

CONTROL COMMAND OF VK-S914 SERIES

[REV. 1.0]

This manual applies following models:

<NTSC>	VK-S914
<PAL>	VK-S914E
<EIA>	VK-K914
<CCIR>	VK-K914E

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[Note]  is difference of data between VK-S714 series and VK-S914.

PART
ONE

- EXTERNAL CONTROL

1. Communication protocol

Communication between the microcomputer of the camera and the PC is available by using the RS-232C protocol. The microcomputer receives each control command given by the PC and echoes it back to the PC.

2. Connect condition

Data length	8 bit
Stop bit	1 bit
Parity	even
Baudrate	4800 bps

3. Communication data format

All communication data consist of eight or ten ASCII characters (8 bytes or 10 bytes).

Communication data start with the character ":"(colon). The format of the communication data is shown in Fig. 1.

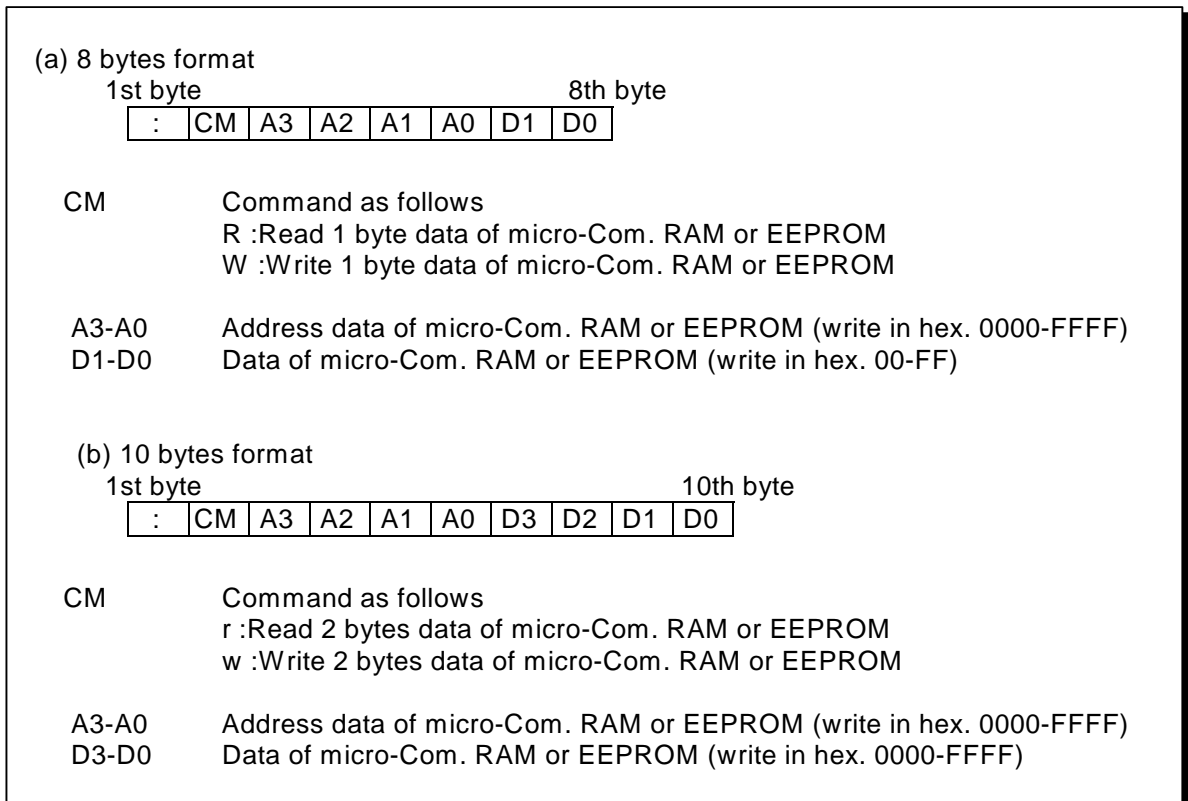


Fig. 1 Communication data format

4. Control commands

- a) Switch the auto focus / manual focus

```

:RFF0E00
:WFF0EX1X0
      bit 3 of X1X0 : 0-Auto   1-Manual
or
:WFCBBA8           ;Change
:WFCBBFE           ;Neutral
    
```

- b) Move focus to FAR in manual focus mode

```

:WFCBBA9           ;Start
:WFCBBFE           ;Stop
    
```

- c) Move focus to NEAR in manual focus mode

```

:WFCBBAA           ;Start
:WFCBBFE           ;Stop
    
```

- d) Move zoom to TELE

```

:WFCBB99           ;Start
:WFCBBFE           ;Stop
    
```

- e) Move zoom to WIDE

```

:WFCBB9B           ;Start
:WFCBBFE           ;Stop
    
```

- f) Select the zoom speed of optical zoom

```

:RFDFC00
:WFDFCX1X0
      Super HIGH SPEED (1.9s) * ;
      X1X0 : Set bit 3 of echo back data to "0".
              Set bit 2 of echo back data to "1".
      HIGH SPEED (3.6s);
      X1X0 : Set bit 3 of echo back data to "0".
              Set bit 2 of echo back data to "0".
      NORMAL SPEED (6.0s);
      X1X0 : Set bit 3 of echo back data to "1".
              Set bit 2 of echo back data to "0".
    
```

[Note] * mark : for 「Zoom Trace Preset Mode」 only

g) Get the status of zoom position

:RFC9100

If echo back data is not "FF", zoom position is calculated by following equation.

$$\text{zoom position} = 16 * 256 / (XX+1)$$

XX; echo back data

If echo back data is "FF", then following commands should be sent.

:rF7200000

Echo back data shows zoom position.

[Please refer to the attached Table.1.]

Table.1 Zoom position data table (reference value)

Zoom position	x1	x2	x3	x4	x5	x6	x7	x8	x9
Echoback data	14C0 less	2EF0 less	3C60 less	44F0 less	4B30 less	4FE0 less	53B0 less	56E0 less	5990 less
Zoom position	x10	x11	x12	x13	x14	x15	x16		
Echoback data	5BF0 less	5DE0 less	5FA0 less	6110 less	6250 less	6360 less	6360 more		

h) Switch the continuous digi. zoom ON/OFF

:RFCCB00

:WFCCB_{X₁}X₀

X₁X₀=00 ; OFF X₁X₀=01 ; ON

i) Set the maximum mag. tuning value in continuous digi. zoom ON mode

:WFDF0X₁X₀

$$X_1X_0 \text{ (hex)} = \{ 512 - (512 / MM) \} / 8 \text{ (dec)}$$

MM; maximum mag.

[EX. mag.1; MM=1 -> X₁X₀=00
mag.2; MM=2 -> X₁X₀=20 ; max.]

j) Switch the instant digi. zoom ON/OFF

:RFF0F00

:WFF0F_{X₁}X₀

bit 7 of X₁X₀ : 0-OFF 1-ON

k) Set the instant mag. tuning value in instant digi. zoom ON mode

:WFDE6X₁X₀

$$X_1X_0 \text{ (hex)} = IM * 10 \text{ (dec)}$$

IM; instant mag.

(more than 1.0 and 0.1 step)

[EX. mag.1; IM=1.0 -> X₁X₀=0A
mag.2; IM=2.0 -> X₁X₀=14 ; max.]

l) Switch the auto / manual shutter speed

:RFB7F00
 :WFB7FX₁X₀
 bit 6 of X₁X₀ : 0-Auto 1-Manual

m) Set the shutter speed tuning value in manual shutter mode

:wFCA8X₅X₄X₃X₂
 :WFCAAX₁X₀
 X₅X₄X₃X₂X₁X₀ : tuning value
 [Please refer to the attached Table.2.]

data(hex) = 261 * SS * 60(dec) ; NTSC,EIA
 data(hex) = 311 * SS * 50(dec) ; PAL,CCIR
 SS; shutter speed

Table.2 Shutter speed data table

NTSC,EIA model			
Shutter Speed (s)	tuning value		
	X ₅ X ₄ X ₃ X ₂	X ₁ X ₀	
1/60	0105	00	min.
1/120	0082	80	
1/180	0057	00	
1/250	003E	A3	
1/500	001F	51	
1/1000	000F	A8	
1/2000	0007	D4	
1/4000	0003	EA	
1/10000	0001	90	
1/30000	0000	85	max.

PAL,CCIR model			
Shutter Speed (s)	tuning value		
	X ₅ X ₄ X ₃ X ₂	X ₁ X ₀	
1/50	0137	00	min.
1/100	0096	80	
1/150	0067	AA	
1/250	003E	33	
1/500	001F	19	
1/1000	000F	8C	
1/2000	0007	C6	
1/4000	0003	E3	
1/10000	0001	8E	
1/30000	0000	84	max.

n) Switch the auto / manual exposure

:RFB7F00
 :WFB7FX₁X₀
 bit 4 of X₁X₀ : 0-Auto 1-Manual

o) Set the brighter exposure tuning value in manual exposure mode

:RFB7E00
 :WFB7EX₁X₀
 X₁X₀ : Set bit 1 of echo back data to "0".

:wFB32X₃X₂X₁X₀
 X₃X₂X₁X₀ : tuning value
 (min. H'0000.....F1.4(wide) ; brightest)
 [Please refer to the attached Table.3.]

p) Set the brighter exposure tuning value in manual exposure mode

:RFB7E00
 :WFB7EX₁X₀
 X₁X₀ : Set bit 1 of echo back data to "1".

:wFB32X₃X₂X₁X₀
 X₃X₂X₁X₀ : tuning value
 (max. H'0640.....F32.0(wide) ; darkest)
 [Please refer to the attached Table.3.]

Table.3 F-value data table (reference value)

F-value [zoom wide]	tuning value X ₃ X ₂ X ₁ X ₀	
F1.4	0000	open (brightest)
F2.0	00C0	[upper] brighter
F2.8	0180	
F4.0	0240	
F5.6	0300	
F8.0	03C0	
F11.2	0480	[lower] darker
F16.0	0540	
F22.4	0600	
F32.0	0640	close (darkest)

- q) Set the darker exposure tuning value in manual exposure mode
 :RFB7F00
 :WFB7FX₁X₀
 bit 7 of X₁X₀ : 0-ON 1-OFF
- r) Switch the auto gain control (AGC) ON/OFF
 :RFB7F00
 :WFB7FX₁X₀
 bit 7 of X₁X₀ : 0-ON 1-OFF
- s) Set the fixed AGC level tuning value in AGC OFF mode
 :wFB38X₃X₂X₁X₀
 X₃X₂X₁X₀ : tuning value
 (X₃X₂X₁X₀=0000 - 03C0 ; 0.03125dB/step)
 [X₃X₂X₁X₀=0000 ; 0dB ,
 X₃X₂X₁X₀=03C0 ; 30dB]
- t) Switch the auto / manual white balance
 :RFBFF00
 :WFBFFX₁X₀
 bit 3 of X₁X₀ : 0-Auto 1-Manual
- u) Set the white balance (R gain) tuning value in manual white balance mode
 :wFBBCX₃X₂X₁X₀
 X₃X₂X₁X₀ : tuning value
 (min. H'0080, max. H'03FF)
- v) Set the white balance (B gain) tuning value in manual white balance mode
 :wFBBEX₃X₂X₁X₀
 X₃X₂X₁X₀ : tuning value
 (min. H'0080, max. H'03FF)

5. Others

[Note] * mark : It is available after power reset.
 Default value in EEPROM area are subject to change without notice.

a) Get the camera type

[EEPROM area]
 :RE1EDX₁X₀
 :RE1EEX₁X₀

	Type data (X ₁ X ₀ =)				
MODEL	VK-S914	VK-S914E	VK-K914	VK-K914E	
FORMAT	NTSC Hi-BAND	PAL Hi-BAND	EIA Hi-BAND	CCIR Hi-BAND	
EEPROM area "E1ED"	D0	D0	D0	D0	
EEPROM area "E1EE"	0X ₀	1X ₀	2X ₀	3X ₀	

b) Set the minimum focus length tuning value in zoom-wide

[EEPROM area]*
 :WE139X₁X₀
 (X₁X₀=00 ; 1cm (approx.) ; default
 X₁X₀=F9 ; 10cm (approx.)
 X₁X₀=F8 ; 30cm (approx.)
 X₁X₀=F7 ; 1m (approx.) ; max.)

c) Set the auto iris control level tuning value in auto exposure mode

i) Iris offset (average) level

[RAM area]
 :WFD9EX₁X₀ (X₁X₀=00 - FF ; 256 step)

[EEPROM area]*
 :WE09EX₁X₀ (X₁X₀=00 - FF ; 256 step)

	default value (X ₁ X ₀ =)				
MODEL	VK-S914	VK-S914E	VK-K914	VK-K914E	
FORMAT	NTSC Hi-BAND	PAL Hi-BAND	EIA Hi-BAND	CCIR Hi-BAND	
EEPROM area "E09E"	80	90	80	80	

ii) Iris offset (peak) level

[RAM area]
:WFD9FX₁X₀ (X₁X₀=00 - 7F ; 128 step)

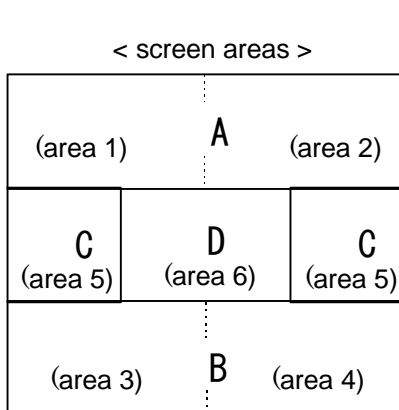
[EEPROM area]*
:WE09FX₁X₀ (X₁X₀=00 - 7F ; 128 step)

	default value (X ₁ X ₀ =)				
MODEL	VK-S914	VK-S914E	VK-K914	VK-K914E	
FORMAT	NTSC Hi-BAND	PAL Hi-BAND	EIA Hi-BAND	CCIR Hi-BAND	
EEPROM area "E09F"	10	10	10	10	

d) Get the luminance data for the 6 screen areas

[RAM area]
 area 1 :RFAE000000 ; data length 3Byte
 area 2 :RFAE300000 ; data length 3Byte
 area 3 :RFAE600000 ; data length 3Byte
 area 4 :RFAE900000 ; data length 3Byte
 area 5 :RFAEC00000 ; data length 3Byte
 area 6 :RFAEF00000 ; data length 3Byte

[Note] This is the average data per one field.



< weighting areas >

A= area 1 + area 2
 B= area 3 + area 4
 C= area 5
 D= area 6

< default weighting-ratio >

A:B:C:D = (K_a+1): (K_b+1): (K_c+1): (K_d+1)
 = (4+1): (6+1): (9+1): (F+1)
 = (5): (7): (10): (16)

e) Set the luminance weighting data tuning value

[RAM area]
:wFDA0X₃X₂X₁X₀
 (X₃=X₂=X₁=X₀=0 - F ; 16 step)
 (X₃: K_a , X₂: K_b , X₁: K_c , X₀: K_d)

[EEPROM area]*
:wE0A0X₃X₂X₁X₀
 (X₃=X₂=X₁=X₀=0 - F ; 16 step)
 (X₃: K_a , X₂: K_b , X₁: K_c , X₀: K_d)
 [X₃X₂X₁X₀=469F ; default]

- f) Switch the back light compensation (BLC) ON/OFF
 [RAM area]
 :RFECE0
 :WFECEX₁X₀
 X₁X₀=00 ; OFF X₁X₀=02 ; ON

- g) Set the BLC level tuning value in BLC ON mode
 [RAM area]
 :WFD8EX₁X₀ (X₁X₀=00 - FF ; 256 step)
 [EEPROM area]*
 :WE08EX₁X₀ (X₁X₀=00 - FF ; 256 step)

	default value (X ₁ X ₀ =)					
MODEL	VK-S914	VK-S914E	VK-K914	VK-K914E		
FORMAT	NTSC Hi-BAND	PAL Hi-BAND	EIA Hi-BAND	CCIR Hi-BAND		
EEPROM area "E08E"	10	10	10	10		

- h) Set the burst ON/OFF
 [EEPROM area]*
 :WE198X₁X₀ (X₁X₀=00 - FF ; 256 step)
 :WE199X₁X₀ (X₁X₀=00 - FF ; 256 step)
 :WE19AX₁X₀ (X₁X₀=00 - FF ; 256 step)
 :WE19BX₁X₀ (X₁X₀=00 - FF ; 256 step)

	default value (X ₁ X ₀ =)		
MODEL	VK-S914	VK-S914E	
FORMAT	NTSC Hi-BAND	PAL Hi-BAND	NTSC / PAL
	burst ON		OFF
EEPROM area			
"E198"	00	13	00
"E199"	6D	6D	00
"E19A"	00	13	00
"E19B"	00	6D	00
"E059"	00	0D	00
"E05A"	66	73	00
"E05B"	00	0D	00
"E05C"	00	73	00

i) Set the chroma suppression level tuning value in AGC range

[RAM area]

:wFD1AX₃X₂X₁X₀

(X₃=X₂=X₁=X₀=0 - F ; 16 step)

X ₃ : AGC gain		- AGC ON ; base
X ₂ : AGC gain	AGC ON	- 2/3 maximum AGC level
X ₁ : AGC gain	2/3 maximum AGC level	- maximum AGC level
X ₀ : AGC gain	maximum AGC level	-

[Note] maximum AGC level setting at page 16 - item m)

[EEPROM area]*

:wE01AX₃X₂X₁X₀

(X₃=X₂=X₁=X₀=0 - F ; 16 step)

X ₃ : AGC gain		- AGC ON ; base
X ₂ : AGC gain	AGC ON	- 2/3 maximum AGC level
X ₁ : AGC gain	2/3 maximum AGC level	- maximum AGC level
X ₀ : AGC gain	maximum AGC level	-

[Note] maximum AGC level setting at page 16 - item m)

	default value (X ₃ X ₂ X ₁ X ₀ =)	
MODEL	VK-S914	VK-S914E
FORMAT	NTSC Hi-BAND	PAL Hi-BAND
EEPROM area "E01A"	FDC8	FD84

j) Select the manual aperture mode

[RAM area]

:RFBFF00

:WFBFFX₁X₀

X₁X₀ : Set bit 1 of echo back data to "1".

[bit 1 of X₁X₀ : 0-Auto 1-Manual]

k) Set the horizontal aperture level tuning value

:WFBF6X₁X₀ (X₁X₀=00 - 1F ; 32 step)

[EEPROM area]*

AGC gain		- AGC ON	:WE029X ₁ X ₀
AGC gain	AGC ON	- 2/3 maximum AGC level	:WE02AX ₁ X ₀
AGC gain	2/3 maximum AGC level	- maximum AGC level	:WE02BX ₁ X ₀
AGC gain	maximum AGC level	-	:WE02CX ₁ X ₀

(X₁X₀=00 - 1F ; 32 step)

[Note] maximum AGC level setting at page 16 - item m)

	default value (X ₇ X ₆ =)				
MODEL	VK-S914	VK-S914E	VK-K914	VK-K914E	
FORMAT	NTSC Hi-BAND	PAL Hi-BAND	EIA Hi-BAND	CCIR Hi-BAND	
EEPROM area					
"E029"	0E	13	0E	13	
"E02A"	0C	0F	0C	0F	
"E02B"	08	07	08	07	
"E02C"	04	07	04	07	

l) Set the vertical aperture level tuning value

:WFBF9X₁X₀ (X₁X₀=00 - 1F ; 32 step)

[EEPROM area]*

AGC gain		- AGC ON	:WE031X ₁ X ₀
AGC gain	AGC ON	- 2/3 maximum AGC level	:WE032X ₁ X ₀
AGC gain	2/3 maximum AGC level	- maximum AGC level	:WE033X ₁ X ₀
AGC gain	maximum AGC level	-	:WE034X ₁ X ₀

(X₁X₀=00 - 1F ; 32 step)

[Note] maximum AGC level setting at page 16 - item m)

	default value (X ₇ X ₆ =)				
MODEL	VK-S914	VK-S914E	VK-K914	VK-K914E	
FORMAT	NTSC Hi-BAND	PAL Hi-BAND	EIA Hi-BAND	CCIR Hi-BAND	
EEPROM area					
"E031"	0C	10	0C	10	
"E032"	0A	0D	0A	0D	
"E033"	06	05	06	05	
"E034"	03	05	03	05	

m) Set the maximum AGC gain tuning value in AGC ON mode

[RAM area]

:wFD46X₃X₂X₁X₀

(X₃X₂X₁X₀=0000 - 0500 ; 0.03125dB/step)

[X₃X₂X₁X₀=0000 ; 0dB ,

X₃X₂X₁X₀=0500 ; 40dB]

[EEPROM area]*

:wE046X₃X₂X₁X₀

(X₃X₂X₁X₀=0000 - 0500 ; 0.03125dB/step)

[X₃X₂X₁X₀=0000 ; 0dB ,

X₃X₂X₁X₀=0500 ; 40dB]

	default value (X ₃ X ₂ X ₁ X ₀ =)				
MODEL	VK-S914	VK-S914E	VK-K914	VK-K914E	
FORMAT	NTSC Hi-BAND	PAL Hi-BAND	EIA Hi-BAND	CCIR Hi-BAND	
EEPROM area "E046"	02C0	0315	0350	0380	
maximum AGC Gain	22.0dB	24.7dB	26.5dB (Without IR Cut Filter)	29.5dB (Without IR Cut Filter)	

n) Change Communication Baudrate

[EEPROM area]*
:WE05EX₁X₀
(X₁X₀=80 or 00 ; 4800 bps , even Parity ; default
X₁X₀=B0 ; 9600 bps , even Parity
X₁X₀=C0 ; 4800 bps , non Parity
X₁X₀=F0 ; 9600 bps , non Parity)

o) Set RAM initialize

[RAM area]
:RFCAC00
:WFCAC00

6. Other useful commands

a) PRESET MODE

(MF, No-Trace, Zoom Speed ; 1.6s)

- Preset mode - Flow chart

See an annexed document "<TYPE-1> TRACE PRESET"

<TYPE-1> TRACE PRESET : s914_pp2.doc

b) ZOOM TRACE PRESET MODE

(MF, Trace, Zoom Speed ; 1.9s)

- Zoom trace preset mode - Flow chart

See an annexed document "<TYPE-2> TRACE PRESET"

<TYPE-2> TRACE PRESET : s914_zt2.doc

PART
TWO

- CONTROL COMMAND TIMING

- APPENDIX

[REV. 1.0]

99/12/28 * New Version