

# Combinatorial PAL10H8 Series

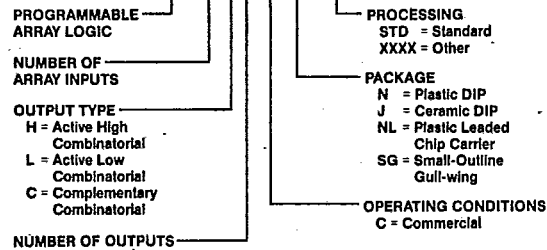
**10H8, 12H6, 14H4, 16H2  
16C1  
10L8, 12L6, 14L4, 16L2**

## Features/Benefits

- Combinatorial architectures
- Active high or active low options
- Security fuse

## Ordering Information

### PAL10H8 C N STD



	INPUTS	OUTPUTS	POLARITY	t <sub>PD</sub> (ns)	I <sub>CC</sub> (mA)
PAL10H8	10	8	HIGH	35	90
PAL12H6	12	6	HIGH	35	90
PAL14H4	14	4	HIGH	35	90
PAL16H2	16	2	HIGH	35	90
PAL16C1	16	2	BOTH	40	90
PAL10L8	10	8	LOW	35	90
PAL12L6	12	6	LOW	35	90
PAL14L4	14	4	LOW	35	90
PAL16L2	16	2	LOW	35	90

## Description

The PAL10H8 Series is made up of nine combinatorial 20-pin PAL devices. They implement simple combinatorial logic, with no feedback. Each has sixteen product terms total, divided among the outputs, with two to sixteen product terms per output.

## Polarity

Both active high and active low versions are available for each architecture. The 16C1 offers both polarities of its single output.

## Performance

The standard series has a propagation delay (t<sub>pd</sub>) of 35 nanoseconds (ns), except for the 16C1 at 40 ns. Standard supply current is 90 milliamperes (mA).

## Packages

The commercial PAL10H8 Series is available in the plastic DIP (N), ceramic DIP (J), plastic leaded chip carrier (NL), and small outline (SG) packages.

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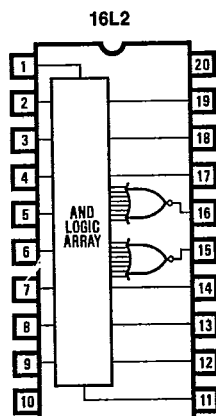
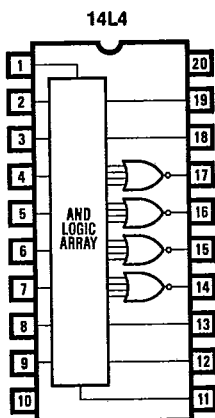
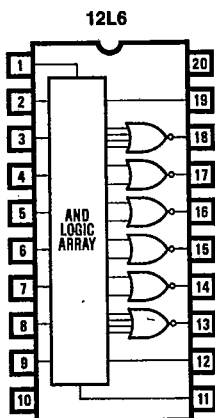
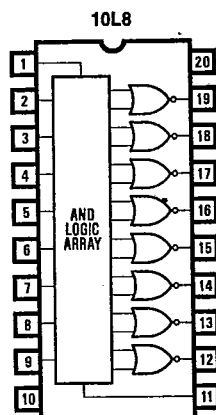
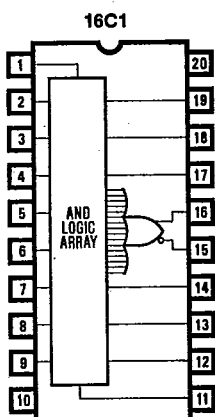
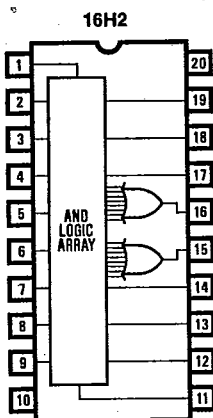
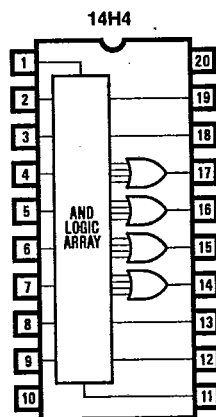
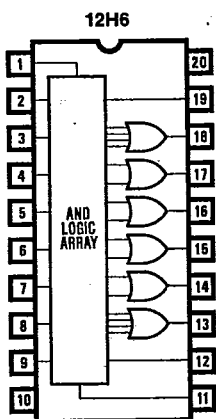
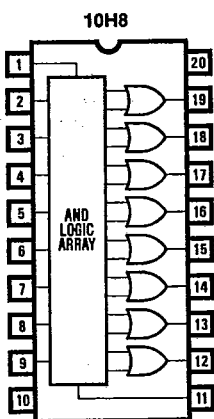
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DIP/SO Pinouts

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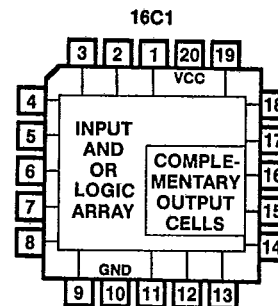
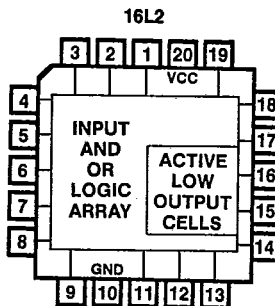
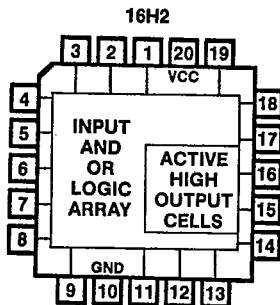
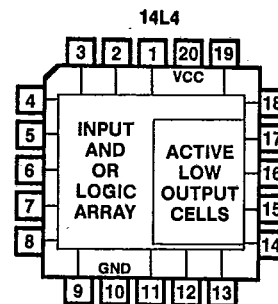
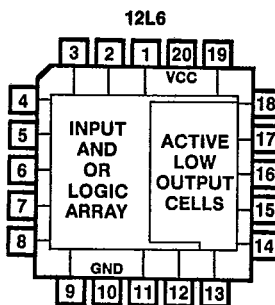
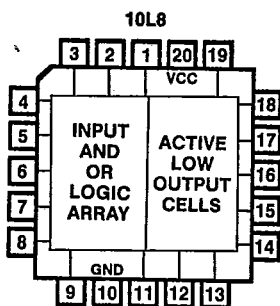
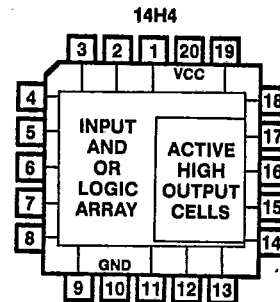
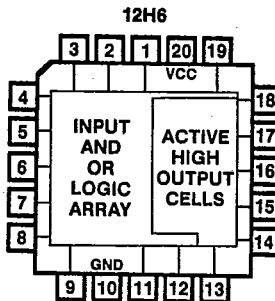
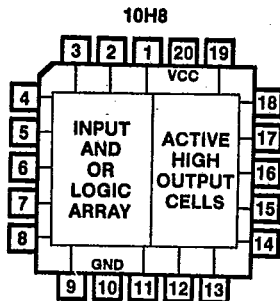
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**PLCC Pinouts**

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**Package Drawings**

(refer to PAL Device Package Outlines, page 3-179)

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**Absolute Maximum Ratings**

	Operating	Programming
Supply voltage $V_{CC}$ .....	-0.5 V to 7.0 V	-0.5 V to 12.0 V
Input voltage .....	-1.5 V to 5.5 V	-1.0 V to 22.0 V
Off-state output voltage .....	5.5 V	12.0 V
Storage temperature .....		-65°C to +150°C

**Operating Conditions**

SYMBOL	PARAMETER	MIN	TYP	MAX	UNIT
$V_{CC}$	Supply voltage	4.75	5	5.25	V
$T_A$	Operating free-air temperature	0	25	75	°C

**Electrical Characteristics** Over Operating Conditions

SYMBOL	PARAMETER	TEST CONDITIONS		MIN	TYP	MAX	UNIT
$V_{IL}^1$	Low-level input voltage					0.8	V
$V_{IH}^1$	High-level input voltage			2			V
$V_{IC}$	Input clamp voltage	$V_{CC} = \text{MIN}$	$I_I = -18 \text{ mA}$		-0.8	-1.5	V
$I_{IL}$	Low-level input current	$V_{CC} = \text{MAX}$	$V_I = 0.4 \text{ V}$		-0.02	-0.25	mA
$I_{IH}$	High-level input current	$V_{CC} = \text{MAX}$	$V_I = 2.4 \text{ V}$			25	$\mu\text{A}$
$I_I$	Maximum input current	$V_{CC} = \text{MAX}$	$V_I = 5.5 \text{ V}$			100	$\mu\text{A}$
$V_{OL}$	Low-level output voltage	$V_{CC} = \text{MIN}$	$I_{OL} = 8 \text{ mA}$		0.3	0.5	V
$V_{OH}$	High-level output voltage	$V_{CC} = \text{MIN}$	$I_{OH} = -3.2 \text{ mA}$	2.4	2.8		V
$I_{OS}^2$	Output short-circuit current	$V_{CC} = 5 \text{ V}$	$V_O = 0 \text{ V}$	-30	-70*	-130	mA
$I_{CC}$	Supply current	$V_{CC} = \text{MAX}$			55	90	mA

**Switching Characteristics** Over Operating Conditions

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
$t_{PD}$	Input or feedback to output	Except 16C1		25	35	ns
		16C1	$R_1 = 560 \Omega$ $R_2 = 1.1 \text{ k}\Omega$	25	40	

1. These are absolute values with respect to the ground pin on the device and include all overshoots due to system and/or tester noise. Do not attempt to test these values without suitable equipment.
2. No more than one output should be shorted at a time, and duration of the short circuit should not exceed one second.

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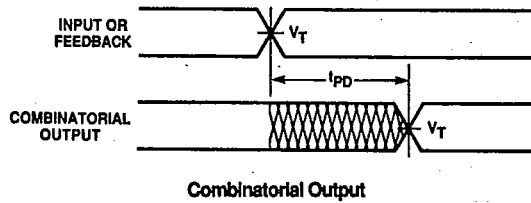
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**Switching Waveforms**

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- Notes:
1.  $V_T = 1.5V$ .
  2. Input pulse amplitude 0 V to 3.0 V.
  3. Input rise and fall times 2-5 ns typical.

**Switching Test Load**

(refer to page 5-164)

**Programmers/Development Systems**

(refer to Programmer Reference Guide, page 3-81)

**Schematic of Inputs and Outputs**

(refer to page 5-164)

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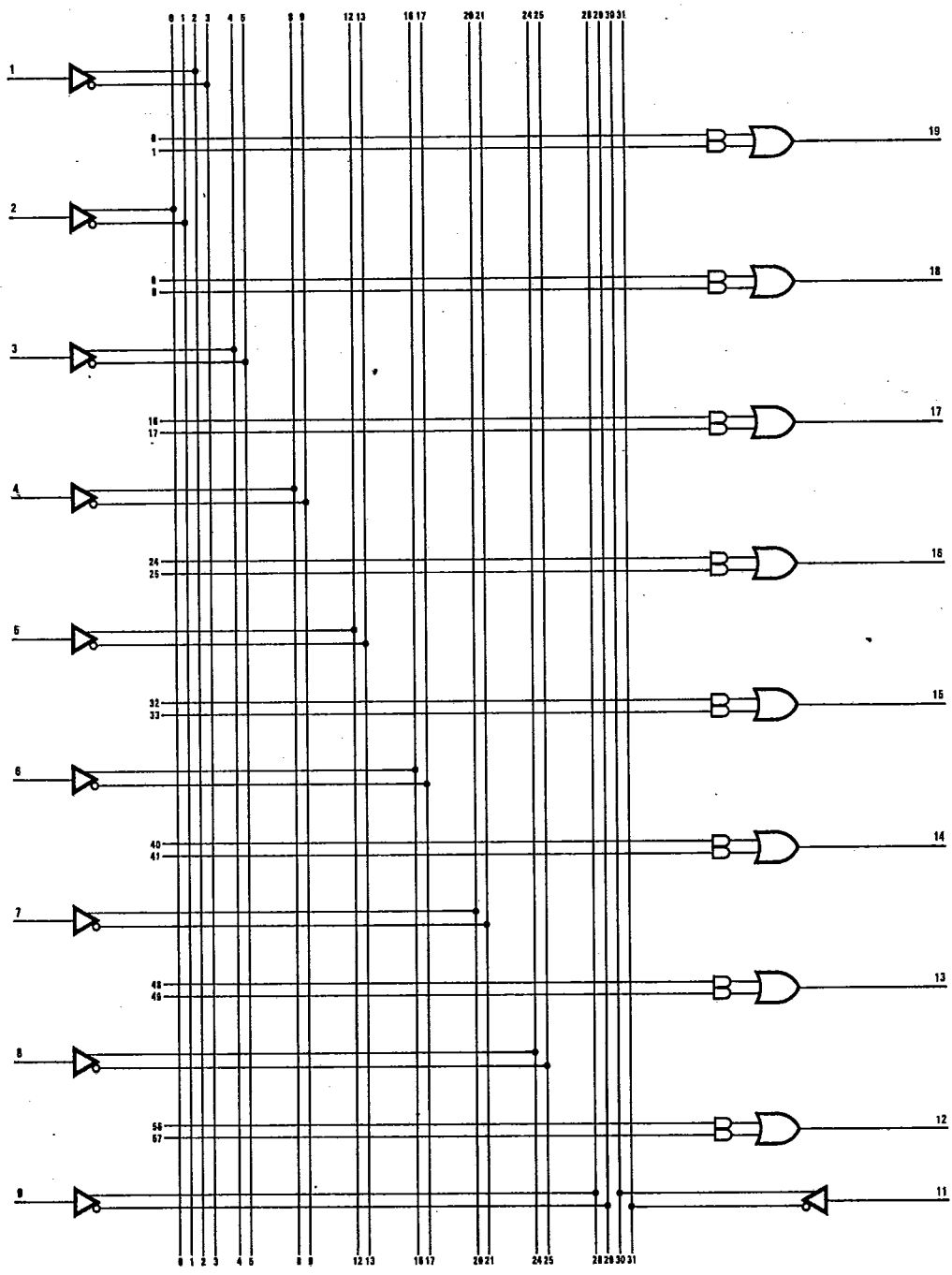
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**Logic Diagram**

**10H8**

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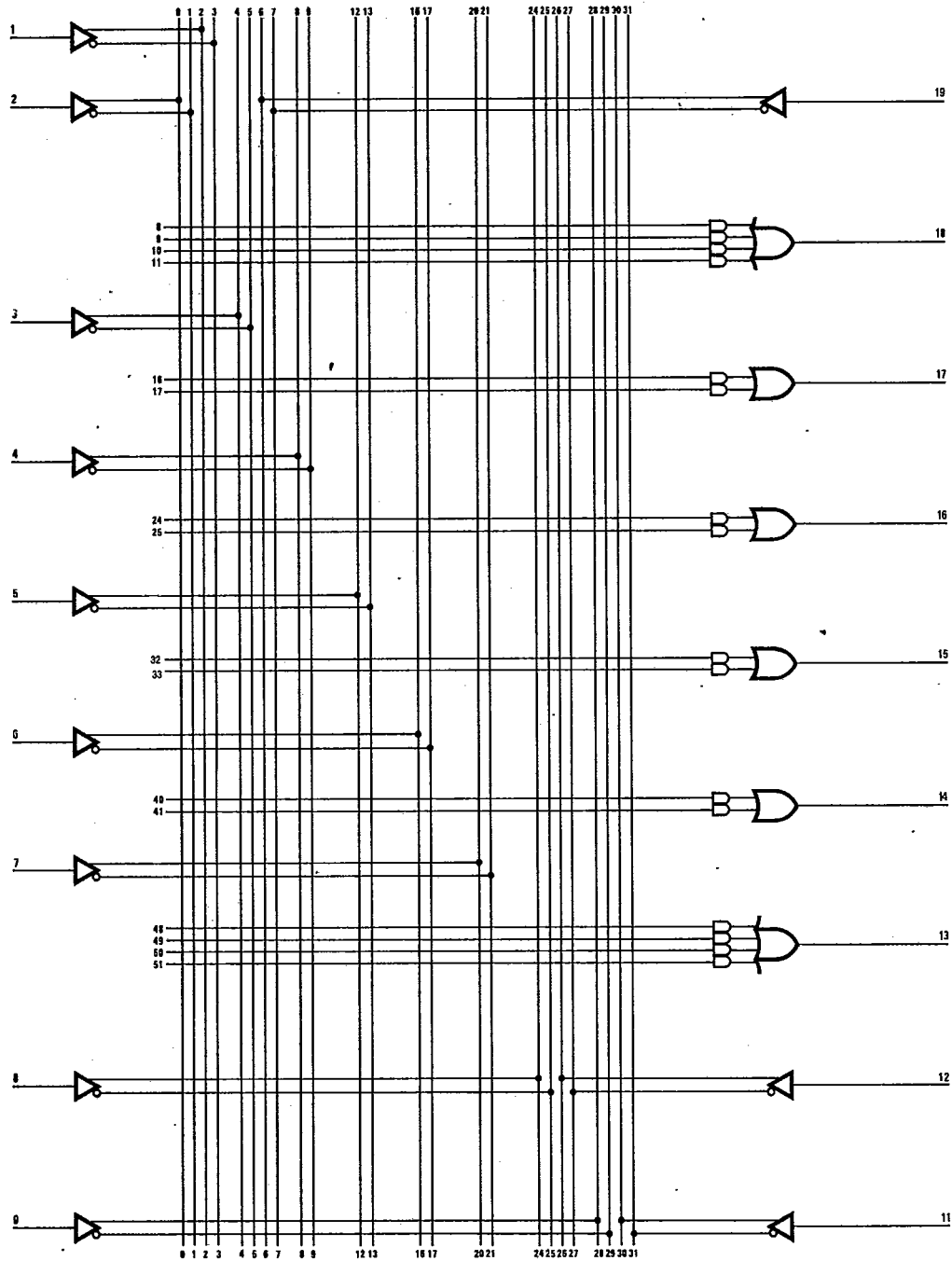
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**Logic Diagram**

**12H6**

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**Combinatorial PAL10H8 Series**  
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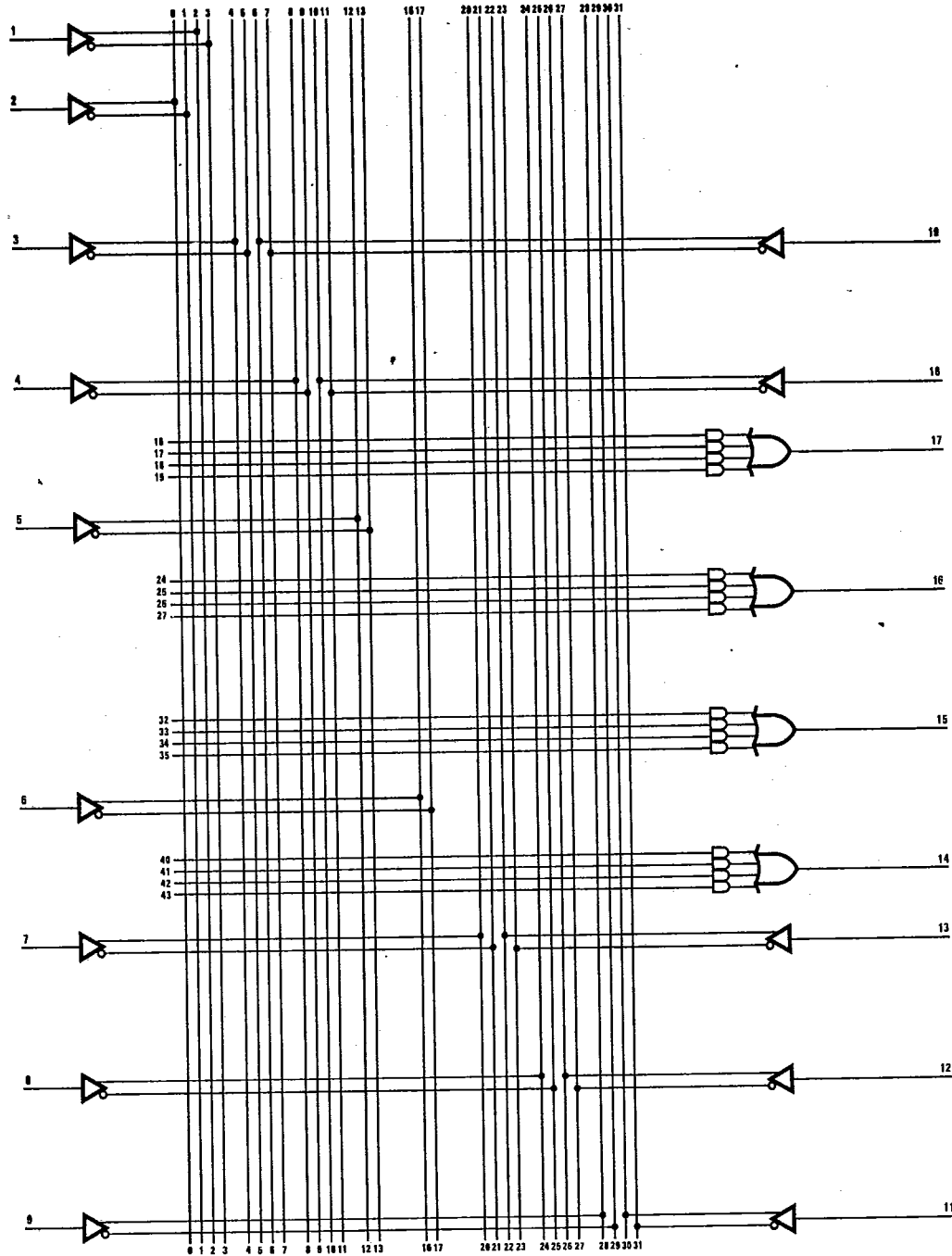
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**Logic Diagram**

**14H4**

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**Combinatorial PAL10H8 Series**

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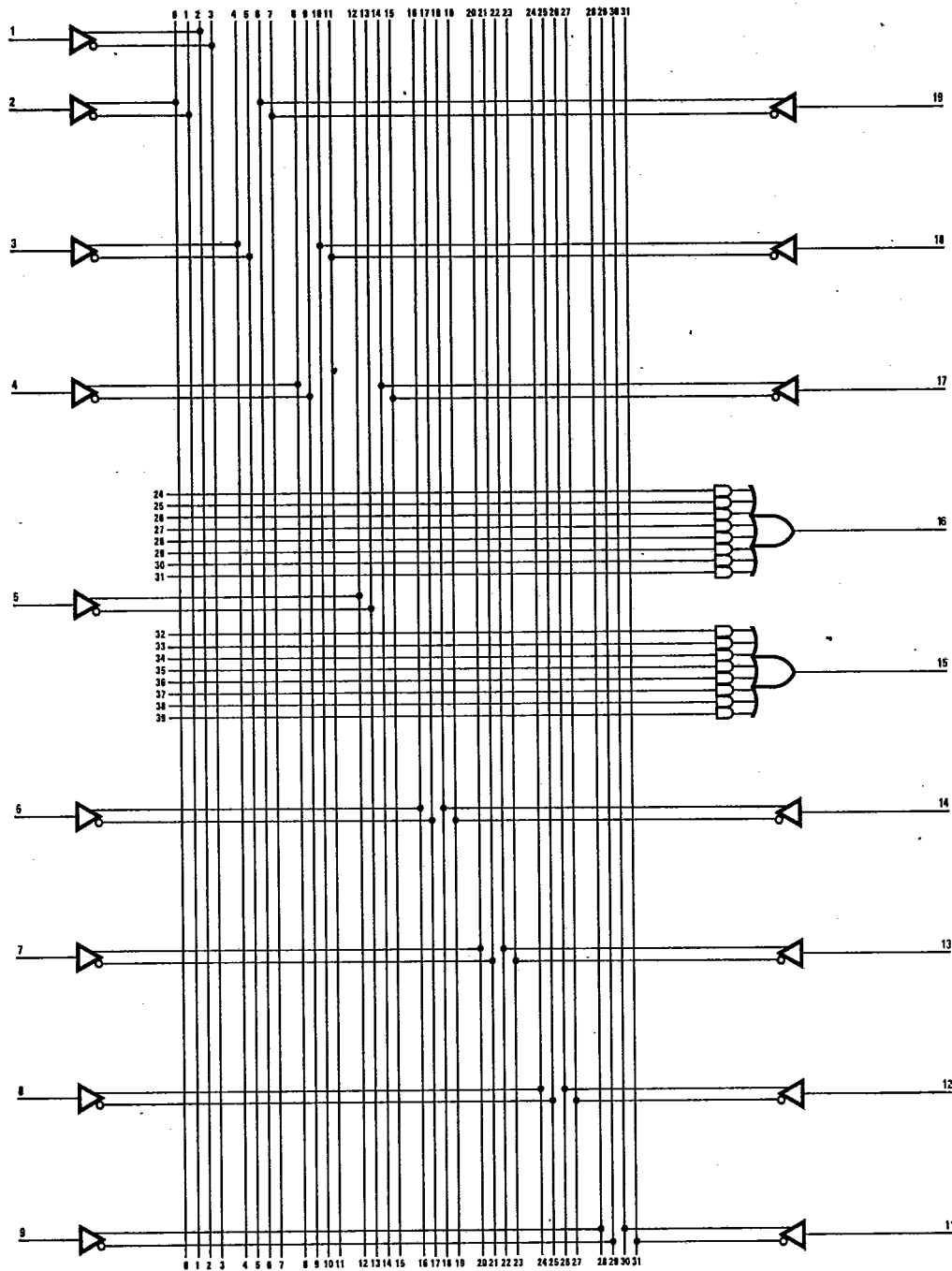
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**Logic Diagram**

**16H2**

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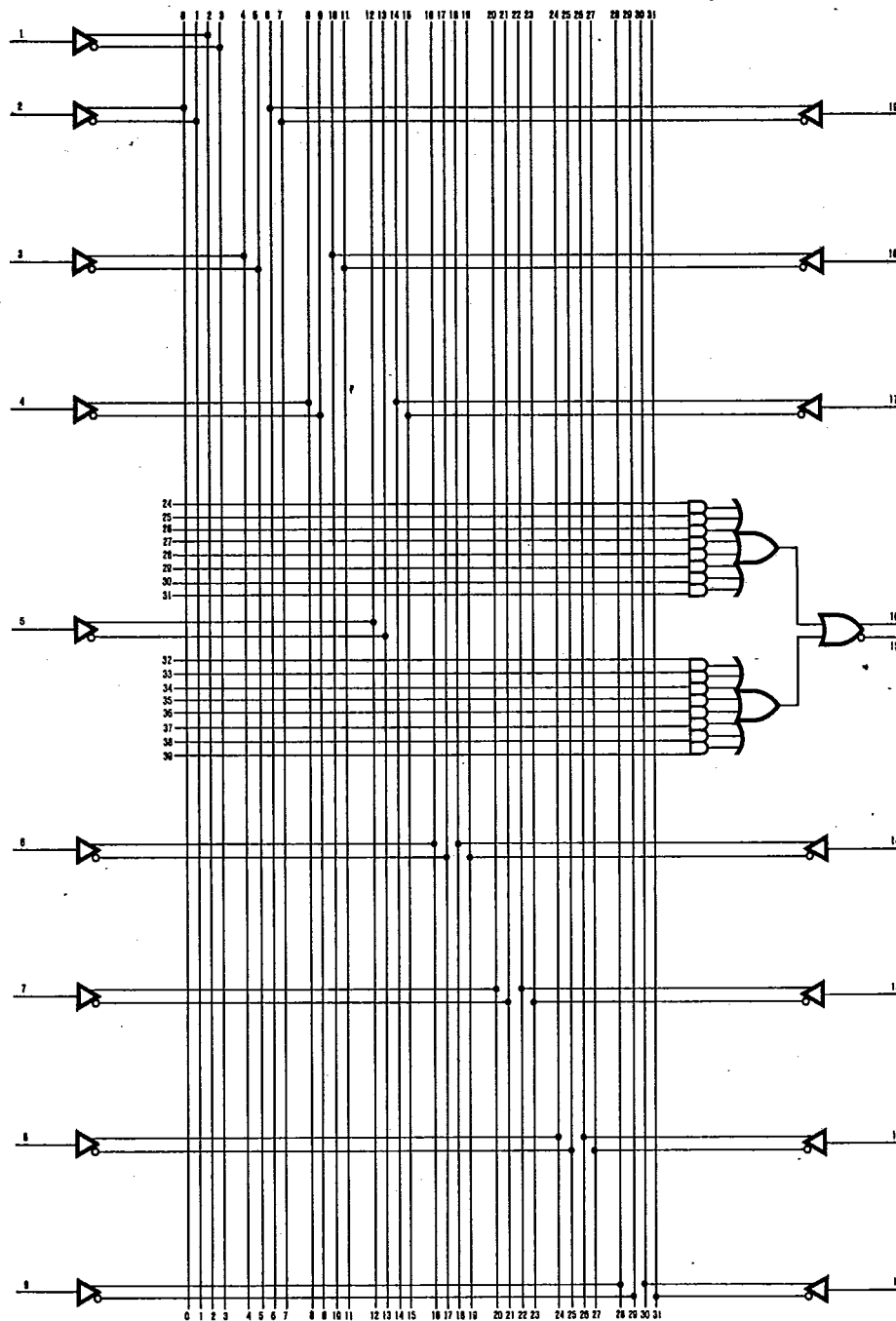
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Logic Diagram

16C1

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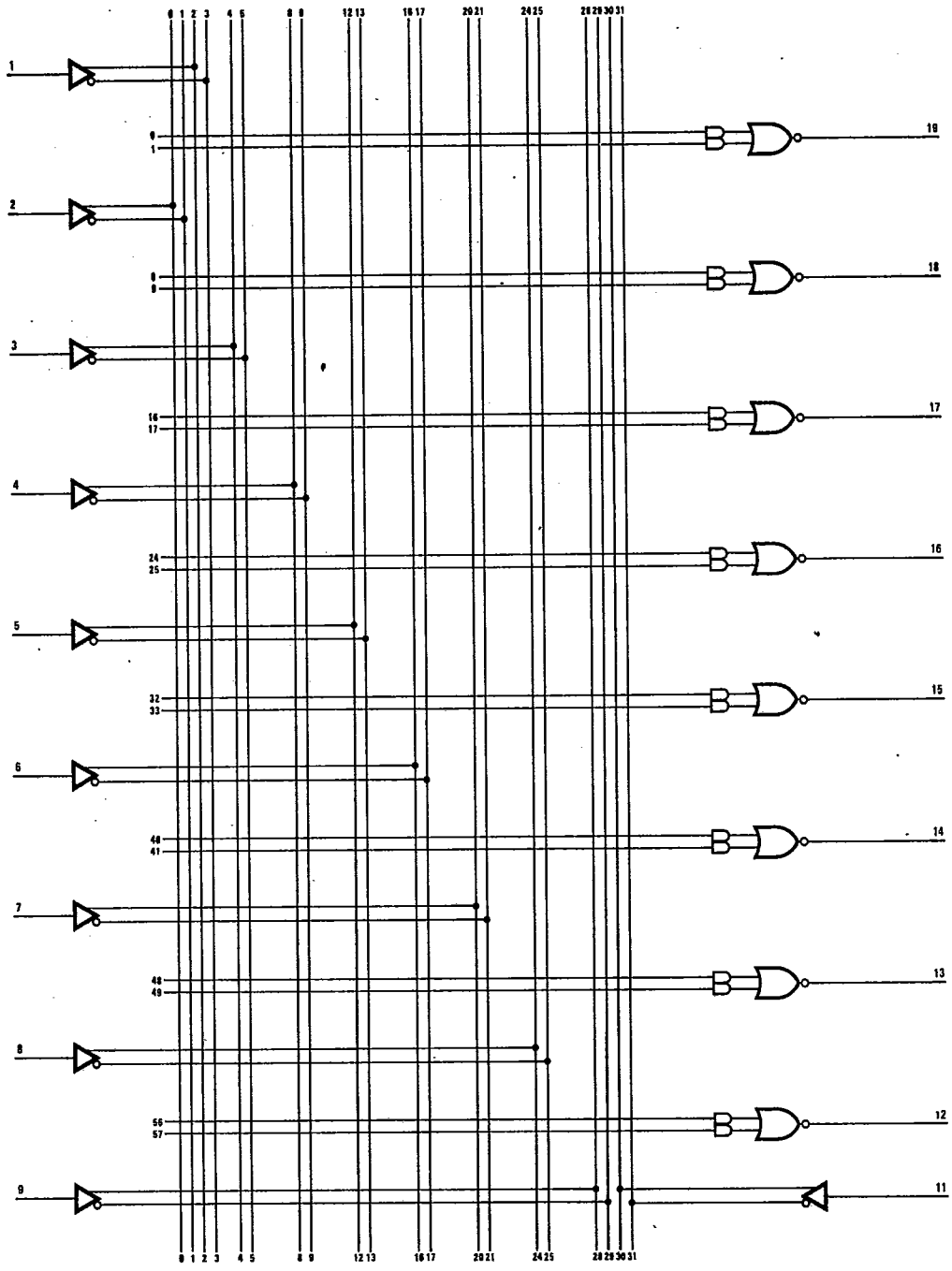
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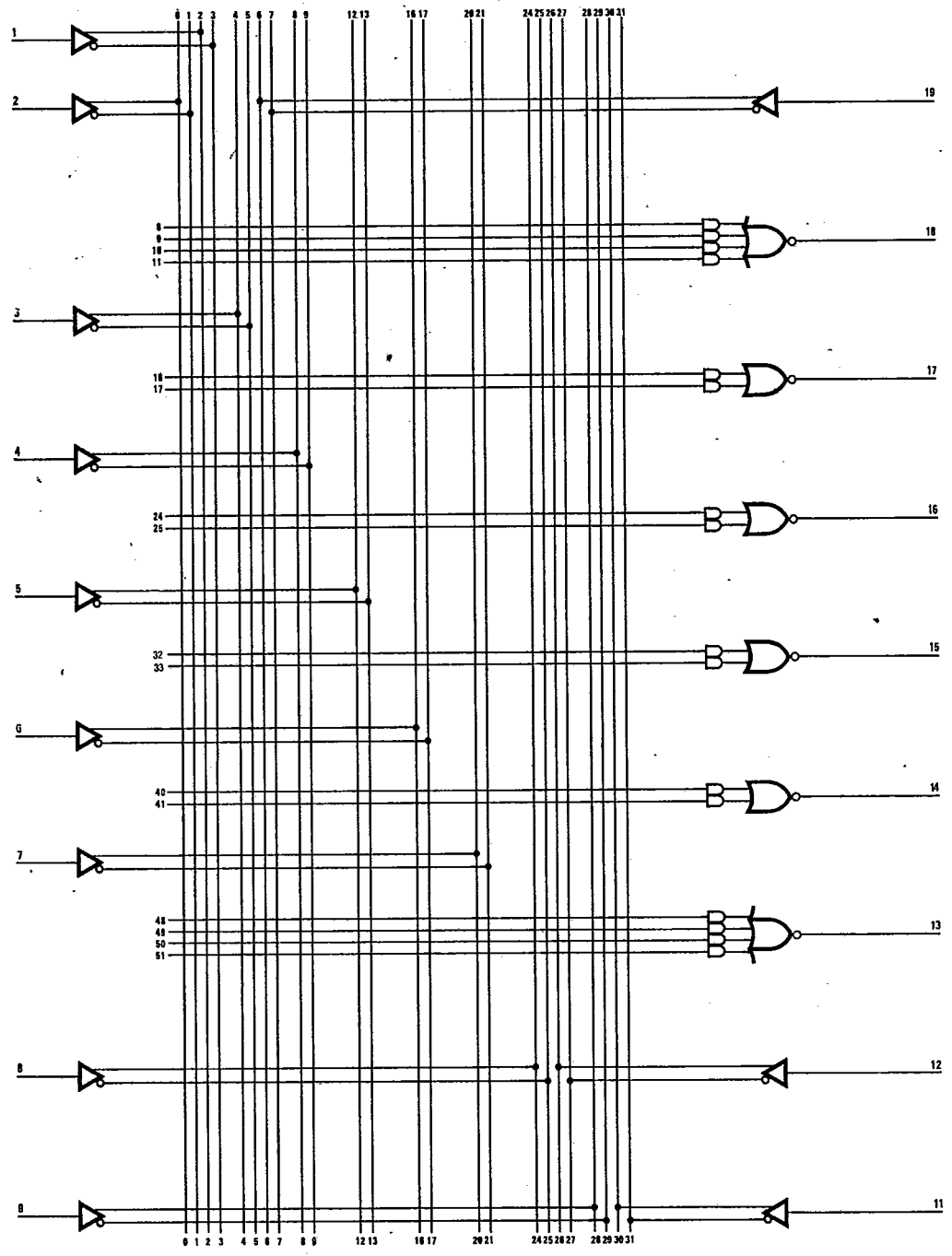
**Logic Diagram**

**10L8**

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**Logic Diagram** **12L6** T-46-13-47

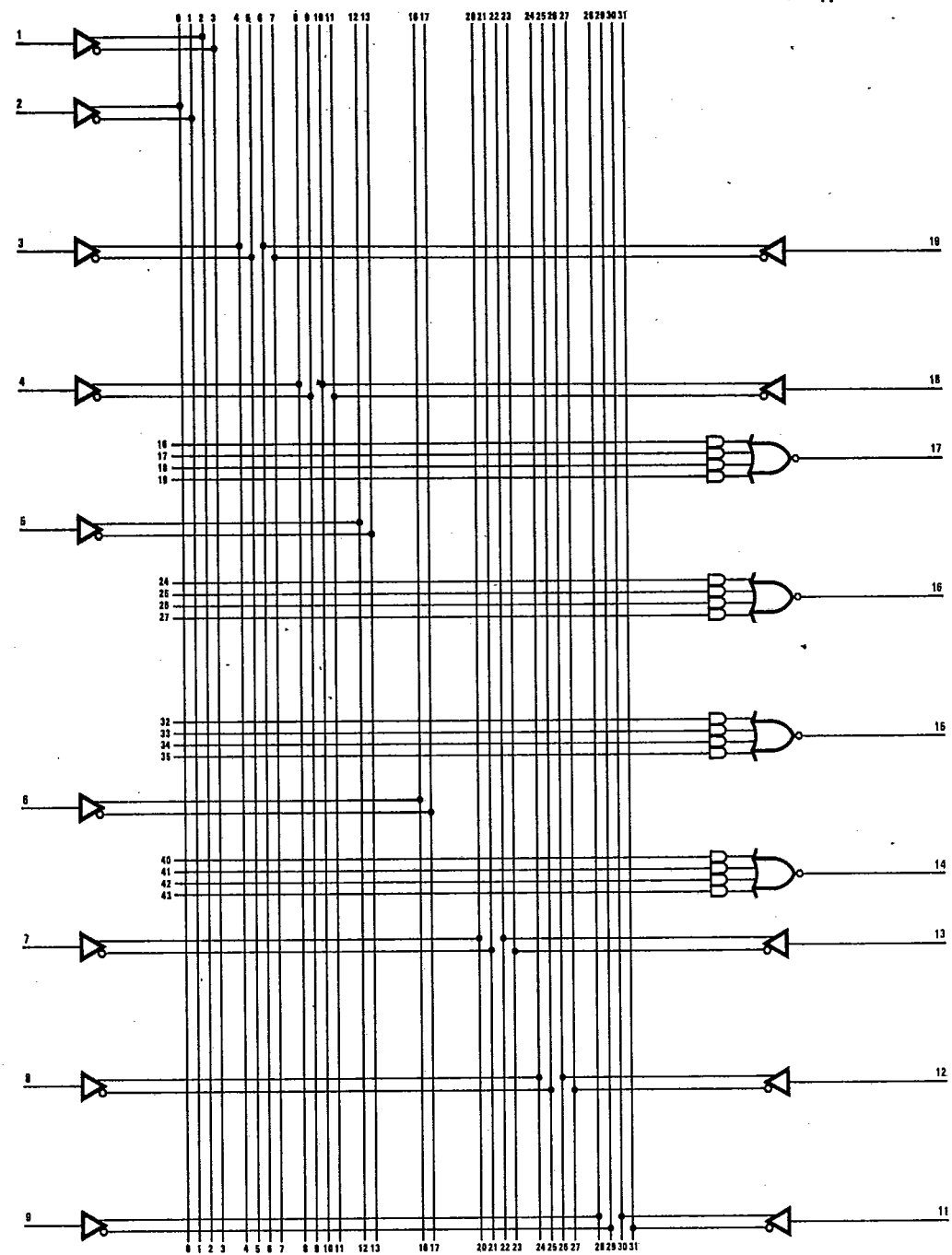


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Logic Diagram

14L4

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Combinatorial PAL10H8 Series

10H8, 12H6, 14H4, 16H2, 16C1, 10L8, 12L6, 14L4, 16L2

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Logic Diagram

16L2

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