

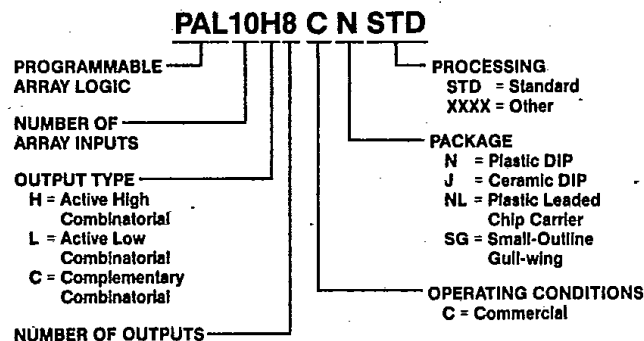
Combinatorial PAL10H8 Series

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

Features/Benefits

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

Ordering Information



| | INPUTS | OUTPUTS | POLARITY | t _{PD} (ns) | I _{CC} (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_{pd}) 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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JANUARY 1988

Combinatorial PAL10H8 Series

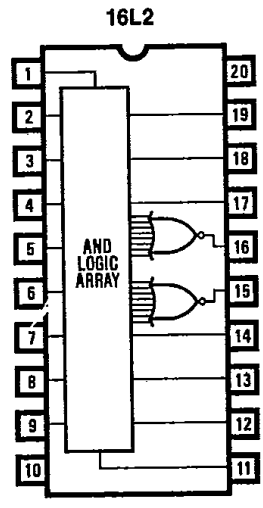
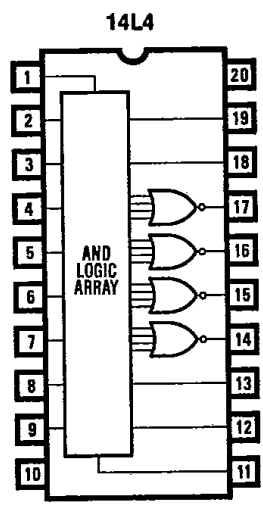
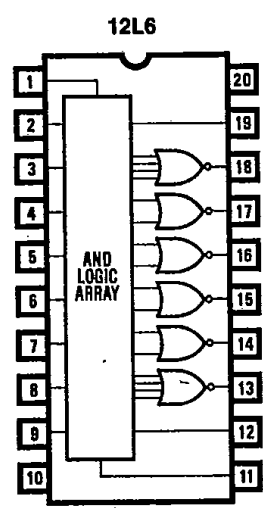
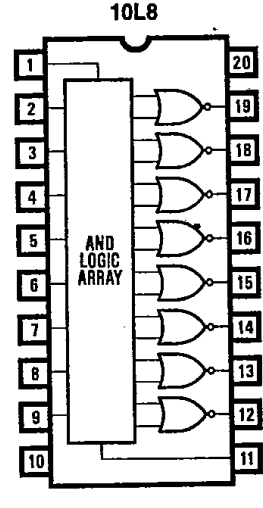
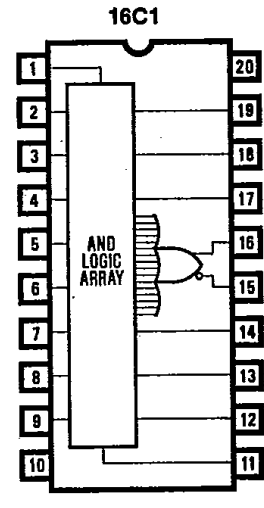
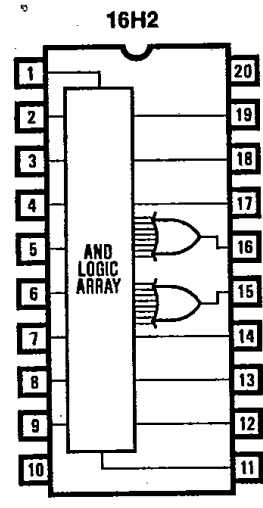
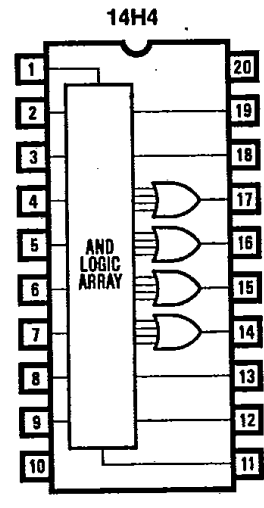
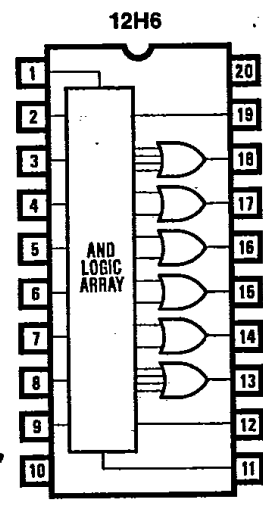
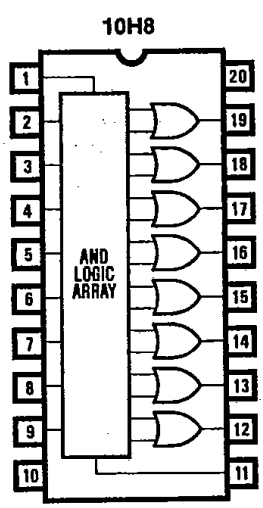
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DIP/SO Pinouts

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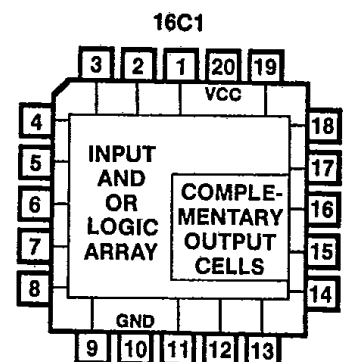
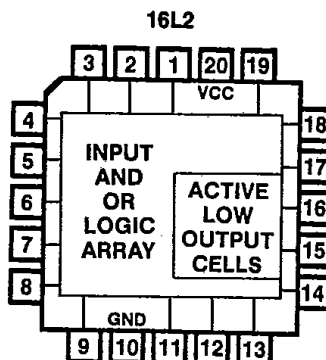
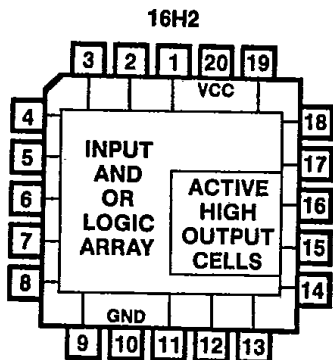
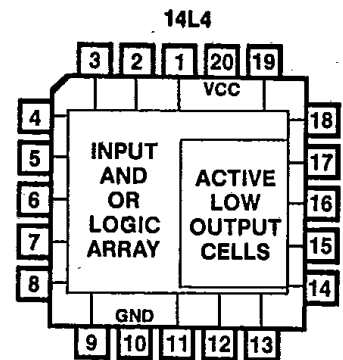
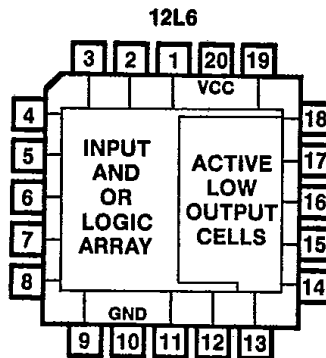
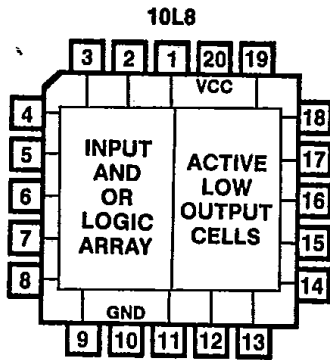
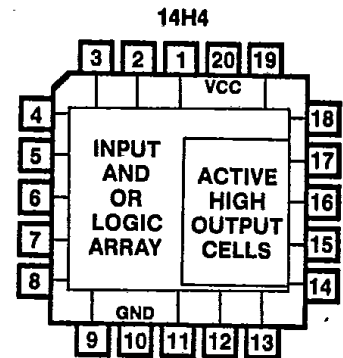
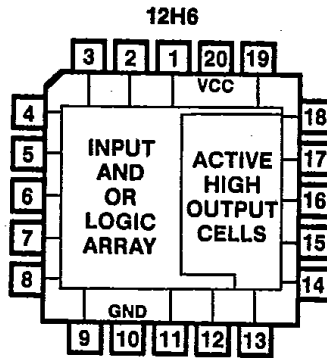
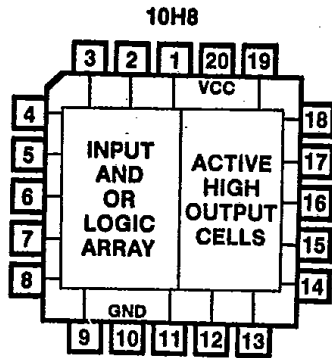
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PLCC Pinouts

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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}^2 | 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 | μA |
| I_I | Maximum input current | $V_{CC} = \text{MAX}$ | $V_I = 5.5 \text{ V}$ | | | 100 | μA |
| 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 | $R_1 = 560 \Omega$ $R_2 = 1.1 \text{ k}\Omega$ | 25 | 35 | ns |
| | | 16C1 | | 25 | 40 | |

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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.

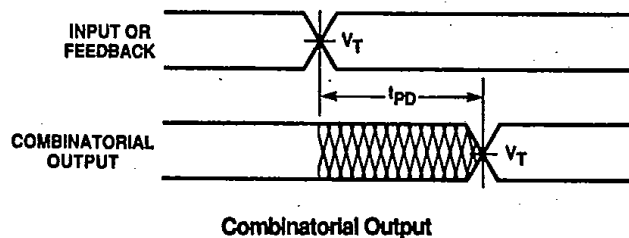
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Switching Waveforms

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

Combinatorial Output

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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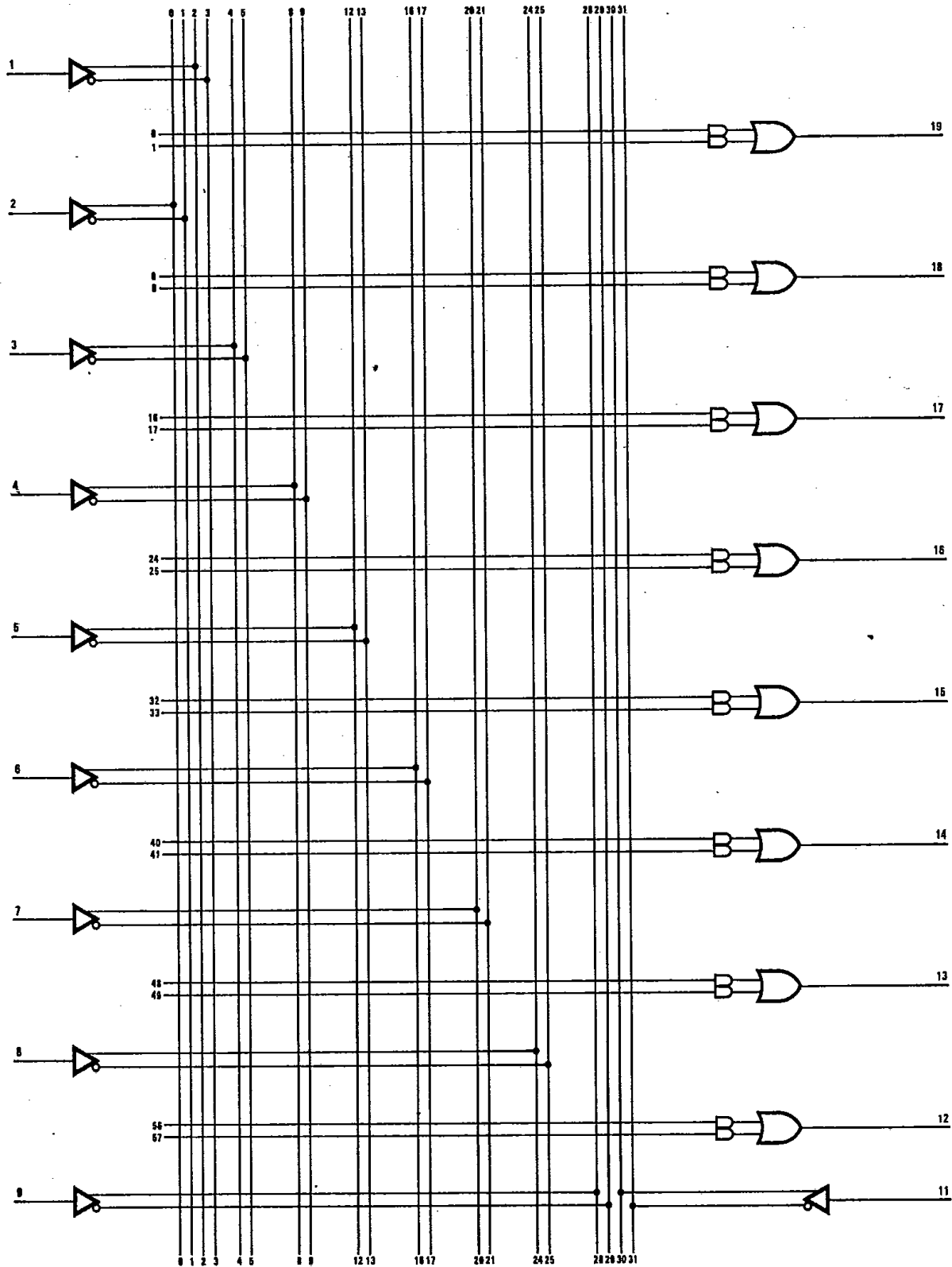
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Logic Diagram

10H8

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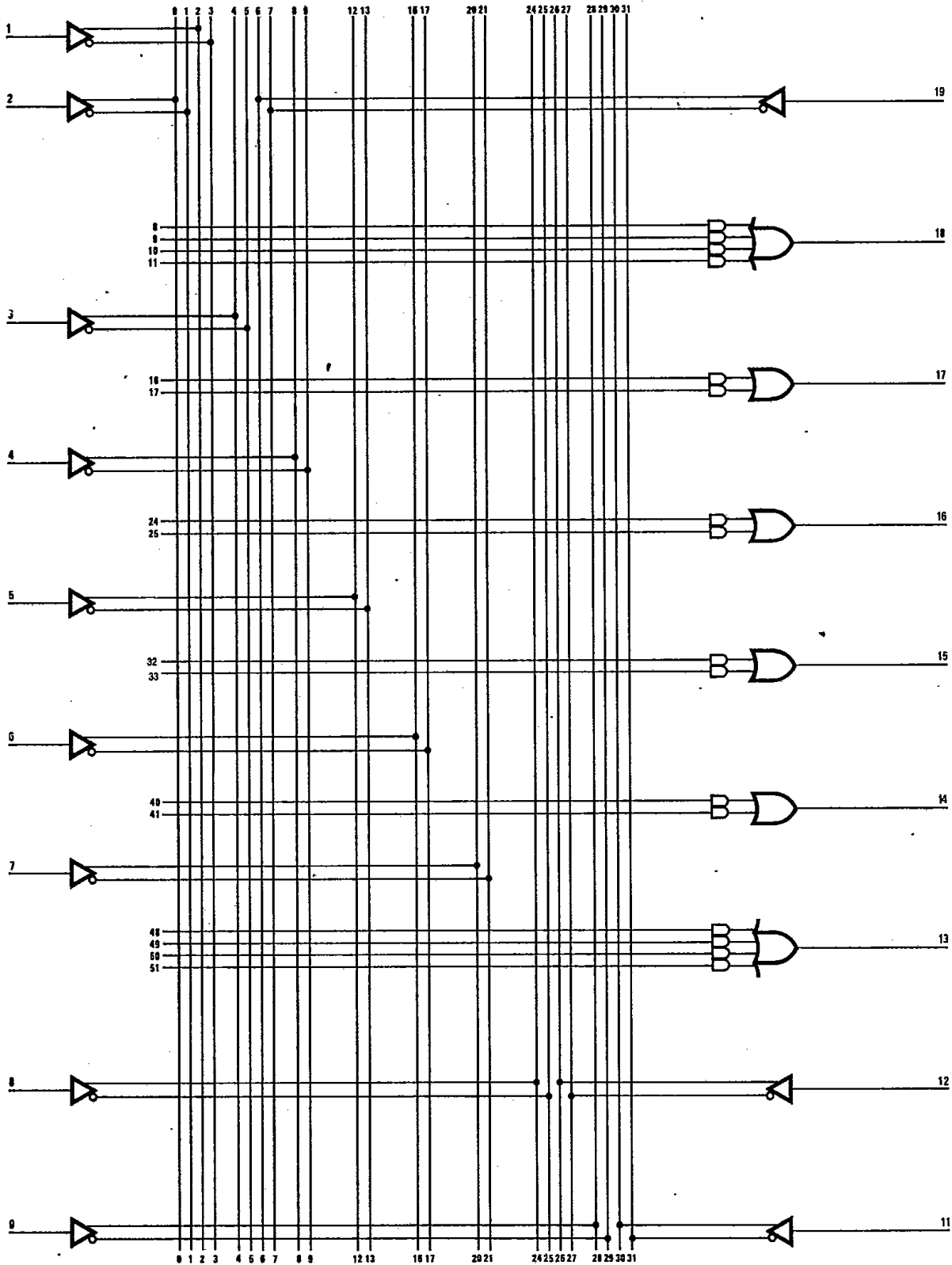
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Logic Diagram

12H6

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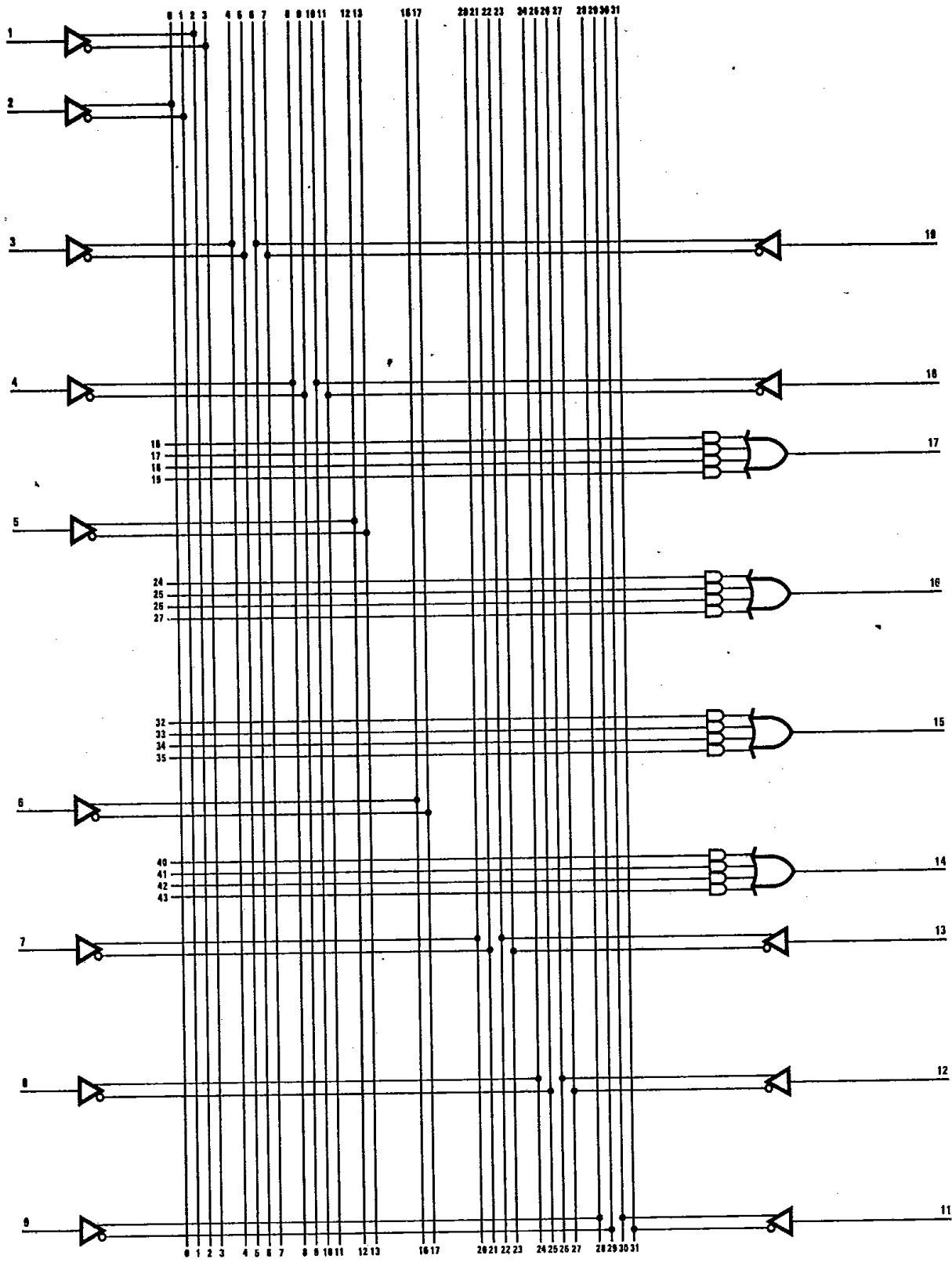


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Logic Diagram

14H4

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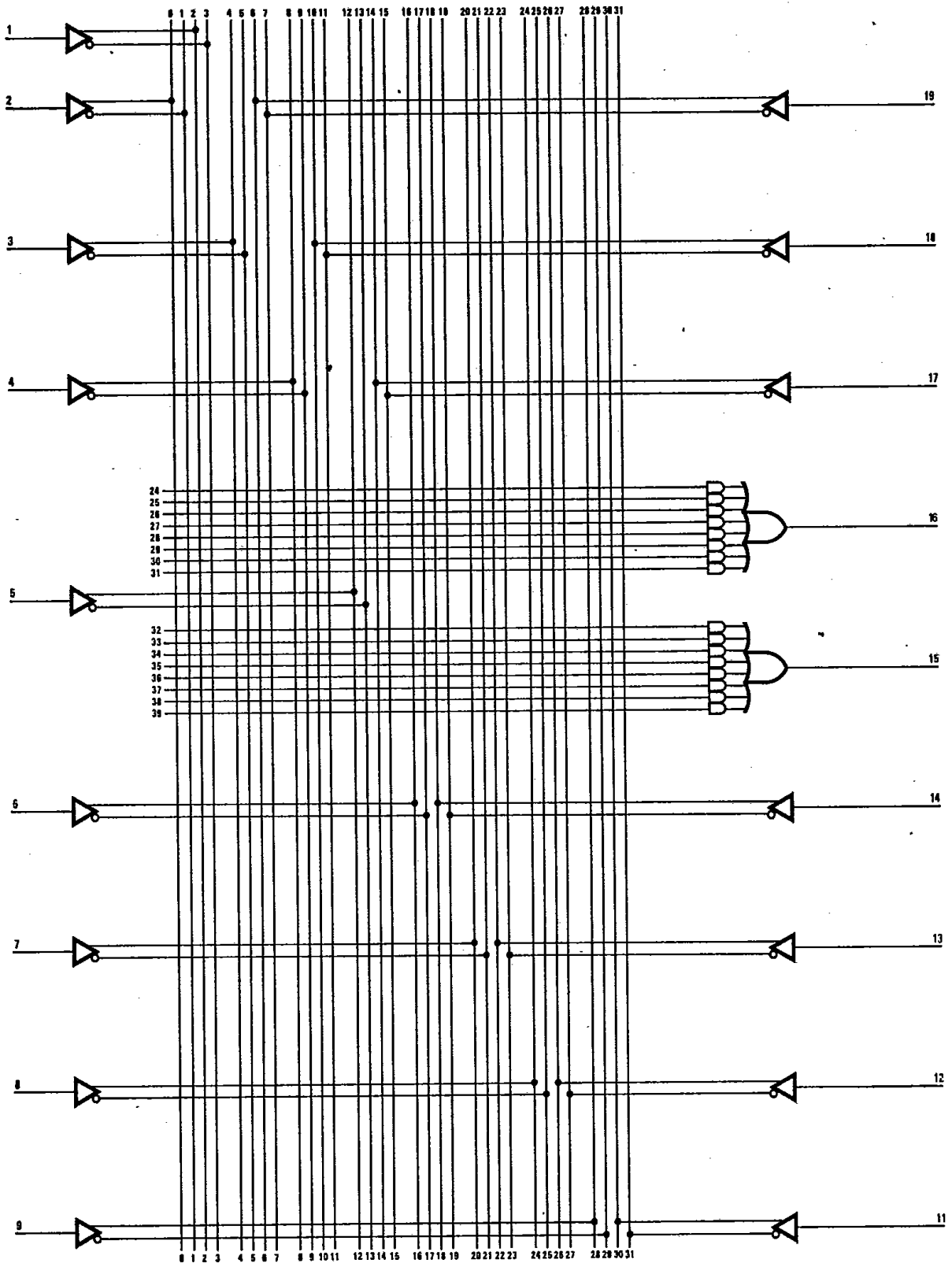
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Logic Diagram

16H2

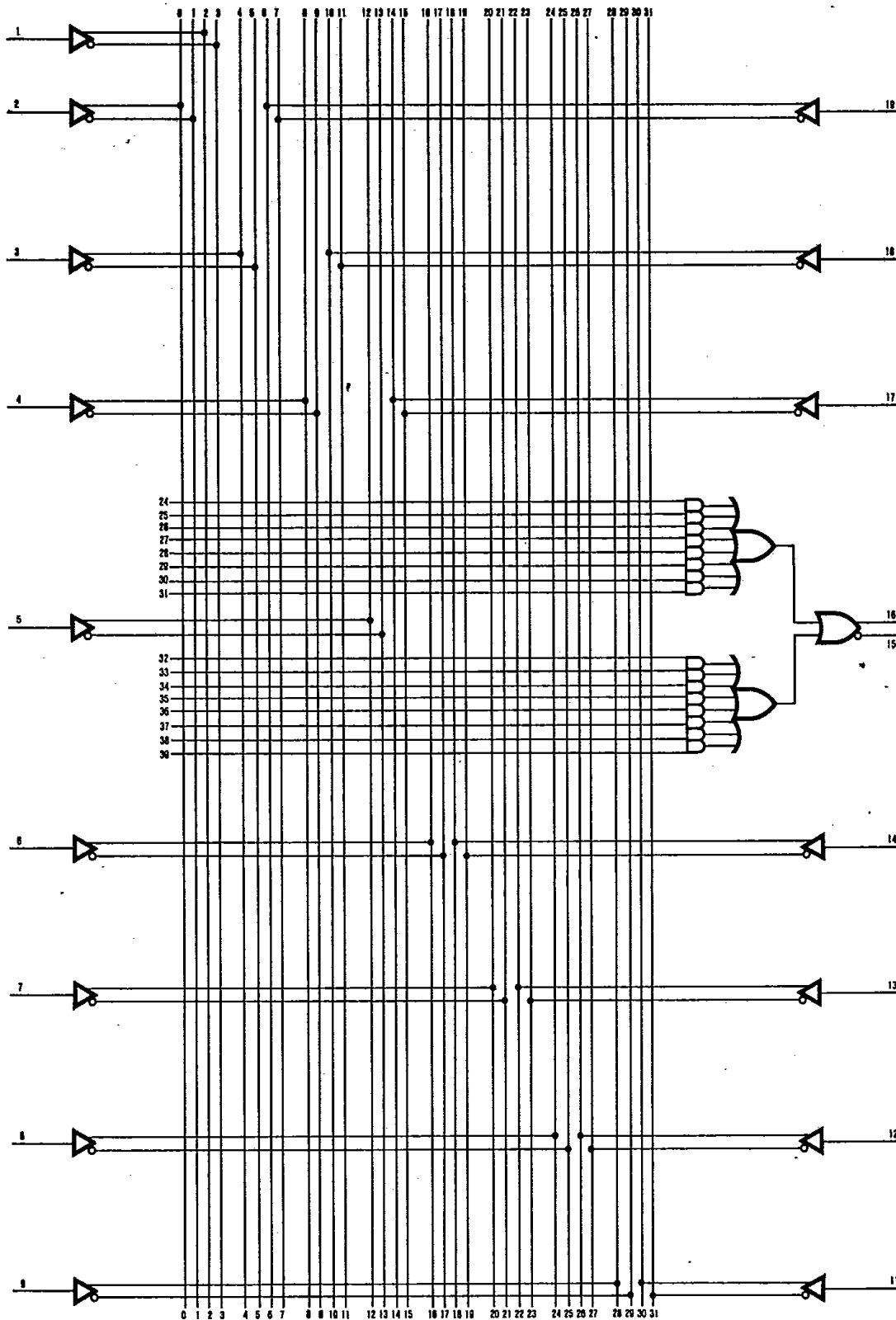
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Logic Diagram

16C1

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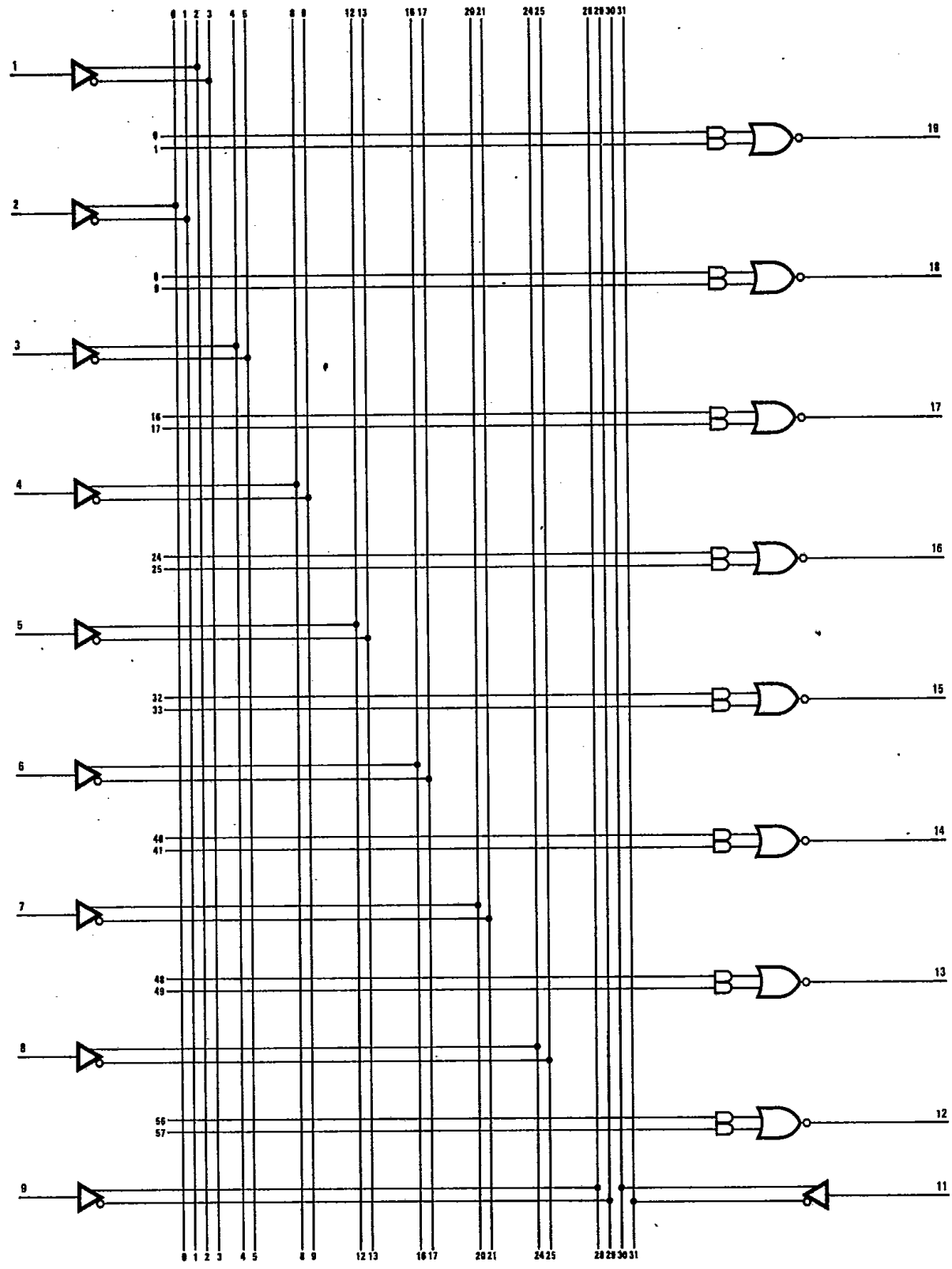
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Logic Diagram

10L8

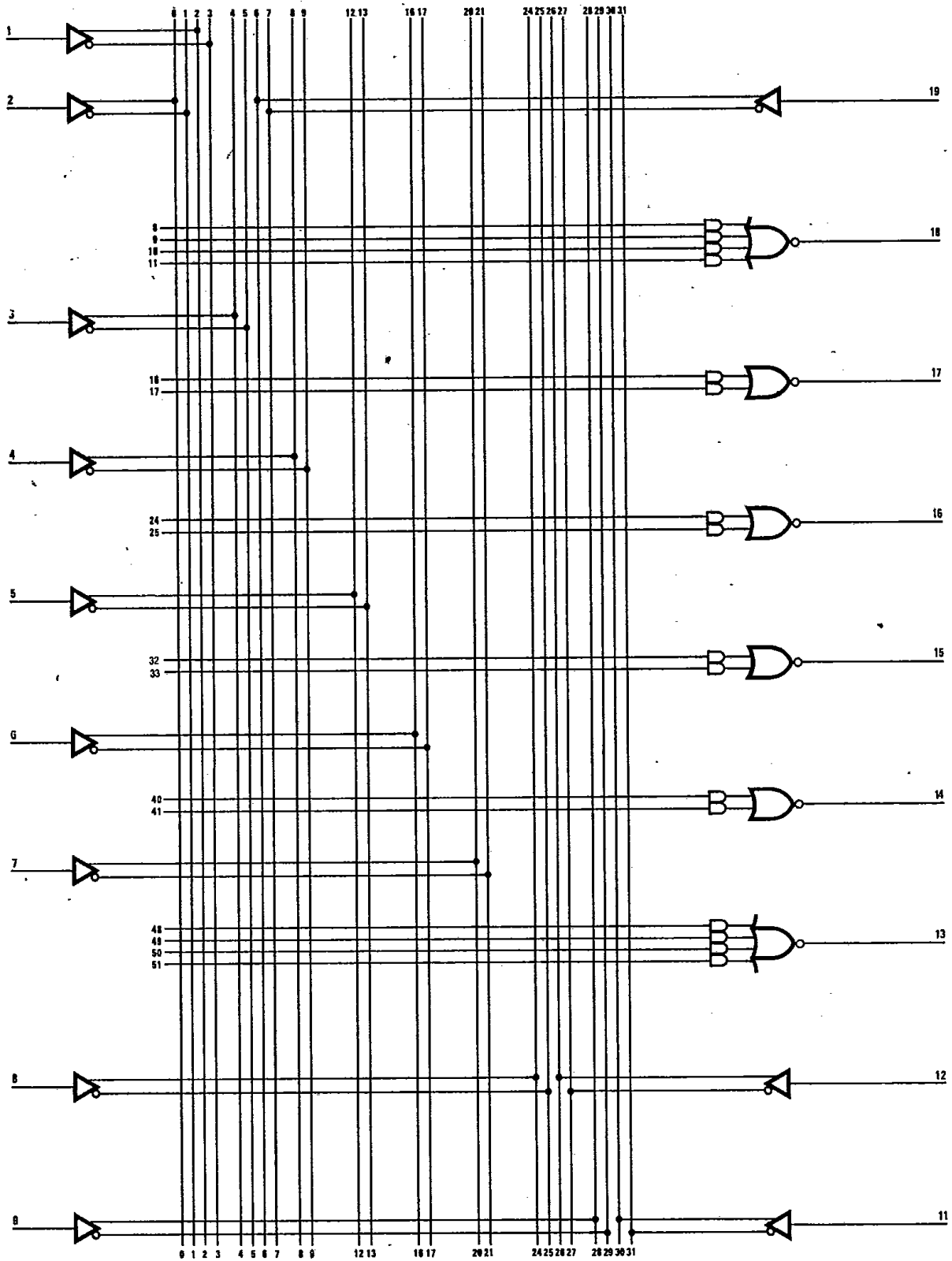
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Logic Diagram

12L6

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Combinatorial PAL10H8 Series

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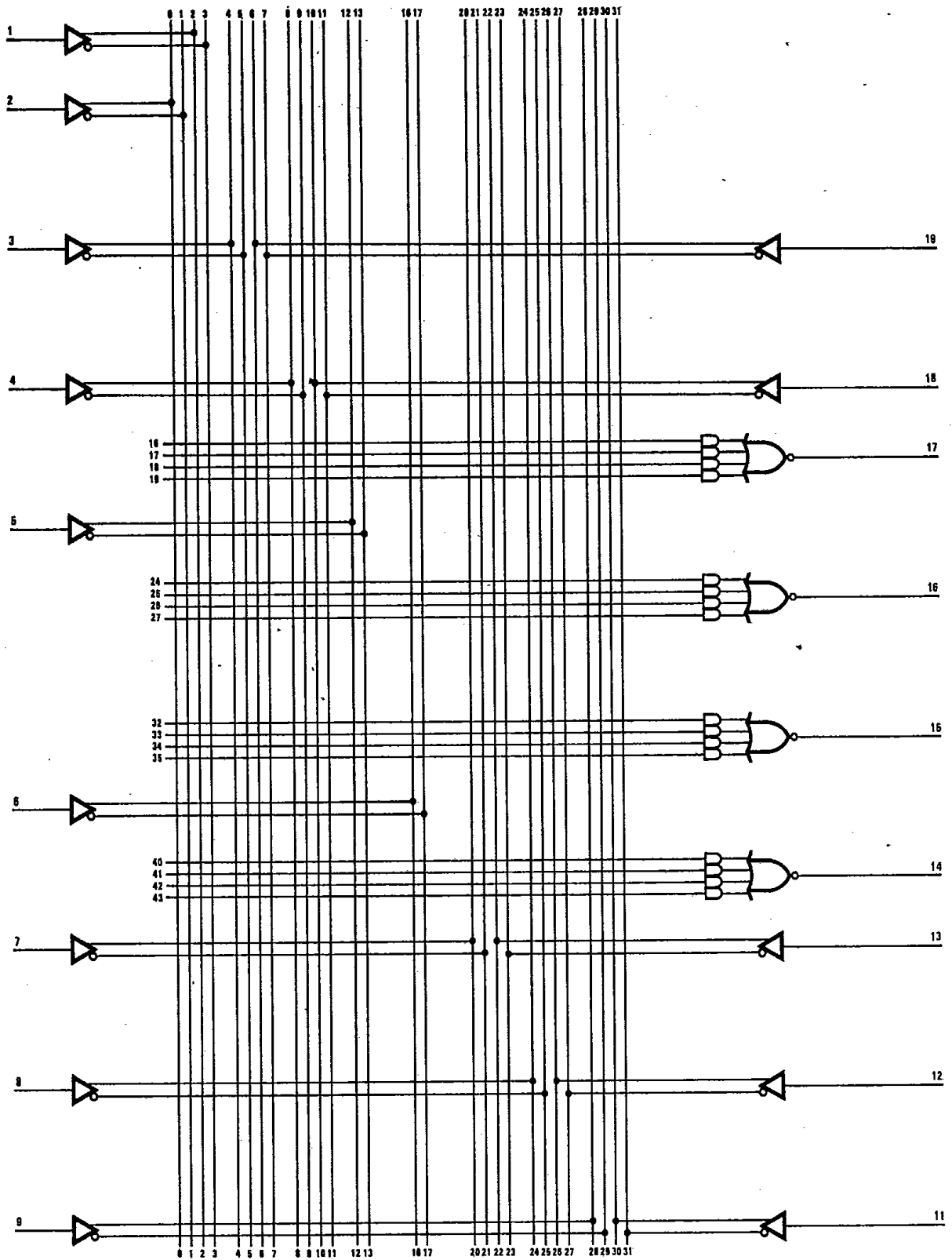
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Logic Diagram

14L4

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Combinatorial PAL10H8 Series

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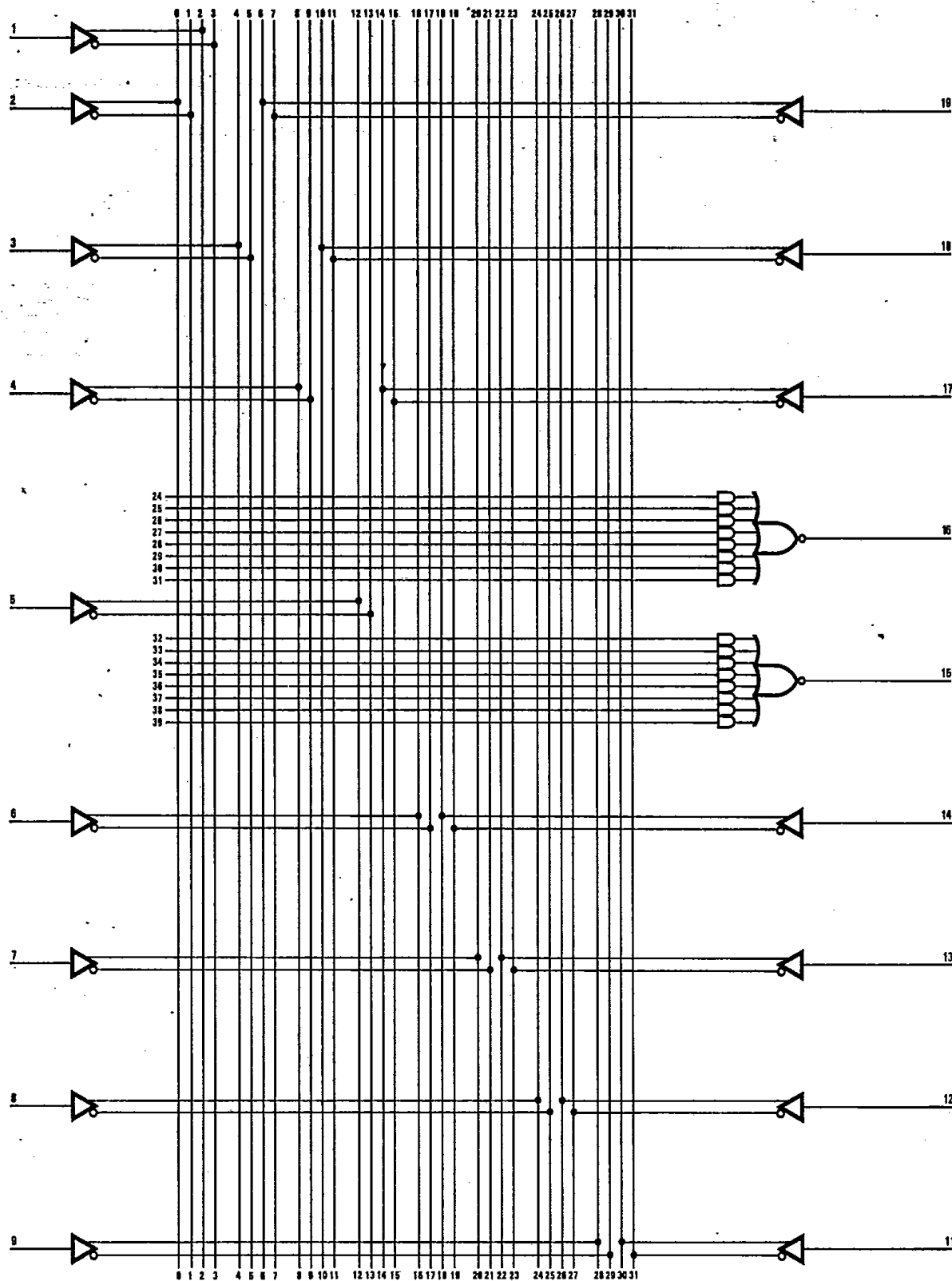
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96D 27127 D

Logic Diagram

16L2

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