PRIVACY MASK FOR VK-S454 SERIES

[REV. 2.0]

This manual applies following models:

<NTSC>	*VK-S454*
<PAL>	*VK-S454E*

CONTENTS

PART
ONE

- SPECIFICATION

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 / non
Baudrate	4800 / 9600 bps

3. Communication data format

All communication data consist of eight or ten ASCII characters (8 bytes or 10 bytes).
The format of the communication data is shown in Fig.1.

a) Normal command
Communication data start with the character ":"(colon).

b) Special command
Communication data start with the character "/"(slash).

(a) 8 bytes format [Normal command]

1st byte							8th byte
:	CM	A3	A2	A1	A0	D1	D0

CM Command as follows
R :Read 1 byte data of micro-Com. RAM or EEPROM
W :Write 1 byte data of micro-Com. RAM or EEPROM

A3-A0 Address data of micro-Com. RAM or EEPROM (write in hex. 0000-FFFF)
D1-D0 Data of micro-Com. RAM or EEPROM (write in hex. 00-FF)

(b) 10 bytes format [Normal command]

1st byte									10th byte
:	CM	A3	A2	A1	A0	D3	D2	D1	D0

CM Command as follows
r :Read 2 bytes data of micro-Com. RAM or EEPROM
w :Write 2 bytes data of micro-Com. RAM or EEPROM

A3-A0 Address data of micro-Com. RAM or EEPROM (write in hex. 0000-FFFF)
D3-D0 Data of micro-Com. RAM or EEPROM (write in hex. 0000-FFFF)

(c) 8 bytes format [Special command]

1st byte							8th byte
/	CM	D5	D4	D3	D2	D1	D0

CM Command as follows
M : <Privacy mask> DEGREE WRITE command

D5-D0 Data of micro-Com. RAM or EEPROM (write in hex. 000000-FFFFFF)

Fig. 1 Communication data format

PART
TWO

- PRIVACY MASK SPECIFICATION

1. Privacy Mask Function mode:

a) Function mode:

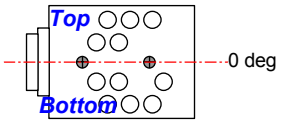
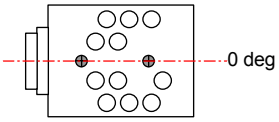
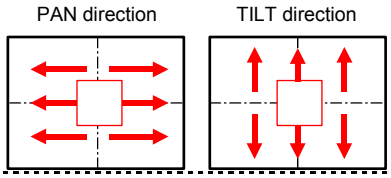
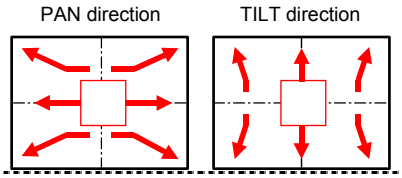
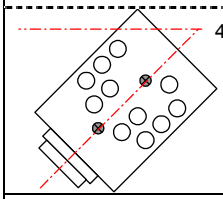
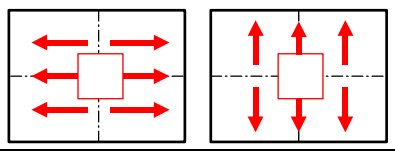
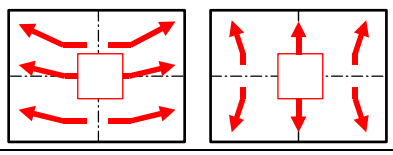
Table 1 shows the available Privacy Mask control functions for the VK-S454 series.
Fig. 1 shows the comparison between the Privacy Mask (Current) and Privacy Mask-2 (New).

\ Privacy Mask control	Privacy Mask *	[Current function]
	Privacy Mask - 2	[New function]

[Note] * mark is default mode.

Table 1 VK-S454 Privacy Mask control

Fig. 1 VK-S454 Privacy masking function comparison chart

		Privacy Mask [Current]	Privacy Mask - 2 [New function]
Number of masking zone		2 / 360 degrees	8 / PAN 360 degrees **[*1]** 2 / screen
Zone setting method		Set by position and size data	Same as current
Camera angle Reference position	PAN	N/A	N/A
	TILT	N/A	Set camera horizontally (0 degree tilting) = Reference position 
Zone position calculate coordinates 		Flat / Plane 	Sphere 
			
Support angle	PAN	---	0 ～ 360 degree
	TILT	---	0 ～ 45 degree
Applied Model	VK-S454	From 1st production unit **[*2]**	**[*3]**
	VK-S454E	From 1st production unit **[*2]**	**[*3]**

[*1] Limited Mask position setting space (Refer to the chart below)
[*2] Additional commands for **Privacy Mask (current) .**
Additional commands apply to all models with required conditions listed in ***Fig. 2*** .
[*3] **Privacy Mask-2 (new)** will be available in all models with the conditions listed in ***Fig. 2*** .

Fig. 2 Required conditions for Privacy Mask-2 (new) function.

< **Privacy Mask (Current)** with additional commands and **Privacy Mask-2 (New)** conditions >
a) Serial Number
b) EEPROM data version
c) Microprocessor version.

Model	Serial Number	EEPROM data version	Microprocessor version
VK-S454	After 21032359	After Ver. 6	After Ver. 2.34
VK-S454E	After 21121809	After Ver. 5	After Ver. 2.34

§¤§ Method to confirm the Microprocessor version #.
:r01060000 → echo back data ; H'XXYY [Ver. XX.YY]
< ex. > :r01060000 → echo back data ; H'0234 [Ver. 02.34]

§¤§ Method to confirm the EEPROM data version #.
:RE1EE00 → echo back data ; H'XY [Model VK-S454/E: Ver. Y]
< ex. > :RE1EE00 → echo back data ; H'06 [Model VK-S454, Ver. 6]

[Note] EEPROM data version code # and Microprocessor version # may be changed without notice However, all models with version numbers greater than the above listed numbers on Fig. 2 can perform functions [1], [2], and [3].

b) Function mode switching:
EEPROM data change to switch between the Privacy Mask [Current function] and Privacy Mask-2 [New function]:

i) Select the Privacy Mask mode

:R108100
:W1081X_1X_0
X_1X_0 bit7-6 = **0**; Privacy Mask [default]
(Current function)
X_1X_0 bit7-6 = **2**; Privacy Mask-2
(New function)

[Note] Power-reset or Soft-reset is required after the data change.

2. Function specification:

a) Setting

Set the masking zone center position data (A,B) and the width and height data (C,D) via serial (RS232C) communication.

i) Center position data

Signed 256-normalized data for the display screen

ii) Width and Height data

Unsigned 256-normalized data for the display screen

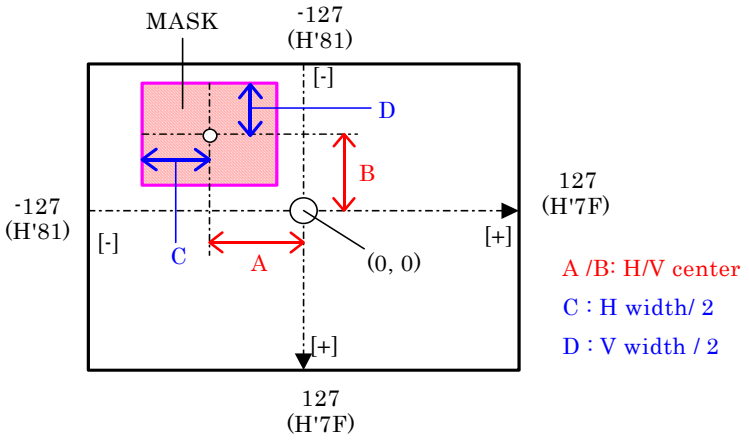


Fig. 1 Coordinate axis for privacy masking

b) Decomposability for the masking zone setting (Display screen)

Table 1 Masking zone display pixels, Decomposability

MODEL	Screen display	H Decomposition	V Decomposition
VK-S454	704[H] x 240[V]	2.75 pixels	0.94 H
VK-S454E	704[H] x 285[V]	2.75 Pixels	1.11 H

c) Display of the masking zones

Masking ON/OFF and gray scale gradation (Black to white) can be set by status control switch.
The masking Color and see through picture function can be set by RAM data.

d) Interlocking control with Zooming.

The masking zone size data is automatically compensated for according to the zooming ratio, (both Optical zooming and Digital zooming).

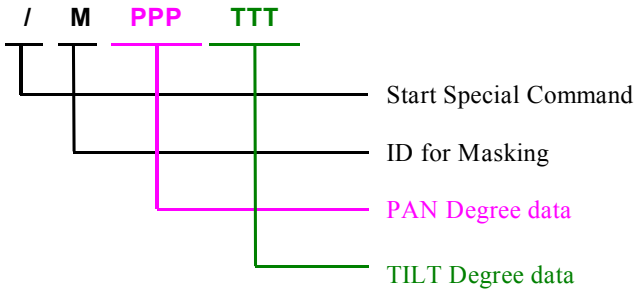
3. PAN, TILT Control

a) Pan/Tilt angle decomposability:
Set every 1/8 degree (H'000～H'B40).

4. Communication process

a) Center position, Width data command.
Use conventional command format for setting.

b) PAN, TILT communication command.
Since the absolute angle date is used for setting, the angle data should be updated every field during Pan/Tilt operation and use the following new command format to maintain the movement of the interlocking masking zone with Pan/Tilt operation.



PART
THREE

- PRIVACY MASK <**Current function**>

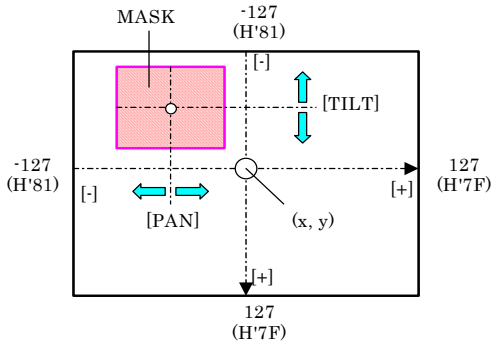
1. Function Specification:

a) Number of masking zone:
Maximum 2 position /zone.

2. PAN, TILT Control

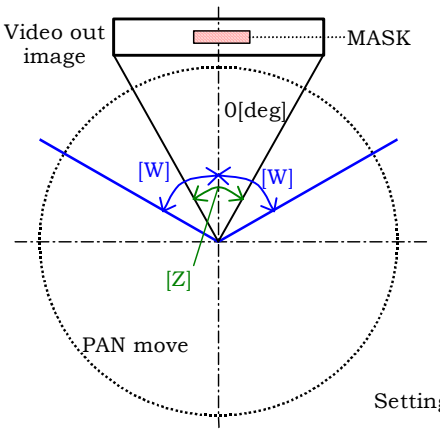
a) Pan / Tilt angle:
Center of Pan/Tilt angle is set at the center of the Video display screen ＜fig. 1 (x, y)＞ and this center angle data (x, y) will be memorized for each masking setting.
Set the absolute position angle data during Pan/Tilt operation.
（Set reference position as optionally）

b) Pan/Tilt movement amount:
Movement Amount (MA) can be calculated as follow:
MA = tan[d] x f value
[d]= (Current angle [P] -> Initial setting angle [Q]) < Refer to fig. 3 >
Note: In case of [d] > 60 degree: Set limit as [d]=60degree < refer to fig. 2 >
Therefore, In order to maintain the interlocking the masking zone movement with Pan/Tilt Movement the angle data should be updated during Pan/Tilt operation.



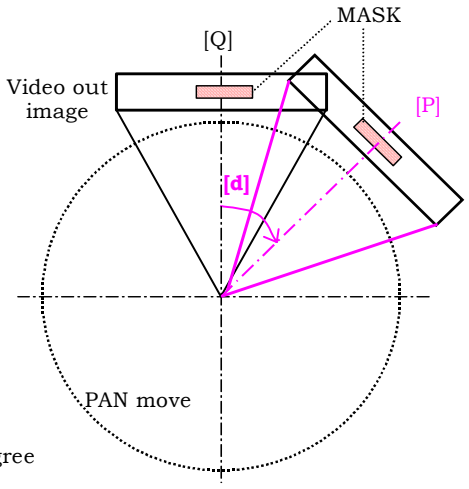
x : Video out center Angle/Degree[H]
y : Video out center Angle/Degree[V]

fig. 1



[Z] : View Angle
[W] : Calculation range = 60 deg

fig. 2



Setting degree

[Q] : Mask setting position (degree)
[P] : Now degree (current angle)
[d] : PAN moved degree (new angle)

fig. 3

3. Command timing

a) Timing table for Privacy Mask position setting (Privacy Mask [Current function])
[Please refer to Fig. 4]

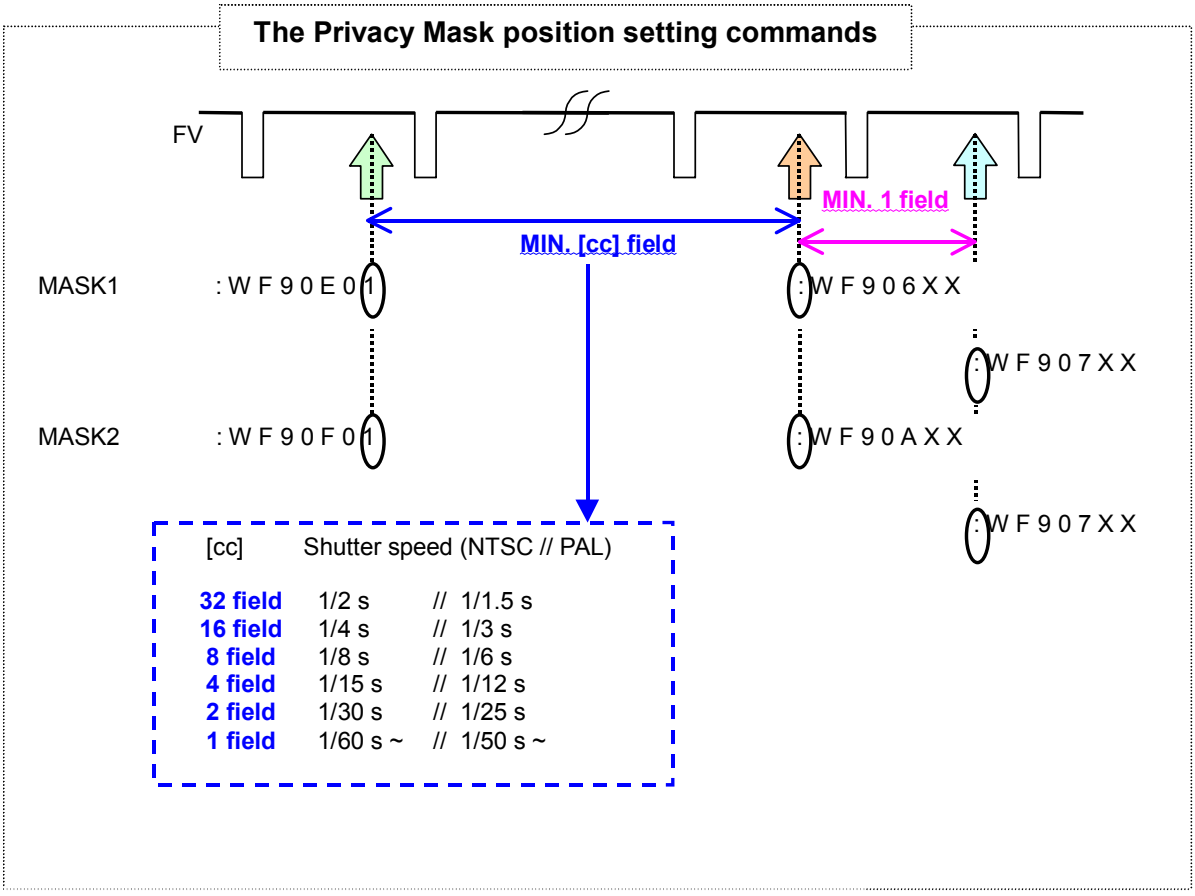


Fig. 4 Command Timing - Changing Privacy Mask position commands

b) Timing table for other commands (Privacy Mask [Current function])
[Please refer to Fig. 5]

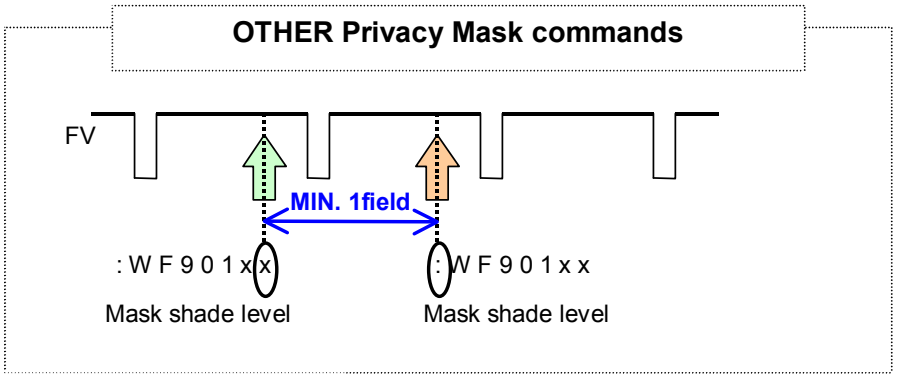


Fig. 5 Changed to other command timing

4. Additional new command:

a) New command list:

		Format	Command	Note
Masking On / Off switch		Current	Refer to b)	Common to Mask 1 & 2
Mask gradation setting		Current	Refer to c)	Common to Mask 1 & 2
Mask 1	H Center position	Current	Refer to d)	
	H width data	Current	Refer to d)	
	V Center position	Current	Refer to d)	
	V width data	Current	Refer to d)	
	Mask setting Switch	Current	Refer to d)	Use Initial Mask setting
	H Mask setting angle	Current	Refer to f)	1/16 degree notch angle data
	V Mask setting angle	Current	Refer to f)	1/16 degree notch angle data
Mask 2	H Center position	Current	Refer to e)	
	H width data	Current	Refer to e)	
	V Center position	Current	Refer to e)	
	V width data	Current	Refer to e)	
	Mask setting Switch	Current	Refer to e)	Use Initial Mask setting
	H Mask setting angle	Current	Refer to f)	1/16 degree notch angle data
	V Mask setting angle	Current	Refer to f)	1/16 degree notch angle data
Panning data		New	Refer to g)	Write only, Common to Mask 1 & 2.. 1/8 degree notch angle data
Tilting data		New	Refer to g)	Write only, Common to Mark 1 & 2. 1/8 degree notch angle data

b) Switch the Privacy Mask ON/OFF

:RF9000
:WF900X_1X_0
X_1X_0=00 ; OFF
X_1X_0=03 ; ON [default]

c) Privacy Mask shade setting

:RF90100
:WF901X_1X_0
(X_1X_0=00 - 0F ; 16 step)
H'00 ; Black
H'08 ; Gray [default]
H'0F ; White

d) Set the Privacy Mask position - MASK1

[New data set] :WF90EX_1X_0
H'01 ; New data set
Become H'00 after the data processing.
H'00 ; Mask data modify

[H center] :WF904X_1X_0
(X_1X_0=81 (nega) - 00 (center) - 7F (plus))

[V center] :WF905X_1X_0
(X_1X_0=81 (nega) - 00 (center) - 7F (plus))

[H size] :WF906X_1X_0
(X_1X_0=00 - 7F ; 128 step)

[V size] :WF907X_1X_0
(X_1X_0=00 - 7F ; 128 step)

e) Set the Privacy Mask position - MASK2

[New data set] :WF90FX_1X_0
H'01 ; New data set
Become H'00 after the data processing.
H'00 ; Mask data modify

[H center] :WF908X_1X_0
(X_1X_0=81 (nega) - 00 (center) - 7F (plus))

[V center] :WF909X_1X_0
(X_1X_0=81 (nega) - 00 (center) - 7F (plus))

[H size] :WF90AX_1X_0
(X_1X_0=00 - 7F ; 128 step)

[V size] :WF90BX_1X_0
(X_1X_0=00 - 7F ; 128 step)

f) Read the setting degree data of MASK1 / MASK2

:rF9140000 ; Mask 1 H degree data
(data range ; H'00000 - H'1680,
; 0.0625 degree/step)
:rF9160000 ; Mask 1 V degree data
(data range ; H'00000 - H'1680,
; 0.0625 degree/step)
:rF9180000 ; Mask 2 H degree data
(data range ; H'00000 - H'1680,
; 0.0625 degree/step)
:rF91A0000 ; Mask 2 V degree data
(data range ; H'00000 - H'1680,
; 0.0625 degree/step)

g) Degree data (Pan / Tilt)

/M$X_2X_1X_0Y_2Y_1Y_0$ [special write command]
$X_2X_1X_0$; PAN degree
$Y_2Y_1Y_0$; TILT degree
($X_2X_1X_0$ / $Y_2Y_1Y_0$ 000 - B40 ; 0.125 degree/step)

h) Demo mode (Moving of mask)

:RF90200
:WF902X_1X_0
X_1X_0=00 ; STOP [default]
X_1X_0=31 ; Mask UP
X_1X_0=32 ; Mask DOWN
X_1X_0=34 ; Mask LEFT
X_1X_0=35 ; Mask UP + LEFT
X_1X_0=36 ; Mask DOEN + LEFT
X_1X_0=38 ; Mask RIGHT
X_1X_0=39 ; Mask UP + RIGHT
X_1X_0=3A ; Mask DOWN + RIGHT

[Note] This function is for full WIDE Zoom only.

5. Additional Command (SETTING FOR PRIVACY MASK CONDITION)

The following Control Commands for the Privacy Masking function are added to VK-S454 series.
Refer to " **Part ONE PRIVACY MASK SPECIFICATION**" for application requirements.

a) Setting of Privacy Mask shade level

:RF90100
:WF901X_1X_0
(X_1X_0=00 - 0F ; 16 step (7 IRE/step))
H'00 ; Black [setup level]
H'08 ; Gray [default]
H'0F ; White [110IRE]

b) Video Image penetration level setting:

:RF92100
:WF921X_1X_0
(X_0= X_1= 0 – 3 ; 4 step)
(X_0 ; bit 0 - 1 ; Chroma level,
X_1 ; bit 4 - 5 ; Luminance level)
X_0= X_1= 0 ; 100% Penetration
X_0= X_1= 1 ; 50% Penetration
X_0= X_1= 2 ; 25% Penetration
X_0= X_1= 3 ; No Penetration [default]

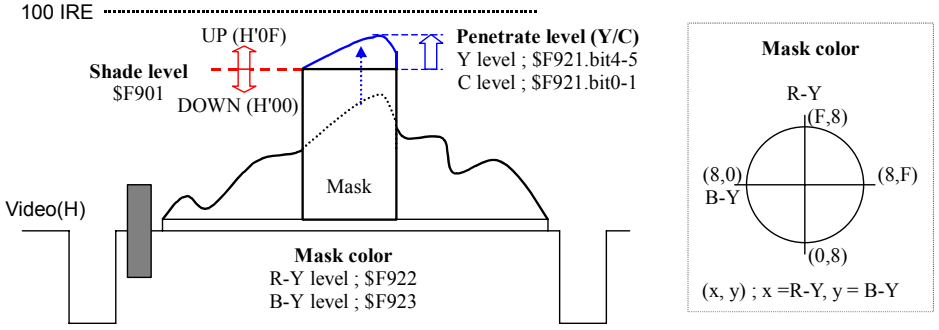
c) Masking Color (R-Y/B-Y) setting:

i) R-Y setting:

:RF92200
:WF922X_1X_0
(X_1X_0=00 - 0F ; 16 step)
H'00 ; <R-Y> min
H'08 ; <R-Y> center [default]
H'0F ; <R-Y> max

ii) B-Y setting:

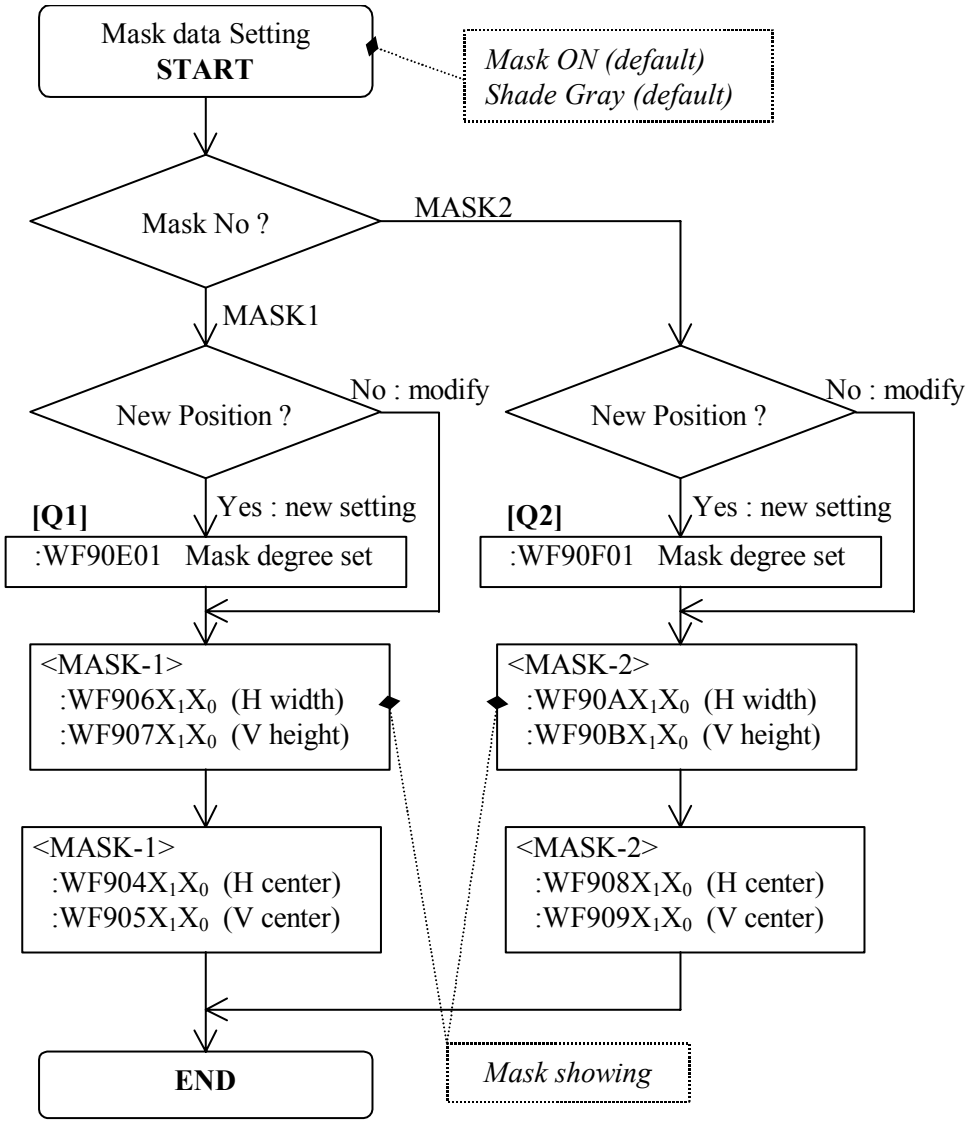
:RF92300
:WF923X_1X_0
(X_1X_0=00 - 0F ; 16 step)
H'00 ; <B-Y> min
H'08 ; <B-Y> center [default]
H'0F ; <B-Y> max



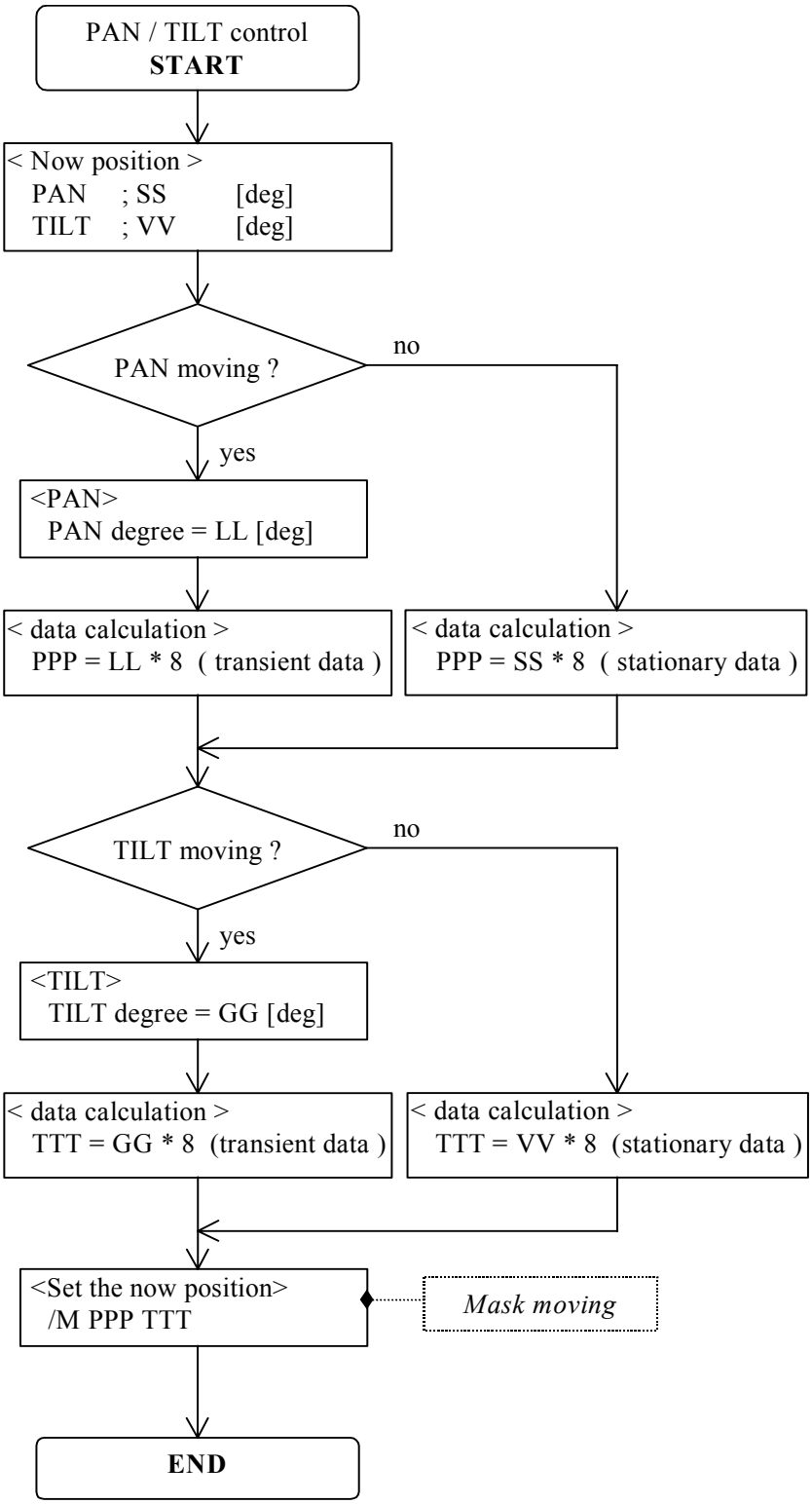
6. Flow Chart:

a) Center position, Width and Height data setting:

Follow the flow chart below for the center position and width data setting.
Masking setting angle data will be memorized when [Q1][Q2] are sent.



b) PAN / TILT Angle data setting:
Refer to the flow chart below for the PAN / TILT angle setting:



PART
FOUR

- PRIVACY MASK - 2 <**New function**>

1. Function specification:

a) New control method for masking zone setting

Calculate absolute angles (θ xpn, θ ypn) for the mask-zone 4 corner positions (θ xpn, θ ypn) from the camera angle (θ x0, θ y0) and the display position on the screen will be calculated from (θ xpn, θ ypn) and (θ x, θ y).

The procedure for masking zone setting and operation is described below:

i) Setting masking–zone

Displays a masking zone according to the position and width data on the screen. The 4 corner position (Xpn,Ypn) of Masking-zone will be determined this time.

ii) Angle setting calculation

Calculate mask-zone angle(θ xpn, θ ypn) for each 4 corner position (Xpn,Ypn).

iii) Position calculation for mask-zone display.

Calculate the display position (Xn,Yn) from absolute angle data(θ xpn, θ ypn) and camera angle data (θ x1, θ y1) then change data(θ x1, θ y1) to move masking zone.

b) Number of masking zone

Maximum 8 zone/360 degree (Maximum 2 zones/Screen) can be set, however the following " Minimum Interval Angle/Tilting Angle" is required to make " 2 zone/Screen ". Refer to " Table.1 - <A>, <B> " below.

Table.1 - <A> Mini. Angle Interval allows 2 zone for H direction.

TILT Angle / Zoom position	0°	5°	10°	15°	20°	25°	30°	35°	40°	45°
VK-S454;Wide End	60.0°	62.0°	64.0°	67.0°	71.0°	76.0°	82.0°	89.0°	98.0°	109.0°
VK-S454E;Wide End	61.5°	63.5°	66.0°	69.0°	73.0°	78.0°	84.0°	91.5°	100.5°	112.0°

Table.1 - <B> Mini. Angle Interval allows 2 zone for V direction

TILT Angle / Zoom position	0°	5°	10°	15°	20°	25°	30°	35°	40°	45°
VK-S454;Wide End	46°									
VK-S454E;Wide End	46°									

i) PAN direction minimum interval angle requirement.

(a) Specification.

The minimum interval angle requirement between the old and new masking zone is listed "Table 1-<A>" according to the TILT angle. Refer to the Table below for 0° TILT angle.

	VK-S454	VK-S454E
Minimum interval angle requirement for PAN direction	60°	61.5°

(b) Out line. Fig.2 <A>

The minimum interval angle requirement for the new masking screens next to the 1st masking screen <A Screen> with masking zone [A-1] and [A-2] shown below.

1. Create new masking zone [B-1], [B-2] on the <B Screen> right side of the <A Screen>.

The position " BL1 " left side of new masking zone [B-1] on the new <B Screen> should be Keep away from the position " AR2 " right side of [A-2] with required interval angle for new masking zone [B-1] setting, and

The position " BL2 " of new masking zone [B-2] on the new <B Screen> should be Keep away from the position " AR1 " of [A-1] with required interval angle for new masking zone [B-2] setting.

2. Create new masking zone [C-1], [C-2] on the <C Screen> left side of the <A Screen>.

The position " CR1 " of new masking zone [C-1] on the new <C Screen> should be Keep away from the position " AL1 " of [A-1] with required interval angle for new masking zone [C-1] setting, and

The position " CR2 " of new masking zone [C-2] on the new <C Screen> should be Keep away from the position " AL2 " of [A-2] with required interval angle for new masking zone [C-2] setting.

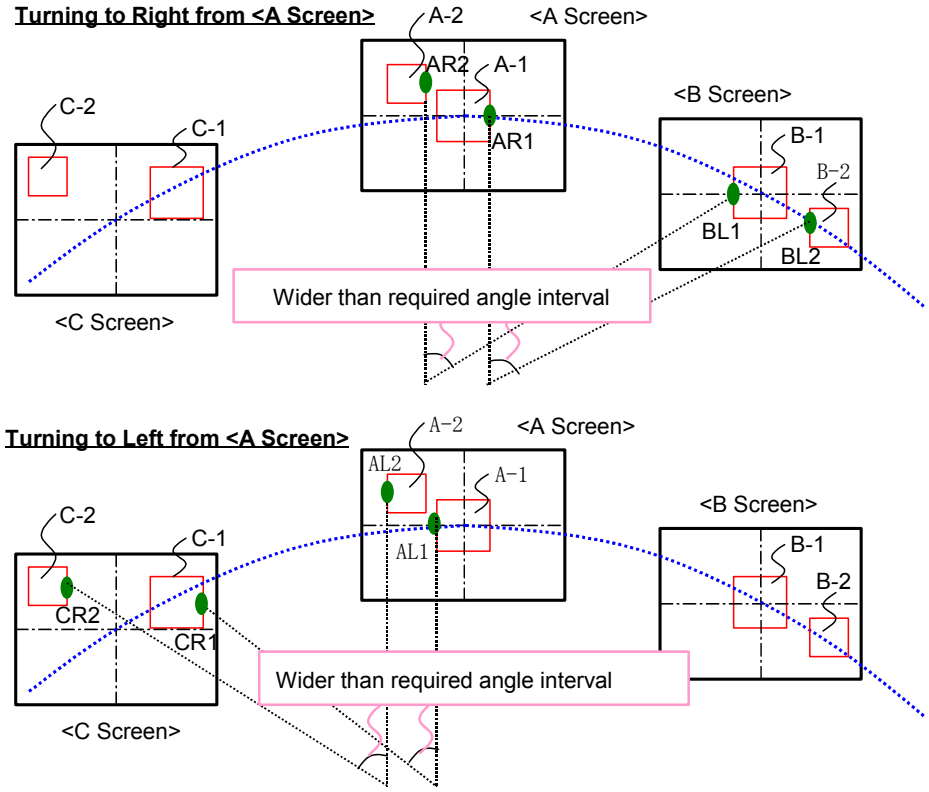


Fig. 2 - <A> PAN direction angle interval requirement

ii) TILT direction minimum interval angle requirement.

(a) Specification.

	VK-S454	VK-S454E
Minimum interval angle requirement for TILT direction	46°	46°

(b) Out line. Fig.2 - <B>
The minimum interval angle requirement for the new masking screens next to the 1st masking screen <A Screen> with masking zone [A-1] and [A-2] shown below.

1. Create new masking zone [B-1],[B-2] on the <B Screen> above the <A Screen>.
The position " BD2 " bottom side of new masking zone [B-2] on the <B Screen> should be Keep away from the position " AU1 " top side of [A-1] with required interval angle for new masking zone [B-2] setting, and
The position " BD1 " of new masking zone [B-1] on the <B Screen> should be Keep away from the position " AU2 " of [A-2] with required interval angle for new Masking zone [B-1] setting.

2. Create new masking zone [C-1],[C-2] on the <C Screen> below the <A Screen>.
The position " CU2 " of new masking zone [C-2] on the <C Screen> should be Keep away from the position " AD2 " of [A-2] with required interval angle for new Masking zone [C-2] setting, and
The position " CU1 " of new masking zone [C-1] on the <C Screen> should be Keep away from the position " AD1 " of [A-1] with required interval angle for new Masking zone [C-1] setting.

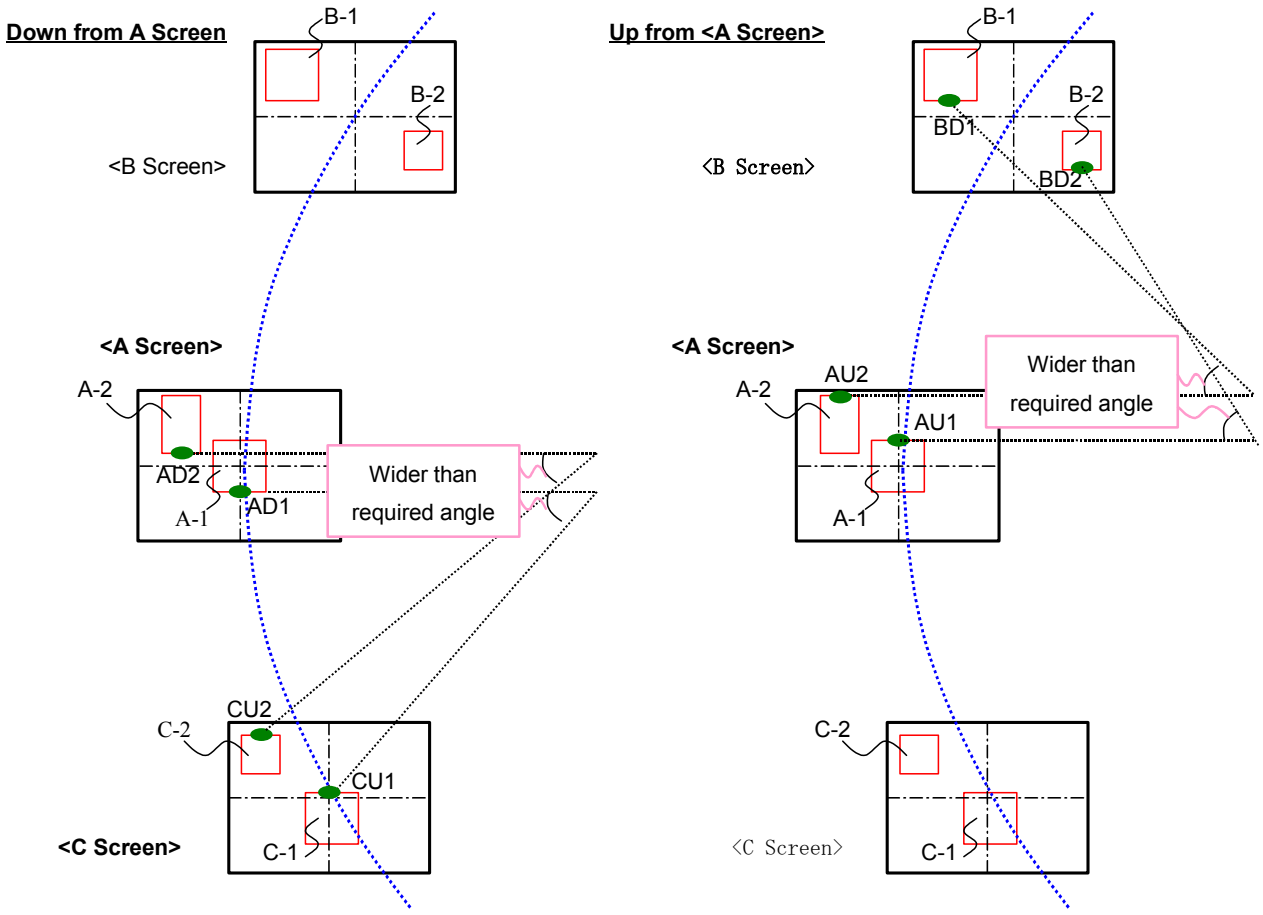


Fig. 2 - <B> TILT direction interval angle requirement

c) New function.

i) See through picture display while mask-zone setting / Status switch: (H'01)
This Function can be ON/ OFF by EEPROM data

ii) Afterimage display for moving masking zone
Display masking zone lager(1 field forwarding) to compensate the communication (RS232c) delay during Panning /Tilting scattering. (H'03)

Fig.3
The masking zone [A] moves from [A]->[B]->[C] then, the afterimage will be added for 1 field frame only and displays as [A]->[B]+[Z]->[C]+[Q] as shown below.

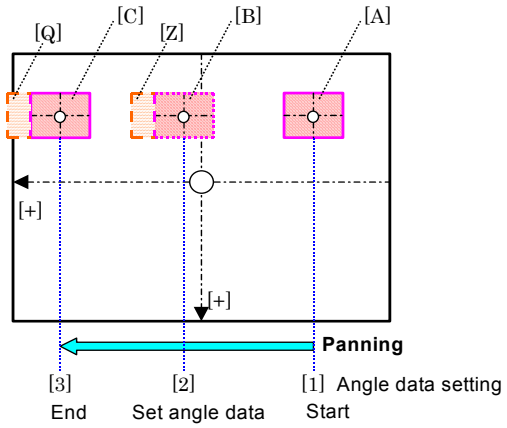
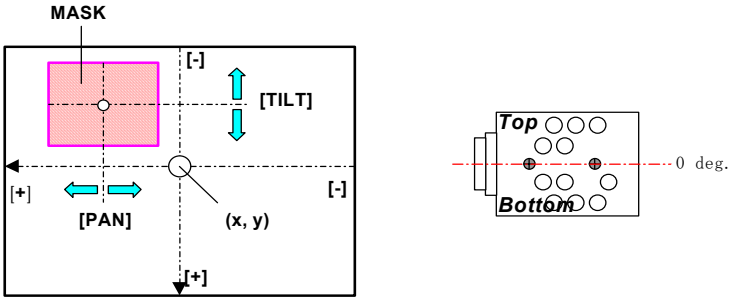


Fig. 3 Afterimage display for moving masking zone

2. PAN, TILT Control

a) PAN, TILT Angle

Center of PAN/TILT angle is set at the center of the video display screen <fig.4(x,y)>.
Set camera Horizontally (0 degree Tilting = Reference)
PAN Operation Angle = 0 – 360 degree, TILT Operation Angle = 0 – 45 degree
+ PAN Angle = Panning to Left.
+ TILT Angle = Tilting to Down.



x : Video out center Degree[H]
y : Video out center Degree[V]

Fig. 4 Coordinate axis for PAN / TILT angle reference

b) Display position after PAN/TILT.

Calculate and memorize the absolute masking zone angle (θ xpn, θ ypn) for each of the 4 corner positions (Xpn,Ypn).
After setting up masking zone(s) and camera movement to (θ x1, θ y2) angle, Calculate (Xn,Yn) from (θ xpn, θ ypn) and (θ x1, θ y2) then display on the screen.

3. Command timing

a) Timing table for Privacy mask position setting (Privacy mask 2 [New function])
[Please refer to Fig. 5]

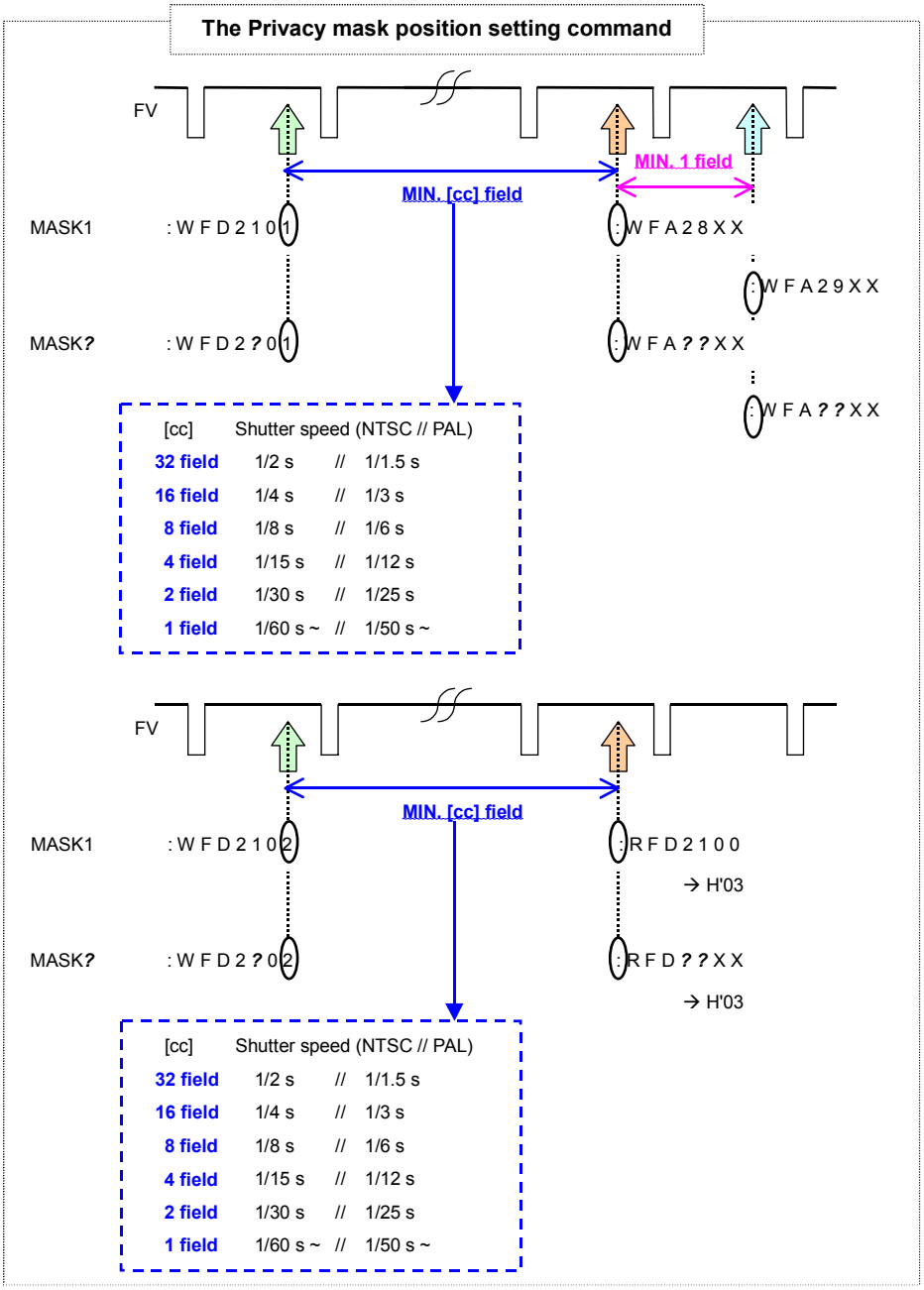


Fig. 5 Command Timing - Privacy mask position change commands

b) Timing table for all other commands (Privacy mask 2 [New function])
[Please refer to Fig. 6]

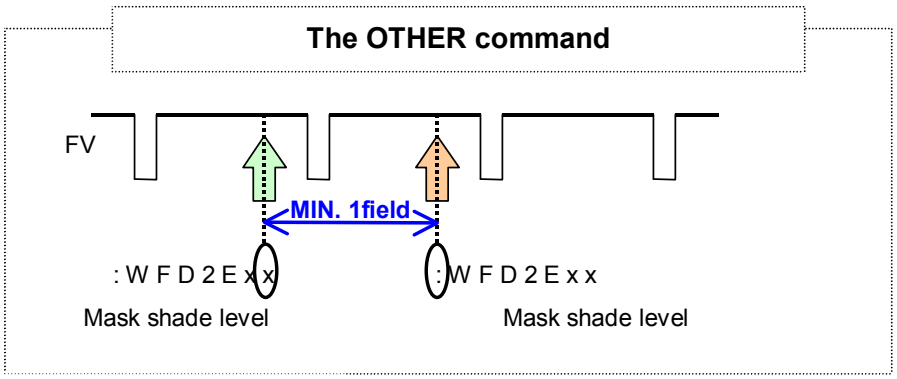


Fig. 6 Command Timing – All other Privacy Mask commands

4. Command

a) Set the Privacy Mask position - MASK1 ~ MASK8

[Masking Zone status control switch] :W****X_1X_0

address; " **** " Refer to "Table.2"

data ; X_1X_0

X_1X_0 = 00 ; OFF

X_1X_0 = 01 ; P-Mask under setting

X_1X_0 = 02 ; Start angle calculation.

:R****00

address; " **** " Refer to Table.2.

data ; X_1X_0

X_1X_0 = 00 ; OFF

X_1X_0 = 03 ; End calculation
(PAN/TILT operation permitted)

X_1X_0 = 04 ; N/A for setting
(Conflict w/other P-Mask)

[Note]

- X_1X_0 = 00 ; No P-mask zone display.
- Data already set will be kept.
- Data becomes H'04 after setting H'01 if an error occurs.
- After setting H'02, Data will become H'03.
  However, Data will become H'04 automatically if error occurs.

[H center] :W****X_1X_0

(X_1X_0=81 (nega) - 00 (center) - 7F (plus))

address; " **** " Refer to Table.2.

[V center] :W****X_1X_0

(X_1X_0=81 (nega) - 00 (center) - 7F (plus))

address; " **** " Refer to Table.2.

[H size] :W****X_1X_0

(X_1X_0=00 - 7F ; 128 step)

address; " **** " Refer to Table.2.

[V size] :W****X_1X_0

(X_1X_0=00 - 7F ; 128 step)

address; " **** " Refer to Table.2.

Table.2

MASK_No	Mask status control SW	H center	V center	H size	V size
Mask - 0	FD21	FA28	FA29	FB00	FB01
Mask - 1	FD22	FA2A	FA2B	FB02	FB03
Mask - 2	FD23	FA2C	FA2D	FB04	FB05
Mask - 3	FD24	FA2E	FA2F	FB06	FB07
Mask - 4	FD25	FA30	FA31	FB08	FB09
Mask - 5	FD26	FA32	FA33	FB0A	FB0B
Mask - 6	FD27	FA34	FA35	FB0C	FB0D
Mask - 7	FD28	FA36	FA37	FB0E	FB0F

b) Maximum number and position for Mask setting on the screen.

i) PAN direction < H direction >

:rFB140000

$X_3X_2Y_1Y_0$

X_3X_2 ; Number of Masks available for setting
; H'02 2 Masks available for setting.
; H'01 1 Mask available for setting.
; H'00 No Masks available for setting.

Y_1Y_0 ; Available setting position.
; Bit0 < Area_A >
; Hi. Area available for setting.
; Lo. : Area Not available for setting.
; Bit1 < Area_B >
; Hi. : Area available for setting
; Lo. : Area Not Available for setting
; Bit2 < Area_C >
; Hi. : Area available for setting
; Lo. : Area Not Available for setting
; Bit3 < Area_D >
; Hi. : Area available for setting
; Lo. : Area Not available for setting
; Bit4 ~ 6 Not used
; Bit7 All Areas: Not available for setting

[Note] Refer to Fig. 7 for Areas A ~ D.

ii) TILT direction < V direction >

:rFB160000

$X_3X_2Y_1Y_0$

X_3X_2 ; Available number for setting
; H'02 Available for 2 masks setting.
; H'01 Available for 1 masks setting.
; H'00 Not available.

Y_1Y_0 ; Screen Position Areas available for setting.
; Bit0 < Area_A >
; Hi. : Area available for setting
; Lo. : Area Not available for setting
; Bit1 < Area_B >
; Hi. : Area available for setting
; Lo. : Area Not available for setting
; Bit2 < Area_C >
; Hi. : Area available for setting
; Lo. : Area Not available for setting
; Bit3 < Area_D >
; Hi. : Area available for setting
; Lo. : Area Not available for setting
; Bit4 ~ 6 : Not used
; Bit7 All Areas: Not available for setting

[Note] Refer to Fig. 7 for Areas A ~ D.

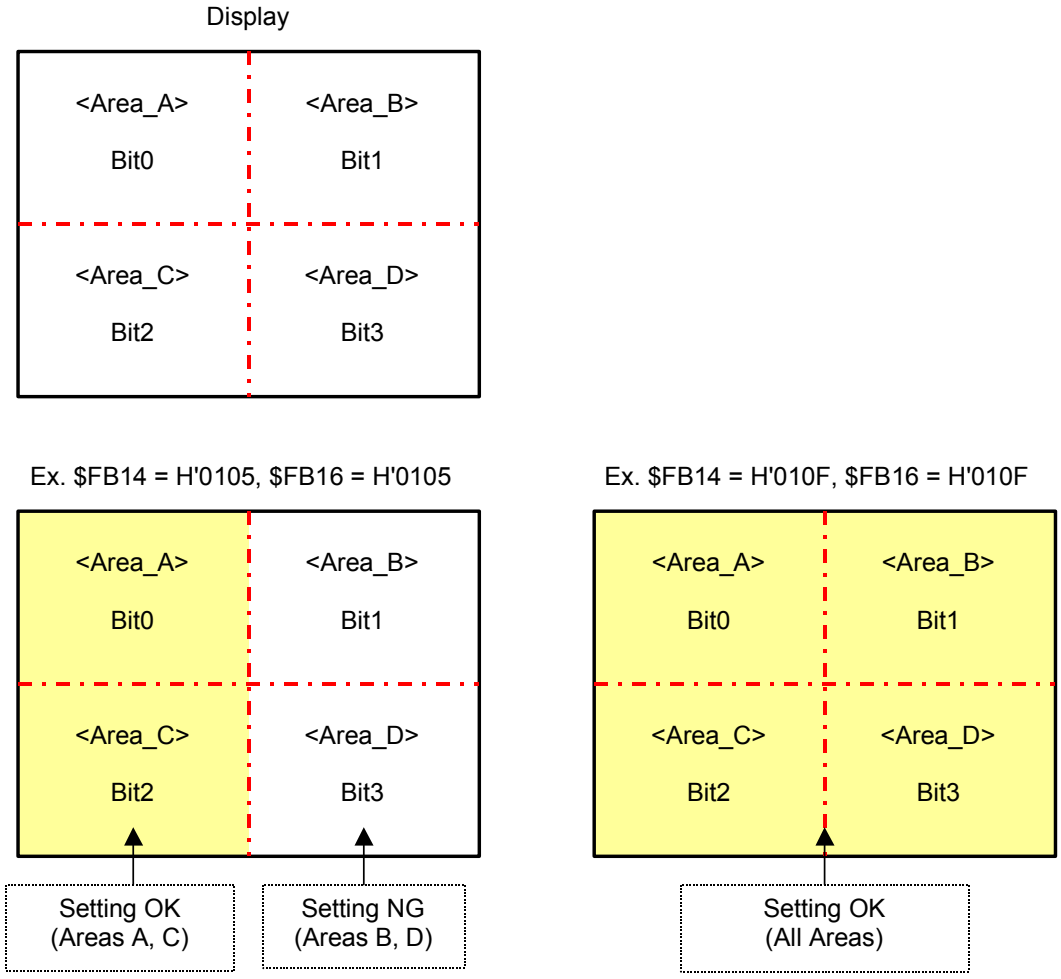

Display
<Area_A>
Bit0
<Area_B>
Bit1
<Area_C>
Bit2
<Area_D>
Bit3
Ex. $FB14 = H'0105, $FB16 = H'0105
Setting OK
(Areas A, C)
Setting NG
(Areas B, D)
Ex. $FB14 = H'010F, $FB16 = H'010F
Setting OK
(All Areas)

Fig. 7

c) Number of Privacy Mask zones displayed on the screen.

:RFD2B00

X_1X_0 ; H'00 No zones displayed
; H'01 1 zone displayed
; H'02 2 zones displayed

[Note]

Numbers of P-mask zones displayed on the screen indicate P-Mask zones during setting process and/or having completed calculation (PAN/TILT operation permitted).

d) Privacy Mask zone Setting Numbers displayed on the screen.

:rFD2C0000

X_3X_2 or X_1X_0
; H'FF No Masks displayed
; H'00 Mask-0 Displayed
; H'01 Mask-1 Displayed
; H'02 Mask-2 Displayed
; H'03 Mask-3 Displayed
; H'04 Mask-4 Displayed
; H'05 Mask-5 Displayed
; H'06 Mask-6 Displayed
; H'07 Mask-7 Displayed

[Note]

Privacy Mask zone Setting Numbers displayed on the screen indicate Privacy Mask zones during setting process and/or having completed calculation (PAN/TILT operation permitted).

e) PAN / TILT Angle setting

/M$X_2X_1X_0Y_2Y_1Y_0$ [special write command]
$X_2X_1X_0$; PAN degree
$Y_2Y_1Y_0$; TILT degree
($X_2X_1X_0$ / $Y_2Y_1Y_0$ 000 - B40 ; 0.125 degree/step)

f) Required separation angle when setting 2 Masks on the screen:

i) PAN direction < H direction >

:rFE280000
$X_3X_2X_1X_0$; 1/8 degree

ii) TILT direction < V direction >

:rFE2C0000
$X_3X_2X_1X_0$; 1/8 degree

g) Gradation setting.

:RFD2E00
:WFD2EX_1X_0
(X_1X_0=00 - 0F ; 16 step)
H'00 ; Black
H'08 ; Gray [default]
H'0F ; White

h) See through picture display level setting

:RFD2F00
:WFD2FX_1X_0
(X_0= X_1= 0 – 3 ; 4 step)
(X_0 ; bit 0 - 1 ; Chroma level,
X_1 ; bit 4 - 5 ; Luminance level)
X_0= X_1= 0 ; 100%
X_0= X_1= 1 ; 50%
X_0= X_1= 2 ; 25%
X_0= X_1= 3 ; No see through [default]

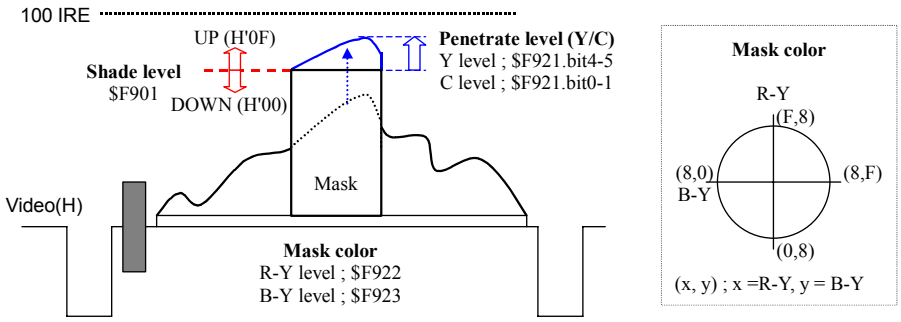
i) Masking Color (R-Y/B-Y) setting:

i) R-Y setting:

:RFD3000
:WFD30X_1X_0
(X_1X_0=00 - 0F ; 16 step)
H'00 ; <R-Y> min
H'08 ; <R-Y> center [default]
H'0F ; <R-Y> max

ii) B-Y setting:

:RFD3100
:WFD31X_1X_0
(X_1X_0=00 - 0F ; 16 step)
H'00 ; <B-Y> min
H'08 ; <B-Y> center [default]
H'0F ; <B-Y> max



j) See through picture display setting while setting Privacy Mask zones

:R107A00
:W107AX_1X_0
X_1X_0 ;
bit 4 = 0 - No see through picture [default]
= 1 - Yes, see through picture

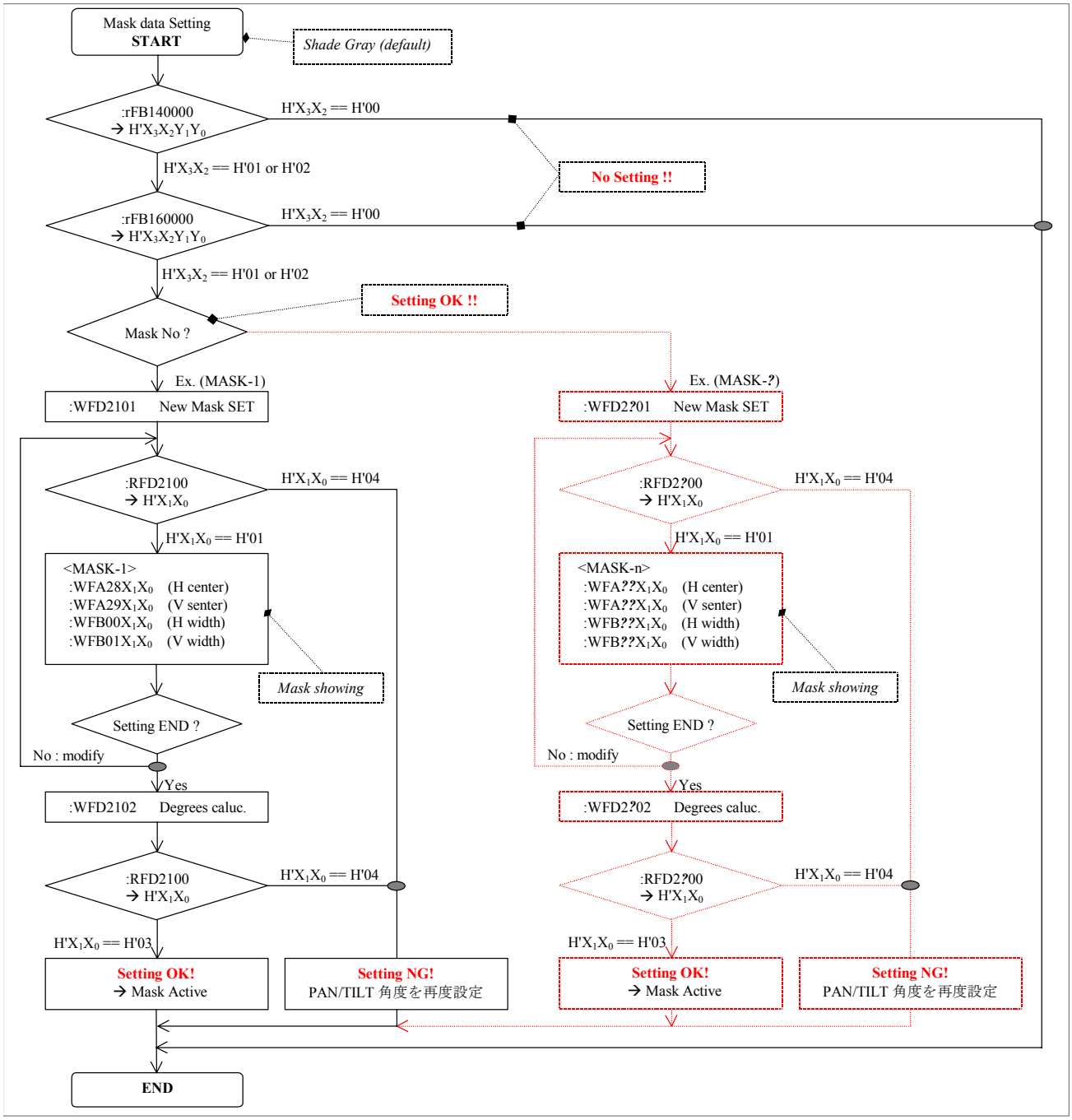
[Note]
- No individual zone setting can be done.
- 2 zones will both be set to the same conditions during either the setting process and/or having completed calculation (PAN/TILT operation permitted).

k) Afterimage display for moving mask-zone.

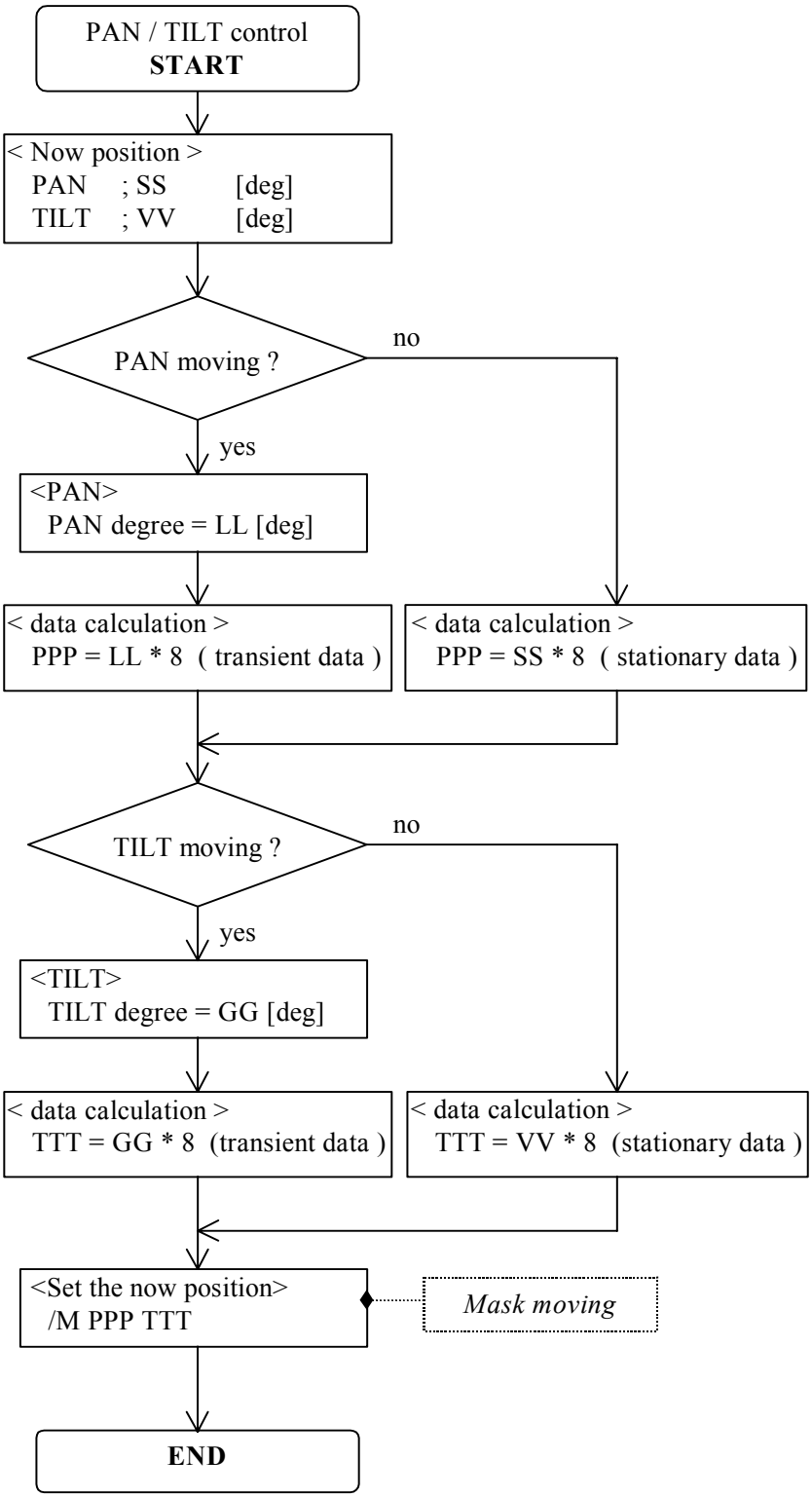
:R108100
:W1081X_1X_0
X_1X_0 ;
bit 5 = 0 – No Afterimage [default]
= 1 – Yes, with Afterimage

5. FLOW CHART

a) Center position and width data setting.



b) PAN / TILT Angle data setting.
Refer to the flow chart below for the PAN / TILT angle setting:



• APPENDIX

[REV. 1.1]
2001/01/12

page - 7 : 4-a)-i) ***<revision : default data>***
Switch the Privacy Mask ON/OFF
H'01 -> H'03

page - 9 : 5-a) ***<revision : flow chart>***
Center position, Width data setting

[REV. 1.2]
2001/01/31 * Mass-production Version **[VK-S454]**

[REV. 1.3]
2001/02/06 * **VK-S454E (PAL) Pilot Sample**

[REV. 1.4]
2001/02/27 * **VK-S454E (PAL) Pre-Pro Sample**

[REV. 1.5]
2001/03/30 * Mass-production Version **[VK-S454E]**

[REV. 2.0]
2002/10/21 * **Additional Privacy mask- 2**