

# Instruction Manual

# AEA MORSE

# MEMORY KEYER

# MODEL CK-1

## LIMITED WARRANTY

ADVANCED ELECTRONIC APPLICATIONS, INC. warrants to the original purchaser that this product shall be free from defects in material or workmanship for ninety days from the date of original purchase. In order to obtain warranty service: (1) Complete and mail the warranty registration card to Advanced Electronic Applications, Inc. and (2) Send written notification to the address below as soon as possible after discovering a possible defect.

Advanced Electronic Applications, Inc.  
Attention: Service Department  
Bldg. "O", 2006 - 196th S W  
Lynnwood, Wa. 98036

The written notification must include a copy of the invoice. Include a description of the defective part or condition, with details of the electrical connections to associated equipment and list such equipment. Please enclose your name, phone number, and address. Shipping charges for any parts or units submitted for replacement under this warranty must be paid by the purchaser.

Correct maintenance, repair, and use are important to insure proper performance form this product. Carefully read the instruction manual. This warranty does not apply to any defect AEA determines is caused by (1) improper maintenance or repair, including the installation of parts or accessories that do not conform to the quality and specification of the original parts; (2) misuse, abuse, neglect, or improper installation. (3) accidental or intentional damage.

All implied warranties, if any, terminate ninety days from the date of original purchase. AEA is not responsible for damage to other equipment or property or any other consequential or incidental damage of any kind whether based on contract, negligence, or strict liability. Maximum liability shall not, in any case, exceed the purchase price of the unit.

The foregoing constitutes AEA's entire obligation with respect to this product. The original purchaser and any user or owner shall have no other remedy and no claim for incidental or consequential damages. Some states do not allow limitations on how long an implied warranty lasts or do not allow the exclusion of incidental or consequential damages, therefore, the above limitations and exclusions may not apply to you.

This warranty gives specific legal rights. You may also have other rights which vary from state to state. Specifications subject to change without notice or obligation.



**ADVANCED ELECTRONIC APPLICATIONS, INC.**  
P.O. Box 2160  
Lynnwood, Washington 98036 USA  
(206) 775-7373

Copyright 1980 by **ADVANCED ELECTRONIC APPLICATIONS, INC.**  
All rights reserved. No part of this book may be reproduced or utilized in any  
form or by any means, without permission in writing from the publisher.

## TABLE OF CONTENTS

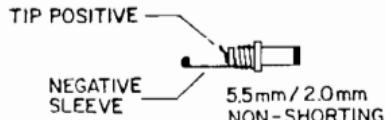
CK-1 WIRING INSTRUCTIONS .....	1
KEYING TRANSISTORIZED TRANSCEIVERS .....	1
<b>OPERATION</b>	
I. GENERAL .....	2
II. KEYER .....	2
1. SPEED CHANGE AND SET .....	2
PRESET SPEEDS .....	2
VARIABLE SPEED ADJUSTMENT .....	3
2. SIDETONE CHANGE .....	3
3. AUTOMATIC OR SEMI-AUTOMATIC (BUG) OPERATION .....	3
4. DOT-SPACE, DASH-SPACE RATIOS (WEIGHTING) .....	3
5. DOT AND DASH MEMORIES .....	5
6. TRANSMITTER TUNING .....	6
7. MISTAKES .....	6
III. MEMORY OPERATIONS .....	6
1. MEMORY LOCATIONS .....	6
2. MEMORY MESSAGE LOAD .....	7
REAL TIME MESSAGE LOADING .....	7
AUTOMATIC MEMORY LOAD .....	7
3. MEMORY ERASE .....	8

4. MEMORY RETENTION .....	8
5. MAXIMUM LOADING SPEED .....	8
6. SERIAL NUMBER LOAD AND SET .....	9
7. EXTRA WORD OR CHARACTER SPACES .....	10
8. MEMORY FULL WARNING .....	10
9. SEMI-AUTO (BUG) MEMORY LOAD .....	10
<b>IV. MEMORY SEND OPERATION .....</b>	<b>11</b>
1. SENDING A MESSAGE .....	11
2. INTERRUPTING AND RESTARTING A MESSAGE .....	11
3. SERIAL NUMBERS IN MEMORY SEND .....	11
<b>V. EDITING MESSAGES IN MEMORY .....</b>	<b>12</b>
1. EDIT CAPABILITIES .....	12
2. INSERTION .....	12
3. DELETION .....	12

## **GENERAL INFORMATION**

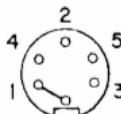
SCHEMATIC .....	14
PARTS PICTORIAL .....	15
PARTS LIST .....	16
APPENDIX A .....	18
CODE .....	18
WARRANTY .....	INSIDE BACK COVER
PROGRAMMING KEY .....	BACK COVER

## CK-1 WIRING INSTRUCTIONS

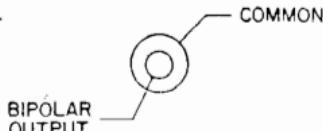


Power Plug

1 - COMMON  
2 - DASH  
3 - DOT  
4 - BLANK  
5 - BLANK



Paddle Connection



Keyer output

## KEYING TRANSISTORIZED TRANSCEIVERS

Some transistorized transceivers such as the ICOM 701 and the Ten-Tec line require a slight modification of the AEA keyer. With this modification, a reed relay is not required for proper keying.

If the CK-1 does not key your transceiver, check your transceivers key input polarity with respect to chassis ground. If positive, modify the unit as follows:

A. Remove the keyer from its case and locate the diode closest to the speaker (D4).

B. Solder a jumper across this diode.

C. Reassemble the keyer.

### IMPORTANT!

If the keyer is to be used with a transceiver or transmitter with negative keying polarity, such as a vacuum tube transmitter with grid blocked keying, it is necessary to remove this jumper.

# OPERATION

## I. General

The AEA Keyer Model CK-1 has been designed for the serious CW operator. It features a versatile memory load and edit capability, automatic serial number, rapid CW speed changes and full weighting control.

## II. Keyer

### 1. Speed Change And Set

Two methods of CW speed control are available, variable and preset.

#### Preset Speeds

Two presetable speeds may be stored and quickly recalled. To store speed "A", press  $\star \star 8 N N$ , where N N is the two digit speed in wpm desired. Similarly, for storing speed "B", press  $\star \star 9 N N$ .

The keyer will be set to the last speed entered.

When the keyer is turned on, speeds "A" and "B" are initialized to 20 and 30 wpm respectively.

To recall speed "A", press  $\star 8$  and to recall speed "B", press  $\star 9$ .

Example: To store 5 and 15 wpm in speeds "A" and "B":

Press  $\star \star 8 0 5$ ,  
 $\star \star 9 1 5$ .

Now, to change from 15 wpm to 5 wpm, press  $\star 8$ . To change back to 15, press  $\star 9$ .

## **Variable Speed Adjustment**

A "variable" speed set is also available. To increase speed, press  6 and hold the 6 until the desired speed is reached. The keyer will send alternating dots and dash during the change.

To reduce speed, press  7 and hold the 7.

## **2. Sidelone Change**

The sidelone is set to 500 Hz when the keyer is turned on. To increase the pitch press  1 and hold the "1" key until the desired tone is reached. The tone may be lowered by pressing  twice and holding the "1" i.e.,   1.

The pitch of the sidelone when the "1" key is released will be the pitch of the CW sidelone. The pitch of the keypad feedback tone will be lower.

## **3. Automatic or semi-automatic (bug) operation**

When the keyer is turned on, it is set for automatic, iambic operation. The keyer may be operated in the semi-automatic mode by pressing   6. The keyer will now behave as a "bug". To return to full automatic operation, press   7.

## **4. Dot-Space, Dash-Space Ratios (Weighting)**

"Perfect" Morse code is formed with the length of a dot equal to the intra character space length, (a dot-space ratio of 1.0) and the dash length equal to three space times (a dash-space ratio of 3.0).

The dot-space ratio is adjustable from 0.5 to 1.5 and is set to 1.0 on turn-on.

To change the dot space ratio, press **\* 2** and enter the ratio using the pound (#) as the decimal.

Example: To enter a dot-space ratio of 0.7 press  
**\* 2 0 # 7** or **\* 2 # 7**.

To enter a dot-space ratio of 1.3 press  
**\* 2 1 # 3**.

If the dot-space ratio entered exceeds 1.5 or is less than 0.5, the ratio will be set to 1.0.

The dash-space ratio is set to 3.0 on turn-on and is adjustable from 2.0 to 4.0. To change the dash-space ratio, enter **\* \* 2** and the new dash ratio.

Example: A dash-space ratio of 3.7 is desired. Press  
**\* \* 2 3 # 7**.

If the dash space ratio entered exceeds 4.0 or is less than 2.0, the ratio will be set to 3.0.

The code speed is automatically adjusted for other than the "perfect" dot-space, dash-space ratios and is based on the word "PARIS". (1)

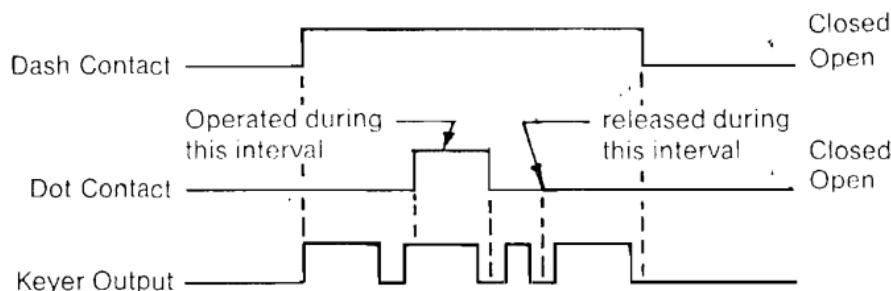
When a new dot-space or dash-space ratio is entered, the code speed will revert to the last speed entered via "**\* \* 8** or **\* \* 9**". If no speed has been entered after turn-on, the keyer will revert to 15 wpm after a dot or dash ratio

(1) See Appendix A

change. This will have the largest effect if the variable speed change feature has been used before changing the ratio.

## 5. Dot and Dash Memories

The selectable dot and dash memories are enabled on keyer turn-on. The dot memory allows insertion of a dot during a string of dashes. For example, the letter "Q" could be sent as follows:



The dash memory operates in the same fashion, allowing the insertion of a dash in a string of dots.

To disable the dot memory, press **\* [3]**.

To enable the dot memory, press **\* \* [3]**.

To disable the dash memory, press **\* [4]**.

To enable the dash memory, press **\* \* [4]**.

Full iambic operation is available with the dot and dash memories enabled or disabled. This feature is useful for generating characters with alternating dots and dashes like the period and the letter "C". To utilize this feature, hold both the dot and dash paddles.

## 6. Transmitter Tuning

To allow transmitter tuning, the keyer output transistors will be operated upon pressing **\*/5**. The "5" must be released before the keypad tone is completed. Tuning will be terminated by pressing any keypad button or operating the dot or dash paddle.

The tune feature only operates in the keyer-memory send mode.

## 7. Mistakes

Incomplete, undesired entries may be terminated by pressing **#**. Unacceptable entries will be ignored. For example, if a speed change were entered **\*/8 2 \***, the result will be no speed change.

# III. Memory Operations

## 1. Memory Locations

The AEA CK-1 keyer has ten separate, variable length memory locations. The total memory length is about 500 characters (the actual length is dependent on the lengths of the characters, the length and number of pauses, etc.), which may be divided into the ten locations in any fashion. Each memory location length is automatically adjusted during message loading.

## **2. Memory Message Load**

Two methods of memory loading are available, Real Time loading and Automatic character and word space loading. In both modes memory loading does not begin until the first character is started. This prevents the undesirable pause at the beginning of the message playback. Messages may also be loaded in semi-automatic (bug) mode.

### **Real Time Message Loading**

To select Real Time message loading, set the mode switch to "Memory Load" (toward the connector panel) and press   9. Select the message location desired, 0 through 9, and press the location digit. Memory loading will begin with the first characters and all pauses in sending will be loaded as sent (pauses use memory space). When message loading is complete, press  to terminate the message load.

### **Automatic Memory Load**

The Keyer is set to automatic memory load on turn-on. If real-time load has been selected, automatic memory load may be re-selected by pressing   9 when the mode switch is in the memory load position.

In automatic message loading, a pause in sending longer than two space length records a character space (three intra character spaces). If the pause is longer than five space lengths, a word space is recorded (seven intra character spaces), loading then stops until the next character is started.

To record a message, set the mode switch to Memory Load, toward front of the unit, press the message location digit, key in the message, and terminate the message with the pound sign key #.

Example: To store a message in memory location 5, set the mode switch to Memory Load and press 5. Now enter the message with the key.

**IMPORTANT:** After the message is entered press # to signal the end of the message load.

### **3. Memory Erase**

Power is supplied to the memory from the 12V source.

Operation of the off-on switch erases the entire memory, however the unit is designed to be left on continuously.

To erase one of the memory locations, switch to Memory Load (toward the connector panel), press the location number and then #. The entire message in that location will be erased.

Example: Erase messages 3 and 7, set mode to Memory Load, press

3 # 7 # or 7 # 3 #

### **4. Memory Retention**

When 12V power is first applied the memory will contain random characters. These random characters should be erased (see previous section) before high speed loading is attempted. Power must be left on to maintain memory.

### **5. Maximum Loading Speed**

Loading speeds up to 99 wpm are permissible if memory locations higher than the location being loaded are empty or contain short messages. If, for example, memory location 5 contains about 300 characters and high speed message loading is attempted in locations 0 through 4 a pause between every two dots and/or dashes will occur. To prevent this either reduce loading speed, erase the long message, or load the new message into a higher memory location.

## 6. Serial Number Load and Set

An automatically incremented serial number may be inserted anywhere in any of the ten messages. It may also be inserted as many times as desired within a message. The serial number is incremented just as the message is completed.

To insert the automatic serial number during the loading of a message press **\*/0**. Insertion of a serial number in real time memory load will halt the real time loading of the pause. The next keyed character will restart pause loading.

When the power switch is turned on, the serial number is set to 01.

If the serial number has incremented, it may be reset to 01 **in the memory load mode** by pressing **\*/\*/0**.

The serial number may be changed to any number between 01 and 9999 in the **keyer-memory send mode** by pressing **\*/\*/0 N N N N #** where N N N N is the one to four digit serial number desired.

Example: A starting serial number of 971 is desired. Press

[\*] [ ] [0] [9] [7] [1] [#]

The next serial number sent will be 971.

## 7. Extra Word or Character Spaces

In the automatic memory load mode, one word space is loaded after keying is halted. If desired, additional word (7 space lengths) or character (3 space lengths) may be entered. Each time [\*] [ ] [8] is pressed an additional word space will be loaded and each time [\*] [8] is pressed an additional character space will be loaded.

Insertion of a word or character space in real time memory loading will stop the real time load of a pause, the next keyed character will restart pause loading.

## 8. Memory Full Warning

When the memory is completely full, the CW sidetone pitch will decrease. At this point, load is automatically terminated. If further loading is desired, it will be necessary to erase one of the other messages.

## 9. Semi-Auto (bug) Memory Load

Messages may be entered in the semi-automatic mode. During memory send, the messages will be sent with the selected dot and dash ratio and the keyer will revert to automatic operation.

If the paddle has contact bounce it will be necessary to connect a 1.0 mf cap across the dash contacts to prevent loading of extra dashes in semi-automatic mode.

## **IV. Memory Send Operation**

### **1. Sending A Message**

To start any of the ten messages, set the mode switch to Keyer-Memory Send (away from the connector panel) and press the digit of the desired message location. The message will start when the key pad button is **released**.

Example: To start message 6, press and release **6**.

### **2. Interrupting and Restarting A Message**

A message being sent from memory may be interrupted by pressing the pound sign key **#** or by tapping either of the keyer paddles. The Memory keyer then enters normal keyer operation and a hand keyed message may be sent.

The interrupted message may either be restarted by pressing the digit of the message or resumed from the point of interruption by pressing **\* 5**. If the message has completed, pressing **\* 5** will start the next message, except for message 9.

### **3. Serial Numbers in Memory Send**

The serial number will be automatically incremented when a message containing a serial number is completed. If the message is interrupted, the serial

number will not be incremented.

A new starting serial number may be loaded, in memory send mode by pressing **\* 0 N N N N #**, where N N N N is the new, one to four digit, serial number.

The previous serial number may be repeated by pressing, in memory send mode, **\* 0** before starting the message. Each operation of **\* 0** will reduce the serial number by one.

## V. Editing Messages in Memory

### 1. Edit Capabilities

Messages in memory may have additions placed anywhere in the message and deletions from any point in the message to the end of the message.

### 2. Insertion

To insert additional text in an existing message, play the message in memory send mode and halt the message at the desired point with either paddle or the pound **#** key. Switch to memory load, press **\* 5** and key in the desired addition. Switch back to memory send without pressing **#**.

If the insertion is at the very beginning of a message, switch to memory load, press the digit of the message location and key in the desired addition, then switch back to memory send without pressing **#**.

### 3. Deletion

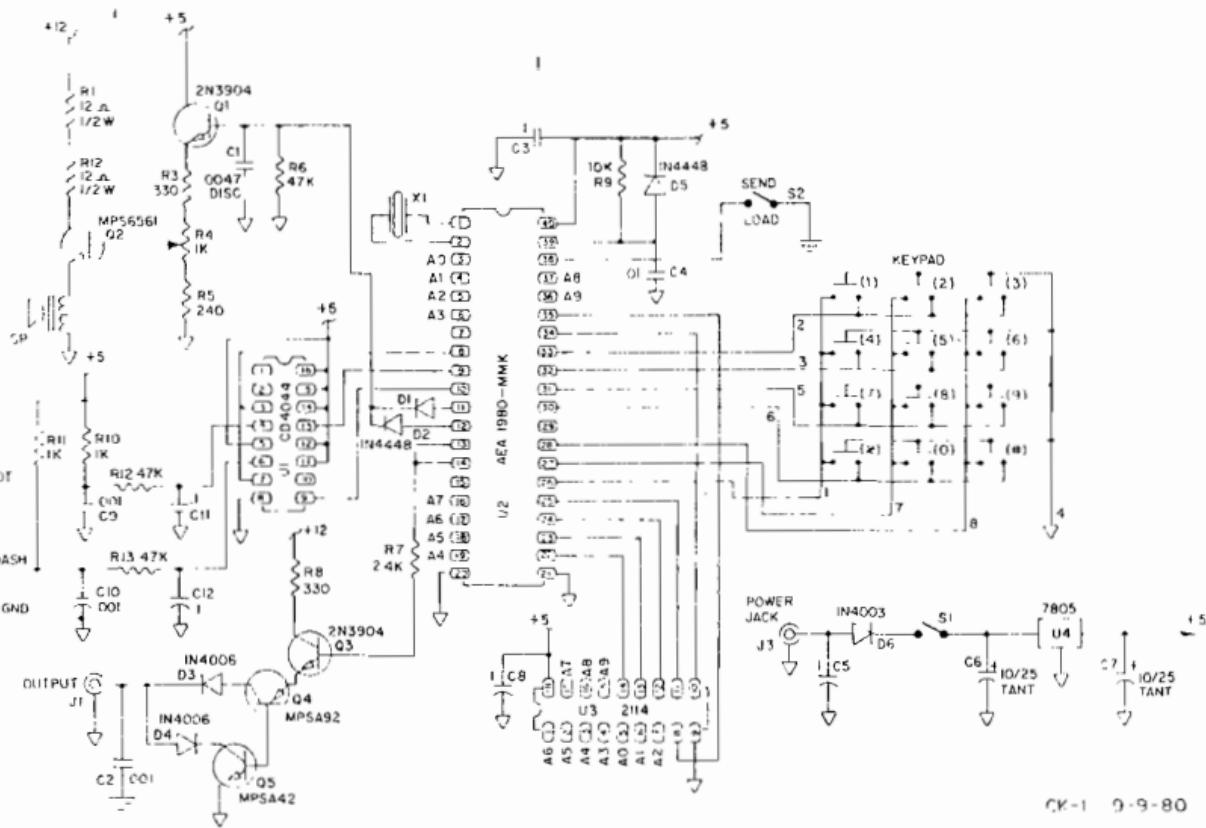
During message loading, operation of the pound **#** key signals the end of

message and erases the previous message from that point to the end of that message location. This may be used for partial message deletion as well as complete message erasure.

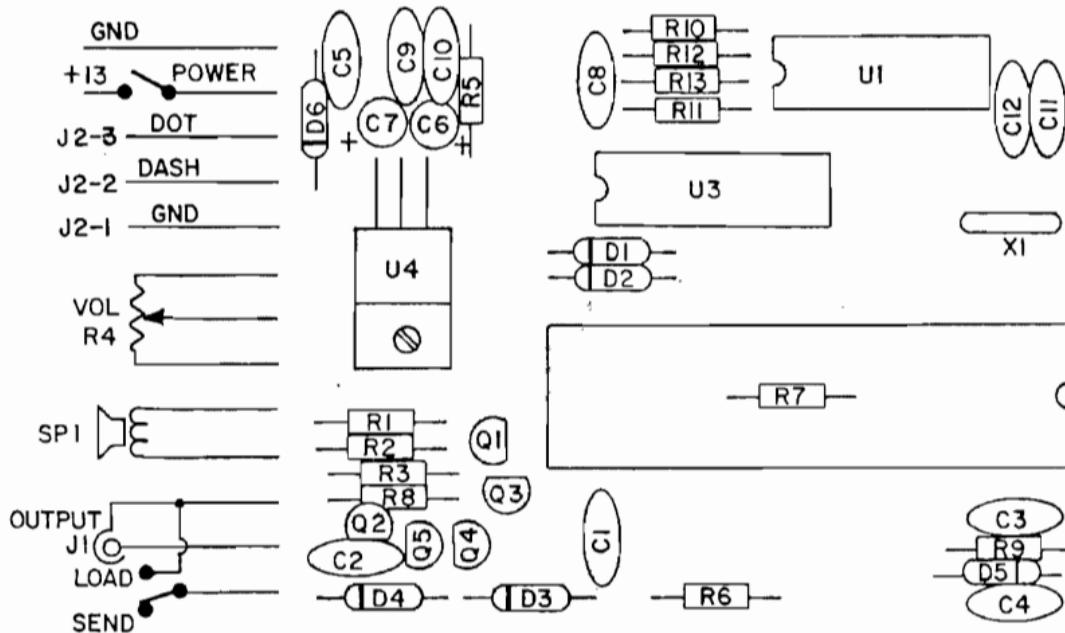
For a partial deletion, in memory send mode, play the message to the desired point and halt it with either the paddle or pound  $\#$  key. Switch to memory load, and press  $\star$   $\text{[5]}$ . At this point additional message text may be entered if desired. Press the pound  $\#$  key. The message will be terminated at this point and the remaining text of the message will be deleted.

## **GENERAL INFORMATION**

**SCHEMATIC**  
**PARTS PICTORIAL**  
**PARTS LIST**  
**APPENDIX A**  
**CODE**  
**WARRANTY**  
**PROGRAMMING KEY**



## SCHEMATIC



## PARTS PICTORIAL

# CK-1 PARTS LIST

C1.....	0.0047 mf	50v disc cer
C2,9,10.....	0.001	500v disc cer
C3,5,8,11,12....	0.1 mf	50v disc cer
C4.....	0.01 mf	50 v disc cer
C6,7.....	10 mf or 6.8 mf	25v dipped tantalum
D1,2,5.....	IN4448 or IN4148	
D3,4.....	IN4006	
D6.....	IN4003	
Q1,3.....	2N3904	
Q2.....	MPS6561	
Q4.....	MPSA92	
Q5.....	MPSA42	

R1,2.....	12 Ohms	½W 5% Carbon Comp
R3,8.....	330 Ohms	¼W 5% Carbon Comp
R4.....	1K Ohms	pot w switch, audio taper
R5.....	240 Ohms	¼W 5% Carbon Comp
R6,12,13.....	47K Ohms	¼W 5% Carbon Comp
R7.....	2.4K Ohms	¼W 5% Carbon Comp
R9.....	10K Ohms	¼W 5% Carbon Comp
R10,11.....	1K Ohms	¼W 5% Carbon Comp
U1.....	CD4044B or MC14044B	
U2.....	AEA 1980 MMK	
U3.....	2114	
U4.....	7805 Voltage regulator	
X1.....	4.00 MHz Xtal	
S1.....	Part of R4	
S2.....	SPST Slide SW	

# PROGRAMMING KEY

## MORSE MEMORY KEYER

KEYER MEMORY/SEND		MEMORY LOAD	
B U T T O N	D I G I T	D I G I T	*
1	Tone Up	Tone Down	Tone Up
2	Dot Ratio	Dash Ratio	Dot Ratio
3	Dot M. Off	Dot M. On	Dot M. Off
4	Dash M. Off	Dash M. On	Dash M. Off
5	Resume	Tune	Edit (Insert)
6	Speed	Semi-Auto	Speed
7	Speed	Auto	Speed
8	A Speed	Set A	Char. Space
9	B Speed	Set B	Word Space
0	S/N Repeat	S/N Set	Real Time
#	Halt		S/N Load
			S/N = 1
			End Input