



THIS SPECIFICATION APPLIES TO THE SUBJECT ITEM AS MANUFACTURED BY TEKTRONIX, INC.

1. ITEM NAME & DESCRIPTION: I. C. 4 Decade Counter with Latches, Digital to Analog Conversion, Multiplexing and Leading Zero's Suppression Logic. Initially designated the M059.

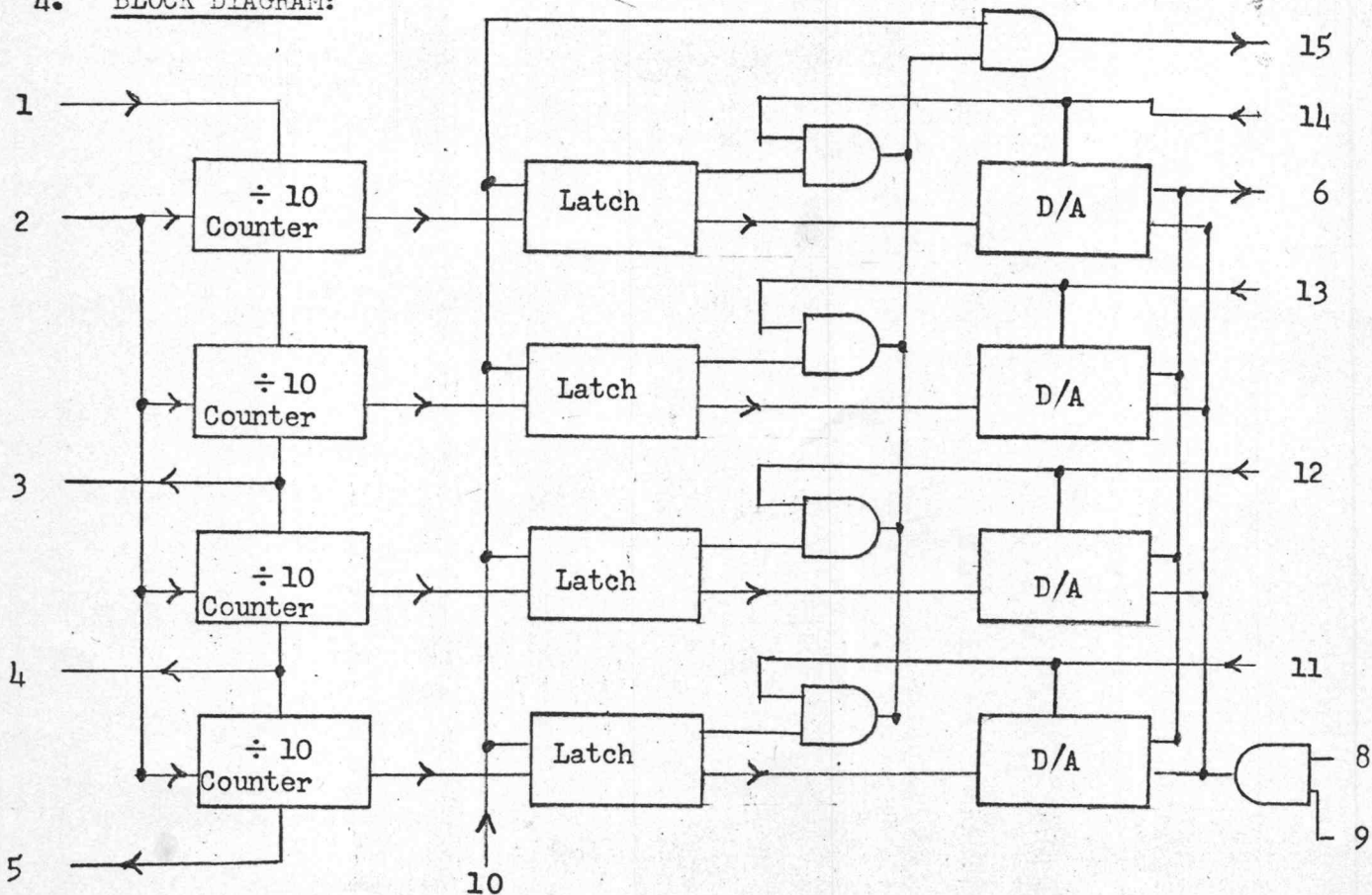
2. PACKAGE: 16 Pin Minipack

3. FUNCTIONAL DESCRIPTION:

A. Terminal Identification:

- |                            |                                  |
|----------------------------|----------------------------------|
| 1. Count Input             | 9. Analog Current Output Control |
| 2. Reset Input             | 10. Transfer                     |
| 3. 2nd Decade Count out    | 11. 4th Decade Read Input        |
| 4. 3rd Decade Count out    | 12. 3rd Decade Read Input        |
| 5. 4th Decade Count Out    | 13. 2nd Decade Read Input        |
| 6. Analog Current Output   | 14. 1st Decade Read Input        |
| 7. Gnd                     | 15. Zero Not Output              |
| 8. Reference Current Input | 16. V <sub>CC</sub>              |

4. BLOCK DIAGRAM:



# TEKTRONIX, INC.

SPECIFICATION NO 155-0090-00

Page

Of

$$V_{CC} = 5.0 \text{ V}$$

ELECTRICAL CHARACTERISTICS (FOR AN AMBIENT TEMPERATURE OF 25 °C EXCEPT WHERE A DIFFERENT TEMPERATURE MAY BE SHOWN)			VALUES		UNITS
SYMBOLS	IDENTIFICATIONS	NOTES AND TEST CONDITIONS <sup>1</sup>	MIN	MAX	
INPUTS	Pin 1, Count Input Pin 2, Reset Input				
$V_H$			2	5	V
$V_L$			0.8	-2	V
$I_H$	$V_H = 1.8\text{V}$			40	$\mu\text{A}$
$I_H$	$V_H = 2.4\text{V}$			1	mA
$V_H$	Pin 9 output Current Control Pin 10 Transfer		2	5	V
$V_L$			0.8	-2	V
$I_H$	$V_H = 2.4$			1.5	mA
$V_H$	Read Inputs, Pins 11, 12, 13 & 14		-1	-10	V
$V_L$			0.5	5	V
$I_H$	$V_H = -10\text{V}$			-1.2	mA
$I_{REF}$	Reference Current		0.95	1.05	mA
$V_{REF}$	$I_{REF} = 1.0 \text{ mA}$	WRT $V_{CC}$	-50	50	mV

# TEKTRONIX, INC.

SPECIFICATION NO 155-0090-00

Page                      Of

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SYMBOLS	IDENTIFICATIONS	NOTES AND TEST CONDITIONS <sup>1</sup>	MIN	MAX	
OUTPUTS		Pin 9 output $\bar{C}on=1$	0	10	$\mu A$
$A_0$	Analog Output Current	Pin 9 = 0			$\mu A$
		0	80	120	
		1	180	220	
		2	280	320	
		3	380	420	
		4	480	520	
		5	580	620	
		6	680	720	
		7	780	820	
		8	880	920	
		9	980	1040	
$V_H$	Counter Outputs Pins 3, 4 & 5 $I_H = -40 \mu A$		2.4		V
$V_L$	$I_L = 1.6 \text{ mA}$			0.8	V
$V_L$	Zero Not Output	Pin 10 = 1	0	0.3	V
		Pin 10 = 0 $R_L = 5K\Omega$	0	0.5	V
$V_H$			3		V
$I_L$		$R_L = 0$		100	$\mu A$
$I_H$		$R_L = 0$	3.0		mA
$I_{CC}$	Supply Current			25	mA

# TEKTRONIX, INC.

SPECIFICATION NO 155-0090-00

Page      Of

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SYMBOLS	IDENTIFICATIONS	NOTES AND TEST CONDITIONS <sup>1</sup>	MIN	MAX	
Switching Parameters					
Negative Transition of Clock to					
$t_{PD2}$	2nd Decade Output			100	n Sec
$t_{PD3}$	3rd Decade Output			150	n Sec
$t_{PD4}$	4th Decade Output			200	n Sec
$t_{CH}$	Clock Input High		100		n Sec
$t_{CL}$	Clock Input Low		50		n Sec
$t_{RH}$	Reset Pulse Width		100		n Sec
$t_{TH}$	Transfer Pulse Width		100		n Sec

# TEKTRONIX, INC.

P. O. BOX 500, BEAVERTON, OREGON  
97005



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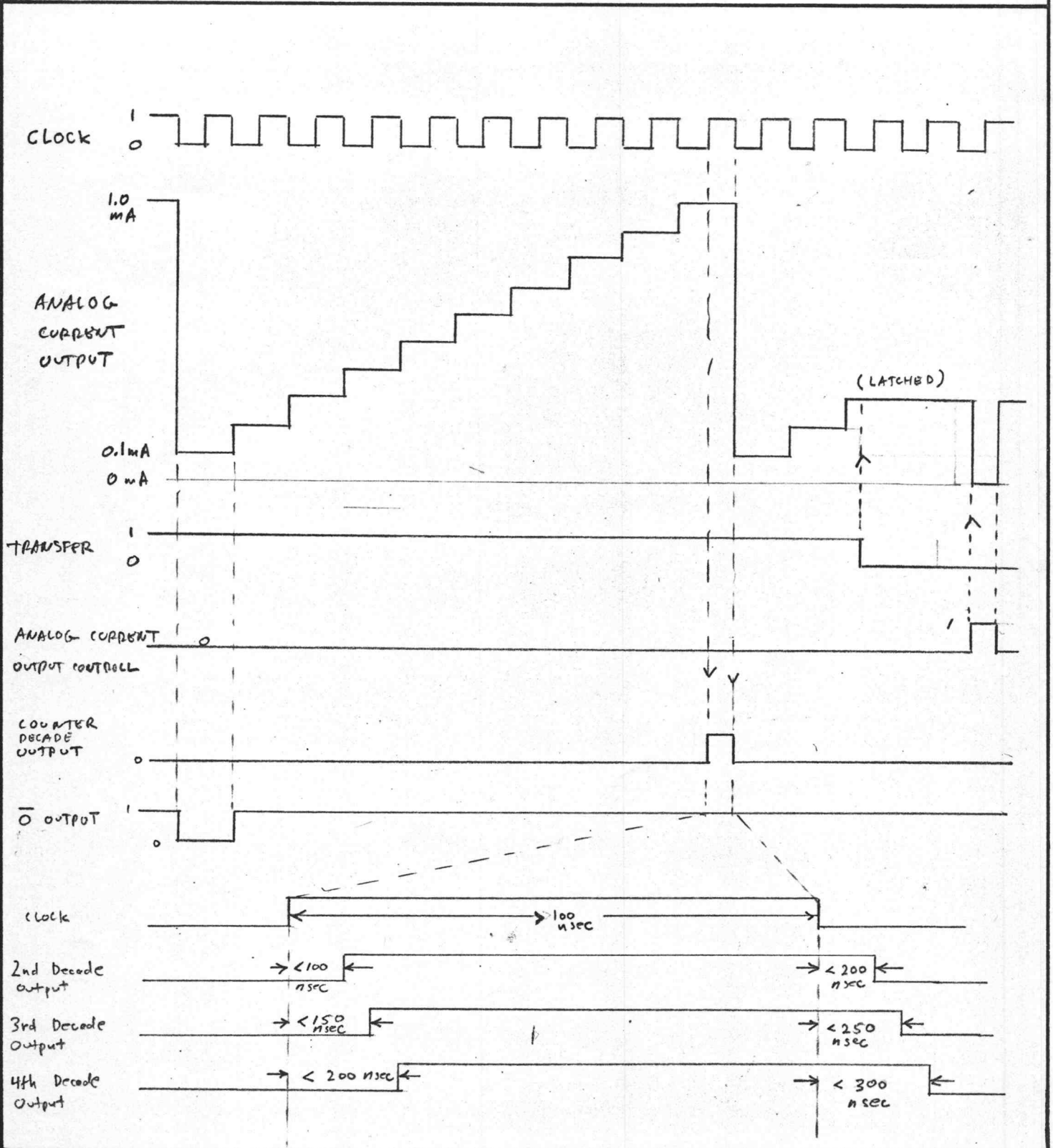
APPROVED \_\_\_\_\_, 19\_\_

SUPERSEDES SPEC NO \_\_\_\_\_

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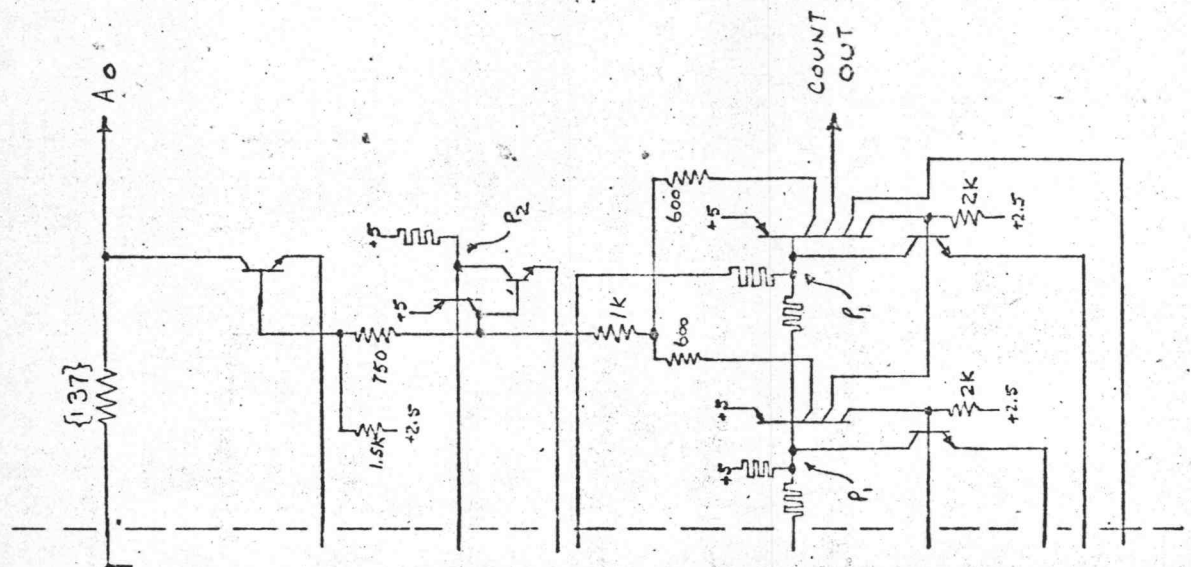
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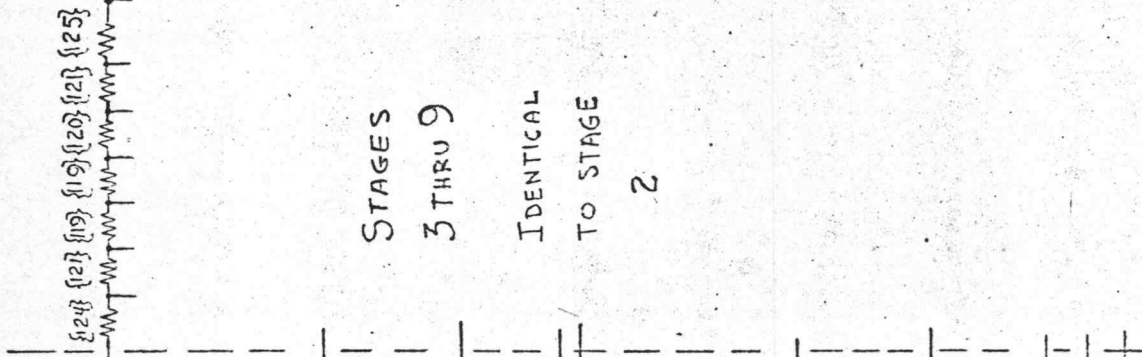
# ← D-A CONVERTER →

10<sup>TH</sup> STAGE

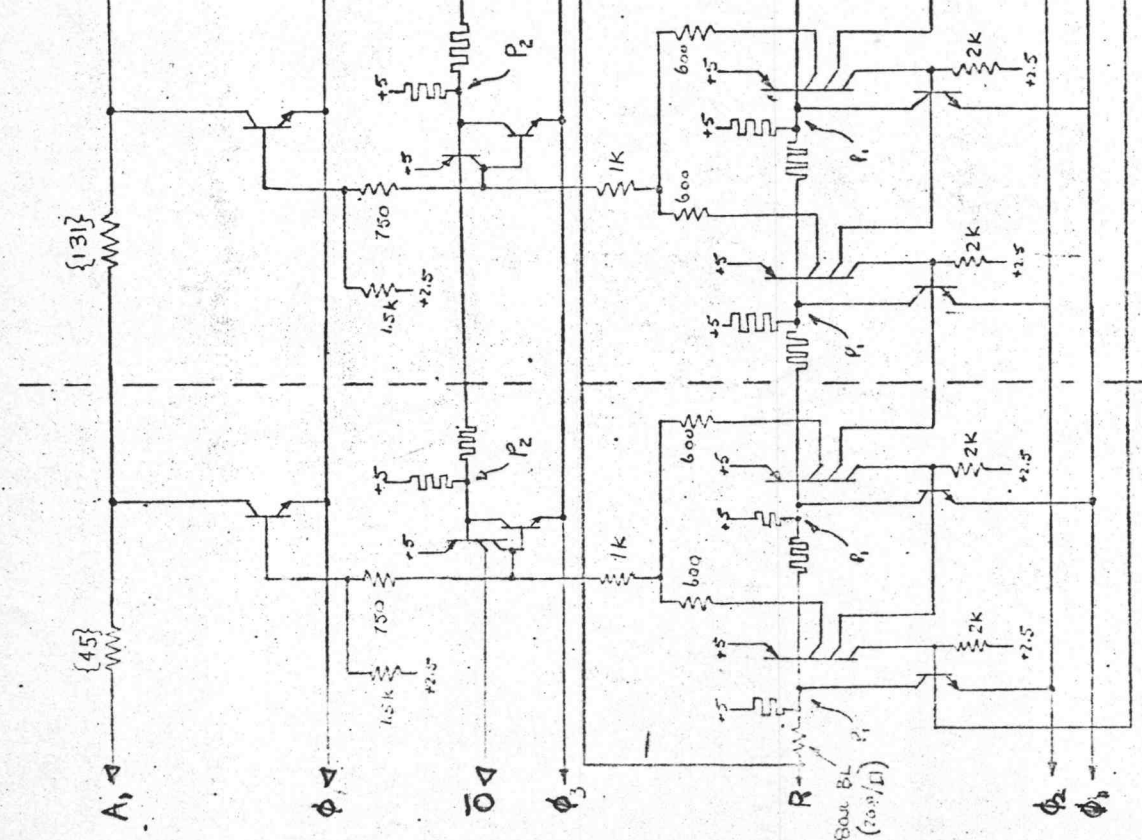


STAGES 3 THRU 9  
IDENTICAL TO STAGE 2

2<sup>ND</sup> STAGE



1<sup>ST</sup> STAGE



MARCH 1, '72 MIKE METCALF

RESISTANCE INTO POINTS  $P_1 = 1.45K$   
 " " " "  $P_2 = 1.65K$  TO  $2.2K$   
 RESISTORS IN { } are N<sup>T</sup>  $10\Omega/\square$   
 " MARKED  $\square$  " EPI  $5.5K\Omega/\square$   
 " " " " " BASE  $200\Omega/\square$

00 part meets ALL specifications

01 part first two decades meet  
ALL specifications

02 part meets ALL specifications  
EXCEPT FOR ZEROS NOT OUTPUT,  
WHICH IS DELETED.