P-ROM PROGRAMMER

PKW 3000

Opérations au Clavier et Nature des Commandes

- **Principales Commandes**
  Les principales commandes à effectuer au clavier sont :

ERS SET	Test de virginité de l'eprom.
CMP SET	Compare le contenu de l'eprom avec le contenu de la RAM.
LOD SET	Charge en ram le contenu de l'eprom, indique le checksum.
RSET puis PRG SET	Programme le contenu de la ram dans l'eprom, vérifie la programmation, indique le checksum.
— PRG SET	**Commande Automatique** Teste la virginité, programme, vérifie la programmation, indique le checksum de la mémoire sur le socket.
ERS SET	**Commandes pour mémoires HN48016** Efface la mémoire en 200 ms et teste la virginité.
JOB	**Commande d'attente** Arrête l'opération en cours, prépare le programmateur à recevoir une autre commande.

- **Commandes Auxilaires**

JOB A SET	Mise à FF du contenu de la Ram du programmateur.
JOB B SET	Inverse le contenu de la RAM.
JOB C SET	Transfert le contenu de la RAM vers le terminal par l'interface série.
JOB D SET	Transfert le contenu du terminal dans la RAM par l'interface série.
JOB E SET	Mise en mode terminal du programmateur.
JOB F SET	Met le programmateur en communication avec un calculateur.

JOB 2 X X X X SET Y Y Y Y SET Z Z Z Z SET

- **Commande "MOVE** ermet le déplacement automatique d'un bloc de la RAM.

X X X X	Adresse de départ.
Y Y Y Y	Adresse d'arrivée.

● Paramètres de Commande

JOB 0 X X X X SET D D SET JOB

Commandes d'édition de la RAM

1 Commande d'édition de la RAM
2 Adresse d'entrée de la RAM
3 Affiche le contenu de la RAM
4 Change le contenu de la RAM : adresse 17a, la data devient 2b
5 Sauve le contenu de la RAM et incrémente l'adresse courante de 1 (17B)
6 Incrémente l'adresse de 1 (17C)
7 Incrémente l'adresse de 1 (17D)
8 Change le contenu de l'adresse 17C = la data devient 09
9 Sauve le contenu de la RAM et incrémente l'adresse de 1 (17E)
10 Décrémente l'adresse de 1 (17D)
11 Retour en mode "Attente".

JOB 1 X X X X SET T T SET JOB

Commande d'édition de la prom
Procédure de lecture identique à JOB 0.

JOB 3 X X X X SET

Permet la lecture d'un ruban perforé par l'interface série, puis charge le contenu à l'adresse du ruban + X X X X

JOB 4 D D SET

Commande de la vitesse de transfert

Paramètre D	Vitesse
0	4800
1	2400
2	1200
3	600
4	300
5	110

JOB 5 D D SET

Reloge le début de l'adresse de la RAM par page de 256 mots.
D D paramètre défini comme ci-contre :

Paramètre	Adresse logique	Adresse physique
0	0	8000
1	100	8000+100
2	200	8000+200
3	300	8000+300
.	.	.
.	.	.
.	.	.
1F	1F00	8000+1F00
.	.	.

JOB 6 D D SET

Commande du format de transmission suivant tableau.

Paramètre	formats
1	Intel HEX
2	Binary
3	Motorola MIKBUG
4	ASCII HEX
5	TEKTRONIX

JOB 7 D D SET

Permet de mettre le programmateur dans différents modes.

JOB 8 D D SET

Initialise le programmateur en début de format au code ASCII/HEX/space pour ruban de papier.

JOB 9 D D SET

Initialise le programmateur en fin de format au code ASCII/HEX/space pour ruban de papier.

JOB — SET D

Permet de tester les commandes essentielles du programmateur : (clavier, afficheur, RS 232).

CHAPTER 4 OPERATION IN THE TERMINAL MODE

Key operation [JOB] [ERS] [SET] on the PKW-3000 causes the TTY to print out the following comment:

```
PKW-3000
*
```

The system goes into the TERMINAL Mode, and key inputs on the PKW-3000 are inhibited and the system waits for the key operations on the TTY (in the JOB Mode). LEDs are turned off. It only display type code of PROM.

4-1 Definition of Symbols and Input Keys Definition

4-1-1 Definition of Symbols

° * Asterisk

Indicates the JOB Mode

° - Underscore

Underscored characters are automatically printed on the TTY

° XXXX, YYYY, ZZZZ Capital Letters

Represents physical addresses

° xxxx, yyyy, zzzz Small Letters

Represents logical addresses

° n

Represents any parameter or parameters

° ? Question Mark

Represents an error

°<CR> Carriage Return Key

A termination code

°<LF> Line Feed Key

A termination code

°<SP> Space Key

A termination code (For details see 3-5)

° </> Slash Key

A termination code (For details see 3-5)

° , Comma Key

Delimiter of the parameters (For details see 3-5)

4-1-2 Input Key Definition

The parameter input procedure is performed as a flow-out type. The parameters are recognized as shown in the following:

Single Byte Parameters

```
    A  <CR>
   0A  <CR>
  20A  <CR>
 320A  <CR>
```

All the four inputs above are understood as "OA"; that is, only the last two digits input are effective.

```
   321  <CR>
  0321  <CR>
 A0321  <CR>
5A0321  <CR>
```

All the four inputs above are understood as "0321"; that is, only the last four digits input are effective.

An input error causes the system to print a "?" and go into the JOB Mode. If (CR) and (LF) are input without inputting the parameter required for a command, the command is understood as the one with the same designation and not requiring the parameter.

4-2 Commands in the Terminal Mode

The following group of commands are available in the TERMINAL Mode:

- E Command

  Executes the erase-check of the PROM

- C Command

  Compares the PROM and the buffer RAM

- L Command

  Loads the content of the PROM into the buffer RAM

- W Command

  Programs the content of the buffer RAM into the PROM

- A Command

  Executes the E command and W command automatically and consecutively.

- B Command

  Checks hardware errors in the buffer RAM and clears the buffer RAM

- O Command

  Inverts the content of the buffer RAM

- P Command

  Punches out the content of the buffer RAM to the same capacity as the selected PROM

- R Command

  Reads the content of an object tape into the buffer RAM

- Ln Command

  Edits the RAM

- Wn Command

  Edits the PROM

° Rn Command

Reads the object tape into the buffer RAM address as specified by the location address

° Xn Command

Sets various types of control codes

° G Command

Punches out the content of the buffer RAM in Binary format to the same capacity as the selected PROM

° S Command

Reads a Binary format tape into the buffer RAM

° D Command

Dumps all the content of the buffer RAM to the same capacity as the selected PROM

° Dn Command

Dumps the content of the specified address range

° Cn Command

Compares the content on the tape with the content of the specified memory area

° Pn Command

Punches out the memory content of the specified address range

° / (Slash) Slash Command

Changes to the key mode

4-3 Commands of the Same Functions as Key Mode

Commands of this group have different designations and formats, but the functions are the same as those of the key mode.

4-3-1 E Command

Erase-check

OPERATION
*E<CR>OK

This command executes the erase-check of the PROM. The system prints out "OK" when no error is detected. With an error the message is as shown below. The voltage value of PROM is displayed before the Logical address.

```
*E
5.00V  xxxx  DD*EE
5.25V  xxxx  DD*EE
4.75V  yyyy  DD*EE ?
```

- DD*EE → DATA REPRESENTING THE ERASED STATUS
- DD*EE → CONTENT OF THE PROM
- yyyy → LOGICAL ADDRESS
- 4.75V → VOLTAGE VALUE OF PROM

This command is executed down to the last address of the PROM even with an error, but can be aborted by inputting the [JOB] Key as that for the "E" Command.

4-3-2 C Command

Compare

OPERATION
*C<CR>SM OK

This command compares the contents of the PROM and the buffer RAM. The system prints out the sum-check data (SW) and "OK" when no error is detected. With an error, the message is as shown below.

```
*C
5.25V  xxxx  DD*TT
9.75V  yyyy  DD*TT  SM  ?
```

CONTENT OF THE RAM
CONTENT OF THE PROM
LOGICAL ADDRESS
VOLTAGE VALUE OF THE PROM

The system displays the supply voltage to the PROM before the logical address. This command is executed down to the last address of the PROM even with an error, but can be aborted by inputting the [JOB] Key on the PKW-3000. The given displays are the same as those for the "C" Command.

4-3-3 L Command

Load

OPERATION
*L<CR>SM OK

This command loads the content of the PROM into the buffer RAM, and then automatically compares the contents of the PROM with the buffer RAM. Operations during the comparison are the same as those for the "C" Command.

4-3-4 W Command

Programming

OPERATION
*W<CR>SM OK

This command programs the content of the buffer RAM into the PROM in the PROM socket. When an anomaly in the content of the buffer RAM is detected during the programming, the system repeats the error tone after the programming operations are completed. The system returns to the JOB Mode only by inputting the [JOB] Key on the PKW-3000. If there is no anomaly in the content of the buffer RAM, the system automatically executes the COMPARE function.

4-3-5 A Command

Automatic

OPERATION
*A <CR> SM OK

This command executes E command and W command automatically and consecutively. W command can not be executed when the erase-errors are detected.

4-3-6 B Command

Buffer Clear and RAM Check

OPERATION
*B<CR>OK

This command clears the buffer RAM and checks hardware errors in the buffer RAM. If there are no errors, the system prints out "OK".

4-3-7 O Command

Invert Buffer RAM

OPERATION
*O<CR>OK

This command inverts all the bits of the buffer RAM. Upon completion the system prints out "OK".

4-3-8 P Command

Punch Out Buffer RAM

OPERATION
*P<CR> *

This command punches out the content of the buffer RAM to the same capacity as the selected PROM. The system returns to the JOB Mode upon completion of the execution. At POWER ON and RESET, the tape format is set in the INTELLEC HEX. The other formats can be set used with the "Xn" command. For those formats with the location address, the logical address is punched as the location address.

4-3-9 R Command

Tape Read to Buffer RAM

OPERATION
*R<CR> xxxx OK
°xxxx=LAST ADDRESS+1

This command reads the content of an object tape into the buffer RAM. At completion of the execution, the RAM location next to the last address of the data storage (physical address) and "OK" are printed. At POWER ON and RESET, the tape format is set in INTELLEC HEX. The other formats can be used with the "Xn" command.

4-3-10 Ln Command

RAM Edit

OPERATION
∘ REFERENCE TO THE CONTENT OF THE SPECIFIED ADDRESS XXXX
* L x x x x <CR>
x x x x DD<CR>
∘ UPDATING THE CONTENT OF THE SPECIFIED ADDRESS XXXX
* L x x x x <CR>
x x x x DD TT<CR>

This command refers and updates a specified single byte of the memory. The input address must be a logical address.

EX. 4-1

```
*L0
0000    E3<SP>----┐
0001    C3  01<SP>-┤
0002    42  43<CR>  ↓
            ADDRESS INCREMENT
```

(SP) refers to the content of the next address

EX. 4-2

```
*L5
0005    62</>-----┐
0004    C3  23</>--┤
0003    80</>------┘
0002    43  12<CR>  ↓
*           ADDRESS DECREMENT
```

(/) refers to the content of the previous address.

4-3-11 Wn Command

PROM Edit

OPERATION

□ FOR REFERENCE THE SEE CONTENT OF THE SPECIFIED ADDRESS OF THE PROM

```
*Wxxxx<CR>
xxxx   DD<CR>
```

□ SINGLE BYTE PROGRAMMING OF THE PROM AT THE SPECIFIED ADDRESS XXXX

```
*Wxxxx<CR>
xxxx   DD TT<CR>
```

This command refers and programs the content of the single byte of the PROM at the specified address. The programming function, however, is not effective unless the system is available for single-byte programming using the "Xn" command. The function of the termination codes for "Wn" command is the same as for the "Ln" command.

4-3-12 Rn Command

Tape Read to Location Address

OPERATION
*RXXXX<CR> YYYY OK
□ YYYY = LAST ADDRESS + 1

This command reads the content of an object tape and stores it at the Location Address on the Tape + XXXX. Upon completion of the execution, the RAM location next to the last address of the data storage (physical address) and "OK" are printed. The input address must be a physical address. At POWER ON and RESET, the tape format is set in INTELLEC HEX. The other formats can be set used with the "Xn" command.

4-3-13 Xn Command

Set Control Code

OPERATION
□ REFERENCE TO THE CONTROL CODE
*Xn<CR> DD<CR>
□ UPDATING THE CONTROL CODE
*Xn<CR> DD TT<CR>
□ ON CONCLITION THAT $4 \leq n \leq 9$

This command sets code for controlling the PKW-3000 system. ▨ is POWER ON and RESET, the states are set as below.

n	FUNCTION	DD	DD SPECIFICATIONS
4	SET BAUD RATE	00	4800 BAUD
		01	2400 BAUD
		02	1200 BAUD
		03	600 BAUD
		04	300 BAUD
		05	110 BAUD
5	SET THE START ADDRESS OF THE BUFFER	00	OH
		01	100H
		02	200H
6	SET THE FORMAT	01	INTELLEC HEX
		02	BINARY
		03	MOTROLA MIKBUG
		04	ASCII HEX
7	SET THE STATUS	00	REFER TO THE 'JOB7' COMMAND
8	SET THE START CODE	02	STX
			ANY CODES(ASCII)
9	SET THE END CODE	03	ETX
			ANY CODES(ASCII)

4-4 Terminal Mode Command

These commands can be used only in the TERMINAL Mode.

4-4-1 G Command

Binary Punch Out

OPERATION
*G<CR>

This command punches out the content of the buffer RAM in Binary format to the same capacity as the selected PROM.

4-4-2 S Command

Binary Read

OPERATION
*S<CR> XXXX OK □XXXX= LAST ADDRESS + 1

This command reads a Binary format tape, and the read data is stored in the buffer RAM. Upon completion of the execution, the RAM location next to the last address of the data storage (physical address) and "OK" are printed.

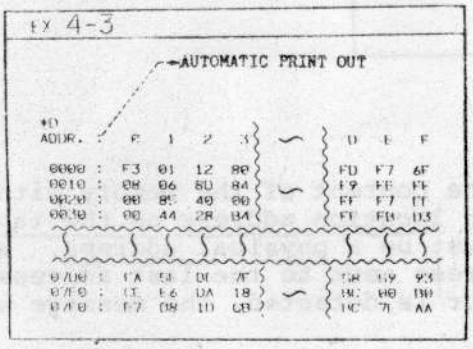
4-4-3 D Command

Buffer RAM Dump Out

OPERATION
*D<CR>

This command dumps all the content of the buffer RAM to the same capacity as the selected PROM. The printed addresses are logical addresses. For aborting the operation, input the [JOB] Key on the PKW-3000, which puts the system into the JOB Mode.

EX 4-3



The above example ..... Buffer RAM = 2K byte

4-4-4 Dn Command

Memory Dump Out

OPERATION

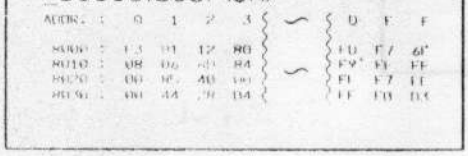
□ FOR DUMPING FROM THE START ADDRESS XXXX TO THE END ADDRESS YYYY

*PXXXX, YYYY<CR>

This command dumps the content of the specified address range of the memory. Both the input parameter and printed address are physical addresses. The start address must be less than or equal to the end address.

EX. 4-4

*D8000,803F<CR>

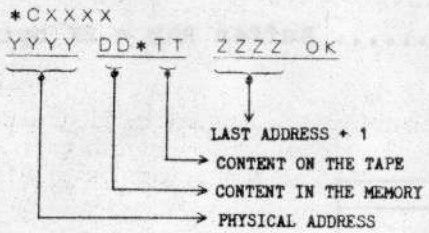


4-4-5 Cn Command

Tape Compare

OPERATION
*CXXXX<CR> YYYY OK ▫YYYY= LAST ADDRESS + 1

This command compares the content of the memory with the content of object tape at the location address on the tape + XXXX. The input parameter must be a physical address. When there are no errors, the address next to the last address and "OK" are printed. If an error is detected, the message will be as follows:



At POWER ON and RESET, the tape format is set in INTELLEC HEX. The other formats can be set used with the "Xn" command. For aborting the operation, input [JOB] Key on the PKW-3000, which puts the system into the JOB Mode.

4-4-6 Pn Command

Memory Punch-Out

OPERATION
▫ FOR PUNCHING OUT THE CONTENT OF THE MEMORY FROM THE START ADDRESS XXXX TO THE END ADDRESS YYYY *PXXXX, YYYY<CR>

This command punches out the content of the specified address range of the memory. The input parameters XXXX and YYYY must be physical addresses. At POWER ON and RESET, the tape format is set in INTELLEC HEX. The other formats can be set by using the "Xn" command.

4-4-7 / Command

OPERATION
*/<CR>

This command changes the Terminal Mode to the Key mode.

4-5 How to Input a Termination Code

When an input parameter value is "0" immediately after the command name, "0" can be omitted by using these code shown below.

* L { <SP> / < ' > / < / > } Input of one of these = LO

* D { <SP> / < , > / < / > } XXXX CR =DO, XXXX

Where ( ) denotes "either one of".

Caution: If <CR> or <LF> is input immediately after the command name, it is recognized as a command with the same name without parameter. After parameter or parameters are input, <CR> or <LF> can be used

4-6 Serial Interface

4-6-1 Specifications

° Communication

Half Duplex communication system

° Baud Rate

4800, 2400, 1200, 600, 300, 110 BPS.
The Baud rate can be set by using "JOB 4" command

° Synchronization

Start Stop System

4-6-2 Type of Signals

° TRANSMIT DATA: TXD (Output)

° RECEIVE DATA: RXD (Input)

° REQUEST TO SEND: RTS (Output)

Prohibit to transmit a data to Modem at LOW level.

° CLEAR TO SEND: CTS (Input)

Capable to transmit a data at HIGH level, prohibit to transmit a data at LOW level.

° DATA SET READY: DSR (Input)

Signal for capable to transmit and receive data.

At LOW level, it recognizes to unable transmitting and receiving a data and repeats a Buzzer Sound. It becames the JOB Mode by input [JOB] Key.

° DATA TERMINAL READY: DTR (Output)

Signal for capable to transmit and receive data.
At the POWER-ON, it is always HIGH level.

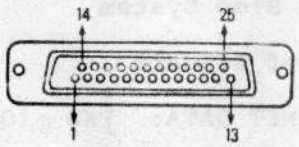
4-6-3 Connecter

° Connecter Standard

DB-25SA-J4 Japan Aviation Electronics Industry Co., Ltd.

° Connecter Terminal Nos. and Signal Name

Pin No.	RS232C
1	FG
2	TXD
3	RXD
4	RTS
5	CTS
6	DSR
7	SG
8 ∫ 19	NC
20	DTR
21 ∫ 25	NC



LIS 4-2 Pin Number List

° Cable Set-up

When cables are set up, the following connecters are to be used.

DB-2SP Japan Aviation Electronics Industry (or equivalent)

DB-C2-J9 Japan Aviation Electronics Industry (or equivalent)

4-6-4 Signal Timing

◦ DATA Timing

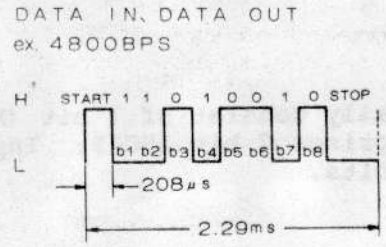


Fig. 4-1 Data Timing Waveform

START bit :1bit
DATA bit :8bit
STOP bit :2bit
1 bit :208μs
1charactor :2.29ms

◦ TXD and CTS signal

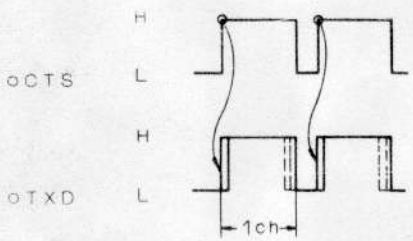


Fig. 4-2 TXD and CTS

When CTS signal is "L", data output is prohibited and the next data output is executed after a rise of CTS signal.

4-6-5 Device Control Character

For the RS-232C-interface, ASCII , functional characters "CC1 (11H)" and "DC3 (13H)" becomes ready to use.

- "P"-command, "R"-command on communicate mode
  Upon "P"-command, data output is generated after recognizing an input of "DC1".
  Upon "R"-command, output of either "DC1" or "DC3" is not generated.

- "P"-command, "R"-command on terminal mode
  Upon "P"-command, "DC1" or "DC3" is not recognized.
  Upon "R"-command, output of "DC1" or "DC3" is generated.

4-6-6 I/O Character

Output characters totally consist of 7 bit (MSB-L) ASCII. Echo back also comprises 7 bit ASCII. Input character may be either 7 bits or 8 bits.

CHAPTER 5 OPERATIONS IN CPU COMMUNICATION MODE

Key operations [J] [F] [ST] on the PKW-3000 outputs the following character codes: ODH (CR), OAH (LF), and 2AH (*). The system then goes into the COMMUNICATION Mode and key input on the PKW-3000 are inhibited. The PKW-3000 waits for the control from the host CPU. The [JOB] Key on the PKW-3000, however, is enabled when some of the command are executed by the host CPU. LED displays are turned off.

5-1 Command and Message

5-1-1 Command

The commands in the COMMUNICATION Mode are as follows:

° E Command

Executes the erase-check of the PROM.

° C Command

Compares the contents of the PROM with the buffer RAM.

° L Command

Loads the content of the PROM into the buffer RAM.

° W Command

Programs the content of the buffer RAM into the PROM.

° A Command

Executes the 'E' command and 'W' command consecutively and automatically

° B Command

Clears the buffer RAM and checks hardware errors in the buffer RAM.

° O Command

Inverts the content of the buffer RAM

° P Command

Transmits the content of the buffer RAM to the same capacity as the selected PROM

° R Command

Receives the object data from the host CPU and reads the data into the buffer RAM

° G Command

The same as the "G" Command in the TERMINAL Mode

° S Command

The same as the "S" Command in the TERMINAL Mode

° / Command

The same as the "/" Command in the TERMINAL Mode.

The functions, operations and LED displays for those commands are the same as those for the commands in the TERMINAL Mode.

5-1-2 Message

When any of the commands described in 5-1-1 are executed normally, the system outputs the following message and waits for the next command input:

ODH (CR), OAH (LF), and 2AH (*)

When an error is detected during the command execution, the system outputs the following message, and waits for the next command input:

3FH (?), ODH (CR), OAH (LF), and 2AH (*)

An "?" output after the command execution means that an error is detected during the command execution.

5-2 Communications With the PKW-3000

The flowchart of the communication between the host CPU and the PKW-7000 is shown in Fig. 4-1. Details of the dotted boxes are described later.

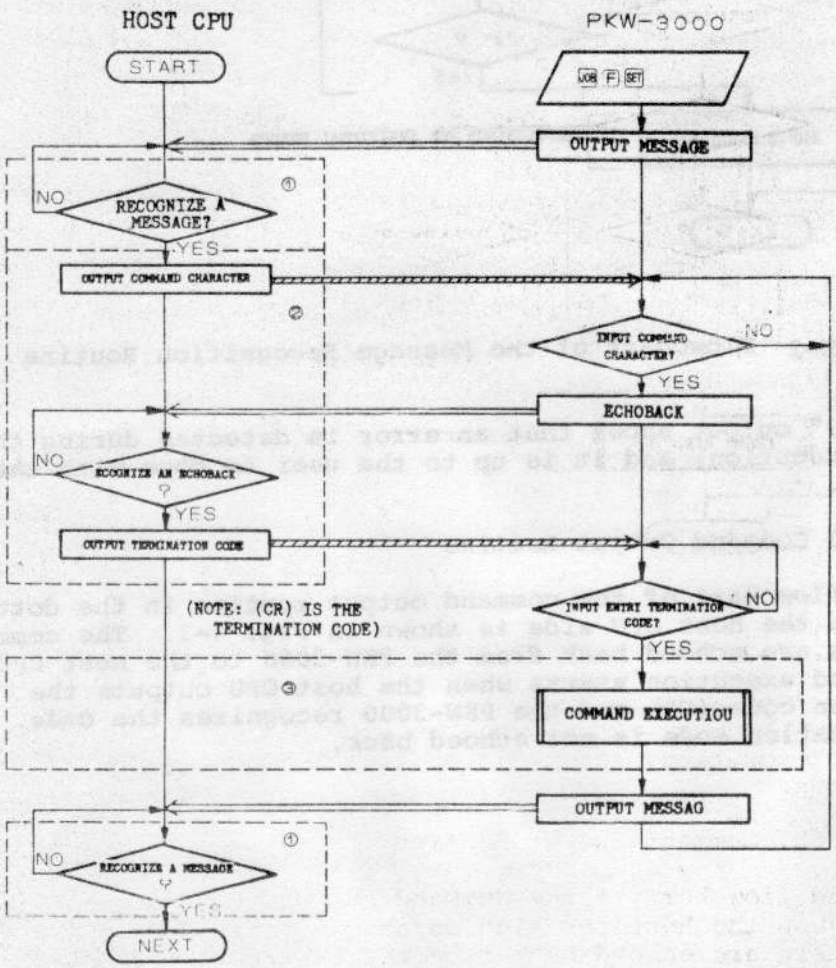


Fig. 5-1

5-2-1 (1) Message Recognition Routine

The flowchart of the message recognition routine in the dotted box (1) on the host CPU side is shown in Fig. 4-2

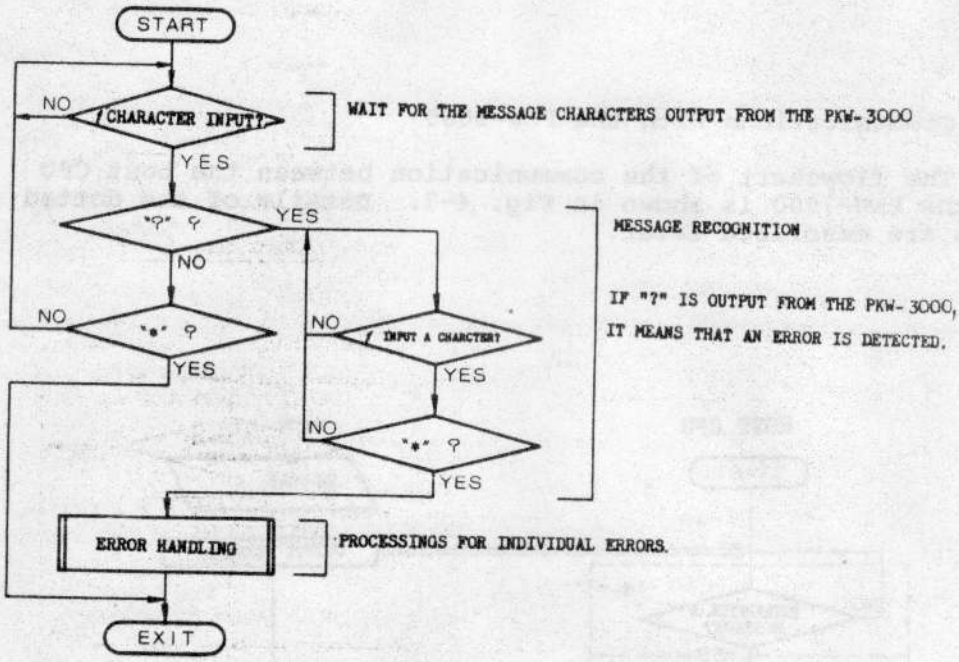


Fig. 5-2 Flowchart of the Message Recognition Routine

An "?" output shows that an error is detected during the command execution, and it is up to the user to cope with that situation.

5-2-2 (2) Command Output Routine

The flowchart of the command output routine in the dotted box (2) on the host CPU side is shown in Fig. 4-3. The command characters are echoed back from the PKW-3000 to the host CPU. The command execution starts when the host CPU outputs the termination code (CR) and the PKW-3000 recognizes the code. The termination code is not echoed back.

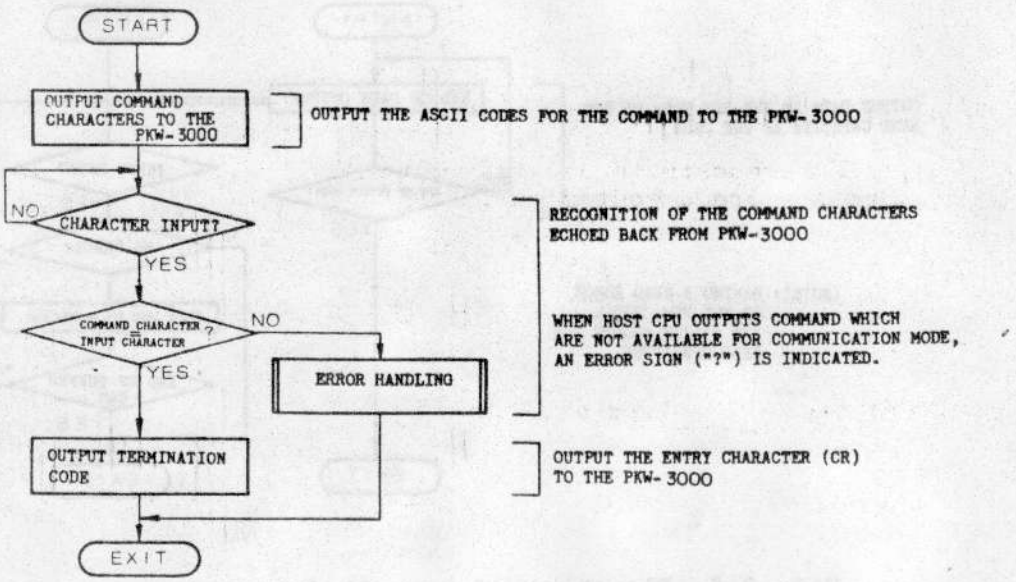


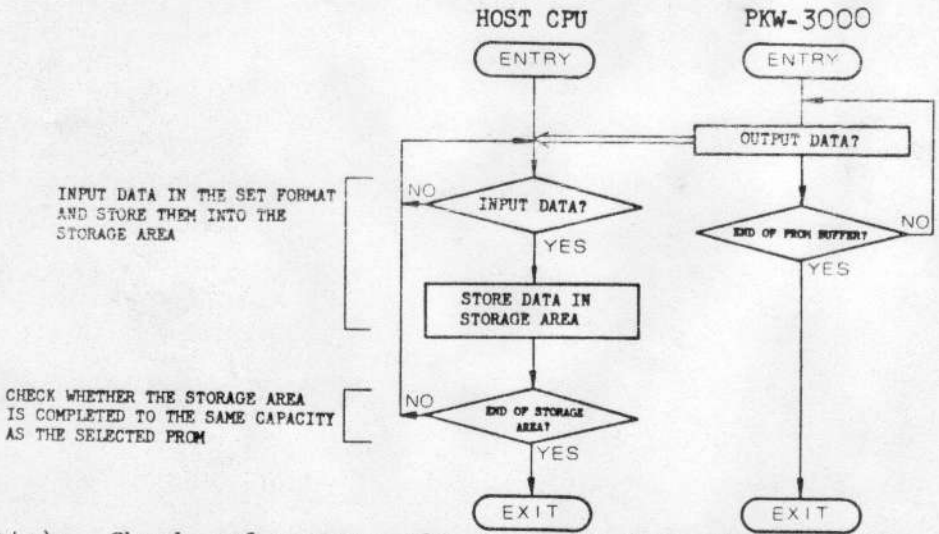
Fig. 5-3 Flowchart of Command Output Routine

5-2-3 (3) Command Execution

Some commands need separate sending and receiving routines.

° Data Receive Routine

It is necessary to use the routines when "P" or "G" command is executed on the PKW-3000.



(Note): Check and process the messages from the PKW-300- even with read error.

Fig. 5-4 Flowchart of Data Reception Routine

° Data Send Routine

It is necessary to use this routine when "R" or "S" Commands are executed on the PKW-3000.

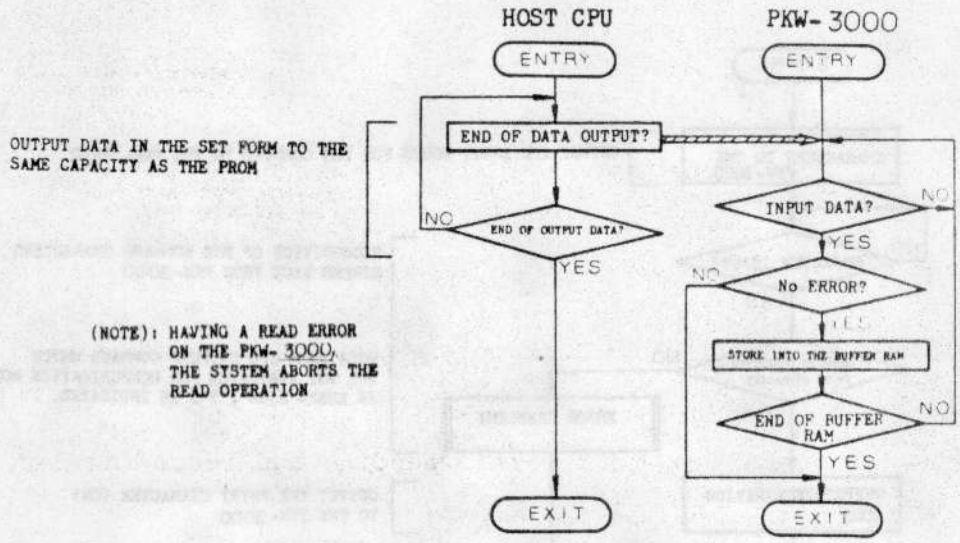


Fig. 5-5 Flowchart of Data Send Routine

CHAPTER 6 BASIC PROCEDURES FOR PROGRAMMING

6-1 Basic Operation

6-1-1 Programming with Data Input Through Manual Key Operations

° 1 [J][A][SET] [JA] (CM)

CLEAR BUFFER RAM

° 2 [J][O][SET] [JO] (CM) [FF] (DT) [ ] (AD)

COMMAND FOR EDITING RAM

° 3 [D][D][SET] [DD] (DT) [1] (AD)

STORE DATA

° 4 [D][D][SET] [DD] (DT) [2] (AD)

⋮

STORE DATA

↓

° 5 [J] [-] (CM)

GO TO THE JOB MODE

° 6 ↕ (E) [E][SET] [E] (CM)

ERASE-CHECK OF PROM

° 7 [W][SET] ↑ (P) [P] (CM)

PROGRAMMING

6-1-2 How to Copy Master PROM

° 1 ↕ (M) [L][SET] ↕ (M) [L] (CM)

LOAD THE PROGRAMMING DATA INTO RAM

° 2 ↕ (E) [E][SET] [E] (CM)

EXECUTE THE ERASE-CHECK OF THE PROM

° 3 [W][SET] ↑ <P> [P] (CM)

PROGRAMMING

6-1-3 How to Program by Data Input Through PTR

° 1 [J] [4] [D] [D] [SET] [J4] (CM) [DD] (DT)

SET BAUD RATE

° 2 [J] [6] [D] [D] [SET] [J6] (CM) [DD] (DT)

SET TAPE FORMAT

° 3 [J] [A] [SET] [JA] (CM)

CLEAR BUFFER RAM

° 4 [J] [D] [SET] NO DISPLAY IS GIVEN

READ TAPE

° 5 ↕ (E) [E] [SET] [E] (CM)

EXECUTE THE ERASE-CHECK OF THE PROM

° 6 [W] [SET] ↑ <P> [P] (CM)

PROGRAMMING

(Note): Operations 1 and 2 are not needed for INTELLEC HEX at 4800 baud.

6-1-4 Programming with Data Input Through TTY

° 1 [J] [4] [D] [D] SET [J4] (CM) [DD] (DT)

SET BAUD RATE

° 2 [J] [E] SET [JE] (CM)

GO TO TERMINAL MODE AND INPUT FROM TTY HEREAFTER

° 3 *X6<CR> DD TT<CR>

SET FORMAT

° 4 *B <CR>

CLEAR BUFFER RAM

° 5 *R <CR>

READ TAPE

° 6 *LYYYY<CR> DD TT<CR>

UPDATE THE DATA AT YYYY

° 7. ↕(E) *E<CR>

EXECUTE THE ERASE-CHECK OF THE PROM

° 8 *W<CR> ↕<P>

PROGRAMMING

APPENDICES

APPENDIX 1. COMMAND LIST

KEY MODE	TERMINAL MODE	COMMUNICATION MODE	PARAMETER	FUNCTION OF COMMANDS
E	E	E		ERASE-CHECK OF THE PROM
C	C	C		COMPARE THE PROM WITH THE BUFFER RAM
L	L	L		LOAD PROM DATA INTO THE BUFFER RAM
P	W	W		PROGRAM THE CONTENT OF THE BUFFER RAM INTO THE PROM
-P	A	A		EXECUTE ERASE-CHECK AND PROGRAMMING AUTOMATICALLY AND CONSECUTIVELY
JA	B	B		CHECK AND CLEAR THE BUFFER RAM
JB	O	O		INVERT THE CONTENT OF THE BUFFER RAM
JC	P	P		OUTPUT THE WHOLE CONTENT OF THE BUFFER RAM
JD	R	R		READ DATA INTO THE BUFFER RAM
JE				BRING THE SYSTEM INTO THE TERMINAL MODE
JF				BRING THE SYSTEM INTO THE cpu COMMUNICATION MODE
JO	Ln		Y	EDIT THE CONTENT OF THE BUFFER RAM
J1	Wn		Y	REFERRING TO THE CONTENT OF THE PROM AND SINGLE BYTE PROGRAMMING
J2	Mn		Y	EXECUTES THE BLOCK TRANSMISSION OF DATA
J3	Rn		Y	READ PAPER TAPE INTO THE LOCATION ADDRESS
J4 - J9	Xn		Y	SET VARIOUS CONTROL CODES
J-			Y	TEST PROGRAM
	G	G		OUTPUT THE WHOLE CONTENT OF THE BUFFER RAM IN BINART FORMAT
	S	S		READ DATA INTO THE BUFFER RAM IN BINARY FORMAT
	D			DUMP THE CONTENT OF THE SPECIFIED ADDRESS RANGE
	Dn		Y	DUMP THE WHOLE CONTENT OF THE BUFFER RAM
	Cn		Y	COMPARE THE CONTENT ON THE PAPER TAPE AND IN THE MEMORY
	Pn		Y	PUNCH OUT THE CONTENT OF THE SPECIFIED ADDRESS RANGE
	/	/		PUT THE SYSTEM INTO THE KEY MODE

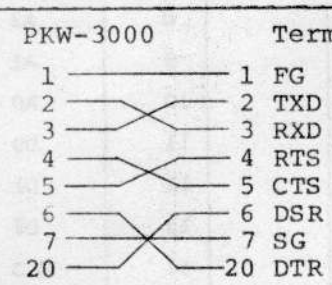
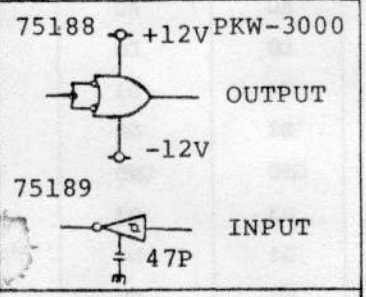
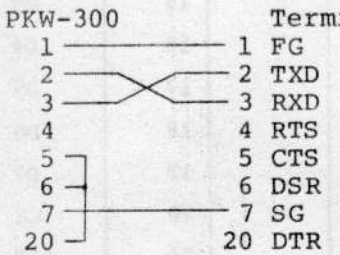
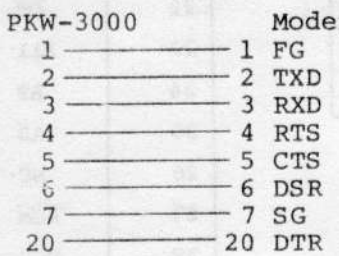
Appendix 3 PIN DESIGNATIONS OF PROMS

	2716	2732	2532
Pin No.	Name	Name	Name
1	A7	A7	A7
2	A6	A6	A6
3	A5	A5	A5
4	A4	A4	A4
5	A3	A3	A3
6	A2	A2	A2
7	A1	A1	A1
8	A0	A0	A0
9	D0	D0	D0
10	D1	D1	D1
11	D2	D2	D2
12	GND	GND	GND
13	D3	D3	D3
14	D4	D4	D4
15	D5	D5	D5
16	D6	D6	D6
17	D7	D7	D7
18	$\overline{CE}$/PGM	CE	A11
19	A10	B10	A10
20	$\overline{OE}$	$\overline{OE}$/VPP	PD/$\overline{PGN}$
21	VPP	A11	VPP
22	A9	A9	A9
23	A8	A8	A8
24	VCC	VCC	VCC

	2764	2564
Pin No.	Name	Name
1	VPP	VPP
2	A12	CS1
3	A7	A7
4	A6	A6
5	A5	A5
6	A4	A4
7	A3	A3
8	A2	A2
9	A1	A1
10	A0	A0
11	D0	D0
12	D1	D1
13	D2	D2
14	GND	GND
15	D3	D3
16	D4	D4
17	D5	D5
18	D6	D6
19	D7	D7
20	CE	A11
21	A10	A10
22	$\overline{OE}$	PD/$\overline{PG}$
23	A11	A12
24	A9	A9
25	A8	A8
26	NC	VCC
27	$\overline{PGM}$	$\overline{CS2}$
28	VCC	VCC

(Note): 2732A is a 2732 family. (2732A, VPP = 21V)
48016 is a 2716 family.

Appendix 4. EXAMPLE OF RS232C INTERFACE CONNECTION

Type	Connection	Remark
RS232C Terminal Handshake YES		
RS232C Terminal Handshake NO		
RS232C Modem Handshake YES		
RS232C Modem Handshake YES