

Panasonic Protocol Data

5 December 2006

Warning from Panasonic

The contents of this document and the function of the protocol are subject to change without notice.

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¹\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/PanProto.tex,v 1.57 2006-12-05 11:38:56-08 Hamilton Exp
Hamilton \$

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1 Introduction

1.1 Basic Configuration of Combination Camera WV-CSR Series [newbcoc]

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 5

WV-CSR Cameras consist of two parts, the Camera Pan/Tilt Block and the Interface (I/F) Block. The I/F block converts commands from RS485 to the Panasonic single wire protocol, and then sends them to the Pan/Tilt block. The I/F block sends one command in a vertical blanking period. The communication between the I/F block and the Pan/tilt block is bidirectional which can send and receive data in a vertical blanking period only.

1.2 I/F Block (Buffer Function) [newobbf]

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 5

The I/F block has a command buffer to store multiple commands from PC. Buffer capacity is about 1 Kbytes. When commands are sent to the I/F block, they are stored in the buffer, and then successively transferred to the Pan/Tilt block at the rate of one command per vertical blanking period. If many commands are sent from PC, the response becomes slow. During the command transfer between the I/F block and the Pan/Tilt block, the I/F block can communicate to PC.

When the I/F block receives a command from the PC successfully, it sends back an ACK command to PC. When the Pan/Tilt Block receives a command and does it successfully, it sends back an ANSWER command to PC via the I/F block. When the buffer is full, I/F block can not receive more data from the PC until a stored command is completed. The buffer can be cleared by the buffer clear command (Section 4.8, page 34).

1.3 Protocol Modes [newpm]

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 3

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 4

WV-CS850 supports two different protocols. One is Panasonic conventional camera protocol, which is compatible with CS600, CS650 etc. The other is the Panasonic new camera protocol, which enables faster PTZF operations. Panasonic new camera protocol is automatically selected when a CS850 is connected to a Panasonic controller/switcher, which supports the new protocol such as CU161, MP204 with CU360. Panasonic conventional protocol is applicable for general commands such as AGC, ALC, shutter etc., even when connected to CU161 or MP204 with CU360.

```

2$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/NewBcoc.inc,v 1.4 2006-12-01 11:19:04-08 Hamilton Exp
Hamilton $
3$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/NewObbf.inc,v 1.6 2006-12-01 11:19:05-08 Hamilton Exp
Hamilton $
4$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/NewPm.inc,v 1.9 2006-12-01 11:56:38-08 Hamilton Exp
Hamilton $

```

1.4 History up to revsion 4.0 of this protocol

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 2

Date	Comment	Page
15 Feb.2000	First edition	
15 Nov. 2000	Minor upgrade edition	3(+ascii code) 5(+STOP command ex.)
11 Dec 2000	Ver. 2.0	2.7(Revise) 4, 5, 6 (Add.)
15 May 2001	Ver. 2.1 3	New protocol revised
22 Aug. 2001	Ver. 2.2 7.	Setup reset commands
31 Oct. 2001	Ver. 3.0	CS850A 256 step PT command, page 21
July 2002	Ver. 3.1	P7 ATW offset, LL phase, P14 QID code
Jan 2003	Ver. 3.2	SD ON Page 6
May 2005	Ver. 4.0	Support CS950 (2.3 2.4 4)

Table 1. History from revision 4.0

1.5 Scope of this document

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Recommended Protocol for cross control, 6/16/2006, page 2

This document is excerpted from the total Panasonic camera control protocol document and is the recommended protocol for cross control between Pelco and Panasonic equipment⁸ since the total protocol document contains extensive protocols and protocols for older generation cameras which may not be needed for cross control with newer equipment.

This document and protocol are applicable for the following PTZ camera models only (Table 2, page 9). Older generation cameras do not work with the protocol in this document.

This notice appears in the Panasonic protocol document that they gave us in the summer of 2006. It lists a very small subset of the full Panasonic protocol. Table 2, page 9 and Appendix D.3, page D-5 are the only new items in the document. The document also includes the following sections: Section 5.3, page 75, Figure 4, page 19, parts of Section 4.12, page 37 and Section 5.4, page 78.

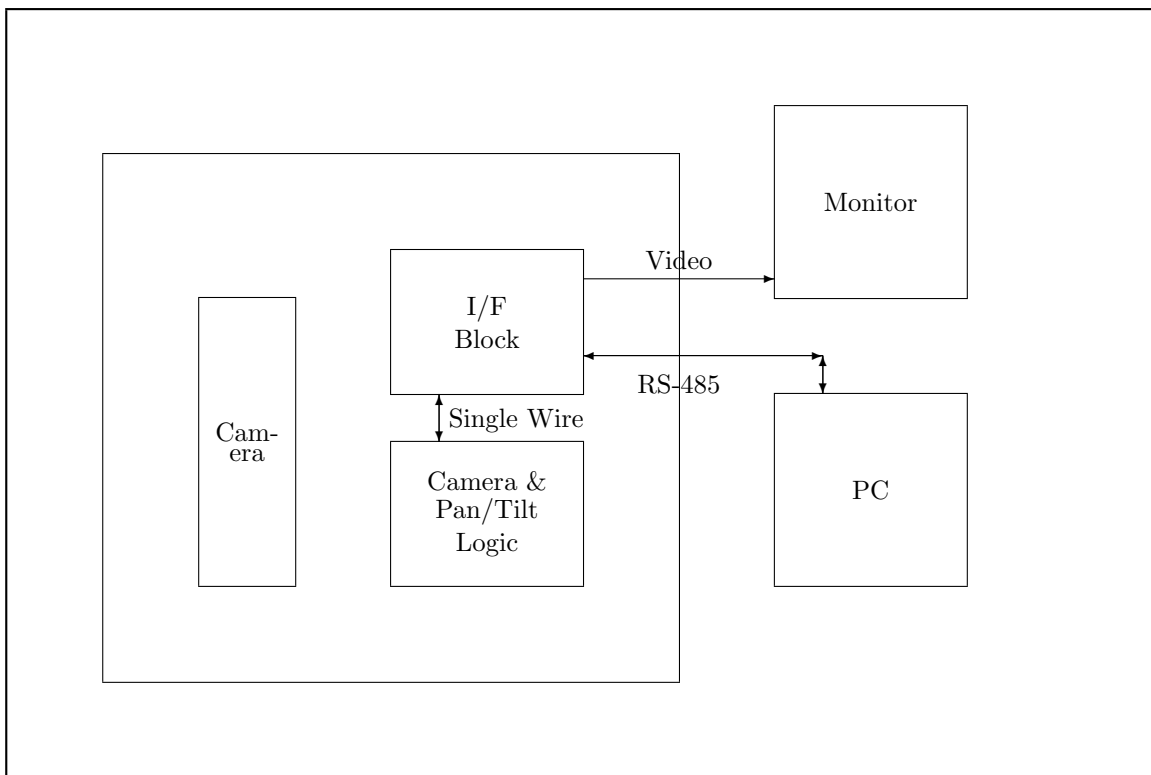
⁵\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/Hist.inc,v 1.1 2006-12-04 13:31:44-08 Hamilton Exp
Hamilton \$

⁶\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/Block.inc,v 1.5 2006-12-01 11:19:03-08 Hamilton Exp
Hamilton \$

⁷\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/Scope.inc,v 1.2 2006-12-05 11:38:56-08 Hamilton Exp
Hamilton \$

⁸By Panasonic!

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 5



\$RCSfile: Block.inc,v \$

Figure 1. Panasonic Dome Block Diagram[block]

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Recommended Protocol for cross control, 6/16/2006, page 2

Generation	PTZ Camera model(US)
4G	WVCS954
	WVCW964
3G	WVCS574
	WVCW864A
	WVCS854B
	WVCW864
	WVCS564
	WVCS854A

Table 2. Camera Types Recommended to Emulate for Cross Control[limits]

2 Protocol Characteristics[pc]

1. With the following exceptions:

- 1.1. Start of Text, STX (0x02)
- 1.2. End of Text, ETX (0x03)
- 1.3. Acknowledge, ACK (0x06)
- 1.4. Negative Acknowledge, NAK (0x15)

ALL protocol characters are printable ASCII.

2. When the PC sends a command:

- 2.1. It is always ACKed by the interface. (Figure 15, page 73)
- 2.2. If the command is a “one-way” command the camera does not send an ANSWER. (Figure 4, page 19) Unless an answer has been requested with an RON command.
- 2.3. For other commands the camera will send an ANSWER which the PC ACKs. (Figure 2, page 15. Figure 7, page 40)
- 2.4. If multiple commands are sent at the same time, the interface sends **one** ACK, the camera sends multiple ANSWERS. (Figure 3, page 17)

3. All commands and ANSWERS (responses) start with an STX and end with an ETX, even if the documentation here “forgets” to mention it.

4. There is no checksum associated with messages.

5. Converting from what looks like a numeric field to Panasonic printable ASCII is done as follows: [encode]

- 5.1. For values from 0x00 through 0x09 0x30 is added to them. This results in ASCII values from “0” through “9”.
- 5.2. For values from 0x0A through 0x0F 0x37 is added to them. This results in ASCII values from “A” through “F”.

This is exactly the same as converting from binary to hexadecimal. Unfortunately it is not always obvious that this is happening when reading the original protocol documents.

6. If PC does not send an ACK after receiving the ANSWER, the camera repeats sending the ANSWER up to 4 times (includes first one). Repeat interval is programmable (off, 100 ms → 1000 ms). (Figure 5, page 20)

7. Some commands have a time out which deactivates the command after a specified time following sending. (Figure 15, page 73)

To keep a command valid, repeat the command within the timeout period. Recommended repeat frequency is shown in the command tables.

For small amount of adjustment, send a STOP command after sending these commands. For example: GCF:0021002:0021004 (Iris Open, Iris Stop)

⁹\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/PC.inc,v 1.7 2006-12-04 08:56:31-08 Hamilton Exp Hamilton
\$

8. Typographic conventions:

- 8.1. Values inside double quotes are printable ASCII characters. E.g. "A3".
 - 8.2. Values written in C format, are their C values. E.g 0x12 is equal to 18₁₀.
 - 8.3. "Blanks" are used liberally for clarity, they are not an actual part of the commands and ANSWERS.
 - 8.4. No lower case letters are actually used in commands. In this document lower case letters usage is always explained.
9. When camera receives a PRESET STORE COMMAND 9030064 90300A3, "MEMORY" is displayed for 3 seconds.
 10. All numeric commands that start with GC usually have commands that are **seven** (7) alphanumeric characters long. In many parts of this document the commands are shortened. Sometimes by accident, but more commonly because Panasonic did so. See the table of length specifiers at Table 5, page 13.
 11. There are three values for the 4th byte of commands: [commandtypes]
 - 11.1. 0: This is a status request.
 - 11.2. 1: This is a control command.
 - 11.3. 2: This is extra data required by a control command. There may be more than one "2" commands following a "1" command.

12. General Case ANSWERS: [responsecodes]

Command byte #4 controls the type of ANSWER byte #4 as follows:

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 7

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 3

Cmnd Byte 4	Ans Byte 4
"0"	"3"
"1"	"E"
"2"	"9"

13. Special ANSWERS:

- 13.1. If the command is "bad" then the ANSWER byte #4 will always be a "D".
- 13.2. Commands of the form "902..." and "903..." never generate ANSWERS.
- 13.3. Status requests of the type:
 - 13.3.1. 00201xx generate 0021xx? ANSWERS (Appendix A.3, page A-7)
 - 13.3.2. 20201xx generate 2021xx? ANSWERS (Appendix A.4, page A-9)

In the above two samples:

 - 13.3.1. xx indicates any two digits.

- 13.3.2. ? indicates an information containing byte. Usually “1” indicates “Off” and “0” indicates “On”. Many other values are used.
- 13.4. 0021033 always generates 002D033
- 13.5. 00216B0 always generates 002D6B0
- 13.6. 00216B1 always generates 002D6B1

Code	Use
A	Alarm
G	Camera(?)
Q	Question
R	Receiver Mode
S	Status(?)

Table 3. First character of commands or responses

2.1 Command Timing [timing]

In Figure 2, page 15 the timing for sending and executing a single command is shown. There are several important things to note in this diagram. They are:

1. Commands do not pass directly to the control logic. Instead they go from the PC to an InterFace unit. (Section 1.2, page 7)
2. All commands, etc., pass from the InterFace unit during the video vertical retrace interval. (Section 1.2, page 7) Video retrace intervals are indicated by horizontal dashed lines in all command timing diagrams.
3. Two different types of response are generated by the unit. (Section 1.2, page 7)
 - 3.1. ACKs from the InterFace unit. These tend to be short single byte responses. The only time that these are different is when they are NAKs in which case an additional byte of information is also sent following the NAK.
 - 3.2. ANSWERS from the Camera. These tend to be long command type responses. Sometimes multiple responses are generated by the camera.
4. The PC should always ACK ANSWERS that it gets. If not then the InterFace resends the ANSWER up to a total of four times. (Figure 5, page 20)
5. Multiple commands sent as a single block (Figure 3, page 17) generate multiple ANSWERS. The multiple ANSWERS are sent one per vertical retrace time.
6. A PC may send the next command when it receives an ACK from the InterFace. (Figure 15, page 73)
7. PC may send up to 10 commands in a single block. But it must wait until it gets the last ANSWERS from the camera before sending more.

3 Command Formats and Conversations

3.1 Single Command[newscl

- Example: SHUTTER 1/250 ON, fields are explained in Table 4, page 13.

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 6	
From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 3	
From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 4	
STX G C 7 : 0 0 2 1 1 0 C ETX	
STX	0x02 ASCII control code for start of text
G C	Command header, GC = Camera Control Command
7	Number of commands. Refer to Table 5, page 13
:	Delimiter
0 0 2	Command destination, 002: Camera functions, 202: Receiver functions, 902: One way command for PTZ commands, 903: One way command for camera commands.
1	Command type , see Section 11, page 11
1 0 C	Function(1/250 On), Refer to Table A.1, page A-1.
ETX	0x03 ASCII control code for end of text

Table 4. Typical single command format[singlecommand]

When sending more than one command, use the codes in Table 5, page 13, e.g. GCF for two commands instead of GC7 for a single command.

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 6							
From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 3							
From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 4							
Code	Hex	Cmnds	Length	Code	Hex	Cmnds	Length
7	0x37	1	(7 bytes)	f	0x66	6	(47 bytes)
F	0x46	2	(15 bytes)	n	0x6E	7	(55 bytes)
N	0x4E	3	(23 bytes)	v	0x76	8	(63 bytes)
V	0x56	4	(31 bytes)	~	0x7E	9	(71 bytes)
~	0x5E	5	(39 bytes)	(	0x28	10	(79 bytes)

Table 5. Command length specifiers[lengthspecifiers]

¹⁰\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/NewSc.inc,v 1.10 2006-12-04 08:56:29-08 Hamilton Exp
Hamilton \$

3.1.1 Single Command Response[newsr]

Responses are identical to their commands with the “command type” field replaced to a “response type” code. The response codes are listed in Table 6, page 14.

After sending a command, following ANSWER will be received.

- Example: SHUTTER 1/250 ON, fields are explained in Table 6, page 14.

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 6	
From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 3	
From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 4	
STX G C 7 : 0 0 2 E 1 0 C ETX	
STX	0x02 ASCII control code for start of text
G C	Command header, GC = Camera Control Command
7	Number of commands. Refer to Table 5, page 13
:	Delimiter
0 0 2	Command destination, 002: Camera functions, 202: Receiver functions, 902: One way command for PTZ commands, 903: One way command for camera commands.
E	Response code, see Section 12, page 11
1 0 C	Function(1/250 On), Refer to Table A.1, page A-1.
ETX	0x03 ASCII control code for end of text

Table 6. Single Command Response[singlecommandresponse]

¹¹\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/NewScr.inc,v 1.11 2006-12-04 08:56:29-08 Hamilton Exp
Hamilton \$

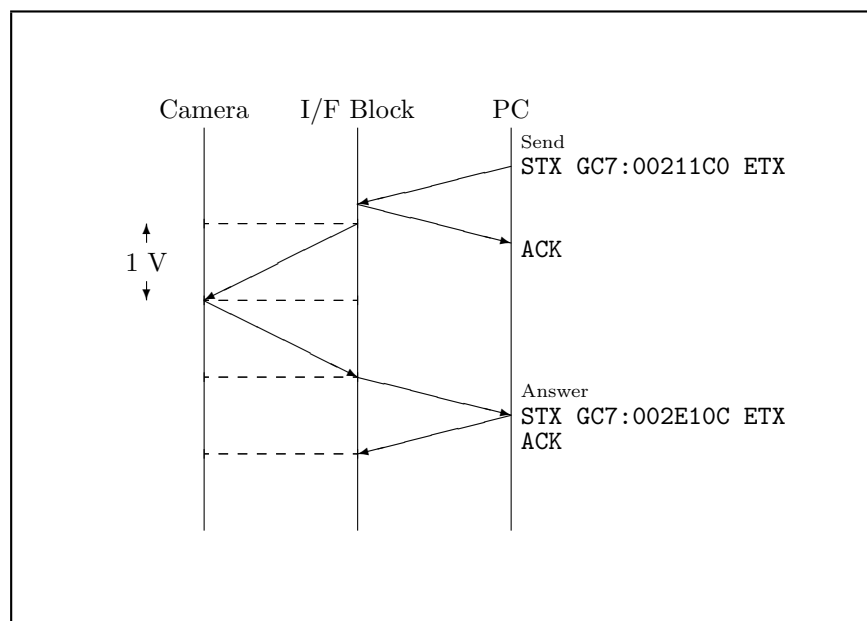
3.1.2 Single Command Acknowledgment [newsc1]

If PC does not send an ACK after receiving the ANSWER, the camera repeats sending the ANSWER up to 4 times (includes first one). Repeat interval is programmable (off, 100 ms $\rightarrow$ 1,000 ms).

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 8

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 5

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 6



\$RCSfile: St.inc,v \$

Figure 2. Single Command Timing [st]

¹²\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/NewSc1.inc,v 1.4 2004-11-19 09:45:32-08 Hamilton Exp
Hamilton \$

¹³\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/St.inc,v 1.4 2006-12-01 11:56:42-08 Hamilton Exp Hamilton
\$

3.2 Multiple Commands[newmc]

- Example: PRESET POSITION CALL #1, fields are explained in Table 7, page 16

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 7	
From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 4	
From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 5	
STX G C F : 2 0 2 1 4 0 0 : 2 0 2 2 0 0 0 ETX	
STX	0x02 of ASCII code table
G C	Command header, GC = Camera Control Command
F	Number of commands. Refer to Table 5, page 13
:	Delimiter
2 0 2	Command destination, 002 = Camera functions, 202 = Receiver functions 902: One way command for PTZ commands, 903: One way command for camera commands.
1	Command type, see Section 11, page 11
4 0 0	Function (Preset position call), Refer to Table B.1, page B-1 and Table A.2, page A-3.
:	Delimiter
2 0 2	Command destination, 002 = Camera functions, 202 = Receiver functions 902: One way command for PTZ commands, 903: One way command for camera commands.
2	Command type, see Section 11, page 11
0 0 0	ASCII text data (Position 1). Preset IDs are 00 → 63
ETX	0x03 of ASCII code table

Table 7. Multiple command format[multiplecommand]

3.2.1 Multiple Command Replys[newmcr]

- Example: PRESET POSITION CALL #1
- ANSWER 1: STX GC7: 202E400 ETX
- ANSWER 2: STX GC7: 2029000 ETX

¹⁴\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/NewMc.inc,v 1.10 2006-12-04 08:56:28-08 Hamilton Exp
Hamilton \$

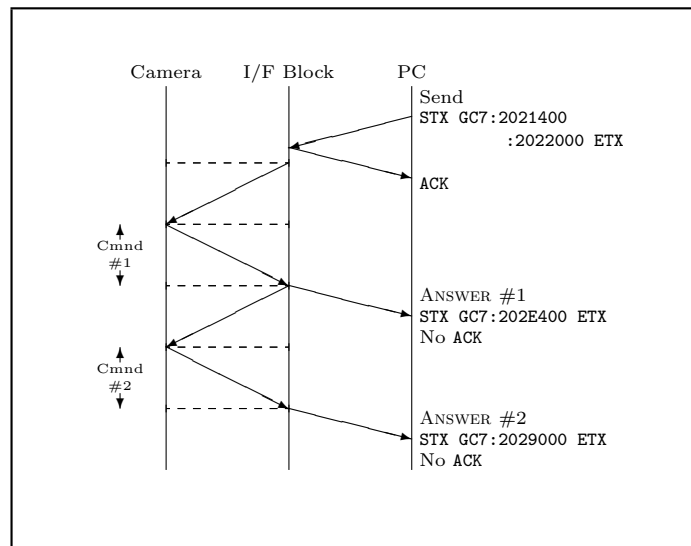
¹⁵\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/NewMcr.inc,v 1.11 2006-12-05 11:38:53-08 Hamilton Exp
Hamilton \$

¹⁶\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/Mt.inc,v 1.7 2006-12-01 11:56:37-08 Hamilton Exp Hamilton
\$

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 7			
From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 4			
Camera	Direction	PC	Notes
	←	STX GCF:2021400:2022000 ETX	Command
STX GC7: 202E400 ETX	→		ANSWER #1
STX GC7: 2029000 ETX	→		ANSWER #2

Table 8. Multiple commands and replies[multireply]

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 9
From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 5
From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 6



\$RCSfile: Mt.inc,v \$

Figure 3. Multiple Command Timing[mt]

3.3 One Way Command[newowc]

The new protocol is one way and does not require ANSWER.

3.3.1 Command Structure[newcs]

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 20

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 21

STX G C 7 : 9 T T X X X X ETX	
STX	0x02 ASCII code for start of text
G C	Command header, GC = Camera Control Command
7	Number of commands. Refer Table 5, page 13
:	Delimiter
9	One Way New Command
T T	Command type, 02 = PTZ command, 03 = Focus command, Preset command etc
X X X X	Command body, Refer to Table 92, page 76.
ETX	0x03 ASCII code for end of text

Table 9. New Protocol Command Structure

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 20

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 21

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Recommended Protocol for cross control, 6/16/2006, page 4

3.3.2 Command ANSWER[newca]

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 20

This protocol does not require ANSWERS from cameras.

Example PRESET POSITION 1 CALL

```

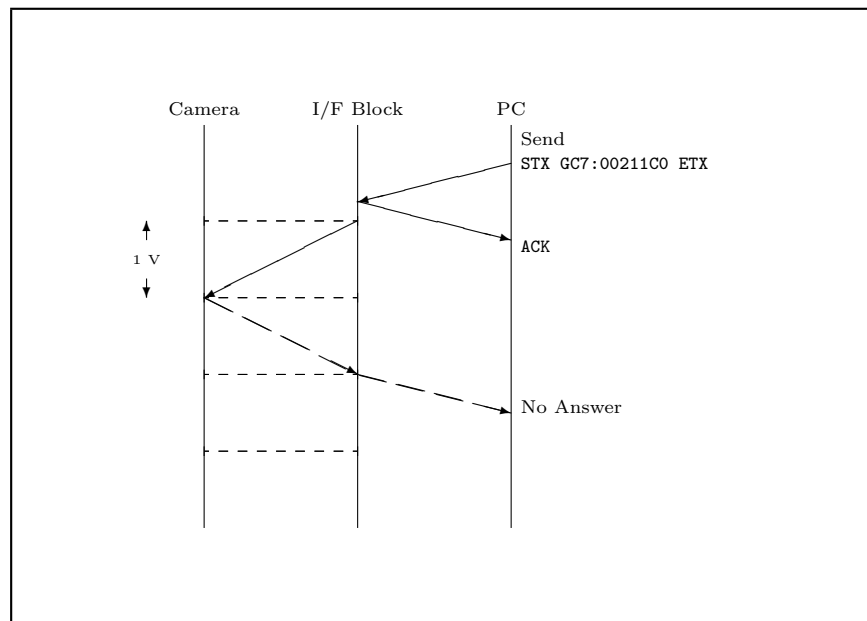
17$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/NewUwc.inc,v 1.2 2004-11-19 09:45:31-08 Hamilton Exp
Hamilton $
18$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/NewCs.inc,v 1.7 2006-12-01 11:56:38-08 Hamilton Exp
Hamilton $
19$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/Ow.inc,v 1.3 2006-12-04 09:39:07-08 Hamilton Exp Hamilton
$
20$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/NewCa.inc,v 1.6 2006-12-01 11:19:04-08 Hamilton Exp
Hamilton $

```

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 20

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 21

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Recommended Protocol for cross control, 6/16/2006, page 4



\$RCSfile: Ow.inc,v \$

Figure 4. One Way Command Timing[ow]

Camera	Direction	PC	Notes
ACK	←	STX GC7:9030000 ETX	Depends on RON mode
(<nothing>)	→		No ANSWER

Table 10. New Protocol Command ANSWER

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 9

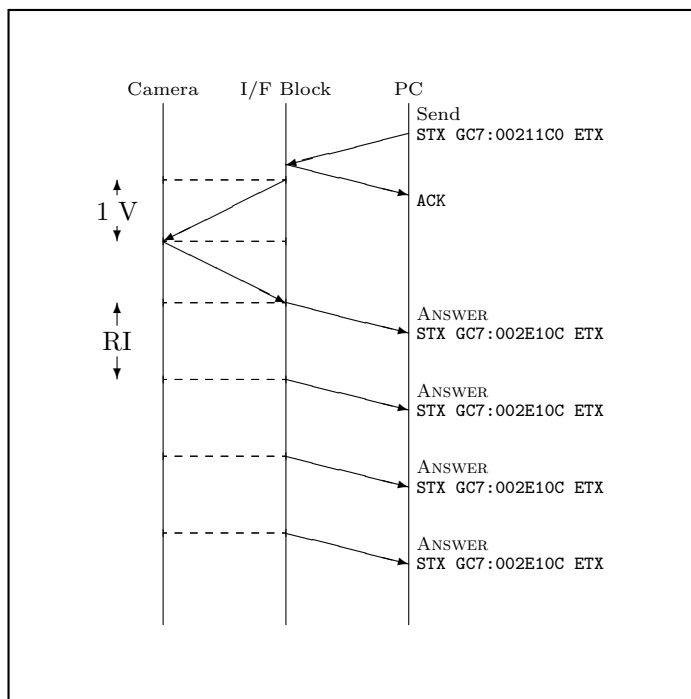
From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 5

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 6

Some commands have a time out which deactivates the command at the specified time after sending. To keep a command valid, repeat the command within the timeout period. Recommended repeat frequency is shown in the command tables. For small amount of adjustment, send a **STOP** command after sending these commands. For example: **GCF:0021002:0021004** (Iris Open, Iris Stop)

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 8

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 5



\$RCSfile: Ua.inc,v \$

Figure 5. Unacknowledged ANSWER command repeat timing[ua]

21 \$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/NewCt.inc,v 1.7 2006-12-04 08:56:28-08 Hamilton Exp
Hamilton \$

22 \$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/Ua.inc,v 1.5 2006-12-01 11:19:09-08 Hamilton Exp Hamilton

3.5 Unit Address[*newua*]

When multiple units are daisy chain connected, a command must have unit address as shown below with its fields explained in Table 11, page 21.

- Example: SHUTTER 1/250 ON to camera 1.

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 7	
From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 4	
From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 5	
STX A D 0 1 ; G C 7 : 0 0 2 1 1 0 C ETX	
STX	0x02 ASCII control code for start of text
A D 0 1	Unit Address 01 → 96, ZZ
;	Delimiter, Note that this is a semi-colon.
G C	Command header, GC = Camera Control Command
7	Number of commands. Refer to Table 5, page 13
:	Delimiter
0 0 2	Command destination, 002: Camera functions, 202: Receiver functions, 902: One way command for PTZ commands, 903: One way command for camera commands.
1	Command type, see Section 11, page 11
1 0 C	Function(1/250 On), Refer to Table A.1, page A-1.
ETX	0x03 ASCII control code for end of text

Table 11. Camera Addresses[*cameraaddress*]

Note

1. Camera addresses are one based. I.e. “01” = 1.
2. Only addresses “01” → “96” are available for CSR Camera series.
3. Only addresses “01” → “16” are available for WV-RM70.
4. ZZ controls all units.

²³\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/NewUa.inc,v 1.10 2006-12-01 11:56:39-08 Hamilton Exp
Hamilton \$

4 System Commands

4.1 Alarm log[newa]

From: Operating Instructions, WV-CW864A

Various units feature:

1. Built-in digital motion detector and alarm outputs.

2. Alarm Input/Output (**ALARM IN/OUT**)

Preset positions are assigned to **ALARM IN** 1 to 4. When alarm inputs are supplied via the alarm input connector, the camera turns to the respective positions. Then the camera sends output signals via the alarm output connector or the coaxial cable to the external devices. The **B/W** mode may be chosen if light is insufficient. **CNT-CLS** (Contact Closure) 1, 2 and **COAX ALM OUT** are used for alarm output setting.

3. Preset Alarm (**PRESET ALM**)

Alarm signals are generated in the following cases if **ON** is selected.

- 3.1. When a preset positioning sequence is completed while **AUTO MODE** is set to **SEQ**.
- 3.2. When a preset positioning sequence is completed while **AUTO MODE** is set to **SORT**.
- 3.3. Positioning is completed at the **HOME** position in the **SELF RETURN** mode.
- 3.4. Positioning is completed in the **ALARM IN** mode.
- 3.5. When positioning to the starting point is completed while **AUTO MODE** is set to **AUTO PAN**.
- 3.6. When positioning to the starting point is completed while **PATROL** is set to **PLAY**.

4.1.1 Alarm log request

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 27

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 13

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 15

Command	ANSWER
STX QLM ETX	STX (Table 16, page 24) ETX

Table 12. Alarm log mode request command (**Q**uestion **a**larm **M**ode)

²⁴\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/NewA.inc,v 1.16 2006-12-04 11:55:38-08 Hamilton Exp
Hamilton \$

4.1.2 Alarm Log Data Request Command[oldalrc]

This command is used to ask for the alarm log when the alarm log mode is “0”.

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 27	
From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 14	
From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 16	
Command	Answer
STX QLD ETX	STX (Table 14, page 23) ETX

Table 13. Alarm log request command (Question aLarm Data)

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 27	
From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 14	
From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 16	
Answer	Alarm Log
“0”	No.
“1”	Yes. Unit is currently not in the alarm status
“2”	Yes. Unit is currently in the alarm status.

Table 14. Alarm Log Requests[table52]

Note

ANSWER “2” is only sent from the device which has alarm status such as WV-RM70. CSR cameras send answer “1” if they have detected a motion in previous 120 seconds. This period is programmable for the RM70.

²⁵\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/0ldAlrc.inc,v 1.11 2006-12-04 08:56:29-08 Hamilton Exp
Hamilton \$

4.1.3 Alarm mode set

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 27	
From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 13	
From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 15	
Command	ANSWER
STX RLM: (Table 16, page 24) ETX	STX RLM ETX

Table 15. Alarm mode set command (**R**eceiver **a**larm **M**ode)

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 27	
From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 13	
From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 15	
Mode	Function
“0”	Camera sends alarm log when requested
“1”	Camera sends alarm log every time an alarm occurs.
“2”	Camera sends alarm log every 5 seconds

Table 16. Alarm modes[alarmmodes]

4.1.4 Alarm mode “0” [newam0]

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 14

This command is used to ask for the alarm log when the alarm mode is “0”.

Command	ANSWER
STX QLD ETX	STX (Table 18, page 25) ETX

Table 17. Alarm log request command, (Question aLarm Data)

ANSWER	Alarm log
“0”	No.
“1”	Yes. There was at least one alarm after previous request.
“2”	Yes. Now there is alarm.

Table 18. Alarm log modes[alarmlog]

4.1.5 Alarm mode “1” [newam1]

This command is sent from camera #xx when the alarm mode is “1”.

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 14

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 16

Command
STX ADxx; ALM : XX ETX

Table 19. Alarm information data

- The exact format of an alarm response is: “sAD01;ALM:xxe” with:
 - “e”: is used to indicate an ASCII ETX, end of text, character.
 - “s”: is used to indicate an ASCII STX, start of text, character.
 - “xx”: is used to indicate the ASCII coded two digit error number. “01” would be used to indicate alarm #1.
- “xx” = Camera unit address : “01” → “96” (Zero based).

²⁶\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/NewAm0.inc,v 1.7 2006-12-01 11:19:04-08 Hamilton Exp
Hamilton \$

²⁷\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/NewAm1.inc,v 1.11 2006-12-01 11:56:37-08 Hamilton Exp
Hamilton \$

- “XX” = Alarm #.

What is the range of the alarms?

Does this also apply to mode 2?

4.2 Auto Focus (AF) [oldaf]

From: Operating Instructions, WV-CW864A

1. Auto Focus (AF MODE)

The camera adjusts the focus automatically by sensing the center of the picture. S, M and L stand for the size of the sensing area: Small, Middle and Large.

1.1. **MANUAL S, M, L:** Auto-focus is activated only when the AF key on the controller is pressed.

1.2. **AUTO S, M, L:** Auto-focus is activated automatically while a manual pan, tilt or zoom operation is performed.

Note: If SENS UP is set to ON except x2 FIX or x2 AUTO, the AUTO (S/M/L) mode is disabled and the MANUAL (S/M/L) mode is automatically selected.

This function is only available for WV-CSR600 & WV-CS600A with WV-RM70.

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 25

Function	Command	Answer
One Push AF On	0021A06	002EA06
AF Area	0021A1 (Table 21, page 27)	002EA1 (Table 21, page 27)

Table 20. Auto Focus

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 25

Code	Function
"8"	Small
"9"	Middle
"A"	Large

Table 21. Auto Focus Codes [table416]

Note : Small, Medium and Large is the size of the Auto Focus zone.

²⁸\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/01dAf.inc,v 1.12 2006-12-04 08:56:29-08 Hamilton Exp
Hamilton \$

4.3 Auto Pan[oldap]

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 16

Function	Command	Answer
Auto Pan	202130 (Table 23, page 28)	202E30 (Table 23, page 28)

Table 22. Auto Pan[autopan]

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 16

Code	Function
"0"	Auto Pan On
"1"	Auto Pan Off
"E"	Endless Auto Pan On
"F"	Endless Auto Pan Off

Table 23. Auto Pan Modes[autopanmodes]

²⁹\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/OldAp.inc,v 1.9 2006-12-04 08:56:30-08 Hamilton Exp
Hamilton \$

4.4 Automatic Gain Control (AGC) [oldagc]

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 22

Function	Command	Answer
AGC	002120 (Table 25, page 29)	002E20 (Table 25, page 29)

Table 24. Automatic Gain Control

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 22

Code	Function
"0"	On
"1"	Off
"8"	AGC Low
"9"	AGC Mid
"A"	AGC High

Table 25. Automatic Gain Control Codes [table412]

³⁰\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/0ldAgc.inc,v 1.11 2006-12-04 08:56:29-08 Hamilton Exp
Hamilton \$

4.5 Automatic Level Control (ALC)[oldalc]

From: Operating Instructions, WV-CW864A

Light Control (ALC/MANUAL)

1. There are several modes of adjusting the lens iris. These are as follows:
 - 1.1. **ALC:** The lens iris is automatically adjusted according to the brightness of an object. You can select one of two modes (**SUPER-D2 ON** or **SUPER-D2 OFF**) of backlight compensation. Backlight compensation is available in the **ALC** mode. It eliminates strong background light which makes the camera picture dark such as a spotlight.
 - 1.2. **MANUAL:** The lens iris is fixed at the value that you have set regardless of the brightness of an object.

2. ALC Mode with **SUPER-D2 ON**

Super-Dynamic 2 Function (SUPER-D2) The important object in a scene is usually placed in the center of the monitor's screen. In the **SUPER-D2** mode, photometric weight is given more to the center of the screen (where the important object is located) than to the edge of the picture (where a bright backlight would most likely to be located). You can use the **SUPER-D2** function if you select **ALC**. The function eliminates interference by strong background lighting which makes the camera picture dark, such as a spotlight.

3. ALC Mode with **SUPER-D2 OFF**

In this mode, the picture is divided into 48 areas. If there is a source of brightness that interferes with the clarity of the picture in these masks, corresponding areas mask the light to keep the clarity of the picture.

Generally, when a light from the background is too strong such as a spotlight, all objects except the main object in the picture are displayed darker because the lens iris is adjusted with respect to strong brightness. This model ignores strong brightness by masking the source of the strong brightness, thereby the main object is displayed clearly.

Notes:

- 3.1. The result of field setup of the mask area and level adjustment is fed back (effected) to the lens iris control in the **ALC** mode.
- 3.2. Select **OFF** for **SUPER-D2** on the **ALC CONT** menu when using only for the outdoors. If **ON** is selected for the **SUPER-D2** parameter, a shadow (black line) may appear at the boundary between the bright and the dim scenes. This is a natural phenomenon and does not indicate trouble.

4. Scene File (**SCENE FILE**)

Stores up to 10 files.

Each file has a set of detailed parameters for the shutter speed, **AGC**, electronic sensitivity enhancement, white balance, motion detector and **AF** mode. The scene files can be recalled later to reproduce the parameter settings under the same conditions as stored in the files.

³¹\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/01dAlc.inc,v 1.14 2006-12-04 08:56:29-08 Hamilton Exp
Hamilton \$

5. Gain Control (AGC)

You can set the gain of an image to automatic adjustment [AGC ON (LOW, MID, HIGH)] or fixed (AGC OFF).

ALC On	0021032	002E032	
ALC/BLC?	0020102	0021020	Off
	0020102	0021021	ALC
	0020102	0021022	ELC
	0020102	0021023	Manual

Table 26. ALC Commands[alcc]

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 21

Function	Command	Answer
ALC On	0021032	002E032
Iris Control	002100 (Table 28, page 31)	002E00 (Table 28, page 31)

Table 27. ALC command[alccommand]

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 21

Code	Function
"2"	Iris Open
"3"	Iris Close
"4"	Iris Stop
"5"	Iris Reset (Factory Preset)

Table 28. Iris control codes[iriscontrolcodes]

4.6 Automatic White Control (AWC) [oldawc]

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 23

Function	Command	Answer
AWC	002130 (Table 30, page 32)	002E30 (Table 30, page 32)

Table 29. AWC

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 23

Code	Function
"0"	AWC On
"5"	AWC Reset
"6"	AWC Start

Table 30. Automatic White Control Codes [table413]

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 31 → 34

AWC On	0021300
AWC Reset	0021305
AWC Set Up	0021300 0022306

Table 31. AWC Commands

³²\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/OldAwc.inc,v 1.12 2006-12-04 08:56:30-08 Hamilton Exp
Hamilton \$

4.7 Auto-Tracking White Balance (ATW) [oldatw]

From: Operating Instructions, WV-CW864A

White Balance (WHITE BAL) You can select either of three modes shown below for white balance adjustment:

1. Auto-Tracing White Balance (ATW1)

In this mode, the color temperature is monitored continuously and thereby white balance is set automatically. The color temperature range for the proper white balance is between approx. 2 700 and 6 000 K. Proper white balance may not be obtained under the following conditions:

- 1.1. When the color temperature is out of the range of $2,700 \rightarrow 6,000$ K.
- 1.2. When the scene contains mostly high color temperature (bluish) objects, such as a blue sky.
- 1.3. When the scene is dim. In these cases, select the AWC mode.
- 1.4. Auto-Tracing White Balance (ATW2) This mode enables the camera to trace the white balance when it is used in an area lit by sodium lamps.
- 1.5. Automatic White Balance Control (AWC)

In this mode, accurate white balance is obtained within a color temperature range of approx. $2,300 \rightarrow 10,000$ K. setting.

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 23

Function	Command	Answer
ATW	0021310	002E310

Table 32. ATW

³³\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/OldAtw.inc,v 1.12 2006-12-01 11:19:06-08 Hamilton Exp
Hamilton \$

4.8 Buffer Clear Command[olddbcc]

This command clears all buffered commands. When an immediate control is required, send this command before the required command (i.e. stop command). The commands that have been buffered are ignored and the new command is immediately executed.

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 26

Command	Answer
STX RBC ETX	STX RBC ETX

Table 33. Buffer Clear Command

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 26

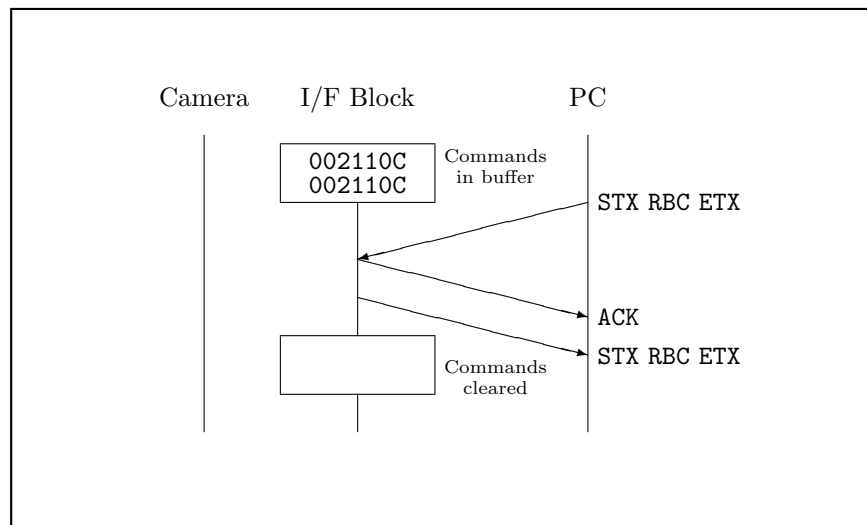


Figure 6. Buffer Clear Command[bcc]

³⁴\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/OldBcc.inc,v 1.5 2006-12-01 11:19:06-08 Hamilton Exp
Hamilton \$

³⁵\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/Bcc.inc,v 1.3 2006-12-01 11:19:03-08 Hamilton Exp Hamilton
\$

4.9 Back Light Compensation (BLC) [olddb1c]

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 23

Function	Command	Answer
BLC mode	00212A (Table 35, page 35)	002E2A (Table 35, page 35)

Table 34. BLC mode

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 23

Code	Function
"2"	Auto BLC
"3"	Preset BLC

Table 35. Back Light Compensation Codes[table412a]

4.9.1 Back Light Compensation (BLC) Setting [olddb5]

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 23

Function	Command	Answer	Note
BLC Set Up Start	00212B0	002E2B0	Start
Select Area Up	00212C8	002E2C8	Cursor position
Select Area Right	00212C9	002E2C9	
Select Area Down	00212CA	002E2CA	
Select Area Left	00212CB	002E2CB	
Mask On	00212C0	002E2C0	Mask Control
Mask Off	00212C1	002E2C1	
Mask Clear	00212C2	002E2C2	
Mask Invert	00212C3	002E2C3	
Set Up End	00212B1	002E2B1	End

Table 36. BLC Setting

³⁶\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/01dB1c.inc,v 1.9 2006-12-04 08:56:30-08 Hamilton Exp
Hamilton \$

³⁷\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/01dBs.inc,v 1.12 2006-12-01 11:19:06-08 Hamilton Exp
Hamilton \$

4.10 Camera Set Up[oldcs]

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 25

Function	Command	Answer
Camera Set Up Start	0021940	002E940
Select Area Up	0021942	002E942
Select Area Fast Up	0021946	002E946
Select Area Right	0021943	002E943
Select Area Fast Right	0021947	002E947
Select Area Down	0021944	002E944
Select Area Fast Down	0021948	002E948
Select Area Left	0021945	002E945
Select Area Fast Left	0021949	002E949
Select Area Stop	002194F	002E94F
Return	002194A	002E94A
Esc	002194B	002E94B
Set Up Finish	0021941	002E941

Table 37. Camera Set Up

None of the operations will be stored without RETURN command.

4.10.1 Camera All Reset[oldcar]

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 24

Function	Command	Answer
Camera All Reset	0021761	002E761

Table 38. Camera All Reset

³⁸\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/0ldCs.inc,v 1.11 2006-12-01 11:19:06-08 Hamilton Exp
Hamilton \$

³⁹\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/0ldCar.inc,v 1.5 2006-12-01 11:19:06-08 Hamilton Exp
Hamilton \$

4.11 Cleaning[mc]

From: Operating Instructions, WV-CW864A

This is used for refreshing the electric-mechanical contacts built in the camera. Use this function for maintenance when the camera has been directed at a specific spot or panned over a specific range for a long time.

Even if this function is used, noise may be produced on the monitor screen, or the preset position may deviate in the course of prolonged use.

To use this camera with WJ-SX550C, WJ-SX150 Matrix Switcher, set the auto cleaning function activated on the Matrix Switcher side, then clean WV-CW864A one time a day.

90300BB	00219F0	0022BB0	Cleaning	Cleaning On (menu)
90300BC	00219F0	0022BC0		Cleaning Off (menu)

Table 39. Cleaning Mode Related Commands

4.12 Communication Configuration[newcc]

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 29

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 16

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 18

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Recommended Protocol for cross control, 6/16/2006, page 4

Panasonic RS485 communication utilizes ACK and ANSWER codes. When PC sends a command, the camera sends back an ACK and an ANSWER codes. This is our basic procedure to make sure that the communication and the camera function are properly executed. But, if the ACK and ANSWER codes are not preferable, these codes can be omitted.

1. RON:7 mode is recommended in 2 wire connection.
2. SRQ (request command) and Qxx (ex. QID) requires either RON:0, RON:1, RON:4, or RON:5 mode.
3. RON codes are used to suppress replies see Table 40, page 37.

Bit	7 6 5 4 3	2	1	0	
	0 1 0 0 0 ₂	Ack	ANSWER	Errors	As documented
	0 0 1 1 0 ₂	Ack	ANSWER	Errors	Reality

Table 40. RON suppression code construction.[ronsupp]

The 00110₂ (01000₂) value in the above table is used to make the three lower bits into a printable character.

RON code suppression flags:

⁴⁰\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/Mc.inc,v 1.2 2004-11-18 08:35:55-08 Hamilton Exp Hamilton
\$

⁴¹\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/NewCc.inc,v 1.11 2006-12-04 08:56:28-08 Hamilton Exp
Hamilton \$

- 0 Enable this set of messages.
- 1 Suppress this set of messages.

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 29
From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 16
From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 18
From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Recommended Protocol for cross control, 6/16/2006, page 4

Command	ANSWER	
STX RON: (Table 42, page 38) ETX	STX RON: 0 ETX	Refer to Table 42, page 38

Table 41. Communication Configuration Commands

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 29
From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 17
From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 19

Code	ACK (Table 44, page 39)	ANSWER (Table 4.12, page 38)	Error Code (Table 43, page 39)
“0”	Yes	Yes	Yes
“1”	Yes	Yes	No(?)
“2”	Yes	No	Yes
“3”	Yes	No	No
“4”	No	Yes	Yes
“5”	No	Yes	No
“6”	No	No	Yes
“7”	No	No	No

Table 42. Camera request IDs[configcodes]

Note

[answernote] When using commands of the form “GC7:9xxxxxx” there is **never** an ANSWER.

⁴²\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/NewCcc.inc,v 1.13 2006-12-04 11:55:38-08 Hamilton Exp
Hamilton \$

⁴³\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/Rp.inc,v 1.5 2006-12-01 11:19:08-08 Hamilton Exp Hamilton
\$

⁴⁴\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/NaNa.inc,v 1.6 2006-12-01 11:19:04-08 Hamilton Exp
Hamilton \$

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 17

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 19

Error	Code	Comments
“ER001”	Invalid command	Cannot execute depending on camera mode Cannot ANSWER for execution waiting Cannot execute for execution waiting Cannot execute depending on menu setting
“ER002”	Invalid parameters	
“ER301”	Invalid command	
“ER305”	Invalid command	
“ER306”	Invalid command	
“ER601”	Wrong command	

Table 43. Error return codes[errorcodes]

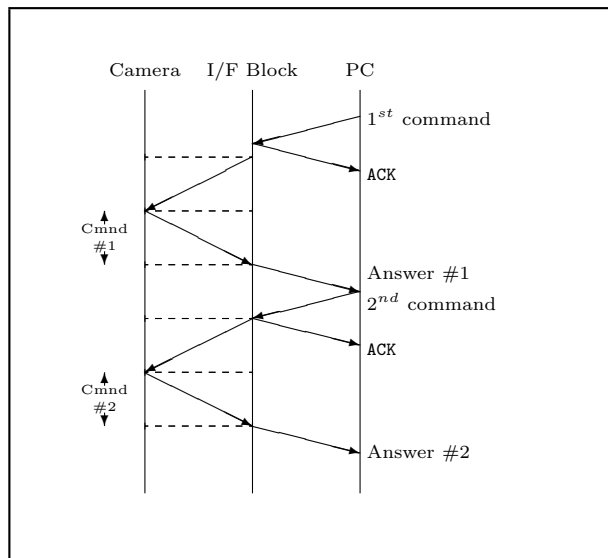
From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 17, 18

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 19

NAK+CODE	Error	Comments
0x15 “1”	Parity Error	Detected data parity error (even, odd), it causes the camera to clear camera received data
0x15 “2”	Buffer Overflow	Detected camera receive buffer full, cannot receive data
0x15 “3”	Framing Error	Detected data framing error (bad length of the stop bit), causes camera to clear camera received data
0x15 “4”	Overrun Error	Detected overwritten data buffer in camera communication hardware, causes camera to clear camera received data
0x15 “5”	Timeout Error	No ETX is received within 10 minutes after STX received, camera goes to wait for STX.

Table 44. NAK codes[NAKcodes]

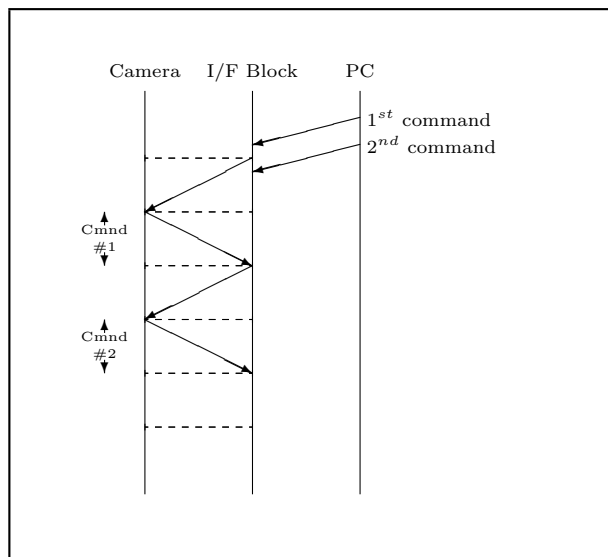
From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 30



\$RCSfile: Rp.inc,v \$

Figure 7. Regular command procedure[**rp**]

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 30



\$RCSfile: NaNa.inc,v \$

Figure 8. No Ack, No ANSWER procedure[**nana**]

4.13 Digital Flip[mf]

From: Operating Instructions, WV-CW864A

Digital flip allows 180° tilting to trace objects passing under the camera.

1. Digital Flip (DIGITAL FLIP)

Tilt range is limited within 0° to 90° if **OFF** is selected.

If **ON** is selected it widens the range up to 180° with the digital flip that reverses horizontal and vertical scanning when the camera is tilted beyond 90° point (Downright position if the camera is installed on a ceiling). Tilt range narrows from 0° to 90° if **PAN LIMIT** is set to **ON**.

	00219A0			Digital Flip On
	00219A1			Digital Flip Off
903004D	00219F0	00224D0	Digital Flip	Digital Flip On
903004E	00219F0	00224E0		Digital Flip Off

Table 45. Digital Flip Commands

4.14 Home Position[mh]

From: Operating Instructions, WV-CW864A

The home position is the camera's basic position. The camera returns to this position automatically after a specific time following a manual operation. This setting functions only when **AUTO MODE** is **OFF**.

	2021410	202E410		Home Position Request
9030058	00219F0	0022580	Home Position	Home Position Move
9030059	00219F0	0022590	BW	Home Position On — Menu Item —
903005A	00219F0	00225A0		Home Position Off — Menu Item —
903005B	00219F0	00225B0		Home Position Auto — Menu Item —

Table 46. Home Position Commands

⁴⁵\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/Mf.inc,v 1.3 2004-11-18 08:35:55-08 Hamilton Exp Hamilton

\$

⁴⁶\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/Mh.inc,v 1.4 2004-11-19 09:45:26-08 Hamilton Exp Hamilton

\$

4.15 Electronic Sensitivity Up[oldesu]

From: Operating Instructions, WV-CW864A

1. Electronic Sensitivity Enhancement (SENS UP)

The electronic sensitivity enhancement function varies the shutter speed to increase the sensitivity in low light conditions. You can select either of the following shutter speeds for **SENS UP**.

1/25 seconds (**x2**), 1/12.5 seconds (**x4**), 1/8.3 seconds (**x6**), 1/5 seconds (**x10**), 1/3.1 seconds (**x16**) or 1/1.6 seconds (**x32**).

There are two modes for **SENS UP** as follows:

- 1.1. **AUTO**: If you select **x32**, the sensitivity is increased automatically up to **x32**.
- 1.2. **FIX**: If you select **x32**, the sensitivity is increased to a fixed **x32**.

Note

- Moving objects will appear blurred when shot in the electronic sensitivity enhancement mode since **SENS UP** is equivalent to reducing the shutter speed in a still picture camera.
- The horizontal and vertical resolution will be lowered in this mode.
- If the iris opening is too small, the **SENS UP/AUTO** mode will not function.

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 22

Function	Command	Answer
Sens Up Auto	002112 (Table 48, page 42)	002E12 (Table 48, page 42)
Sens Up Fix	002115 (Table 48, page 42)	002E15 (Table 48, page 42)

Table 47. Electronic Sensitivity Up Auto and Fix

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 22

Code	Function
"0"	On
"1"	Off
"2"	Increase
"3"	Decrease

Table 48. Electronic Sensitivity Codes[table411]

⁴⁷\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/01dEsu.inc,v 1.12 2006-12-04 08:56:30-08 Hamilton Exp
Hamilton \$

From: Operating Instructions, WV-CW864A

Sens Up Auto On	0021120	002E120
Sens Up Auto Off	0021121	002E121
Sens Up Auto Inc	0021122	002E122
Sens Up Auto Dec	0021123	002E123
Sens Up Manual On	0021150	002E150
Sens Up Manual Off	0021151	002E151
Sens Up Manual Inc	0021152	002E152
Sens Up Manual Dec	0021153	002E153

Table 49. Electronic Sensitivity Enhancement Commands

4.16 ID Requests

4.16.1 Gateway Mode[newgm]

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 26

The commands in this document can be sent over the coax via switcher equipment supporting gateway command such as SX550A, FS616, MP204 etc.

The new protocol (9xxxxxx code) can be gatewayed by MP204 only. Refer switcher's protocol document for detail.

4.16.2 Camera ID Request Command for a standard camera over the coax gateway equipment.

[newcir]

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 15

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 17

Camera	Direction	PC	Notes
	←	STX GCf	6 command message follows
	←	:0021900	Read
	←	:0022000	ID Index
	←	:0021930	ID Read Start
	←	:0020308	SRQ3
	←	:0020301	SRQ3
	←	:0021931	ID Read End
	←	ETX	
STX GC7:002E900 ETX	→		Read Ack
STX GC7:0029000 ETX	→		ID Index Ack
STX GC7:002E930 ETX	→		ID Read Start Ack
STX GC7:00231x8 ETX	→		ID 1x
STX GC7:0023yz1 ETX	→		ID yz
STX GC7:002E931 ETX	→		Read End Ack
			xyz : refer to Table 51, page 45

Table 50. Camera ID request command[camidrequest]

⁴⁸\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/NewGm.inc,v 1.6 2006-12-04 08:56:28-08 Hamilton Exp
Hamilton \$

⁴⁹\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/NewCir.inc,v 1.13 2006-12-04 13:31:32-08 Hamilton Exp
Hamilton \$

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 15

Answer	Model	ANSWER	Model
"006"	WV-CP610 series NTSC	"00A"	WV-BP510 series NTSC
"007"	WV-CP610 series PAL	"00B"	WV-BP510 series PAL
"00A"	WV-BP510 series NTSC	"00E"	WV-BS300 series NTSC
"00B"	WV-BP510 series PAL	"00F"	WV-BS300 series PAL
"00C"	WV-CS400 series NTSC	"057"	WV-CP470CH
"00D"	WV-CS400 series PAL	"052"	WV-CP470 NTSC
"00E"	WV-BS300 series NTSC	"053"	WV-CP470 PAL
"00F"	WV-BS300 series PAL	"006"	WV-CP610 series NTSC
"010"	WV-CS600 series NTSC	"007"	WV-CP610 series PAL
"011"	WV-CS600 series PAL	"01A"	WV-CPR650 series NTSC(?)
"01A"	WV-CPR650 series NTSC(?)	"01B"	WV-CPR650 series PAL(?)
"01B"	WV-CPR650 series PAL(?)	"04D"	WV-CS320 series
"03E"	WV-CS850 series	"00C"	WV-CS400 series NTSC
"048"	WV-CW464P	"00D"	WV-CS400 series PAL
"049"	WV-CW464E	"04E"	WV-CS550 series NTSC
"04D"	WV-CS320 series	"010"	WV-CS600 series NTSC
"04E"	WV-CS550 series NTSC	"011"	WV-CS600 series PAL
"052"	WV-CP470 NTSC	"03E"	WV-CS850 series
"053"	WV-CP470 PAL	"049"	WV-CW464E
"057"	WV-CP470CH	"048"	WV-CW464P

Table 51. Camera ID Request Responses[idresp]

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 18

Answer	Model	Answer	Model
006	WV-CP610 series NTSC	00A	WV-BP510 series NTSC
007	WV-CP610 series PAL	00B	WV-BP510 series PAL
00A	WV-BP510 series NTSC	00E	WV-BS300 series NTSC
00B	WV-BP510 series PAL	00F	WV-BS300 series PAL
00C	WV-CS400 series NTSC	006	WV-CP610 series NTSC
00D	WV-CS400 series PAL	007	WV-CP610 series PAL
00E	WV-BS300 series NTSC	01A	WV-CPR650 series NTSC
00F	WV-BS300 series PAL	01B	WV-CPR650 series PAL
010	WV-CS600series NTSC	04D	WV-CS320 series
011	WV-CS600 series PAL	00C	WV-CS400 series NTSC
01A	WV-CPR650 series NTSC	00D	WV-CS400 series PAL
01B	WV-CPR650 series PAL	052	WV-CP470 NTSC
03E	WV-CS850 series NTSC/PAL (DIPSW1 RS485 and coax setup)	053	WV-CP470 PAL
04E	WV-CS550 series NTSC	057	WV-CP470CH
04D	WV-CS320 series	04E	WV-CS550 series NTSC
048	WV-CW464P	08E	WV-CS570 series NTSC
049	WV-CW464E	08F	WV-CS570 series PAL
057	WV-CP470CH	010	WV-CS600series NTSC
052	WV-CP470 NTSC	011	WV-CS600 series PAL
053	WV-CP470 PAL	03E	WV-CS850 series NTSC/PAL (DIPSW1 RS485 and coax setup)
07E	WV-CS950 series NTSC	07E	WV-CS950 series NTSC
07F	WV-CS950 series PAL	07F	WV-CS950 series PAL
08E	WV-CS570 series NTSC	049	WV-CW464E
08F	WV-CS570 series PAL	048	WV-CW464P

Table 52. Full Camera ID Request Responses[**fidresp**]

4.16.3 “Old” Device ID Request [olddir]

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 28

Command	Answer
STX QID ETX	STX (Table 54, page 47) ETX

Table 53. Device ID request command

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 28

Answer	Model	Answer	Model
“006”	WV-CP610 series NTSC	“00A”	WV-BP510 series NTSC
“007”	WV-CP610 series PAL	“00B”	WV-BP510 series PAL
“00A”	WV-BP510 series NTSC	“00E”	WV-BSR300,BS300 series NTSC
“00B”	WV-BP510 series PAL	“00F”	WV-BSR300,BS300 series PAL
“00C”	WV-CSR400,CS400 series NTSC	“006”	WV-CP610 series NTSC
“00D”	WV-CSR400,CS400 series PAL	“007”	WV-CP610 series PAL
“00E”	WV-BSR300,BS300 series NTSC	“012”	WV-CPR650 series NTSC
“00F”	WV-BSR300,BS300 series PAL	“013”	WV-CPR650 series PAL
“010”	WV-CSR600,CS600 series NTSC	“00C”	WV-CSR400,CS400 series NTSC
“011”	WV-CSR600,CS600 series PAL	“00D”	WV-CSR400,CS400 series PAL
“012”	WV-CPR650 series NTSC	“010”	WV-CSR600,CS600 series NTSC
“013”	WV-CPR650 series PAL	“011”	WV-CSR600,CS600 series PAL
“WV-RM70”	WV-RM70	“WV-RM70”	WV-RM70

Table 54. Device ID Responses, by Code [table53]

4.16.4 “New” Device ID Request [newdir]

4.16.5 Full list of Device IR request answers [fulldir]

⁵⁰\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/OldDir.inc,v 1.9 2006-12-04 08:56:30-08 Hamilton Exp
Hamilton \$

⁵¹\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/NewDir.inc,v 1.10 2006-12-04 08:56:28-08 Hamilton Exp
Hamilton \$

⁵²\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/Fid.inc,v 1.1 2006-12-04 13:31:49-08 Hamilton Exp Hamilton
\$

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 14

Command	ANSWER	Notes
STX QID ETX	STX 010 ETX	Refer to Table 56, page 48

Table 55. ID Request and an ANSWER from a WV-CSR600 NTSC unit. (Question **ID**entification)

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 14

Answer	Model	ANSWER	Model
"00C"	WV-CSR400, CS400, NTSC	"00E"	WV-BSR300, BS300, NTSC
"00D"	WV-CSR400, CS400, PAL	"00F"	WV-BSR300, BS300, PAL
"00E"	WV-BSR300, BS300, NTSC	"WV-"	WV-CLR920, PAL
"00F"	WV-BSR300, BS300, PAL	"WV-CPR650"	WV-CPR650, NTSC
"010"	WV-CSR600, CS600, NTSC	"WV-CPR650"	WV-CPR650, PAL
"011"	WV-CSR600, CS600, PAL	"TBA"	WV-CS320, NTSC, PAL
"TBA"	WV-CS320, NTSC, PAL	"WV-CS850"	WV-CS850, NTSC, PAL
"WV-CPR650"	WV-CPR650, NTSC	"00C"	WV-CSR400, CS400, NTSC
"WV-CPR650"	WV-CPR650, PAL	"00D"	WV-CSR400, CS400, PAL
"WV-CS850"	WV-CS850, NTSC, PAL	"010"	WV-CSR600, CS600, NTSC
"WV-CW860"	WV-CW860, NTSC, PAL	"011"	WV-CSR600, CS600, PAL
"WV-"	WV-CLR920, PAL	"WV-CW860"	WV-CW860, NTSC, PAL

Table 56. Model Return Codes [modelcodes]

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 16

Command	ANSWER	Notes
STX QID ETX	STX 010 ETX	Refer to Table 58, page 49

Table 57. ID Request and an ANSWER from a WV-CSR600 NTSC unit. (Question **ID**entification)

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 16

Answer	Model	Answer	Model
00C	WV-CSR400 series NTSC	00E	WV-BSR300 series NTSC
00D	WV-CSR400 series PAL	00F	WV-BSR300 series PAL
00E	WV-BSR300 series NTSC	00C	WV-CSR400 series NTSC
00F	WV-BSR300 series PAL	00D	WV-CSR400 series PAL
010	WV-CSR600 series NTSC	010	WV-CSR600 series NTSC
011	WV-CSR600 series PAL	011	WV-CSR600 series PAL
WV-CLR920	WV-CLR920 series PAL	WV-CPR650	WV-CPR650 series NTSC
WV-CPR650	WV-CPR650 series NTSC	WV-CPR650	WV-CPR650 series PAL
WV-CPR650	WV-CPR650 series PAL	WV-CS570	WV-CS570
WV-CS850	WV-CS850 series NTSC, PAL	WV-CS850	WV-CS850 series NTSC, PAL
WV-CS570	WV-CS570	WV-CW860	WV-CW860 series NTSC PAL
WV-CS950	WV-CS950	WV-CLR920	WV-CLR920 series PAL
WV-CW860	WV-CW860 series NTSC PAL	WV-CS950	WV-CS950

Table 58. Full list of Device ID Responses [fid]

4.17 Line Lock (LL) [oldll]

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 24

Function	Command	Answer
LL	002145 (Table 60, page 50)	002E45 (Table 60, page 50)

Table 59. Line Lock

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 24

Code	Function
"2"	LL On
"3"	LL Off

Table 60. Line Lock Codes [table414]

4.18 Manual Iris Control [oldmic]

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 21

Function	Command	Answer
Manual Iris	0021034	002E034
Iris Control	002100 (Table 28, page 31)	002E00 (Table 28, page 31)

Table 61. Manual Iris Control

⁵³\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/0ldLl.inc,v 1.11 2006-12-04 08:56:30-08 Hamilton Exp
Hamilton \$

⁵⁴\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/0ldMic.inc,v 1.9 2006-12-04 08:56:30-08 Hamilton Exp
Hamilton \$

4.19 Motion Detection[oldmd]

Motion Detector (MOTION DET)

The motion detector detects motion in a scene by monitoring changes in the brightness level. You can select the sensitivity level for the motion on the setup menu.

When the camera detects motion, it sends an alarm signal to the external equipment and stops at its position for the preset dwell time.

This function is only available for WV-CSR600 & WV-CS600A with WV-RM70.

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 24

Function	Command	Answer
Motion Detection	002169 (Table 63, page 51)	002E69 (Table 63, page 51)

Table 62. Motion Detection

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 24

Code	Function
"0"	On
"1"	Off

Table 63. Motion Detection Codes[table415]

From: Operating Instructions, WV-CW864A

Motion Detect On	0021690	002E690	
Motion Detect Off	0021691	002E691	
Motion Detect?	0020176	0021760	Off
	0020176	0021761	On

Table 64. Motion Detection Commands

⁵⁵\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/01dMd.inc,v 1.12 2006-12-04 08:56:30-08 Hamilton Exp
Hamilton \$

4.20 Patrol Functions [mp]

From: Operating Instructions, WV-CW864A

A patrol is A run of manual operations is memorized in the patrol-learn mode for repetitive use in future.

A set of manual operations is stored (**LEARN**), reproduced (**PLAY**) or turned inactive (**OFF**). Patrol operation stops if **SEQ**, **SORT** or **AUTO PAN** is set to **AUTO MODE** on the **SETUP** menu.

Patrol Play	2021490
Patrol Stop	2021491
Patrol Learn	2021494

Table 65. Patrol Function Commands

4.21 Presets

4.21.1 Normal Preset Position Set Command [newnppsc]

From: Operating Instructions, WV-CW864A

1. Presetting

1.1. Position (**POSITION SET**)

Aligns the camera position and focal point by panning, tilting, zooming and focusing.

1.2. Preset Identification (**PRESET ID**)

Assigns the name for preset IDs (identification of up to 16 alphanumeric characters) and can be switched on or off on the monitor screen.

1.3. Light Control (**ALC/MANUAL**)

Selects the **ALC** or **MANUAL** mode for adjusting the lens iris.

1.4. Dwell Time (**DWELL TIME**)

Displays the picture at each camera position for the selected duration. You can select a preset duration from the menu.

1.5. Scene File (**SCENE FILE**)

Stores up to 10 files.

Each file has a set of detailed parameters for the shutter speed, **AGC**, electronic sensitivity enhancement, white balance, motion detector and **AF** mode. The scene files can be recalled later to reproduce the parameter settings under the same conditions as stored in the files.

To set a preset position, send **PRE POSITION SET** command and set the **PTZ** to the desired position by using **Pan/Tilt** and **Zoom/focus** command.

This command is used to set a preset position. To do so, send this command and set the **PTZ** to the desired position by using **Pan/Tilt** and **Zoom/Focus** commands.

This function is only available for **WV-CSR600** & **WV-CS600A** with **WV-70**.

⁵⁶\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/Mp.inc,v 1.1 2004-11-17 12:30:11-08 Hamilton Exp Hamilton \$

⁵⁷\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/NewNppsc.inc,v 1.13 2006-12-05 11:38:53-08 Hamilton Exp Hamilton \$

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 15

Use the direct function command (chapter 4) for preset 65-256. It is desirable to use the direct function command for preset 1-64, too.

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 19

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 13

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 15

Camera	Direction	PC	Notes
GC7:202E540	←	GC7:2021540	Set Up Start ANSWER
	→		
GC7:2029XY0	←	GC7:2022XY0	Pre Position Number ANSWER
	→		
		“XY” = Preset Position ID “00” = Preset 1 to “0x3F” = Preset 64	
	Use Pan/tilt Zoom/Focus Commands		Position Camera
GC7:202E542	←	GC7:2021542	Position Set Dome ANSWER
	→		
GC7:202E543	←	GC7:2021543	Set Up End ANSWER
	→		

Table 66. Preset commands[`presetcommand`]

4.21.2 Preset Position Call Command [newppc]

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 12

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 14

STX G C F : 2 0 2 1 4 0 0 : 2 0 2 2 X Y 0 ETX Note: Above commands can be sent separately.	
STX	0x02 ASCII code for start of text
G C	Command header, GC = Camera Control Command
F	Number of commands. Refer to Table 5, page 13
:	Delimiter
2 0 2	Command destination, 002: Camera functions, 202: Receiver functions, 902: One way command for PTZ commands, 903: One way command for camera commands.
1	Command type, see Section 11, page 11
4 0 0	Function (Preset position call), Refer to Table A.2, page A-3.
:	Delimiter
2 0 2	Command destination, 002: Camera functions, 202: Receiver functions, 902: One way command for PTZ commands, 903: One way command for camera commands.
2	Command type, see Section 11, page 11
X Y	Preset Position, "00" = Preset 1 to "0x3F" = Preset 64
0	Filler
ETX	0x03 ASCII code for end of text

Table 67. Preset call command [presetcall]

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 14

Use the direct function command (chapter 4) for preset 65-256. It is desirable to use the direct function command for preset 1-64, too.

⁵⁸\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/NewPpc.inc,v 1.11 2006-12-04 13:31:33-08 Hamilton Exp
Hamilton \$

4.21.3 Direct Preset Position SET Command[newdppsc]

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 12

Replaced by Direct Function Command GCF:00219F0:0022640

Refer to Table B.2, page B-4 and Table C, page C-1.

4.21.4 Direct Pre Position Set Command[olddppsc]

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 17

To set a preset position, set the PTZ to desired position and send this command.

1. Send a “DIRECT PRE POSITION SET” command. Wait until 10 Answers are sent back from the camera. (Table 69, page 57)
2. Send a “PRE POSITION STORE” command. Wait until an Answer is sent back from the Camera. (Table 70, page 57)

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 17

Code	Function
“01”	Preset-01
“02”	Preset-02
“0A”	Preset-10
“40”	Preset-64

Table 68. Preset Position[presetpositionn]

This table may be off by one. It might be “zero based”.

4.21.5 Pre Position Store command[oldpps]

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 18

Pre position data will not be stored without this command.

Note

This function is available only for the WV-CSR600 or WV-RM70 with WV-CS600, CS604, BS500, BS504 and CS600A.

4.21.6 Preset Sequenceing[oldps]

From: Operating Instructions, WV-CW864A

There are three automatic preset modes as follows:

```

59$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/NewDppsc.inc,v 1.3 2006-12-04 08:56:28-08 Hamilton Exp
Hamilton $
60$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/OldDppsc.inc,v 1.9 2006-12-04 08:56:30-08 Hamilton Exp
Hamilton $
61$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/OldPps.inc,v 1.6 2006-12-01 11:19:07-08 Hamilton Exp
Hamilton $
62$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/OldPs.inc,v 1.11 2006-12-04 08:56:30-08 Hamilton Exp
Hamilton $

```


From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 17

Camera	Direction	PC	Notes
	←	STX GC(:0021902	Direct Pre Position Set
	←	:0022EC8	
	←	:0022011	
	←	:0021912	
	←	:0022010	
	←	:0021902	
	←	:0022228	
	←	:0022051	
	←	:0021912	
	←	:0022 Ta-	
		ble 68, page 56 0	
	←	ETX	
STX GC7:002E902 ETX	→		Ram Address Set OK
STX GC7:0029EC8 ETX	→		Address 0xEC
STX GC7:0029011 ETX	→		Address 0x01
STX GC7:002E912 ETX	→		Ram Write Start
STX GC7:0029010 ETX	→		Data OK
STX GC7:002E902 ETX	→		Address OK
STX GC7:0029228 ETX	→		Address 0x22
STX GC7:0029051 ETX	→		Address 0x05
STX GC7:002E912 ETX	→		Ram Write Start OK
STX GC7:0029 Table 68, page 56 0 ETX	→		Position Number OK

Table 69. Direct Pre Position Set[directsett]

Camera	Direction	PC	Notes
	←	STX GCF:2021542	Pre Position Store
	←	:2021543	
	←	ETX	
STX GC7:202E542 ETX	→		Data store
STX GC7:202E543 ETX	→		Data store OK

Table 70. Pre Position Store[prepositionstore]

1. **OFF**: No automatic operation. The camera can be operated only manually.
2. **SEQ**: The camera operates in the sequence of preset positions in numerical order.
3. **SORT**: The camera operates in the sequence of preset positions counterclockwise from pan starting point.

This function is only available for WV-CSR600 & WV-CS600A with WV-RM70.

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 20

Function	Command	Answer
Preset Sequence	202143 (Table 72, page 58)	202E43 (Table 72, page 58)

Table 71. Preset Sequence[**presetsequence**]

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 20

Code	Function
"1"	Off
"7"	Sequence On
"8"	Sort Sequence On

Table 72. Preset Sequence Codes[**presetsequencecodes**]

4.21.7 Pre Position Call Up[**oldppcu**]

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 19

Function	Command	Answer
Position Request	2021400	202E400
Position Number	2022 (Table 75, page 59) 0	2029 (Table 75, page 59) 0

Table 73. Single command[**ppsinglcommand**]

4.21.8 New Protocol Preset Position Set/Call Command[**newnppps**]

Refer to Table C, page C-1.

⁶³\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/OldPpcu.inc,v 1.12 2006-12-04 08:56:30-08 Hamilton Exp
Hamilton \$

⁶⁴\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/NewNppps.inc,v 1.2 2004-11-18 08:35:44-08 Hamilton Exp
Hamilton \$

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 19

Function	Command	Answer
Position Request Position Number	STX GCF:2021400 :2022 (Table 75, page 59) 0 ETX	STX GC7:202E400 ETX STX GC7:2029 (Table 75, page 59) 0 ETX

Table 74. Multiple command[ppmultiplecommand]

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 19

Code	Function
"00"	Preset-01
"01"	Preset-02
"09"	Preset-10
"3F"	Preset-64

Table 75. Preset Position Codes[presetpositioncodes]

4.22 Privacy Zone [mpz]

From: Operating Instructions, WV-CW864A

Privacy zone feature enables users to veil unwanted zones.

1. Privacy Zone (PRIVACY ZONE)

This setting is used for masking unwanted zones, hiding them from display on the monitor screen. Up to 8 zones can be registered. Submenus are provided for zone number selection and parameter setting.

Privacy Zone On	0021640
Privacy Zone Off	0021641

Table 76. Privacy Zone Commands

4.23 Screen Titles [mtitle]

From: Operating Instructions, WV-CW864A

1. Area Title (AREA TITLE)

Up to 8 area titles can be assigned to specific scenes on the DIRECTION (NESW) menu or by alphanumeric (USER) assignment. The area title is displayed under the camera ID on the monitor screen when the camera turns to a position that has been assigned an area title.

2. Camera Identification (CAMERA ID)

You can use the camera identification to assign a name to the camera. The camera ID consists of up to 16 alphanumeric characters. You can select whether to have the camera ID displayed on the monitor screen or not.

3. Preset Identification (PRESET ID)

Assigns the name for preset IDs (identification of up to 16 alphanumeric characters) and can be switched on or off on the monitor screen.

903005E	00219F0	00225E0	Area Title	Area Title NESW On
903005F	00219F0	00225F0		Area Title User On
9030060	00219F0	0022600		Area Title Off

Table 77. Screen Title Commands, part 1 [sct1]

⁶⁵\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/Mpz.inc,v 1.3 2004-11-19 09:45:26-08 Hamilton Exp Hamilton \$

⁶⁶\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/MTitle.inc,v 1.6 2006-12-04 08:56:27-08 Hamilton Exp Hamilton \$

Area Title 1 Set	00219C8	Area Title 3 Read Start	00219E4
Area Title 2 Set	00219C9	Area Title 3 Write Start	00219E5
Area Title 3 Set	00219CA	Area Title 4 Read Start	00219E6
Area Title 4 Set	00219CB	Area Title 4 Write Start	00219E7
Area Title 5 Set	00219CC	Area Title 5 Read Start	00219E8
Area Title 6 Set	00219CD	Area Title 5 Write Start	00219E9
Area Title 7 Set	00219CE	Area Title 6 Read Start	00219EA
Area Title 8 Set	00219CF	Area Title 6 Write Start	00219EB
Area Title Default On	00219D0	Area Title 7 Read Start	00219EC
Area Title Off	00219D1	Area Title 7 Write Start	00219ED
Area Title 1 Read Start	00219E0	Area Title 8 Read Start	00219EE
Area Title 1 Write Start	00219E1	Area Title 8 Write Start	00219EF
Area Title 2 Read Start	00219E2	—	—
Area Title 2 Write Start	00219E3	—	—

Table 78. Screen Title Commands, part 2[sct2]

4.24 Shutter Speed[oldss]

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 21

Function	Command	Answer
Shutter Speed	00211 (Table 80, page 62)	002E1 (Table 80, page 62)

Table 79. Shutter Speed

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 21

Code	Function	Code	Function
"00"	On	"0C"	1/250
"01"	Off	"0D"	1/500
"02"	Increase	"0E"	1/1000
"03"	Decrease	"0F"	1/2000
"09"	1/100	"19"	1/4000
"0A"	1/120	"1A"	1/10000

Table 80. Shutter Speed Codes[shutterspeedcodes]

Note

1. The code "10" is used to request that the current shutter speed be sent back to the head end. (Appendix A.3, page A-7)
2. To turn the shutter on: "Need SD2 off (BLC mode off)", is the note from the Camera Function Commands Appendix B.2, page B-4 line #13.

⁶⁷\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/0ldSs.inc,v 1.12 2006-12-04 08:56:30-08 Hamilton Exp
Hamilton \$

4.25 Synchronization [ms]

From: Operating Instructions, WV-CW864A

1. Sync selectable from among internal, line-lock and VD2.

2. Synchronization (SYNC)

You can select the internal sync (INT) mode or the line-lock sync (LL) mode. Additionally, this model accepts the VD2 signal from a specified component. Whenever the VD2 signal is supplied to this camera, the camera automatically switches to the VD2 sync mode.

When you select the line-lock (LL) mode, you can adjust vertical phase.

Important Notices:

The priorities of sync modes are assigned as follows:

- 2.1. Multiplexed vertical drive (VD2) (highest)
- 2.2. Line-lock (LL)
- 2.3. Internal sync (INT) (lowest)

Note: The priorities of the automatic sync modes are the same as the above.

⁶⁸\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/Ms.inc,v 1.1 2004-11-17 13:24:26-08 Hamilton Exp Hamilton
\$

4.26 Wide D-Range[oldwdr]

This function is only available for WV-CSR600 & WV-CS600A with WV-RM70.

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 24

Function	Command	Answer
D-Range	00216B (Table 63, page 51)	002E6B (Table 63, page 51)

Table 81. Wide D-Range

4.27 Zoom/Focus[oldzf]

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 14

STX	GC7:202122 (Table 83, page 64)	ETX
-----	--------------------------------	-----

Table 82. Zoom/Focus

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 14

Code	Function	Code	Function
"4"	Stop	"C"	Wide
"8"	Tele	"D"	Wide + Near
"9"	Tele + Far	"E"	Near
"A"	Far	"F"	Tele + Near
"B"	Wide + Far	—	—

Table 83. Zoom/Focus Codes[zoomfocus]

⁶⁹\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/OldWdr.inc,v 1.8 2006-12-01 11:19:07-08 Hamilton Exp
Hamilton \$

⁷⁰\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/OldZf.inc,v 1.11 2006-12-04 08:56:31-08 Hamilton Exp
Hamilton \$

5 Motion Control

5.1 PTZ Control (Conventional Protocol) [newpc]

Variable Pan/Tilt speed command (Timeout 2.2 sec).

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 12

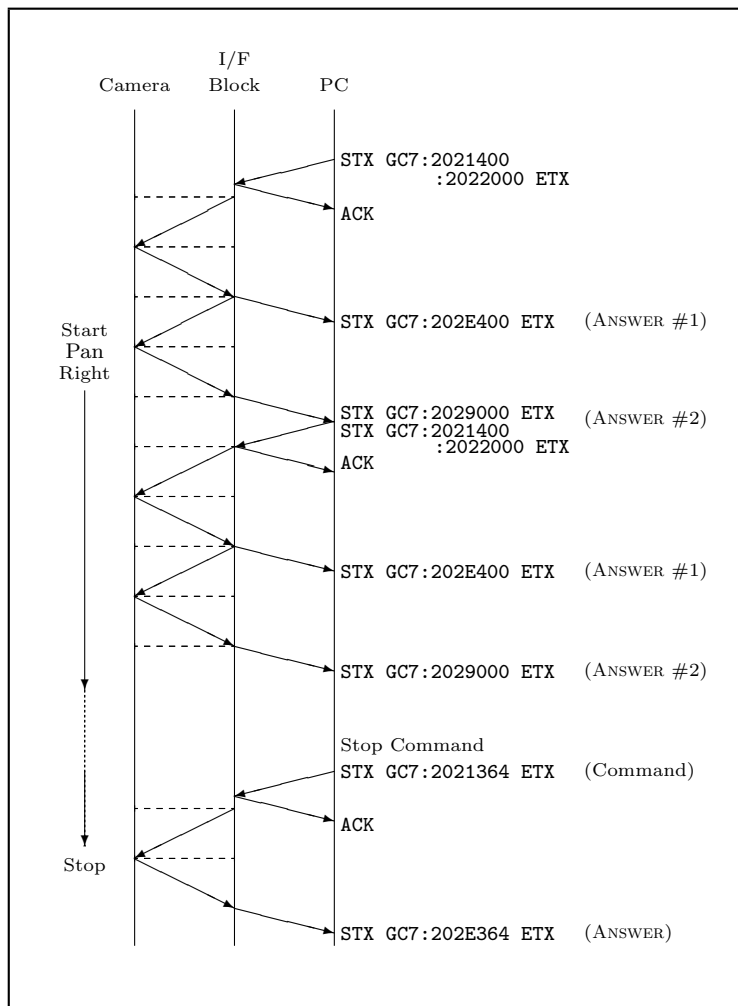
From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 14

STX G C F : 2 0 2 1 3 6 9 : 2 0 2 2 X Y 0 ETX	
STX	0x02 ASCII code for start of text
G C	Command header, GC = Camera Control Command
F	Number of commands. Refer Table 5, page 13
:	Delimiter
2 0 2	Command destination, 002: Camera functions, 202: Receiver functions, 902: One way command for PTZ commands, 903: One way command for camera commands.
1	Command type, see Section 11, page 11
3 6 9	Function(Pan left + tilt up), Refer to Table A.2, page A-3.
:	Delimiter
2 0 2	Command destination, 002: Camera functions, 202: Receiver functions, 902: One way command for PTZ commands, 903: One way command for camera commands.
2	Command type, see Section 11, page 11
X	Pan Speed, "0" = Min to "7" = Max.
Y	Tilt Speed, "0" = Min to "7" = Max.
0	Filler
ETX	0x03 ASCII code for end of text

Table 84. Variable Pan/Tilt speed command (Timeout 2.2 sec)[variableptspeedcmd]

⁷¹\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/NewPc.inc,v 1.8 2006-12-04 08:56:29-08 Hamilton Exp
Hamilton \$

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 13



\$RCSfile: Mptzt.inc,v \$

Figure 9. Multiple Command Units Pan Right Command Timing [mptzt]

⁷²\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/Mptzt.inc,v 1.5 2006-12-01 11:19:04-08 Hamilton Exp
Hamilton \$

5.1.1 Variable Speed Pan/Tilt Control Command[oldvsptc]

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 7

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 4

Function	Command
Vari Speed	STX GCF:202136 (Table 89, page 72)
Pan/Tilt	:2022 (Table 86, page 67) (Table 87, page 67) 0 ETX

Table 85. Multiple axis commands[multipleaxis]

5.2 Older Pan/Tilt Speeds[speeds]

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 15

	0	1	2	3	4	5	6	7	
WV-CSR600	3.0	5.1	8.6	14.6	24.7	41.8	70.8	120	Figure 10, page 68
WV-CSR400/BSR300	3.0	4.0	5.4	7.3	9.8	13.2	17.8	24	Figure 11, page 68

Table 86. Pan Speed [$^{\circ}$ /sec][panspeed]

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 15

	0	1	2	3	4	5	6	7	
WV-CSR600	1.5	2.6	4.3	7.3	12.3	20.9	35.4	60	Figure 12, page 69
WV-CSR400/BSR300	1.5	2.0	2.7	3.7	4.9	6.6	8.9	12	Figure 13, page 69

Table 87. Tilt Speed [$^{\circ}$ /sec][tiltspeed]

⁷³\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/OldVsptc.inc,v 1.9 2006-12-01 11:19:07-08 Hamilton Exp
Hamilton \$

⁷⁴\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/Speeds.inc,v 1.8 2006-12-01 13:11:00-08 Hamilton Exp
Hamilton \$

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 15

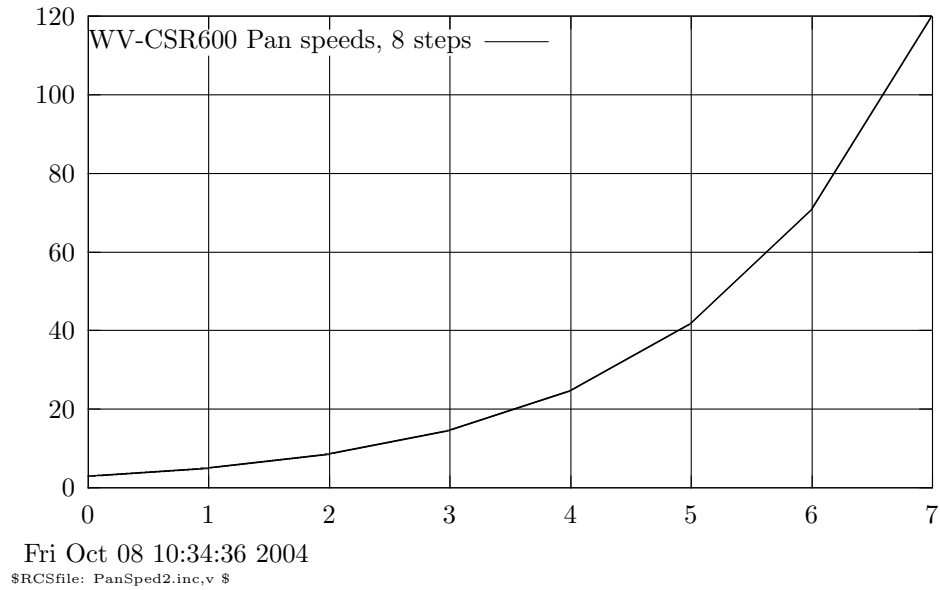


Figure 10. WV-CSR600 Pan speeds[csr600p]

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 15

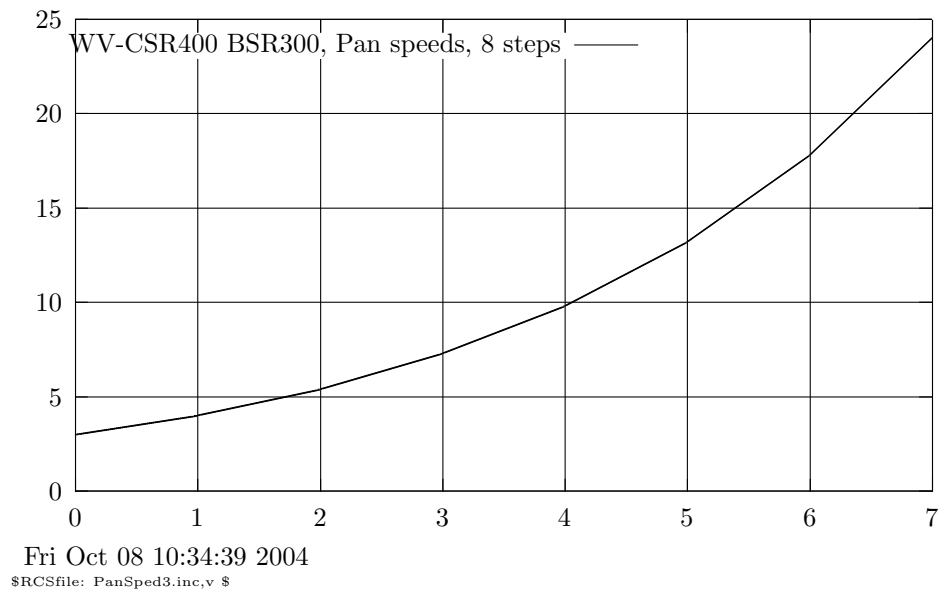


Figure 11. WV-CSR400/BSR300 Pan speeds[csr400p]

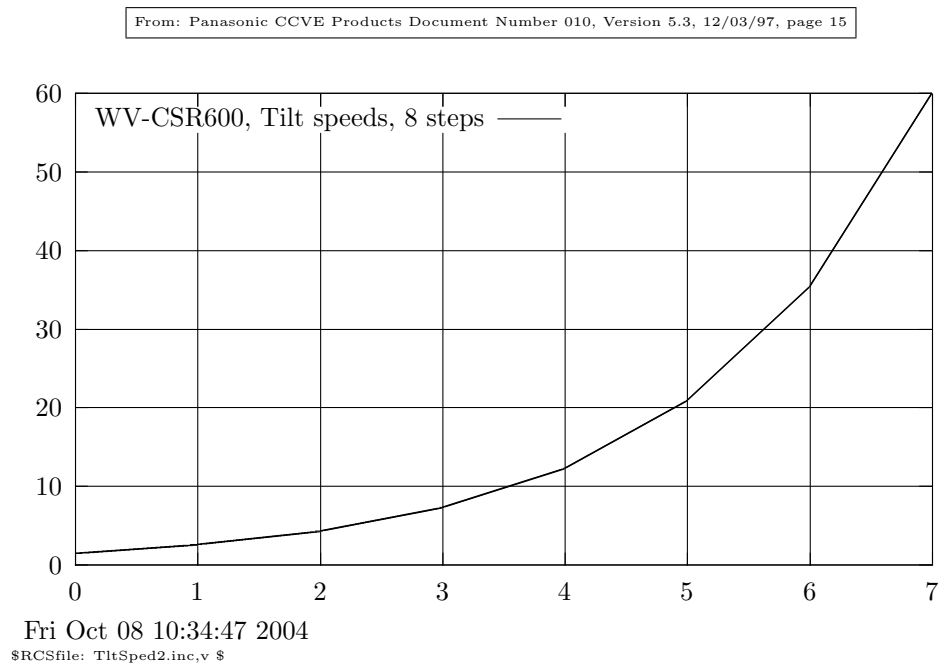


Figure 12. WV-CSR600 Tilt speeds[csr600t]

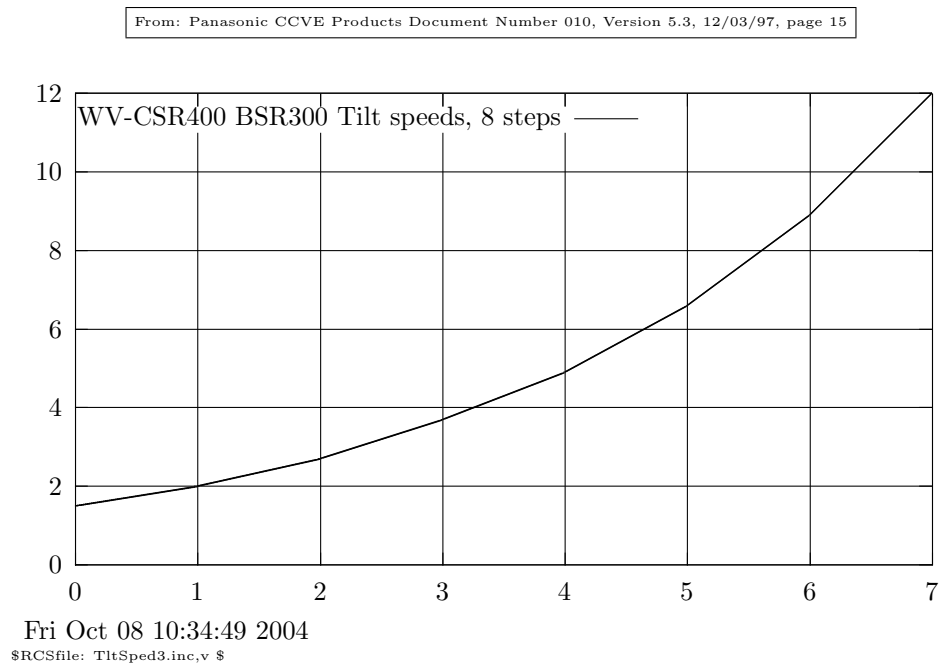
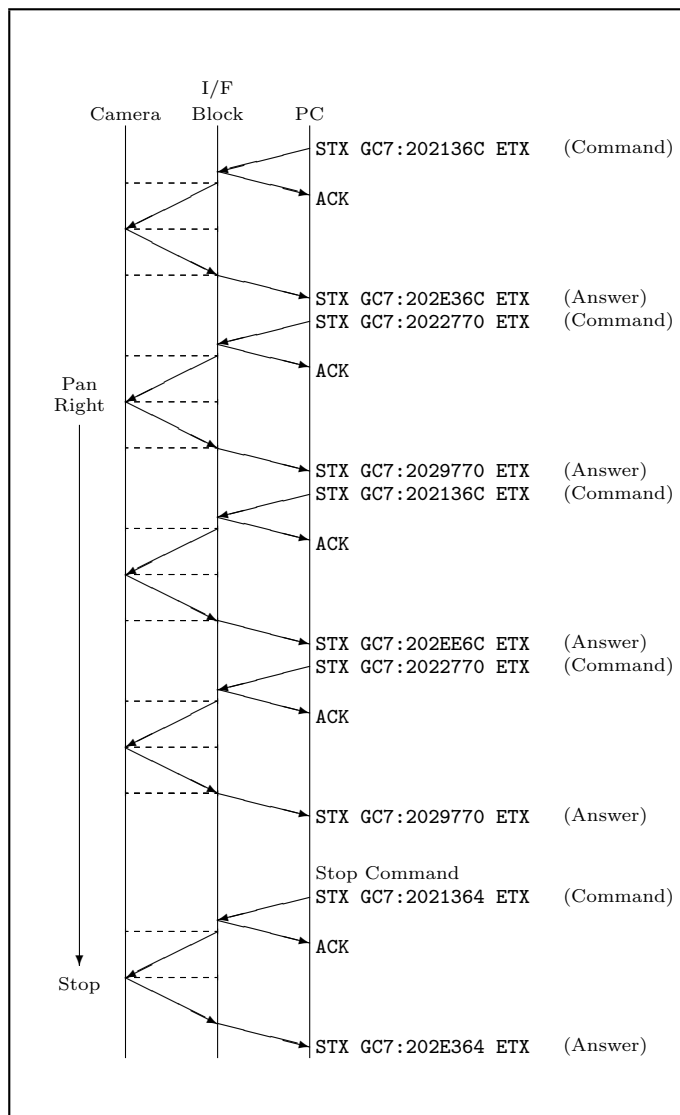


Figure 13. WV-CSR400/BSR300 Tilt speeds[csr400t]

⁷⁹\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/Vptz.inc,v 1.4 2006-12-01 11:19:09-08 Hamilton Exp
Hamilton \$

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 12



\$RCSfile: Vptz.inc,v \$

Figure 14. Variable Speed PTZ Command Timing [vptz]

5.2.1 Pan/Tilt Fixed Speed[oldptfs]

Fixed Speed Pan /Tilt Control Command

See also Appendix A.2, page A-3.

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 14

Function	Command	Answer
Pan Fast/Tilt Fast	202132 (Table 89, page 72)	202E32 (Table 89, page 72)
Pan Fast/Tilt Slow	202133 (Table 89, page 72)	202E33 (Table 89, page 72)
Pan Slow/Tilt Fast	202134 (Table 89, page 72)	202E34 (Table 89, page 72)
Pan Slow/Tilt Slow	202135 (Table 89, page 72)	202E35 (Table 89, page 72)

Table 88. Fixed Speed Pan/Tilt Control Command[fixedspeed]

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 15

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 21

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 22

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Recommended Protocol for cross control, 6/16/2006, page 3

Command	Function	Command	Function
"0"	Null	"B"	Right + Up
"1"	Stop	"C"	Right
"4"	Stop	—	—
"8"	Left	"D"	Right + Down
"9"	Left + Up	"E"	Down
"A"	Up	"F"	Left + Down

Table 89. PT directions[ptdirections]

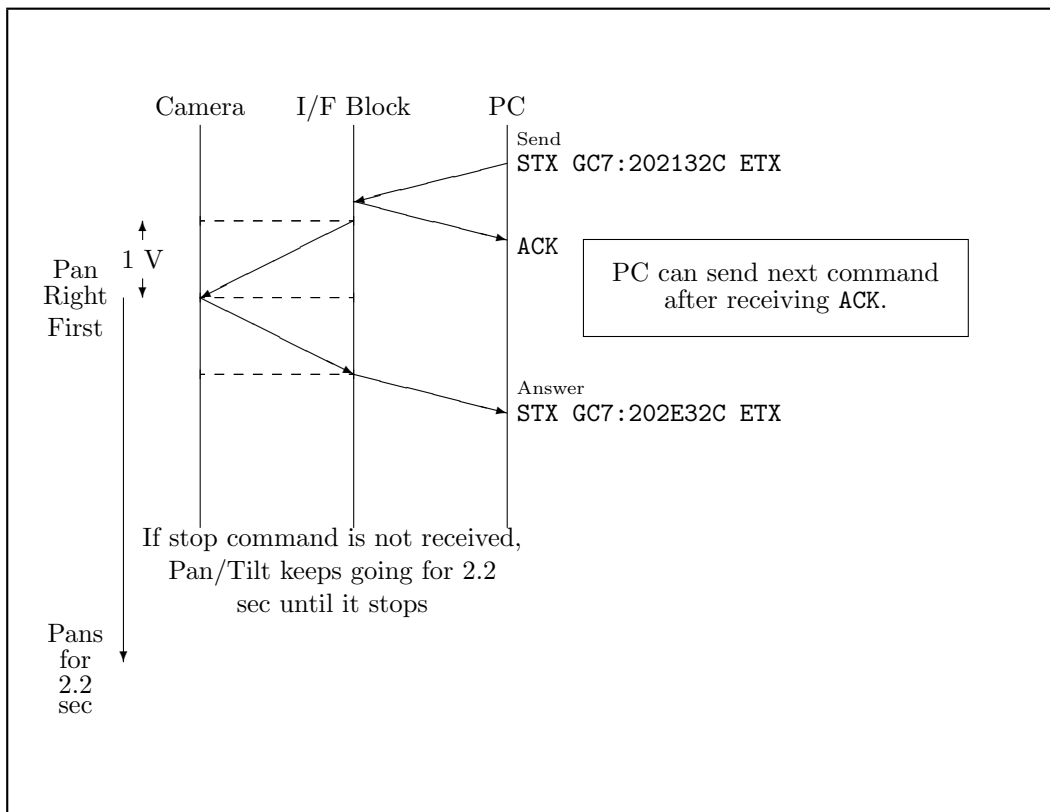
Note

Each camera has different maximum speed

- WV-CSR600 Pan, 120°/Sec: Tilt, 60°/Sec (Table 86, page 67 and Table 87, page 67).
- WV-CSR400/BSR300 Pan, 24°/Sec: Tilt, 12°/Sec (Table 86, page 67 and Table 87, page 67).

⁸⁰\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/OldPtfs.inc,v 1.13 2006-12-04 09:39:07-08 Hamilton Exp
Hamilton \$

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 10

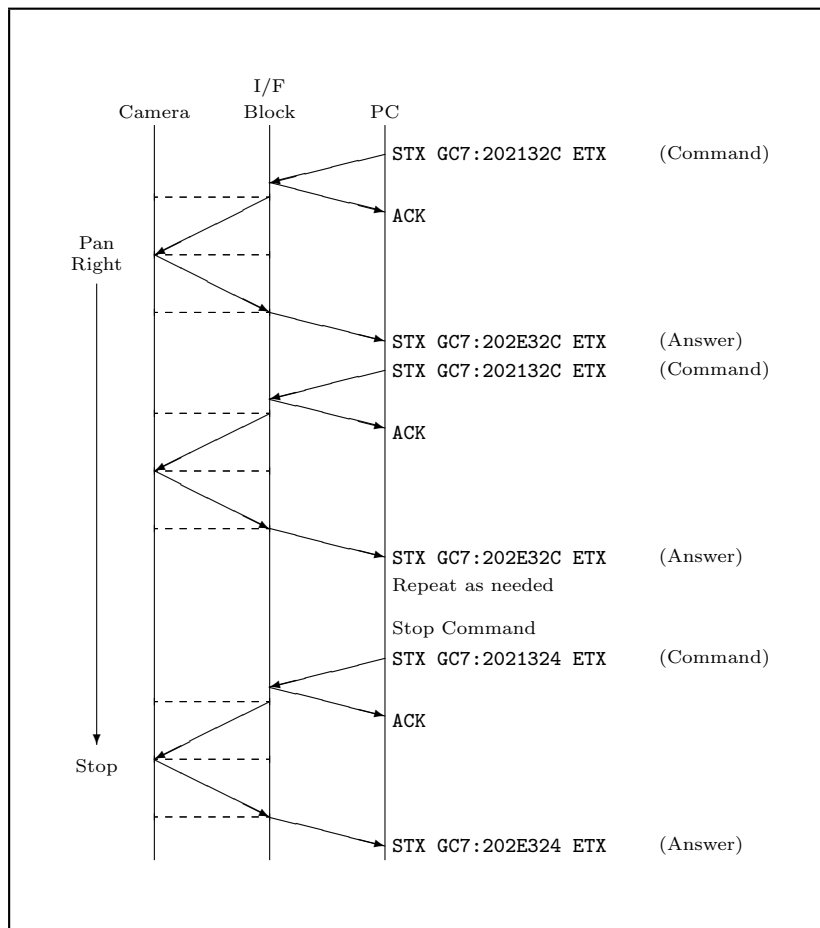


\$RCSfile: Pf.inc,v \$

Figure 15. PTZ Fixed Speed Control Command Timing[pf]

⁸¹\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/Pf.inc,v 1.5 2006-12-04 09:39:08-08 Hamilton Exp Hamilton
\$

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 11



\$RCSfile: Ptzt.inc,v \$

Figure 16. PTZ Fixed Speed and Stop Command Timing[ptzt]

⁸²\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/Ptzt.inc,v 1.3 2006-12-01 11:19:08-08 Hamilton Exp
Hamilton \$

5.3 New Protocol Pan/Tilt Commands [newnp2s]

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 22

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 23

This is only for CS850A and newer equipment. Prior to using this command, check for its availability by using a SRQ1 command.

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 22

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 23

Camera	Direction	PC	Notes
	←	SRQ1:2020150	Is this a 256 step PT unit?
2021500	→		Yes there are 256 steps to PT speeds
nop	→		No (Actually there is no reply at all.)

Table 90. Determining if the camera has 256 speed capability.

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 22

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 23

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Recommended Protocol for cross control, 6/16/2006, page 3

STX G C 7 : D X X X X X ETX	
STX	0x02 ASCII code for start of text
G C	Command header, GC = Camera Control Command
7	Number of commands. Refer to Table 5, page 13
:	Delimiter
D	One Way 256 step Command
X X X X X X	Command body, Refer to Table 92, page 76
ETX	0x03 ASCII code for end of text

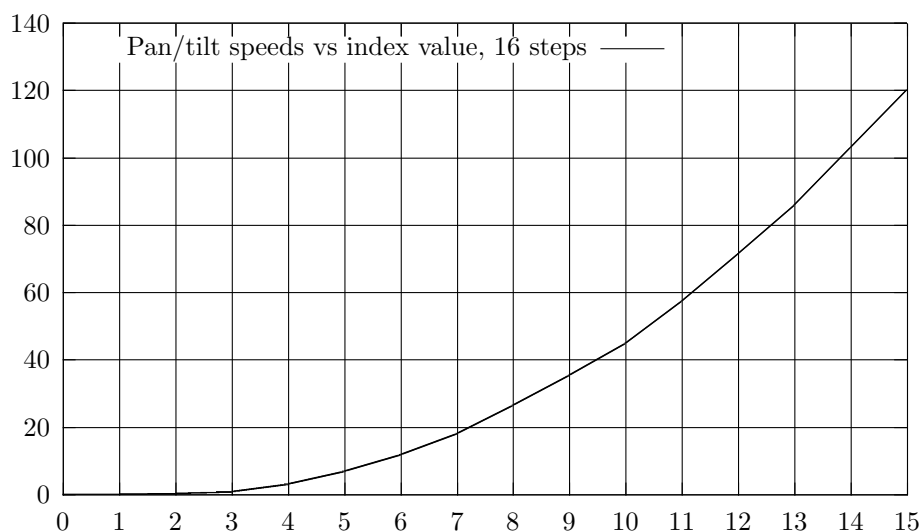
Table 91. 256 step PTZ commands [256steps]

- Example 1: PAN LEFT MAX SPEED = GC7:90288F0 (Zoom 1000_2 = “0x8”)
 - 902 This indicates that this is a “new PTZ” command.
 - 88F0
 - * 8... = No zoom, Table 93, page 77
 - * .8.. = Left, Table 89, page 72
 - * ..F. = Max Pan Speed, Table 94, page 77
 - * ...0 = Min Tilt Speed, Table 94, page 77
- Example 2: ZOOM TELE MAX SPEED = GC7:9023000 (Zoom 0011_2 = “0x3”)

⁸³\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/NewNp2s.inc,v 1.12 2006-12-04 09:39:05-08 Hamilton Exp
Hamilton \$

- 902 This indicates that this is a “new PTZ” command.
- 3000
 - * 3... = Zoom Tele Max Speed, Table 93, page 77
 - * .0.. = No Motion, Table 89, page 72
 - * ..0. = Min Pan Speed, Table 94, page 77
 - * ...0 = Min Tilt Speed, Table 94, page 77

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 21



Fri Oct 08 06:29:48 2004

\$RCSfile: Speed1.inc,v \$

Figure 17. 16 Speed PT Table Plotted[16pt]

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 20

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 21

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Recommended Protocol for cross control, 6/16/2006, page 3

Zc	Zd	Zs2	Zs1	.	.	.	.	.	.	.	.	.	.	.	.
Zoom				PT Direction				Pan Speed				Tilt Speed			
(Table 93, page 77)				(Table 89, page 72)				(Table 94, page 77)				(Table 94, page 77)			

Table 92. Command body structure[commandstructure]

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 20

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 21

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Recommended Protocol for cross control, 6/16/2006, page 3

Zc:	Zoom Control, 0 ₂ = Zoom control, 1 ₂ = Zoom stop
Zd:	Zoom Direction, 0 ₂ = Tele, 1 ₂ = Wide
Zs2, Zs1:	Zoom Speed

Table 93. Zoom control bit definations.[zoomcontrol]

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 21

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 22

Pan Speed	“0” (Min) “1”, “2”“E”, “F” (Max)
Tilt Speed	“0” (Min) “1”, “2”“E”, “F” (Max)
Zoom Speed	“0” (Min) “1”, “2”, “3” (Max)

Table 94. PTZ Speeds[ptzspeeds]

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 21

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 22

	Pan	Tilt	Pan	Tilt	
Speed	°/sec	°/sec	Speed	°/sec	°/sec
Figure 17, page 76					
“0”	0.10	0.10	“8”	26.54	26.54
“1”	0.21	0.21	“9”	35.55	35.55
“2”	0.47	0.47	“A”	44.97	44.97
“3”	1.00	1.00	“B”	57.52	57.52
“4”	3.19	3.19	“C”	71.63	71.63
“5”	7.06	7.06	“D”	86.02	86.02
“6”	12.01	12.01	“E”	103.10	103.10
“7”	18.27	18.27	“F”	120.24	120.24

Table 95. PT Speeds[ptspeeds]

5.4 New Protocol Focus Command [newnpfc]

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 22

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 22

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Recommended Protocol for cross control, 6/16/2006, page 5

.	.	.	.	.	.	.	.	.	.	.	.	.	Zc	Fd	Fs2	Fs1
0x4				0x0				0x0				Focus/Zoom				

Table 96. Focus Command body structure [focusbodystructure]

Note

- All of these commands have three digit prefix of “903”. Thus we have a typical command of: “STX AD01; 9034005 ETX” for “FOCUS FAR SPEED 1”.
- **Fs2, Fs1:** Focus Speed: 00₂ (Min) 01₂, 10₂, 11₂ (Max)
- **Fd:** 0₂: Near, 1₂: Far
- **Zc:** 0₂: Zoom control, 1₂: Zoom stop *This might really be Focus Control as there is another Zoom Control bit Section 5.5, page 78.*

5.5 New Protocol 256 Step PTZ Commands [newnpptc]

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 22															
From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 24?															
From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Recommended Protocol for cross control, 6/16/2006, page 3															
Pan Speed 256 steps				(Min) “0x00”, “0x01”, “0x02” “0xFE”, “0xFF” (Max)											
Tilt Speed 256 steps				(Min) “0x00”, “0x01”, “0x02” “0xFE”, “0xFF” (Max)											
Zoom Speed 4 steps				(Min) “0x0”, “0x1”, “0x2”, “0x3” (Max)											

Table 97: PTZ Speed, refer to both parts of the detailed speed table [PTZspeeds]. Command values start at 0.

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 23

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 24

Step	Value	°/sec	Step	Value	°/sec	Step	Value	°/sec	Step	Value	°/sec
0	"00"	0.10	32	"20"	0.39	64	"40"	1.42	96	"60"	5.39
1	"01"	0.10	33	"21"	0.39	65	"41"	1.42	97	"61"	5.39
2	"02"	0.10	34	"22"	0.39	66	"42"	1.42	98	"62"	5.71
3	"03"	0.10	35	"23"	0.39	67	"43"	1.58	99	"63"	5.71
4	"04"	0.12	36	"24"	0.47	68	"44"	1.58	100	"64"	6.03
5	"05"	0.12	37	"25"	0.47	69	"45"	1.75	101	"65"	6.03
6	"06"	0.12	38	"26"	0.56	70	"46"	1.75	102	"66"	6.37
7	"07"	0.12	39	"27"	0.56	71	"47"	1.93	103	"67"	6.37
8	"08"	0.14	40	"28"	0.56	72	"48"	1.93	104	"68"	6.71
9	"09"	0.14	41	"29"	0.65	73	"49"	2.12	105	"69"	6.71
10	"0A"	0.14	42	"2A"	0.65	74	"4A"	2.12	106	"6A"	7.06
11	"0B"	0.14	43	"2B"	0.65	75	"4B"	2.32	107	"6B"	7.06
12	"0C"	0.17	44	"2C"	0.76	76	"4C"	2.32	108	"6C"	7.42
13	"0D"	0.17	45	"2D"	0.76	77	"4D"	2.52	109	"6D"	7.42
14	"0E"	0.17	46	"2E"	0.76	78	"4E"	2.52	110	"6E"	7.80
15	"0F"	0.17	47	"2F"	0.76	79	"4F"	2.74	111	"6F"	7.80
16	"10"	0.21	48	"30"	0.87	80	"50"	2.74	112	"70"	8.17
17	"11"	0.21	49	"31"	0.87	81	"51"	2.96	113	"71"	8.17
18	"12"	0.21	50	"32"	0.87	82	"52"	2.96	114	"72"	8.56
19	"13"	0.21	51	"33"	0.87	83	"53"	3.19	115	"73"	8.56
20	"14"	0.21	52	"34"	1.00	84	"54"	3.44	116	"74"	8.96
21	"15"	0.21	53	"35"	1.00	85	"55"	3.44	117	"75"	8.96
22	"16"	0.21	54	"36"	1.00	86	"56"	3.69	118	"76"	9.37
23	"17"	0.21	55	"37"	1.00	87	"57"	3.69	119	"77"	9.37
24	"18"	0.26	56	"38"	1.13	88	"58"	3.95	120	"78"	9.79
25	"19"	0.26	57	"39"	1.13	89	"59"	3.95	121	"79"	9.79
26	"1A"	0.26	58	"3A"	1.13	90	"5A"	4.22	122	"7A"	10.21
27	"1B"	0.26	59	"3B"	1.13	91	"5B"	4.22	123	"7B"	10.21
28	"1C"	0.32	60	"3C"	1.27	92	"5C"	4.50	124	"7C"	10.65
29	"1D"	0.32	61	"3D"	1.27	93	"5D"	4.79	125	"7D"	10.65
30	"1E"	0.32	62	"3E"	1.27	94	"5E"	4.79	126	"7E"	11.54
31	"1F"	0.32	63	"3F"	1.27	95	"5F"	5.09	127	"7F"	11.54

Table 98. 256 Step PT speed (°/sec), part 1[256step1]

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 23

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 24

Step	Value	°/sec	Step	Value	°/sec	Step	Value	°/sec	Step	Value	°/sec
128	"80"	12.01	160	"A0"	23.18	192	"C0"	46.80	224	"E0"	79.86
129	"81"	12.01	161	"A1"	23.83	193	"C1"	47.73	225	"E1"	81.07
130	"82"	12.48	162	"A2"	24.49	194	"C2"	48.66	226	"E2"	82.30
131	"83"	12.96	163	"A3"	25.17	195	"C3"	49.61	227	"E3"	83.53
132	"84"	13.45	164	"A4"	25.85	196	"C4"	50.57	228	"E4"	84.77
133	"85"	13.45	165	"A5"	25.85	197	"C5"	51.53	229	"E5"	86.02
134	"86"	13.95	166	"A6"	26.54	198	"C6"	52.51	230	"E6"	88.54
135	"87"	13.95	167	"A7"	26.54	199	"C7"	53.49	231	"E7"	89.82
136	"88"	14.46	168	"A8"	27.24	200	"C8"	54.49	232	"E8"	91.11
137	"89"	14.46	169	"A9"	27.95	201	"C9"	54.49	233	"E9"	93.71
138	"8A"	14.97	170	"AA"	28.67	202	"CA"	55.49	234	"EA"	95.02
139	"8B"	14.97	171	"AB"	29.40	203	"CB"	56.50	235	"EB"	97.68
140	"8C"	15.50	172	"AC"	30.13	204	"CC"	57.52	236	"EC"	100.37
141	"8D"	15.50	173	"AD"	30.88	205	"CD"	58.55	237	"ED"	103.10
142	"8E"	16.03	174	"AE"	31.64	206	"CE"	59.59	238	"EE"	105.86
143	"8F"	16.03	175	"AF"	32.40	207	"CF"	60.64	239	"EF"	108.66
144	"90"	16.58	176	"B0"	33.17	208	"D0"	61.70	240	"F0"	110.08
145	"91"	17.13	177	"B1"	33.96	209	"D1"	61.70	241	"F1"	112.93
146	"92"	17.13	178	"B2"	34.75	210	"D2"	62.76	242	"F2"	115.83
147	"93"	17.70	179	"B3"	35.55	211	"D3"	63.84	243	"F3"	118.76
148	"94"	18.27	180	"B4"	36.36	212	"D4"	64.92	244	"F4"	120.24
149	"95"	18.27	181	"B5"	37.18	213	"D5"	66.02	245	"F5"	120.24
150	"96"	18.85	182	"B6"	38.01	214	"D6"	67.12	246	"F6"	120.24
151	"97"	18.85	183	"B7"	38.85	215	"D7"	69.36	247	"F7"	120.24
152	"98"	19.44	184	"B8"	39.69	216	"D8"	70.49	248	"F8"	120.24
153	"99"	19.44	185	"B9"	40.55	217	"D9"	71.63	249	"F9"	120.24
154	"9A"	20.65	186	"BA"	41.41	218	"DA"	72.77	250	"FA"	120.24
155	"9B"	20.65	187	"BB"	42.29	219	"DB"	73.93	251	"FB"	120.24
156	"9C"	21.27	188	"BC"	43.17	220	"DC"	75.10	252	"FC"	120.24
157	"9D"	21.27	189	"BD"	44.06	221	"DD"	76.28	253	"FD"	120.24
158	"9E"	21.89	190	"BE"	44.97	222	"DE"	77.46	254	"FE"	120.24
159	"9F"	22.53	191	"BF"	45.88	223	"DF"	78.66	255	"FF"	120.24

Table 99. 256 Step PT speed (°/sec), part 2[256step2]

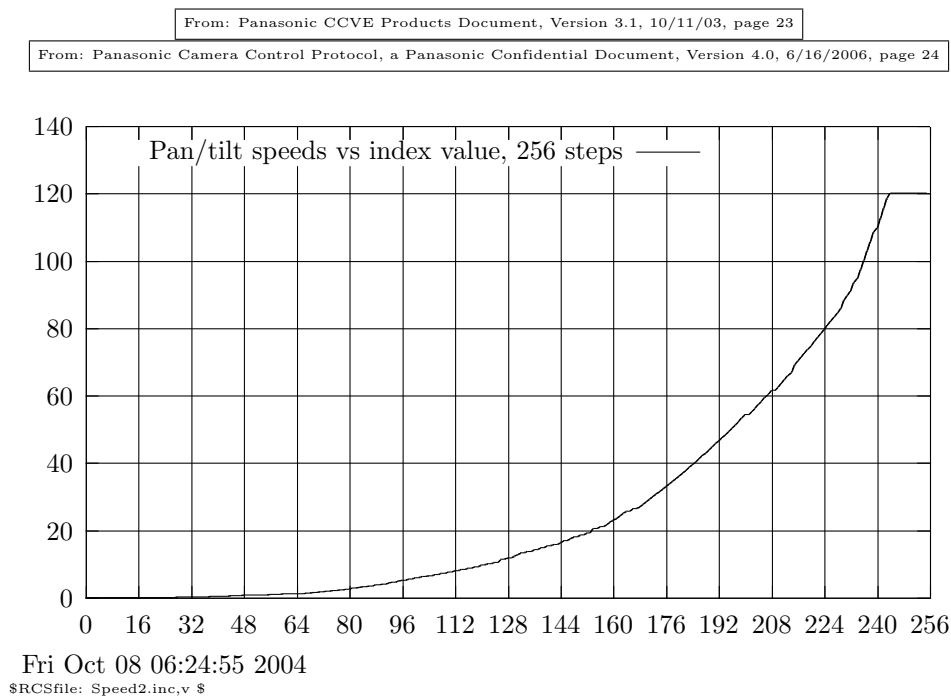


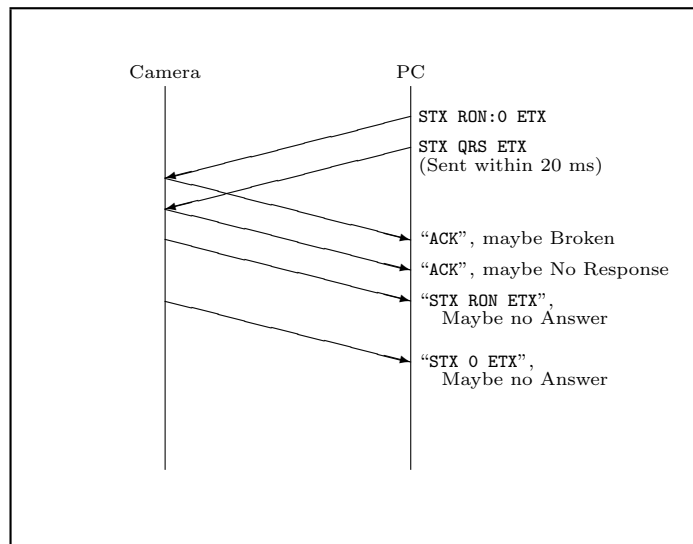
Figure 18: 256 Step PT Speed Table Plotted. Note that the first and last few items are “on the line”. [256pt]

6 Tips for Two Wire Communications Configuration[newtftw]

Do not send a command before receiving ACK and ANSWER from the previous command.
If you do so, data may be broken.

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 18

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 20



\$RCSfile: Bef.inc,v \$

Figure 19. Bad Example[bef]

⁸⁶\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/NewTftw.inc,v 1.5 2006-12-04 11:55:39-08 Hamilton Exp
Hamilton \$

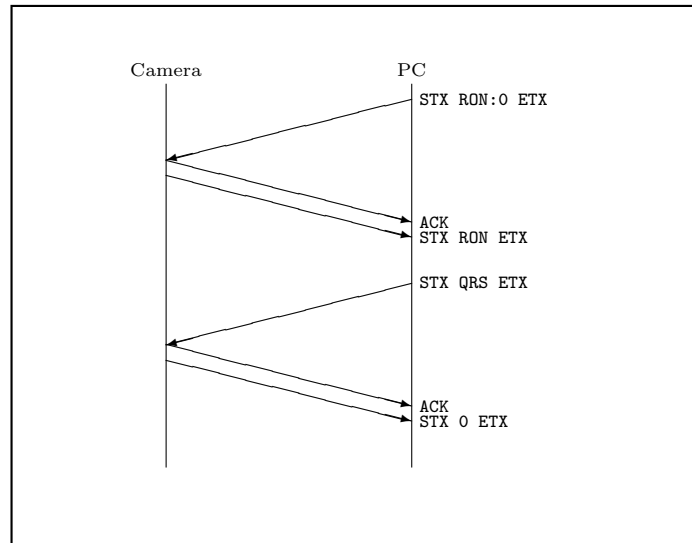
⁸⁷\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/Bef.inc,v 1.1 2006-12-04 11:55:53-08 Hamilton Exp Hamilton
\$

⁸⁸\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/GE1.inc,v 1.1 2006-12-04 11:56:03-08 Hamilton Exp Hamilton
\$

⁸⁹\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/GE2.inc,v 1.1 2006-12-04 11:56:06-08 Hamilton Exp Hamilton
\$

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 18

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 20

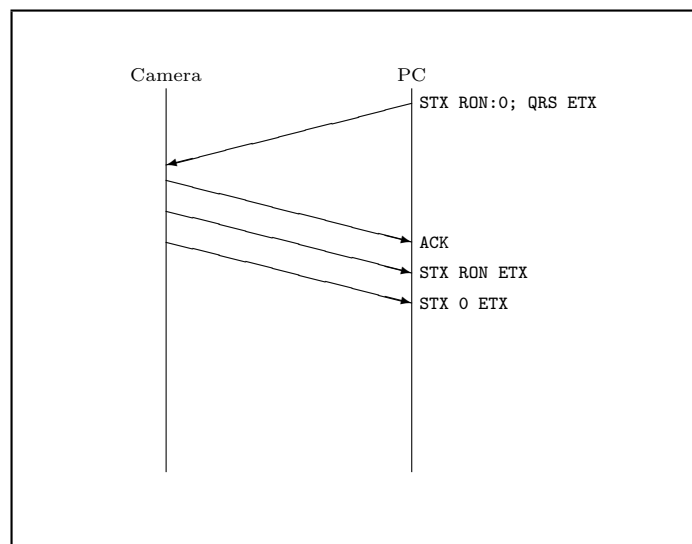


\$RCSfile: GE1.inc,v \$

Figure 20. Good Example #1[ge1]

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 18, 19

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 20

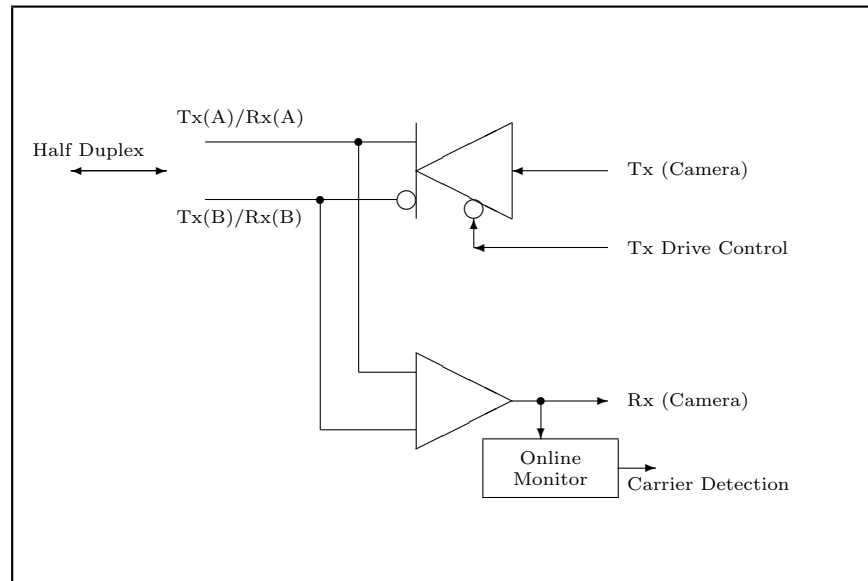


\$RCSfile: GE2.inc,v \$

Figure 21. Good Example #2[ge2]

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 26

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 27



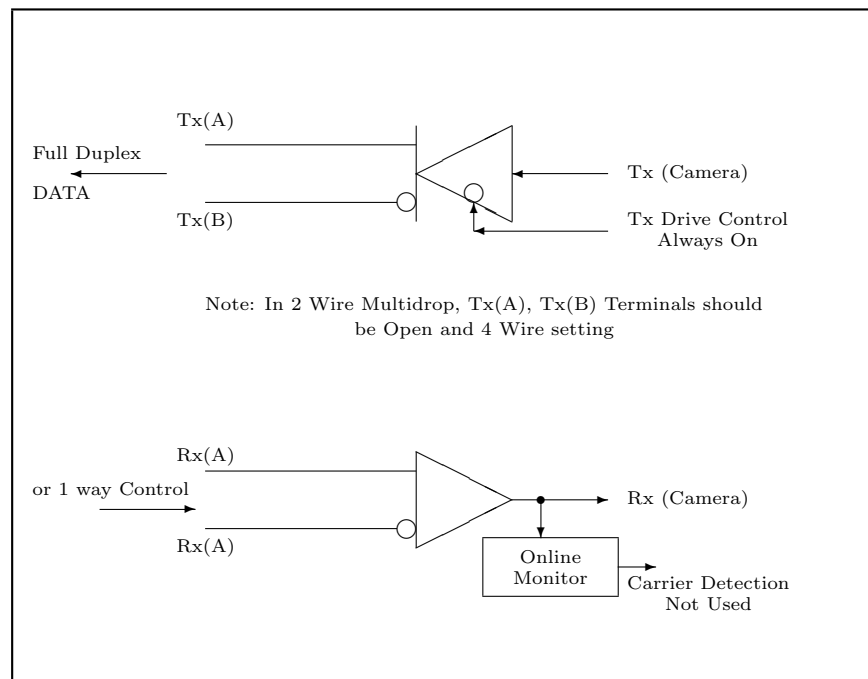
\$RCSfile: Wiring.inc,v \$

Figure 22. 2 Wire Internal Circuitry [2wire]

⁹⁰\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/Wiring.inc,v 1.1 2006-12-05 11:39:05-08 Hamilton Exp
Hamilton \$

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 26

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 27



\$RCSfile: Wiring.inc,v \$

Figure 23. 4 Wire Internal Circuitry [4wire]

APPENDIX A

A “Old” Commands and Status Requests

A.1 Camera Function Commands (old)[cfco]

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 31 → 34

Function Command Camera (old) "cfco"			
Function	Command	Reply	Reference
Iris (camera) Open	GC7:0021002	GC7:002E002	(4.5, 30)
Iris (camera) Close	GC7:0021003	GC7:002E003	(4.5, 30)
Iris (camera) Stop	GC7:0021004	GC7:002E004	(4.5, 30)
Iris (camera) Reset	GC7:0021005	GC7:002E005	(4.5, 30)
ALC On	GC7:0021032	GC7:002E032	(4.5, 30)
ELC On	—	—	
Manual Iris On	GC7:0021034	GC7:002E034	(4.18, 50)
Shutter On	GC7:0021100	GC7:002E100	(4.24, 62)
Shutter Off	GC7:0021101	GC7:002E101	(4.24, 62)
Shutter Inc	GC7:0021102	GC7:002E102	(4.24, 62)
Shutter Dec	GC7:0021103	GC7:002E103	(4.24, 62)
Shutter 1/100 (NTSC Only)	GC7:0021109	GC7:002E109	(4.24, 62)
Shutter 1/120 (PAL Only)	GC7:002110A	GC7:002E10A	(4.24, 62)
Shutter 1/250	GC7:002110C	GC7:002E10C	(4.24, 62)
Shutter 1/500	GC7:002110D	GC7:002E10D	(4.24, 62)
Shutter 1/1000	GC7:002110E	GC7:002E10E	(4.24, 62)
Shutter 1/2000	GC7:002110F	GC7:002E10F	(4.24, 62)
Shutter 1/4000	GC7:0021119	GC7:002E119	(4.24, 62)
Shutter 1/10000	GC7:002111A	GC7:002E11A	(4.24, 62)
Sens Up Auto On	GC7:0021120	GC7:002E120	(4.15, 42)
Sens Up Auto Off	GC7:0021121	GC7:002E121	(4.15, 42)
Sens Up Auto Inc	GC7:0021122	GC7:002E122	(4.15, 42)
Sens Up Auto Dec	GC7:0021123	GC7:002E123	(4.15, 42)
Sens Up Manual On	GC7:0021150	GC7:002E150	(4.15, 42)
Sens Up Manual Off	GC7:0021151	GC7:002E151	(4.15, 42)
Sens Up Manual Inc	GC7:0021152	GC7:002E152	(4.15, 42)
Sens Up Manual Dec	GC7:0021153	GC7:002E153	(4.15, 42)
AGC On	GC7:0021200	GC7:002E200	(4.4, 29)
AGC Off	GC7:0021201	GC7:002E201	(4.4, 29)
<i>Continued on the next page.</i>			

⁹¹\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/CFCo.inc,v 1.19 2006-12-04 11:55:37-08 Hamilton Exp
Hamilton \$

<i>Continued from the previous page.</i>			
Function Command Camera (old) "cfco"			
Function	Command	Reply	Reference
AGC Gain Up Low	GC7:0021208	GC7:002E208	(4.4, 29)
AGC Gain Up Mid	GC7:0021209	GC7:002E209	(4.4, 29)
AGC Gain Up High	GC7:002120A	GC7:002E20A	(4.4, 29)
Manual Gain Up Low	GC7:0021228	GC7:002E228	(—)
Manual Gain Up Mid	GC7:0021229	GC7:002E229	(—)
Manual Gain Up High	GC7:002122A	GC7:002E22A	(—)
BLC Mode Auto	GC7:00212A2	GC7:002E2A2	(4.9, 35) Super-D On
BLC Mode Preset	GC7:00212A3	GC7:002E2A3	(4.9, 35) Super-D Off
BLC Set Up [start]	GC7:00212B0	GC7:002E2B0	(4.9.1, 35)
BLC Set Up [end]	GC7:00212B1	GC7:002E2B1	(4.9.1, 35)
BLC Set Up [mask on]	GC7:00212C0	GC7:002E2C0	(4.9.1, 35)
BLC Set Up [mask off]	GC7:00212C1	GC7:002E2C1	(4.9.1, 35)
BLC Set Up [mask clear]	GC7:00212C2	GC7:002E2C2	(4.9.1, 35)
BLC Set Up [mask reverse]	GC7:00212C3	GC7:002E2C3	(4.9.1, 35)
BLC Set Up [cursor (up)]	GC7:00212C8	GC7:002E2C8	(4.9.1, 35)
BLC Set Up [cursor (right)]	GC7:00212C9	GC7:002E2C9	(4.9.1, 35)
BLC Set Up [cursor (down)]	GC7:00212CA	GC7:002E2CA	(4.9.1, 35)
BLC Set Up [cursor (left)]	GC7:00212CB	GC7:002E2CB	(4.9.1, 35)
AWC On	GC7:0021300	GC7:002E300	(4.6, 32)
AWC Reset	GC7:0021305	GC7:002E305	(4.6, 32)
AWC Set Up	GC7:0021300 :0021306	GC7:002E300 GC7:002E306	(4.6, 32) (4.6, 32)
ATW On	GC7:0021310	GC7:002E310	(4.7, 33)
Burst Phase Up (+)	GC7:0021382	GC7:002E382	(—)
Burst Phase Up (—)	GC7:0021383	GC7:002E383	(—)
Burst Phase Stop	GC7:0021384	GC7:002E384	(—)
Burst Phase Reset	GC7:0021385	GC7:002E385	(—)
Line Lock On	GC7:0021452	GC7:002E452	(4.17, 50)
Line Lock Off (int)	GC7:0021453	GC7:002E453	(4.17, 50)
Motion Detect On	GC7:0021690	GC7:002E690	(4.19, 51)
Motion Detect Off	GC7:0021691	GC7:002E691	(4.19, 51)
D-Range On	GC7:00216B0	GC7:002E6B0	(4.26, 64)
D-Range Off	GC7:00216B1	GC7:002E6B1	(4.26, 64)
All Reset	GC7:0021760	GC7:002E760	(4.19, 51)
<i>Continued on the next page.</i>			

<i>Continued from the previous page.</i>			
Function Command Camera (old) "cfco"			
Function	Command	Reply	Reference
Re-set	GC7:0021761	GC7:002E761	(4.9.1, 35)
Set Up Menu On	GC7:0021940	GC7:002E940	(4.10, 36)
Set Up Menu Off	GC7:0021941	GC7:002E941	(4.10, 36)
Set Up Menu [Cursor (stop)]	GC7:002194F	GC7:002E94F	(4.10, 36)
Set Up Menu [Cursor (up arrow)]	GC7:0021942	GC7:002E942	(4.10, 36)
Set Up Menu [Cursor (right arrow)]	GC7:0021943	GC7:002E943	(4.10, 36)
Set Up Menu [Cursor (down arrow)]	GC7:0021944	GC7:002E944	(4.10, 36)
Set Up Menu [Cursor (left arrow)]	GC7:0021945	GC7:002E945	(4.10, 36)
Select Area Fast Up	GC7:0021946	GC7:002E946	(4.10, 36)
Select Area Fast Right	GC7:0021947	GC7:002E947	(4.10, 36)
Select Area Fast Down	GC7:0021948	GC7:002E948	(4.10, 36)
Select Area Fast Left	GC7:0021949	GC7:002E949	(4.10, 36)
Set Up Menu Set1	GC7:002194A	GC7:002E94A	(4.10, 36)
Set Up Menu Set2	GC7:002194B	GC7:002E94B	(4.10, 36)
Set Up Menu SW (reset)	GC7:002194C	GC7:002E94C	(—)
Set Up Menu SW (all reset)	GC7:002194D	GC7:002E94D	(—)
Auto Focus On	GC7:0021A06	GC7:002EA06	(4.2, 27)
Auto Focus Area (small)	GC7:0021A18	GC7:002EA18	(4.2, 27)
Auto Focus Area (middle)	GC7:0021A19	GC7:002EA19	(4.2, 27)
Auto Focus Area (large)	GC7:0021A1A	GC7:002EA1A	(4.2, 27)

A.2 Reciever Function Commands (old) [rfco]

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 35 → 39

Function Command Reciever (old) "rfco"			
Function	Command	Reply	Int/TO
Zoom [stop(f)] + Focus [stop(f)]	GC7:2021224	GC7:002E224	(—)
Zoom [tele(f)]	GC7:2021228	GC7:002E228	1.0/2.2 (—)
Zoom [tele(f)] + Focus [far(f)]	GC7:2021229	GC7:002E229	1.0/2.2 (—)
Focus [far(f)]	GC7:202122A	GC7:002E22A	1.0/2.2 (—)
Zoom [wide(f)] + Focus [far(f)]	GC7:202122B	GC7:002E22B	1.0/2.2 (—)
Zoom [wide(f)]	GC7:202122C	GC7:002E22C	1.0/2.2 (—)
Zoom [wide(f)] + Focus [near(f)]	GC7:202122D	GC7:002E22D	1.0/2.2 (—)
Focus [near(f)]	GC7:202122E	GC7:002E22E	1.0/2.2 (—)
Zoom [wide(f)] + Focus [near(f)]	GC7:202122F	GC7:002E22F	1.0/2.2 (—)

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Function Command Reciever (old) "rfco"			
Function	Command	Reply	Int/TO
Auto Pan On	GC7:2021300	GC7:002E300	(4.6, 32)
Auto Pan Off	GC7:2021301	GC7:002E301	(—)
Auto Pan Endless On	GC7:202130E	GC7:002E30E	(—)
Auto Pan Endless Off	GC7:002130F	GC7:002E30F	(—)
Pan [stop(f)] + Tilt [stop(f)]	GC7:2021324	GC7:202E324	(—)
Pan [left(f)]	GC7:2021328	GC7:002E328	1.0/2.2 (—)
Pan [left(f)] + Tilt [up(f)]	GC7:2021329	GC7:002E329	1.0/2.2 (—)
Tilt [up(f)]	GC7:202132A	GC7:002E32A	1.0/2.2 (—)
Pan [right(f)] + Tilt [up(f)]	GC7:202132B	GC7:002E32B	1.0/2.2 (—)
Pan [right(f)]	GC7:202132C	GC7:002E32C	1.0/2.2 (—)
Pan [right(f)] + Tilt [down(f)]	GC7:202132D	GC7:002E32D	1.0/2.2 (—)
Tilt [down(f)]	GC7:202132E	GC7:002E32E	1.0/2.2 (—)
Pan [left(f)] + Tilt [down(f)]	GC7:202132F	GC7:002E32F	1.0/2.2 (—)
Pan [stop(f)] + Tilt [stop(s)]	GC7:2021324	GC7:002E324	(—)
Pan [left(f)]	GC7:2021338	GC7:202E338	1.0/2.2 (5.2.1, 72)
Pan [left(f)] + Tilt [up(s)]	GC7:2021339	GC7:202E339	1.0/2.2 (5.2.1, 72)
Tilt [up(s)]	GC7:202133A	GC7:202E33A	1.0/2.2 (5.2.1, 72)
Pan [right(f)] + Tilt [up(s)]	GC7:202133B	GC7:202E33B	1.0/2.2 (5.2.1, 72)
Pan [right(f)]	GC7:202133C	GC7:202E33C	1.0/2.2 (5.2.1, 72)
Pan [right(f)] + Tilt [down(s)]	GC7:202133D	GC7:202E33D	1.0/2.2 (5.2.1, 72)
Tilt [down(s)]	GC7:202133E	GC7:202E33E	1.0/2.2 (5.2.1, 72)
Pan [left(f)] + Tilt [down(s)]	GC7:202133F	GC7:202E33F	1.0/2.2 (5.2.1, 72)
Pan [stop(s)] + Tilt [stop(f)]	GC7:2021344	GC7:202E344	(5.2.1, 72)
Pan [left(s)]	GC7:2021348	GC7:202E348	1.0/2.2 (5.2.1, 72)
Pan [left(s)] + Tilt [up(f)]	GC7:2021349	GC7:202E349	1.0/2.2 (5.2.1, 72)
Tilt [up(f)]	GC7:202134A	GC7:202E34A	1.0/2.2 (5.2.1, 72)
<i>Continued on the next page.</i>			

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Function Command Reciever (old) "rfco"			
Function	Command	Reply	Int/TO
Pan [right(s)] + Tilt [up(f)]	GC7:202134B	GC7:202E34B	1.0/2.2 (5.2.1, 72)
Pan [right(s)]	GC7:202134C	GC7:202E34C	1.0/2.2 (5.2.1, 72)
Pan [right(s)] + Tilt [down(f)]	GC7:202134D	GC7:202E34D	1.0/2.2 (5.2.1, 72)
Tilt [down(f)]	GC7:202134E	GC7:202E34E	1.0/2.2 (5.2.1, 72)
Pan [left(s)] + Tilt [down(f)]	GC7:202134F	GC7:202E34F	1.0/2.2 (5.2.1, 72)
Pan [stop(s)] + Tilt [stop(s)]	GC7:2021354	GC7:202E354	(5.2.1, 72)
Pan [left(s)]	GC7:2021358	GC7:202E358	1.0/2.2 (5.2.1, 72)
Pan [left(s)] + Tilt [up(s)]	GC7:2021359	GC7:202E359	1.0/2.2 (5.2.1, 72)
Tilt [up(s)]	GC7:202135A	GC7:202E35A	1.0/2.2 (5.2.1, 72)
Pan [right(s)] + Tilt [up(s)]	GC7:202135B	GC7:202E35B	1.0/2.2 (5.2.1, 72)
Pan [right(s)]	GC7:202135C	GC7:202E35C	1.0/2.2 (5.2.1, 72)
Pan [right(s)] + Tilt [down(s)]	GC7:202135D	GC7:202E35D	1.0/2.2 (5.2.1, 72)
Tilt [down(s)]	GC7:202135E	GC7:202E35E	1.0/2.2 (5.2.1, 72)
Pan [left(s)] + Tilt [down(s)]	GC7:202135F	GC7:202E35F	1.0/2.2 (5.2.1, 72)
Pan [stop(v)] + Tilt [stop(v)]	GC7:2021364	GC7:202E364	(5.1.1, 67)
Pan [left(v)]	—	GC7:202E36.	1.0/2.2 (5.1.1, 67)
	—	GC7:2029ss0	(5.1.1, 67)
Pan [left(v)] + Tilt [up(v)]	GCF:2021369	GC7:202E36.	1.0/2.2 (5.1.1, 67)
	:2022ss0	GC7:2029ss0	(5.1.1, 67)
Tilt [up(v)]	GCF:202136A	GC7:202E36.	1.0/2.2 (5.1.1, 67)
	:2022ss0	GC7:2029ss0	(5.1.1, 67)
<i>Continued on the next page.</i>			

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Function Command Reciever (old) "rfco"			
Function	Command	Reply	Int/TO
Pan [right(v)] + Tilt [up(v)]	GCF:202136B :2022ss0	GC7:202E36. GC7:2029ss0	1.0/2.2 (5.1.1, 67) (5.1.1, 67)
Pan [right(v)]	GCF:202136C :2022ss0	GC7:202E36. GC7:2029ss0	(5.1.1, 67) 1.0/2.2
Pan [right(v)] + Tilt [down(v)]	GCF:202136D :2022ss0	GC7:202E36. GC7:2029ss0	1.0/2.2 (5.1.1, 67) (5.1.1, 67)
Tilt [down(v)]	GCF:202136E :2022ss0	GC7:202E36. GC7:2029ss0	1.0/2.2 (5.1.1, 67) (5.1.1, 67)
Pan [left(v)] + Tilt [down(v)]	GCF:202136F :2022ss0	GC7:202E36. GC7:2029ss0	1.0/2.2 (5.1.1, 67) (5.1.1, 67)
Preset Position Request	GCF:2021400 :2022pp0	GC7:202E400 GC7:2029pp0	(4.21.7, 58)
Home Position Request	GC7:2021410	GC7:202E410	(4.14, 41)
Preset Mode [off]	GC7:2021431	GC7:202E431	(4.21.6, 56)
Preset Mode [seq on]	GC7:2021437	GC7:202E437	(4.21.6, 56)
Preset Mode [sort on]	GC7:2021438	GC7:202E438	(4.21.6, 56)
Preset Position Mode [start]	GCF:2021540 :2022pp0	GC7:202E540 GC7:2029pp0	(66, 54) (66, 54)
Preset Position Mode [set]	GC7:2021542	GC7:202E542	(66, 54)
Preset Position Mode [end]	GC7:2021543	GC7:202E543	(66, 54)
Preset Position Mode [ID all clear]	GC7:2021547	GC7:202E547	(—)
Preset Position Mode [ID all clear]	GCF:0021902 :0022EC8 :0022011 :0021912 :0022210 :0021902 :0022228 :0022051 :0021912 :0022pp0 GCF:2021542 :2021543	GC7:002E902 GC7:0029EC8 GC7:0029011 GC7:0029912 GC7:0029010 GC7:0029902 GC7:0029228 GC7:0029051 GC7:0029912 GC7:0029pp0 GC7:202E542 GC7:202E543	(69, 57) (69, 57) (69, 57) (69, 57) (69, 57) (69, 57) (69, 57) (69, 57) (69, 57) (69, 57) (69, 57) (69, 57) (69, 57)
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Function Command Reciever (old) "rfco"			
Function	Command	Reply	Int/TO

Note

1. **f**: "Fast" speed type for the 202132., 202133., 202134. and 202135. series of commands, Section 5.2.1, page 72.
2. **pp**: Preset Id number. "1" based in older commands (2021400/2022pp0 series) and "0" based in newer commands (90300pp series).
3. **s**: "Slow" speed type for the 202132., 202133., 202134. and 202135. series of commands, Section 5.2.1, page 72.
4. **ss**: Speed data for the 202136./2022ss series of commands, Section 5.1.1, page 67 and Section 5.2, page 67.
5. **v**: Speed type for the 202136./2022ss series of commands, Section 5.1.1, page 67 and Section 5.2, page 67.
6. Items 1 through 23 have been changed from type "002" commands to type "202" commands as that seems to be a better choice.

A.3 Camera Status Requests (old) [csro]

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 40 → 42

Status Request Camera (old) "csro"			
Function	Command	Reply	Note
Shutter?	GC7:0020110	GC7:0021110	Off
	GC7:0020110	GC7:0021111	1/100 NTSC only
	GC7:0020110	GC7:0021112	1/120 PAL only
	GC7:0020110	GC7:0021114	1/250
	GC7:0020110	GC7:0021115	1/500
	GC7:0020110	GC7:0021116	1/1000
	GC7:0020110	GC7:0021117	1/2000
	GC7:0020110	GC7:0021118	1/4000
	GC7:0020110	GC7:0021119	1/10000
Sens Up Auto (Set-up)?	GC7:0020112	GC7:0021120	Off
	GC7:0020112	GC7:0021121	Auto x1
	GC7:0020112	GC7:0021122	Auto x2
	GC7:0020112	GC7:0021123	Auto x4
	GC7:0020112	GC7:0021124	Auto x6

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Status Request Camera (old) "csro"			
Function	Command	Reply	Note
	GC7:0020112	GC7:0021126	Auto x10
	GC7:0020112	GC7:0021129	Auto x16
	GC7:0020112	GC7:0021133	Auto x32
Sens Up Auto (Condition)?	GC7:0020114	GC7:0021140	Off
	GC7:0020114	GC7:0021141	Auto x1
	GC7:0020114	GC7:0021142	Auto x2
	GC7:0020114	GC7:0021143	Auto x4
	GC7:0020114	GC7:0021144	Auto x6
	GC7:0020114	GC7:0021146	Auto x10
	GC7:0020114	GC7:0021149	Auto x16
	GC7:0020114	GC7:0021143	Auto x32
Sens Up Manual (Set-up)?	GC7:0020116	GC7:0021160	Off
	GC7:0020116	GC7:0021161	Auto x1
	GC7:0020116	GC7:0021162	Auto x2
	GC7:0020116	GC7:0021163	Auto x4
	GC7:0020116	GC7:0021164	Auto x6
	GC7:0020116	GC7:0021166	Auto x10
	GC7:0020116	GC7:0021169	Auto x16
	GC7:0020116	GC7:0021163	Auto x32
ALC/BLC?	GC7:0020102	GC7:0021020	Off (4.5, 30)
	GC7:0020102	GC7:0021021	ALC (4.5, 30)
	GC7:0020102	GC7:0021022	ELC (4.5, 30)
	GC7:0020102	GC7:0021023	Manual (4.5, 30)
AGC?	GC7:0020121	GC7:0021210	Off
	GC7:0020121	GC7:0021211	Low
	GC7:0020121	GC7:0021212	Mid
	GC7:0020121	GC7:0021213	High
Gain Up?	GC7:0020122	GC7:0021220	Off
	GC7:0020122	GC7:0021221	Low
	GC7:0020122	GC7:0021222	Mid
	GC7:0020122	GC7:0021223	High
ELC?	GC7:0020124	GC7:0021241	Auto
	GC7:0020124	GC7:0021242	Reset
	GC7:0020124	GC7:0021243	Normal
White Balance?	GC7:0020130	GC7:0021301	ATW
	GC7:0020130	GC7:0021302	AWC
<i>Continued on the next page.</i>			

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Status Request Camera (old) "csro"			
Function	Command	Reply	Note
	GC7:0020130	GC7:0021303	Manual
Line Lock?	GC7:0020140	GC7:0021400	On
	GC7:0020140	GC7:0021401	Off
Motion Detect?	GC7:0020176	GC7:0021760	Off (4.19, 51)
	GC7:0020176	GC7:0021761	On (4.19, 51)
Auto Focus Area?	GC7:00201A2	GC7:0021A20	Small
	GC7:00201A2	GC7:0021A21	Middle
	GC7:00201A2	GC7:0021A22	Large

A.4 Reciever Status Requests (old) [rsro]

From: Panasonic CCVE Products Document Number 010, Version 5.3, 12/03/97, page 43, 44

Status Request Reciever (old) "rsro"			
Function	Command	Reply	Note
Wiper?	GC7:2020100	GC7:2021000	On
	GC7:2020100	GC7:2021001	Off
Def?	GC7:2020102	GC7:2021020	On
	GC7:2020102	GC7:2021021	Off
AUX 1/2?	GC7:2020110	GC7:2021100	AUX1:On/AUX2:On
	GC7:2020110	GC7:2021102	AUX1:Off/AUX2:On
	GC7:2020110	GC7:2021108	AUX1:On/AUX2:Off
	GC7:2020110	GC7:202110A	AUX1:Off/AUX2:Off
AUX 1/2 Mode?	GC7:2020118	GC7:2021180	AUX1:MOMETARY/- AUX2:MOMETARY
	GC7:2020118	GC7:2021181	AUX1:LATCH/- AUX2:MOMETARY
	GC7:2020118	GC7:2021182	AUX1:MOMETARY/- AUX2:LATCH
	GC7:2020118	GC7:2021183	AUX1:LATCH/- AUX2:LATCH
Camera Power?	GC7:2020120	GC7:2021200	On
	GC7:2020120	GC7:2021201	Off
Random Pan?	GC7:2020130	GC7:2021300	On
	GC7:2020130	GC7:2021301	Off
	GC7:2020132	GC7:2021320	On
<i>Continued on the next page.</i>			

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Status Request Reciever (old) "rsro"			
Function	Command	Reply	Note
Auto Pan?	GC7:2020132	GC7:2021321	Off
Pan/Tilt Variable?	GC7:2020136	GC7:2021360	Available
	GC7:2020136	GC7:2021361	Not Available
One way commands?	GC7:2020137	GC7:2021370	Available??
	GC7:2020137	GC7:2021371	Not Available??
Auto Pan Endless?	GC7:2020138	GC7:2021380	On
	GC7:2020138	GC7:2021381	Off
Preset Mode?	GC7:2020146	GC7:2021461	Off
	GC7:2020146	GC7:2021467	Seq
	GC7:2020146	GC7:2021468	Sort

APPENDIX B

B “New” Commands

B.1 Reciever Function Commands (new) [rfcn]

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 8 → 11

Reciever Function Commands (new) "rfcn"		
Function	Command	CS850/Notes
AUX All On	2021130	Depends on menu :CONT 1
AUX All Off	2021131	Depends on menu :CONT 1
AUX 1 On	2021160	Depends on menu :CONT 1
AUX 1 Off	2021161	Depends on menu :CONT 1
AUX 2 On	2021162	Depends on menu :CONT 2
AUX 2 Off	2021163	Depends on menu :CONT 2
AUX 1 Momentary	2021180	Depends on menu :CONT 1
AUX 1 Latch	2021181	Depends on menu :CONT 1
AUX 2 Momentary	2021182	Depends on menu :CONT 2
AUX 2 Latch	2021183	Depends on menu :CONT 2
Zoom [stop(f)] + Focus [stop(f)]	2021224	Timeout 2.2 sec (4.27, 64)
Zoom [tele(f)]	2021228	Timeout 2.2 sec (4.27, 64)
Zoom [tele(f)] + Focus [far(f)]	2021229	Timeout 2.2 sec (4.27, 64)
Focus [far(f)]	202122A	Timeout 2.2 sec (4.27, 64)
Zoom [wide(f)] + Focus [far(f)]	202122B	Timeout 2.2 sec (4.27, 64)
Zoom [wide(f)]	202122C	Timeout 2.2 sec (4.27, 64)
Zoom [wide(f)] + Focus [near(f)]	202122D	Timeout 2.2 sec (4.27, 64)
Focus [near(f)]	202122E	Timeout 2.2 sec (4.27, 64)
Zoom [wide(f)] + Focus [near(f)]	202122F	Timeout 2.2 sec (4.27, 64)
Zoom [stop(v)] + Focus [stop(v)]	2021264	Timeout 2.2 sec (—)
Zoom [tele(v)]	2021268	Timeout 2.2 sec (—)
Zoom [tele(v)] + Focus [far(v)]	2021269	Timeout 2.2 sec (—)
Focus [far(v)]	202126A	Timeout 2.2 sec (—)
Zoom [wide(v)] + Focus [far(v)]	202126B	Timeout 2.2 sec (—)
Zoom [wide(v)]	202126C	Timeout 2.2 sec (—)
Zoom [wide(v)] + Focus [near(v)]	202126D	Timeout 2.2 sec (—)
Focus [near(v)]	202126E	Timeout 2.2 sec (—)
Zoom [wide(v)] + Focus [near(v)]	202126F	Timeout 2.2 sec (—)
Auto Pan On	2021300	(4.3, 28)
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Reciever Function Commands (new) "rfcn"		
Function	Command	CS850/Notes
Auto Pan Off	2021301	(4.3, 28)
Auto Pan Reverse	2021305	Y (—)
Auto Pan Left End Set	2021306	Y (—)
Auto Pan Right End Set	2021307	Y (—)
Auto Pan Speed Inc	2021308	(—)
Auto Pan Speed Dec	2021309	(—)
Auto Pan End Less On	202130E	(4.3, 28)
Auto Pan End Less Off	202130F	(4.3, 28)
Pan [stop(f)] + Tilt [stop(f)]	2021324	(5.2.1, 72)
Pan [left(f)]	2021328	Timeout 2.2 sec (5.2.1, 72)
Pan [left(f)] + Tilt [up(f)]	2021329	Timeout 2.2 sec (5.2.1, 72)
Tilt [up(f)]	202132A	Timeout 2.2 sec (5.2.1, 72)
Pan [right(f)] + Tilt [up(f)]	202132B	Timeout 2.2 sec (5.2.1, 72)
Pan [right(f)]	202132C	Timeout 2.2 sec (5.2.1, 72)
Pan [right(f)] + Tilt [down(f)]	202132D	Timeout 2.2 sec (5.2.1, 72)
Tilt [down(f)]	202132E	Timeout 2.2 sec (5.2.1, 72)
Pan [left(f)] + Tilt [down(f)]	202132F	Timeout 2.2 sec (5.2.1, 72)
Pan [stop(s)] + Tilt [stop(s)]	2021334	Timeout 2.2 sec (5.2.1, 72)
Pan [left(s)]	2021338	Timeout 2.2 sec (5.2.1, 72)
Pan [left(s)] + Tilt [up(s)]	2021339	Timeout 2.2 sec (5.2.1, 72)
Tilt [up(s)]	202133A	Timeout 2.2 sec (5.2.1, 72)
Pan [right(s)] + Tilt [up(s)]	202133B	Timeout 2.2 sec (5.2.1, 72)
Pan [right(s)]	202133C	Timeout 2.2 sec (5.2.1, 72)
Pan [right(s)] + Tilt [down(s)]	202133D	Timeout 2.2 sec (5.2.1, 72)
Tilt [down(s)]	202133E	Timeout 2.2 sec (5.2.1, 72)
Pan [left(s)] + Tilt [down(s)]	202133F	Timeout 2.2 sec (5.2.1, 72)
Pan [stop(s)] + Tilt [stop(f)]	2021344	Timeout 2.2 sec (5.2.1, 72)
Pan [left(s)]	2021348	Timeout 2.2 sec (5.2.1, 72)
Pan [left(s)] + Tilt [up(f)]	2021349	Timeout 2.2 sec (5.2.1, 72)
Tilt [up(f)]	202134A	Timeout 2.2 sec (5.2.1, 72)
Pan [right(s)] + Tilt [up(f)]	202134B	Timeout 2.2 sec (5.2.1, 72)
Pan [right(s)]	202134C	Timeout 2.2 sec (5.2.1, 72)
Pan [right(s)] + Tilt [down(f)]	202134D	Timeout 2.2 sec (5.2.1, 72)
Tilt [down(f)]	202134E	Timeout 2.2 sec (5.2.1, 72)
Pan [left(s)] + Tilt [down(f)]	202134F	Timeout 2.2 sec (5.2.1, 72)
Pan [stop(s)] + Tilt [stop(s)]	2021354	(5.2.1, 72)
<i>Continued on the next page.</i>		

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Reciever Function Commands (new) "rfcn"		
Function	Command	CS850/Notes
Pan [left(s)]	2021358	Timeout 2.2 sec (5.2.1, 72)
Pan [left(s)] + Tilt [up(s)]	2021359	Timeout 2.2 sec (5.2.1, 72)
Tilt [up(s)]	202135A	Timeout 2.2 sec (5.2.1, 72)
Pan [right(s)] + Tilt [up(s)]	202135B	Timeout 2.2 sec (5.2.1, 72)
Pan [right(s)]	202135C	Timeout 2.2 sec (5.2.1, 72)
Pan [right(s)] + Tilt [down(s)]	202135D	Timeout 2.2 sec (5.2.1, 72)
Tilt [down(s)]	202135E	Timeout 2.2 sec (5.2.1, 72)
Pan [left(s)] + Tilt [down(s)]	202135F	Timeout 2.2 sec (5.2.1, 72)
Pan [stop(v)] + Tilt [stop(v)]	2021364:2022ss0	(—)
Pan [left(v)]	2021368:2022ss0	Timeout 2.2 sec (—)
Pan [left(v)] + Tilt [up(v)]	2021369:2022ss0	Timeout 2.2 sec (—)
Tilt [up(v)]	202136A:2022ss0	Timeout 2.2 sec (—)
Pan [right(v)] + Tilt [up(v)]	202136B:2022ss0	Timeout 2.2 sec (—)
Pan [right(v)]	202136C:2022ss0	Timeout 2.2 sec (—)
Pan [right(v)] + Tilt [down(v)]	202136D:2022ss0	Timeout 2.2 sec (—)
Tilt [down(v)]	202136E:2022ss0	Timeout 2.2 sec (—)
Pan [left(v)] + Tilt [down(v)]	202136F:2022ss0	Timeout 2.2 sec (—)
Auto Pan Key:Auto Pan	2021390	Y (—)
Auto Pan Key:Seq	2021391	Y (—)
Auto Pan Key:Sort	2021392	Y (—)
Propo Pan/Tilt On	20213A0	Y (—)
Propo Pan/Tilt Off	20213A1	Y (—)
Pan Limit On	20213C0	Y (—)
Pan Limit Off	20213C1	Y (—)
180 Deg Turn	20213D1	Y (—)
Preset Position Call	2021400:2022pp0	(4.21.7, 58)
Home Position Call	2021410	(4.14, 41)
Preset Seq [off]	2021431	(4.21.6, 56)
Preset Mode [seq on]	2021437	(4.21.6, 56)
Preset Mode [sort on]	2021438	(4.21.6, 56)
Patrol Play	2021490	Y (4.20, 52)
Patrol Stop	2021491	Y (4.20, 52)
Patrol Learn	2021494	Y (4.20, 52)
Preset Position ID all clear	2021547	(—)
Alarm In 1 Off	2021600	Y (—)
Alarm In 1 Posi	2021601	Y (—)
<i>Continued on the next page.</i>		

<i>Continued from the previous page.</i>		
Reciever Function Commands (new) "rfcn"		
Function	Command	CS850/Notes
Alarm In 2 Off	2021610	Y (—)
Alarm In 2 Posi	2021611	Y (—)
Alarm In 3 Off	2021620	Y (—)
Alarm In 3 Posi	2021621	Y (—)
Alarm In 4 Off	2021630	Y (—)
Alarm In 4 Posi	2021631	Y (—)
Alarm In 4 BW	2021632	Y (—)
Cont 1 Off	2021700	Y (—)
Cont 1 AUX 1	2021701	Y (—)
Cont 1 VMD	2021702	Y (—)
Cont 2 Off	2021710	Y (—)
Cont 2 AUX 2	2021711	Y (—)
Cont 2 BW	2021713	Y (—)

Note

1. **f**: “Fast” speed type for the 202132., 202133., 202134. and 202135. series of commands, Section 5.2.1, page 72.
2. **pp**: Preset Id number. “1” based in older commands (2021400/2022pp0 series) and “0” based in newer commands (90300pp series).
3. **s**: “Slow” speed type for the 202132., 202133., 202134. and 202135. series of commands, Section 5.2.1, page 72.
4. **ss**: Speed data for the 202136./2022ss series of commands, Section 5.1.1, page 67 and Section 5.2, page 67.
5. **v**: Speed type for the 202136./2022ss series of commands, Section 5.1.1, page 67 and Section 5.2, page 67.

B.2 Camera Function Commands (new) [cfcn]

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 6 → 8

Camera Function Commands (new) "cfcn"		
Function	Command	CS850/Notes
Iris (camera) Open	0021002	Timeout 2.2 sec (4.5, 30)
Iris (camera) Close	0021003	Timeout 2.2 sec (4.5, 30)
Iris (camera) Stop	0021004	(4.5, 30)
Iris (camera) Reset	0021005	(4.5, 30)

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Camera Function Commands (new) "cfcn"		
Function	Command	CS850/Notes
ALC On	0021032	(26, 31) (27, 31)
ELC On	0021033	N/A Always sends back 002D033
Manual Iris On	0021034	(4.18, 50)
BW On	0021040	Y (—)
BW Off	0021041	Y (—)
BW Auto	0021042	Y (—)
BW Burst On	0021050	Y (—)
BW Burst Off	0021051	Y (—)
Shutter On	0021100	(4.24, 62)
Shutter Off	0021101	(4.24, 62)
Shutter Inc	0021102	(4.24, 62)
Shutter Dec	0021103	(4.24, 62)
Shutter 1/100 NTSC, 1/120 PAL	0021109	(4.24, 62)
Shutter 1/250	002110C	(4.24, 62)
Shutter 1/500	002110D	(4.24, 62)
Shutter 1/1000	002110E	(4.24, 62)
Shutter 1/2000	002110F	(4.24, 62)
Shutter 1/4000	0021119	(4.24, 62)
Shutter 1/10000	002111A	(4.24, 62)
Sens Up Auto On	0021120	(4.15, 42)
Sens Up Auto Off	0021121	(4.15, 42)
Sens Up Auto Inc	0021122	(4.15, 42)
Sens Up Auto Dec	0021123	(4.15, 42)
Sens Up Manual On	0021150	(4.15, 42)
Sens Up Manual Off	0021151	(4.15, 42)
Sens Up Manual Inc	0021152	(4.15, 42)
Sens Up Manual Dec	0021153	(4.15, 42)
AGC On	0021200	(4.4, 29)
AGC Off	0021201	(4.4, 29)
AGC Gain Up Low	0021208	(4.4, 29)
AGC Gain Up Mid	0021209	(4.4, 29)
AGC Gain Up High	002120A	(4.4, 29)
Manual Gain Up Low	0021228	(—)
Manual Gain Up Mid	0021229	(—)
Manual Gain Up High	002122A	(—)
BLC Mode Auto	00212A2	(4.9, 35)
<i>Continued on the next page.</i>		

<i>Continued from the previous page.</i>		
Camera Function Commands (new) "cfcn"		
Function	Command	CS850/Notes
BLC Mode Preset	00212A3	(4.9, 35)
BLC Set Up [start]	00212B0	(4.9.1, 35)
BLC Set Up [end]	00212B1	(4.9.1, 35)
BLC Set Up [mask on]	00212C0	(4.9.1, 35)
BLC Set Up [mask off]	00212C1	(4.9.1, 35)
BLC Set Up [mask clear]	00212C2	(4.9.1, 35)
BLC Set Up [mask reverse]	00212C3	(4.9.1, 35)
BLC Set Up [cursor up]	00212C8	(4.9.1, 35)
BLC Set Up [cursor right]	00212C9	(4.9.1, 35)
BLC Set Up [cursor down]	00212CA	(4.9.1, 35)
BLC Set Up [cursor left]	00212CB	(4.9.1, 35)
AWC On	0021300	(4.6, 32)
AWC Reset	0021305	(4.6, 32)
AWC Set Up	0021300 0022306	(4.6, 32)
ATW On	0021310	(4.7, 33)
R Offset Up	0021312	Timeout 2.2 sec (—)
R Offset Down	0021313	Timeout 2.2 sec (—)
R Offset Stop	0021314	(—)
R Offset Reset	0021315	(—)
B Offset Up	0021316	Timeout 2.2 sec (—)
B Offset Down	0021317	Timeout 2.2 sec (—)
B Offset Stop	0021318	(—)
B Offset Reset	0021319	(—)
Burst Phase Up (+)	0021382	Timeout 2.2 sec (—)
Burst Phase Down (—)	0021383	Timeout 2.2 sec (—)
Burst Phase Stop	0021384	(—)
Burst Phase Reset	0021385	(—)
Line Lock On	0021452	NTSC: 60Hz, PAL 50Hz AC power (4.17, 50)
Line Lock Off (int)	0021453	(4.17, 50)
LL Phase Up	0021454	Timeout 2.2 sec (—)
LL Phase Down	0021455	Timeout 2.2 sec (—)
LL Phase Stop	0021456	(—)
EL-Zoom On	0021560	Y (—)
EL-Zoom Off	0021561	Y (—)
Privacy Zone On	0021640	Y (4.22, 60)
<i>Continued on the next page.</i>		

<i>Continued from the previous page.</i>		
Camera Function Commands (new) "cfcn"		
Function	Command	CS850/Notes
Privacy Zone Off	0021641	Y (4.22, 60)
Motion Detect On	0021690	(4.19, 51)
Motion Detect Off	0021691	(4.19, 51)
D-Range On	00216B0	N/A Always send back 002D6B0 (4.26, 64)
D-Range Off	00216B1	N/A Always send back 002D6B1 (4.26, 64)
All Reset	0021760	No need to set the menu cursor. (—)
Restart	0021761	Equivalent to power OFF-ON. (—)
Set Up Menu On	0021940	(4.10, 36)
Set Up Menu Off	0021941	(4.10, 36)
Set Up Menu [cursor stop]	002194F	(4.10, 36)
Set Up Menu [cursor up]	0021942	(4.10, 36)
Set Up Menu [cursor right]	0021943	(4.10, 36)
Set Up Menu [cursor down]	0021944	(4.10, 36)
Set Up Menu [cursor left]	0021945	(4.10, 36)
Set Up Menu Set1	002194A	(4.10, 36)
Set Up Menu Set2	002194B	Equivalent to pressing set button for 2 seconds. (4.10, 36)
Left + Right Button Pressed (F2)	002194C	For Special menu, Gain reset etc. Need to set the set Up menu cursor. (—)
Left + Centre + Right Button Pressed (F3)	002194D	For Camera reset. Need to set the set Up menu cursor (—)
Digital Flip On	00219A0	(4.13, 41)
Digital Flip Off	00219A1	(4.13, 41)
Menu On	00219C0	Y (—)
Menu Off	00219C1	Y (—)
Area Title 1 Set	00219C8	Y (78, 61)
Area Title 2 Set	00219C9	Y (78, 61)
Area Title 3 Set	00219CA	Y (78, 61)
Area Title 4 Set	00219CB	Y (78, 61)
Area Title 5 Set	00219CC	Y (78, 61)
Area Title 6 Set	00219CD	Y (78, 61)
Area Title 7 Set	00219CE	Y (78, 61)
Area Title 8 Set	00219CF	Y (78, 61)
Area Title Default On	00219D0	Y (78, 61)
<i>Continued on the next page.</i>		

<i>Continued from the previous page.</i>		
Camera Function Commands (new) "cfcn"		
Function	Command	CS850/Notes
Area Title Off	00219D1	Y (78, 61)
Area Title 1 Read Start	00219E0	Y (78, 61)
Area Title 1 Write Start	00219E1	Y (78, 61)
Area Title 2 Read Start	00219E2	Y (78, 61)
Area Title 2 Write Start	00219E3	Y (78, 61)
Area Title 3 Read Start	00219E4	Y (78, 61)
Area Title 3 Write Start	00219E5	Y (78, 61)
Area Title 4 Read Start	00219E6	Y (78, 61)
Area Title 4 Write Start	00219E7	Y (78, 61)
Area Title 5 Read Start	00219E8	Y (78, 61)
Area Title 5 Write Start	00219E9	Y (78, 61)
Area Title 6 Read Start	00219EA	Y (78, 61)
Area Title 6 Write Start	00219EB	Y (78, 61)
Area Title 7 Read Start	00219EC	Y (78, 61)
Area Title 7 Write Start	00219ED	Y (78, 61)
Area Title 8 Read Start	00219EE	Y (78, 61)
Area Title 8 Write Start	00219EF	Y (78, 61)
Function Request	00219F0	Y (77, 60)
Set Up Special Menu	002194E	(—)
One Shot Auto Focus On	0021A06	(4.2, 27)
Auto Focus Area (small)	0021A18	(4.2, 27)
Auto Focus Area (middle)	0021A19	(4.2, 27)
Auto Focus Area (large)	0021A1A	(4.2, 27)

APPENDIX C

C New Commands [nc]

From: Panasonic CCVE Products Document, Version 3.1, 10/11/03, page 24, 25

New Commands "nc"				
New Protocol	Old Protocol [GCF: CMD : TXT]		Function	Comment
9030000	00219F0	0022000	Preset Call	Preset 1 Call
9030001	00219F0	0022010		Preset 2 Call
903003E	00219F0	00223E0		Preset 63 Call
903003F	00219F0	00223F0		Preset 64 Call
9030040	00219F0	0022400	Auto — Pan	Auto — Pan On
9030041	00219F0	0022410		Auto — Pan Off
9030042	00219F0	0022420		Auto — Pan Speed Inc
9030043	00219F0	0022430		Auto — Pan Speed Dec
9030044	00219F0	0022440		Auto — Pan Start Point Set
9030045	00219F0	0022450		Auto — Pan End Point Set
9030046	00219F0	0022460	Auto — Mode	Auto — Mode Off
9030047	00219F0	0022470		Auto — Seq On
9030048	00219F0	0022480		Auto — Sort On
9030049	00219F0	0022490		Auto — Pan Sweep Area Invert
903004A	00219F0	00224A0		
903004B	00219F0	00224B0	Endless	Endless On
903004C	00219F0	00224C0		Endless Off
903004D	00219F0	00224D0	Digital Flip	Digital Flip On
903004E	00219F0	00224E0		Digital Flip Off
903004F	00219F0	00224F0	Propo — P/T	Proportional P/T On
9030050	00219F0	0022500		Proportional P/T Off
9030051	00219F0	0022510		
9030052	00219F0	0022520		
9030053	00219F0	0022530	Super —	Super-DII On
9030054	00219F0	0022540		Super-DII Off
9030055	00219F0	0022550	AF	Stop AF On — Menu Item —
9030056	00219F0	0022560		Stop AF Off — Menu Item —
9030057	00219F0	0022570		1 Shot AF On (start)
9030058	00219F0	0022580	Home Position	Home Position Move

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New Commands "nc"				
New Protocol	Old Protocol [GCF: CMD : TXT]		Function	Comment
9030059	00219F0	0022590	BW	Home Position On — Menu Item —
903005A	00219F0	00225A0		Home Position Off — Menu Item —
903005B	00219F0	00225B0		Home Position Auto — Menu Item —
903005C	00219F0	00225C0	Camera ID	Camera ID On
903005D	00219F0	00225D0		Camera ID Off
903005E	00219F0	00225E0	Area Title	Area Title NESW On
903005F	00219F0	00225F0		Area Title User On
9030060	00219F0	0022600		Area Title Off
9030061	00219F0	0022610	EL-Zoom	EL-Zoom On
9030062	00219F0	0022620		EL-Zoom Off
9030063	00219F0	0022630	Refresh	Refresh
9030064	00219F0	0022640	Preset Store	Preset 1 Set
9030065	00219F0	0022650		Preset 2 Set
90300A2	00219F0	0022A20		Preset 63 Set
90300A3	00219F0	0022A30		Preset 64 Set
90300A4	00219F0	0022A40	Patrol	Patrol — Play
90300A5	00219F0	0022A50		Patrol — Stop
90300A6	00219F0	0022A60		Patrol — Learn
90300A8	00219F0	0022A80	Iris	Iris Open
90300A9	00219F0	0022A90		Iris Close
90300AA	00219F0	0022AA0	Shutter	Shutter On
90300AB	00219F0	0022AB0		Shutter Off
90300AC	00219F0	0022AC0		Shutter Inc
90300AD	00219F0	0022AD0		Shutter Dec
90300AE	00219F0	0022AE0	AGC	AGC On
90300AF	00219F0	0022AF0		AGC Off
90300B0	00219F0	0022B00	Sens Up Fix	Sens Up Fix — On
90300B1	00219F0	0022B10		Sens Up Fix — Off
90300B2	00219F0	0022B20		Sens Up Fix — Inc
90300B3	00219F0	0022B30		Sens Up Fix — Dec
90300B4	00219F0	0022B40	Sens Up Auto	Sens Up Auto On
90300B5	00219F0	0022B50		Sens Up Auto Off
90300B6	00219F0	0022B60		Sens Up Auto Inc
<i>Continued on the next page.</i>				

<i>Continued from the previous page.</i>				
New Commands "nc"				
New Protocol	Old Protocol [GCF: CMD : TXT]		Function	Comment
90300B7	00219F0	0022B70		Sens Up Auto Dec
90300B8	00219F0	0022B80	LL Phase	LL Phase Inc
90300B9	00219F0	0022B90		LL Phase Dec
90300BA	00219F0	0022BA0	180 Deg Pan Turn	180 Deg Pan Turn
90300BB	00219F0	0022BB0	Cleaning	Cleaning On (menu)
90300BC	00219F0	0022BC0		Cleaning Off (menu)

C.1 Newly discovered commands [newcmds]

From: Operating Instructions, WV-CW864A				
New Commands "nc"				
New Protocol	Old Protocol [GCF: CMD : TXT]		Function	Comment
90300BD	—	—	BW SW Auto	30 Sec
90300BE	—	—		60 Sec
90300BF	—	—		300 Sec
90300C0	—	—		600 Sec

Note

1. **f**: "Fast" speed type for the 202132., 202133., 202134. and 202135. series of commands, Section 5.2.1, page 72.
2. **pp**: Preset Id number. "1" based in older commands (2021400/2022pp0 series) and "0" based in newer commands (90300pp series).
3. **s**: "Slow" speed type for the 202132., 202133., 202134. and 202135. series of commands, Section 5.2.1, page 72.
4. **ss**: Speed data for the 202136./2022ss series of commands, Section 5.1.1, page 67 and Section 5.2, page 67.
5. **v**: Speed type for the 202136./2022ss series of commands, Section 5.1.1, page 67 and Section 5.2, page 67.

APPENDIX D

D “CS950” Command Additions

D.1 CS950 Camera Function Commands[cs950cam]

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 7 → 13

Additional commands added in for the CS950 camera. The numbers under the “#” column are the original line numbers in the source document.

Function Command CS950 Camera "cs950cam"			
Function	Command	Reply	Reference
Shutter Auto	0021107	Y	
Privacy zone(2) On	0021642	Y	
DNR Low	00216A8	Y	
DNR High	00216AA	Y	
Motion Detect Mode 2 On	0021696	Y	Scene Change Detection
Stabilizer On	00216F0	Y	
Stabilizer Off	00216F1	Y	
Resolution Normal	00217C0	Y	
Resolution High	00217C1	Y	
Zoom Limit Inc	2021272	Y	
Zoom Limit Dec	2021273	Y	
Auto Pan KEY:Patrol 1	2021393	Y	
Auto Pan KEY:Patrol 2	2021394	Y	
Auto Pan KEY:Patrol 3	2021395	Y	
Auto Pan KEY:Patrol 4	2021396	Y	
Auto Pan KEY:Auto Tracking	2021397	Y	
Self Return Mode:Auto Tracking	20213B4	Y	
Self Return Mode:Patrol 2	20213B5	Y	
Self Return Mode:Patrol 3	20213B6	Y	
Self Return Mode:Patrol 4	20213B7	Y	
Self Return Mode:Off	20213B8	Y	
Self Return Mode:Auto	20213B9	Y	
Self Return Mode:Home-Posi	20213BA	Y	
Self Return Mode:AutoPan	20213BB	Y	
Self Return Mode:Seq	20213BC	Y	
Self Return Mode:Sort	20213BD	Y	
<i>Continued on the next page.</i>			

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Function Command CS950 Camera "cs950cam"			
Function	Command	Reply	Reference
Self Return Mode:Patrol 1	20213BE	Y	
Patrol Setting Number:1	2021480	Y	When changing a setting number, implement after erasing memory contents by Patrol Del 202149B-E.
Patrol Setting Number:2	2021481	Y	When changing a setting number, implement after erasing memory contents by Patrol Del 202149B-E.
Patrol Setting Number:4	2021482	Y	When changing a setting number, implement after erasing memory contents by Patrol Del 202149B-E.
Patrol 1(S) Play	2021488	Y	
Patrol 2(S) Play	2021489	Y	
Patrol 3(S) Play	202148A	Y	
Patrol 4(S) Play	202148B	Y	
Patrol 2 Play	2021495	Y	To stop Play Learn of Patrol 2-4, implement Patrol Stop 2021491.
Patrol 3 Play	2021496	Y	To stop Play Learn of Patrol 2-4, implement Patrol Stop 2021491.
Patrol 4 Play	2021497	Y	To stop Play Learn of Patrol 2-4, implement Patrol Stop 2021491.
Patrol 2 Learn	2021498	Y	Y or N, depends on the setting number.
Patrol 3 Learn	2021499	Y	Y or N, depends on the setting number.
Patrol 4 Learn	202149A	Y	Y or N, depends on the setting number.
<i>Continued on the next page.</i>			

<i>Continued from the previous page.</i>			
Function Command CS950 Camera "cs950cam"			
Function	Command	Reply	Reference
Patrol 1 Del	202149B	Y	
Patrol 2 Del	202149C	Y	
Patrol 3 Del	202149D	Y	
Patrol 4 Del	202149E	Y	
Image Hold On	20214E0	Y	
Image Hold Off	20214E1	Y	
Alarm IN 1 Auto Pan	2021602	Y	
Alarm IN 1 Patrol 1	2021603	Y	
Alarm IN 1 Auto Tracking 1	2021604	Y	
Alarm IN 2 Seq	2021612	Y	
Alarm IN 2 Patrol 2	2021613	Y	
Alarm IN 2 Auto Tracking 2	2021614	Y	
Alarm IN 3 SORT	2021622	Y	
Alarm IN 3 Patrol 3	2021623	Y	
Alarm IN 3 Auto Tracking 3	2021624	Y	
Alarm IN 4 Patrol 4	2021633	Y	
Alarm IN 4 Auto Tracking 4	2021634	Y	

D.2 CS950 Reciever Function Commands [rcs950]

From: Panasonic Camera Control Protocol, a Panasonic Confidential Document, Version 4.0, 6/16/2006, page 25 – – 26

New Commands for CS950 "cs950"				
New Protocol	Old Protocol [GCF: CMD : TXT]		Function	Comment
90300BD	00219F0	0022BD0	BW Duration Time	BW Duration Time 10s
90300BE	00219F0	0022BE0		BW Duration Time 30s
90300BF	00219F0	0022BF0		BW Duration Time 60s
90300C0	00219F0	0022C00		BW Duration Time 300s
90300C1	00219F0	0022C10	Patrol	Patrol2 Play (Implement Patrol Stop 90300A5 to Stop)
90300C2	00219F0	0022C20		Patrol3 Play
90300C3	00219F0	0022C30		Patrol4 Play
90300C4	00219F0	0022C40		Patrol2 Learn
90300C5	00219F0	0022C50		Patrol3 Learn
90300C6	00219F0	0022C60		Patrol4 Learn
90300C7	00219F0	0022C70	auto Tracking	Auto Tracking (Implement Auto Mode Off 9030046 to Stop)
90300C8	00219F0	0022C80	Stabilizer	Stabilizer On
90300C9	00219F0	0022C90		Stabilizer Off
90300CA	00219F0	0022CA0	OSD	P/T/Z Position Display On
90300CB	00219F0	0022CB0		P/T/Z Position Display Off
9031000	—	—	Preset Call	Preset 1 Call
9031001	—	—		Preset 2 Call
	—	—		
90310FE	—	—		Preset 255 Call
90310FF	—	—		Preset 256 Call
903112C	—	—	Preset Set	Preset 1 Set
903112D	—	—		Preset 2 Set
	—	—		
903122A	—	—		Preset 255 Set
903122B	—	—		Preset 256 Set

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D.3 Limited Cross Control Commands[limitedcommands]

No	Function	Command	Remark
1	Iris (Camera) Open	0021002	Timeout 2.2 sec
2	Iris (Camera) Close	0021003	Timeout 2.2 sec
3	Iris (Camera) Stop	0021004	
4	IriS (Camera) Reset	0021005	
5	BW On	0021040	
6	BW Off	0021041	
7	BW Auto	0021042	
8	All Reset	0021760	No need to set the menu cursor.
9	Restart	0021761	Equivalent to power Off-On.
10	Setup Menu On	0021940	
11	Setup Menu Off	0021941	
12	Setup Menu [Cursor Stop]	002194F	
13	Setup Menu [Cursor UP]	0021942	
14	Setup Menu [Cursor Right]	0021943	
15	Setup Menu [Cursor Down]	0021944	
16	Setup Menu [Cursor Left]	0021945	
17	Setup Menu Set 1	002194A	
18	Setup Menu Set 2	002194B	Equivalent to pressing set button for 2 seconds.
19	Left+Right button pressed (F2).	002194C	For Special menu, Gain reset etc. Need to set the setup menu cursor.
20	Left+Centre+Right button pressed (F3).	002194D	For Camera reset. Need to set the setup menu cursor
21	Digital Flip On	00219A0	
22	Digital Flip Off	00219A1	
23	One Shot Auto Focus On	0021A06	
24	Aux 1 On	2021160	Depends on Menu :Cont 1 Aux 1
25	Aux 1 Off	2021161	Depends on Menu :Cont 1 Aux 1
26	Aux 2 On	2021162	Depends on Menu :Cont 2 Aux 2
27	Aux 2 Off	2021163	Depends on Menu :Cont 2 Aux 2
28	Auto Pan On	2021300	
29	Auto Pan Off	2021301	
30	Auto Pan Reverse	2021305	
31	Auto Pan Left End Set	2021306	
32	Auto Pan Right End Set	2021307	

Continued on the next page.

¹⁰⁰\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/LimCmnds.inc,v 1.1 2006-12-04 12:38:38-08 Hamilton Exp
Hamilton \$

<i>Continued from the previous page.</i>			
No	Function	Command	Remark
33	Preset 1 Call	9030000	
34	Preset 2 Call	9030001	
35	—	—	
36	Preset 63 Call	903003E	
37	Preset 64 Call	903003F	
38	Preset 1 Set	9030064	
39	Preset 2 Set	9030065	
40	—	—	
41	Preset 63 Set	90300A2	
42	Preset 64 Set	90300A3	
43	Home Position Call	2021410	
44	Preset Mode [Seq On]	2021437	
45	Preset Mode [Sort On]	2021438	
46	Patrol Play	2021490	
47	Patrol Stop	2021491	
48	Patrol Learn	2021494	

APPENDIX E

E Sample Capture Files

E.1 Initial Power Up Sequence[first]

When a CU-161 keyboard is powered up, without a camera attached, the following is a sample of the commands sent.

```

1 % unblank.L    67 $ Id: UnBlank.l,v 1.4 2004-09-03 12:59:53-07 Hamilton Exp Hamilton $
2 % fix2.L    125 $ Id: Fix2.l,v 1.5 2004-09-03 14:41:40-07 Hamilton Exp Hamilton $
3 % fix1.L    77 $ Id: Fix1.l,v 1.6 2004-10-13 11:56:57-07 Hamilton Exp Hamilton $
4 % fix1.L    80 $ Id: Reading from "Panasonic 2.dat"
5 % fix1.L    83 $ Id: Writing into "x99"
6 %
7 % FTS capture file: E:\Capture\newtest.cfa (8/26/2004 12:34:27 PM)
8 % Event 1 (8/26/2004 12:06:06.434 PM) through
9 % Event 30,910 (8/26/2004 12:32:44.595 PM)
10 %
11 06:35.060 STX AD01; RON: 0 ETX
12 06:35.106 STX AD01; GC7: 2020000 ETX
13 06:36.141 STX AD01; GC7: 2020020 ETX
14 06:37.177 STX AD01; GC7: 0020106 ETX
15 06:38.212 STX AD01; GC7: 2020130 ETX
16 06:39.247 STX AD01; GC7: 2020132 ETX
17 06:40.283 STX AD01; GC7: 2020146 ETX
18 06:41.312 STX AD01; GC7: 2020136 ETX
19 06:42.347 STX AD01; GC7: 2020137 ETX
20 06:43.383 STX AD01; GC7: 2020000 ETX
21 06:44.418 STX AD01; GC7: 2020136 ETX
22 06:45.454 STX AD01; GC7: 2020137 ETX
23 06:46.489 STX AD01; GC7: 2020136 ETX
24 06:47.518 STX AD01; GC7: 2020136 ETX

```

In this listing note the following:

1. All items go to camera #1, or is it #2 if numbering starts at “0” instead of “1”. The available documentation suggests that numbering starts at “0”.
2. The first command is a RON 0. This enables:
 - 2.1. ACKs
 - 2.2. ANSWERS
 - 2.3. Error Codes

Or the RON 0 command enables the maximum number of things possible.

3. It then sends out a mixture of known and unknown commands:

3.1. Line 11, 2020000

¹⁰¹\$Header: d:\TXB-Panasonic/ProtocolDocument\RCS/First.inc,v 1.2 2004-11-19 09:45:25-08 Hamilton Exp
Hamilton \$

- 3.2. Line 12, 2020020
- 3.3. Line 13, 0020020
- 3.4. Line 14, 2020130 Requests if Random Pan is On.
- 3.5. Line 15, 2020132 Requests if Auto Pan is On.
- 3.6. Line 16, 2020146 Requests if Preset Mode is Off.
- 3.7. Line 17, 2020136 Requests if Pan/Tilt Variable Speed is Available.
- 3.8. Line 18, 2020137 Requests of One Way Commands are Available?
- 3.9. Line 19, 2020000 a second time.
- 3.10. Line 20, 2020136 a second time.
- 3.11. Line 21, 2020137 a second time.
4. It then sends out a command pair of 2020136/2020137 followed by a doubled 2020136 command. (Lines 22 → 24)
5. Next it sends out the repeated command pair of 2020136/2020137 (lines 21, 22) followed by a doubled 2020136 command (lines 23, 24). The doubled 2020136 command (lines 23, 24) comes out about every 20 seconds while during that 20 seconds the other commands (lines 21, 22) are sent alternately.
6. This pattern of two repeated commands followed by two identical commands then repeats every 20 seconds. Each of the commands is sent one per second as is shown in included breakout listing.
7. With the exception of **not** sending out the RON command, the above pattern (lines 12 → 20) repeats every minute until I lost interest a 1/2 hour later on.

E.2 Command patterns[second]

E.2.1 Boot up sequence with a dome attached

```

---> 00:00.000 RON 0 <newcc> Suppress: None
<--- 00:00.001 ACK

<--- 00:00.001 RON <newcc> ETX

---> 00:00.002 2020000 <rsro><rfco> Unknown command
<--- 00:00.003 ACK

---> 00:00.003 ACK

<--- 00:00.003 2020004 <rsro><rfco> Unknown command
---> 00:00.004 ACK

---> 00:00.004 2020020 <rsro><rfco> Unknown command
<--- 00:00.005 ACK

<--- 00:00.005 2020230 <rsro><rfco> Unknown command
---> 00:00.006 ACK

---> 00:00.006 0020106 <cfcn><cfco><csro><rfco> Unknown command
<--- 00:00.007 ACK

<--- 00:00.007 0021062 <cfcn><cfco><csro><rfco> Unknown command
---> 00:00.008 ACK

```

¹⁰²\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/Second.inc,v 1.3 2006-12-04 08:56:32-08 Hamilton Exp
Hamilton \$

```

---> 00:00.008 2020130 <rsro> Random Pan?
<--- 00:00.009 ACK

<--- 00:00.009 2021301 <rfcn> Auto Pan Off
---> 00:00.010 ACK

---> 00:00.010 2020132 <rsro> Auto Pan?
<--- 00:00.011 ACK

<--- 00:00.011 2021321 <rsro> Auto Pan Off
---> 00:00.012 ACK

---> 00:00.012 2020146 <rsro> Preset Mode?
<--- 00:00.013 ACK

<--- 00:00.013 2021461 <rsro> Preset Mode Off
---> 00:00.014 ACK

---> 00:00.014 2020136 <rsro> Pan/Tilt Variable?
<--- 00:00.015 ACK

<--- 00:00.015 2021360 <rsro> Pan/Tilt Variable Available
---> 00:00.016 ACK

---> 00:00.016 2020137 <rsro><rfco> Unknown command
<--- 00:00.017 ACK

<--- 00:00.017 2021370 <rsro><rfco> Unknown command
---> 00:00.018 ACK

```

E.2.2 Short repeating pattern

```

---> 00:00.020 2020136 <rsro> Pan/Tilt Variable?
<--- 00:00.021 ACK

<--- 00:00.021 2021360 <rsro> Pan/Tilt Variable Available
---> 00:00.022 ACK

---> 00:00.022 2020137 <rsro><rfco> Unknown command
<--- 00:00.023 ACK

<--- 00:00.023 2021370 <rsro><rfco> Unknown command
---> 00:00.024 ACK

```

E.2.3 Long repeating pattern

```

---> 00:00.245 0020106 <cfcn><cfco><csro><rfco> Unknown command
<--- 00:00.246 ACK

<--- 00:00.246 0021062 <cfcn><cfco><csro><rfco> Unknown command
---> 00:00.247 ACK

---> 00:00.247 2020130 <rsro> Random Pan?
<--- 00:00.248 ACK

<--- 00:00.248 2021301 <rfcn> Auto Pan Off
---> 00:00.249 ACK

---> 00:00.249 2020132 <rsro> Auto Pan?
<--- 00:00.250 ACK

<--- 00:00.250 2021321 <rsro> Auto Pan Off
---> 00:00.251 ACK

---> 00:00.251 2020146 <rsro> Preset Mode?
<--- 00:00.252 ACK

<--- 00:00.252 2021468 <rsro> Preset Mode Sort
---> 00:00.253 ACK

```

```

--> 00:00.253 2020136 <rsro> Pan/Tilt Variable?
<--- 00:00.254 ACK

<--- 00:00.254 2021360 <rsro> Pan/Tilt Variable Available
--> 00:00.255 ACK

```

E.3 Recent Commands Detected

```

--> 00:00.006 0020106 <cfcn><cfc><csro><rfdc> Unknown command
<--- 00:00.007 0021062 <cfcn><cfc><csro><rfdc> Unknown command
--> 00:00.056 0021940 <cfcn> Setup Menu On
--> 00:01.592 0021941 <cfcn> Setup Menu Off
--> 00:00.812 0021946 <cfcn><cfc><csro><rfdc> Unknown command

--> 00:00.102 0021947 <cfcn><cfc><csro><rfdc> Unknown command
--> 00:00.076 0021948 <cfcn><cfc><csro><rfdc> Unknown command
--> 00:00.150 0021949 <cfcn><cfc><csro><rfdc> Unknown command
--> 00:00.846 002194A <cfcn> Setup Menu Set1
--> 00:01.506 002194B <cfcn> Setup Menu Set2

--> 00:00.110 002194F <cfcn> Setup Menu [cursor stop]
<--- 00:00.467 002D947 <cfcn><cfc><csro><rfdc> Unknown command
<--- 00:00.057 002E940 <cfcn><cfc><csro><rfdc> Unknown command
<--- 00:01.593 002E941 <cfcn><cfc><csro><rfdc> Unknown command
<--- 00:00.813 002E946 <cfcn><cfc><csro><rfdc> Unknown command

<--- 00:00.869 002E946 <cfcn><cfc><csro><rfdc> Unknown command
<--- 00:00.104 002E947 <cfcn><cfc><csro><rfdc> Unknown command
<--- 00:00.167 002E948 <cfcn><cfc><csro><rfdc> Unknown command
<--- 00:00.230 002E949 <cfcn><cfc><csro><rfdc> Unknown command
<--- 00:00.847 002E94A <cfcn><cfc><csro><rfdc> Unknown command

<--- 00:01.497 002E94B <cfcn><cfc><csro><rfdc> Unknown command
<--- 00:00.113 002E94F <cfcn><cfc><csro><rfdc> Unknown command
--> 00:00.002 2020000 <rsro><rfdc> Unknown command
<--- 00:00.003 2020004 <rsro><rfdc> Unknown command
--> 00:00.004 2020020 <rsro><rfdc> Unknown command

--> 00:00.008 2020130 <rsro> Random Pan?
--> 00:00.010 2020132 <rsro> Auto Pan?
--> 00:00.014 2020136 <rsro> Pan/Tilt Variable?
--> 00:00.016 2020137 <rsro><rfdc> Unknown command
--> 00:00.012 2020146 <rsro> Preset Mode?

<--- 00:00.005 2020230 <rsro><rfdc> Unknown command
<--- 00:00.009 2021301 <rfdc> Auto Pan Off
<--- 00:00.015 2021360 <rsro> Pan/Tilt Variable Available
<--- 00:00.017 2021370 <rsro><rfdc> Unknown command
<--- 00:00.013 2021461 <rsro> Preset Mode Off

<--- 00:00.075 ER601 <newccc> Wrong command: Cannot execute depending on menu setting
--> 00:00.000 R0N 0 <newcc> Suppress: None
--> 00:00.074 R0N 7 <newcc> Suppress: Acks, Answers, Errors

```

E.3.1 19NOV04a

```

--> 00:00.050 ' 2' 9034001 <newnpfc> Focus Control: Near speed 1
--> 00:00.051 ' 9' 9034008 <newnpfc> Focus Control: Stop
--> 00:00.089 '100' 9030063 <nc> Refresh
--> 00:00.215 '168' 90300A7 <nc> Unknown command
--> 00:00.236 '194' 90300C1 <nc> Unknown command

--> 00:00.251 '195' 90300C2 <nc> Unknown command
--> 00:00.262 '196' 90300C3 <nc> Unknown command
--> 00:00.269 '197' 90300C4 <nc> Unknown command

```

¹⁰³\$Header: d:\TXB-Panasonic\ProtocolDocument\RCS\Cmnds.inc,v 1.3 2006-12-04 08:56:27-08 Hamilton Exp
Hamilton \$

```

----> 00:00.280 '198' 90300C5 <nc> Unknown command
----> 00:00.287 '199' 90300C6 <nc> Unknown command

----> 00:00.298 '200' 90300C7 <nc> Unknown command
----> 00:00.317 '201' 90300C8 <nc> Unknown command
----> 00:00.328 '202' 90300C9 <nc> Unknown command
----> 00:00.335 '203' 90300CA <nc> Unknown command
----> 00:00.346 '204' 90300CB <nc> Unknown command

----> 00:00.353 '205' 90300CC <nc> Unknown command
----> 00:00.360 '206' 90300CD <nc> Unknown command
----> 00:00.366 '207' 90300CE <nc> Unknown command
----> 00:00.384 '208' 90300CF <nc> Unknown command
----> 00:00.394 '209' 90300D0 <nc> Unknown command

----> 00:00.405 '210' 90300D1 <nc> Unknown command
----> 00:00.186 '75' 903004A <nc> Unknown #3
----> 00:00.193 '82' 9030051 <nc> Unknown #1
----> 00:00.204 '83' 9030052 <nc> Unknown #2
----> 00:00.006 0020106 <cfcn><cfc><csro><rfdc> Unknown command

<--- 00:00.007 0021062 <cfcn><cfc><csro><rfdc> Unknown command
----> 00:01.020 0021940 <cfcn> Setup Menu On
----> 00:01.166 0021941 <cfcn> Setup Menu Off
----> 00:01.132 0021947 <cfcn><cfc><csro><rfdc> Unknown command
----> 00:01.040 0021948 <cfcn><cfc><csro><rfdc> Unknown command

----> 00:01.120 0021949 <cfcn><cfc><csro><rfdc> Unknown command
----> 00:01.134 002194F <cfcn> Setup Menu [cursor stop]
<--- 00:01.021 002E940 <cfcn><cfc><csro><rfdc> Unknown command
<--- 00:01.167 002E941 <cfcn><cfc><csro><rfdc> Unknown command
<--- 00:01.133 002E947 <cfcn><cfc><csro><rfdc> Unknown command

<--- 00:01.041 002E948 <cfcn><cfc><csro><rfdc> Unknown command
<--- 00:01.135 002E94F <cfcn><cfc><csro><rfdc> Unknown command
----> 00:00.002 2020000 <rsro><rfdc> Unknown command
<--- 00:01.147 2020004 <rsro><rfdc> Unknown command
----> 00:00.004 2020020 <rsro><rfdc> Unknown command

----> 00:00.008 2020130 <rsro> Random Pan?
----> 00:00.010 2020132 <rsro> Auto Pan?
----> 00:00.014 2020136 <rsro> Pan/Tilt Variable?
----> 00:00.022 2020137 <rsro><rfdc> Unknown command
----> 00:00.012 2020146 <rsro> Preset Mode?

<--- 00:00.005 2020230 <rsro><rfdc> Unknown command
<--- 00:00.009 2021301 <rfdc> Auto Pan Off
<--- 00:00.015 2021360 <rsro> Pan/Tilt Variable Available
<--- 00:00.017 2021370 <rsro><rfdc> Unknown command
<--- 00:00.013 2021461 <rsro> Preset Mode Off

<--- 00:01.039 ER601 <newccc> Wrong command: Cannot execute depending on menu setting
----> 00:00.000 RDN 0 <newcc> Suppress: None
----> 00:01.038 RDN 7 <newcc> Suppress: Acks, Answers, Errors
<--- 00:00.001 RDN <newcc> ETX
----> 00:00.034 newnpptc 9028100 Zoom stop, Motion stop, Pan = 0.10 deg/sec, Tilt = 0.10 deg/sec

----> 00:00.035 newnpptc 9028811 Zoom stop, Left, Pan = 0.21 deg/sec, Tilt = 0.21 deg/sec
----> 00:00.782 newnpptc 9028833 Zoom stop, Left, Pan = 1.00 deg/sec, Tilt = 1.00 deg/sec
----> 00:00.780 newnpptc 9028877 Zoom stop, Left, Pan = 18.27 deg/sec, Tilt = 18.27 deg/sec
----> 00:00.038 newnpptc 90288DD Zoom stop, Left, Pan = 86.02 deg/sec, Tilt = 86.02 deg/sec
----> 00:00.039 newnpptc 90288FF Zoom stop, Left, Pan = 120.24 deg/sec, Tilt = 120.24 deg/sec

----> 00:00.733 newnpptc 9028977 Zoom stop, Left + Up, Pan = 18.27 deg/sec, Tilt = 18.27 deg/sec
----> 00:00.626 newnpptc 90289FF Zoom stop, Left + Up, Pan = 120.24 deg/sec, Tilt = 120.24 deg/sec
----> 00:00.726 newnpptc 9028A77 Zoom stop, Up, Pan = 18.27 deg/sec, Tilt = 18.27 deg/sec
----> 00:00.602 newnpptc 9028AFF Zoom stop, Up, Pan = 120.24 deg/sec, Tilt = 120.24 deg/sec
----> 00:00.719 newnpptc 9028B77 Zoom stop, Right + Up, Pan = 18.27 deg/sec, Tilt = 18.27 deg/sec

----> 00:00.576 newnpptc 9028BFF Zoom stop, Right + Up, Pan = 120.24 deg/sec, Tilt = 120.24 deg/sec
----> 00:00.074 newnpptc 9028C11 Zoom stop, Right, Pan = 0.21 deg/sec, Tilt = 0.21 deg/sec
----> 00:00.075 newnpptc 9028C33 Zoom stop, Right, Pan = 1.00 deg/sec, Tilt = 1.00 deg/sec

```

```
---> 00:00.531 newnpptc 9028C55 Zoom stop, Right, Pan = 7.06 deg/sec, Tilt = 7.06 deg/sec
---> 00:00.033 newnpptc 9028C77 Zoom stop, Right, Pan = 18.27 deg/sec, Tilt = 18.27 deg/sec

---> 00:00.076 newnpptc 9028C99 Zoom stop, Right, Pan = 35.55 deg/sec, Tilt = 35.55 deg/sec
---> 00:00.078 newnpptc 9028CBB Zoom stop, Right, Pan = 57.52 deg/sec, Tilt = 57.52 deg/sec
---> 00:00.541 newnpptc 9028CDD Zoom stop, Right, Pan = 86.02 deg/sec, Tilt = 86.02 deg/sec
---> 00:00.030 newnpptc 9028CFF Zoom stop, Right, Pan = 120.24 deg/sec, Tilt = 120.24 deg/sec
---> 00:00.759 newnpptc 9028D77 Zoom stop, Right + Down, Pan = 18.27 deg/sec, Tilt = 18.27 deg/sec

---> 00:00.693 newnpptc 9028DFF Zoom stop, Right + Down, Pan = 120.24 deg/sec, Tilt = 120.24 deg/sec
---> 00:00.753 newnpptc 9028E77 Zoom stop, Down, Pan = 18.27 deg/sec, Tilt = 18.27 deg/sec
---> 00:00.678 newnpptc 9028EFF Zoom stop, Down, Pan = 120.24 deg/sec, Tilt = 120.24 deg/sec
---> 00:00.746 newnpptc 9028F77 Zoom stop, Left + Down, Pan = 18.27 deg/sec, Tilt = 18.27 deg/sec
---> 00:00.656 newnpptc 9028FFF Zoom stop, Left + Down, Pan = 120.24 deg/sec, Tilt = 120.24 deg/sec
```


APPENDIX F

F Model No. WV-CW864A [cw864a]

From: Operating Instructions, WV-CW864A

The color cameras WV-CW864A are designed for installation in an outdoor video surveillance system. The camera incorporates the digital signal processor, pan/tilt mechanism, x22 zoom lens and RS485 communication interface in a compact outdoor enclosure.

A newly developed 1/4" CCD makes the camera suitable for use under extremely low illumination conditions as well as in daylight.

Setup menus allow the camera to perform surveillance tasks by such means as motion detection, digital flip, patrol-learn and privacy zones.

F.1 Features

1. Outdoor enclosure based on IP66¹⁰⁵ of IEC-60529 standard.
2. Provided with built-in heater and fan.
3. High quality picture of 768 x 494 pixels.
4. Minimum illumination of 1 lux for color and 0.06 lux for black/white surveillance.
5. Super-Dynamic 2 extends the dynamic range up to 48 dB..
6. Privacy zone feature enables users to veil unwanted zones.
7. Protocol adaptability to Panasonic's protocol.
8. Auto black/white mode enables the camera to switch between color and B/W in response to input light levels.
9. Reduction in minimum illuminance to 0.03 lux in the black/white mode thanks to PIX SENS UP.
10. Digital flip allows 180° tilting to trace objects passing under the camera.
11. A run of manual operations is memorized in the patrol-learn mode for repetitive use in future.
12. Built-in digital motion detector and alarm outputs.
13. Up to 64 preset positions.
14. 360° panning at a rotation speed of 300 °/s.
15. Sync selectable from among internal, line-lock and VD2.
16. Automatic gain control circuit.
17. Image hold.

¹⁰⁴\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/Cw864A.inc,v 1.3 2004-11-18 08:35:41-08 Hamilton Exp
Hamilton \$

¹⁰⁵Waterproof structure resistant to powerful jetting as classified by the International Protection code.

18. Digital noise reduction effect.
19. Setting change executable only by authorized personnel thanks to the password lock function.
20. Enhanced horizontal resolution by resolution setting.

F.2 Special Features

F.2.1 Preset Data Uploading or Downloading

To download the preset data from the camera to the controller or upload the downloaded data to the camera, set the following functions to OFF.

Downloading or uploading the data may not work normally if these functions are set to ON.

1. Alarm
2. Preset alarm
3. Cleaning
4. Motion detection
5. Auto mode
6. Self return

Aim the camera at a motionless object such as a wall, if possible, to download or upload the preset data.
Note: Take notice of the following when uploading the downloaded data to the camera.

1. Preset positions may vary. If a preset position has deviated, delete the preset position and set the correct preset position newly.
2. **Uploading of WV-CW864A preset data to other models (e.g. WV-CW864, WV-CS854, WV-CS854A and WV-NS324) may cause an error and failure of the uploading process.**

Caution: The preset data for other cameras (WV-CW654 for example) is incompatible with WV-CW864A's. WV-CW864A's preset data will be destroyed if you upload the conventional data. If this happened, reset the WV-CW864A to the default settings. Download the factory settings into the controller and upload the correct preset data newly to the initialized WV-CW864A.

1. Self Return (SELF RETURN)

The self return function allows the camera to resume one of the operations described below after a specified time.

This function automatically works after a lapse of setting time from manual operation is finished.

- 1.1. OFF: Cancels the auto mode (SEQ, SORT, AUTO PAN and PATROL).
- 1.2. AT (the auto mode is set to OFF): Shifts the camera direction to the home position.
- 1.3. AT (the auto mode is set to other than OFF): Activates the auto mode.
- 1.4. HP: Shifts the camera direction to the home position.

- 1.5. AP: Starts the auto pan function.
- 1.6. SQ: Starts the sequence function.
- 1.7. SR: Starts the sort function.
- 1.8. PT: Starts the patrol function.
2. Auto Mode (**AUTO MODE**)

The auto mode is used for setting the movement of the camera.

You can select one of four automatic operation modes and one manual operation mode as follows:

 - 2.1. OFF: No automatic operation. The camera can be operated only manually.
 - 2.2. SEQ: The camera operates in the sequence of preset positions in numerical order.
 - 2.3. SORT: The camera operates in the sequence of preset positions counterclockwise from pan starting point.
 - 2.4. AUTO PAN: The camera automatically turns within the preset panning range.
 - 2.5. PATROL: The camera operates in the patrol-learn function.
3. Proportional Pan-Tilt Speed (**PROPO. P/T**)

If ON is selected, the pan-tilt speed changes automatically corresponding to the zoom ratio. For example, the pan-tilt speed slows down when the camera zooms in.
4. Electronic Zoom (**EL-ZOOM**)

Up to 10-fold electronic zooming is available besides 22-fold optical zooming.
5. Image Hold (**IMAGE HOLD**)

The camera picture remains as a still image on the monitor screen or until the camera reaches the preset position. This function is useful for surveillance via a local area network.
6. Tilt Angle 0°5°

You can select a titling range. If 5° is selected, the tilting angle is adjustable up to 5° beyond the horizontal position.

F.2.2 Camera

1. Self-diagnosis Function

If the camera continues operating abnormally for 30 seconds or more due to such accident as external noise, the camera will automatically reset its power. In the case it happens frequently, check if there would be any environmental cause.

F.2.3 RS485 Communication

RS485 Parameter Setup

The selected protocol, communication parameters, and set unit numbers are read into the camera when the power is switched on.

1. Switch off the camera.

2. Set the switch.
3. Set the unit number with the DIP switch.
4. Switch on the camera to read in the changed switch settings.

Note: The changed communication parameters are displayed on the RS485 SET UP menu after the camera has been switched on.

1. Full/Half duplex
2. Transmission speed (4,900 - 19,200 bps)
3. Parity bit, Stop bit, Flow control
4. Wait time, Delay time, Alarm output
5. Camera units (96 units max.)
6. Termination ON/OFF
The 4-bit DIP switch is used for RS485 termination.
7. Reset parameters

F.2.4 Pan Offset

If the camera is replaced with a new one, the pan offset function is used to adjust its positions to be the same as before except patrol setting. The system controller can download or upload the preset position data.

F.2.5 Setting the Switches

The 8-bit DIP switch has two functions. It is used to restore the factory default settings and to specify the unit number. Before setting, peel off the seal covering the switch holes. After setting the switch, replace the seal. The 4-bit DIP switch selects termination ON/OFF and half/full duplex for RS485 communication. The switch settings are read into the camera when the power is turned on. After changing the switch settings, be sure to turn the power off, then turn it back on again. Switch positions and functions are shown below. Seal

F.2.6 Unit Number

Switch 1, an 8-bit DIP switch, specifies the unit number or restores the factory default settings when using the Panasonic protocol. When the switch position corresponding to the unit number 1-96 is selected, setting should be made on the RS485 SET UP menu.

APPENDIX G

G References [refs]

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¹⁰⁶\$Header: d:/TXB-Panasonic/ProtocolDocument/RCS/Refs.inc,v 1.5 2006-12-04 11:55:41-08 Hamilton Exp
Hamilton \$

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