User's Manual

9800 SERIES
EPROM/EEPROM/PLD
PROGRAMMERS

OPERATION MANUAL

AMERICAN RELIANCE INC.

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PROGRAMMERS

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ONE: ONE-YEAR LIMITED WARRANTY

American Reliance warrants to the original user or purchaser that your unit is free from any defects in material or workmanship for a period of one year from the date of purchase. If any defect is discovered within the warranty period, ARI will repair or replace the unit, subject to verification of the defect or malfunction, upon delivery or prepaid shipment to ARI.

IMPORTANT:

(1) Unless a problem is discovered upon initial inspection after purchase of the unit, please do not return the product to the distributor where it was purchased. ARI accepts the responsibility of keeping you a satisfied customer.

(2) If after-warranty or any service not covered by this warranty is needed, please contact the ARI Service Department at (818) 287-8400 for current charges.

This warranty does not apply to defects or to physical damage resulting from abuse, neglect, accident, improper repair, alteration, or unreasonable use of the unit, resulting in (but not limited to) cracked or broken cases or parts, or to units damaged by excessive heat. Except upon initial purchase, this warranty does not cover finish or appearance items nor does it cover items damaged in shipment to ARI for repair or calibration.

To receive service under this warranty, you must include proof of purchase, including date and place of purchase (a copy of your purchase receipt) or we will not be responsible for repairs or replacement of the unit under warranty.

ARI assumes no responsibility for shipping and handling. However, repaired units will be shipped back to the customer with return shipping charges paid by ARI.

Any applicable implied warranties, including warranties of merchantability and fitness for a particular use, are hereby limited to one year from the date of purchase. Consequential or incidental damages resulting from loss of use, or from a breach of any applicable express or implied warranties are hereby excluded.

This warranty is in lieu of all other agreements and warranties, general or special, express or implied. No representative or person is authorized to assume for us any other liability in connection with the sale or use of this ARI product.

Some states do not allow limitations on how long implied warranties last and do not allow exclusion of incidental or consequential damages, so the above limitations and exclusions may not apply to you. This warranty gives you specific legal rights which may vary from state to state.

TWO: INTRODUCTION

Congratulations! You have just purchased one of the finest Programmers available. With proper care and use, this instrument will provide years of reliable operation.

In order to obtain the maximum performance possible, it is very important to completely familiarize yourself with the unit before attempted use. Therefore, please read this manual carefully, paying particular attention to the safety section.

We at ARI thank you for your selection of one of our products, and welcome you to the family of ARI product owners. Remember that at ARI, service does not end upon your purchase, it's just beginning. Please do not hesitate to call on us if you have any questions.

Important Note

The computer diskette (5-1/4", 360K MS-DOS format) that was supplied with your programmer contains the PC software required to interface a PC or compatible with a 9800-series programmer.

This original disk should be copied and the copy used rather than the original. The original should then be stored in a safe place for backup purposes.

2.1 Description

The AR-9800 series of EPROM, EEPROM, and PLD programmers are designed to program all generic 5-volt EPROMs and EEPROMs, with sizes ranging from 2K to 512K bits. Additionally, most popular 20 and 24-pin PLDs are programmable by models 9810 and 9820. The ability to program up to eight EPROMs simultaneously is available with models 9800 and 9820.

With state-of-the-art hardware design, and unique, sophisticated system firmware, the series incorporates three high-speed programming algorithms, including Intel Intelligent, Fast Programming, and Quick Pulse. In addition, the standard, traditional programming method is also provided.

All models provide a standard RS-232 serial interface, and are accompanied by a comprehensive software package which allows them to communicate with, and to be controlled from, virtually any standard PC capable of running MS-DOS. This powerful feature allows easy storage of program and PLD pattern data on the PC floppy or hard disk drive, and also allows simple downloading of data to memory devices from development systems. Supported file formats include **binary**, **Intel hex**, and **Motorola S formats**. JEDEC file format for PLDs is also supported by models 9810 and 9820.

The AR-9800 series of programmers provide increased value over other programmers available. All functions are controllable either from the easy-to-use front panel or from an associated PC. The units communicate to the user with simple english phrases which generally require no interpretation.

Easy to use, and providing an impressive list of standard features, the units are ideal for use in production, design, development, and field service, as well as anywhere else a powerful, compact, and inexpensive programmer is required.

2.2 Inspection

When you unpack your new Programmer from its original packaging, carefully check each item for damage that may have occurred in shipment. If anything is damaged or missing, take the entire unit, including the box and packing materials, back to the distributor from whom it was purchased, where they will either replace the item or the entire programmer. In the unlikely event that the distributor is unable to provide the assistance you request, please contact the factory at (818) 287-8400.

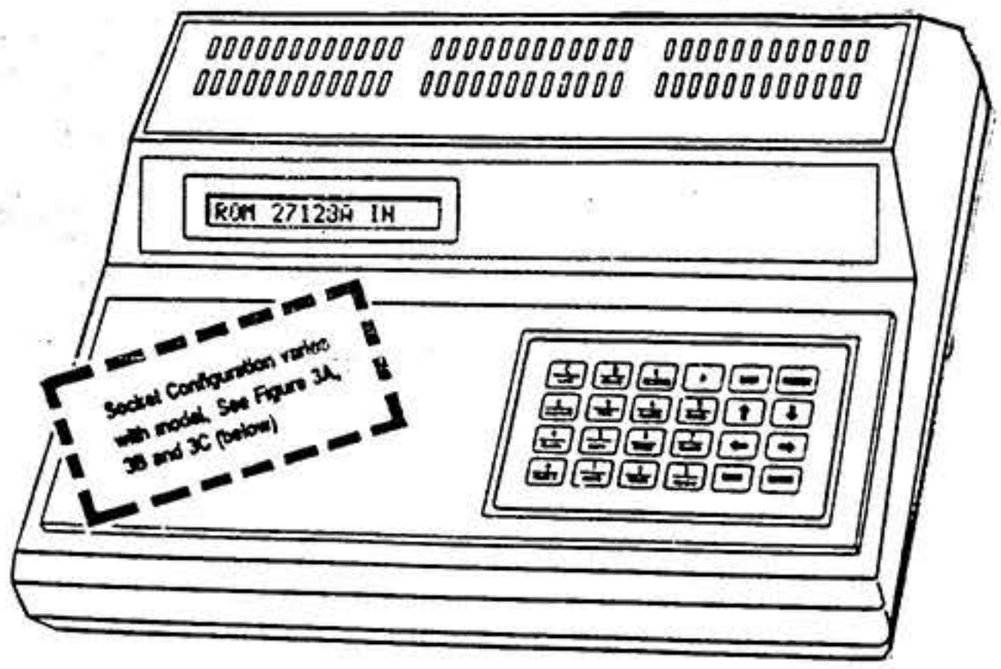
2.3 Included Items

Programmer (AR-9800, AR-9810, or AR-9820)
Operator's Manual
RS-232 Interconnect Cable
5-1/4" MS-DOS Floppy Disk with Program
Power Cord
Three-to-Two Prong Power Adaptor

2.4 Unit Familiarization

Please use the illustrations below, in conjunction with the following descriptions of the controls and connections to help familiarize yourself with the programmer:

FIGURE ONE - Front Panel



ALPHA-NUMERIC Keys ..... Used to enter data into Programmer (0-9, A-F) buffer memory when using EDIT mode. Also used to enter address and length data.

EXIT Key ..... Used to exit the active operational mode.

RESET Key	Forces the unit into a hardware reset, which performs a self-test and other power-up routines.
^ Key	Used in EDIT mode to scroll the display up to the to the next lower address.
v Key	Used in EDIT mode to scroll the display down to the next higher address
<-- and --> Keys	Used in conjunction with the BRAND, BAUD RATE, TYPE, and ALGORI keys to select the desired parameter, then followed by pressing ENTER.
EDIT Key	Used to enter EDIT mode.
ENTER Key	Used to complete the choice of a desired parameter, or to terminate an alphanumeric entry.
LAST Key*	Burns (opens) the last (security) fuse in a PLD. Disables reading of the PLD device.
BRAND Key*	Selects either NS or MMI as the PLD brand.
PLD/EPROM Key*	Selects the desired programming mode. (EPROM mode includes EEPROMs).

***NOTE:** The LAST, BRAND, and PLD/EPROM keys are only present on the AR-9810 and AR-9820.

BAUD RATE Key	Allows selection of data rate for the RS-232 port. Used with the <-- and --> keys to select the data rate, then completed by the ENTER key.
TYPE Key	Allows selection of device type. Used with the <-- and --> keys to select the type, then completed by the ENTER key.
ALGORI Key	Allows selection of programming algorithm. Used with the <-- and --> keys to select the algorithm, then completed by the ENTER key.
CHECK	Toggles between CHECK ON and CHECK OFF modes. The desired mode is then selected by pressing the ENTER key. (CHECK OFF disables the test for the presence of a device before initiating programming operations).
BLANK Key	Initiates BLANK Test to verify that the device addresses are filled with blank data ($FF).
COPY Key	Initiates COPY mode to copy data from memory locations in a master device to a slave device (or devices).
ERASE Key	Initiates ERASE mode to erase EEPROM device types 2816I and 2816M. Not active

on other devices.

ON/OFF Key ..... Initiates REMOTE mode for operation with an optional PC. If unit is already operating in REMOTE mode, restores normal (stand-alone) operation.

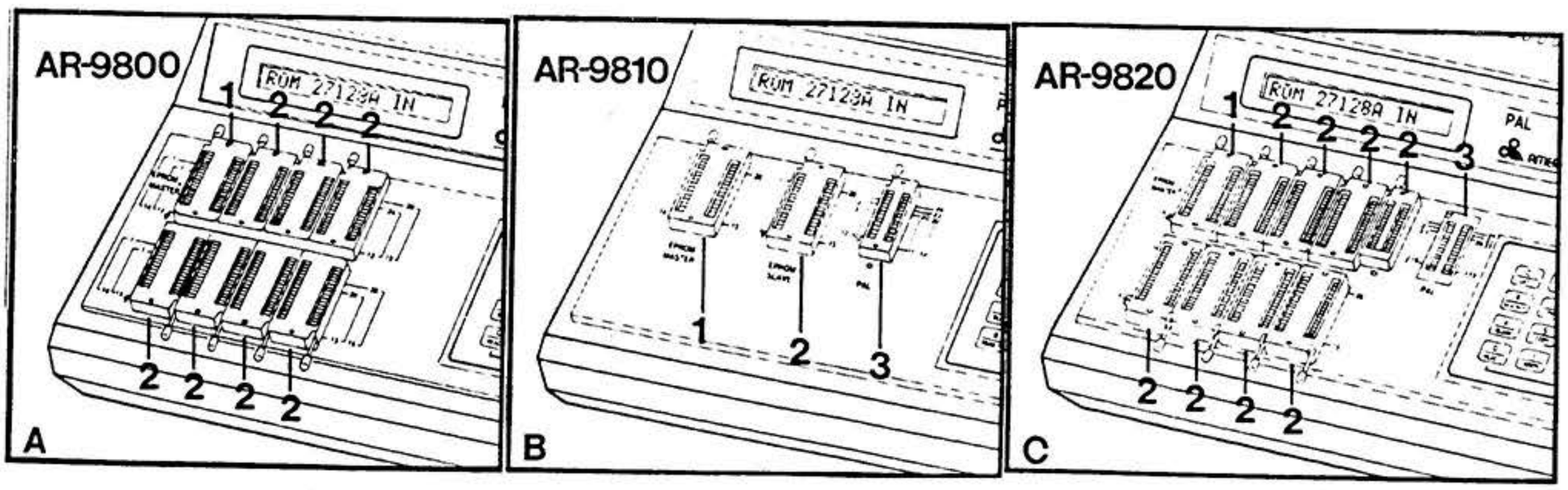
READ 1 Key ..... When pressed alone, computes and displays the checksum of data in internal buffer memory. When pressed simultaneously with READ 2 key, initiates READ mode to read data from a memory device into the internal buffer memory.

WRITE Key ..... Initiates WRITE mode to write data from internal buffer memory into a memory device (or devices). Note that either a READ or a COPY function must have previously been performed to initially place data in the internal buffer memory.

VERIFY Key ..... Initiates VERIFY mode to check the data in a memory device (or devices) against the data stored in the internal buffer memory.

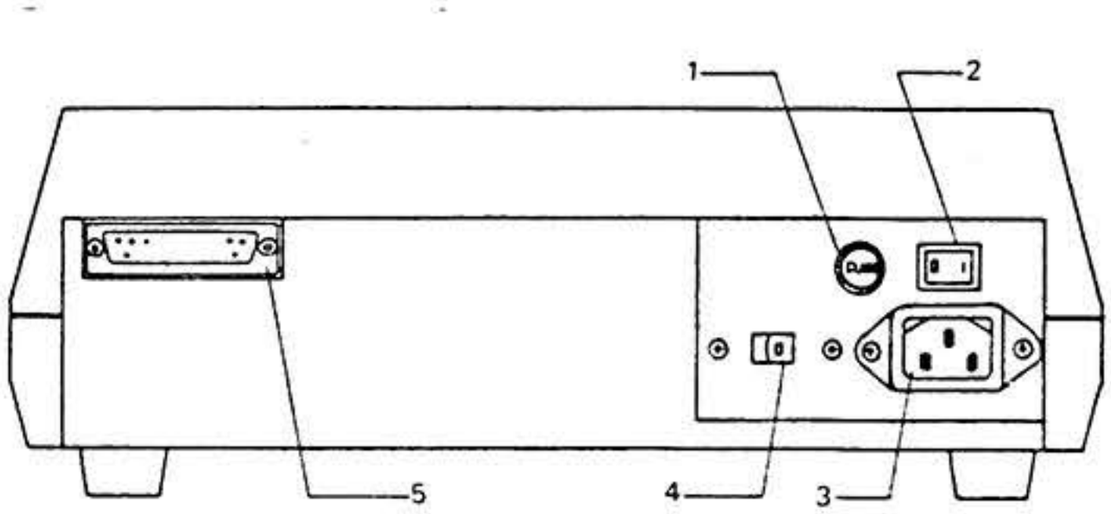
READ 2 Key ..... When pressed alone, computes and displays the checksum of the data in internal buffer memory. When pressed simultaneously with the READ 1 key, initiates READ mode to read data from a memory device into the internal buffer memory.

FIGURE TWO - Socket Configuration



(1) Master Socket ..... Used for master EPROM device and for all EEPROMs.
(2) Slave Socket(s) .... Used for slave EPROMs.
(3) PLD Socket ..... Used for programmable logic devices. Not present on AR-9800.

FIGURE THREE - Rear Panel



(1) Fuse Holder ..... Replace defective fuse only with a 0.5 amp, 250 volt fast-blow type.
(2) Power Switch ..... Used to apply/remove AC power. 0 = Off, 1 = On.
(3) AC Power Input ..... Either 110 or 220 VAC applied here.
(4) Voltage Selector ... Selects either 110 or 220 VAC input power. BE CERTAIN TO SET PROPERLY, OR DAMAGE TO THE UNIT MAY RESULT.
(5) DB-25F Connector .. RS-232 serial communication port for connection to a standard PC or compatible.

THREE: OPERATION AND USE

3.1 Warning

Electricity can cause severe injuries or even death, sometimes even with relatively low voltages or currents.

Therefore it is vitally important that any electronic instruments such as this programmer be totally understood before use.

Please do not use this instrument, or any other piece of electrical or electronic test equipment, without first thoroughly familiarizing yourself with its correct operation and use.

3.2 Cautions

(1) Never apply power to the programmer while memory devices are mounted in the sockets. Failure to comply may cause damage to such memory devices.
(2) Always select the correct type number before inserting a device into a socket. Otherwise, damage to the memory device could result.
(3) Device type number 2816M is for Motorola 2816 EEPROMs. These devices use 25 volts for erase, which will destroy other devices. Be careful when using this type.
(4) Do not use solvents or aromatic hydrocarbons to clean the programmer, or the plastic case may be damaged. If cleaning is necessary, use only a mild solution of warm water and detergent. Be careful not to allow water to enter the unit, and be sure to always disconnect the power cord before cleaning.

3.3 Important Information

(1) Check mode verifies the presence of a device or devices in the programmer's sockets before attempting programming operations. Detection is accomplished by measuring the current drawn by the device. However, some newer CMOS devices draw such little current that the AR-9800 series cannot detect their presence. Therefore, when programming CMOS devices unit must be in default value of CHECK "OFF".

(2) **When Check Mode Off is selected, all sockets become active. Therefore, any socket not containing a memory device will be indicated as errors at the end of an operation. For example, if there were devices present in sockets one through four, the message at the end of a write cycle would be "ERR-5678". This DOES NOT indicate a failure of the programming process. The programmer is merely informing you that it cannot verify the data in devices mounted in sockets five through eight (because they do not exist).**

(3) **When programming 2716 or 2732 devices, please select the "TRADI" algorithm for best results.**

(4) As part of their normal operation, the AR-9800 series continually perform system RAM memory checks. If the machine determines that data contained in the RAM buffer memory may have been corrupted, the message "Data RAM Error" will be displayed, along with an intermittent audible beep. Such corruption may be caused, for example, by a power line transient, but does not indicate failure of the programmer. To clear the error display, press and hold either the READ1 or READ2 buttons for about one second, then re-read the master device into the programmer to insure that the buffer contains the proper data.

(5) EEPROMS (2816, 2817, 2832, and 2864) and EPROM types 2532 and 2564 may be programmed or read only from the "Master" socket. For these devices, the "Copy" function is not active.

(6) When programming 27512 and 27C512 EPROMs only, the PC software program will accept and understand a length of $0000 to mean $10000. This allows uploading and downloading the complete contents of this type number. Alternatively, the default value of $0000 may be retained and used and will also actually mean $10000.

(7) After completing an operation such as copy, blank check, etc., pressing the "Enter" key will cause the question "Try Again?" to be displayed. At this point if "Enter" is pressed a second time, the previous operation will be repeated.

(8) **Before attempting to program devices, please refer to appendix one to select the correct "device type number".**

3.3.1 Power-up

Upon applying power to the programmer, the unit will perform an automatic self-test. A "beep" should be heard from the unit, and the following message should be seen in the display:

```
AR-9800: ARI AR9800 Vx.yz
AR-9810: ARI AR9810 Vx.yz
AR-9820: ARI AR9820 Vx.yz
```

Where "x.yz" indicates the System Firmware version number.

Failure of the unit to correctly pass the self-check routine is indicated by no "beep", or by any display other than the message shown above. If a failure is due to internal buffer memory, the following message will be seen in the display:

```
RAM  ERR  xxxx  y
```

Where "xxxx" is the hexadecimal memory address of the failure and "y" is the corresponding RAM IC number. For example, the message "RAM ERR 4000 3" indicates a failure of RAM IC number 3 at memory location $4000 (the "$" indicates a hexadecimal address).

Alternatively, the failure message:

```
ROM  ERR
```

indicates a failure of the unit's internal firmware ROM. In case of any failure, the unit should be returned to ARI or to an authorized service center for repair or replacement. Attempted repairs by unauthorized personnel will void the warranty.

3.3.2 Programmer Defaults

Memory Device Access Ranges:

DEVICE	RANGE (Hex)
2716, 2716B, 2816, 2817	$0000 - $07FF
2732, 2732A, 2532, 2832	$0000 - $0FFF
2764, 2764A, 2564, 2864	$0000 - $1FFF
27128, 27128A	$0000 - $3FFF
27256, 27256D	$0000 - $7FFF
27512, 27513	$0000 - $FFFF

Starting Address: $0000

Programmer Default Settings:

PARAMETER	POWER-ON	RESET
Device Type	27128	Last Selected
Mode	Local (Stand-Alone)	Last Selected
Algorithm	Intel Intelligent	Intel Intelligent
Baud Rate	9600	Last Selected
Check	Off	Off

3.3.3 Message Organization

There are four data fields in the liquid crystal display that the AR-9800 series employs to pass status information to the user. These are arranged as follows:

aaa bbbbbb cc dd

In EPROM mode, the "aaa" data field always displays the message "ROM". In PLD mode, the last selected manufacturer type will be displayed.

The "bbbbbb" data field displays the type of EPROM, EEPROM, or PLD selected, such as "27128A", "2864", or "12L10".

In EPROM mode, the "cc" data field displays the currently selected programming algorithm, according to the following chart:

DISPLAY	METHOD
TR	Traditional Programming
IN	Intel Intelligent
FP	Fast Programming
QP	Quick Pulse

In PLD mode, the "cc" data field is empty.

The "dd" data field shows "ON" when the remote RS-232 control mode is enabled. If this data field is empty, local control (stand-alone) mode is indicated.

3.3.4 Status Messages

The following status messages may appear in the display, and have the following meanings:

MESSAGE	MEANING
NO MASTER	No device in master socket
NO SLAVE	No device in slave socket
NO INSERT	No device in any socket
OVER CURRENT	Device (Vcc pin) overload

In addition, the socket's LED illuminate when an error occurs.

3.4 EPROM/EEPROM Programming Mode

This section describes the actual use of the AR-9800 series in each of the different modes of operation for use with EPROMs and EEPROMs.

The use of each mode begins with the default display (ROM 27128A IN) showing in the LCD. At any prompt message, the default value as defined in the default setting section of this manual may be accepted by pressing the "ENTER" key. Otherwise, a user-determined hexadecimal value must be entered by pressing the appropriate alphanumeric keys, and the entry terminated by then pressing the "ENTER" key. Operation of the specific modes of operation are as follows (**Please refer to the operational flow charts in Appendix Three for more detailed instructions**):

3.4.1 Type Selection

DISPLAY PROMPT	USER ACTION
Default	Press TYPE
27128A Vpp=12.5V	Press <--
27128 Vpp=21.0V	
- or alternatively -	
27128A Vpp=12.5V	Press -->
27256D Vpp=21.0V	
	Press ENTER to accept selection

NOTE: **Please refer to Appendix One for complete Device Type listing.**

3.4.2 Programming Algorithm Selection

DISPLAY PROMPT	USER ACTION
Default	Press ALGORI
ALGORI: INTEL	Press <--
ALGORI: TRADI	
- or alternatively -	
ALGORI: INTEL	Press -->
ALGORI: FAST	
	Press ENTER to accept selection

NOTE: Algorithms available are Traditional Programming, Intel Intelligent Programming, Fast Programming, Quick Pulse Programming.

3.4.3 Read

DISPLAY PROMPT	USER ACTION
Default	Press READ1 & READ2 simultaneously
READ SADDR:	Enter starting address
READ LENTH:	Enter read length
READ- xxxx	Reading address "xxxx"
READ- OK yyyy	Successful read of device, data checksum is "yyyy"

- Press any key to return to default display -

3.4.4 Blank Check

DISPLAY PROMPT	USER ACTION
Default	Press BLANK
BLNK SADDR:	Enter starting address
BLNK LENTH:	Enter blank check length
BLNK- xxxx	Checking address "xxxx"
BLNK- OK	Blank test OK
- or if error occurs-	
B : ERR -36	IC's in sockets 3 and 6 not blank

- Press any key to return to default display -

3.4.5 Verify

DISPLAY PROMPT	USER ACTION
Default	Press VERIFY
VERI SADDR:	Enter starting address
VERI LENTH:	Enter verify length
VERI- xxxx	Verifying address "xxxx"
VERI- OK yyyy	Verify OK; data checksum is "yyyy"
- or if error occurs-	
V : ERR -45	Data in devices 4 & 5 is not the same as data in buffer memory

- Press any key to return to default display -

3.4.6 Write

DISPLAY PROMPT	USER ACTION
Default	Press WRITE
WRIT SADDR:	Enter starting address
WRIT LENTH:	Enter write length
WRIT- xxxx	Writing address "xxxx"
WRIT- OK yyyy	Write OK; data checksum is "yyyy"
- or -	
W : ERR- 26	Devices 2 & 6 had improper write

3.4.7 Copy

DISPLAY PROMPT	USER ACTION
Default	Press COPY
COPY SADDR:	Enter starting address
COPY LENTH:	Enter copy length
COPY- xxxx	Copying address "xxxx"
REMOVE MASTER	Remove master IC from socket and insert slave devices(2-8)
COPY- OK yyyy	Copy OK; data checksum is "yyyy"
- or -	
C : ERR -35	Devices 3 & 5 had improper copy

- Press any key to return to default display -

3.4.8 Check Sum

DISPLAY PROMPT	USER ACTION
Default	Press and hold READ1 or READ2
CHECK SUM: yyyy	Data checksum is "yyyy"
	Release key
Default	

3.4.9 Device Insertion Check Mode

DISPLAY PROMPT	USER ACTION
Default	Press CHECK
CHECK: OFF	Press CHECK
CHECK: ON	Used for the detection of devices

NOTE: Press CHECK, to toggle between insertion check OFF and insertion check ON modes.

3.4.10 **Erase** (For 2816I & 2816M device types only)

DISPLAY PROMPT	USER ACTION
Default	Press ERASE
ERASE EEPROM !	Press ENTER to erase EEPROM
	Press EXIT
Default	

NOTE: Erase is ONLY active when an EEPROM type 2816I(Vpp=21.0V) or 2816M(Vpp=25.0V) has been selected as the device type.

3.5 Stand-Alone Editing Mode

The Edit mode has several commands available to help facilitate data entry, movement, and alteration. These commands are:

COMMAND	PURPOSE
DISPLAY	Display data at specified address
MODIFY	Modify data at specified address
INSERT	Insert data at specified address
DELETE	Delete data from specified address range
MOVE	Move data from source address to target address
FILL	Fill data into specified address range
COPY	Copy data from source address to target address

These commands are selected by first entering the edit mode, and then using the <-- or --> keys to select the desired command. The ENTER key is then pressed to complete the selection. When using any of these commands, the EXIT key may be used to immediately return to the main edit menu. The following examples assume that memory has been filled with zeros. The procedure for doing so is explained in Section 3.4.11.6, FILL.

For the purpose of these exercises, 00 is used to fill memory. However any two-digit hexadecimal number could have been used, such as "7A", etc.

3.5.1 Display

DISPLAY mode has no effect on and cannot harm data in the AR-9800 buffer memory.

DISPLAY PROMPT	USER ACTION
Default	Press EDIT
EDIT: DISPLAY	Press ENTER
DIS SADDR:A0	Enter starting address, press ENTER
00A0:XX	Unit displays the data in the selected buffer memory location. ^ and v may now be used to scroll through the data.

3.5.2 Modify

MODIFY mode modifies data in the AR-9800 buffer memory one byte at a time. Care must be exercised or data may be lost if the mode is improperly used.

DISPLAY PROMPT	USER ACTION
Default	Press EDIT
EDIT: DISPLAY	Press -->
EDIT: MODIFY	Press ENTER
MOD SADDR:	Enter starting address
0000:00 -->	Enter data (2 hex digits, e.g. 4A)
0000:00 -->4A	Press ENTER
0000:4A -->	Press | to go to next address, or press EXIT to return to EDIT menu
EDIT: MODIFY	Press EXIT

3.5.3 Insert

INSERT mode inserts new data into the existing data already in the AR-9800 buffer memory. The existing data at and following the insertion point is moved towards the high end of buffer memory by the number of bytes the inserted data is in length. Please note that address 0000 is reserved and the Insert operation cannot start there.

DISPLAY PROMPT	USER ACTION
Default	Press EDIT
EDIT: DISPLAY	Press --> twice
EDIT: INSERT	Press ENTER
INS SADDR:	Enter starting address
0001:	Enter data (2 hex digits, e.g. 7F)
0001:7F	Press ENTER
0002:	Enter data (2 hex digits), or press Enter to terminate insert mode
EDIT: INSERT	Press EXIT

- The number of bytes that are shifted are dependent upon the length of the inserted data -

3.5.4 Delete

DELETE mode deletes data from the AR-9800 buffer memory. Care must be exercised or data may be lost if the mode is improperly used. The data following the deletion point is moved towards the low end of buffer memory by the number of bytes the deleted data was in length.

DISPLAY PROMPT	USER ACTION
Default	Press EDIT
EDIT: DISPLAY	Press --> three times
EDIT: DELETE	Press ENTER
DEL SADDR:	Enter starting address
DEL LENTH:	Enter delete length, e.g. FF
EDIT: DELETE	Press EXIT

- Data has now been deleted from memory -

3.5.5 Move

MOVE mode copies the specified number of bytes that begin at the starting address over the destination addresses. Data at the destination address is written over and data at the source address is erased (filled with $FF data bytes). Therefore, care must be exercised or desired data may be lost if the mode is improperly used.

DISPLAY PROMPT	USER ACTION
Default	Press EDIT
EDIT: DISPLAY	Press --> four times
EDIT: MOVE	Press ENTER
MOV SADDR:	Enter starting address
MOV LENTH:	Enter move length, e.g. 1F
MOV DADDR:	Enter destination address, e.g. 1FF
EDIT: MOV	Press Exit

- Data has now been moved in memory -

3.5.6 Fill

FILL mode fills the specified addresses with the designated data byte. Existing data is over-written, therefore care must be exercised or desired data may be lost if the mode is improperly used.

DISPLAY PROMPT	USER ACTION
Default	Press EDIT
EDIT: DISPLAY	Press --> five times
EDIT: FILL	Press ENTER
FIL SADDR:	Press ENTER
FIL LENTH:	Press ENTER
FIL VALUE:	Press 00, ENTER
EDIT: FILL	Press EXIT

- Memory is now filled with 00 data bytes -

3.5.7 COPY

Copy mode copies a specified length of data from a source address to a target address. The data at the target address is written over and the data at the source remains the same.

DISPLAY PROMPT	USER ACTION
Default .	Press EDIT
EDIT: DISPLAY	Press --> six times
EDIT: COPY	Press ENTER
COP SADDR:	Enter starting address
COP LENTH:	Enter copy length, e.g. 1F
COP DADDR:	Enter destination address, e.g. 1FF
EDIT: COPY	Press EXIT

- Data has now been copied to a destination address -

3.6 PLD Programming Mode (AR-9810 & AR-9820 only)

This section describes the actual use of the AR-9800 series in each of the different modes of operation for use with PLDs. The use of each mode begins with the PLD default display which consists of a manufacturer and a PLD type number showing in the LCD (E.G. "MMI 14L8").

At any prompt message, the default value as defined in the default setting section of this manual may be accepted by pressing the "ENTER" key. Otherwise, a user-determined hexadecimal value must be entered by pressing the appropriate alphanumeric keys, and the entry terminated by then pressing the "ENTER" key. Operation of the specific modes of operation are as follows:

3.6.1 Type Selection

DISPLAY PROMPT	USER ACTION
Default	Press TYPE
PLDTYPE:14L8	Press <--
PLDTYPE:12L10	
- or alternatively -	
PLDTYPE:14L8	Press -->
PALTYPE:16L6	Press ENTER to accept selection

NOTE: PLD types are:

20-pin: 10H8, 12H6, 14H4, 16H2, 16C1, 10L8, 12L6, 14L4, 16L2, 16L8, 16R8, 16R6, 16R4, 16X4

24-pin: 12L10, 14L8, 16L6, 18L4, 20L2, 20C1, 20L10, 20X10, 20X8, 20X4, 20L8, 20R8, 20R6, 20R4

3.6.2 Brand Selection

DISPLAY PROMPT	USER ACTION
Default	Press BRAND
BRAND: NS (AMD/MMI)	Press <-- (-->)
BRAND: AMD/MMI (NS)	Press ENTER to accept selection

3.6.3 Read

DISPLAY PROMPT	USER ACTION
Default	Insert PLD
Default	Press READ1 & READ2 simultaneously
READ- xxxx	Reading address "xxxx"
READ- OK yyyy	Successful read of device, data checksum is "yyyy"

- Press any key to return to default display -

3.6.4 Write

Before writing the PLD, the correct fuse pattern data must be placed into the memory buffer either by reading it from a another non-protected PLD or by reading it from a disk.

DISPLAY PROMPT	USER ACTION
Default	Press WRITE
INSERT PLD	Press WRITE again
WRIT- xxxx	Writing address "xxxx"
WRIT- OK yyyy	Write OK; data checksum is "yyyy"

- Press any key to return to default display -

3.6.5 Verify

DISPLAY PROMPT	USER ACTION
Default	Insert PLD in socket
Default	Press VERIFY
VERI- xxxx	Verifying address "xxxx"
VERI- OK yyyy	Verify OK; data checksum is "yyyy"

- Press any key to return to default display -

3.6.6 Last

The "last" function provides the ability to burn the security fuse, thereby preventing unauthorized persons access to the PLD's fuse map. This step is irreversible, so use caution.

DISPLAY PROMPT	USER ACTION
Default	Press LAST
INSERT PLD	Press LAST Again
LAST- xxxx	Burning last (security) fuse
LAST- OK yyyy	Last OK

- Press any key to return to default display -

3.7 Remote Control Mode

In addition to their powerful stand-alone programming functions, the AR-9800 series of programmers may also be used in conjunction with almost any PC-compatible personal computer. This allows uploading and downloading of EPROM, EEPROM, and PLD programming data on computer disk, and easy retrieval of that data at a later time for programming or editing purposes.

The necessary MS-DOS« program is included with each of the programmers on a 5 1/4 inch floppy disk. To use the remote control capability, first connect the programmer to the serial communications port on the PC with the supplied cable. Second, select the appropriate data rate (baud) on the programmer to match that of the PC. Third, run the PC program and set the appropriate communication port and baud rate to be used. **Please refer to Appendix Three for the remote mode flow chart.**

3.7.1 Baud Rate Selection

Use the procedure below to set the data rate of the programmer to match that which will be used on the PC (the default rate for both the programmer and the PC program is 9600 baud):

DISPLAY PROMPT	USER ACTION
Default	Press BAUD
BAUDRATE: 9600	Press <--
BAUDRATE: 75	

- or alternatively -

BAUDRATE: 9600	Press -->
BAUDRATE: 7200	

Press ENTER to accept setting

Available data rates are 75, 150, 300, 600, 1200, 1800, 2400, 3600, 4800, 7200 and 9600 baud.

3.7.2 Remote Mode Activation - ON/OFF

Once the set-up is complete, and the program is up-and-running on the PC, remote control mode may be entered by performing the following steps on the programmer:

DISPLAY PROMPT	USER ACTION
Default	Press ON/OFF
ROM 27128A IN ON	<"ON" indicates remote mode active>
ROM 27128A IN ON	Press ON/OFF
ROM 27128A IN	<Normal stand-alone mode>

The ON/OFF key toggles the programmer between local and remote modes. The "ON" in the display indicates remote mode, while its absence indicates local mode. If the microcomputer is not ready, or if the RS-232 cable is not connected from the AR-9800 to computer, after approximately 3 seconds the display will show:

---TIME OUT---

After this message is displayed for one second, the default message (ROM 27128A IN) will be seen in the display.

3.7.3 PC Software Use

The PC software package has been designed to be easy to use, and is completely menu driven. The following guide and a few minutes practice should be all that is necessary to learn the correct procedures for use.

Upon running the software, the following status display and main menu will appear on the PC screen:

```
 ------------------------------------------------------
| MODE      :EPROM     RS232 PORT:COM1     DEVICE ADDR:0000  |
| TYPE      :27128A    BAUD RATE :9600     LENGTH/SIZE:4000  |
| LAST ADDR:3FFF       ALGORITHM :INTEL    BUFFER ADDR:0000  |
|======================================================|
|                                                      |
|       R>   READ                    | PC <-- PROGRAMMER   |
|       W>   WRITE                   | PC --> PROGRAMMER   |
|       V>   VERIFY                  | PC --> PROGRAMMER   |
|       B>   BLANK CHECK             | PROGRAMMER          |
|       C>   COPY                    | PROGRAMMER          |
|       L>   LOAD FILE               | PC <-- DISK         |
|       S>   SAVE FILE               | PC --> DISK         |
|       E>   EDIT BUFFER MEMORY      | PC                  |
|       P>   PRINT BUFFER MEMORY     | PC                  |
|       A>   SET ADDRESS/LENGTH      | PC                  |
|       O>   SET ALGORITH/RS232      | PC                  |
|       T>   SET DEVICE TYPE         | PC                  |
|       I>   SAVE DEFAULT SETTINGS   | PC                  |
|       M>   CHANGE MODE (TO PLD)    | PC                  |
|       X>   EXIT                    | PC                  |
|======================================================|
|   SELECT COMMAND:                                    |
 ======================================================
```

NOTE: Menu items may be selected by pressing the appropriate letter and then "Enter", or by using the ^ and v keys to highlight the desired selection, and then pressing "Enter".

The first three lines of the display are status information, and inform the user the current status of the programmer. For example, the display shown here indicates that EPROM mode is selected (versus PLD mode), that the COM1 RS-232 port has been selected, that the device type is presently 27128A, with a communication data rate of 9600 baud and the programming algorithm set to Intel Intelligent. Additionally, it is indicated that the starting address for programming is $0000 with an ending (last) address of $3FFF, that the present device has a length (or size) of $4000, and that the buffer is presently positioned to address $0000.

Note: PLD mode("M" Menu) is not available on AR-9800

3.7.4 Select Command Definitions

Following is a brief description of each of the available menu options:

Read: Reads data from the memory device to the programmer RAM buffer and transfers the data to the PC buffer memory.

Write: Writes data to the programmer RAM buffer from the PC buffer memory and then writes the data to the memory device(s) in the programmer's socket(s).

Verify: Verifies the data in the PC buffer memory against the data contained in the memory device(s) in the programmer's socket(s).

Blank Check: Tests the device(s) mounted in the programmer's sockets for data. If empty (blank), no error message is generated.

Copy: Reads the data from the device mounted in the Master socket into the programmer RAM buffer, and then writes that data to the device(s) mounted in the Slave socket(s).

Load File: Loads a file from floppy or hard drive into the PC buffer memory.

Save File: Saves a file to floppy or hard drive from the PC buffer memory.

Edit Buffer: Allows Hex or ASCII editing of the data in PC buffer memory. See Section (3.6.3.1) below.

Print Buffer Memory: Prints the contents of the PC buffer memory to the printer (LPT1) in the same form as displayed when in edit mode.

Set Address/ Length: Used to set the beginning address and length of data when it is desired to transfer less than the total amount of data.

Set Algorithm/ RS232: Used to select the desired programming algorithm and RS-232 data transfer rate.

Set Device Type: Selects type (2732, 2764, etc.) of memory device to read or program.

Save Default Settings: Saves current program settings (type, baud rate, etc.) to disk for later use.

Change Mode (To {mode}): If EPROM mode is selected, changes to PLD mode. If in PLD mode, changes to EPROM mode. The word {mode} changes accordingly.

Exit: Quits the program and returns to the PC operating system.

3.8 PC Edit Mode

When PC edit mode is chosen, the main menu will be replaced by a display of the PC buffer memory contents. **The main menu may be brought back at any time by use of the <ESC> key. This will not affect data in the buffer memory.**

The buffer memory data may be edited either in Hex or ASCII by changing to the appropriate data field with the command <CNTL>-A.

3.8.1 EPROM/EEPROM Editing

The following is an example of the manner in which the data is displayed when in EPROM mode:

Addr	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	
0000	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	....
0010	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	....
0020	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	....
0030	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	....
0040	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	....
0050	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	....
0060	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	....
0070	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	....
0080	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	....
0090	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	....
00A0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	....
00B0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	....
00C0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	....
00D0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	....
00E0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	....
00F0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	....

In this display configuration, the most significant address bytes are the row values, and the least significant address byte is the column value. The "FF" data bytes represent the blank data, and the "......." field would display the ASCII representation of the data contained in the buffer memory.

3.8.2 PLD Editing

When PLD mode is selected, the fuse pattern display format is different from that of EPROM mode. The following is an example of how the PLD data is displayed:

```
MODE      :PAL      RS232 PORT:COM1
TYPE      :10H8     BAUD RATE :9600
I/P LINES :32/64    BRAND     :MMI
 ---------------------------------------------
|    |    |    |  11|1111|1111|2222|2222|2233 |
|    |0123|4567|8901|2345|6789|0123|4567|8901 |
|---------------------------------------------|
|   0|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX |
|   1|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX |
|   2|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX |
|   3|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX |
|   4|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX |
|   5|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX |
|   6|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX |
|   7|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX |
|   8|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX |
|   9|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX |
|  10|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX |
|  11|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX |
|  12|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX |
|  13|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX |
|  14|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX |
|  15|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX|XXXX |
 ---------------------------------------------
```

The status lines indicate that PLD mode is selected, the RS-232 port is COM1 with a data rate of 9600 baud, the PLD type is set to an MMI 10H8, and I/P lines are 32/64.

For the data display, intact PLD fuses are indicated by an "X", while blown (or burned) fuses are represented by a "-" sign. A "0" represents a phantom fuse.

NOTE: **Prior to programming a PLD device, it is necessary to either load the fuse data pattern file into the PC buffer memory, or to edit the PLD fuse data pattern using the EDIT command.**

3.8.3 Edit Mode Commands

The following are the keyboard commands available during edit mode and their functions:

KEY	FUNCTION
HOME	Go to first address of current line.
END	Go to last address of current line.
PG UP	Go back one page.
PG DN	Go forward one page.
CUR UP	Go up one row on current page.
CUR RIGHT	Go forward one address on current page.
CUR DOWN	Go down one row on current page.
CUR LEFT	Go back one address on current page.
<CNTL> CUR LEFT	Go back eight addresses or to leftmost column on current page.
<CNTL> CUR RIGHT	Go forward eight addresses or to rightmost column on current page.
<CNTL> HOME	Go to first address of current page.
<CNTL> END	Go to first address of last row on current page.
<CNTL> PG UP	Go back $1000 addresses.
<CNTL> PG DN	Go forward $1000 addresses.
SPACE BAR	Go forward one character on current page.
BACKSPACE	Go back one character on current page.
0-9, A-F, X, "-"	Data entry keys. Use to change data in PC buffer memory.
ESC	From main menu, exits program to computer operating system. **Also used to "back out" of any undesired operation and return to the previous menu**

SPECIFICATIONS:

	AR-9800	AR-9810	AR9820
FUNCTIONS			
Programming	Copy, Read, Write, Erase Verify, Blank Check	Copy, Read, Write, Erase, Verify, Blank Check	Copy, Read, Write, Erase Verify, Blank Check
Data Editing	Display, Delete, Insert Modify, Move, Copy, Fill	Display, Delete, Insert, Modify, Move, Copy, Fill	Display, Delete, Insert, Modify, Move, Copy, Fill
Device Check	Blank, Verify, Reverse, Over Current,Checksum, Device Present	Blank, Verify, Reverse, Over Current, Checksum,Device Present	Blank, Verify, Reverse, Over Current,Checksum, Device Present
PROGRAMMING ALGORITHMS	Intel Intelligent,Traditional, Fast Pulse, Quick Pulse,	Intel Intelligent, Traditional, Fast Pulse, Quick Pulse	Intel Intelligent, Traditional, Fast Pulse, Quick Pulse
DEVICES PROGRAMMED	Note: Intel and NS 2816 select 2816I type number; Motorola 2816 use 2816M type number		
EPROMs	2532, 2564, 2716, 2716B 2732, 2732A, 2732B, 2764, 2764A,27128, 27128A,27256, 27256D,27512, 27513	2532, 2564, 2716, 2716B, 2732,2732A, 2732B, 2764, 2764A, 27128, 27128A, 27256, 27256D, 27512, 27513	2532, 2564, 2716, 2716B, 2732, 2732A, 2732B, 2764, 2764A,27128, 27128A, 27256, 27256D, 27512, 27513
EEPROMS	2816, 28C16, 2816A, 2817, 2817A 2832, 2864, 28C64, 2864A	2816,28C16, 2816A, 2817, 2817A 2832, 2864, 28C64, 2864A	2816, 28C16, 2816A, 2817, 2817A, 2832, 2864, 28C64, 2864A
PLDs (AMD/MMI, TI, NS, and equivalents)			
20-Pin	-None-	10H8, 12H6, 14H4, 16H2, 16C1 10L8, 12L6, 14L4, 16L2, 16L8 16R8, 16R6, 16R4, 16X4	10H8,12H6, 14H4, 16H2, 16C1, 10L8, 12L6, 14L4, 16L2, 16L8, 16R8,16R6, 16R4, 16X4
24-Pin	-None-	12L10, 14L8, 16L6, 18L4, 20L2, 20C1, 20L10, 20X10, 20X8, 20X4, 20L8, 20R8, 20R6, 20R4	12L10, 14L8, 16L6, 18L4, 20L2, 20C1, 20L10, 20X10, 20X8, 20X4, 20L8, 20R8, 20R6, 20R4
PROTECTION	Reverse Insertion. Null Insertion	Reverse Insertion. Null Insertion.	Reverse Insertion. Null Insertion
INTERNAL RAM	72Kbytes (756K bits)	72Kbytes (756K bits)	72Kbytes (756K bits)
SERIAL INTERFACE			
Type	RS-232C	RS-232C	RS-232C
Connector	DB25F	DB25F	DB25F
Data Rates	75 -9600 baud	75-9600 baud	75-9600 baud
Data Format	Intel Hexadecimal	Intel Hexadecimal	Intel Hexadecimal
SOCKETS	(8) 28 Pin ZIF	(1) 28 Pin ZIF (1) Pin ZIF (Textool)	(8) 28 Pin ZIF (1) 24 Pin ZIF (Textool)
DISPLAY	16 Character, 5x7 Dot -Matrix LCD	16 Character, 5x7 Dot-Matrix LCD	16 Character, 5x7 Dot-Matrix LCD
KEYBOARD	24 Tactile -Feedback Push Buttons, Polycarbonate Overlay	24 Tactile-Feedback Push Buttons, Polycarbonate Overlay	24 Tactile-Feedback Push Buttons, Polycarbonate Overlay
SELF TEST	Tests ROM, RAM, I/O, Speaker and LCD	Tests ROM, RAM, I/O, Speaker and LCD	Tests ROM, RAM, I/O, Speaker and LCD
ENVIRONMENTAL DATA			
Operating Temp.	50-104 F (10-40 C)	50-104 F (10-40 C)	50-104 F (10-40 C)
Storage Temp.	32-122 F (0-50 C)	32-122 F (0-50 C)	32-122 F (0-50 C)
Relative Humidity	<80%, Non-Condensing	<80%, Non-Condensing	<80%, Non-Condensing
Maximum Altitude	15,000 Feet (4572 Meters)	15,000 Feet (4572 Meters)	15,000 Feet (4572 Meters)
POWER REQUIREMENTS			
Frequency	50-60 Hz	50-60 Hz	50 -60 Hz
Voltage	110/220 VAC, 10%	110/220 VAC, 10%	110/220 VAC, 10%
Power	3.5 Watts	3.5 Watts	3.5 Watts
SIZE (HxWxD)	4.5 x 13.4 x 11.8 inches (11.5 x 34.0 x 30.0 cm)	4.5 x 13.4 x 11.8 inches (11.5 x 34.0 x 30.0 cm)	4.5 x 13.4 x 11.8 inches (11.5 x 34.0 x 30.0 cm)
WEIGHT	7.7 lbs. (3.5Kg.)	7.7 lbs. (3.5Kg.)	7.7 lbs (3.5Kg.)

FIVE: USER MAINTENANCE

5.1 Fuse Replacement

If the fuse is suspected of being defective, it should be inspected and, if necessary, replaced. To inspect or replace the fuse, please perform the following steps:

(1) Disconnect the AC power cord.
(2) Unscrew the removable portion of the fuse holder.
(3) Remove the fuse from the fuse holder. Test for electrical continuity with an ohmmeter.
(4) If the fuse is found to be open, replace it only with a 0.5 amp, 250 volt replacement fuse.

NOTE: USE OF ANY FUSE OTHER THAN THE 0.5 AMP, 250 VOLT UNIT SPECIFIED MAY DISABLE THE OVERLOAD PROTECTION AND CAUSE DAMAGE TO THE INSTRUMENT.

5.2 In Case of Difficulties

The AR-9800 Series has been designed to be reliable and easy-to-use. However, it is possible that you may experience difficulties during operation. If there appears to be any kind of problem during use of the programmer, please perform the following steps to help determine the source:

(1) Re-read the operating instructions. It is very easy to inadvertently make mistakes in operating procedure.
(2) Remove and test the fuse. The instrument will not function with an open fuse.
(3) Verify that the proper type number has been selected for the device in the socket (Refer to Appendix One).
(4) If programming an EPROM, verify that the memory locations it is desired to program are filled with $FF (blanks). The programmer cannot re-write over existing data.

If the preceding steps fail to resolve the problem, please do not hesitate to call for application information. Sometimes, merely describing the problem to another person can make the solution obvious. Otherwise, please refer to the "Obtaining Service" section.

NOTE: ATTEMPTED REPAIR, MODIFICATIONS, OR TAMPERING BY UNAUTHORIZED PERSONNEL WILL VOID THE WARRANTY.

SIX: OBTAINING SERVICE

6.1 Warranty Service

ARI warrants this product for a period of one year to the original purchaser. If the instrument is thought to be defective while covered under warranty, it should be returned to ARI, following the directions under the heading "Shipping Instructions" in this section.

ARI will, at our option, repair or replace the instrument if it is found to be defective. We will then return the serviced unit at no further cost to you.

6.2 Non-Warranty Service

Any out-of-warranty instrument that is thought to be defective, but that is repairable, may be sent to ARI for non-warranty service. Please contact our service department at (818) 287-8400 for current service charges for the 9800-series.

The instrument should be returned to ARI, following the directions under the heading "Shipping Instructions" in this section.

6.3 Shipping Instructions

Any product returned to ARI for service must be shipped, freight prepaid (we will not accept COD shipments) to attention: Service Dept.

In U.S.A.	In Canada
American Reliance Inc.	BCS Electronics Limited
9241 E. Valley Blvd.	980 Alness St., Unit #7
Rosemead, CA 91770	Downsview,ONT. M3J 2S2
Phone:(800)654-9838	Phone:(416)661-5585
Fax:(818)287-8855	Fax: (416)661-5589

The instrument must be carefully packed, preferably in its original carton, and should be accompanied by a letter or note containing the following information:

Users name	Proof-of-purchase
Users Address	Description of problem
Model number	Serial number

If service is desired, it must be stated in the enclosed letter. For non-warranty repairs the correct service charge must accompany the unit, in the form of a check or money order payable to American Reliance Inc. Please do not send cash. Contact the service department at (818) 287-8400 for current charges.

ARI will return the serviced instrument, with freight paid by ARI, via UPS ground service unless otherwise requested.

Appendix One .... Device Types

The following is a partial list of manufacturers and their type numbers of EPROM memory devices, versus the proper type number to select on the AR-9800 series programmers. Please use this list to help ascertain the proper type number to use for programming any given EPROM or EEPROM memory device.

Manufacturers Legend:

AMD .. AMD Semiconductor
Ex.... Excel Semiconductor
Fu.... Fujitsu
GI ... General Instruments
H .... Hitachi Semiconductor
I .... Intel Semiconductor
Mi ... Mitsubishi Semiconductor
Mo ... Motorola Semiconductor
NEC .. NEC Semiconductor
NS.... National Semiconductor
OKI... OKI Semiconductor
Sa ... Samsung Semiconductor
SEEQ . SEEQ Technologies
SGS .. SGS Thomson
TI ... Texas Instruments
To ... Toshiba Semiconductor
VLSI.. VLSI Semiconductor
X..... Xicor Semiconductor

EPROM	Vpp	MANUFACTURER	USE TYPE NUMBER
2532	+25V	NS,TI	2532
2564	+25V	TI	2564
2716	+25V	AMD, H, I, Mi, Mo, NS, SGS, TI, OKI	2716
2716B	+12.5V	AMD	2716B
2732	+25V	I, H, AMD, Fu, OKI MI, NS, NEC, TI	2732
2732A	+21V	H, I, SGS, TI,To, AMD, Fu, Mi, NEC, OKI	2732A
2732B	+12.5V	AMD,I	2732B
2764	+21V	AMD, I, Mi, NEC, SEEQ, TI, Fu, OKI	2764
27C64	+21V	Fu, H	2764
27C64	+12.5V	GI, TI, AMD, I, SGS	2764A
2764A	+12.5V	H, I, To, SGS, AMD	2764A
27128	+21V	AMD, Fu, H, I, Mi, NEC, TI, To,OKI, SEEQ	27128
27C128	+21V	Fu, H	27128
27C128	+12.5V	GI, TI, AMD, VLSI	27128A
27128A	+12.5V	AMD, H, I, SGS	27128A
27256	+12.5V	AMD, I, Mi, Fu H, SGS	27256
27C256	+12.5V	GI, TI, AMD, H, I, Mi, SEEQ, VLSI	27256
27256D	+21V	To(Toshiba)	27256D
27512	+12.5V	I, To, H, Mi, SGS	27512
27C512	+12.5V	TI, AMD, VLSI	27512
27513	+12.5V	I	27513

EEPROM	MANUFACTURER	USE TYPE NUMBER
2816	I, NS	2816I
2816	Mo	2816M*
28C16	GI	2816A
2816A	Ex, Sa, SEEQ, X	2816A
2832	AMD	2832
2864	Ex, SEEQ, X	2864
28C64	GI	2864
2864A	I, Sa	2864
2864D	AMD	2864
2817A	I, Sa, SEEQ	2817

***Note:** The Motorola 2816 (2816M type selection) uses a 25-volt level for erase. If accidently used with a non-Motorola device, this can and probably will destroy it. BE CAREFUL when this type number is selected.

Appendix Two .... Serial Interconnection

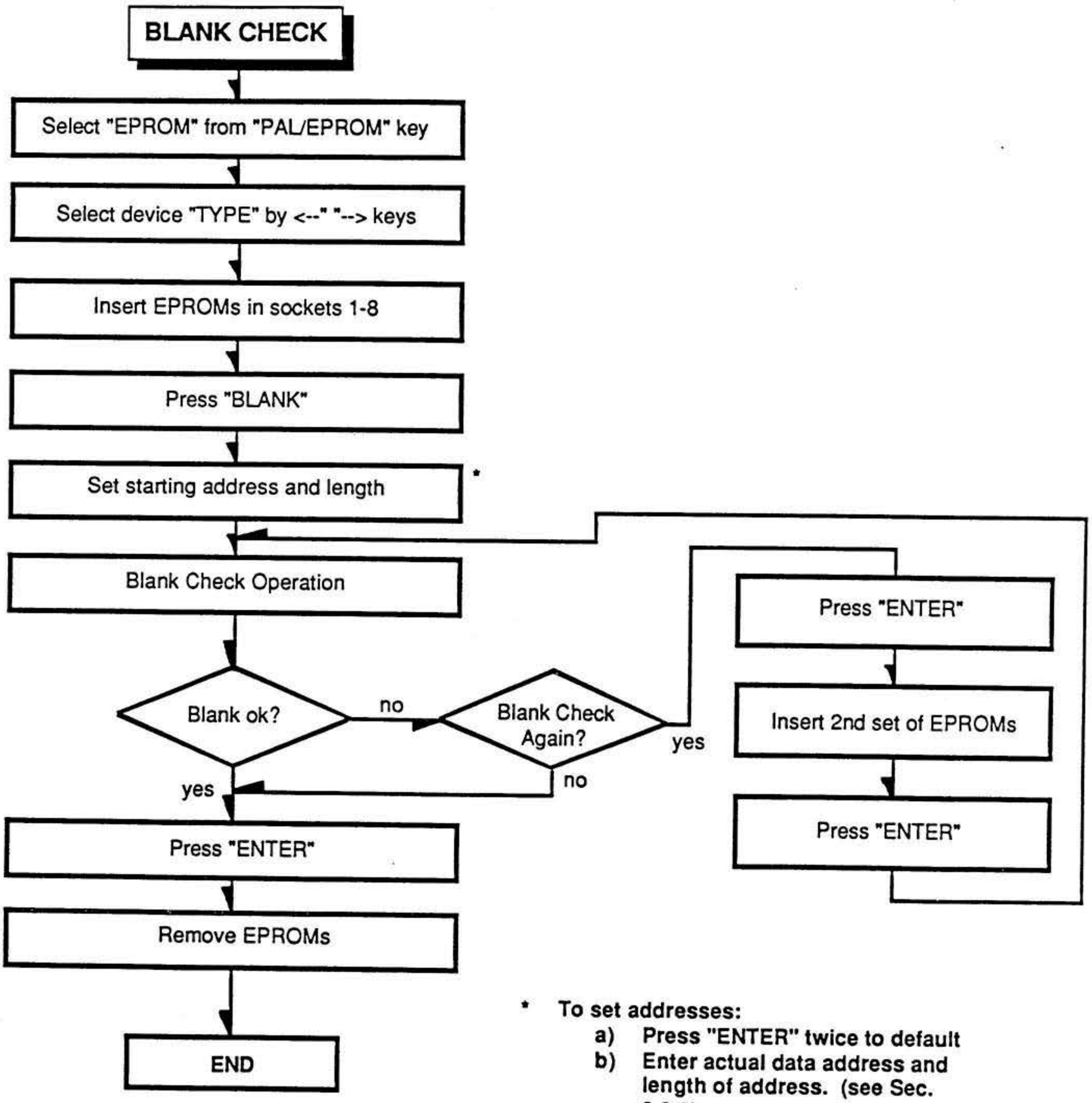
The RS-232 serial connection required between an AR-9800 series programmer and an associated PC is the 7-wire, full handshaking type, which is wired as shown below>

DB-25M		DB-25F
2	----------	3
3	----------	2
4	----------	6
5	----------	20
6	----------	4
7	----------	7
20	----------	5

APPENDIX THREE ...

OPERATIONAL FLOW CHARTS

EPROM "BLANK CHECK" OPERATION
(Flow Chart #1)



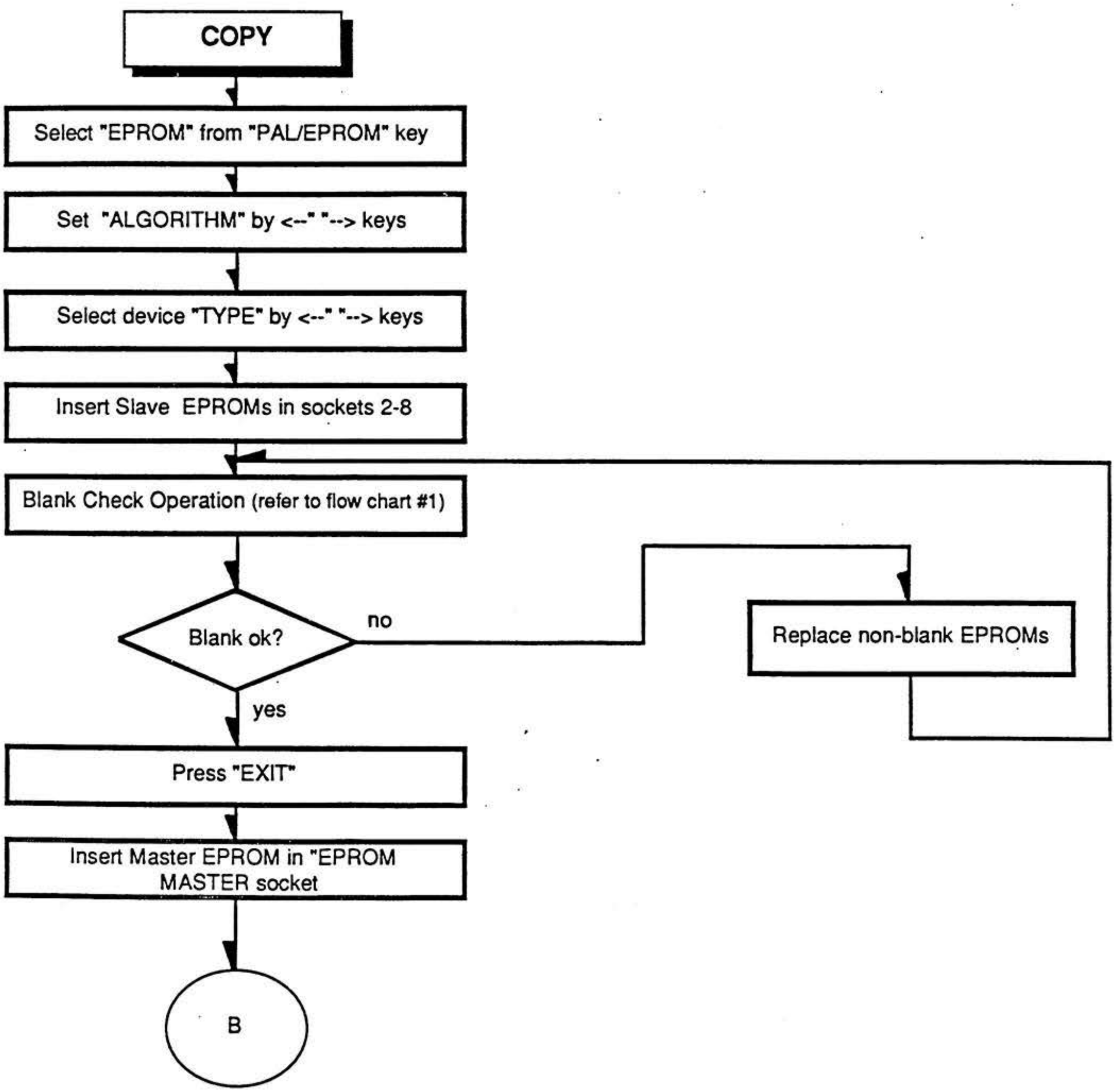
* To set addresses:

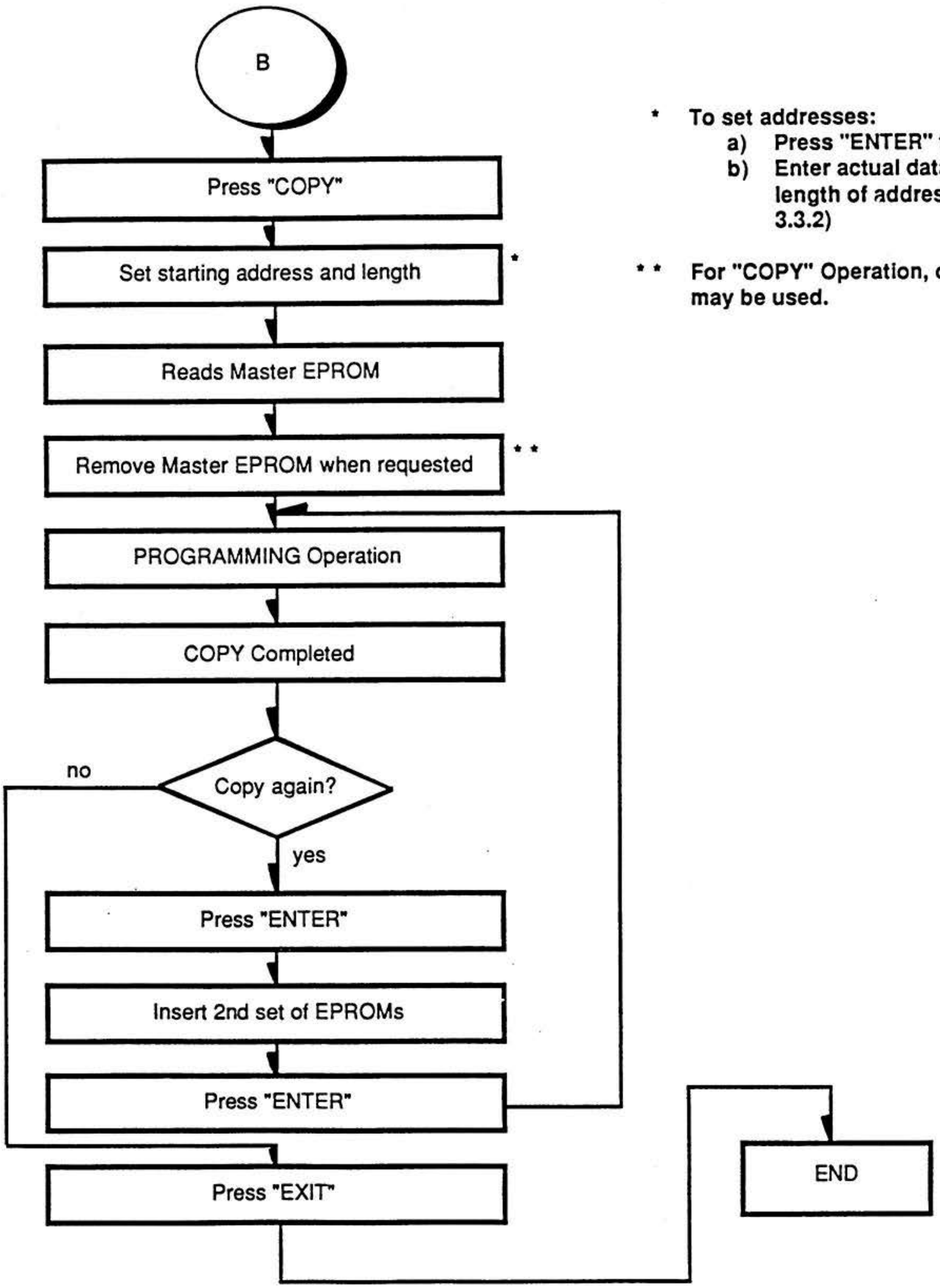
a) Press "ENTER" twice to default

b) Enter actual data address and length of address. (see Sec. 3.3.2)

EPROM "COPY" OPERATION
(Flow Chart #3)

In "COPY" mode, the master and slave EPROMs are to be identical in brand and type
(i.e. - the same Vpp and access time.)



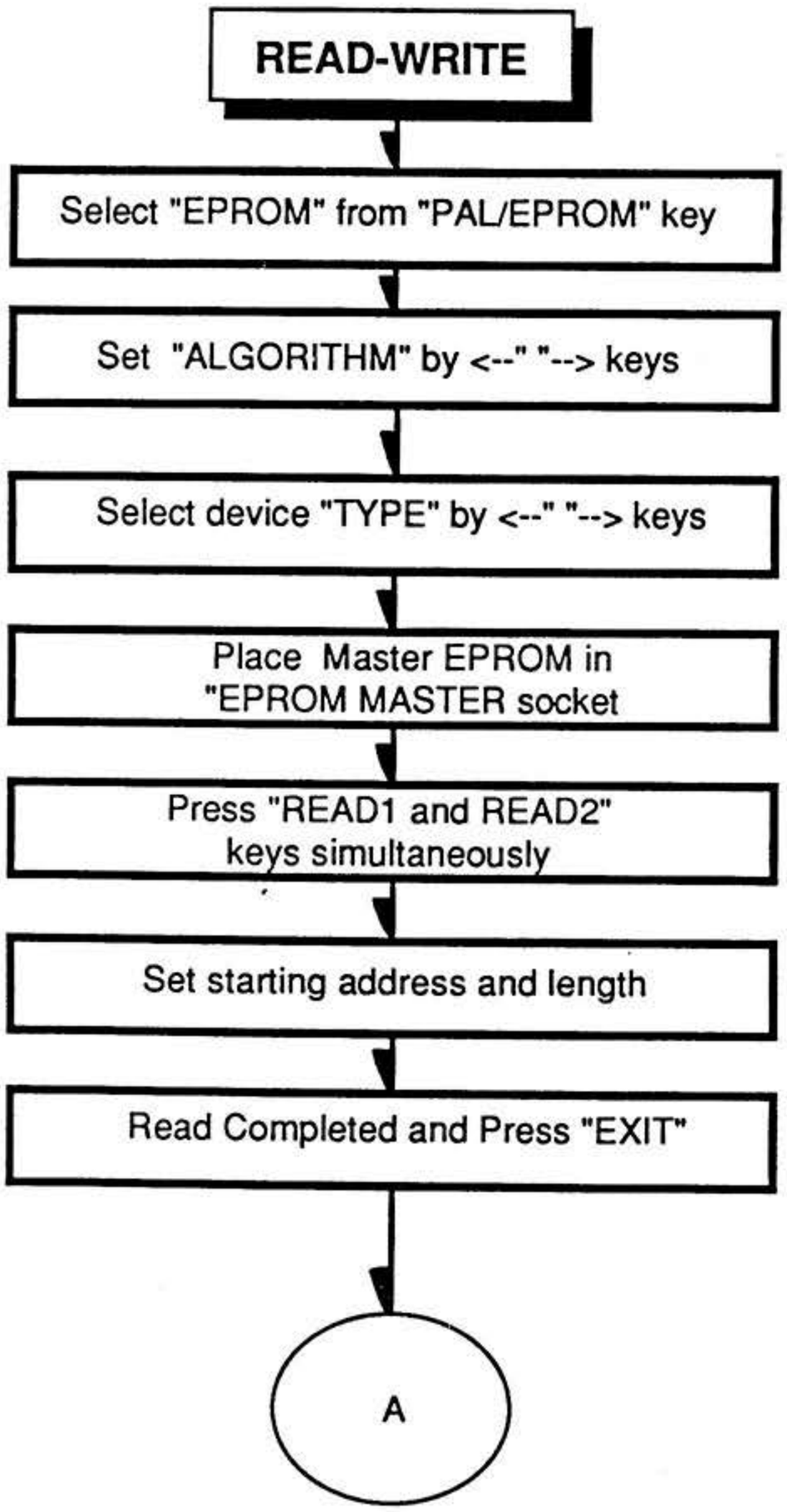


* To set addresses:
  a) Press "ENTER" twice to default
  b) Enter actual data address and length of address. (see Sec. 3.3.2)

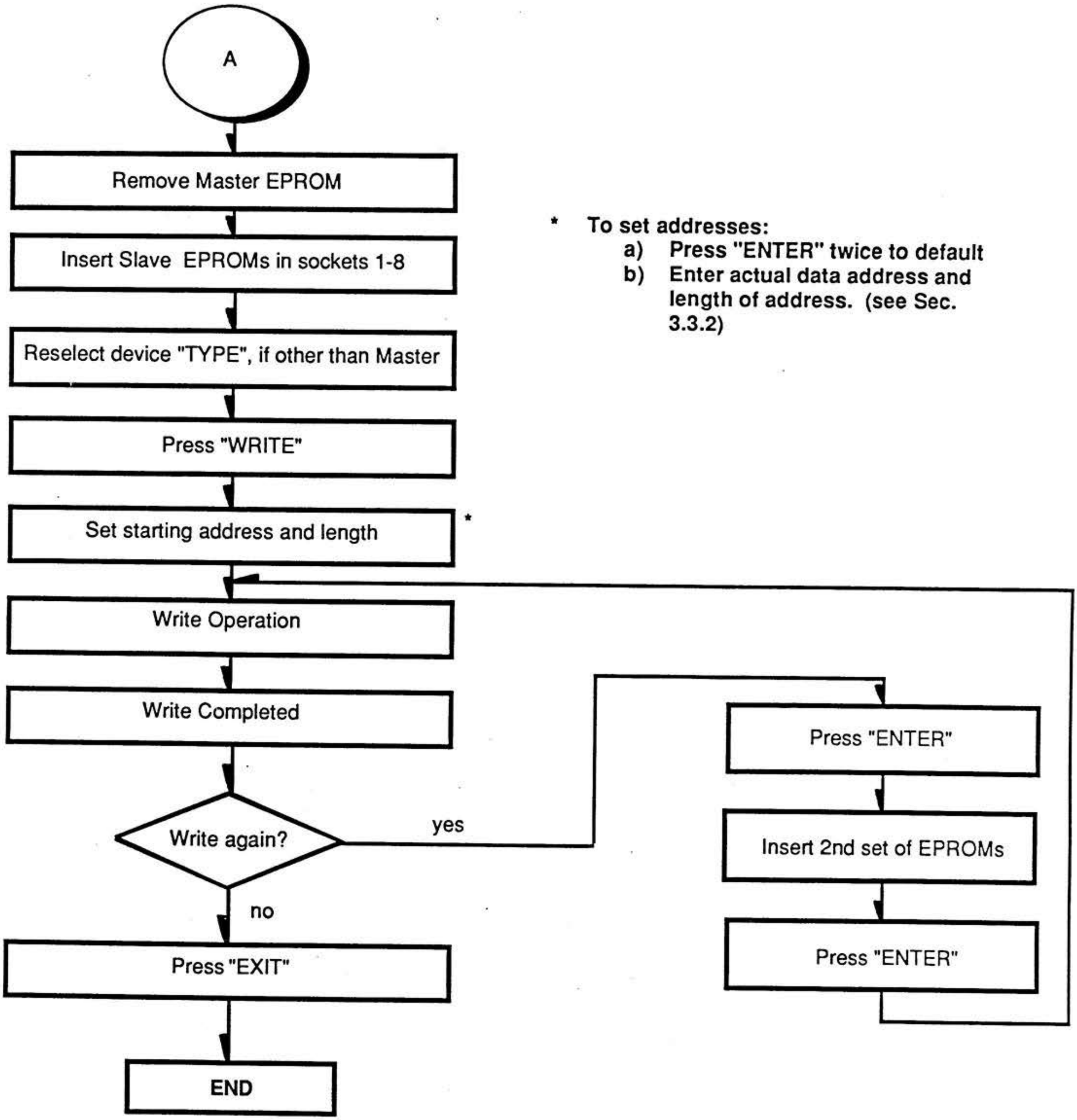
* * For "COPY" Operation, only sockets 2-8 may be used.

EPROM "READ-WRITE" OPERATION
(Flow Chart #2)

The "READ-WRITE" operation is ideal for EPROMs that have the same type number, but their chaqracteristics differ.

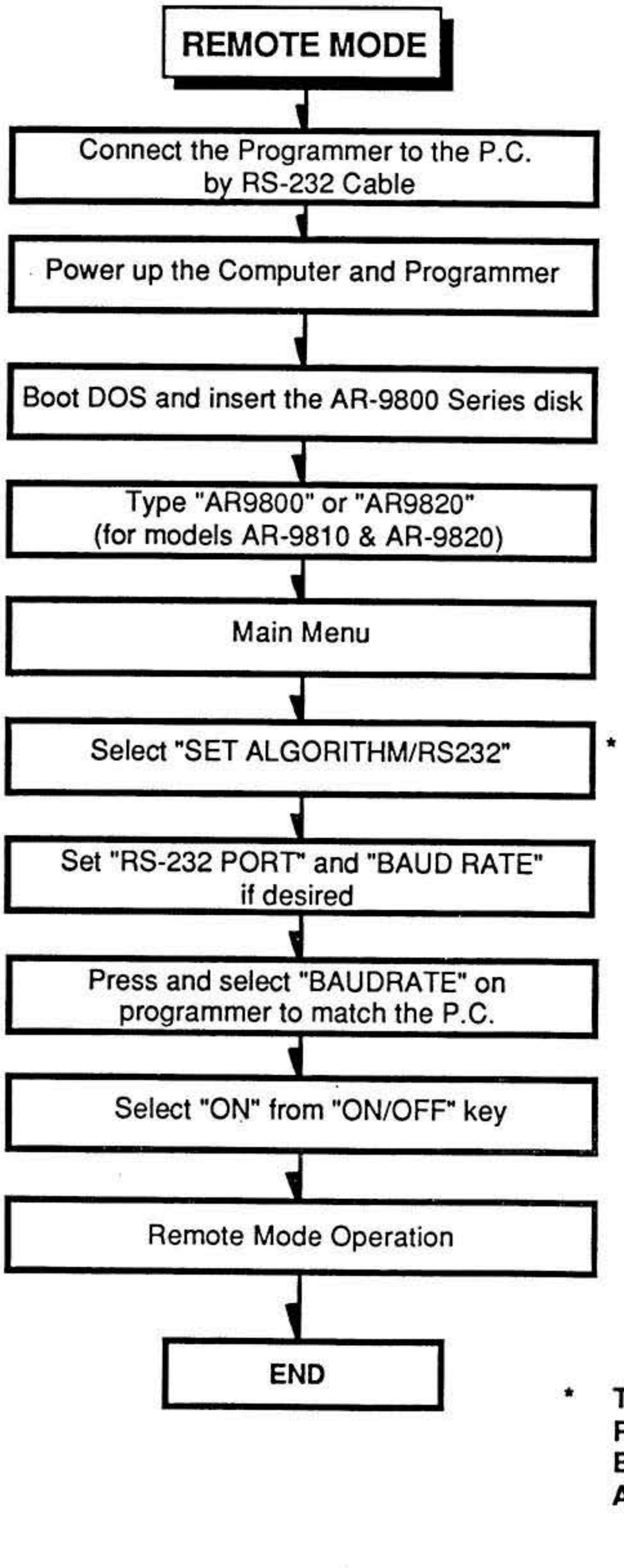


* To set addresses:
- a) Press "ENTER" twice to default
- b) Enter actual data address and length of address. (see Sec. 3.3.2)



* To set addresses:
  a) Press "ENTER" twice to default
  b) Enter actual data address and length of address. (see Sec. 3.3.2)

REMOTE MODE OPERATION
(Flow Chart #4)



* **The default values are:**
RS232 Port: COM 1
BAUD RATE: 9600
ALGORITHM: INTEL