SHARP SERVICE MANUAL

CODE : 00ZXEA201UCSE

XE-A201
ONLINE COMMUNICATION FUNCTION

ELECTRONIC CASH REGISTER

MODEL XE-A201

(For "U" & "A" version)

CONTENTS

Parts marked with "⚠" are important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

SHARP CORPORATION

CHAPTER 1. OVERVIEW

1. GENERAL

This is a specification of the on-line data communication via RS-232 interface.
It enables the ECR to perform on-line communication.
For on-line data communication a ECR can be connected to a host computer.
We support mainly the following functions.

a) The function of ONLINE
   1) Down load of ECR data (ECR ← PC)
   2) Up load of ECR data (ECR → PC)
   3) RJE (Remote job entry) function (ECR ← PC)

CHAPTER 2. SYSTEM CONFIGURATION

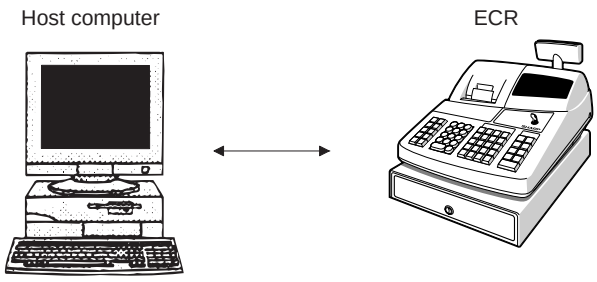
1. GENERAL

Online data communication is allowed always.

2. ONLINE DATA COMMUNICATION

In this machine, the type of data communication is “Direct connection” only.

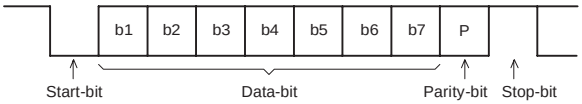
(a) Direct connection



CHAPTER 3. INTERFACE SPECIFICATION

1. ONLINE INTERFACE

a) Interface : RS-232
b) Duplex type : Half-duplex / Full-duplex
c) Line configuration : Direct connection/Modem connection
d) Data rate : 19200, 9600, 4800 and 2400 bps (Programmable)
e) Synchronizing mode : Asynchronous
f) Parity check : Vertical parity check (odd)
g) Code : ASCII
h) Bit sequence : LSB first
i) Data format : 1 start bit + 7 data bits + 1 parity + 1 stop bit

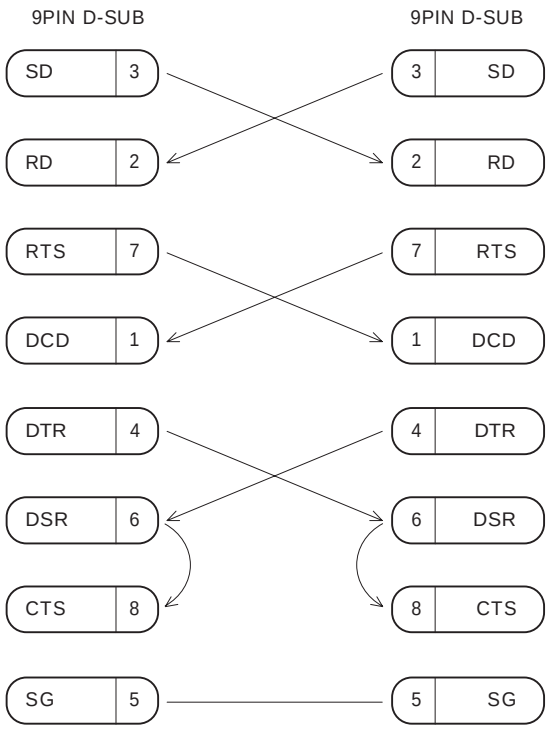


j) Protocol : Polling/selecting (Simple procedure)
k) Transmission:
   Cable : Shielded cable
   Connector (ECR side): D-sub 9 pin (female type) connector Inch pitch (4-40 UNC) lock screw
   Connector cover : Shielded cover

CHAPTER 4. SIGNAL CONNECTION DIAGRAM

1. CONNECTION BETWEEN THE MASTER (HOST) AND SATELLITE

This cable is supported as the standard cable with ECR.

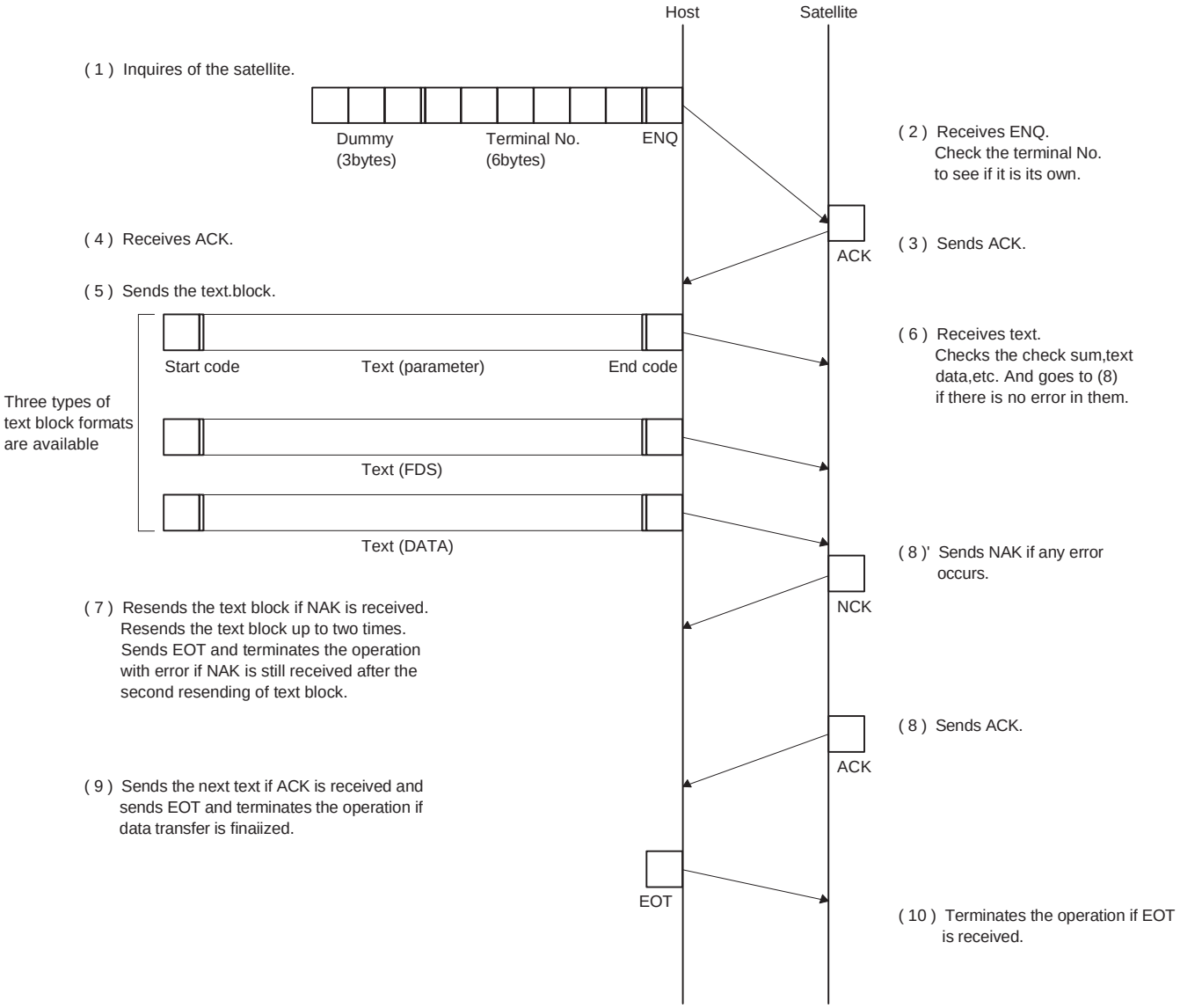


SD : TRANSMITTED DATA
RD : RECEIVED DATA
DTR : DATA TERMINAL READY
DSR : DATA SET READY
RTS : REQUEST TO SEND
DCD : DATA CARRIER DETECTOR
CTS : CLEAR TO SEND

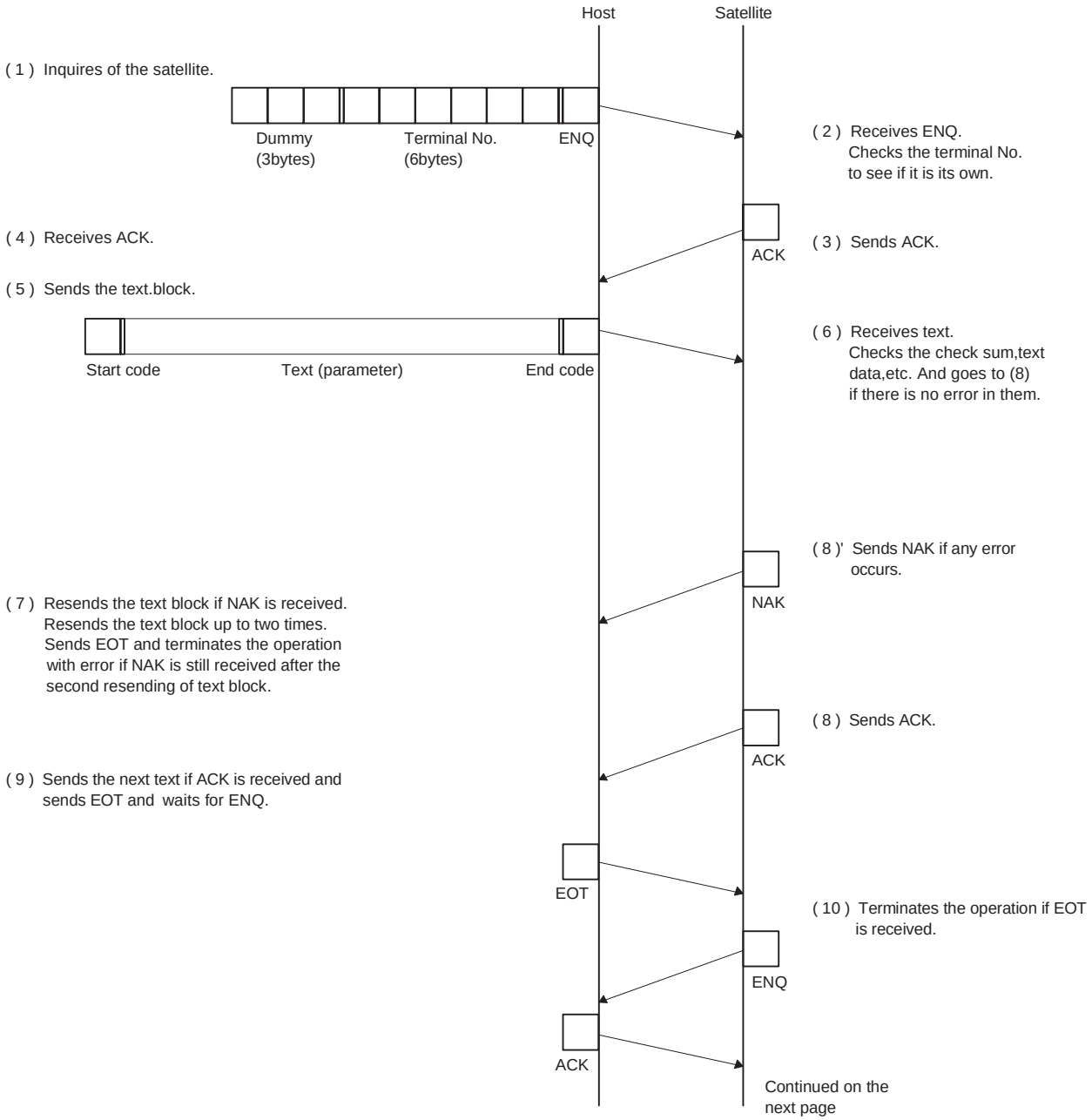
CHAPTER 5. ONLINE PROTOCOL

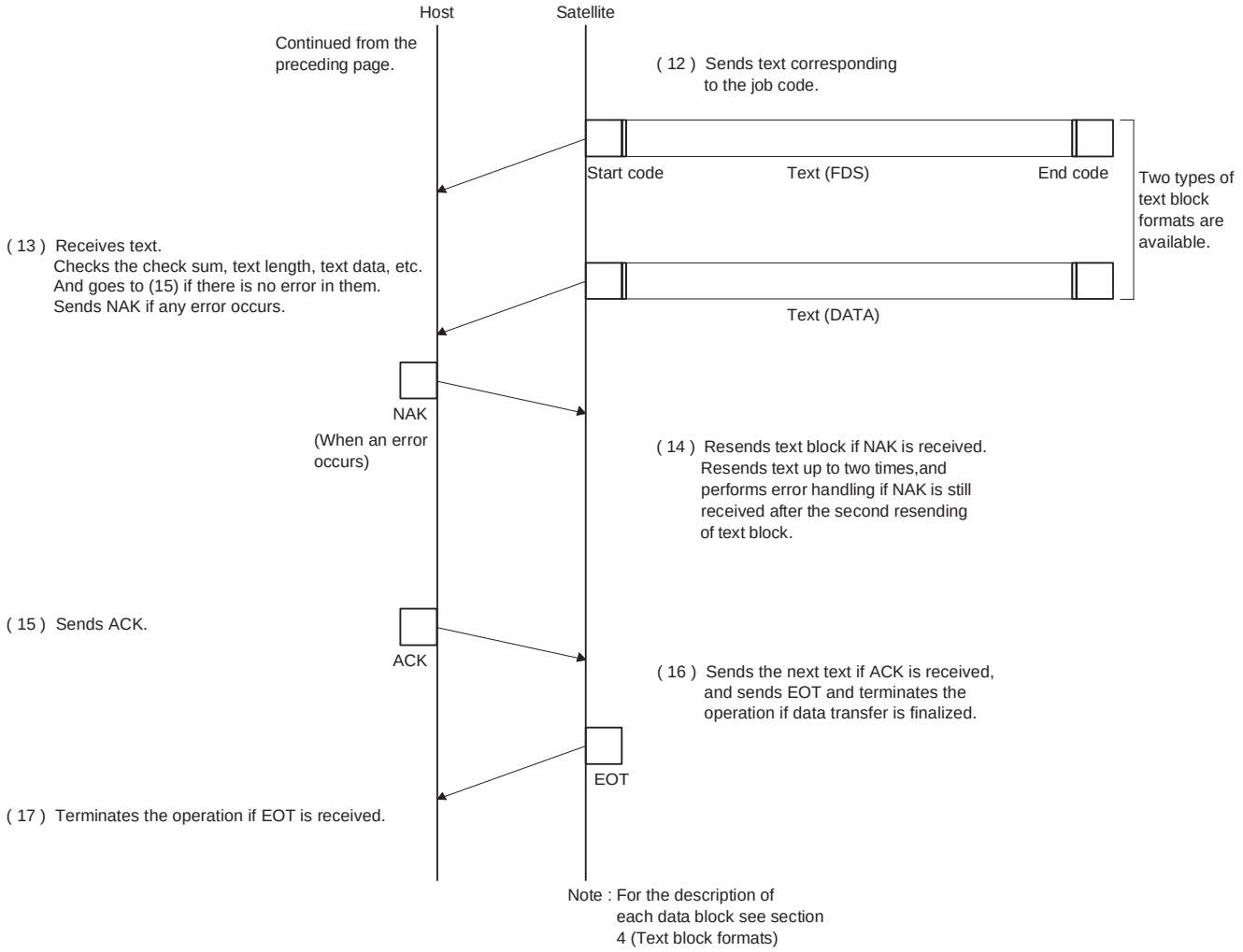
1. BASIC PROTOCOL SPECIFICATION

1) Data transmission from the host to a satellite



2) Data transmission from satellite to the host





2. TRANSMISSION CONTROL PROCEDURE MATRIX

1) Down-loading matrix for the host

STATE / EVENT	Initial	After sending ID ENQ	After sending text
	0	1	2
ENQ	—	—	—
ACK	—	Sends text and goes to 2.	Sends text and goes to 2. Sends EOT and then goes to 0. (Normal end)
NAK	—	—	Resends the text and then goes to 2. If the host has resent the text two times, it sends EOT and goes to 0. (ERROR END)
EOT	—	—	The host goes to 0. (ERROR END)
TEXT	—	—	—
TIME-UP	—	Resends ID ENQ and then goes to 1. If the host has resent ID ENQ two times, it sends EOT and goes to 0. (ERROR END)	Resends the text and then goes to 2. If the host has resent the text two times, it sends EOT and goes to 0. (ERROR END)
KEY ENTRY	Sends ID ENQ and goes to 1.	—	—

Time-up: One second after sending of ID ENQ.
Four seconds after sending of text.

2) Up-loading matrix for the host

STATE / EVENT	Initial	After sending ID ENQ	After sending text
	0	1	2
ENQ	—	—	—
ACK	—	Sends text and goes to 2.	Sends EOT and goes to 3.
NAK	—	—	Resends the text and then goes to 2. If the host has resent the text two times, it goes to 0. (ERROR END)
EOT	—	—	The host goes to 0. (ERROR END)
TEXT	—	—	—
TIME-UP	—	Resends ID ENQ and then goes to 1. If the host has resent ID ENQ two timesit goes to 0. (ERROR END)	Resends the text and then goes to 2. If the host has resent the text two times, it goes to 0. (ERROR END)
KEY ENTRY	Sends ID ENQ and goes to 1.	—	—

Time-up: One second after sending of ID ENQ.
Four seconds after sending of text.

STATE / EVENT	After sending EOT	After sending ACK	After sending NAK
	3	4	5
ENQ	Sends ACK and goes to 4.	After the host has received ENQ, resends ACK and goes to 4. After the host has received TEXT, ignores the ENQ.	—
ACK	—	—	—
NAK	—	—	—
EOT	The host goes to 0. (ERROR END)	After the host has received TEXT, goes to 0. (Normal end) After the host has received ENQ, goes to 0. (ERROR END)	The host goes to 0. (ERROR END)
TEXT	—	The host checks the text block, if the block is correct, the host sends ACK and goes to 4. If is not correct, the host sends NAK and goes to 5. If transmission cannot be continued, the host sends EOT and goes to 0.	The host checks the text block, if the block is correct, the host sends ACK and goes to 4. If is not correct, the host sends NAK and goes to 5. If transmission cannot be continued, the host sends EOT and goes to 0. (ERROR END)
TIME-UP	Resends EOT and goes to 3. If the host has resent the EOT two times, it goes to 0. (ERROR END)	The host goes to 0. (ERROR END) Time-up is 7 seconds	The host goes to 0. (ERROR END) Time-up is 7 seconds
KEY ENTRY	—	—	—

Time-up: Two second after sending of EOT.

3) Down-loading matrix for the satellite

STATE / EVENT	Initial	After sending ACK	After sending NAK
	0	1	2
ID-ENQ	Satellite checks the terminal No.:If it is correct, satellite sends ACK and goes to 1. If is not correct, Satellite ignores the ID-ENQ.	Satellite checks the terminal No.:If it is correct, satellite sends ACK and goes to 1. If it is not correct, Satellite ignores the ID-ENQ.	—
ACK	—	—	—
NAK	—	—	—
EOT	—	After satellite has received TEXT, goes to 0. (Normal end) Before satellite has received TEXT, ignores the EOT	Satellite goes to 0. (ERROR END)
TEXT	—	Satellite checks the text block, if the block is correct, Satellite sends ACK and goes to 1. If it is not correct, satellite sends NAK and goes to 2. If transmission cannot be continued, satellite sends EOT and goes to 0. (ERROR END)	Satellite checks the text block, if the block is correct, Satellite sends ACK and goes to 1. If it is not correct, satellite sends NAK and goes to 2. If transmission cannot be continued, satellite sends EOT and goes to 0. (ERROR END)
TIME-UP	—	Satellite sends EOT, and goes to 0. (ERROR END) Time-up is 7 seconds	The host goes to 0. (ERROR END) Time-up is 7 seconds

4) Up-loading matrix for the satellite

STATE / EVENT	Initial	After receiving ID-ENQ and sending ACK.	After sending NAK
	0	1	2
ID-ENQ	Satellite checks the terminal No.:If it is correct, satellite sends ACK and goes to 1. If it is not correct, satellite ignores the ID-ENQ.	Satellite checks the terminal No.:If it is correct, satellite sends ACK and goes to 1. If it is not correct, satellite ignores the ID-ENQ.	—
ACK	—	—	—
NAK	—	—	—
EOT	—	—	Satellite goes to 0. (ERROR END)
TEXT	—	Satellite checks the text block, if the block is correct, satellite sends ACK and goes to 3. If it is not correct, Satellite sends NAK and goes to 2. If transmission cannot be continued, satellite sends EOT and goes to 0. (ERROR END)	Satellite checks the text block, if the block is correct, satellite sends ACK and goes to 3. If it is not correct, Satellite sends NAK and goes to 2. If transmission cannot be continued, satellite sends EOT and goes to 0. (ERROR END)
TIME-UP	—	Satellite goes to 0. (ERROR END) Time-up is 7 seconds	Satellite goes to 0. (ERROR END) Time-up is 7 seconds

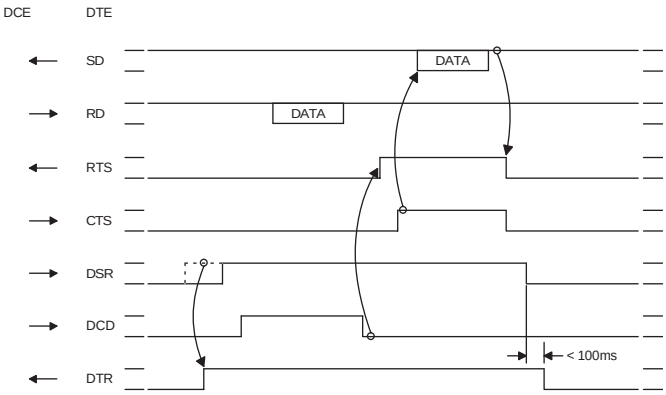
STATE / EVENT	After receiving text and sending ACK	After sending ENQ	After sending TEXT
	3	4	5
ID-ENQ	—	—	—
ACK	—	Satellite sends the text and goes to 5.	Satellite sends the text and goes to 5, or sends the EOT and goes to 0. (Normal END)
NAK	—	—	Resends the text and then goes to 5. If satellite has resent the text two times, sends EOT and goes to 0. (ERROR END)
EOT	Satellite sends ENQ and goes to 4.	Resends the ENQ and then goes to 4. If satellite has resent the ENQ two times, sends EOT and goes to 0. (ERROR END)	Satellite goes to 0. (ERROR END)
TEXT	Satellite checks the text block, if the block is correct, satellite sends ACK and goes to 3. If it is not correct, satellite sends NAK and goes to 2. If transmission cannot be continued, satellite sends EOT and goes to 0. (ERROR END)	—	—
TIME-UP	The host goes to 0. (ERROR END) Time-up is 7 seconds	Resends the ENQ and then goes to 4. If satellite has resent the ENQ two times, sends EOT and goes to 0. (ERROR END)	Resends the text and then goes to 5. If satellite has resent the text two times, sends EOT and goes to 0. (ERROR END)

Time-up: Four seconds after sending of text.
Two second after sending of ENQ.

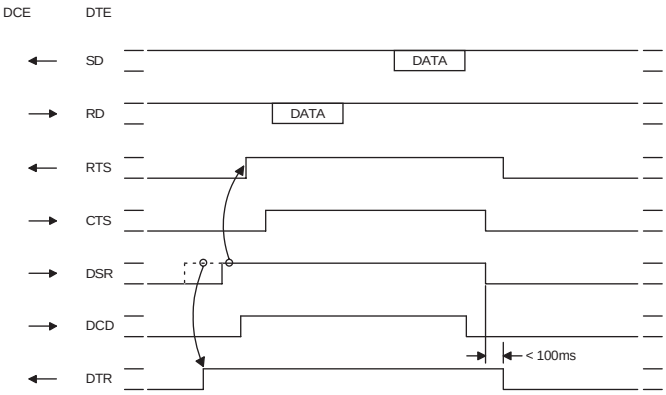
CHAPTER 6. CONTROL SIGNAL SEQUENCE

1. ONLINE TRANSMISSION

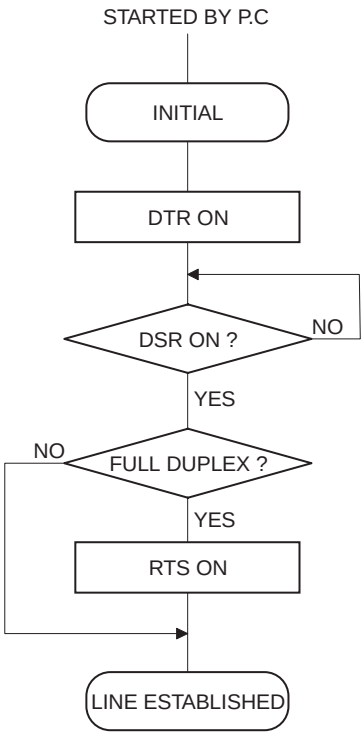
1) Half duplex transmission



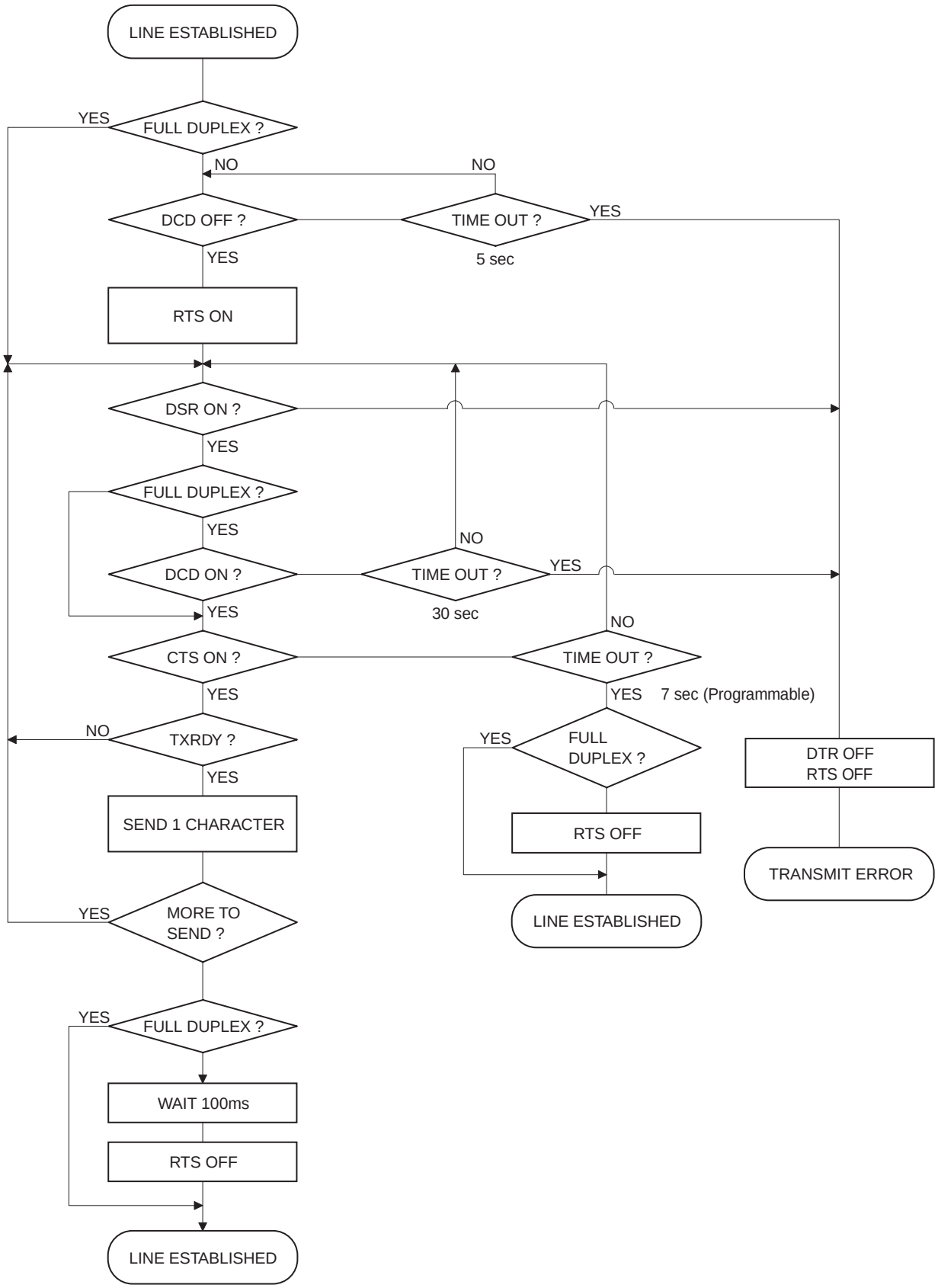
2) Full duplex transmission



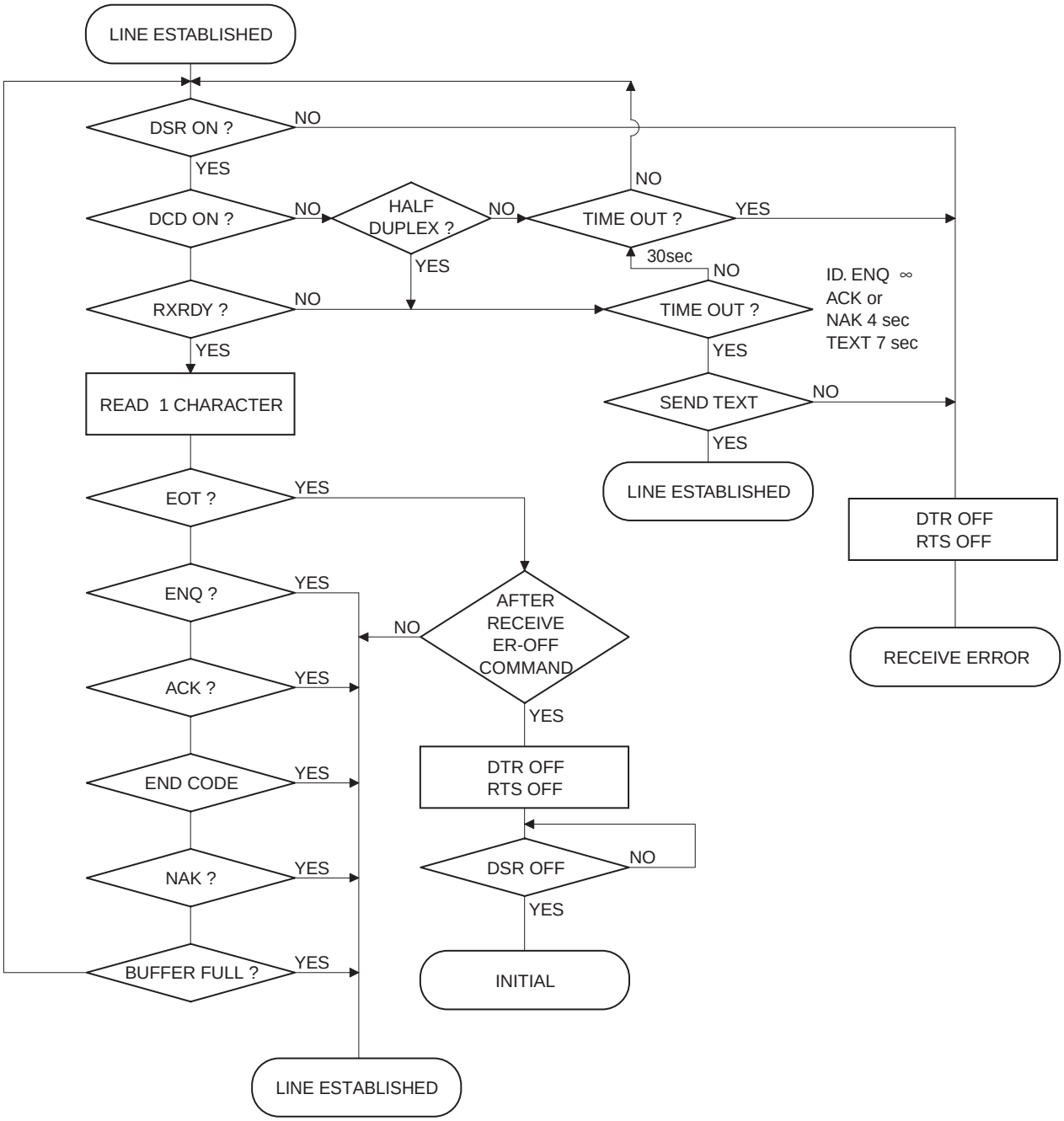
3) Line connection sequence flow



4) Transmission sequence flow



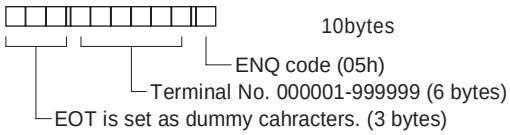
5) Receiving sequence flow



CHAPTER 7. TEXT BLOCK FORMAT

1. BASIC FORMAT

1) ID-ENQ :



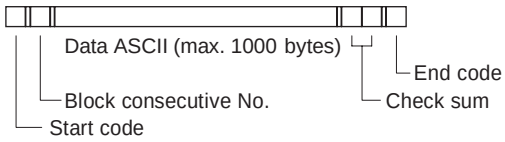
2) ACK : ☐ 1 byte 06h

3) NAK : ☐ 1 byte 15h

4) EOT : ☐ 1 byte 04h

5) ENQ : ☐ 1 byte 05h

6) TEXT :



Start code : This code may not be provided.
Null is impermissible.

End code : This code may not be provided.
Null or any same code as the start code is not permissible.

When master reset is performed, the default is assumed:

Start code = 02h

End code = 0Dh

Block consecutive No. : This number starts with 30h and cycles like this: 30h, 31h — 39h, 30h, 31h
(Ring counter system)

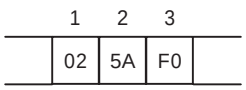
Check sum : 2 bytes hex number
Low-order 8-bit data of the complement of 2 for the sum of text data.

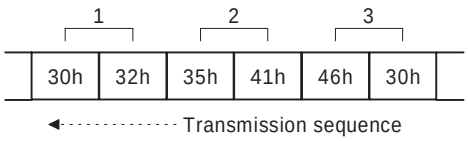
RAM data : Even number of data that is obtained by dividing one byte of RAM data into high-order 4 bits and low-order 4 bits and converting them to ASCII codes shown in the code conversion table.

Code conversion table.

Print code (high-order or low-order 4 bits)		Line image
Bit image	Hexadecimal	ASCII
0000	0	30h
0001	1	31h
0010	2	32h
0011	3	33h
0100	4	34h
0101	5	35h
0110	6	36h
0111	7	37h
1000	8	38h
1001	9	39h
1010	A	41h
1011	B	42h
1100	C	43h
1101	D	44h
1110	E	45h
1111	F	46h

Example





CHAPTER 8. ONLINE APPLICATION

1. ONLINE PRESET

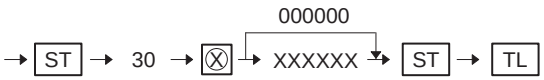
1. PGM Preset

Job #	PGM-MODE programming for online operation
30	Programming of the terminal number
31	Programming of the transmission control
32	Programming of the baud rate
33	Programming of the start and end code
35	Programming of the timeout time

[JOB #30] MRS = 000001

Programming of the terminal number

PGM mode



XXXXXX : Terminal number

MRS = 000001

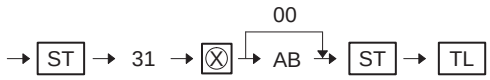
It is set to "000001" when master resetting is taken.

[JOB #31] MRS = 00

Programming of the transmission control

If the specification of direct connection is used, this programming must be not changed.

PGM mode



31-A: Not used

31-B:

Transmission line form	31-B
Half duplex system	1
Full duplex system	0

[JOB #32] MRS = 05

Programming of the transmission data rate (Baud rate)

PGM mode

32-A:

Transmission data	32-A
Print data send	1
RAM data download and upload	0

32-B:

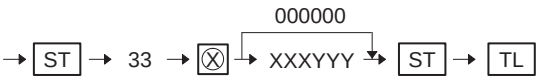
Transmission baud rate	32-B
2400 bps	6
4800 bps	5
9600 bps	4
19200 bps	3

[JOB #33] MRS = 002013

Programming of the start end code

If “000” is specified for each of the codes, the data block is provided with neither the start code nor the end code.

PBM mode



XXX : Start code

YYY : End code

When master resetting is taken, “002013” is specified.

This means that the data block is provided with the start code 02h (STX) and the end code 0Dh (CR).

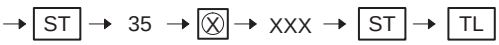
Enter both the codes in decimal digits.

Any figures greater than 127 can not be specified for start and end codes.

[JOB #35] MRS = 007

Programming of the timeout time

PGM2 mode



XXX : Time out time (1-255 sec)

SHARP

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