



# 256KZ

**Random  
Access  
Memory**

## **Instruction**

## **Manual**

# **Cromemco<sup>®</sup>** **256KZ**

**Instruction Manual**

**CROMEMCO, Inc.**  
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**Mountain View, CA. 94043**

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Cromemco 256KZ Memory Board  
1. Introduction

**Chapter 1**

**INTRODUCTION**

The Cromemco 256KZ RAM board can be configured as four 64 Kbyte banks of memory, for use with Z-80 systems, or as 256 Kbytes of contiguous memory, for use with 68000 systems. One 256KZ board, for example, will support three users or tasks in a Z-80 Cromix system or provide 256 Kbytes of contiguous memory in a 68000 system while two boards will support six users in a Z-80 Cromix system or provide 512 Kbytes in a 68000 system.

**68000 BASED SYSTEMS**

For 68000 based systems (using the Cromemco DPU) the position of the 256KZ in address space is set by six switches. These switches are used to set the high-order address bits of the board (A18 through A23) so that it can be placed at any 256K boundary in the 16-megabyte address space of the 68000. A seventh switch on the board is used to set power-on enable or disable.

**Z-80 BASED SYSTEMS**

For Z-80 systems, the 256KZ is the logical equivalent of four 64K boards. A single PROM is used to determine the banks in which each of the 64K segments of memory reside. This PROM (IC39 on the board) is normally a Cromemco 74947 which fills banks 0, 1, 2, and 3 with memory for 3-user Cromix systems and maps the other banks to bank zero. For a 6-user Cromix system, two 256KZ boards are required, with IC39 replaced by other Cromemco PROMS for proper bank addressing.

## Cromemco 256KZ Memory Board

### 1. Introduction

#### **FEATURES**

The 256KZ automatically switches from contiguous memory when used with a DPU based 68000 Cromix system to bank selected memory in Z-80 Cromix systems. The switch settings on the board determine its address range in 68000 memory space. The PROM plugged into the IC39 socket determines the memory banks selected in Z-80 systems. This means that with Cromemco's dual processor D-series systems you can use either the Z-80 or 68000 Cromix Operating System interchangeably, without changing any settings on the 256KZ memory boards.

The 256KZ can be byte-addressed or word-addressed. During Z-80 memory operations eight bits of data are transferred at one time, while with 68000 memory operations, 16 bits of data are transferred at one time. In this way, there is no speed degradation when using the 256KZ with 68000 systems.

## Chapter 2

### USING THE 256KZ IN A Z-80 SYSTEM

#### SELECTING A PROM

Determination of the 64 Kbyte banks of memory which a board contains is made via a PROM, IC39. The 256KZ is shipped with a Cromemco 74947 PROM in this location. This PROM places memory banks zero through three in the 256KZ as required by a 3-user Z-80 Cromix system.

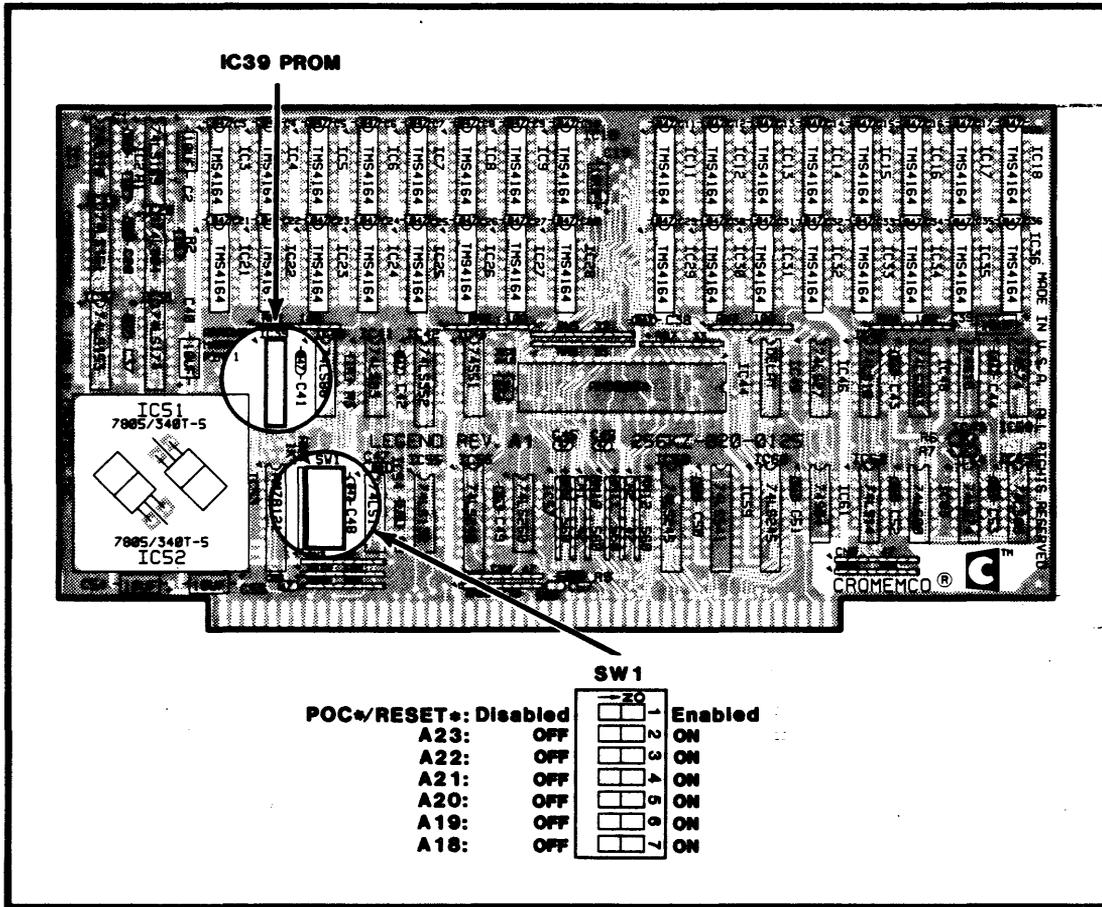
If two 256KZ boards are being used for a 6-user Z-80 Cromix system, the 74947 PROMs must be removed from **both** boards and new PROMs installed. Cromemco PROM number 74948 is installed in one board, placing memory banks zero through three in the 256KZ as required by a 6-user system. (This is the board with switch bit one ON, as explained below.) Cromemco PROM number 74949 is installed in the other board, placing memory banks four through six in this 256KZ as required by a 6-user system. (This is the board with switch bit one OFF, as explained below.) Refer to the illustration and table at the end of this chapter.

If no PROM is in the IC39 socket, the 256KZ will assume that it is operating in a 68000 based system and that its addresses are being set by the switches (refer to Chapter 3).

#### SWITCH SETTINGS

There is only one switch bit which affects the operation of a 256KZ board in a Z-80 based system. This is switch bit one (labeled POC\*/RESET\* in the illustration) which enables the bottom 32 Kbytes of the board when the system is first turned on or reset.

Cromemco 256KZ Memory Board  
 2. Using the 256KZ in a Z-80 System



Switch bits two through seven are only significant in 68000 based Cromix systems.

Switch bit one must ON in systems using one 256KZ board.

In Z-80 based systems incorporating two 256KZ boards, one board contains memory banks zero through three while the other contains banks four through six. Switch bit one must be in the ON position on the board containing banks zero through three and OFF on the other board. Refer to the following table.

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2. Using the 256KZ in a Z-80 System

Cromix System	256KZ #1	256KZ #2
3 user	switch bit 1 - ON PROM as shipped (74947)	not applicable
6 user	switch bit 1 - ON change PROM to 74948	switch bit 1 - OFF change PROM to 74949

Settings of other switches on the board are not relevant to Z-80 operation.

Cromemco 256KZ Memory Board

## Chapter 3

### USING THE 256KZ IN A 68000 SYSTEM

#### SELECTING A PROM

The IC39 PROM has no effect on the operation of a 256KZ board in a 68000 based system. If the 256KZ board is to be used with the Cromemco DPU board in both a Z-80 and 68000 environments, a PROM accommodating the needs of the Z-80 portion of the DPU should be used. Refer to Chapter 2 for a description of the 256KZ in a Z-80 environment.

#### SWITCH SETTINGS

When switch bit one (labeled POC\*/RESET\* in the illustration) is on, it enables the bottom 32 Kbytes of the board when the system is first turned on or reset. Switch bit one must be in the ON position on the 256KZ board addressed as the lowest area of memory. It must be OFF on all other 256KZ boards in the system.

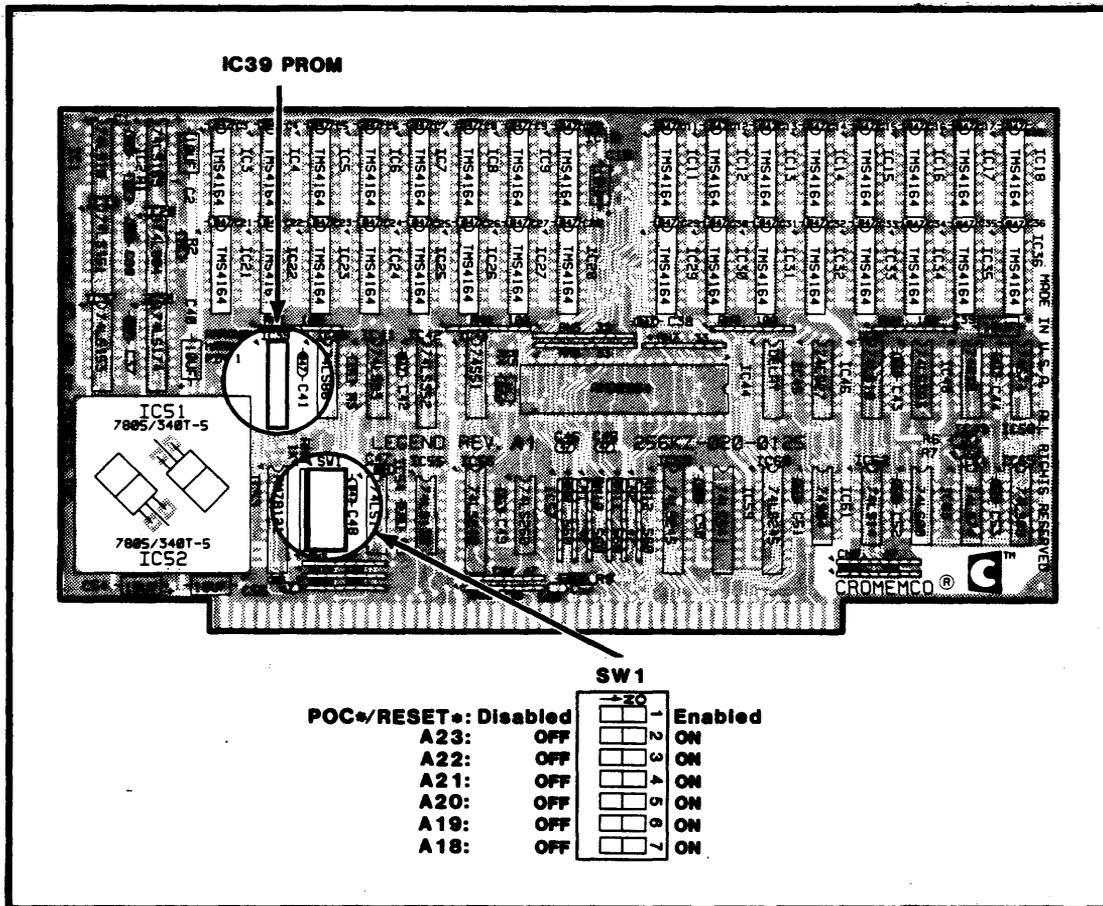
Switch bits two through seven are used to select the upper six address bits for 68000 operation. Refer to the following illustration.

The first (or only) 256KZ board in any 68000 based system should have switch bits two through seven ON. (This is the board with switch bit one ON, as explained above.) This causes the board to be addressed starting at location zero. It must also have the standard PROM (74947) in the IC39 socket. This enables memory to be accessed by the DPU during start-up procedures.

The second 256KZ board in the system should have switch bit seven OFF and bits two through six ON. (This and all subsequent boards should have switch bit one OFF, as explained above.) The second and subsequent boards in

**Cromemco 256KZ Memory Board**  
**3. Using the 256KZ in a 68000 System**

the system do not require a PROM. If there is no PROM in the IC39 socket, the 256KZ will assume that it is in a 68000 based system.



For switch settings in systems with more than two 256KZ boards, consult the following table.

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 3. Using the 256KZ in a 68000 System

First Memory Address		Switch Bit					
Hexadecimal (0000)	Decimal (K)	2	3	4	5	6	7
00	0	ON	ON	ON	ON	ON	ON
04	256	ON	ON	ON	ON	ON	OFF
08	512	ON	ON	ON	ON	OFF	ON
0C	1024	ON	ON	ON	ON	OFF	OFF
10	1280	ON	ON	ON	OFF	ON	ON
14	1536	ON	ON	ON	OFF	ON	OFF
.	.			.			
.	.			.			
.	.			.			
F4	15616	OFF	OFF	OFF	OFF	ON	OFF
F8	15872	OFF	OFF	OFF	OFF	OFF	ON
FC	16128	OFF	OFF	OFF	OFF	OFF	OFF

**Cromemco 256KZ Memory Board**

# Cromemco 256KZ Memory Board

## A. Limited Warranty

### Appendix A

## LIMITED WARRANTY

Cromemco, Inc. ("Cromemco") warrants this product against defects in material and workmanship to the original purchaser for ninety (90) days from the date of purchase, subject to the following terms and conditions.

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During the ninety (90) day warranty period Cromemco will, at its option, repair or replace this Cromemco product or repair or replace with new or used parts any parts or components, manufactured by Cromemco, which prove to be defective, provided the product is returned to an Authorized Cromemco Dealer as set forth below.

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You should immediately notify IN WRITING your Authorized Cromemco Dealer or Cromemco of problems encountered during the warranty period. In order to obtain warranty service, first obtain a return authorization number by contacting the Authorized Cromemco Dealer from whom you purchased the product. Then attach to the product:

1. Your name, address and telephone number,
2. the return authorization number,
3. a description of the problem, and
4. proof of the date of retail purchase.

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Cromemco does not warrant any products, components or parts not manufactured by Cromemco.

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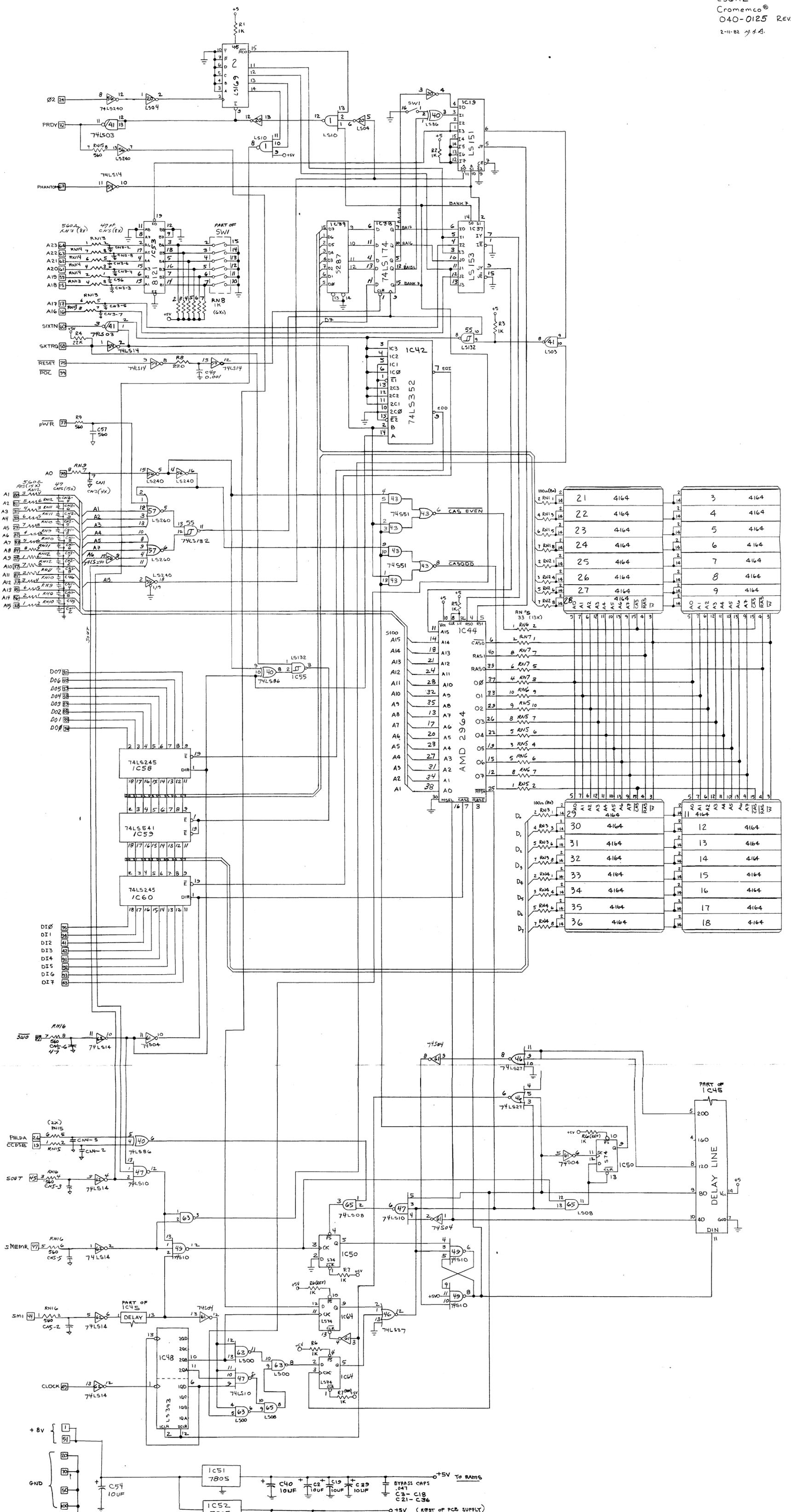
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#### Other Important Provisions:

Some states do not allow the exclusion or limitation of incidental or consequential damages or limitations on how long an implied warranty lasts, so the above limitation or exclusion may not apply to you. This warranty shall not be applicable to the extent that any provision of this warranty is prohibited by any federal, state or municipal law which cannot be preempted. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

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