BV-700G

for INR

Serial Interface Specifications

TZ5-10164
9th Edition

Revision

Edition	Date	Contents	APP.	CHK'D	DRAW
1st	22nd Jul. 2013	Established	A. Yokota		J. Chida
2nd	10th Oct. 2014	4.8.16 INFORMATION ON TRANSFER (Page 35) The details of BNA ID and ROM Version were added.	A. Yokota		J. Chida
3rd	24th Nov. 2014	Descriptions of additional commands (Escrow CMD, Reject CMD) were added to the below chapter. 2.1 List of Commands / Response 3.1 Effective Commands for equipment state 4.13 Escrow CMD [55] 4.14 Reject CMD [56] 6.1.1 Description of equipment state 7. Command/Response sequence chart Specified Connector was changed to D-sub 9-pin. 1.3 Connectors and Signal assignment	A. Yokota		J. Chida
4th	16th Jan. 2015	Descriptions of additional commands (Acceptance Level setting CMD) were added to the below chapter. 2.1 List of Commands / Response 3.1 Effective Commands for equipment state 4.15 Acceptance Level Setting CMD [76] Spec. of Reset operation was modified. 3.1 Effective Commands for equipment state 4.1 Reset CMD [30] 6.1.1 Description of equipment state 7. Command/Response sequence chart	A. Yokota		J. Chida
5th	3rd Feb. 2015	6.1.1 Description of Equipment state (Page 46) "After power-on" state was more described.	A. Yokota		J. Chida
6th	20th Dec. 2016	Company name was changed. 6.3.2 MONEY CODE (Genuine note) (Page 58) INR 500 and INR 2,000 issued in 2016 were added to the acceptable denominations.	Y. Nagai		A. Yokota

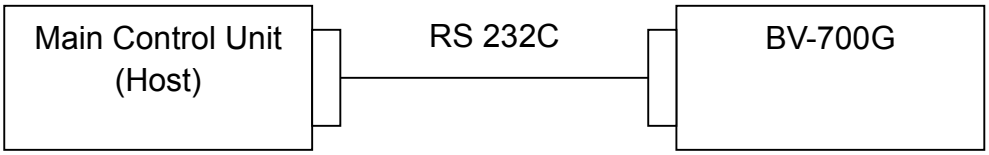
Edition	Date	Contents	APP.	CHK'D	DRAW
7th	14th Nov. 2017	6.3.2 MONEY CODE (Genuine note) (Page 59) INR 50 and INR 200 issued in 2017 were added to the acceptable denominations. Addition of denomination setting by the version	A. Yokota	K.Aizawa	K. Ohashi
8th	22th Jun. 2018	6.3.2 MONEY CODE (Genuine note) (Page 59) INR 10 issued in 2018 was added to the acceptable denominations.	K. Ohashi		K.Aizawa
9th	27th Dec. 2018	6.3.2 MONEY CODE (Genuine note) (Page 59) INR 100 issued in 2018 was added to the acceptable denominations.	K. Ohashi		K.Aizawa

Contents

1. OUTLINE

1.1 CONNECTING FORM

BV-700G is connected to the main control unit via the serial interface, which conforms to EIA standards RS 232C.
The main control unit serves as the host for BV-700G.



1.2 COMMUNICATION STANDARDS

(1)	Communication procedures	Conforming to Communication Procedure Specifications TZ5-4782
(2)	Interface standards	Conforming to EIA standards RS 232C
(3)	Synchronizing system	Start-stop synchronous system
(4)	Baud Rate	9,600 / 19,200 / 38,400 / 57,600 / 115,200 bps (Selection by DIP-Switch setting)
(5)	Communication system	Half-duplex
(6)	Control system	Contention system Priority of the master station is the main control unit.
(7)	Error detection	Horizontal (even) /vertical (even) parity system
(8)	Bit configuration / Outgoing direction	Lower bit preceding

<<<	ST	D0	D1	D2	D3	D4	D5	D6	D7	P	SP

ST	Start bit	1bit
D0-D7	Data bits	8bits
P	Parity bit	1bit
SP	Stop bit	1bit

1.3 CONNECTORS AND SIGNAL ASSIGNMENT

D-SUB 9-pin connector (female) on the BV-700G side

Terminal (Pin No.)	Signal		Signal name and function
	Symbol	Direction	
1	--	--	No used
2	RxD	Host << BV	Received data (sent from BV-700G)
3	TxD	Host >> BV	Transmitted data (sent from Host)
4	--	--	No used
5	SG	Host -- BV	Signal ground
6	--	--	No used
7	--	--	No used
8	--	--	No used
9	--	--	No used

1.4 SWITCH SETTING

SW1 (on 62CNT-B PCB)

	1	2	3	4	5	6	7	8
ON								
OFF	O	O	O					O

7	Manual Renewal (*1)
ON	Immediate change
OFF	Time switched change

4	5	6	Baud Rate
OFF	OFF	OFF	9,600 bps
OFF	OFF	ON	19,200 bps
OFF	ON	OFF	38,400 bps
OFF	ON	ON	57,600 bps
ON	OFF	OFF	115,200 bps
ON	OFF	ON	Prohibition (*2)
ON	ON	OFF	
ON	ON	ON	

(*1) Using the RENEW DOWNLOADED DATA command

- Immediate change:
  The new program is applied immediately after this command.
- Time switched change:
  The new program id applied at the specified time and date.

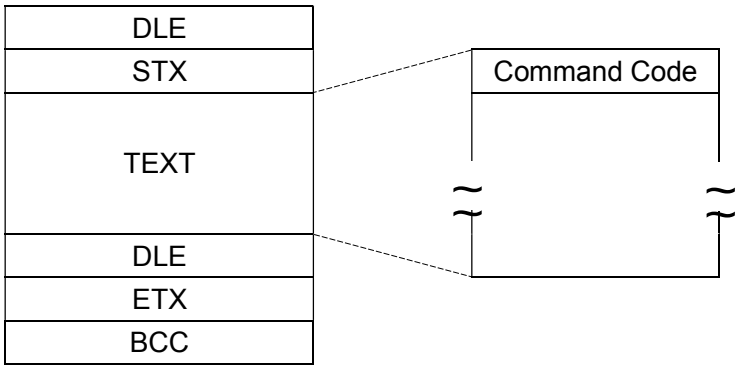
Refer to TZ5-8973 (Downloading Specifications).

(*2) Under these setting, the baud rate is fixed at 9,600 bps.

1.5 DATA BLOCK FORMAT

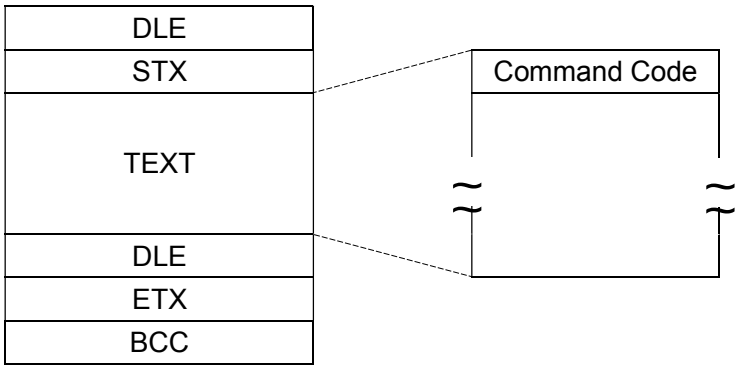
1.5.1 COMMAND (CMD)

Format is described in Communication Procedure Specifications TZ5-4782.



1.5.2 RESPONSE (RSP)

Format is described in Communication Procedure Specifications TZ5-4782.



2. LIST OF COMMANDS / RESPONSES

2.1 LIST OF COMMANDS / RESPONSES

After the specified command has been executed, a response is sent out.

Command Code	Command Name	Outline of Command Function
30	RESET	BV is initialized.
40	SENSE	State of the BV is acquired.
50	INSERTION AUTHORIZED	Money type received is indicated, where insertion of notes is authorized.
51	INSERTION INHIBITED	Insertion of notes is inhibited.
52	RECEIPT	Notes at escrow position are carried to the free-fall box.
53	RETURN	Notes at escrow position are carried to the outlet.
54	INTAKE	Notes at the outlet in receiving wait condition is taken into the free-fall box.
55	ESCROW	A note which is judged as a genuine is carried to the escrow position.
56	REJECT	A note which is judged as a genuine is returned to the outlet.
70	MEMORY TRANSFER	Various transaction data held in the BV are transferred.
71	MEMORY ERASE	Various transaction data held in the BV are erased.
72	YEAR/MONTH/DAY/HOUR /MIN. (DATE) TRANSFER	Year/month/day/hour/minute (date) data held in the BV are transferred.
73	YEAR/MONTH/DAY/HOUR /MIN. (DATE) SETTING	Year/month/day/hour/minute (date) data held in the BV are set.
74	YEAR/MONTH/DAY/HOUR /MIN. (DATE) ADDITION	Year/month/day/hour/minute (date) data are added to all responses.
76	ACCEPTANCE LEVEL SETTING	Changing the acceptance level.

Download command refer to TZ5-8973 (Downloading Specifications) for the details.

Command Code	Command Name	Outline of Command Function
78	DOWNLOAD DATA	Download the BV programs and validate data with the fixed format.
79	RENEW Downloaded Data	Renew the BV programs & data, then appoint the restarting
7A	RESPONSE Download Version	Response the information of the controlled version on the Downloaded programs & data.
7B	DOWNLOAD Init	Initialization for the updating software.

2.2 LIST OF RESPONSES

When the status and/or the number of escrow notes have been changed, a response is sent out though no command from host.

Command Code	Command Name	Outline of Command Function
80	Change in State and/or No. of Escrow notes	Change in Equipment state and/or the number of escrow notes is indicated.

3. EFFECTIVE COMMANDS FOR EQUIPMENT STATE

3.1 EFFECTIVE COMMANDS FOR EQUIPMENT STATE

(1/2)

Equipment State (Detail)			Command														
Equipment state	Status Code	Escrow Yes/No	Reset [30]	Sense [40]	Authorized [50]	Inhibited [51]	Receipt [52]	Return [53]	Intake [54]	Escrow [55]	Reject [56]	Memory Transfer [70]	Memory Erase [71]	Date Transfer [72]	Date Setting [73]	Date Addition [74]	Acceptance Level [76]
After Power-on	1-[00]	N	O	O													
		Y	O	O													
In RESET operation	1-[01]	N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
STAND-BY	1-[02]	N		O	O	O						O	O	O	O	O	O
	1-[12]	Y		O	O	O	O	O						O			
Ready for insertion	1-[03]	N		O	O	O								O			
	1-[13]	Y		O	O	O	O	O						O			
In VALIDATION operation	1-[04]	N		O										O			
		Y		O										O			
Acceptance a note	1-[05]	N		O	Δ	Δ				O	O			O			
		Y		O	Δ	Δ				O	O			O			
In RECEIPT operation	1-[06]	N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
In RETURN operation	1-[07]	N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
In REJECTION operation	1-[08]	N	_	O	Δ	Δ	_	_	_	_	_	_	_	O	_	_	
		Y	_	O	Δ	Δ	_	_	_	_	_	_	_	O	_	_	
Waiting to be received: Reject	1-[09]	N		O	Δ	Δ								O			
		Y		O	Δ	Δ								O			
Waiting to be received: Return	1-[0A]	N															
		Y		O	Δ	Δ			O					O			
In INTAKE operation	1-[0B]	N															
		Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
In ESCROW operation	1-[0C]	N	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
		Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Remaining Escrow notes	1-[0D]	N															
		Y		O			O	O				O		O			
Sensor trouble	1-[80]	N		O								O		O			
		Y		O								O		O			
Alarm	1-[81]	N	O	O								O		O			
		Y	O	O								O		O			

Regarding the details for the equipment state, see item 6.1.1.

(2/2)

Equipment State (Detail)			Command			
Equipment state	Status Code	Escrow Yes/No	DLD [78] *1	RND [79] *1	RDV [7A] *1	DLI [7B] *1
After Power-on	1-[00]	N				
		Y				
In RESET operation	1-[01]	N	X	X	X	X
		Y	X	X	X	X
STAND-BY	1-[02]	N		O	O	O
	1-[12]	Y		O	O	O
Ready for insertion	1-[03]	N		O	O	O
	1-[13]	Y		O	O	O
In VALIDATION operation	1-[04]	N		O		
		Y		O		
Acceptance a note	1-[05]	N		O	Δ	Δ
		Y		O	Δ	Δ
In RECEIPT operation	1-[06]	N	X	X	X	X
		Y	X	X	X	X
In RETURN operation	1-[07]	N	X	X	X	X
		Y	X	X	X	X
In REJECTION operation	1-[08]	N	_	O	Δ	Δ
		Y	_	O	Δ	Δ
Waiting to be received: Reject	1-[09]	N		O	Δ	Δ
		Y		O	Δ	Δ
Waiting to be received: Return	1-[0A]	N				
		Y		O	Δ	Δ
In INTAKE operation	1-[0B]	N				
		Y	X	X	X	X
In ESCROW operation	1-[0C]	N	X	X	X	X
		Y	X	X	X	X
Remaining Escrow notes	1-[0D]	N				
		Y				
Sensor trouble	1-[80]	N		O		
		Y		O		
Alarm	1-[81]	N	O	O		
		Y	O	O		

Regarding the details for the equipment state, see item 6.1.1.

※1 DLD・・・DOWNLOAD DATA Command
RND・・・RENEW Downloaded Data Command
RDV・・・RESPONSE Download Version Command
DLI ・・・DOWNLOAD Initial Command

- O mark: The command processing specified is executed.
  The response, after the specified processing has been executed, is sent out.

- No mark: The command is invalid.
  The response sets the alarm in Status to (Command unexecutable (2-[01]) and posts command invalidity.

- Δ mark: On completion of currently executed operation, the command processing specified is executed. The response is sent out even if the current operation is not been completed. (The response is sent out when the memory inisde the BV unit controlling the processing has been changed.)

- x mark: No command is accepted. Processing specified is not executed.
  Acknowledge to Selecting (ENQ) from the host is made EOT.

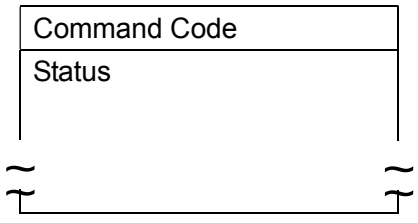
~~- # mark: No command is accepted. Processing specified is not executed.While in reset operation following supply of power, this is treated in the same way as no mark.~~
~~While in reset operation by "Reset CMD", this is treated in the same way as X mark.~~

- O mark: While in operation by self-judgement, this is treated in the same way as O mark.
  While in operation by "Reject CMD", this is treated in the same way as X mark.

- Δ mark: While in operation by self-judgement, this is treated in the same way as Δ mark.
  While in operation by "Reject CMD", this is treated in the same way as X mark.

- _ mark: While in operation by self-judgement, this is treated in the same way as “no” mark.
  While in operation by "Reject CMD", this is treated in the same way as X mark.

- Undefined command
  Data format following a command is wrong
  The command is made invalid. Processing specified is not executed.
  As the response, Status is added to the command code.
  In-Status alarm is set to (Command unexecutable (2-[01]) and invalidity is posted.



(NOTE)

(1) The BV does not accept a command until a response for the command isreceived by the host. The acknowledge from the host to Selecting (ENQ), therefore, becomes a negative acknowledge (EOT).

(2) A response is erased in the following cases:
- No acknowledge is made from the host concerning Selecting (ENQ) from the BV.
- A negative acknowledge is made from the host concerning Selecting (ENQ) from the BV.
- No acknowledge is made from the host after text has been sent from the BV.
- A negative acknowledge (NAK) is made from the holst after text has been sent fromthe BV.

In the above state, when no change takes place by the BV having repeatedre-sending by the specified number of times, transmission is terminated with EOT sent by the BV.

(3) The BV, following affirmative acknowledge (DLE1) from the host to the text, executes processing as following the command.

3.2 RUN TIME FOR EACH COMMAND

Max. 20 seconds
(Time length required from receipt of a command to sending of a response for the command)

4. DETAILS OF COMMANDS/RESPONSES

4.1 RESET CMD [30]

4.1.1 COMMAND

1	Command Code	[30]

4.1.2 CONTENT

(1) Initializes the BV.
(2) Cancels the alarm state.
(3) Throws a certain or rejected note out if it remains in the acceptor module.
(4) Keeps the Escrow notes if they remain at the escrow position.

4.1.3 RESPONSE

1	Command Code	[30]
2	Status	
≈	See item 6.1.	≈

4.1.4 CONTENT

(1) On completion of reset operation, a response is sent out.
(2) Equipment State (Status):
On normal ending without any notes {Standby (1-[02])}
On normal ending with Escrow notes {Remaining Escrow notes (1-[0D])}
On fault ending {While in sensor trouble (1-[80])}
On abnormal ending {While in alarm (1[81])}

4.2 SENSE CMD [40]

4.2.1 COMMAND

1	Command Code	[40]

4.2.2 CONTENT

(1) Requests state data of the BV.

(2) No change takes place in Equipment state in Status of response when this command has been processed.

4.2.3 RESPONSE

1	Command Code	[40]
2	Status	
	See item 6.1.	
3	Sensor State	
	See item 6.2.	
4	No. of Escrow Notes	
	See item 6.3.	

4.2.4 CONTENT

(1) In addition to Equipment state (Status), the data concerning sensor state and the number of "Escrow" notes are added.

4.3 INSERTION AUTHORIZING CMD [50]

4.3.1 COMMAND

1	Command Code [50]
2	Acceptable money code assignment data
3	Ditto

Acceptable Money Type Assignment Data [01] - [0F]:

	D7	D6	D5	D4	D3	D2	D1	D0
2	[08]	[07]	[06]	[05]	[04]	[03]	[02]	[01]
3	---	[0F]	[0E]	[0D]	[0C]	[0B]	[0A]	[09]

1 = Authorized
0 = Inhibited
--- Blank (don't care)

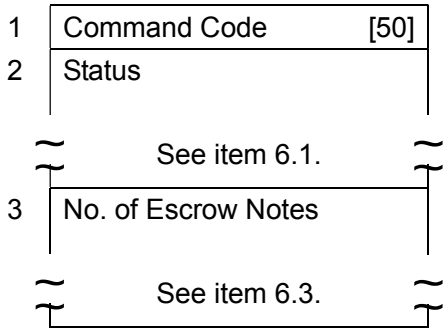
4.3.2 CONTENT

(1) Sets and authorizes acceptable notes by money code.

(2) No taking-in nor identifying operation is performed in the following cases even with notes are placed at the inlet:
- All money codes are inhibited by received money type assignment data.
- Current number of "Escrow" notes is 20.

(3) When only a part of money code has been inhibited for acceptance, those except the ones having been authorized are returned to the inlet or outlet according to results identified.

4.3.3 RESPONSE



4.3.4 CONTENT

(1) On receiving of this command while in Standby (1-[02] or [12]), Equipment state of Status is made Ready for insertion (1-[03] or [13]).

In the following case, however, as "Insertion Authorizing CMD" function is invalid, and Equipment state of Status remains in Standby (1-[02] or [12]).
- Receiving of all money codes are inhibited by Acceptable money type assignment data.
- The current number of "Escrow" notes is 20.

(2) When this command has been received in Δ-marked Equipment state among effective commands for item 3 Equipment states, the Equipment state (Status) indicates in-execution.

4.4 INSERTION INHIBITING CMD [51]

4.4.1 COMMAND

1	Command Code	[51]

4.4.2 CONTENT

(1) Inhibited notes regardless of money code.

(2) BV does not take in notes placed at the inlet, where no identifing operation is performed.

4.4.3 RESPONSE

1	Command Code	[51]
2	Status	
~	See item 6.1.	~
3	No. of Escrow Notes	
~	See item 6.3.	~

4.4.4 CONTENT

(1) When this command has been received in Ready for insertion (1-[03] or [13]), Equipment state (Status) is made Standby (1-[02] or [12]).

(2) When this command has been received in Δ-marked Equipment state among effective commands for item 3 Equipment states, Equipment states (Status) indicates in-execution.

4.5 RECEIPT CMD [52]

4.5.1 COMMAND

1	Command Code	[52]

4.5.2 CONTENT

(1) On receiving of "Receipt CMD", the BV takes in notes at the "Escrow" position into the free-fall box .

(NOTE) "[80] State and/or No. of Escrow notes Change RSP" which indicates shift into intake operation by receipt of the command is not sent out.

4.5.3 RESPONSE

1	Command Code	[52]
2	Status	
	≈ See item 6.1. ≈	
3	Fixed at [FF]	
4	Fixed at [FF]	
5	No. of Escrow Notes (= Received Notes)	
	≈ See item 6.3. ≈	

4.5.4 CONTENT

(1) A response is sent out after command processing ends on completion of receiving operation into the free-fall box.
With normal ending, following sending of a response, the number of "Escrow" notes is cleared.

(2) Equipment state (Status): On normal ending {Standby (1-[02])}
On abnormal ending {While in alarm (1-[81])}

4.6 RETURN CMD [53]

4.6.1 COMMAND

1	Command Code	[53]

4.6.2 CONTENT

(1) The BV, on receipt of "Return CMD", carries notes at "Escrow" position to the outlet.

(NOTE) "[80] State and/or No. of Escrow notes Change RSP" which indicates shift into return operation by receipt of the command is not sent out.

4.6.3 RESPONSE

1	Command Code	[53]
2	Status	
~	See item 6.1.	~
3	No. of Escrow Notes (= Returned Notes)	
~	See item 6.3.	~

4.6.4 CONTENT

(1) A response is sent out after command processing ends when conveyance to the outlet has been completed and state ready to receive is created.

(2) Equipment State (Status): On normal ending {Ready to receive notes (Outlet)(1-[0A])}
On abnormal ending {While in alarm (1-[81])}

(3) No. of "Escrow" notes makes no change from that in the data held in "Escrow" position.

4.7 INTAKE CMD [54]

4.7.1 COMMAND

1	Command Code	[54]

4.7.2 CONTENT

(1) On receiving of "Intake CMD", the BV takes in notes, which are held at the outlet as being left, into the free-fall box.

(NOTE) "[80] State and/or No. of Escrow notes Change RSP" which indicates shift into intake operation by receipt of the command is not sent out.

4.7.3 RESPONSE

1	Command Code	[54]
2	Status	
~	See item 6.1.	~
3	Fixed at [FF]	
4	Fixed at [FF]	
5	No. of Escrow Notes (= Received Notes)	
~	See item 6.3.	~

(NOTE) The notes, before taking-in above mentioned takes place, have been conveyed to the outlet. Therefore, if a part of them are taken out by your customer, the actual number of notes in the free-fall box can be different from that held in these logging data.

4.7.4 CONTENT

(1) A response is sent out after command processing ends on completion of receiving operation into the free-fall box.
With normal ending, following sending of a response, the number of "Escrow" notes is cleared.

(2) Equipment state (Status): On normal ending {Standby (1-[02])}
On abnormal ending {While in alarm (1-[81])}

4.8 MEMORY TRANSFER CMD [70]

4.8.1 COMMAND

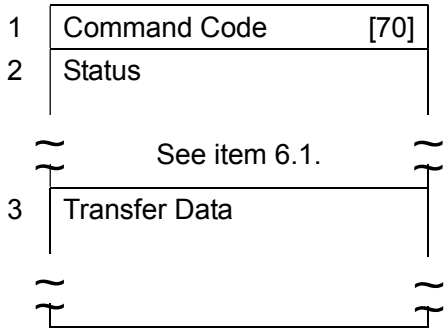
1	Command Code [70]
2	Transfer assignment data
3	Ordinal number of times of transfer

4.8.2 CONTENT

According to "Transfer assignment data", "Ordinal number of times of transfer" of the retained data is transferred.

Transfer Assignment Data	Ordinal No. of Times of Transfer	Details of Transferred Data	Remarks
[10]	[00] – [31]	Alarm occurrence history (latest -- 49 times before)	See 4.8.5.
[20]	[00] – [31]	Sensor trouble occurrence history (latest -- 49 times before)	See 4.8.6.
[30] – [3E]	[00] – [63]	Identification results (latest -- 1499 times before)	See 4.8.7.
[50]	[00] – [31]	Intake history (latest -- 49 times before)	See 4.8.8.
[60]	[00] – [0B], [0F]	Monthly aggregated data [alarm] (latest --11 month ago, aggregate)	See 4.8.9.
[70]	[00] – [0B], [0F]	Monthly aggregated data [accept] (latest --11 month ago, aggregate)	See 4.8.10.
[80]	[00] – [0B], [0F]	Monthly aggregated data [receipt] (latest --11 month ago, aggregate)	See 4.8.11
[90]	[00] – [0B], [0F]	Monthly aggregated data [return] (latest --11 month ago, aggregate)	See 4.8.12.
[A0]	[00] – [0B], [0F]	Monthly aggregated data [intake] (latest --11 month ago, aggregate)	See 4.8.13.
[B0]	[00] – [0B], [0F]	Monthly aggregated data [sensor trouble] (latest --11 month ago, aggregate)	See 4.8.14.
[C0]	[00] – [0B], [0F]	Monthly aggregated data [rejection] (latest --11 month ago, aggregate)	See 4.8.15.
[F0]	[00]	Information for transfer	See 4.8.16.

4.8.3 RESPONSE



4.8.4 CONTENT

(1) Transfers "Logging" data having been specified.

(2) On receiving of assigned transfer data which are undefined or undefined transfer time, a response is sent out without transfer data being added.

4.8.5 ALARM OCCURRENCE HISTORY DATA (For the past 50 times)

CONTENT

(1) On occurrence of an alarm in the BV, the following data are retained. (Per time)
(2) Amount of logging data concerning alarm is up to 50 times. When the number of times of occurrence has exceeded it, the oldest alarm data are erased.
(3) According to the transfer assigned data and the transfer time, alarm occurrence history data for the assigned time are sent out in response.
Transfer time [00]: latest – [31]: 49 times before
(4) Data capacity for one alarm is equal to 32 bytes.

Order	Content of logging data	Capacity byte	Break-down	Details	
1	Lower 2 digits of alarm code	1	1	Lower 2 digits of Alarm Code (E3_ _) [00] – [FF] For details, see the maintenance manual	
2	Year/ month/ day/ hour / minute of occurrence	5	2	Minute [00] – [59]	
			3	Hour [00] – [23]	
			4	Day [01] – [31]	
			5	Month [01] – [12]	
			6	Year [00] – [99] (Lower 2 digits)	
3	Code of money type, which caused alarm	1	7	See item 6.3. - On occurrence of alarm while in Escrow operation. >>> [01] -- [0F] - On occurrence of alarm when notes are being rejected. >>> [81] – [8F]	
4	Fixed at [FF]	2	8	[FF]	
			9	[FF]	
5	Sensor state	3	10	See item 6.2 Sensor state.	
			11		
			12		
6	Number of accepted notes after occurrence of this alarm	3	13	Lower digit (L)	Number of notes is indicated by 3 Bytes HEX data.
			14	Middle digit (M)	
			15	Higher digit (H)	
7	Return hour/minute by auto resetting	2	16	Minute [00] – [59]	
			17	Hour [00] – [23]	
8	No. of Escrow notes	15	18 – 32	See item 6.3	

- Number of accepted notes after occurrence of this alarm:
Number of notes which are through normal Escrow operation after occurrence of this alarm.

4.8.6 SENSOR TROUBLE OCCURRENCE DATA (For the past 50 times)

CONTENT

(1) On occurrence of a sensor trouble in the BV, the data of the following table are retained. (Per time)

(2) When two or more sensor troubles have occurred simultaneously, the first one detected is retained.

(3) Amount of logging data concerning sensor troubles is up to for 50 times. When the number of occurrence has exceeded it, the oldest sensor trouble data are erased.

(4) According to the transfer assigned data and the transfer time, the sensor trouble data covering one time of occurrence are sent out as the response.
Transfer time [00]: latest – [31]: 49 times before

(5) Data capacity covering one sensor trouble is equal to 10 bytes.

Order	Content of logging data	Capacity byte	Break-down	Details
1	Sensor trouble code	1	1	For details, see the maintenance manual
2	Year/ month/ day/ hour / minute of occurrence	5	2	Minute [00] – [59]
			3	Hour [00] – [23]
			4	Day [01] – [31]
			5	Month [01] – [12]
			6	Year [00] – [99] (Lower 2 digits)
3	Equipment state	1	7	See item 6.1.1 Equipment state.
4	Sensor state	3	8	See item 6.2 Sensor state.
			9	
			10	

4.8.7 IDENTIFICATION RESULTS DATA (For the past 1500 times)

CONTENT

(1) When result of judgment for identification has been given for the notes having been inserted into the BV, the data of the following table are retained. (Per time)

(2) Amount of logging data concerning identification result is up to 1500 times. When the number of times of insertion has exceeded it, the oldest identification result data are erased.

(3) According to the transfer assigned data and the transfer time, the identification result data covering one occurrence having been assigned are sent out in response.

Transfer Assigment Data
[30] latest -- 99 times before
[31] 100 times before -- 199 times before
[32] 200 times before -- 299 times before
:
[3E] 1400 times before -- 1499 times before

Transfer time e.x.
[00] xx00 times before
:
[63] xx99 times before

(4) Data capacity covering one time of identification result is equal to 6 bytes.

Order	Content of logging data	Capacity byte	Break-down	Details
1	Identification result	1	1	See item 6.3.
2	Year/ month/ day/ hour / minute of occurrence	5	2	Minute [00] – [59]
			3	Hour [00] – [23]
			4	Day [01] – [31]
			5	Month [01] – [12]
			6	Year [00] – [99] (Lower 2 digits)

4.8.8 INTAKE DATA (For the past 50 times)

CONTENT

(1) On normal completion of intake operation, the BV retains data of the following table. (Per time)
(2) Amount of logging data concerning intake is up to 50 times. When the number of times has exceeded it, the oldest intake data are erased.
(3) According to the transfer assigned data and the transfer time, intake history data for one occurrence having been assigned are set out in response.
Transfer time [00]: latest – [31]: 49 times before
(4) Data capacity covering one time of intake history is equal to 22 bytes.

Order	Content of logging data	Capacity byte	Break-down	Details
1	Fixed at [FF]	2	1	[FF]
			2	[FF]
2	Year/ month/ day/ hour / minute of occurrence	5	3	Minute [00] – [59]
			4	Hour [00] – [23]
			5	Day [01] – [31]
			6	Month [01] – [12]
			7	Year [00] – [99] (Lower 2 digits)
3	Escrow notes	15	8 – 22	See item 6.3

(NOTE) The above notes are those which have been already conveyed to the outlet.
In case that a customer has taken away some of them, therefore, the number of notes in the free-fall box can produce discrepancy with that of these data.

4.8.9 MONTHLY AGGREGATED DATA [ALARM]

CONTENT

(1) On occurrence of alarm in the BV, the cumulative total number of times of occurrence for each code is retained.

(2) According to the transfer assigned data and the transfer time, the the aggregated data for alarms for the assigned month are sent out in response.
Transfer time [00]: latest month, [01]: 1 month before, - - - - , [0B]: 11 month before, [0F]: cumulative total

(3) Data capacity of monthly aggregated data [Alarm] is equal to 130 bytes.

Order	Content of logging data	Capacity byte	Break-down	Details
1	Month for aggregation	2	1	Year [00] – [99], [FF]* (Lower 2 digits)
			2	Month [01] – [12], [FF]*
2	Number of times of occurrence for each alarm code	128	3 –130	7 ---------- 0 E3xx (L) E3xx (H) By 2 bytes HEX data See below.

*Year / Month data on aggregation are [FF].

- Number of times of occurrence for each alarm code

Break-down	Alarm Code	Break-down	Alarm Code	Break-down	Alarm Code	Break-down	Alarm Code
3, 4	Vacant	35, 36	E323	67, 68	Vacant	99,100	Vacant
5, 6	Vacant	37, 38	E324	69, 70	Vacant	101,102	E365
7, 8	Vacant	39, 40	E330	71, 72	E350	103,104	E366
9, 10	Vacant	41, 42	E331	73, 74	E351	105,106	E367
11, 12	Vacant	43, 44	E332	75, 76	E352	107,108	Vacant
13, 14	E391	45, 46	E333	77, 78	E353	109,110	Vacant
15, 16	E392	47, 48	E334	79, 80	E354	111,112	E370
17, 18	E310	49, 50	E335	81, 82	E355	113,114	E371
19, 20	E311	51, 52	E336	83, 84	E356	115,116	Vacant
21, 22	E312	53, 54	E337	85, 86	Vacant	117,118	Vacant
23, 24	E313	55, 56	E340	87, 88	Vacant	119,120	Vacant
25, 26	Vacant	57, 58	E341	89, 90	Vacant	121,122	Vacant
27, 28	Vacant	59, 60	E342	91, 92	E360	123,124	Vacant
29, 30	E320	61, 62	E343	93, 94	Vacant	125,126	E390
31, 32	E321	63, 64	E344	95, 96	Vacant	127,128	E399
33, 34	E322	65, 66	E345	97, 98	Vacant	129,130	Vacant

* As for details of the alarm code, see the maintenance manual.

Vacant: Fixed at 0 (Number of times of occurrence = 0)

4.8.10 MONTHLY AGGREGATED DATA [ACCEPT]

CONTENT

(1) With Escrow operation, the BV retains the aggregate by data of the following table.

(2) According to the transfer assigned data and the transfer time, the the aggregated data for alarms for the assigned month are sent out in response.
Transfer time [00]: latest month, [01]: 1 month before, - - - - , [0B]: 11 month before, [0F]: cumulative total

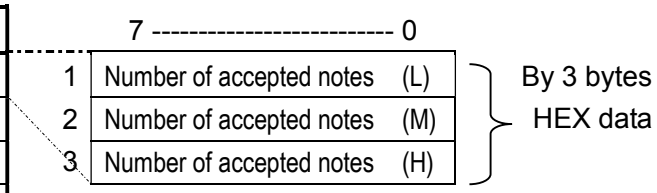
(3) Data capacity of monthly aggregated data [Accept] is equal to 47 bytes.

Order	Content of logging data	Capacity byte	Break-down	Details
1	Month for aggregation	2	1	Year [00] – [99], [FF]* (Lower 2 digits)
			2	Month [01] – [12], [FF]*
2	Number of accepted notes	45	3 – 5	Number of money code [01] See below
			6 – 8	Number of money code [02] See below
			:	:
			42 – 44	Number of money code [0E] See below
			45 – 47	Number of money code [0F] See below

*Year / Month data on aggregation are [FF].

- Number of accepted notes

Break-down	Details
3 – 5	Number of money code [01]
6 – 8	Number of money code [02]
9 – 11	Number of money code [03]
12 – 14	Number of money code [04]
15 – 17	Number of money code [05]
18 – 20	Number of money code [06]
21 – 23	Number of money code [07]
24 – 26	Number of money code [08]
27 – 29	Number of money code [09]
30 – 32	Number of money code [0A]
33 – 35	Number of money code [0B]
36 – 38	Number of money code [0C]
39 – 41	Number of money code [0D]
42 – 44	Number of money code [0E]
45 – 47	Number of money code [0F]



* Undefined money types are fixed at 0.

4.8.11 MONTHLY AGGREGATED DATA [RECEIPT]

CONTENT

(1) On normal completion of either receipt or intake operation, the BV retains the aggregate by data of the following table.

(2) According to the transfer assigned data and the transfer time, the the aggregated data for alarms for the assigned month are sent out in response.
Transfer time [00]: latest month, [01]: 1 month before, - - - - , [0B]: 11 month before, [0F]: cumulative total

(3) Data capacity of monthly aggregated data [Receipt] is equal to 50 bytes.

Order	Content of logging data	Capacity byte	Break-down	Details
1	Month for aggregation	2	1	Year [00] – [99], [FF]* (Lower 2 digits)
			2	Month [01] – [12], [FF]*
2	Number of times of receipt operation	3	3 – 5	See below.
3	Number of received notes	45	6 – 8	Number of money code [01] See below
			9 – 11	Number of money code [02] See below
			:	:
			45 – 47	Number of money code [0E] See below
			48 – 50	Number of money code [0F] See below

*Year / Month data on aggregation are [FF].

- Number of times of receipt operation (including the number of times of intake operation)

7 ---------- 0

1	Number of times (L)	By 3 bytes HEX data
2	Number of times (M)	
3	Number of times (H)	

- Number of received notes

Break-down	Details
6 – 8	Number of money code [01]
9 – 11	Number of money code [02]
12 – 14	Number of money code [03]
:	:
45 – 47	Number of money code [0E]
48 – 50	Number of money code [0F]

7 ---------- 0

1	Number of received notes (L)	By 3 bytes HEX data
2	Number of received notes (M)	
3	Number of received notes (H)	

* Undefined money types are fixed at 0.

4.8.12 MONTHLY AGGREGATED DATA [RETURN]

CONTENT

(1) On normal completion of Return operation, the BV retains the aggregate by data of the following table.

(2) According to the transfer assigned data and the transfer time, the the aggregated data for alarms for the assigned month are sent out in response.
Transfer time [00]: latest month, [01]: 1 month before, - - - - , [0B]: 11 month before, [0F]: cumulative total

(3) Data capacity of monthly aggregated data [Return] is equal to 50 bytes.

Order	Content of logging data	Capacity byte	Break-down	Details
1	Month for aggregation	2	1	Year [00] – [99], [FF]* (Lower 2 digits)
			2	Month [01] – [12], [FF]*
2	Number of times of return operation	3	3 – 5	See below.
3	Number of returned notes	45	6 – 8	Number of money code [01] See below
			9 – 11	Number of money code [02] See below
			:	:
			45 – 47	Number of money code [0E] See below
			48 – 50	Number of money code [0F] See below

*Year / Month data on aggregation are [FF].

- Number of times of return operation

	7 ---------- 0		
1	Number of times	(L)	By 3 bytes HEX data
2	Number of times	(M)	
3	Number of times	(H)	

- Number of returned notes

Break-down	Details
6 – 8	Number of money code [01]
9 – 11	Number of money code [02]
12 – 14	Number of money code [03]
:	:
45 – 47	Number of money code [0E]
48 – 50	Number of money code [0F]

	7 ---------- 0		
1	Number of returned notes	(L)	By 3 bytes HEX data
2	Number of returned notes	(M)	
3	Number of returned notes	(H)	

* Undefined money types are fixed at 0.

4.8.13 MONTHLY AGGREGATED DATA [INTAKE]

CONTENT

(1) On normal completion of intake operation, the BV retains the aggregate by data of the following table.

(2) According to the transfer assigned data and the transfer time, the the aggregated data for alarms for the assigned month are sent out in response.
Transfer time [00]: latest month, [01]: 1 month before, - - - - , [0B]: 11 month before, [0F]: cumulative total

(3) Data capacity of monthly aggregated data [Intake] is equal to 50 bytes.

Order	Content of logging data	Capacity byte	Break-down	Details
1	Month for aggregation	2	1	Year [00] – [99], [FF]* (Lower 2 digits)
			2	Month [01] – [12], [FF]*
2	Number of times of intake operation	3	3 – 5	See below.
3	Number of taken notes	45	6 – 8	Number of money code [01] See below
			9 – 11	Number of money code [02] See below
			:	:
			45 – 47	Number of money code [0E] See below
			48 – 50	Number of money code [0F] See below

*Year / Month data on aggregation are [FF].

- Number of times of intake operation

	7 ---------- 0		
1	Number of times	(L)	By 3 bytes HEX data
2	Number of times	(M)	
3	Number of times	(H)	

- Number of taken notes

Break-down	Details
6 – 8	Number of money code [01]
9 – 11	Number of money code [02]
12 – 14	Number of money code [03]
:	:
45 – 47	Number of money code [0E]
48 – 50	Number of money code [0F]

	7 ---------- 0		
1	Number of taken notes	(L)	By 3 bytes HEX data
2	Number of taken notes	(M)	
3	Number of taken notes	(H)	

* Undefined money types are fixed at 0.

(NOTE) The above notes are those which have been already conveyed to the outlet.
In case that a customer has taken away some of them, therefore, the number of notes in the free-fall box can produce discrepancy with that of these data.

4.8.14 MONTHLY AGGREGATED DATA [SENSOR TROUBLE]

CONTENT

(1) On occurrence of sensor trouble in the BV, the cumulative total number of times of occurrence for each code is retained.

(2) According to the transfer assigned data and the transfer time, the the aggregated data for alarms for the assigned month are sent out in response.
Transfer time [00]: latest month, [01]: 1 month before, - - - - , [0B]: 11 month before, [0F]: cumulative total

(3) Data capacity of monthly aggregated data [Sensor Trouble] is equal to 66 bytes.

Order	Content of logging data	Capacity byte	Break-down	Details
1	Month for aggregation	2	1	Year [00] – [99], [FF]* (Lower 2 digits)
			2	Month [01] – [12], [FF]*
2	Number of times of occurrence for each sensor trouble code	64	3 | 66	7 ---------- 0 Sensor code xx (L) Sensor code xx (H) } By 2 bytes HEX data See below.

*Year / Month data on aggregation are [FF].

- Number of times of occurrence for each sensor trouble code

Break-down	Sensor Code	Break-down	Sensor Code	Break-down	Sensor Code	Break-down	Sensor Code
3, 4	01	19, 20	Vacant	35, 36	17	51, 52	25
5, 6	02	21, 22	Vacant	37, 38	18	53, 54	Vacant
7, 8	Vacant	23, 24	11	39, 40	19	55, 56	Vacant
9, 10	Vacant	25, 26	12	41, 42	Vacant	57, 58	Vacant
11, 12	05	27, 28	13	43, 44	Vacant	59, 60	29
13, 14	Vacant	29, 30	14	45, 46	Vacant	61, 62	Vacant
15, 16	Vacant	31, 32	15	47, 48	23	63, 64	Vacant
17, 18	Vacant	33, 34	16	49, 50	24	65, 66	Vacant

* As for details of the sensor trouble code, see the maintenance manual.

Vacant: Fixed at 0 (Number of times of occurrence = 0)

4.8.15 MONTHLY AGGREGATED DATA [REJECTION]

CONTENT

(1) When a note inserted into the BV has been rejected, the cumulative total number of times of occurrence for each code is retained.

(2) According to the transfer assigned data and the transfer time, the the aggregated data for alarms for the assigned month are sent out in response.
Transfer time [00]: latest month, [01]: 1 month before, - - - - , [0B]: 11 month before, [0F]: cumulative total

(3) Data capacity of monthly aggregated data [Rejection] is equal to 50 bytes.

Order	Content of logging data	Capacity byte	Break-down	Details
1	Month for aggregation	2	1	Year [00] – [99], [FF]* (Lower 2 digits)
			2	Month [01] – [12], [FF]*
2	Number of times of occurrence for each rejection code	48	3 – 50	7 ---------- 0 Reject code xx (L) Reject code xx (M) Reject code xx (H) } By 3 bytes HEX data See below.

*Year / Month data on aggregation are [FF].

- Number of times of occurrence for each sensor trouble code

Break-down	Reject Code	Break-down	Reject Code	Break-down	Reject Code	Break-down	Reject Code
3 – 5	40	15 – 17	44	27 – 29	48	39 – 41	4L
6 – 8	41	18 – 20	45	30 – 32	49	42 – 44	4P / 4t / 4U
9 – 11	42	21 – 23	46	33 – 35	4E	45 – 47	4- / 4d
12 – 14	43	24 – 26	47	36 – 38	4H	48 – 50	Vacant

* As for details of reject code, see the maintenance manual.

Vacant: Fixed at 0 (Number of times of occurrence = 0)

4.8.16 INFORMATION ON TRANSFER

CONTENT

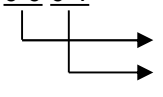
(1) Use this to control the content of other transfer data. Therefore, it is better to transfer these data at the time of data transfer.

(2) Data capacity information on transfer is equal to 21 bytes.

Order	Content of logging data	Capacity byte	Break-down	Details
1	Year/ month/ day/ hour / minute of transfer	5	1	Minute [00] – [59]
			2	Hour [00] – [23]
			3	Day [01] – [31]
			4	Month [01] – [12]
			5	Year [00] – [99] (Lower 2 digits)
2	Year/ month/ day/ hour / minute of last “Clear”	5	6	Minute [00] – [59]
			7	Hour [00] – [23]
			8	Day [01] – [31]
			9	Month [01] – [12]
			10	Year [00] – [99] (Lower 2 digits)
3	Completion date of inspection of BV by manufacturer	3	11	Day [01] – [31]
			12	Month [01] – [12]
			13	Year [00] – [99] (Lower 2 digits)
4	BNA ID No. (*1)	4	14	7 ---------- 0 BNA ID No. [00] – [99] (H)
			15	BNA ID No. [00] – [99] (L)
			16	Vacant
			17	Vacant
5	ROM Version	4	18	7 ---------- 0 Validation digit (H) (ASCII)
			19	Validation digit (L) (ASCII)
			20	Mechanical control digit (H) (ASCII)
			21	Mechanical control digit (L) (ASCII)

(*1) BNA ID No. shows the last 4 digits of the serial number.

Example) Serial number of the unit = 0 0 0 0 1



BNA ID No. is memorized in the memory on 62CNT-B PCB. When this PCB will be supplied as a spare part, the factory default number 00 00 is set it.

4.9 MEMORY ERASING CMD [71]

4.9.1 COMMAND

1	Command Code	[71]

4.9.2 CONTENT

(1) Erases various transaction data retained in the BV.

4.9.3 RESPONSE

1	Command Code	[71]
2	Status	
≈	See item 6.1.	≈

4.9.4 CONTENT

(1) Notifies of erasure of data retained in the BV.

4.10 YEAR/MONTH/DAY/HOUR/MIN. TRANSFER CMD [72]

4.10.1 COMMAND

1	Command Code	[72]

4.10.2 CONTENT

(1) Transfers the current year / month / day / hour / minute data being retained.

4.10.3 RESPONSE

1	Command Code	[72]
2	Status	
≈	See item 6.1.	≈
3	Minute	[00] – [59]
4	Hour	[00] – [23]
5	Day	[01] – [31]
6	Month	[01] – [12]
7	Year (Lower 2 digits)	[00] – [99]

4.10.4 CONTENT

(1) Transfers the current year / month / day / hour / minute data being retained.

4.11 YEAR/MONTH/DAY/HOUR/MIN. SETTING CMD [73]

4.11.1 COMMAND

1	Command Code	[73]
2	Minute	[00] – [59]
3	Hour	[00] – [23]
4	Day	[01] – [31]
5	Month	[01] – [12]
6	Year (Lower 2 digits)	[00] – [99]

4.11.2 CONTENT

(1) Year / month / day / hour / minute data being retained are set.

(NOTE) Do not set a year / month / day / hour / minute not existing.

4.11.3 RESPONSE

1	Command Code	[73]
2	Status	
≈	See item 6.1.	≈

4.11.4 CONTENT

(1) Notifies of setting of the year / month / day / hour / minute data being retained.

4.12 YEAR/MONTH/DAY/HOUR/MIN. ADDING CMD [74]

4.12.1 COMMAND

1	Command Code	[74]

4.12.2 CONTENT

(1) Adds, at the end of each response, the year / month / day / hour / minute data on sending of the following responses:

1	Minute	[00] – [59]
2	Hour	[00] – [23]
3	Day	[01] – [31]
4	Month	[01] – [12]
5	Year (Lower 2 digits)	[00] – [99]

(NOTE 1) This setting allows no addition of year / month / day / hour / minute data after power is supplied.

(NOTE 2) Year / month / day / hour / minute data are added to the year / month / day / hour / minute transfer RSP.

(NOTE 3) When this CMD is executed in "Addition" setting, the setting is changed into "No Addition".

(Example of Addition Response)

When response sending to the Reset CMD is 23:45, 1st of February, 2009:

1	Command Code	[30]
2	Status	
≈	See item 6.1.	≈
3	Minute	[45]
4	Hour	[23]
5	Day	[01]
6	Month	[02]
7	Year (Lower 2 digits)	[09]

4.12.3 RESPONSE

- This CMD executed in "No Addition" setting:

1	Command Code	[74]
2	Status	
	See item 6.1.	
3	Minute	[00] – [59]
4	Hour	[00] – [23]
5	Day	[01] – [31]
6	Month	[01] – [12]
7	Year (Lower 2 digits)	[00] – [99]

(Ex.)
Sending of this response, at 23:45, 1st of February, 2008

3	[45]
4	[23]
5	[01]
6	[02]
7	[08]

- This CMD executed in "Add" setting:

1	Command Code	[74]
2	Status	
	See item 6.1.	

4.12.4 CONTENT

(1) Notifies of setting to add year / month / day / hour / minute data.

4.13 ESCROW CMD [55]

4.13.1 COMMAND

1	Command Code	[55]

4.13.2 CONTENT

(1) The BV, on receipt of "Escrow CMD", carries a note, which is inserted and judged as genuine, to "Escrow" position.

(NOTE) "[80] State and/or No. of Escrow notes Change RSP" which indicates shift into escrow operation by receipt of the command is not sent out.

4.13.3 RESPONSE

1	Command Code	[55]
2	Status	
	~ See item 6.1. ~	
3	No. of Escrow Notes	
	~ See item 6.3. ~	

4.13.4 CONTENT

(1) A response is sent out after command processing ends.

(2) Equipment State (Status): On normal ending {Standby with Escrow note (1-[12])}
On abnormal ending {While in alarm (1-[81])}

(3) No. of "Escrow" notes makes no change from that in the data held in "Escrow" position.

4.14 REJECT CMD [56]

4.14.1 COMMAND

1	Command Code	[56]

4.14.2 CONTENT

(1) The BV, on receipt of "Reject CMD", returns a note, which is inserted and judged as genuine, to the outlet.

(NOTE) "[80] State and/or No. of Escrow notes Change RSP" which indicates shift into rejection operation by receipt of the command is not sent out.

4.14.3 RESPONSE

1	Command Code	[56]
2	Status	
	~ See item 6.1. ~	
3	No. of Escrow Notes	
	~ See item 6.3. ~	

4.14.4 CONTENT

(1) A response is sent out after command processing ends.

(2) Equipment State (Status): On normal ending {Standby (1-[02]) or (1-[12])}
On abnormal ending {While in alarm (1-[81])}

(3) No. of Escrow notes:
Appropriate money code is counted down, since it was already counted as Escrow notes when the status changed to {Acceptance a note (1-[05]}.

4.15 ACCEPTANCE LEVEL SETTING CMD [76]

4.15.1 COMMAND

1	Command Code	[76]
2	Acceptance Level	[01] – [04]

4.15.2 CONTENT

(1) The host can change the acceptance level of the BV by this command.

(NOTE) Do not sent the value other than the above ([01] – [04]).

4.15.3 RESPONSE

1	Command Code	[76]
2	Status	
	≈ See item 6.1. ≈	
3	Acceptance Level	

4.15.4 CONTENT

(1) The BV returns the acceptance level after receiving the command.

(NOTE) If an invalid value (level) is sent from the host, the BV keeps and informs the level before receiving that command.

After the power supply is on, the acceptance level is set according the switch setting.
* As for details of the switch setting, see the maintenance manual.

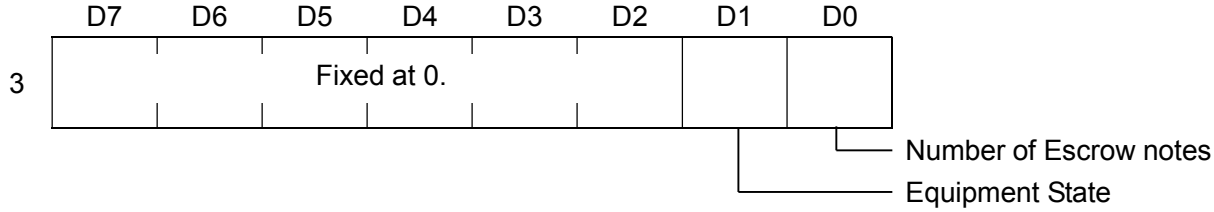
5. DETAILS OF RESPONSES

5.1 CHANGE RSP for State and/or No. of Escrow notes [80]

5.1.1 RESPONSE

1	Command Code	[80]
2	Status	
	≈ See item 6.1. ≈	
3	Detail of Change data See below.	
4	No. of Escrow Notes	
	≈ See item 6.3. ≈	

- Detail of Change data



D1 = 0: No change of Equipment State.
D1 = 1: Equipment State has been changed.

D0 = 0: No change of number of Escrow notes.
D0 = 1: Number of Escrow notes has been changed (= added).

5.1.2 CONTENT

(1) Regardless of commands, notifies of change in State and/or No. of Escrow notes.

6. DESCRIPTION OF RESPONSES

6.1 STATUS

Order	Content of logging data	Capacity byte	Break-down	Details
1	Equipment State	1	1	See item 6.1.1.
2	Warning	1	2	See item 6.1.2.
3	Code	1	3	(1) On occurrence of alarm (State [81]): Alarm code lower 2 digits (2) On occurrence of sensor trouble (State [80]): Sensor trouble code (3) Other than listed above: Fixed at [00] See Item 6.1.3.
4	Model Code	1	4	[0D] = BV-700G (reference) [03] = BV-6810G

6.1.1 DESCRIPTION OF EQUIPMENT STATE

(1/7)

Data	Equipment State	Details for State and Next Transition
1-[00]	After power-on	On supply of power, the BV opens the serial communication circuit after the initialization of the peripheral LSIs and checking memory. After receiving “Reset CMD”, the state moves into {In reset operation (1-[01])}. NOTE: (1) The BV can receive “Sense CMD” under this state, however, the sensor state and the number of the Escrow notes in ”Sense RSP” are uncertainly value. (2) If the host sends ENQ to the BV before opening the circuit of communication, BV returns no answer. In this case, the host should not judge that the BV has error condition.
1-[01]	In reset operation	~~Receiving of notes remaining in Escrow position or notes held in the free fall box.~~ When there is no remaiming notes on the transportation area, the mechanical initialization is executing, and after the normal completion of this operation, the state moves into {Standby (1-[02])}. If a certain note or rejected note remains in the acceptor module, the BV tries to throw it out. If the notes remain at the Escrow position, the BV keeps them and the state moves into {Remaining Escrow notes (1-[0D])}. On occurrence of the Abnormal state while in this operation, "Reset RSP" is sent out and {In Alarm (1-[81])} state is created. On occurrence of the sensor trouble state after normal ending of Reset operation, "Reset RSP" is sent out and {While in Sensor Trouble (1-[80])} state is created.

(2/7)

Data	Equipment State	Details for State and Next Transition
1-[02] 1-[12]	Stand-by (Without escrow) Stand-by (With escrow)	The BV does not take in notes even if they are placed at the inlet. When there is any money type which has received "Insertion Authorize CMD" and which has authorized acceptance, the state moves into {Ready for Insertion (1-[03][13])}. In the following cases, however, "Insertion Authorize CMD" is not validated, where {Standby (1-[02][12])} state continues. (1) Acceptance of any money type is inhibited under "Insertion Authorize CMD". (2) Number of Escrow is already 20 notes. On occurrence of the sensor trouble state while in standby, "State and/or No.-of-Notes Change RSP" is sent out and {While in Sensor Trouble (1-[80])} state is created. The shutter of the outlet is opened when Escrow notes exist, "State and/or No.-of-Note Change RSP" is sent out and the state moves into {In Receipt Operation (1-[06])}.
1-[03] 1-[13]	Ready for insertion (Without escrow) Ready for insertion (With escrow)	Waiting for notes to be inserted by a customer. With note insertion having been detected, state moves into {In Identification Judgment (1-[04])}. On occurrence of the sensor trouble state before insertion, "State and/or No.-of-Notes Change RSP" is sent out and {While in Sensor Trouble (1-[80])} state is created. The shutter of the outlet is opened when Escrow notes exist, "State and/or No.-of-Note Change RSP" is sent out and the state moves into {In Receipt Operation (1-[06])}.

(3/7)

Data	Equipment State	Details for State and Next Transition
1-[04]	In Identification Judgment	Waiting for notes to be conveyed and identified so that their validity is judged. With OK result, state moves into {Acceptance a note (1-[05])}. With rejected result, state moves into {In Rejection operation (1-[08]). On occurrence of the Abnormal state while in this operation, "State and/or No.-of-Notes Change RSP" is sent out and {In Alarm (1-[81])} state is created.
1-[05]	Acceptance a note	An inserted note has been judged as genuine and, Waiting to the next action. At start of Escrow operation, the Number of Escrow notes data are renewed and the receipt money types are notified in "State and/or No.-of-Notes Change RSP". On occurrence of the Abnormal state while in this operation, "State and/or No.-of-Notes Change RSP" is sent out and {In Alarm (1-[81])} state is created.
1-[06]	In receipt operation	While in operation to receive notes at Escrow position into the free-fall box. On completion of receipt into the free-fall box, state moves into {Standby 1-[02]}. On occurrence of the Abnormal state while in this operation, "Receipt RSP" is sent out and {In Alarm (1-[81])} state is created. However, when this operation has been created as a result of opening of the outlet shutter in {Standby (1-[12])} or {Ready for Ins ertion (1-[13])} (with Escrow notes), "State and/or No.-of-Notes Change RSP" is sent out and {In Alarm (1-[81])} state is created.

(4/7)

Data	Equipment State	Details for State and Next Transition
1-[07]	In return operation	A note at Escrow position is being carried to the outlet. On completion of conveyance of the note to the outlet, state moves into {Waiting to be received (outlet) (1-[0A])}. On occurrence of the Abnormal state while in this operation, "Return RSP" is sent out and {In Alarm (1-[81])} state is created.
1-[08]	In rejection operation	With rejected result in Identification operation, the note thus judged is carried to the inlet or outlet. This operation is performed when: (1) an inserted note is not judged as genuine. (self-judgement) (2) "Reject CMD" has been received while in {Acceptance a note (1-[05])}. In case of (1); On completion of carrying of the rejected note, "State and/or No.- of-Notes Change RSP" is sent out and state moves into {Waiting to be received (Rejection) (1-[09])}. In case of (2); On completion of carrying of the rejected note, state moves into {Waiting to be received (Rejection) (1-[09])}. On occurrence of the Abnormal state while in this operation, "State and/or No.-of-Notes Change RSP" is sent out and {In Alarm (1-[81])} state is created.

(5/7)

Data	Equipment State	Details for State and Next Transition
1-[09]	Waiting to be received: Rejection (inlet / outlet)	A note, after being carried to the inlet or outlet by rejected notes conveyance, is waiting to be taken by Customer. When the notes has been taken away by Customer, "State and/or No.- of- Notes Change RSP" is sent out and state moves into {Standby (1-[02][12])}. However, in the case of Δ mark of Item 3.1, state moves into {Ready for Insertion (1-[03][13])}. On occurrence of the Abnormal state while in this operation, "State and/or No.-of-Notes Change RSP" is sent out and {In Alarm (1-[81])} state is created.
1-[0A]	Waiting to be received: Return (outlet)	Escrow notes having been carried to the outlet by "Return CMD" is waiting to be pulled out by Customer. When the notes has been pulled out by Customer, "State and/or No.- of- Notes Change RSP" is sent out and state moves into {Standby (1-[02])}. However, in the case of Δ mark of Item 3.1, it moves into {Ready for Insertion (1-[03])}. On occurrence of the Abnormal state while in this operation, "State and/or No.-of-Notes Change RSP" is sent out and {In Alarm (1-[81])} state is created.
1-[0B]	In intake operation	A note waiting to be received at the outlet by "Intake CMD" is received into the free-fall box. On completion of receipt into the free-fall box, state moves into {Standby (1-[02])}. On occurrence of the Abnormal state while in this operation, "Intake RSP" is sent out and {In Alarm (1-[81])} state is created.

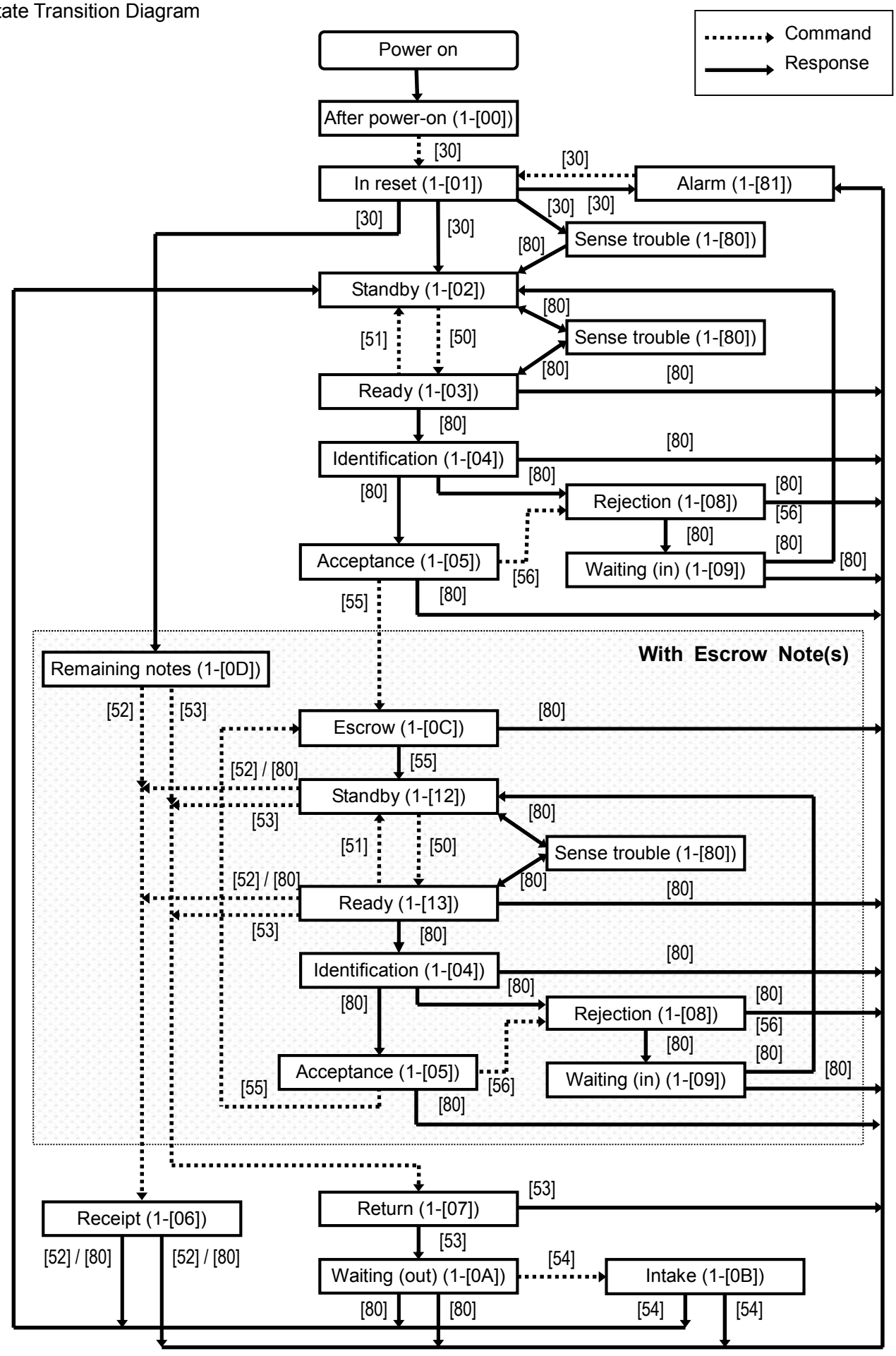
(6/7)

Data	Equipment State	Details for State and Next Transition
1-[0C]	In escrow operation	A note which has been judged as genuine is being carried to Escrow position. On completion of conveyance to Escrow position, state moves into {Standby (1-[12])}. ~~However, when the case of Δ mark of Item 3.1 applies, it moves into {Ready for Insertion (1-[13])}.~~ On occurrence of the Abnormal state while in this operation, "Escrow RSP" is sent out and {In Alarm (1-[81])} state is created.
1-[0D]	Remaining escrow notes	The notes are remaining in Escrow position after the power-on or the alarm state. BV waits the removal of the notes by “Return CMD” or “Receipt CMD”. Therefore, "Insertion Authorize CMD" is not validated under this state even if the number of Escrow is less than 20 notes.

(7/7)

Data	Equipment State	Details for State and Next Transition
1-[80]	While in sensor trouble	Because of Sensor state of the BV, operational state (state ready to receive notes by command) cannot be created. When the cause for the trouble has been removed (the sensor state prior to occurrence of the trouble has been recovered), Equipment state before {In Sensor Trouble (1-[80])}. changes as follows: For {In Reset Operation (1-[80])}, into {Standby (1-[02][12])} For {Standby (1-[02][12])}, into {Standby (1-[02][12])} For {Ready for Insertion (1-[03][13])}, into {Ready for Insertion (1-[03][13])} "State and/or No.-of-Notes Change RSP" is sent out as of shifting into this state and as of returning to the sensor state prior to occurrence of a trouble.
1-[81]	While in alarm	When the following state has taken place, the function as the BV is stopped: (1) The BV, while in Identification Judgment, Escrow, Return, Receipt, or Reject operation, has become unable to correctly transfer notes due to jamming, etc. (2) The BV, while in Identification Judgment, Escrow, Return, Receipt, or Reject operation, is opened, thus stopping conveyance. (3) In Reset or Receipt operation, Stacking operation for receipt into the free-fall box is not properly completed. After removing the cause for a trouble concerned, use "Reset CMD" to move out of this state. No sending of a response in this state.

State Transition Diagram



6.1.2 DESCRIPTION OF WARNING

Data	Equipment State	Ref.	Data	Equipment State	Ref.
[01]	Command inexecutable	See (A)			

(A) Command inexecutable (2-[01])

(1) CONTENT
When a command from the ticket machine has been judged inexecutable and invalid according to the state of the BV, alarm [01] is produced and a response is sent out.

See item 3. Effective Commands for Equipment State.

6.1.3 DESCRIPTION OF CODE

(1) When the BV gets {In Alarm (1-[81])}, lower 2 digits of Alarm Code is provided.

[Alarm Code]
(Ex) The provided code on occurrence of Alarm Code "E399" is [99].
*For details, see the maintenance manual.

(2) When the BV gets {In Sensor Trouble (1-[80])}, Sensor Trouble Code is provided.

[Sensor Trouble Code]
(Ex) The provided code on occurrence of Sensor Trouble Code "12" is [12].
*For details, see the maintenance manual.

(3) Other than listed above, [00] is provided.

6.2 SENSOR STATE

Position	Content							
	D7 (2^7)	D6 (2^6)	D5 (2^5)	D4 (2^4)	D3 (2^3)	D2 (2^2)	D1 (2^1)	D0 (2^0)
1	S02		S11				S06	S05
2	S27	S16					S04	
3	S03			S17		S15	S14	S13

Position	Sensor Name	Function	State Logic	
			0	1
1-2^0	S05	Validation sensor (PTC)	No note	With note
1-2^1	S06	Validation sensor (PTR)	No note	With note
1-2^2				
1-2^3				
1-2^4				
1-2^5	S11	Acceptor lid detection sensor	Closed	Open
1-2^6				
1-2^7	S02	Insertion detection sensor (Left)	No note	With note
2-2^0				
2-2^1	S04	Validation sensor (PTL)	No note	With note
2-2^2				
2-2^3				
2-2^4				
2-2^5				
2-2^6	S16	Outlet shutter sensor	Closed	Open
2-2^7	S27	Free-fall sensor	No note	With note
3-2^0	S13	Position sensor	No note	With note
3-2^1	S14	Position sensor	No note	With note
3-2^2	S15	Position sensor	No note	With note
3-2^3				
3-2^4	S17	Stacking control sensor	Normal position	Un-normal position
3-2^5				
3-2^6				
3-2^7	S03	Insertion detection sensor (Right)	No note	With note

6.3 ESCROW NOTES AND MONEY CODE

6.3.1 ESCROW NOTES

1	Number of Money Code [01]
2	Number of Money Code [02]
3	Number of Money Code [03]
4	Number of Money Code [04]
5	Number of Money Code [05]
6	Number of Money Code [06]
7	Number of Money Code [07]
8	Number of Money Code [08]
9	Number of Money Code [09]
10	Number of Money Code [0A]
11	Number of Money Code [0B]
12	Number of Money Code [0C]
13	Number of Money Code [0D]
14	Number of Money Code [0E]
15	Number of Money Code [0F]

Number of Money Code: 0 – 15 notes
>>> [00] – [0F]

* An undefined code is fixed at 0.

6.3.2 MONEY CODE (Genuine note)

[01] – [0F]

Money Code	Denomination(V4159~)	Denomination(V4403~)
[01]	INR 5	INR 5
[02]	INR 10 *5	INR 10 *5
[03]	INR 20	INR 20
[04]	INR 50 *4	INR 50 *4
[05]	INR 100 *6	INR 100 *6
[06]	INR 500 *1,2	(Undefined)
[07]	~~INR 1000~~ (Undefined) *2	(Undefined)
[08]	INR 2000 *1	(Undefined)
[09]	INR 200 *3	(Undefined)
[0A]	(Undefined)	(Undefined)
[0B]	(Undefined)	(Undefined)
[0C]	(Undefined)	(Undefined)
[0D]	(Undefined)	(Undefined)
[0E]	(Undefined)	(Undefined)
[0F]	(Undefined)	(Undefined)

*1 Banknotes were issued in 2016 was handled in money code [06] and [08].

*2 INR 500 and 1,000 in Mahatma Gandhi Series 1996 / 2005 is rejected.

*3 Banknotes were issued in 2017 was handled in money code [09]

*4 Banknotes were issued in 1996/2005 and 2017 was handled in money code [04].

*5 Banknotes were issued in 1996/2005 and 2018 was handled in money code [02].

*6 Banknotes were issued in 1996/2005 and 2018 was handled in money code [05].

6.3.3 MONEY CODE (Rejected note)

[81] – [8F]

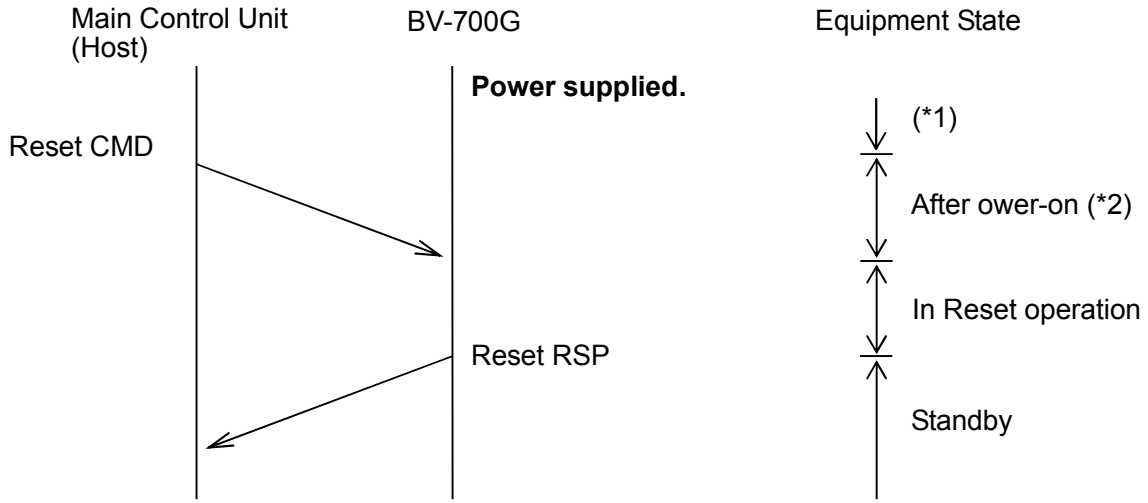
Money Code	Reject Code (Display Code)
[81]	“40”
[82]	“41”
[83]	“42”
[84]	“43”
[85]	“44”
[86]	“45”
[87]	“46”
[88]	“47”
[89]	“48”
[8A]	“49”
[8B]	“4E”
[8C]	“4H”
[8D]	“4L”
[8E]	“4P” / “4t” / “4U”
[8F]	“4-” / “4d”

*For the details of reject code, see the maintenance manual.

7. COMMAND/RESPONSE SEQUENCE CHART

7.1 POWER ON

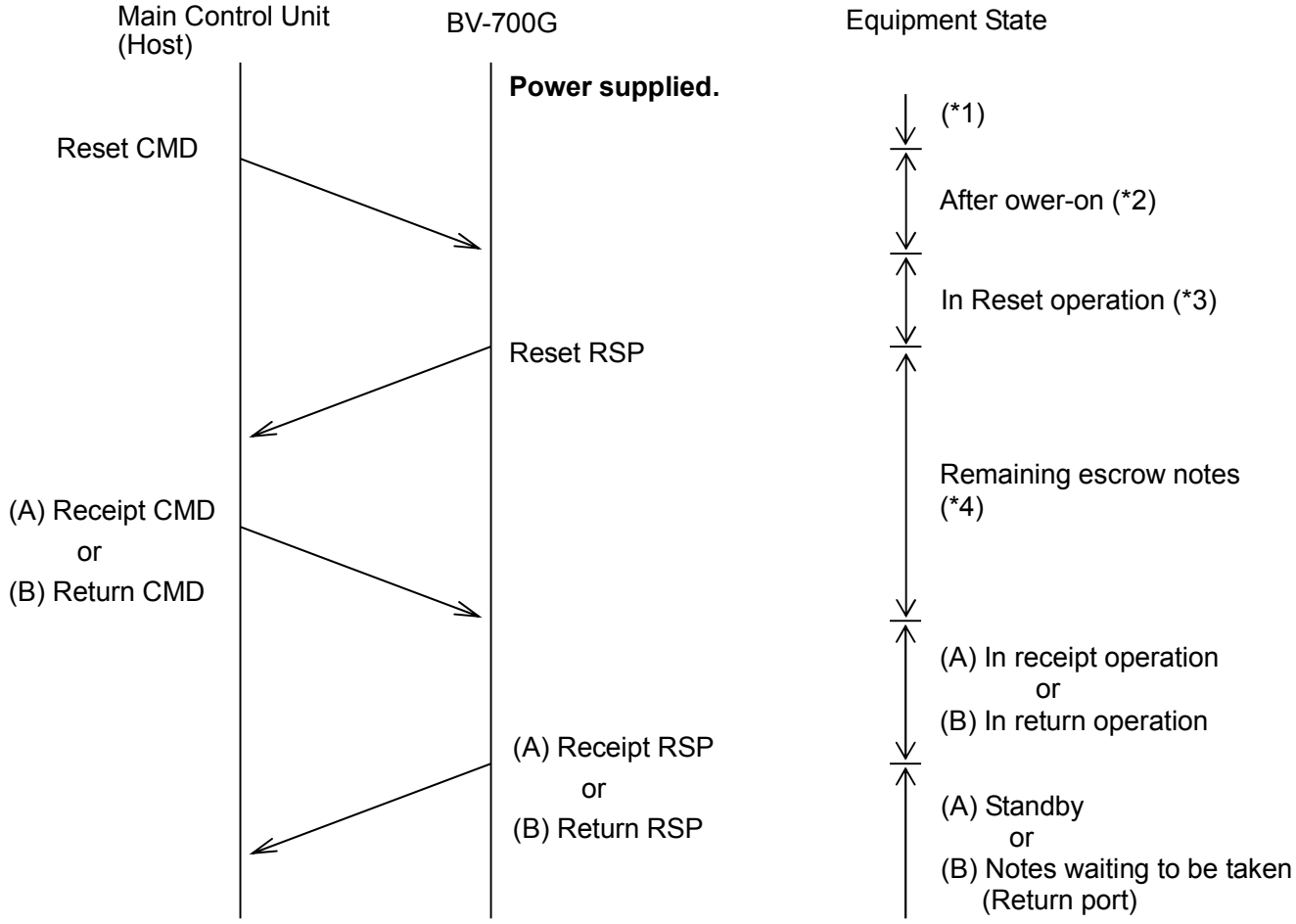
[Without remaining notes]



(*1) On supply of power, the BV opens the serial communication circuit after the initialization of the peripheral LSIs and checking memory.
If the host sends ENQ to the BV during this period, BV returns no answer. In this case, the host should not judge that the BV has error condition.

(*2) The BV can receive “Sense CMD” under this state; however, the sensor state in “Sense RSP” is uncertainly value.

[With remaining notes]



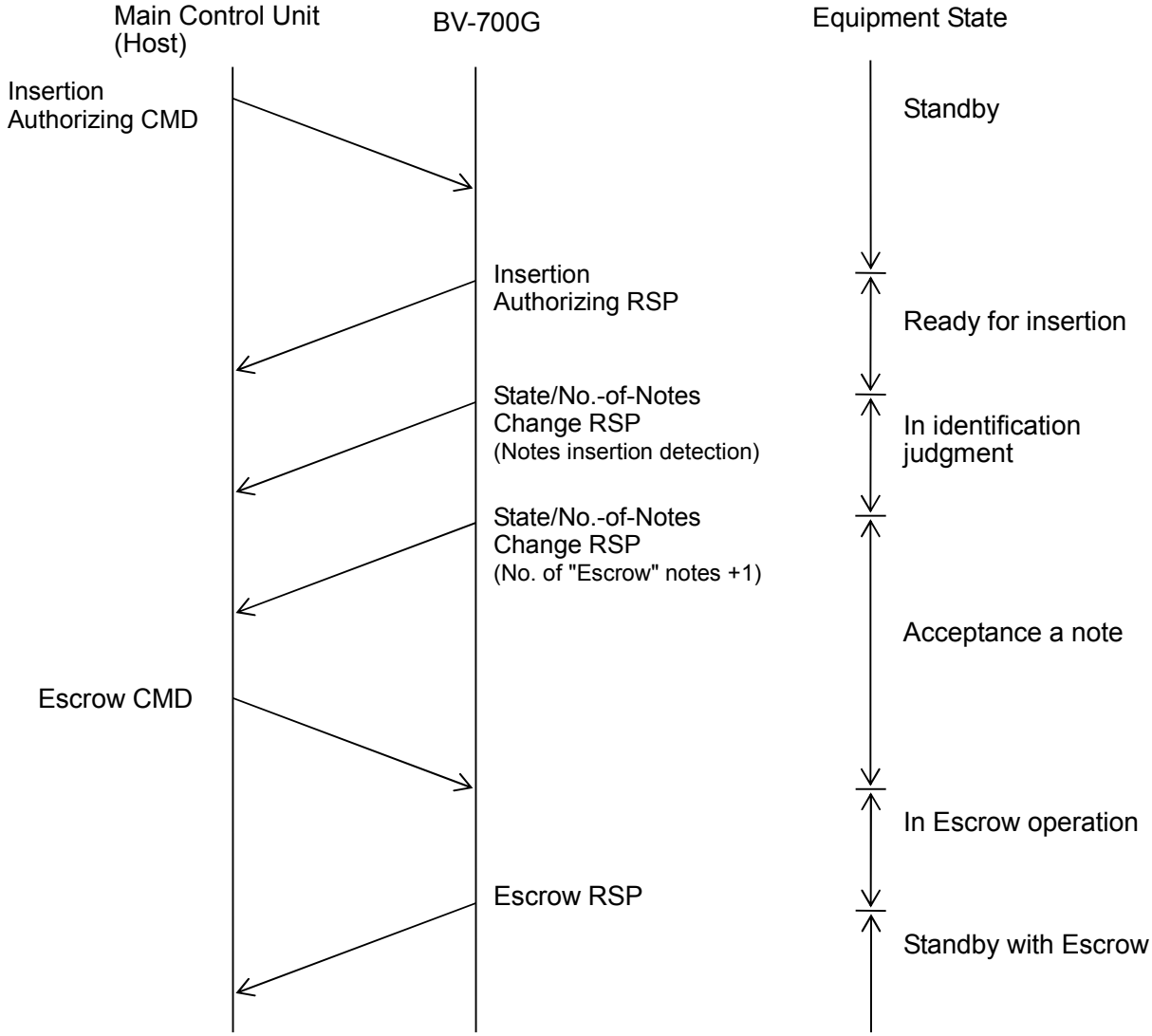
(*1) On supply of power, the BV opens the serial communication circuit after the initialization of the peripheral LSIs and checking memory.
If the host sends ENQ to the BV during this period, BV returns no answer. In this case, the host should not judge that the BV has error condition.

(*2) The BV can receive “Sense CMD” under this state; however, the sensor state in “Sense RSP” is uncertainly value.

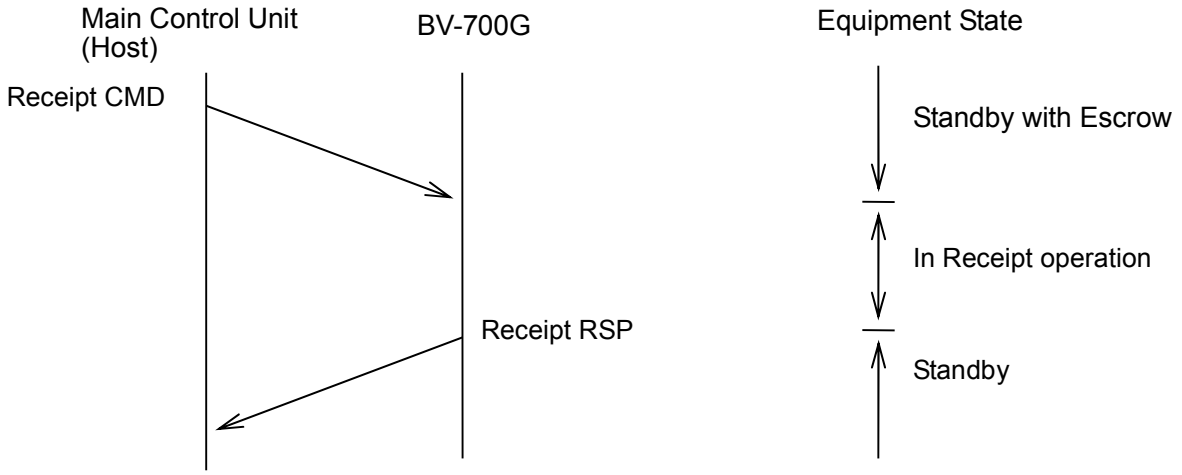
(*3) If a certain note or rejected note remains in the acceptor module, the BV tries to throw it out. And if the notes remain at the Escrow position, the BV keeps them.

(*4) The host can confirm the number of the remaining escrow notes by “Sense CMD” during this period.
The BV waits the removal of these notes by “Receipt CMD” or “Return CMD”.

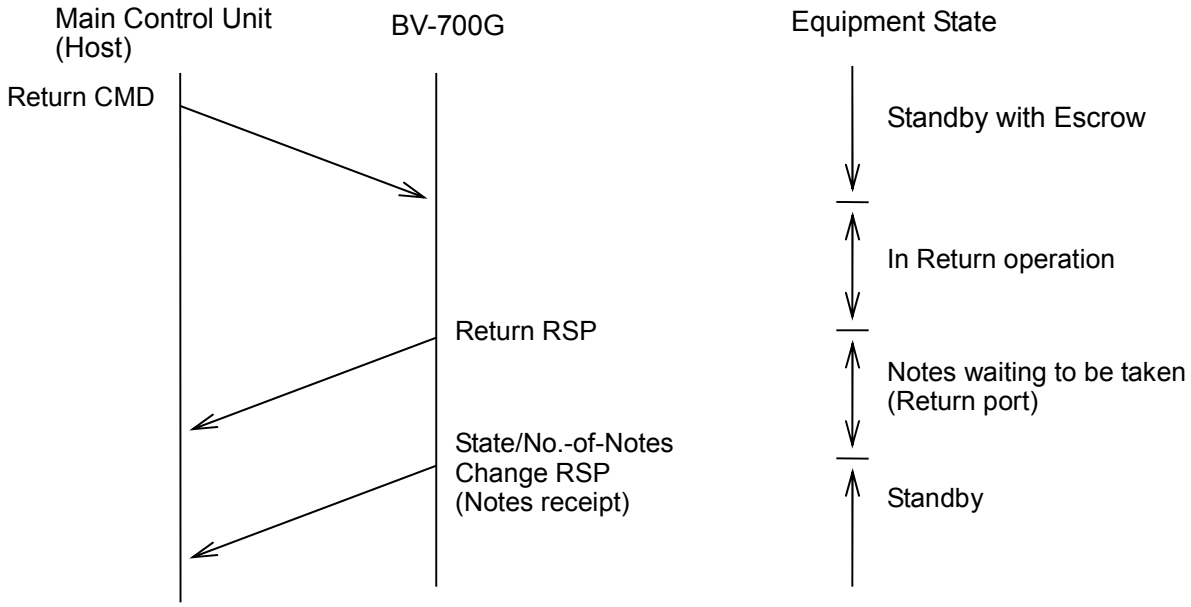
7.2 IDENTIFICATION (IDENTIFICATION JUDGED OK) >> ESCROW



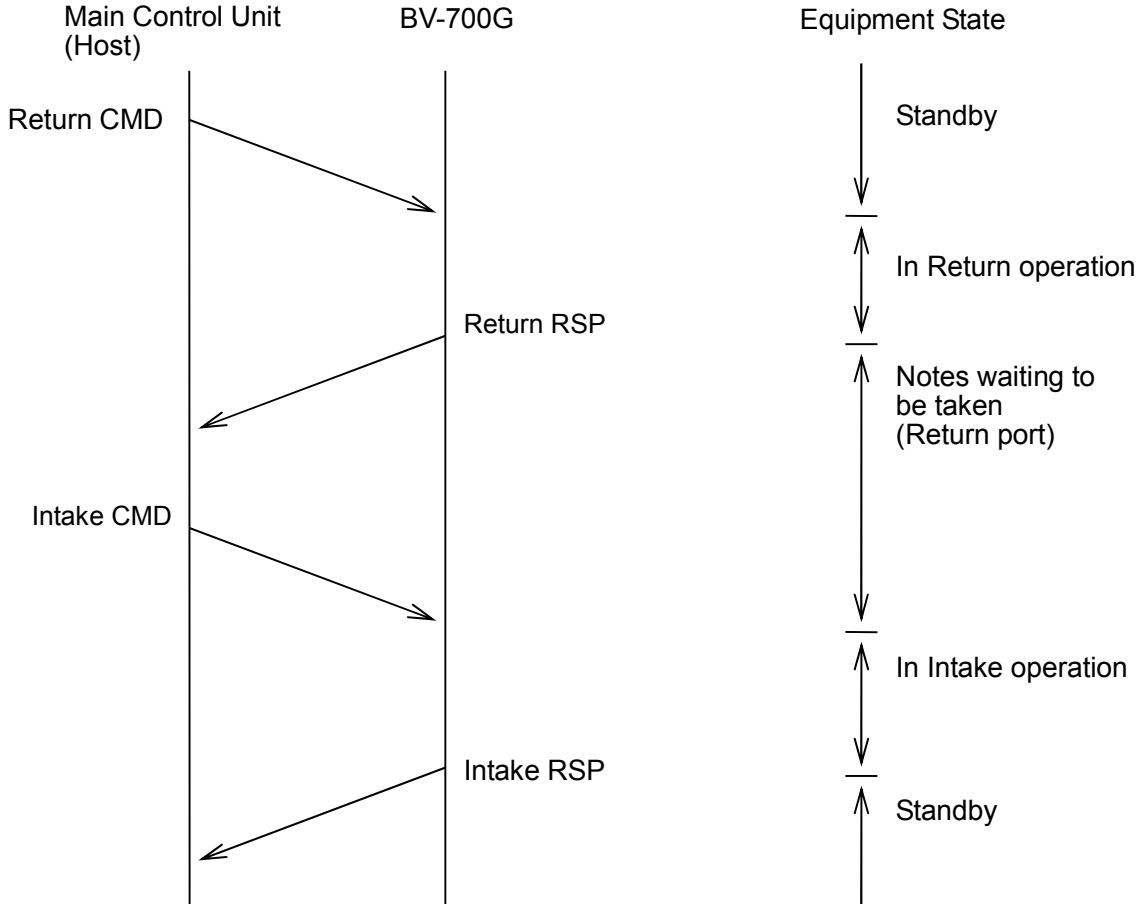
7.3 STANDBY with ESCROW >> RECEIPT



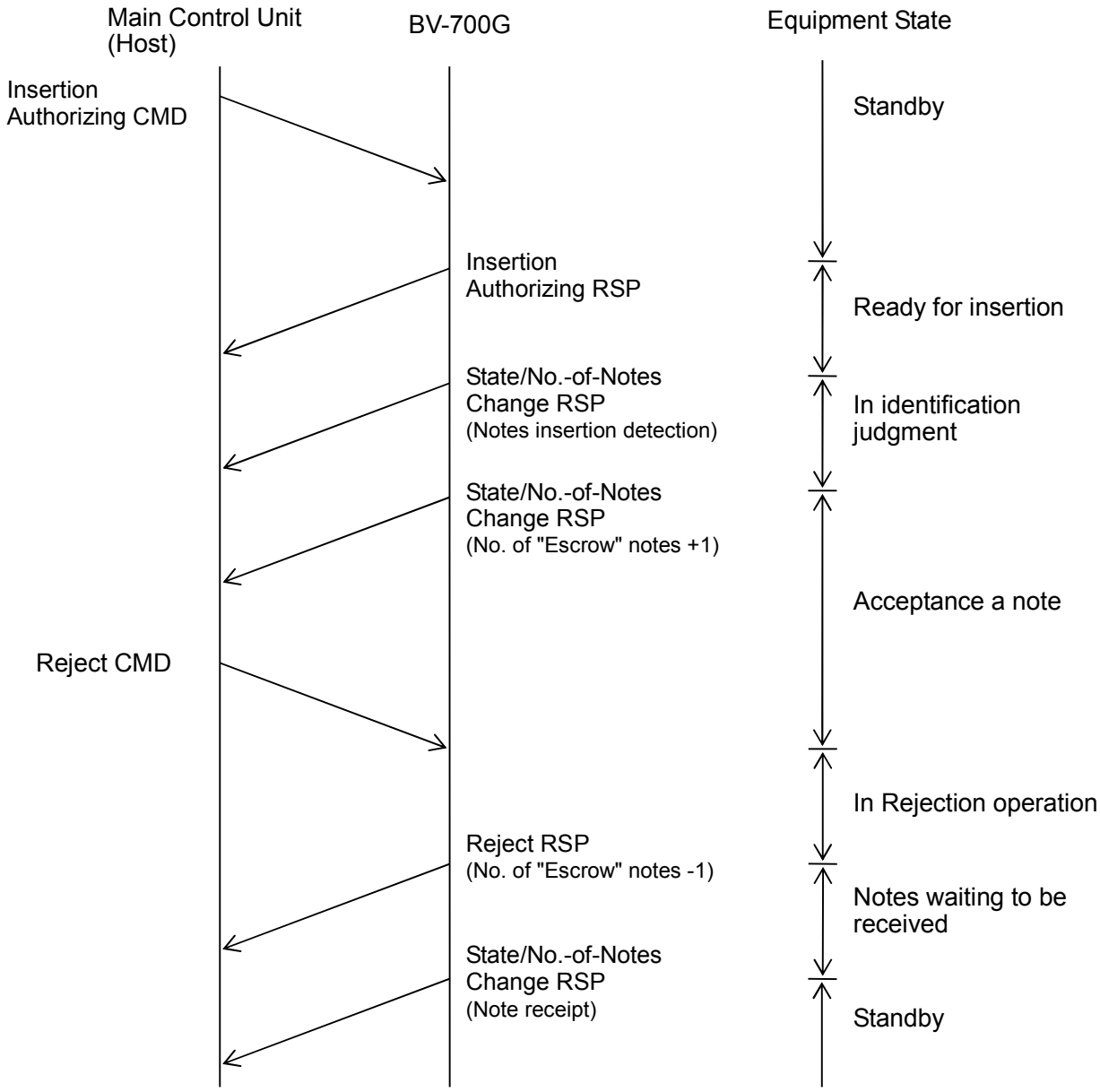
7.4 STANDBY with ESCROW >> RETURN



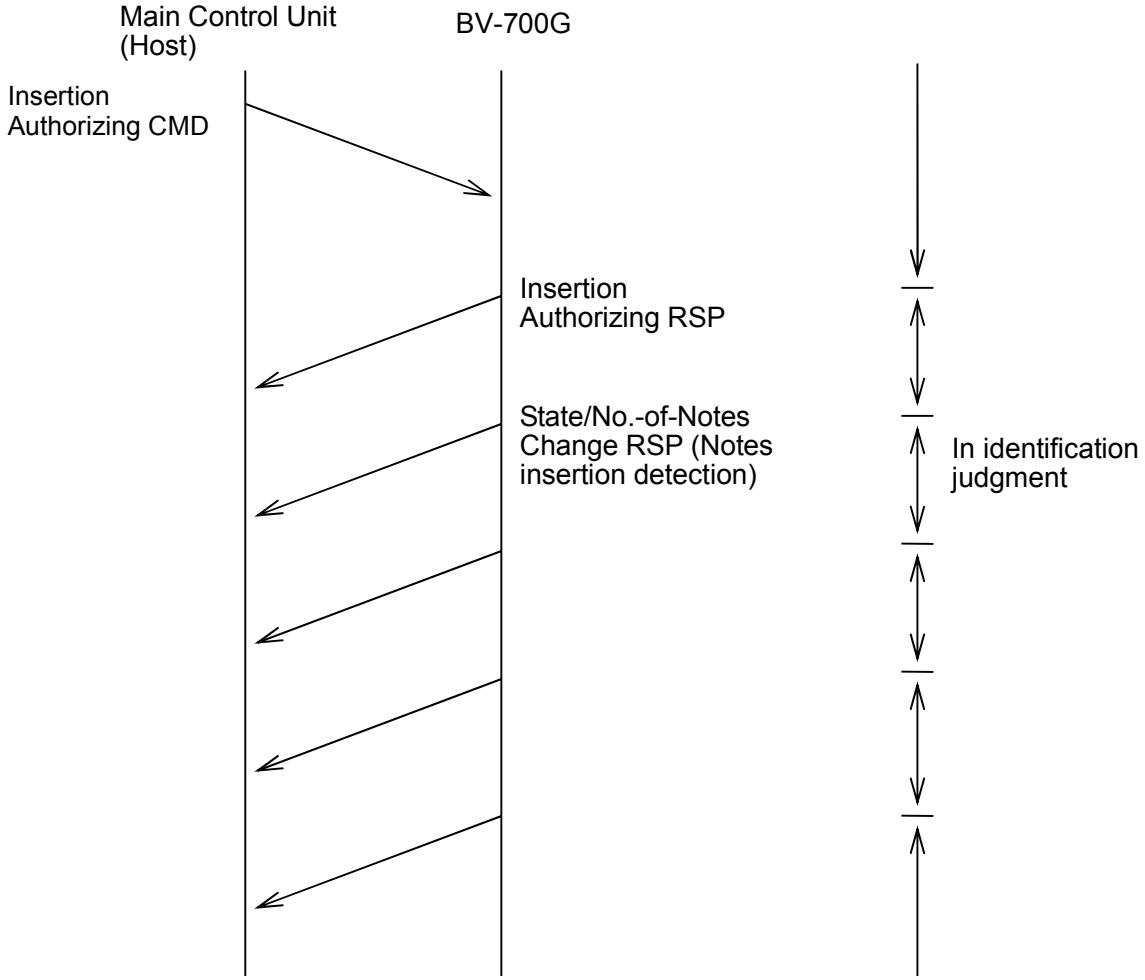
7.5 STANDBY with ESCROW >> RETURN >> INTAKE



7.6 IDENTIFICATION (IDENTIFICATION JUDGED OK) >> REJECTION



7.7 IDENTIFICATION (IDENTIFICATION JUDGED NG)



8. OTHERS

8.1 CONCEPT OF NUMBER OF ESCROW NOTES

Clearly set the renewal time of data concerning the number of Escrow notes in response which is sent from the BV to the ticket selling machine.

8.1.1 DATA RENEWAL TIMING

- When a note having been judged OK in identification judgment is carried to the Escrow position, the number of Escrow notes of the money type concerned is renewed by +1.

8.1.2 DATA CLEAR TIMING

- At the processing start of "Reset CMD", it is zero-cleared.

- Zero Clear takes place, ater completion of conveyance of notes at Escrow position to the outlet, when the note to be received has been taken away. (Prior to sending of "State and/or Number of Escrow Notes Change RSP" which notifies that Customer has taken them out.)

- Zero Clear takes place, after normal completion, by "Receipt CMD", of receipt of notes at Escrow position into the free-fall box.

- Zero Clear takes place, after normal completion, by "Intake CMD", of receipt of notes at "Intake CMD", when "Intake RSP" has been sent out.

- Zero Clear takes place on normal completion of the note at Escrow position into the free-fall box because of opening of the outlet shutter in {Standby (1-[12])} or {Ready for Insertion (1-[13])}.