLLER → PROJECTOR	11	*CMD2	XX
					*CMD2
					03 ALL MCU
					04 MAIN MCU
					05 REGI MCU
					06 OSD MCU
					07 COMM MCU
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	DATA #1 DATA #2 DATA #3 DATA #4 ~ DATA #16
					ALL MCU ROM VERSION (MAIN REGI OSD COM) DATA 4BYTES * 4 = 16BYTES
					OR
					DATA #1 DATA #2 DATA #3 DATA #4
					MAIN MCU ROM VERSION DATA
					REGI MCU ROM VERSION DATA
					OSD MCU ROM VERSION DATA
					COMM MCU ROM VERSION DATA
	ERR REQUEST	CONTROLLER → PROJECTOR	11	08	XX
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	MAIN MCU ERROR REGI MCU ERROR OSD MCU ERROR COMM MCU ERROR
					00~99(BCD) 00~99(BCD) 00~99(BCD) 00~99(BCD)
	POWER STATUS SENSE	CONTROLLER → PROJECTOR	11	0B	XX
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	POWER
					00 OFF
					01 ON

FUNCTION	COMMAND	DIRECTION	CMD1	CMD2	DATA
	SET MODE ACT STATUS SENSE	CONTROLLER → PROJECTOR	11	0D	XX
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	SET MODE
					00 USER
					01 SERVICE
					02 FACTORY
	POLE STATUS SENSE	CONTROLLER → PROJECTOR	11	0E	XX
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	POLE
					00 NORMAL
					01 HINV
					02 VINV
					03 HVINV
	ALL WHITE MODE STATUS SENSE	CONTROLLER → PROJECTOR	11	0F	XX
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	ALL WHITE
					00 OFF
					01 ON
	POWER SAVING STATUS SENSE	CONTROLLER → PROJECTOR	11	10	XX
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	POWER SAVING
					00 OFF
					01 ON
	PICTURE MUTING STATUS SENSE	CONTROLLER → PROJECTOR	11	11	XX
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	PICTURE MUTING
					00 OFF
					01 ON
	PROTECTION STATUS SENSE	CONTROLLER → PROJECTOR	11	17	XX
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	PROTECTION
					00 OFF
					01 ON
	FH TOO HIGH STATUS SENSE	CONTROLLER → PROJECTOR	11	18	XX
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	FH TOO HIGH
					00 NORMAL
					01 FH TOO HIGH
	OVER CORRECTION STATUS SENSE	CONTROLLER → PROJECTOR	11	19	XX
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	OVER CORRECRION
					00 NORMAL
					01 OVER CORRECTION
	COMM TARGET DEVICE INDEX SENSE	CONTROLLER → PROJECTOR	11	1A	XX
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	DEVICE INDEX
					UPPER DATA LOWER DATA
					2BYTES DATA
	NVM IMEM ENTRY LOAD FROM SENSE	CONTROLLER → PROJECTOR	11	1B	XX
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	LOAD FROM
					00~63 0~99

FUNCTION	COMMAND	DIRECTION	CMD1	CMD2	DATA
	NVM IMEM ENTRY SAVE TO SENSE	CONTROLLER → PROJECTOR	11	1C	XX
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	SAVE TO 00~63 0~99
	SIGNAL STABILIZED STATUS SENSE	CONTROLLER → PROJECTOR	11	1D	XX
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	SIGNAL STABILIZED 00 INSTABILITY 01 STABILITY
	INPUT SIGNAL SENSE	CONTROLLER → PROJECTOR	11	2B	XX
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	CHANNEL / CHANNEL SW'ER / SIGNAL REQ / SIGNAL ACT / HIGH SCAN / COL SYS 00 VIDEO — OLD 00~07(1-1~2-8) — 10 VIDEOCVBS — 00 NOINPUT — 00 NORMAL — 00 INVALID 01 INPUT A — 20(OTHER) — 11 VIDEOYC — 10 VIDEOCVBS — 01 INT_2FH — 07 NTSC 02 INPUT B — 20 RGB — 11 VIDEOYC — 02 INT_2FHFV — 19 PAL 03 OLD SW'ER — 30 COMP — 20 RGB — 04 INT_EDTVII — 1D SECAM 40 HDTVYPBPR — 21 RGB15K — 08 INT_PALPLUS — 05 NTSC443 41 HDTVGBR — 30 COMP — 10 EXT_2FH — 2B PALM 50 IDTVCOMP60 — 40 HDTVYPBPR — 20 EXT_2FHFV — 02 BW60 51 IDTVNOTCOMP60 — 41 HDTVGBR — 40 EXT_EDTVII — 10 BW50 50 IDTV — 80 EXT_PALPLUS 52 IDTVNTSC
	INPUT fH,fV,SYNC DATA SENSE	CONTROLLER → PROJECTOR	11	2C	XX
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	DATA #11 / DATA #12 / DATA #21 / DATA #22 / SonG / H/C / V / Sync Level fH (DATA#11*256+DATA#12)/10 (KHz) — fV (DATA#21*256+DATA#22)/10 (Hz) 00 OFF — 00 OFF — 00 OFF — 00 UNKNOWN 01 NEGATIVE — 01 NEGATIVE — 01 NEGATIVE — 01 2 02 POSITIVE — 02 POSITIVE — 02 POSITIVE — 02 3
	OPERATION TIME STATUS SENSE	CONTROLLER → PROJECTOR	11	30	XX
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	DATA #1 / DATA #2 / DATA #3 / DATA #4 SET ACTIVE TIME — 4BYTES (* 10 mSec)
	CRT TIME STATUS SENSE	CONTROLLER → PROJECTOR	11	31	XX
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	DATA #1 ~ / DATA #5 ~ / DATA #9 ~ / DATA #12 CRT ACTIVE TIME(R) — CRT ACTIVE TIME(G) — CRT ACTIVE TIME(B) 4BYTES (* 10 mSec) — 4BYTES (* 10 mSec) — 4BYTES (* 10 mSec)
	ALL WHITE MODE STATUS SENSE	CONTROLLER → PROJECTOR	11	40	XX
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	ALL WHITE / ALL WHITE TIME 00 OFF — 1BYTE (* 1 Min) 01 ON
	PIC ORBITING STATUS SENSE	CONTROLLER → PROJECTOR	11	43	XX
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	PIC ORBITING / PIC ORBITING TIME 00 OFF — 1BYTE (* 1 Min) 01 ON
	POWER SAVING STATUS SENSE	CONTROLLER → PROJECTOR	11	49	XX
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	POWER SAVING / POWER SAVING TIME 00 OFF — 1BYTE (* 1 Min) 01 ON

FUNCTION	COMMAND	DIRECTION	CMD1	CMD2	DATA
	POWER DIRECT STATUS SENSE	CONTROLLER → PROJECTOR	11	50	XX
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	AC POWER ON/OFF
					00 OFF
					01 ON
	POWER ON DELAY STATUS SENSE	CONTROLLER → PROJECTOR	11	51	XX
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	POWER ON DELAY
					00 OFF
					01 ON
	5BNC OLD SW'ER STATUS SENSE	CONTROLLER → PROJECTOR	11	52	XX
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	5BNC OLD SW'ER
					00 OFF
					01 ON
	AUTO BACK GROUND STATUS SENSE	CONTROLLER → PROJECTOR	11	55	XX
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	AUTO BK
					00 OFF
					01 ON
	ABL LINK STATUS SENSE	CONTROLLER → PROJECTOR	11	56	XX
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	ABL LINK
					00 OFF
					01 ON
	IR IN STATUS SENSE	CONTROLLER → PROJECTOR	11	57	XX
					IR IN
					00 FRONT REAR
					01 FRONT
					02 REAR
	OSD LANGUAGE STATUS SENSE	CONTROLLER → PROJECTOR	11	60	XX
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	OSD LANGUAGE
					00 ENGLISH
					01 FRENCH
					02 GERMAN
					03 ITALIAN
					04 SPANISH
					05 JAPANESE
					06 CHINESE
	OSD SHOW STATUS SENSE	CONTROLLER → PROJECTOR	11	61	XX
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	OSD SHOW
					00 ON
					01 NORMAL OFF
					02 ALL OFF
	INPUT STATUS SENSE	CONTROLLER → PROJECTOR	11	70	XX
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	INPUT CHANNEL / OLD SW'ER CHANNEL / DUMMY
					00 VIDEO / 00~07 SW'ER1-1~8 / 0
					01 INPUT A / 10~17 SW'ER2-1~8
					02 INPUT B / 20 OTHER
					03 OLD SW'ER

FUNCTION	COMMAND	DIRECTION			CMD1	CMD2	DATA							
	VIDEO SETTING SENSE	CONTROLLER	→	PROJECTOR	11	74	XX							
	RETURN DATA	CONTROLLER	←	PROJECTOR	10	20	VIDEO	VIDEO COL SYS	VIDEO IDTV USE					
							10 VIDEO	00 AUTO	00 NOT USE					
							11 SVIDEO	07 NTSC	01 USE					
								19 PAL						
								1D SECAM						
								05 NTSC443						
								2B PALM						
	INPUT A SETTING SENSE	CONTROLLER	→	PROJECTOR	11	78	XX							
	RETURN DATA	CONTROLLER	←	PROJECTOR	10	20	INPUT A	INPUT A COL SYS	INPUT A IDTV USE					
							10 VIDEO	00 AUTO	00 NOT USE					
							11 SVIDEO	07 NTSC	01 USE					
							20 RGB	19 PAL						
							30 COMP	1D SECAM						
							40 HDTVYPBPR	05 NTSC443						
							41 HDTVGBR	2B PALM						
	INPUT B SETTING SENSE	CONTROLLER	→	PROJECTOR	11	7C	XX							
	RETURN DATA	CONTROLLER	←	PROJECTOR	10	20	INPUT B	INPUT B COL SYS	INPUT B IDTV USE					
							10 VIDEO	00 AUTO	00 NOT USE					
							11 SVIDEO	07 NTSC	01 USE					
							20 RGB	19 PAL						
							30 COMP	1D SECAM						
							40 HDTVYPBPR	05 NTSC443						
							41 HDTVGBR	2B PALM						
	OLD SW'ER ALL SETTING SENSE	CONTROLLER	→	PROJECTOR	11	80	XX							
	RETURN DATA	CONTROLLER	←	PROJECTOR	10	20	DATA 1	~	DATA 24	DATA 25	~	DATA 48		
							OLD SW'ER 1-1	~	OTHER	OLD SW'ER 1-1	~	OTHER		
							OLD SW'ER COL SYS	~	OLD SW'ER COL SYS	OLD SW'ER IDTV USE	~	OLD SW'ER IDTV USE		
							00 AUTO			00 NOT USE				
							07 NTSC			01 USE				
							19 PAL							
							1D SECAM							
							05 NTSC443							
							2B PALM		24BYTES			24BYTES		
	OLD SW'ER SETTING SENSE	CONTROLLER	→	PROJECTOR	11	81	OLD SW'ER CHANNEL	SLOT No.						
							00 1	00~07 1~8						
							01 2							
							02 OTHER							
	RETURN DATA	CONTROLLER	←	PROJECTOR	10	20	OLD SW'ER COL SYS	OLD SW'ER IDTV USE						
							00 AUTO	00 NOT USE						
							07 NTSC	01 USE						
							19 PAL							
							1D SECAM							
							05 NTSC443							
							2B PALM							
	SCREEN TYPE SENSE	CONTROLLER	→	PROJECTOR	11	88	XX							
	RETURN DATA	CONTROLLER	←	PROJECTOR	10	20	SCREEN TYPE							
							00 S1							
							01 S2							

FUNCTION	COMMAND	DIRECTION	CMD1	CMD2	DATA
	COLOR UNIFORMITY SETTING SENSE	CONTROLLER → PROJECTOR	11	89	XX
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	COLOR UNIFORMITY
					00 OFF
					01 ADJUST
					02 PRESET S1
					03 PRESET S2
	BRIGHTNESS UNIFORMITY	CONTROLLER → PROJECTOR	11	8A	XX
	SETTING SENSE				
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	BRIGHTNESS UNIFORMITY
					00 OFF
					01 ADJUST
					02 PRESET S1
					03 PRESET S2
	COLOR TEMP. SETTING SENSE	CONTROLLER → PROJECTOR	11	9 *CMD2	XX
					*CMD2
					0 OFF
					1~A 1~10 VIDEO MEMRY No.
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	TEMP.
					00 9300K
					01 6500K
					02 5400K
					03 3200K
					04 PRESET
	D PICTURE SETTING SENSE	CONTROLLER → PROJECTOR	11	A *CMD2	XX
					*CMD2
					0 OFF
					1~A 1~10 VIDEO MEMRY No.
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	D PICTURE
					00 OFF
					01 ON
	V.SHIFT SETTING SENSE	CONTROLLER → PROJECTOR	11	B *CMD2	XX
					*CMD2
					0 OFF
					1~A 1~10 VIDEO MEMRY No.
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	V.SHIFT NARROW/WIDE
					00 WIDE
					01 NARROW
	NTSCSETUP COMPONENT SETTING SENSE	CONTROLLER → PROJECTOR	11	D *CMD2	XX
					*CMD2
					0 OFF
					1~A 1~10 VIDEO MEMRY No.
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	NTSC SETUP 75 COMPONENT FORMAT
					00 0% 00 SMPTE/EBU-N10
					01 7.5% 01 BETACAM 7.5
	VIDEO MEMORY SETTING SENSE	CONTROLLER → PROJECTOR	11	F1	XX
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	VIDEO MEMORY
					00 OFF
					01~0A 1~10 VIDEO MEMRY No.

FUNCTION	COMMAND	DIRECTION	CMD1	CMD2	DATA
	CLAMP SETTING SENSE	CONTROLLER = PROJECTOR	11	F2	XX
	RETURN DATA	CONTROLLER + PROJECTOR	10	20	CLAMP
					00 AUTO
					01 SONG
					02 HC
					03 HP
					04 TRILEVELS
	SYNC SETTING SENSE	CONTROLLER = PROJECTOR	11	F3	XX
	RETURN DATA	CONTROLLER + PROJECTOR	10	20	SYNC SELECT
					00 AUTO
					01 INTERNAL
					02 EXTERNAL
					02 EXTERNAL C
					03 EXTERNAL HV
	SYNC OSC SHIFT SETTING SENSE	CONTROLLER = PROJECTOR	11	F5	XX
	RETURN DATA	CONTROLLER + PROJECTOR	10	20	SYNC OSDC SHIFT
					00 1
					01 2
SYSTEM SELECT	POWER REQUEST	CONTROLLER = PROJECTOR	13	0A	POWER
<CMD1=13HEX>					00 OFF
					01 ON
	SET MODE ACT SELECT	CONTROLLER = PROJECTOR	13	0D	SET MODE
					00 USER
					01 SERVICE
	POLE STATUS SELECT	CONTROLLER = PROJECTOR	13	0E	POLE
					00 NORMAL
					01 HINV
					02 VINV
					03 HVINV
	PICTURE MUTING STATUS SELECT	CONTROLLER = PROJECTOR	13	11	PICTURE MUTING
					00 OFF
					01 ON

FUNCTION	COMMAND	DIRECTION	CMD1	CMD2	DATA	
	ALL WHITE MODE ALL WRITE	CONTROLLER → PROJECTOR	13	40	ALL WHITE TIME	ALL WHITE TIME
					00 OFF	1BYTE (* 1 Min)
					01 ON	
	ALL WHITE MODE ON/OFF SELECT	CONTROLLER → PROJECTOR	13	41	ALL WHITE TIME	
					00 OFF	
					01 ON	
	ALL WHITE MODE TIME WRITE	CONTROLLER → PROJECTOR	13	42	ALL WHITE TIME	
					1BYTE (* 1 Min)	
	PIC ORBITING ALL WRITE	CONTROLLER → PROJECTOR	13	43	PIC ORBITING	PIC ORBITING TIME
					00 OFF	1BYTE (* 1 Min)
					01 ON	
	PIC ORBITING ON/OFF SELECT	CONTROLLER → PROJECTOR	13	44	PIC ORBITING	
					00 OFF	
					01 ON	
	PIC ORBITING TIME WRITE	CONTROLLER → PROJECTOR	13	45	PIC ORBITING TIME	
					1BYTE (* 1 Min)	
	POWER SAVING ALL SELECT	CONTROLLER → PROJECTOR	13	49	POWER SAVING	POWER SAVING TIME
					00 OFF	1BYTE (* 1 Min)
					01 ON	
	POWER SAVING ON/OFF SELSECT	CONTROLLER → PROJECTOR	13	4A	POWER SAVING	
					00 OFF	
					01 ON	
	POWER SAVING TIME WRITE	CONTROLLER → PROJECTOR	13	4B	POWER SAVING TIME	
					1BYTE (* 1 Min)	
	POWER DIRECT SELECT	CONTROLLER → PROJECTOR	13	50	AC POWER ON/OFF	
					00 OFF	
					01 ON	
	POWER ON DELAY STATUS SELECT	CONTROLLER → PROJECTOR	13	51	POWER ON DELAY	
					00 OFF	
					01 ON	
	5BNC OLD SW'ER STATUS SELECT	CONTROLLER → PROJECTOR	13	52	5BNC OLD SW'ER	
					00 OFF	
					01 ON	
	AUTO BACK GROUND SELECT	CONTROLLER → PROJECTOR	13	55	AUTO BK	
					00 OFF	
					01 ON	
	ABL LINK STATUS SELECT	CONTROLLER → PROJECTOR	13	56	ABL LINK	
					00 OFF	
					01 ON	
	IR IN STATUS SELECT	CONTROLLER → PROJECTOR	13	57	IR IN	
					00 FRONT REAR	
					01 FRONT	
					02 REAR	

FUNCTION	COMMAND	DIRECTION	CMD1	CMD2	DATA		
	OSD LANGUAGE SELECT	CONTROLLER → PROJECTOR	13	60	OSD LANGUAGE		
					00 ENGLISH		
					01 FRENCH		
					02 GERMAN		
					03 ITALIAN		
					04 SPANISH		
					05 JAPANESE		
					06 CHINESE		
	OSD SHOW SELECT	CONTROLLER → PROJECTOR	13	61	OSD SHOW		
					00 ON		
					01 NORMAL OFF		
					02 ALL OFF		
	INPUT ALL SELCT	CONTROLLER → PROJECTOR	13	70	INPUT CHANNEL	OLD SW'ER CHANNEL	DUMMY
					00 VIDEO	00~07 SW'ER1-1~8	0
					01 INPUT A	10~17 SW'ER2-1~8	
					02 INPUT B	20 OTHER	
					03 OLD SW'ER		
	INPUT CHANNEL SELCT	CONTROLLER → PROJECTOR	13	71	INPUT CHANNEL		
					00 VIDEO		
					01 INPUT A		
					02 INPUT B		
					03 OLD SW'ER		
	OLD SW'ER CHANNEL SELCT	CONTROLLER → PROJECTOR	13	72	OLD SW'ER CHANNEL		
					00~07 SW'ER1-1~8		
					10~17 SW'ER2-1~8		
					20 OTHER		
	VIDEO ALL SELECT	CONTROLLER → PROJECTOR	13	74	VIDEO	VIDEO COL SYS	VIDEO IDTV USE
					10 VIDEO	00 AUTO	00 NOT USE
					11 SVIDEO	07 NTSC	01 USE
						19 PAL	
						1D SECAM	
						05 NTSC443	
						2B PALM	
	VIDEO SIGNAL SELECT	CONTROLLER → PROJECTOR	13	75	VIDEO		
					10 VIDEO		
					11 SVIDEO		
	VIDEO COL SYS SELECT	CONTROLLER → PROJECTOR	13	76	VIDEO COL SYS		
					00 AUTO		
					07 NTSC		
					19 PAL		
					1D SECAM		
					05 NTSC443		
					2B PALM		
	VIDEO IDTV USE SELECT	CONTROLLER → PROJECTOR	13	77	VIDEO IDTV USE		
					00 NOT USE		
					01 USE		
	INPUT A ALL SELECT	CONTROLLER → PROJECTOR	13	78	INPUT A	INPUT A COL SYS	INPUT A IDTV USE
					10 VIDEO	00 AUTO	00 NOT USE
					11 SVIDEO	07 NTSC	01 USE
					20 RGB	19 PAL	
					30 COMP	1D SECAM	
					40 HDTVYPBPR	05 NTSC443	
					41 HDTVGBR	2B PALM	

FUNCTION	COMMAND	DIRECTION	CMD1	CMD2	DATA
	INPUT A SIGNAL SELECT	CONTROLLER → PROJECTOR	13	79	INPUT A
					10 VIDEO
					11 SVIDEO
					20 RGB
					30 COMP
					40 HDTVYPBPR
					41 HDTVGBR
	INPUT A COL SYS SELECT	CONTROLLER → PROJECTOR	13	7A	INPUT A COL SYS
					00 AUTO
					07 NTSC
					19 PAL
					1D SECAM
					05 NTSC443
					2B PALM
	INPUT A IDTV USE SELECT	CONTROLLER → PROJECTOR	13	7B	INPUT A IDTV USE
					00 NOT USE
					01 USE
	INPUT B ALL SELECT	CONTROLLER → PROJECTOR	13	7C	INPUT B / INPUT B COL SYS / INPUT B IDTV USE
					10 VIDEO / 00 AUTO / 00 NOT USE
					11 SVIDEO / 07 NTSC / 01 USE
					20 RGB / 19 PAL
					30 COMP / 1D SECAM
					40 HDTVYPBPR / 05 NTSC443
					41 HDTVGBR / 2B PALM
	INPUT B SIGNAL SELECT	CONTROLLER → PROJECTOR	13	7D	INPUT B
					10 VIDEO
					11 SVIDEO
					20 RGB
					30 COMP
					40 HDTVYPBPR
					41 HDTVGBR
	INPUT B COL SYS SELECT	CONTROLLER → PROJECTOR	13	7E	INPUT B COL SYS
					00 AUTO
					07 NTSC
					19 PAL
					1D SECAM
					05 NTSC443
					2B PALM
	INPUT B IDTV USE SELECT	CONTROLLER → PROJECTOR	13	7F	INPUT B IDTV USE
					00 NOT USE
					01 USE
	OLD SW'ER ALL SELECT	CONTROLLER → PROJECTOR	13	80	DATA 1 ~ DATA 24 / DATA 25 ~ DATA 48
					OLD SW'ER 1-1 ~ OTHER / OLD SW'ER 1-1 ~ OTHER
					OLD SW'ER COL SYS ~ OLD SW'ER COL SYS / OLD SW'ER IDTV USE ~ OLD SW'ER IDTV USE
					00 AUTO / 00 NOT USE
					07 NTSC / 01 USE
					19 PAL
					1D SECAM
					05 NTSC443
					2B PALM / 24BYTES / 24BYTES
	OLD SW'ER COLSYS IDTV SELECT	CONTROLLER → PROJECTOR	13	81	OLD SW'ER CHANNEL / SLOT No. / OLD SW'ER COL SYS / OLD SW'ER IDTV USE
					00 1 / 00~07 1~8 / 00 AUTO / 00 NOT USE
					01 2 / 07 NTSC / 01 USE
					03 OTHER / 19 PAL
					1D SECAM
					05 NTSC443
					2B PALM

FUNCTION	COMMAND	DIRECTION	CMD1	CMD2	DATA							
	OLD SW'ER COL SYS SELECT	CONTROLLER → PROJECTOR	13	82	OLD SW'ER CHANNEL	SLOT No.	OLD SW'ER COL SYS					
					00 1	00~07 1~8	00 AUTO					
					01 2		07 NTSC					
					03 OTHER		19 PAL					
							1D SECAM					
							05 NTSC443					
							2B PALM					
	OLD SW'ER IDTV USE SELECT	CONTROLLER → PROJECTOR	13	83	OLD SW'ER CHANNEL	SLOT No.	OLD SW'ER IDTV USE					
					00 1	00~07 1~8	00 NOT USE					
					01 2		01 USE					
					03 OTHER							
	SCREEN TYPE SELECT	CONTROLLER → PROJECTOR	13	88	SCREEN TYPE							
					00 S1							
					01 S2							
					02 S3							
	COLOR UNIFORMITY SETTING SELECT	CONTROLLER → PROJECTOR	13	89	COLOR UNIFORMITY							
					00 OFF							
					01 ADJUST							
					02 PRESET S1							
					03 PRESET S2							
					04 PRESET S3							
	BRIGHTNESS UNIFORMITY SETTING SELECT	CONTROLLER → PROJECTOR	13	8A	BRIGHTNESS UNIFORMITY							
					00 OFF							
					01 ADJUST							
					02 PRESET S1							
					03 PRESET S2							
					04 PRESET S3							
	COLOR TEMP. SELECT	CONTROLLER → PROJECTOR	13	9 *CMD2	TEMP.							
					00 9300K							
					01 6500K							
					02 5400K							
					03 3200K	*CMD2						
					04 PRESET	0 OFF						
						1~A 1~10	VIDEO MEMRY No.					
	D PICTURE SELECT	CONTROLLER → PROJECTOR	13	A *CMD2	D PICTURE							
					00 OFF	*CMD2						
					01 ON	0 OFF						
						1~A 1~10	VIDEO MEMRY No.					
	V.SHIFT SELECT	CONTROLLER → PROJECTOR	13	B *CMD2	V.SHIFT NARROW/WIDE							
					00 WIDE	*CMD2						
					01 NARROW	0 OFF						
						1~A 1~10	VIDEO MEMRY No.					
	NTSCSETUP COMPONENT SETTING SELECT	CONTROLLER → PROJECTOR	13	D *CMD2	NTSC SETUP 75	COMPONENT FORMAT						
					00 0%	00 SMPTE/EBU-N10	*CMD2					
					01 7.5%	01 BETACAM 7.5	0 OFF					
							1~A 1~10	VIDEO MEMRY No.				
	VIDEO MEMORY SELECT	CONTROLLER → PROJECTOR	13	F1	VIDEO MEMORY							
					00 OFF							
					01~0A 1~10	VIDEO MEMRY No.						

FUNCTION	COMMAND	DIRECTION			CMD1	CMD2	DATA							
	CLAMP SELECT	CONTROLLER	→	PROJECTOR	13	F2	CLAMP							
							00 AUTO							
							01 SONG							
							02 HC							
							03 HP							
							04 TRILEVELS							
	SYNC SELECT	CONTROLLER	→	PROJECTOR	13	F3	SYNC SELECT							
							00 AUTO							
							01 INTERNAL							
							02 EXTERNAL							
							02 EXTERNAL C							
							03 EXTERNAL HV							
	SYNC OSC SHIFT SETTING SELECT	CONTROLLER	→	PROJECTOR	13	F5	SYNC OSDC SHIFT							
							00 1							
							01 2							
INTERNAL TEST SIGNAL GEN	OSC INT ON/OFF STATUS SENSE	CONTROLLER	→	PROJECTOR	15	01	XX							
<CMD1=15HEX>														
	RETURN DATA	CONTROLLER	←	PROJECTOR	10	20	OSC INTERNAL							
							00 OFF							
							01 ON							
	OSC INTERNAL STATUS SENSE	CONTROLLER	→	PROJECTOR	15	10	XX							
	RETURN DATA	CONTROLLER	←	PROJECTOR	10	20	OSC INTERNAL							
							00~07 1~8							
	OSC INT ON/OFF SELECT	CONTROLLER	→	PROJECTOR	15	21	OSC INTERNAL							
							00 OFF							
							01 ON							
	OSC INTERNAL SELECT	CONTROLLER	→	PROJECTOR	15	30	OSC INTERNAL							
							00~07 1~8							
SIRCS CODE DIRECT	SIRCS CODE DIRECT SEND	CONTROLLER	→	PROJECTOR	16	*CMD2	REPEAT	REPEAT NUMBER						
<CMD1=16HEX>							00 ONE SHOT							
							01 REPEAT							
							*CMD2							
							00~7F SIRCS CODE							
ACTIVE MEMORY READ	COLOR UNIFORMITY DATA READ	CONTROLLER	→	PROJECTOR	30	08	SSET	COLOR						
<CMD1=30HEX>							00 OFF	00 R						
							01 ADJUST	01 G						
							02 PRESET S1	02 B						
							03 PRESET S2							
							04 PRESET S3							
	REUTRN DATA	CONTROLLER	←	PROJECTOR	10	20	H R	V R		COLOR = R				
							H G	V G	V	COLOR = G				
							H B	V B		COLOR = B				
	BRTIGHT UNIFORMITY READ	CONTROLLER	→	PROJECTOR	30	0A	SSET							
							00 OFF							
							01 ADJUST							
							02 PRESET S1							
							03 PRESET S2							
							04 PRESET S3							
	RETURN DATA	CONTROLLER	←	PROJECTOR	10	20	H	V						

FUNCTION	COMMAND	DIRECTION	CMD1	CMD2	DATA							
	CXA1839 00H DATA READ	CONTROLLER → PROJECTOR	30	10	FORMAT							
					00 ORDINARY							
					01 RGB							
					02 COMP							
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	PICTURE[ORDINARY]							
					PICTURE[RGB]							
					PICTURE[COMP]							
	CXA1839 05H DATA READ	CONTROLLER → PROJECTOR	30	20	FROMAT							
					00 ORDINARY							
					01 NTSC OR SETUP75							
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	SUB-HUE[ORDINARY]	SUB-BRIGHT[ORDINARY]						
					SUB-HUE[NTSC]	SUB-BRIGHT[SETUP75]						
	CXA1839 08H DATA READ	CONTROLLER → PROJECTOR	30	27	FORMAT							
					00 NTSC							
					01 PAL							
					02 PALPLUS							
	RETURN DATA	CONTROLLER ← PROJECTOR	10	20	SUB-CON1	SUB-COL1[NTSC]						
						SUB-COL1[PAL]						
						SUB-COL1[PALPLUS]						
	PICTURE CONTROL DATA READ	CONTROLLER → PROJECTOR	30	52	VIDEO MEM NO							
					0 OFF							
					01~0A 1~10							
	REUTRN DATA	CONTROLLER ← PROJECTOR	10	20	CONTR	BRT	HUE	SHARP	COLOR			
	RGB SIZE DATA READ	CONTROLLER → PROJECTOR	30	54	VIDEO MEM NO							
					0 OFF							
					01~0A 1~10							
	REUTRN DATA	CONTROLLER ← PROJECTOR	10	20	H COARSE	H FINE	V COARSE	V FINE				
	RGB SHIFT DATA READ	CONTROLLER → PROJECTOR	30	56	VIDEO MEM NO							
					0 OFF							
					01~0A 1~10							
	REUTRN DATA	CONTROLLER ← PROJECTOR	10	20	H COARSE	H FINE	V					
	BLANKING DATA READ	CONTROLLER → PROJECTOR	30	58	VIDEO MEM NO							
					0 OFF							
					01~0A 1~10							
	REUTRN DATA	CONTROLLER ← PROJECTOR	10	20	LEFT	RIGHT	TOP	BOTTOM				
	CENT DATA READ	CONTROLLER → PROJECTOR	30	60	COLOR							
					00 R							
					01 G							
					02 B							
	REUTRN DATA	CONTROLLER ← PROJECTOR	10	20	H COARSE	H FINE SERVICEMAN	H FINE	H COARSE INVERT	H FINE SERVICEMAN	H FINE INVERT	V COARSE	V FINE SERVICEMAN
					V FINE							
ACTIVE MEMORY WRITE ***<CMD1=32HEX>***	COLOR UNIFORMITY DATA ALL WRITE	CONTROLLER → PROJECTOR	32	08	SSET	COLOR	H R	V R		COLOR = R		
					00 OFF	00 R	H G	V G	V	COLOR = G		
					01 ADJUST	01 G	H B	V B		COLOR = B		
					02 PRESET S1	02 B						
					03 PRESET S2							

FUNCTION	COMMAND	DIRECTION	CMD1	CMD2	DATA
	COLOR UNIFORMITY DATA R/G/B WRITE	CONTROLLER → PROJECTOR	32	09	SSET: 00 OFF; 01 ADJUST; 02 PRESET S1; 03 PRESET S2 / COLOR: 00 R; 01 G; 02 B / H/V: 00 HR HG HB; 01 VR VG VB; 02 V / COLOR UNIFORMITY
	BRT UNIFORMITY DATA ALL WRITE	CONTROLLER → PROJECTOR	32	0A	SSET: 00 OFF; 01 ADJUST; 02 PRESET S1; 03 PRESET S2 / H / V
	BRT UNIFORMITY DATA LR/TB WRITE	CONTROLLER → PROJECTOR	32	0B	SSET: 00 OFF; 01 ADJUST; 02 PRESET S1; 03 PRESET S2 / POSITION: 00 H; 01 V / BRT UNIFORMITY
	CXA1839 00H DATA WRITE	CONTROLLER → PROJECTOR	32	10	FORMAT: 00 ORDINARY; 01 RGB; 02 COMP / PICTURE
	CXA1839 05H DATA WRITE	CONTROLLER → PROJECTOR	32	21	FORMAT: 00 ORDINARY; 01 NTSC / SUB-HUE
	CXA1839 08H DATA FORMAT WRITE	CONTROLLER → PROJECTOR	32	29	FORMAT: 00 NTSC; 01 PAL; 02 PALPLUS / SUB-COL1
	PICTURE CONTROL DATA ALL WRITE	CONTROLLER → PROJECTOR	32	52	VIDEO MEM NO: 00 OFF; 01~0A 1~10 / CONTR / BRT / HUE / SHARP / COLOR
	PICTURE CONTROL DATA WRITE	CONTROLLER → PROJECTOR	32	53	VIDEO MEM NO: 00 OFF; 01~0A 1~10 / TYPE: 00 CONTR; 01 BRT; 02 HUE; 03 SHARP; 04 COLOR / PICTURE CONTROL
	RGB SIZE DATA ALL WRITE	CONTROLLER → PROJECTOR	32	54	VIDEO MEM NO: 00 OFF; 01~0A 1~10 / SIZE(H COARSE) / SIZE(H FINE) / SIZE(V COARSE) / SIZE(V FINE)
	RGB SIZE DATA H/V WRITE	CONTROLLER → PROJECTOR	32	55	VIDEO MEM NO: 00 OFF; 01~0A 1~10 / TYPE: 00 H COARSE; 01 H FINE; 02 V COARSE; 03 V FINE / RGB SIZE
	RGB SHIFT DATA ALL WRITE	CONTROLLER → PROJECTOR	32	56	VIDEO MEM NO: 00 OFF; 01~0A 1~10 / SHIFT(H COARSE) / SHIFT(H FINE) / SHIFT(V)
	RGB SHIFT DATA H/V WRITE	CONTROLLER → PROJECTOR	32	57	VIDEO MEM NO: 00 OFF; 01~0A 1~10 / H/V: 00 H COARSE; 01 H FINE; 02 V / SHIFT

FUNCTION	COMMAND	DIRECTION	CMD1	CMD2	DATA
	BLANKING DATA ALL WRITE	CONTROLLER = PROJECTOR	32	58	VIDEO MEM NO / LEFT / RIGHT / TOP / BOTTOM
					00 OFF
					01~0A 1~10
	BLANKING DATA WRITE	CONTROLLER = PROJECTOR	32	59	VIDEO MEM NO / POSITION / BLANKING
					00 OFF
					01~0A 1~10
					00 LEFT
					01 RIGHT
					02 TOP
					03 BOTTOM
	CENT DATA ALL WRITE	CONTROLLER = PROJECTOR	32	60	COLOR / H COARSE / H FINE SERVICEMAN / H FINE / H COARSE INVERT / INE SERVICEMAN INVI / H FINE INVERT / V COARSE
					00 R
					01 G
					02 B
					V FINE SERVICEMAN / V FINE
	CENT DATA WRITE	CONTROLLER = PROJECTOR	32	61	COLOR / TYPE / CENT
					00 R
					01 G
					02 B
					00 H COARSE
					01 H FINE SERVICEMAN
					02 H FINE
					09 H COARSE INVERT
					0A H FINE SERVICEMAN INVERT
					0B H FINE INVERT
					12 V COARSE
					13 V FINE SERVICEMAN
					14 V FINE

	CMD1 = 16 HEX						SIRCS CODE									
CMD2	x0	x1	x2	x3	x4	x5	x6	x7	x8	x9	xA	xB	xC	xD	xE	xF
0x											SWITCHER 1-1	SWITCHER 1-2	SWITCHER 1-3	SWITCHER 1-4	SWITCHER 1-5	SWITCHER 1-6
1x	SWITCHER 1-7	SWITCHER 1-8				POWER ON/OFF			CONTRAST + HIGH		COLOR + HIGH	COLOR - LOW			BRITNESS + BRIGHT	
2x	HUE + PURPLISH	HUE - GREENISH	SHARPNESS + SHARP	SHARPNESS - SOFT	PICTURE MUTING	STATUS ON	STATUS OFF			MENU	VIDEO	INPUT A	INPUT B	CENT	POWER ON	POWER OFF
3x		POSITION +	POSITION -	CURSOR →	CURSOR ←	CURSOR ↑	CURSOR ↓	SWITCHER 2-1	SWITCHER 2-2	SWITCHER 2-3	SWITCHER 2-4	SWITCHER 2-5	SWITCHER 2-6	SWITCHER 2-7	SWITCHER 2-8	
4x		ADJUSTMENT COLOR RED	ADJUSTMENT COLOR GREEN	ADJUSTMENT COLOR BLUE	CUT OFF COLOR RED	CUT OFF COLOR GREEN		RGB SIZE	RGB SHIFT	CENTTERING RED			SIZE	LINEARITY	SKEW	BOW
5x	KEYSTONE	PINCUSHION	W/B GAIN	W/B BIAS	MG. FOCUS		ZONE		BLANKING		ENTER				MEMORY	VIDEO / S VIDEO
6x	INDEX 0(ALL)	INDEX 1	INDEX 2	INDEX 3	INDEX 4	INDEX 5	INDEX 6	INDEX 7	INDEX 8	INDEX 9						
7x												RESET		NORMAL	PATTERN	
8x																
9x																
Ax																
Bx																
Cx																
Dx																
Ex																
Fx																