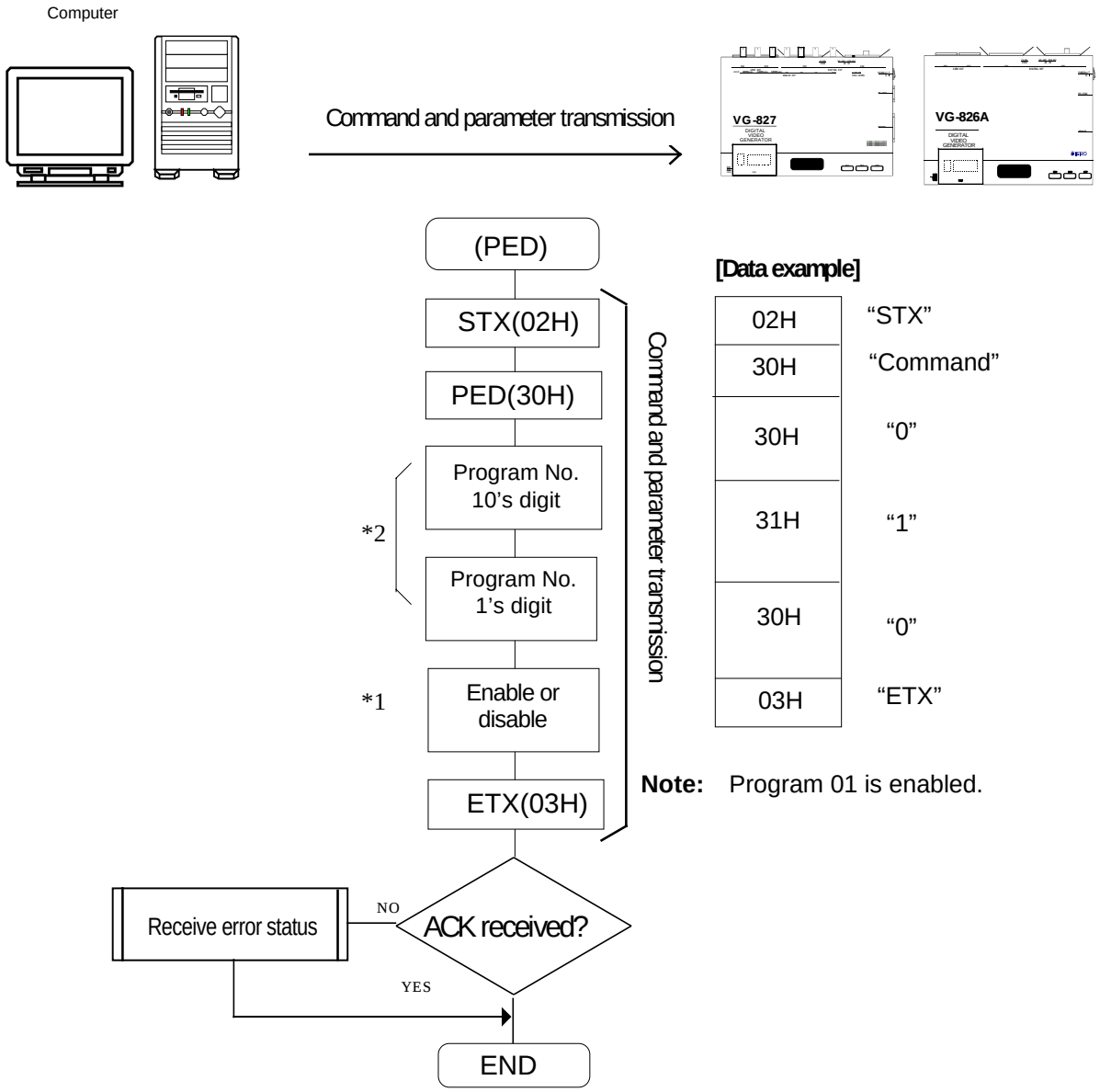
CHAPTER 8-1 DESCRIPTION OF CONTROL COMMAND FUNCTION

8-1 [PED](30H)

This command enables or disables programs in the panel ROM. The program No. (01-40) and enable or disable selection data are sent as the parameters.

* All parameters are in ASCII code.

1)



Note: Program 01 is enabled.

*1: "0" for enable; "1" for disable.

*2: Three digits are designated for program numbers (001 to 040 and 500 to 779) when the AH-3000 is used.

When the HN58C256 panel ROM is used, the number of digits differs depending on the program number.

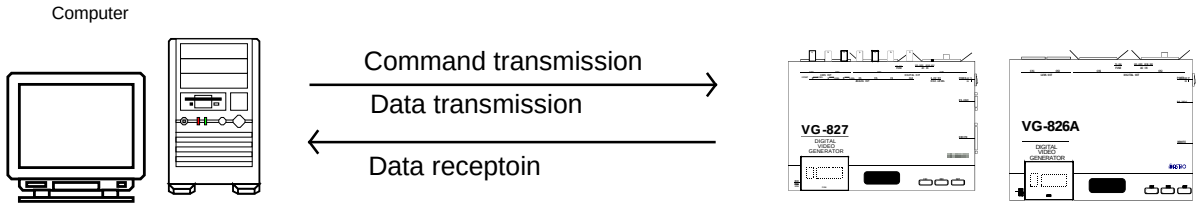
2 digits are designated for program No.01 to 40.

3 digits are designated for program No.501 to 540, 601 to 640, and 701 to 740.

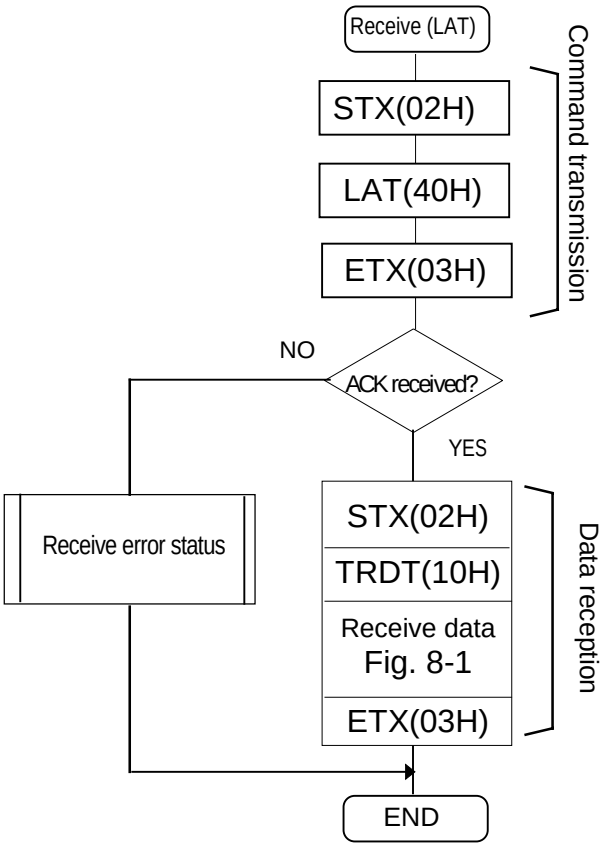
8-2 [LAT](40H)・[SAT](46H)

These commands are for sending or receiving parameters to execute the auto display. The data sent is written in the panel ROM.
The parameters sent or received are the interval (time) and program numbers consisting of 3 blocks.

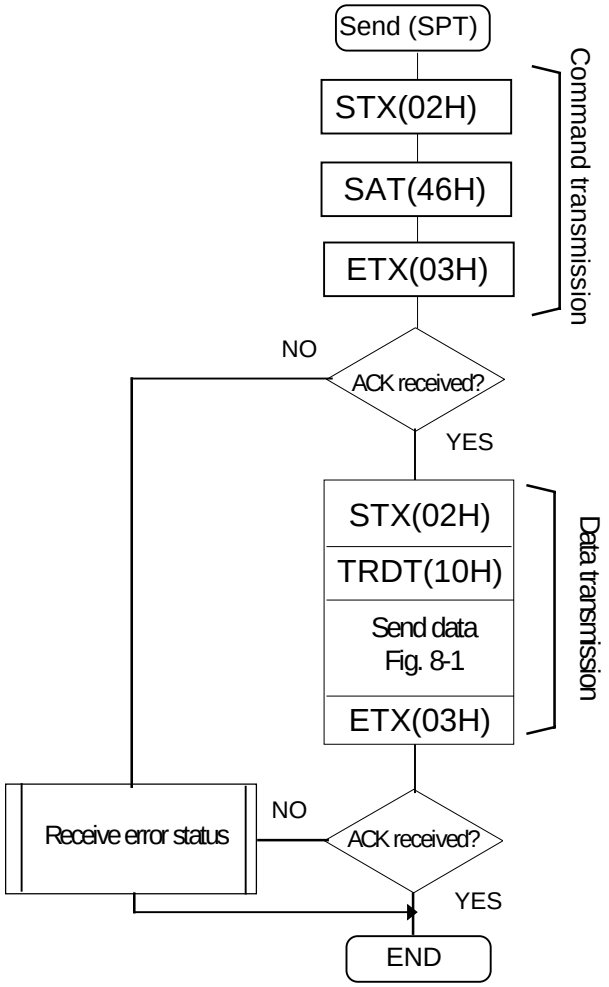
* All parameters are in ASCII code.



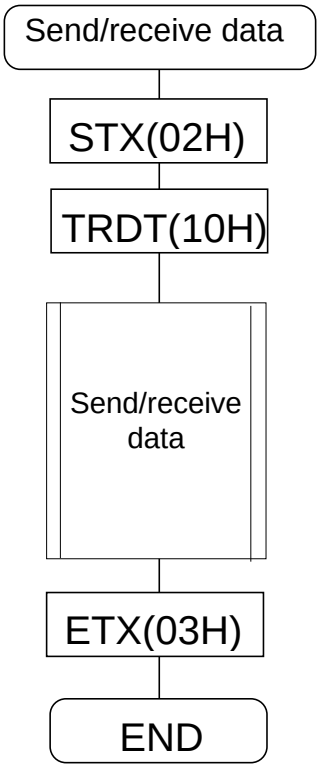
For sending commands and receiving data



For sending commands and sending data



The format is comprised of the interval (time) and program numbers consisting of 3 blocks.



02H	"STX"
10H	"TRDT"
30H	"0"
30H	"0"(001sec)
31H	"1"
30H	"0"
31H	"1"(01-40)
34H	"4"
30H	"0"
30H	"0"
30H	"0"(00-00)
30H	"0"
30H	"0"
30H	"0"
30H	"0"(00-00)
30H	"0"
30H	"0"
03H	"ETX"

Fig. 8-1

			When the AH-3000 or HN58C256 is used		
↑	10^2	Interval	↑	10_2	Interval
*1	10^1	(sec.)	*1	10_1	(sec.)
↓	10^0		↓	10_0	
↑	10^1		↑	10_2	
	10^0	Block 1		10_1	
	10^1			10_0	Block 1
	10^0			10_2	
	10^1			10_1	
*2	10^0	Block 2		10_0	
	10^1			10_2	
	10^0			10_1	
	10^1			10_0	Block 2
	10^0	Block 3	*2	10_2	
	10^1			10_1	
↓	10^0			10_0	
				10_2	
				10_1	
				10_0	Block 3
				10_2	
				10_1	
			↓	10_0	

*1 000 to 999sec
*2 01 to 40

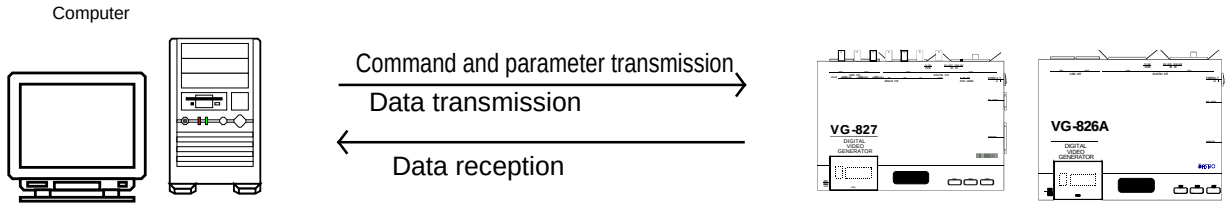
Program numbers 001 to 040 and 500 to 779 apply when the AH-3000 is used; program numbers 001 to 040, 501 to 540, 601 to 640, and 701 to 740 apply when the HN58C256 is used.

Note: Set blocks 2 and 3 to "0" when using block 1 only

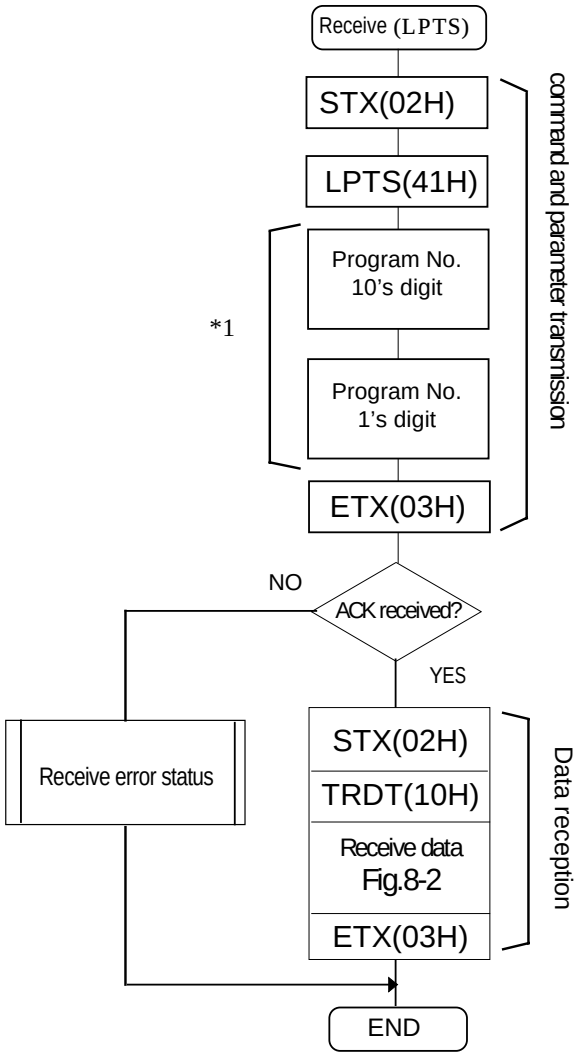
8-3 [LPTS](41H)・[SPTS](47H)

These commands are for sending or receiving the pattern select data in the designated program number. The data sent is written in buffer RAM for program No.00 and in the panel ROM for program No.01 to 40. The parameters sent and received are in pattern key codes.

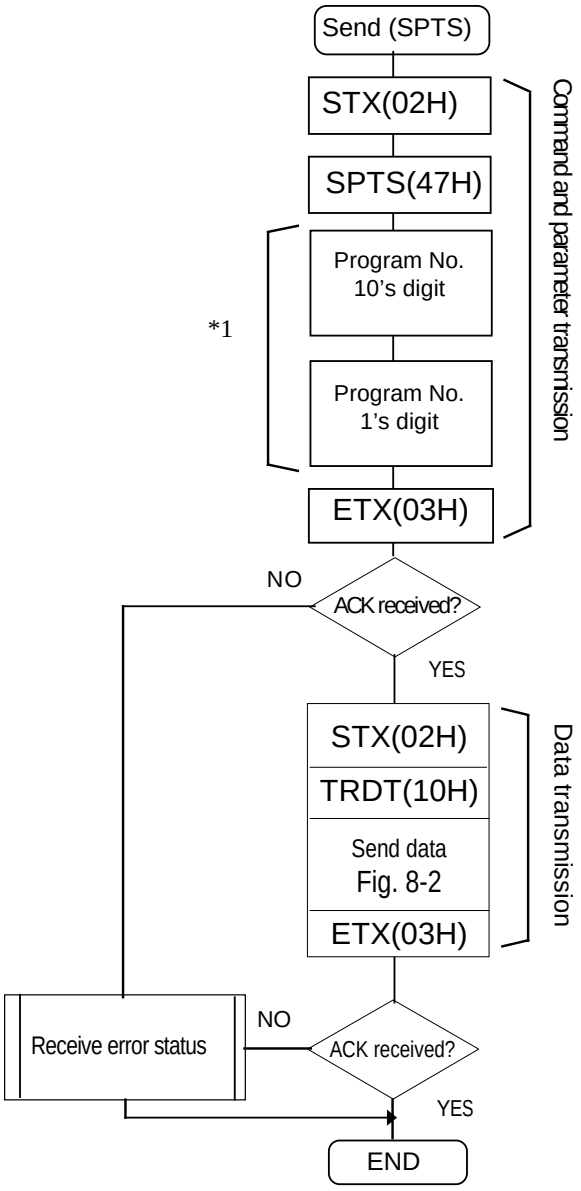
* All parameters are in ASCII code.



For sending commands and parameters and receiving data

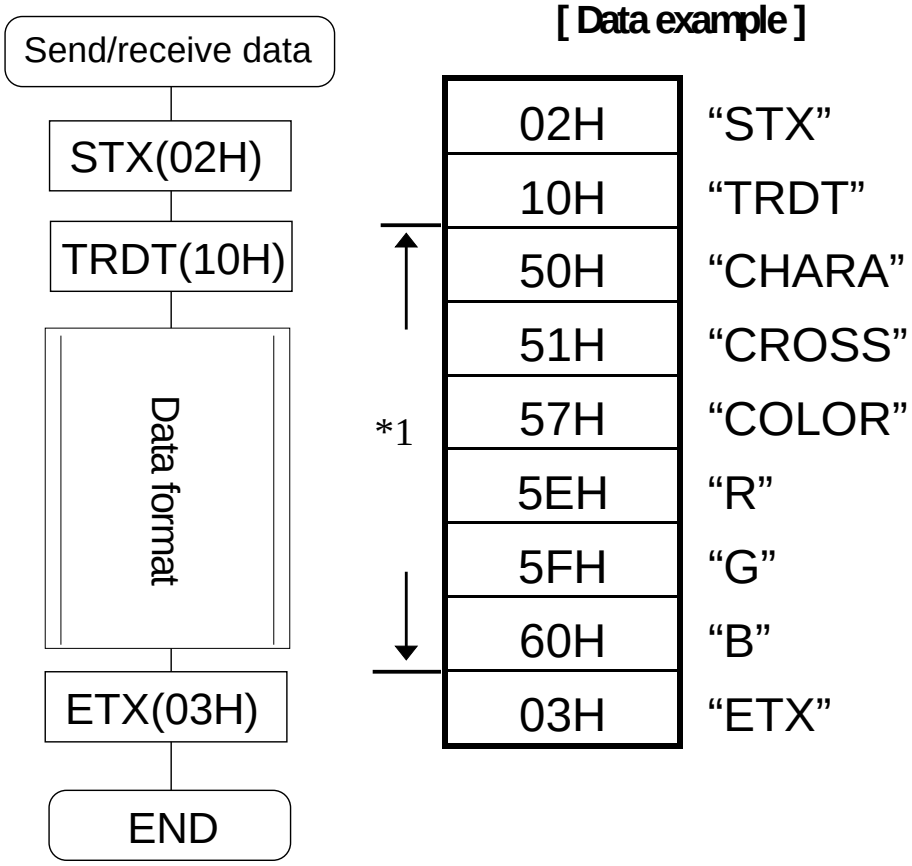


For sending commands and parameters and sending data



*1: Three digits are designated for program numbers (001 to 040 and 500 to 779) when the AH-3000 is used.
When the HN58C256 panel ROM is used, the number of digits differs depending on the program number.
2 digits are designated for program No.01 to 40.
3 digits are designated for program No.501 to 540, 601 to 640, and 701 to 740.

• This is the H timing data format.



*1: Variable length data

Fig. 8-2

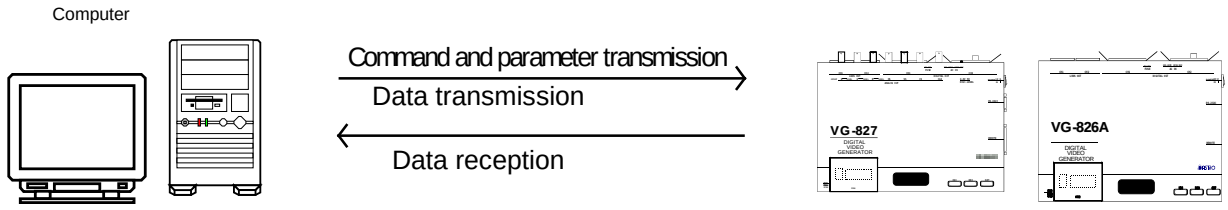
CHARA 50H)
CROSS(51H)
COLOR(57H)
•
•
•
R(5EH)
G(5FH)
B(60H)

Note: Refer to the table of key codes in Section 6-5 for the pattern key and output key codes.

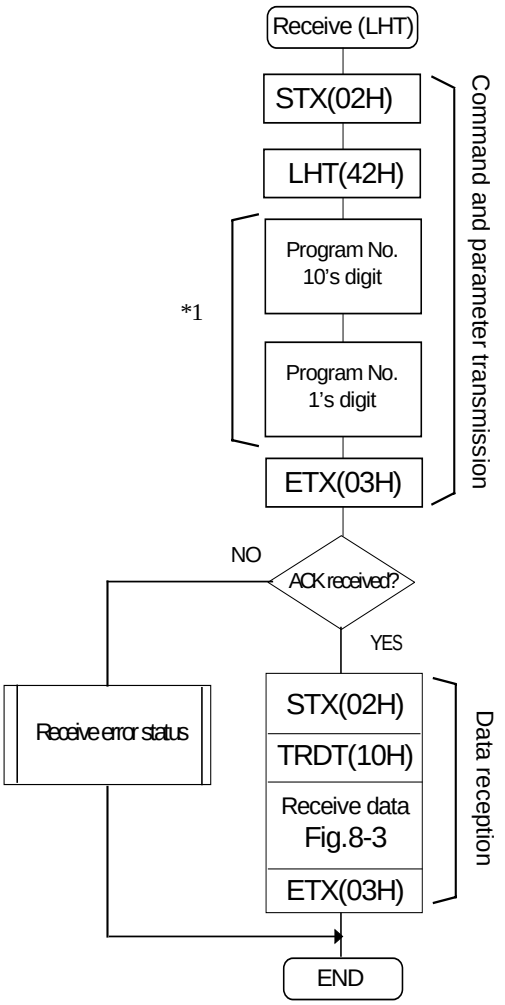
8-4 [LH](T42H)・[SHT](48H)

These commands are for sending or receiving the H timing data in the designated program number. The transmitted data is written in the buffer RAM for program No.00 or in the panel ROM for program No.01 to 40.

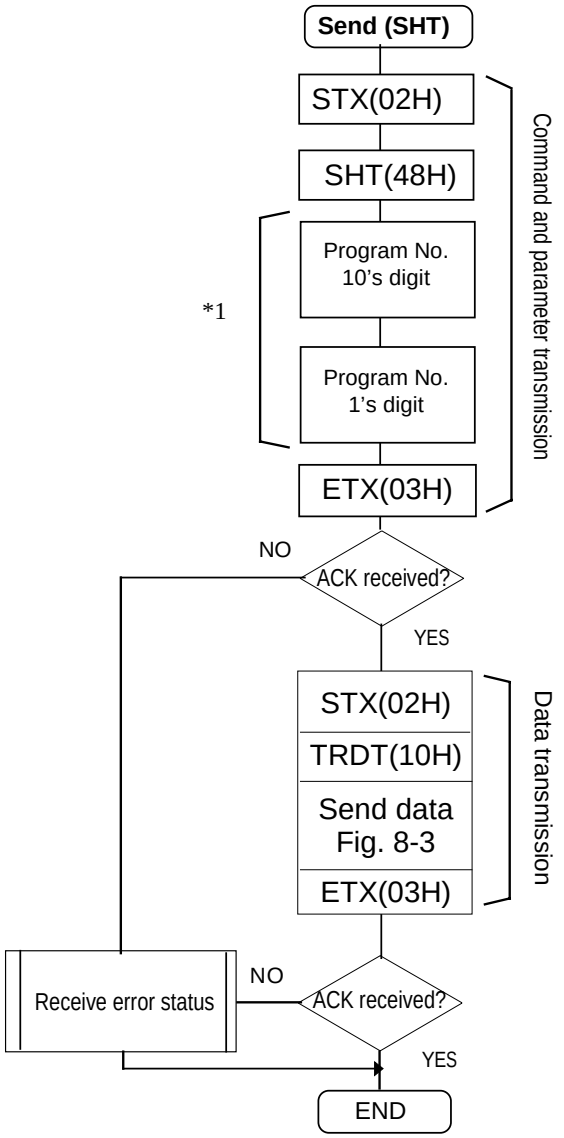
* All parameters are in ASCII code.



For sending commands and parameters and receiving data

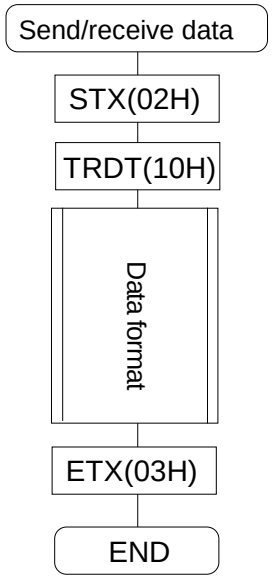


For sending commands and parameters and sending data



*1: Three digits are designated for program numbers (001 to 040 and 500 to 779) when the AH-3000 is used.
When the HN58C256 panel ROM is used, the number of digits differs depending on the program number.
2 digits are designated for program No.01 to 40.
3 digits are designated for program No.501 to 540, 601 to 640, and 701 to 740.

- This is the H timing data format.



02H	"STX"
10H	"TRDT"
30H	"μ"
30H	DOT CLOCK 010.00
31H	
30H	
30H	
30H	
36H	H-PERIOD 63.50
33H	
35H	
30H	
34H	H-DISPLAY 42.00
32H	
30H	
30H	
30H	H-SYNC 04.90
34H	
39H	
30H	

31H	H-BACK-PORCH 10.00
30H	
30H	
30H	
30H	HD-START 00.00
30H	
30H	
30H	
30H	HD-WIDTH 00.00
30H	
30H	
30H	
03H	ETX

Fig. 8-3

*1	μ／(dot)	MODE(μ／dot)
	10^2	DOT CLOCK
	10^1	
	10^0	
	10^{-1}	
	10^{-2}	
	10^1 (10^3)	H-PERIOD
	10^0 (10^2)	
	10^{-1}(10^1)	
	10^{-2}(10^0)	
	10^1 (10^3)	H-DISPLAY
	10^0 (10^2)	
	10^{-1}(10^1)	
	10^{-2}(10^0)	
	10^1 (10^3)	H-SYNC
	10^0 (10^2)	
	10^{-1}(10^1)	
	10^{-2}(10^0)	

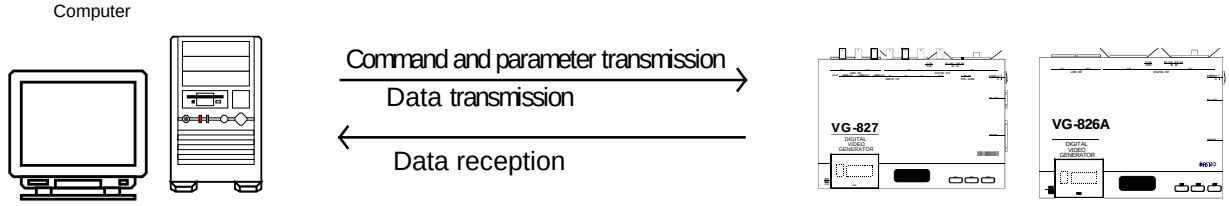
10^1 (10^3)	H-BACK-PORCH
10^0 (10^2)	
10^{-1}(10^1)	
10^{-2}(10^0)	
10^1 (10^3)	HD-START
10^0 (10^2)	
10^{-1}(10^1)	
10^{-2}(10^0)	
10^1 (10^3)	HD-WIDTH
10^0 (10^2)	
10^{-1}(10^1)	
10^{-2}(10^0)	

*1 "0"= μ
"1"=dot

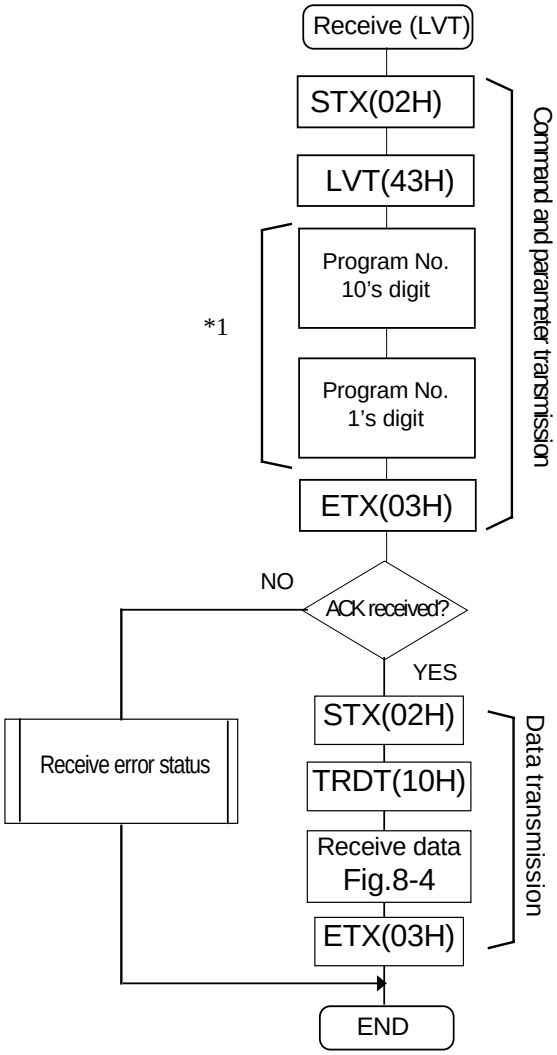
8-5 [LVT](43H)・[SVT](49H)

These commands are for sending or receiving the V timing data in the designated program number. The transmitted data is written in the buffer RAM for program No.00 or in the panel ROM for program No.01 to 40.

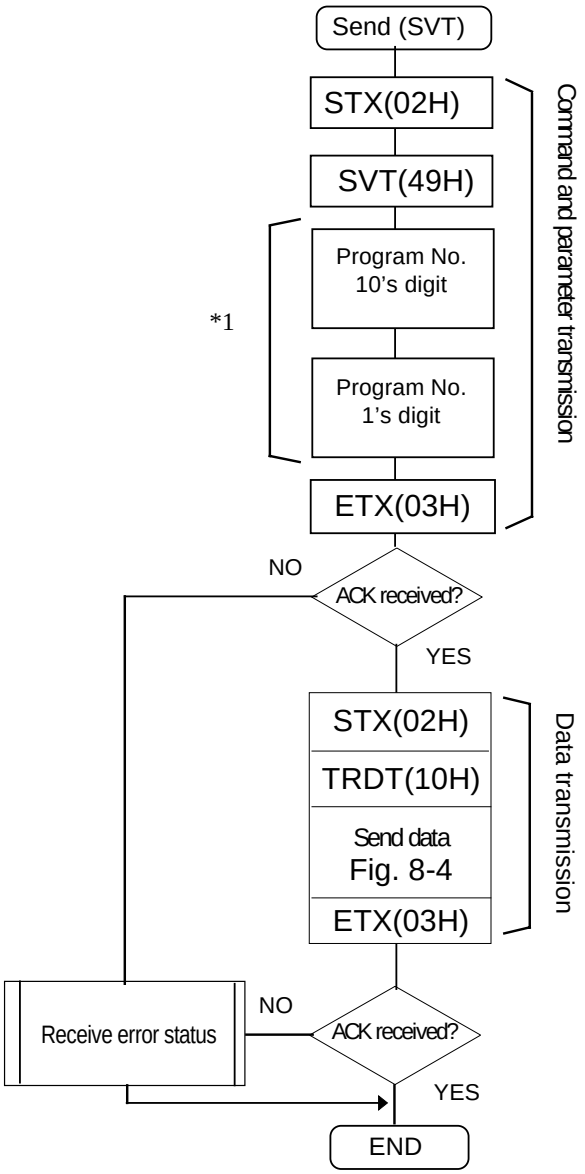
* All parameters are in ASCII code.



For sending commands and parameters and receiving dat



For sending command and parameters and sending data



*1: Three digits are designated for program numbers (001 to 040 and 500 to 779) when the AH-3000 is used.
When the HN58C256 panel ROM is used, the number of digits differs depending on the program number.
2 digits are designated for program No.01 to 40.
3 digits are designated for program No.501 to 540, 601 to 640, and 701 to 740.

• This is the V timing data format.

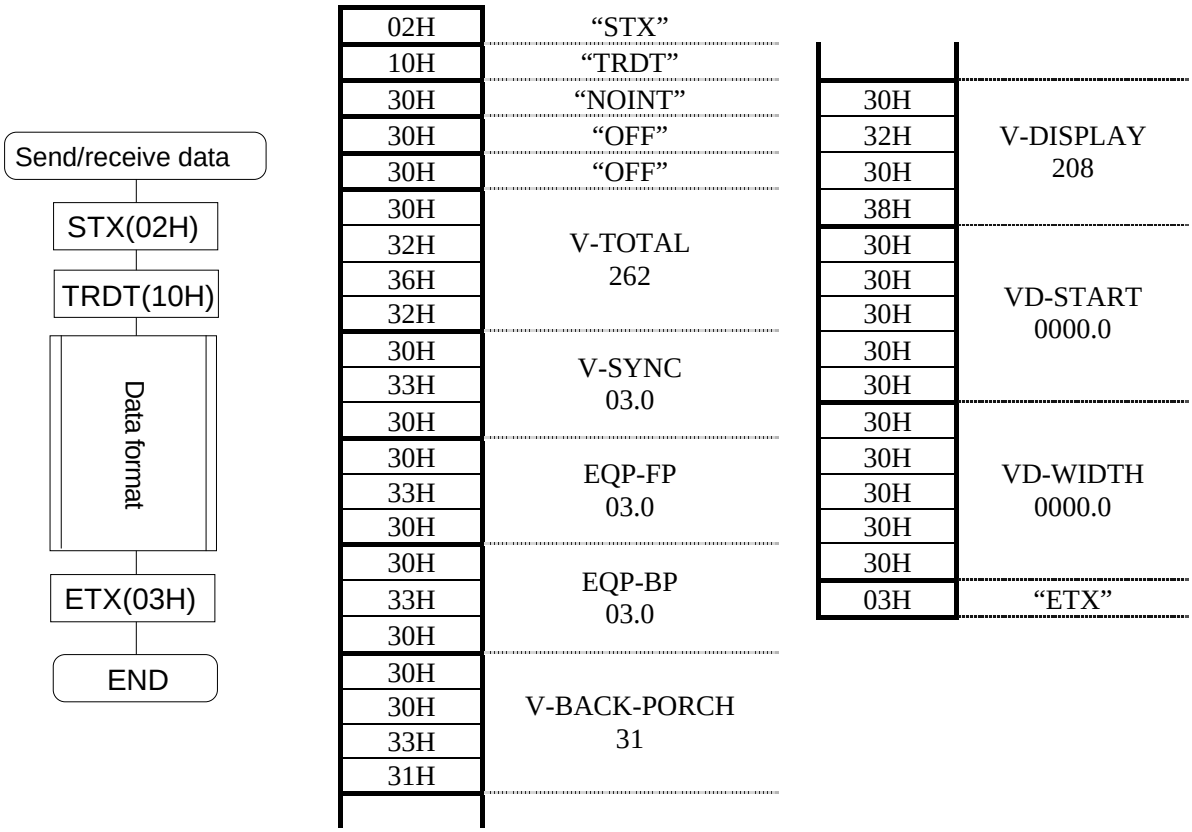
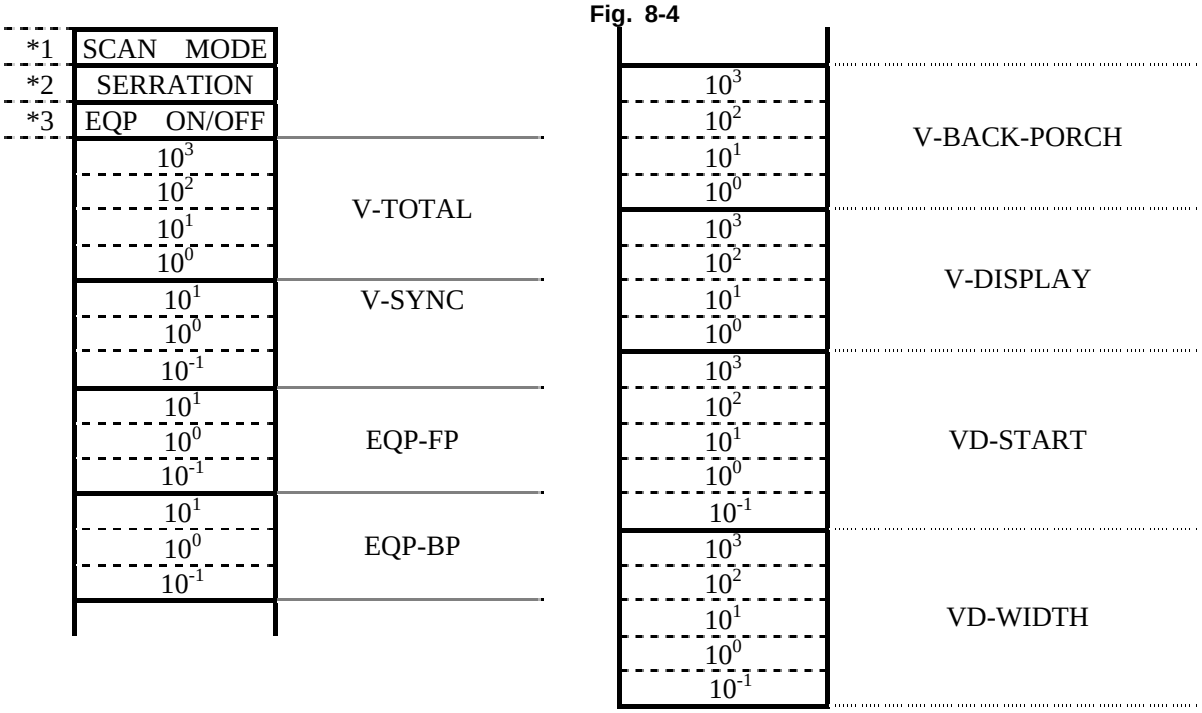


Fig. 8-4

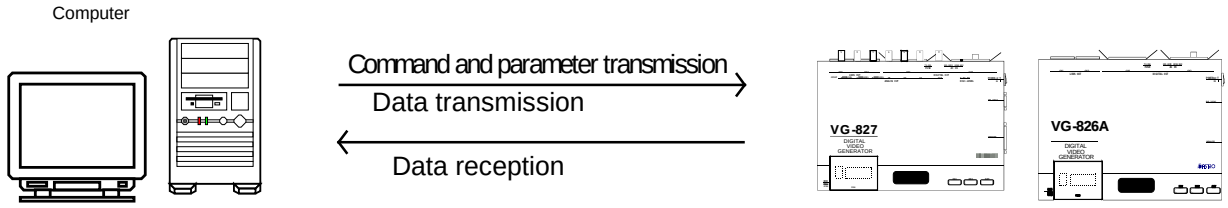


*1: SCAN MODE "0"=NOINT,"1"=INT&SYNC,"2"=INT&VIDEO
*2: SERRATION "0"=OFF,"1"=0.5H,"2"=1H,"3"=XOR
*3: EQP ON/OFF "0"=OFF,"1"=ON

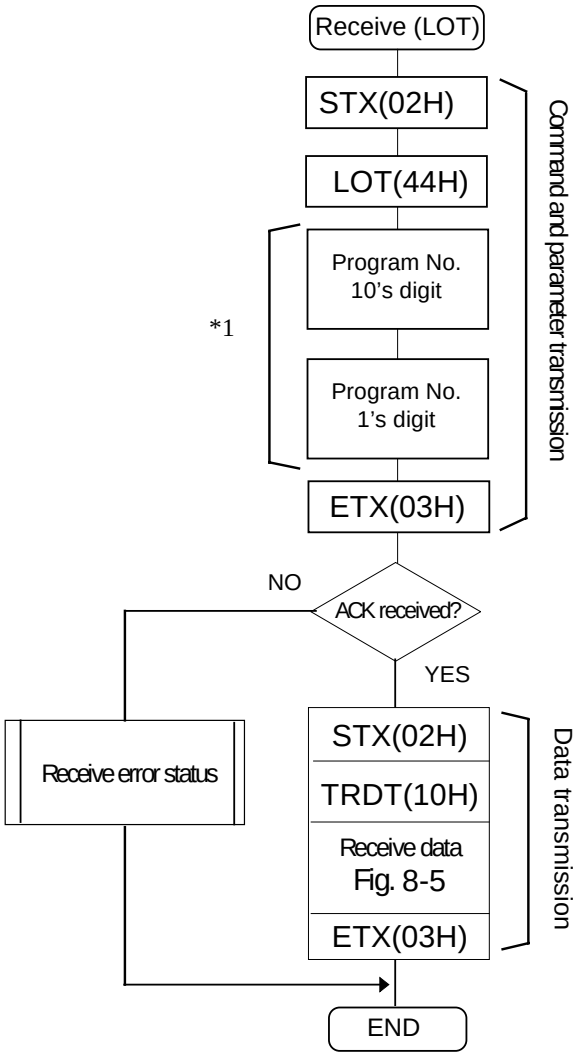
8-6 [LOT](44H)・[SOT](4AH)

These commands are for sending or receiving the output conditions in the designated program number. The transmitted data is written in the buffer RAM for program No.00 or in the panel ROM for program No.01 to 40.

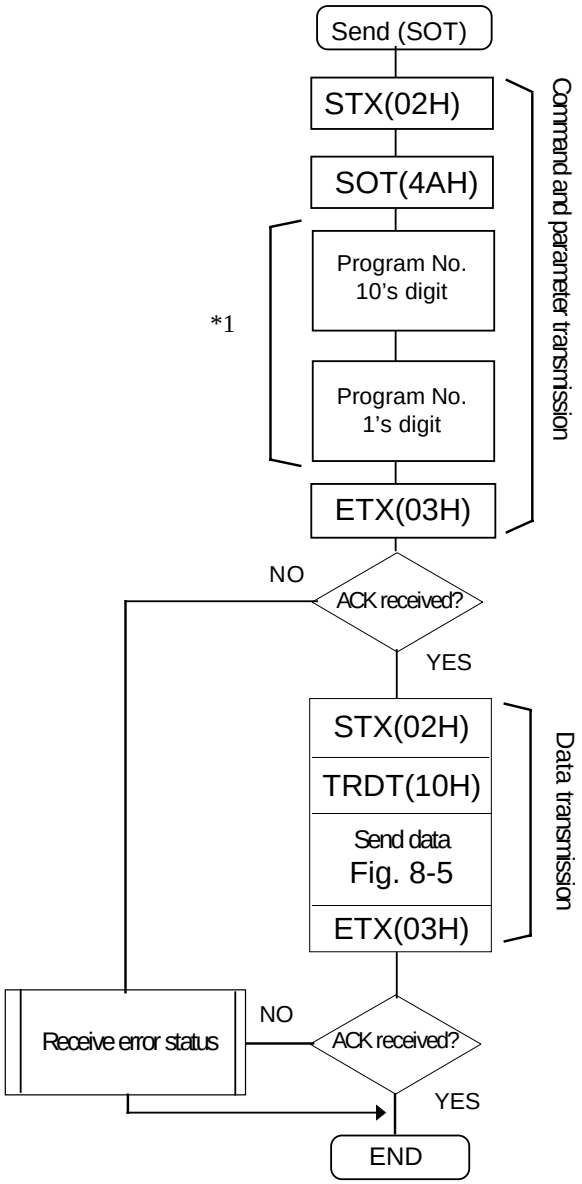
* All parameters are in ASCII code.



For sending commands and parameters and receiving data



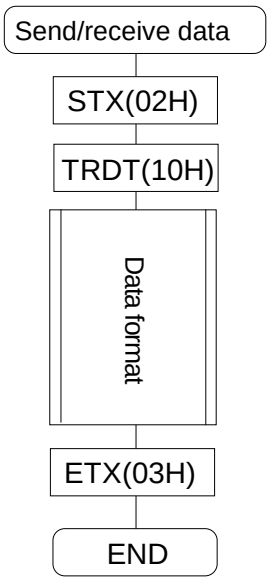
FOr sending command and parameters and sending deta



*1: Three digits are designated for program numbers (001 to 040 and 500 to 779) when the AH-3000 is used. When the HN58C256 panel ROM is used, the number of digits differs depending on the program number. 2 digits are designated for program No.01 to 40.

3 digits are designated for program No.501 to 540, 601 to 640, and 701 to 740.

• This is the output condition data format.



02H	“STX”
10H	“TRDT”
30H	“1/1 CLPCK”
30H	“NEGA”
30H	“NEGA”
30H	“NEGA”
31H	“POSI”
31H	“POSI”
30H	“NEGA”
30H	“NEGA”
31H	“POSI”
30H	“NEGA”
30H	“NRZ”
31H	ON
30H	OFF
30H	OFF
30H	ALL
33H	16ns
38H	8 bit
46H	R d7～d4=ON
46H	R d3～d0=ON
30H	G d7～d4=OFF
30H	G d3～d0=OFF
43H	B d7～d6=ON d5～d4=OFF
33H	B d3～d2=OFF d1～d0=ON
03H	ETX

Fig. 8-5

*1	CLOCK MODE
	HS
	VS
	CS
	HD
*2	VD
	1ch RGB
	2ch RGB
	CLOCK
	DISP
*3	RZ/NRZ
	SW0
*4	SW1
	DELAY MODE
*5	CLOCK AREA
*6	DELAY TIME
*7	RGB BIT OUT
	R MASK high order
	R MASK low order
	G MASK high order
*8	G MASK low order
	B MASK high order
	B MASK low order

*1	“0”=1/1 clock		“1”=1/2 clock	
*2	“0”=NEGA		“1”=POSI	
*3	“0”=NRZ		“1”=RZ	
*4	“0”=OFF		“1”=ON	
*5	“0”=DISP		“1”=ALL	
*6	“1”=4ns	“2”=8ns	“3”=12ns	“4”=16ns
	“5”=20ns	“6”=24ns	“7”=28ns	“8”=32ns
*7	“1”=1bit	“2”=2bit	“3”=3bit	“4”=4bit
	“5”=5bit	“6”=6bit	“7”=7bit	“8”=8bit

*8

d7	d6	d5	d4	d3	d2	d1	d0
MASK high order				MASK low order			

“0”=OFF “1”=ON

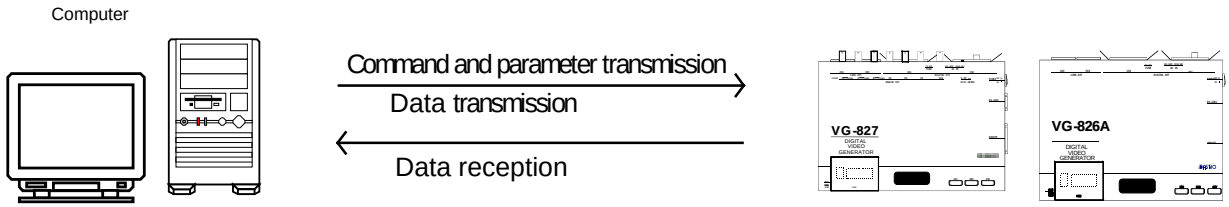
1	0	1	0	0	1	0	1
"A"H				"5"H			
↓(ASCII)				↓(ASCII)			
41H				35H			

d7,d5,d2,d0=ON d6,d4d3,d1=OFF

8-7 [LPT](45H)・[SPT](4BH)

These commands are for sending or receiving the pattern data in the designated program number. The transmitted data is written in the buffer RAM for program No.00 or in the panel ROM for program No.01 to 40. The pattern data is divided into 11 blocks for sending or receiving.

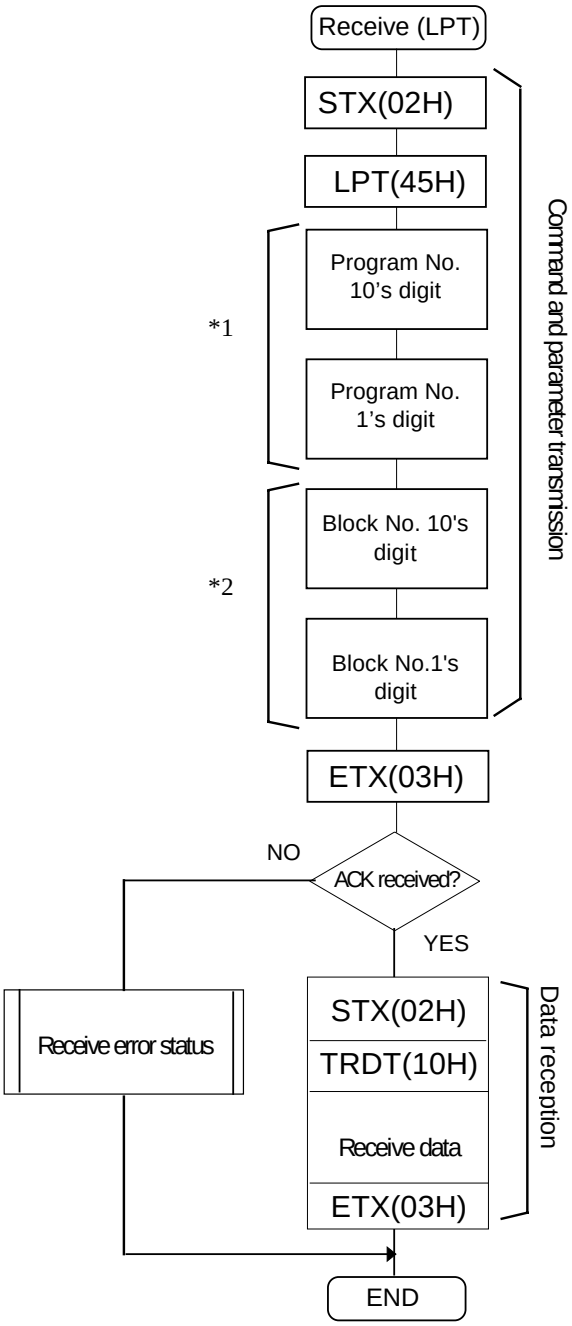
* All parameters are in ASCII code.



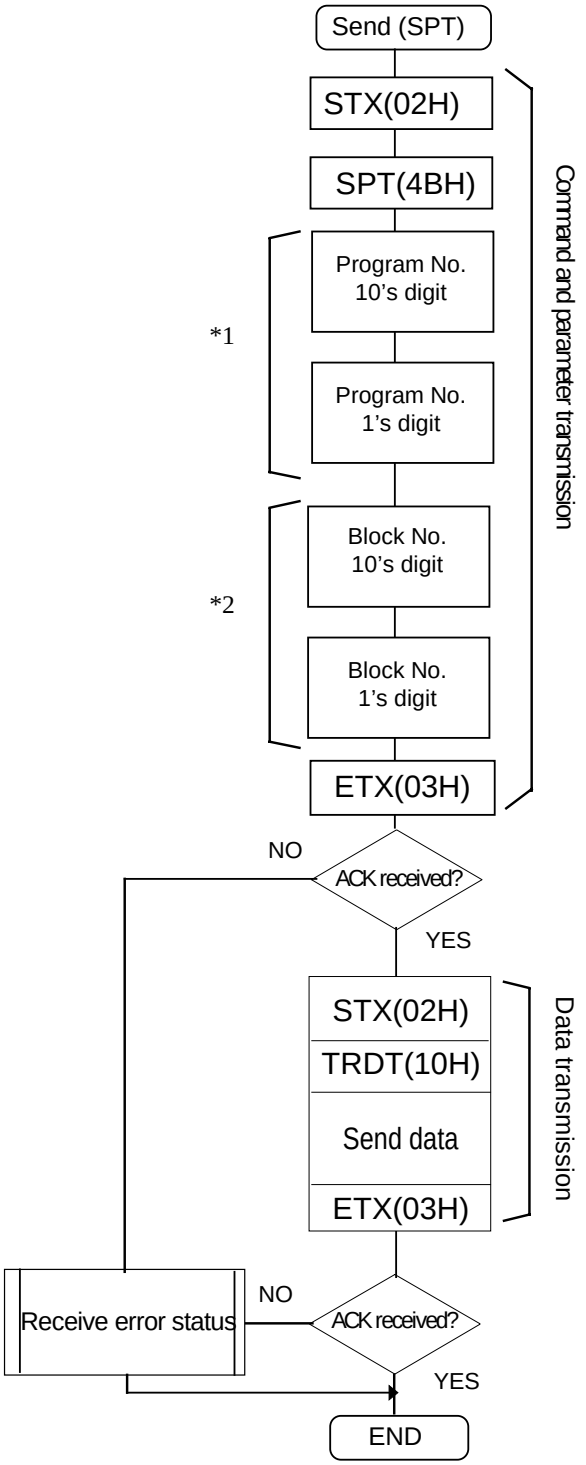
Block No.	Pattern data
01	Graphic color
02	Character
03	Crosshatch
04	Dot
05	Circle
06	Burst
07	Window
08	OPtion1 (*1)
09	Option2 (*1)
10	Color bar
11	Gray scale

*1: Use two digits (00 to 1F) to assign the option pattern codes.

For sending command and parameters and receiving data



For sending commands + parameters and sending data



*1: "00" to "40" (ASCII code)

Three digits are designated for program numbers (001 to 040 and 500 to 779) when the AH-3000 is used.

When the HN58C256 panel ROM is used, the number of digits differs depending on the program number.

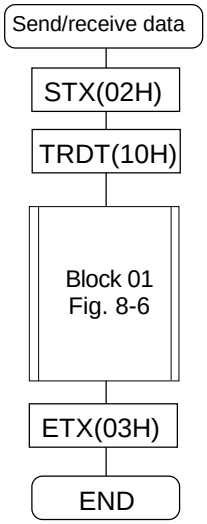
2 digits are designated for program No.01 to 40.

3 digits are designated for program No.501 to 540, 601 to 640, and 701 to 740.

*2: "01" to "11" (ASCII code)

Block No. [01] Graphic color data format

Fig. 8-6



↑	10^2	R	32H	"255"
	10^1		35H	
	10^0		35H	
*1	10^2	G	32H	"255"
	10^1		35H	
	10^0		35H	
↓	10^2	B	32H	"255"
	10^1		35H	
	10^0		35H	
*2			30H	Dummy data
*2			30H	Dummy
*3	Background		30H	OFF

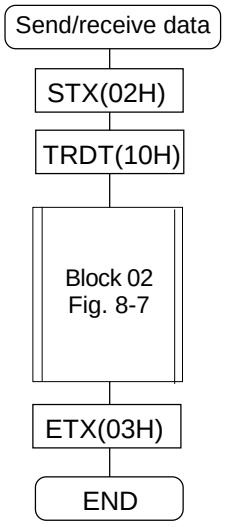
*1: These assign the colors in the case of analog signals (000 to 255).

*2: Dummy data = "0"

*3: "0"=OFF, "1"=ON

Block No. [02] Character data format

Fig. 8-7



*1	Character format		31H	Format 1
*2	Character font		31H	7×9
*3	10^1	Character code	34H	48(H)
	10^0		38H	
*4	10^1	H cell size	36H	H 64
	10^0		34H	
*4	10^1	V cell size	36H	V 64
	10^0		34H	

*1: "0"= format 0, "1"= format 1,"2"= format 2

*2: "0"=5×7, "1"=7×9 "2"=16×16

*3: "20" to "E3", "20" to "EF" when AH-3000 is used, "20" to "E7" when HN-58C256 is used.

*4: "01" to "64"

Block No. [03] Crosshatch data format

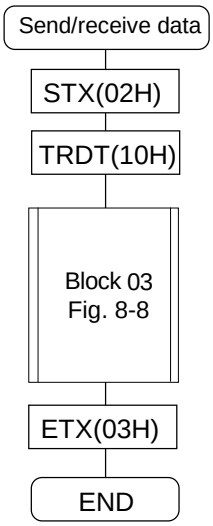


Fig. 8-8

↑	10^3	H interval	30H	H 10
*1	10^2		30H	
	10^1		31H	
↓	10^0		30H	
↑	10^3	V interval	30H	V 10
*1	10^2		30H	
	10^1		31H	
↓	10^0		30H	

*1 “0000” to “9999”

Block No. [04] Dot data format

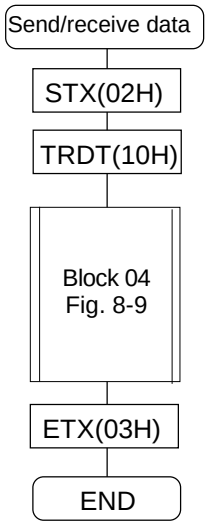


Fig. 8-9

↑	10^3	H interval	30H	H 5
*1	10^2		30H	
	10^1		30H	
↓	10^0		35H	
↑	10^3	V interval	30H	V 5
*1	10^2		30H	
	10^1		30H	
↓	10^0		35H	

*1 “0000” to “9999”

Block No. [05] Circle data format

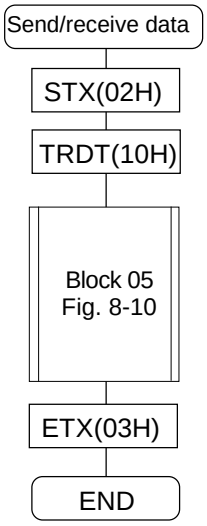


Fig. 8-10

*1	Circle format	32H	Format 2

*1 “0” to ”4”

Block No. [06] Burst data format

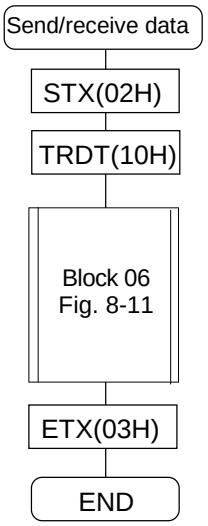


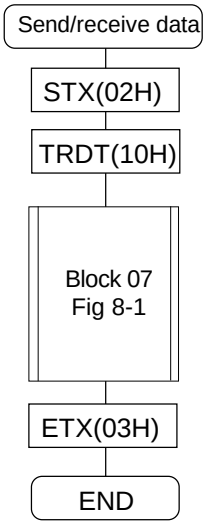
Fig. 8-11

*1	Burst Format		32H	Format 2
*2 ↓	10^1	Interval Step	30H	Interval
	10^0		31H	01
*2 ↓	10^1	Step	30H	Step 03
	10^0		33H	

*1: “0” to “3”
*2: “01” to “99”

Block No. [07] Window data format

Fig. 8-12



	*1	Window mode (%/dot)		30H	%
	↑	$10^2(10^3)$	**H** width	30H	H 025.0%
	*2	$10^1(10^2)$		32H	
		$10^0(10^1)$		35H	
	↓	$10^{-1}(10^0)$		30H	
	↑	$10^2(10^3)$	**V** Width	30H	V 025.0%
	*2	$10^1(10^2)$		32H	
		$10^0(10^1)$		35H	
	↓	$10^{-1}(10^0)$		30H	
Analog color	↑	10^2	**R**	32H	255 R
		10^1		35H	
		10^0		35H	
	*3	10^2	**G**	32H	255 G
		10^1		35H	
		10^0		35H	
		10^2	**B**	32H	255 B
		10^1		35H	
	↓	10^0		35H	
	*4			30H	Dummy data
	*4			30H	Dummy data
	*5	Format		35H	Format 5
	*6	Flicker interval		32H	Interval 2

*1: “0”=% “1”=dot

*2: “0001” to “1000”%, “0004” to display dots

*3: “000” to “255”

*4: Dummy data =”0”

*5: “0” to “F”

*6: “0” to “7”

Refer to the section on the flicker intervals in the pattern descriptions of Section 5-4-9 for the flicker interval settings.

Block No. [08] Option 1 data format

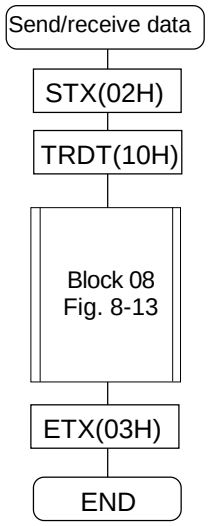


Fig. 8-13

*1	Option code 10^1	30H	Option code1
*2	Option code 10^0	31H	

*1: 0 to 1(“0” to “1”)

*2: 0 to F(“0” to “9”,“A” to “F”)

Block No. [09] Option 2 data format

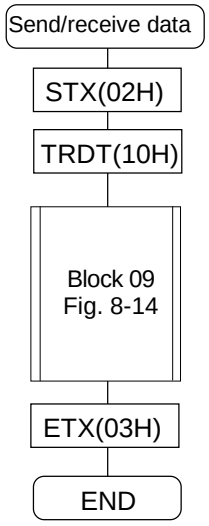


Fig. 8-14

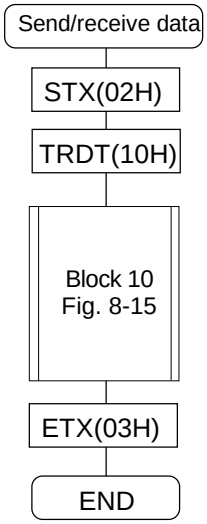
*1	Option code 10^1	30H	Option code 1
*2	Option code10^0	31H	

*1: 0 to 1(“0”to“1”)

*2: 0 to F(“0” to “9”,“A” to “F”)

Block No. [10] Color bar data format

Fig. 8-15



*1	Mode (%/dot)		30H	%
*2	$10^{2}(10^{3})$	H width	30H	6.3%
	$10^{1}(10^{2})$		30H	
	$10^{0}(10^{1})$		36H	
	$10^{-1}(10^{0})$		33H	
*2	$10^{2}(10^{3})$	V width	30H	12.5%
	$10^{1}(10^{2})$		31H	
	$10^{0}(10^{1})$		32H	
	$10^{-1}(10^{0})$		35H	
*3	Direction H/V		30H	H
			30H	None
*4	Color destination		31H	R
	Color destination		32H	G
	Color destination		33H	RG
	Color destination		34H	B
	Color destination		35H	RB
	Color destination		36H	GB
	Color destination		37H	RGB
	Color destination		30H	None
	Color destination		31H	R
	Color destination		32H	G
	Color destination		33H	RG
	Color destination		34H	B
	Color destination		35H	RB
	Color destination		36H	GB
	Color destination		37H	RGB
	Color destination			

*1: “0” = %, “1” = dot

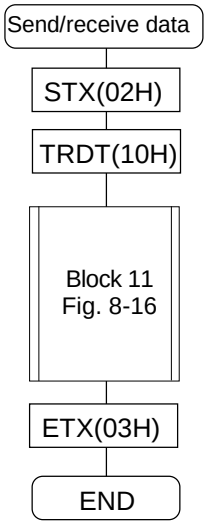
*2: “0000” to “1000”%, “0004” to display dots

*3: “0” = horizontal; “1”= = vertical; “2” = horizontally repeated; “3” = vertically repeated

*4: “0” = none, “1” = R, “2” = G, “3” = RG, “4” = B, “5” = RB, “6” = GB, “7” = RGB

Block No. [11] Gray scale data format

Fig. 8-16



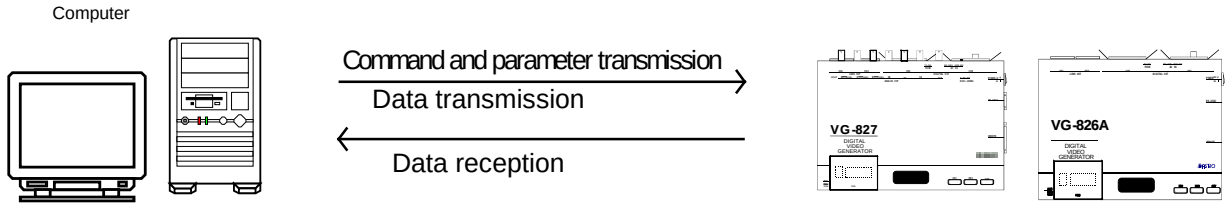
*1		Direction H/V			30H	Horizontal
↑	↑	10^2		↑	30H	
	1	10^1	Level	1	31H	16
	↓	10^0		↓	36H	
	↑	10^2		↑	30H	
	2	10^1	Level	2	33H	32
	↓	10^0		↓	32H	
	↑	10^2		↑	30H	
*2	3	10^1	Level	3	34H	48
	↓	10^0		↓	38H	
	↑	10^2		↑	30H	
	4	10^1	Level	4	36H	64
	↓	10^0		↓	34H	
	•	•	•	•	•	•
	•	•	•	•	•	•
	•	•	•	•	•	•
	↑	10^2		↑	31H	
	12	10^1	Level	12	39H	192
	↓	10^0		↓	32H	
	↑	10^2		↑	32H	
	13	10^1	Level	13	30H	208
*2	↓	10^0		↓	38H	
	↑	10^2		↑	32H	
	14	10^1	Level	14	32H	224
	↓	10^0		↓	34H	
	↑	10^2		↑	32H	
	15	10^1	Level	15	34H	240
	↓	10^0		↓	30H	
	↑	10^2		↑	32H	
	16	10^1	Level	16	35H	255
↓	↓	10^0		↓	35H	

*1: “0” = horizontal; “1” = vertical

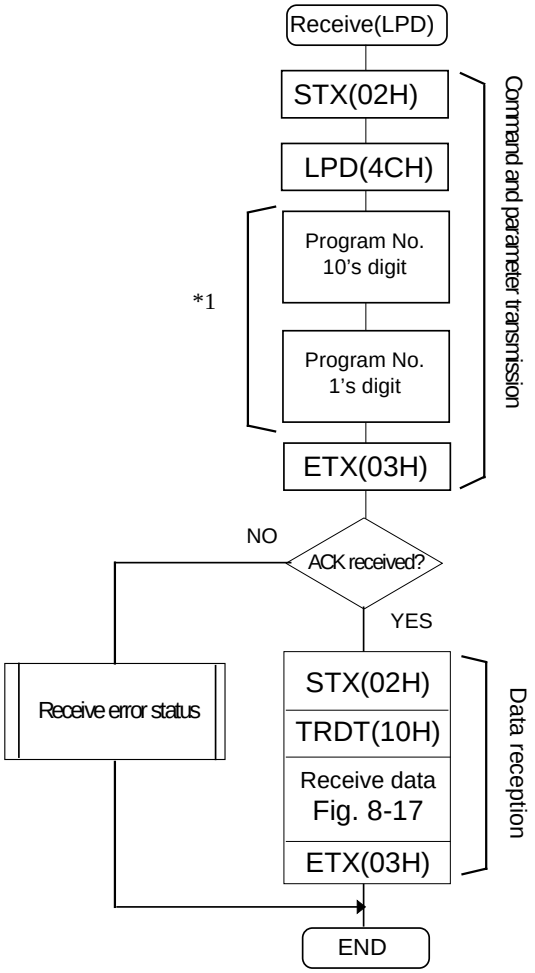
*2: “000” to “255”

8-8 [LPD](4CH)・[SPD](4DH)

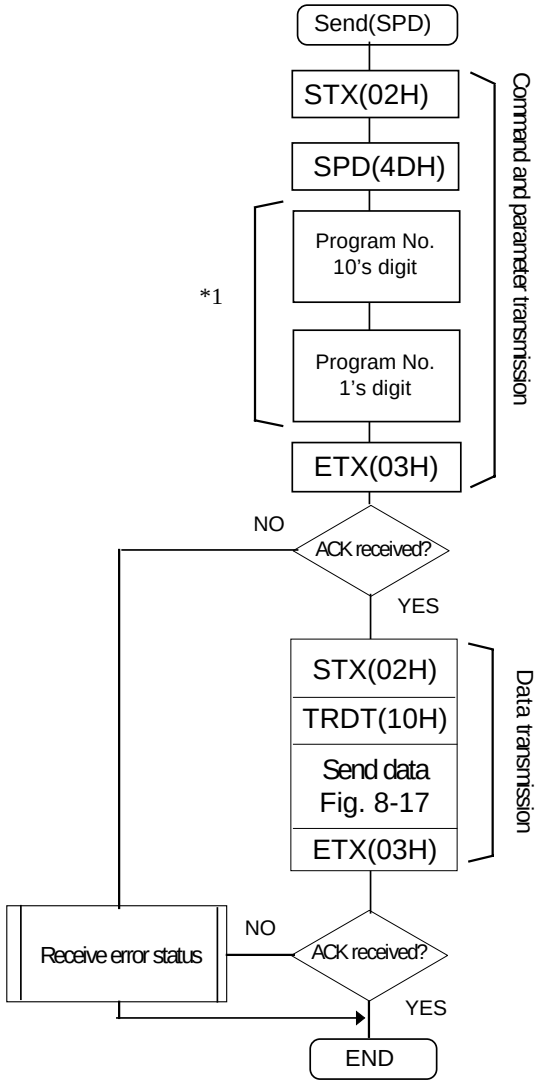
These commands are for sending or receiving all the data in the designated program number. The data sent is written in the buffer RAM for program No.00 and in panel ROM for program No.01 to 40 but not executed in the latter case.



For sending commands and parameters and receiving data



For sending commands and parameters and sending data

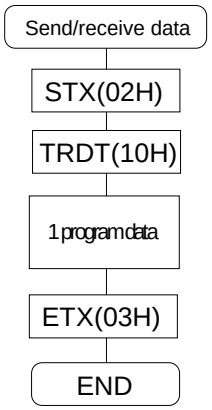


*1: Three digits are designated for program numbers (001 to 040 and 500 to 779) when the AH-3000 is used.
When the HN58C256 panel ROM is used, the number of digits differs depending on the program number.
2 digits are designated for program No.01 to 40.
3 digits are designated for program No.501 to 540, 601 to 640, and 701 to 740.

Use two digits (00 to 1F) to assign the option pattern codes.

• This is the 1 program data format.

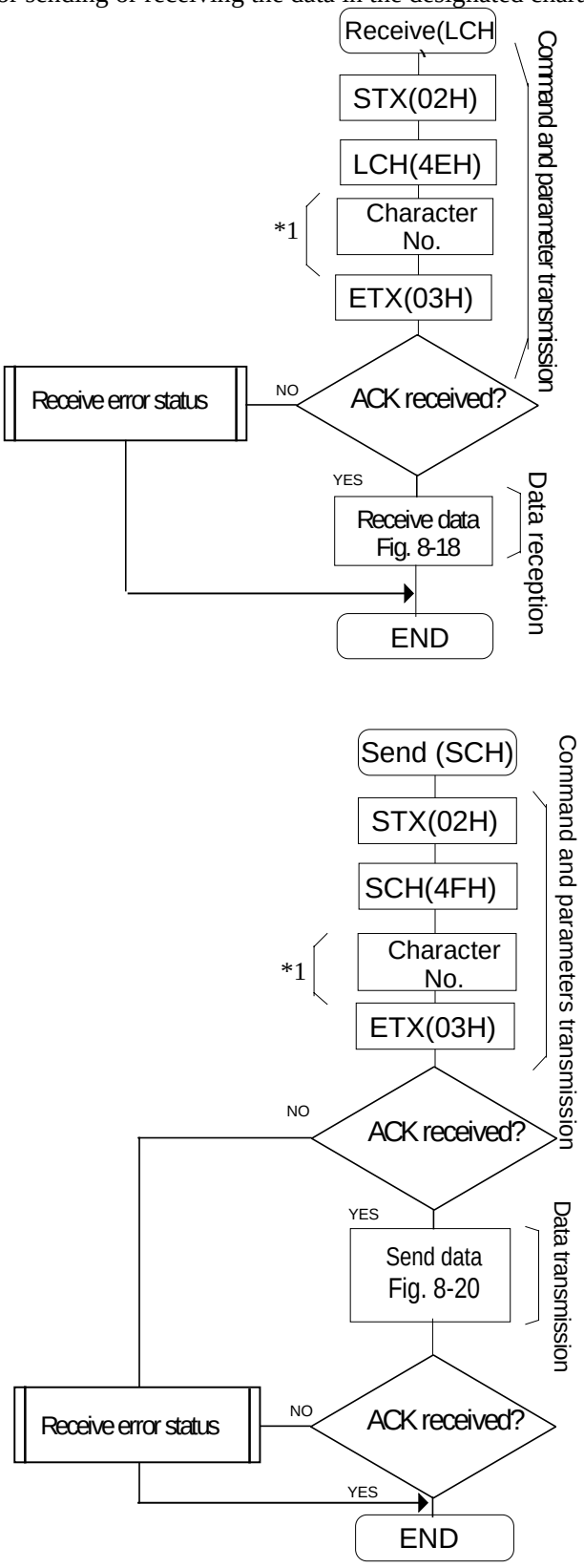
Fig. 8-17



Horizontal timing Fig. 8-3	
(2CH)	","Delimiter
Vertical timing Fig. 8-4	
(2CH)	","Delimiter
Output conditions Fig. 8-5	
(2CH)	","Delimiter
Block Fig. 8-6 01 Pattern color	
Block Fig.8-7 02 Character	
Block Fig.8-8 03 Crosshatch	
Block Fig.8-9 04 Dot	
Block Fig.8-10 05 Circle	
BlockFig.8-11 06 Burst	
Block Fig.8-12 07 Window	
Block Fig.8-13 08 Option 1	
Block Fig.8-14 09 Option 2	
(2CH)	","Delimiter
Bloc kFig.8-15 10 Color bar	
(2CH)	","Delimiter
Block Fig.8-16 11 Gray scale	

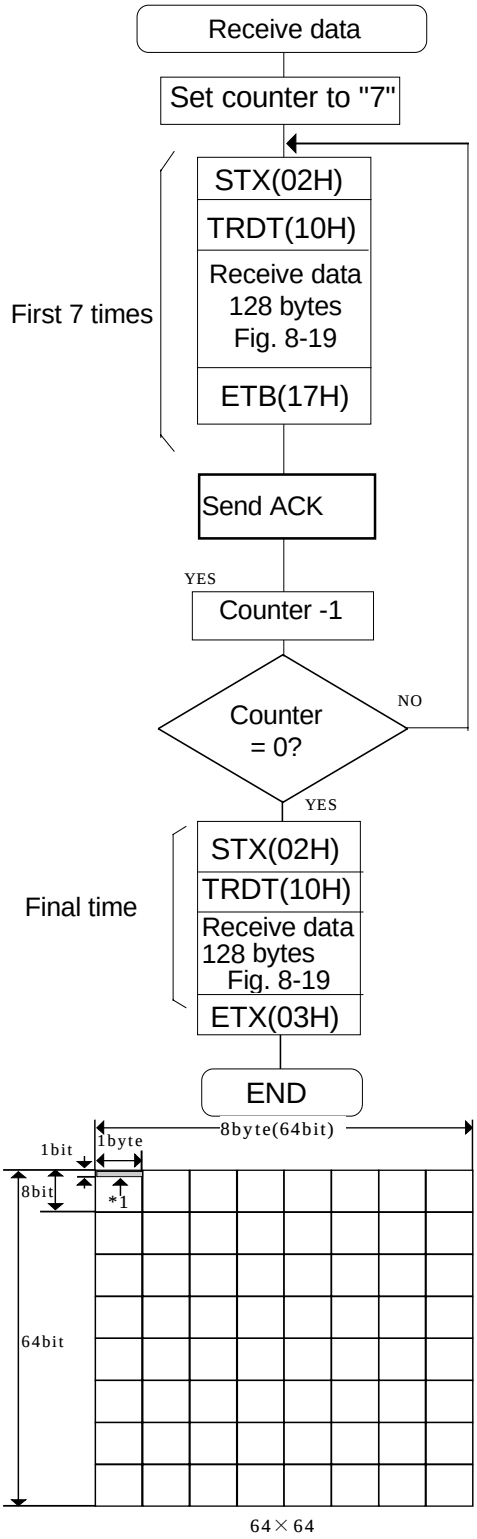
8-9 [LCH](4EH)・[SCH](4FH)

These commands are for sending or receiving the data in the designated character number (E0H to E1H).



*1: “0”=E0H “1”=E1H

Fig. 8-18

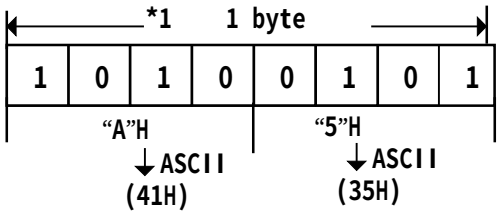


8 bytes×64 = 512 bytes

512 bytes×2 = 1024 bytes (ASCII)

1024 bytes÷128 bytes = 8

Since the amount of data sent is fixed at 128 bytes every time, it is divided into 8 blocks of 128 bytes for receiving.



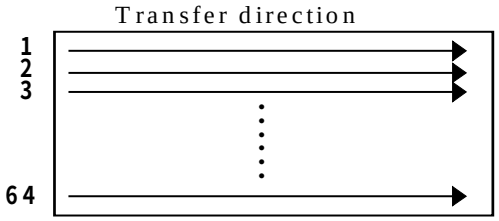


Fig. 8-19

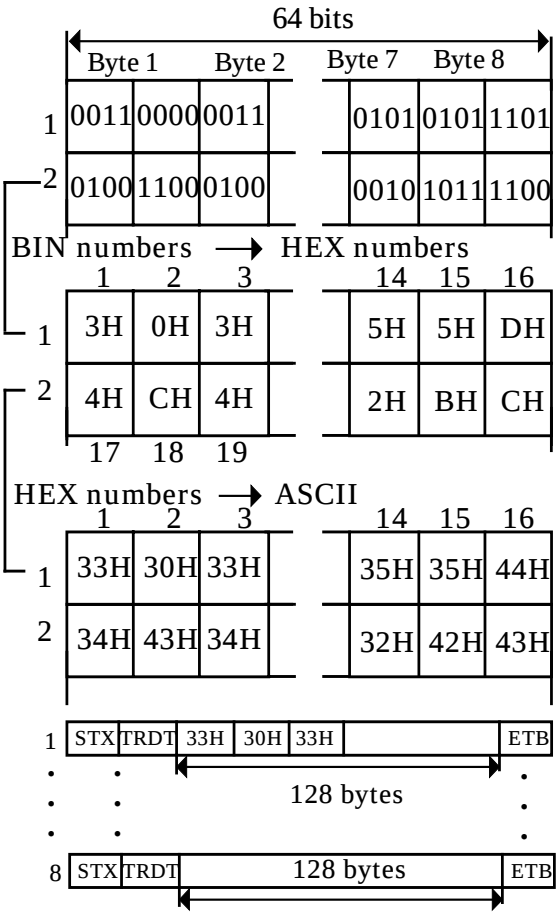
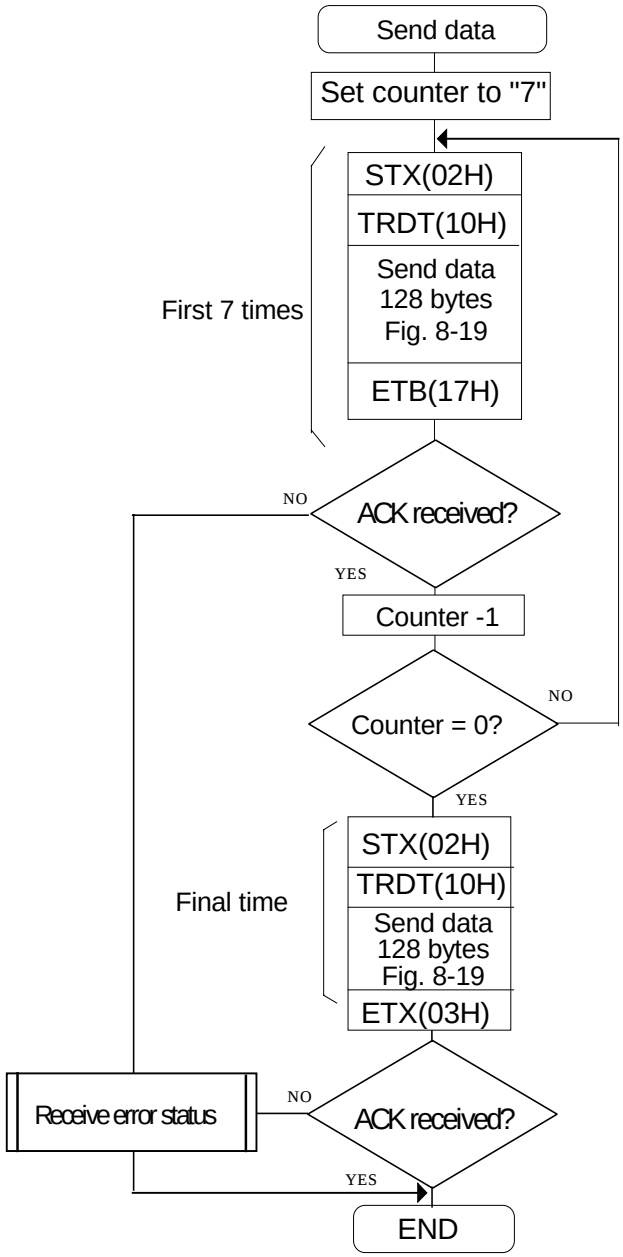


Fig.8-20


Send data
Set counter to "7"
First 7 times
STX(02H)
TRDT(10H)
Send data
128 bytes
Fig. 8-19
ETB(17H)
NO
ACK received?
YES
Counter -1
NO
Counter = 0?
YES
Final time
STX(02H)
TRDT(10H)
Send data
128 bytes
Fig. 8-19
ETX(03H)
Receive error status
NO
ACK received?
YES
END