

Logic Gates

Basic Logic circuits used to troubleshoot the 88D

Topics covered in this section

Why do we need to understand the logic gates?

An example of using the logic gates?

Truth Table

“AND” gate

“OR” gate

“INVERT” gate

“NAND” gate

“NOR” gate

“XOR” gate

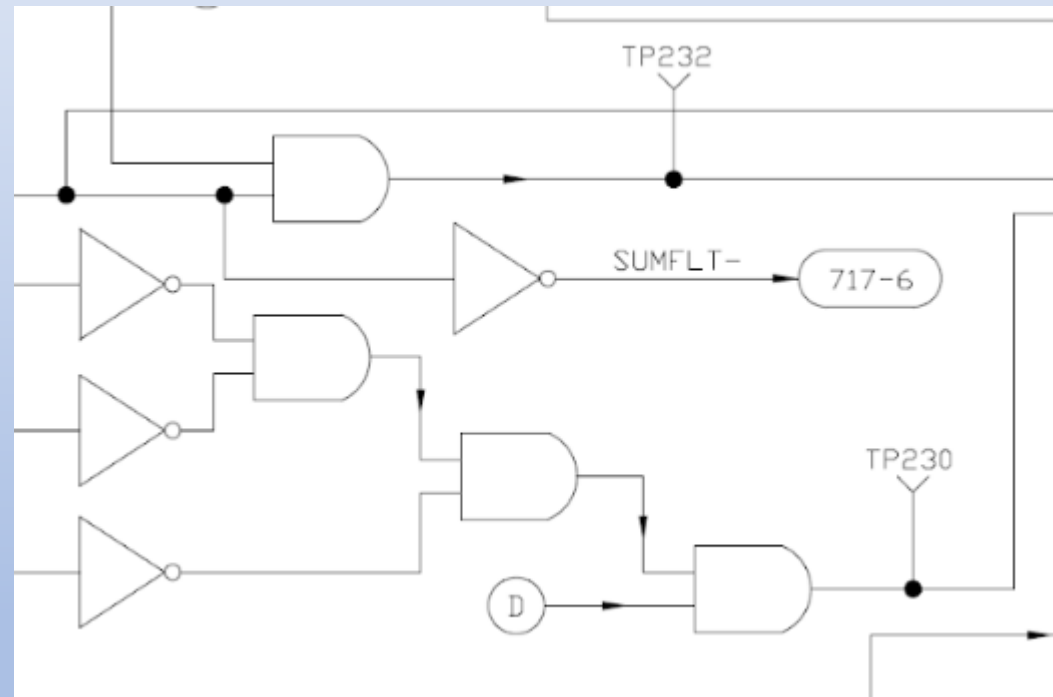
“XNOR” gate

Latches

J/K flip flop

D-Type Flip-Flop

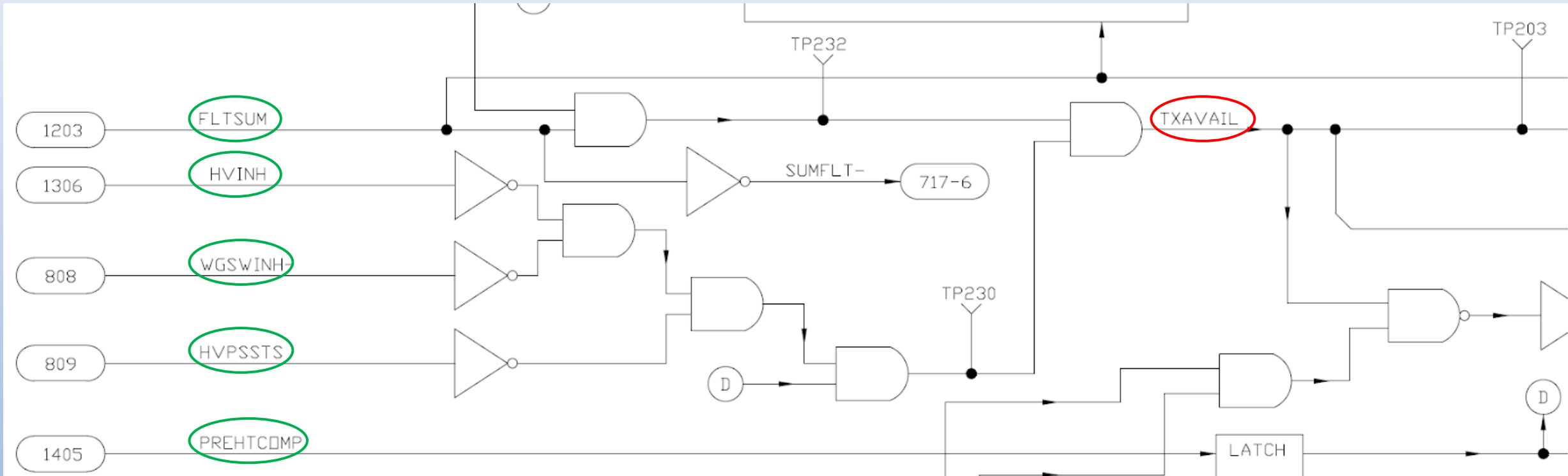
Signal Names in the RADAR



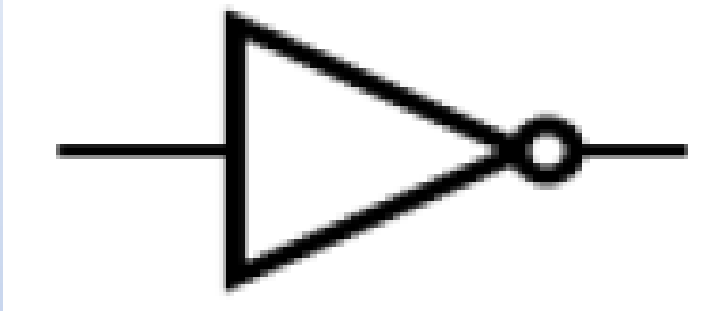
Why do we need to understand the logic gates?

- When a solution to a fault is not discovered in a fault flowchart or alarm table you may have to understand what is dependent on what to operate.
- Understanding how to use the logical drawings in the transmitter allows the technician to find answers that are not in the manuals.
- The class covers “Control and Monitoring” which explains the dependencies in the operation of the transmitter. This is based on logic gates.

An example of using the logic gates



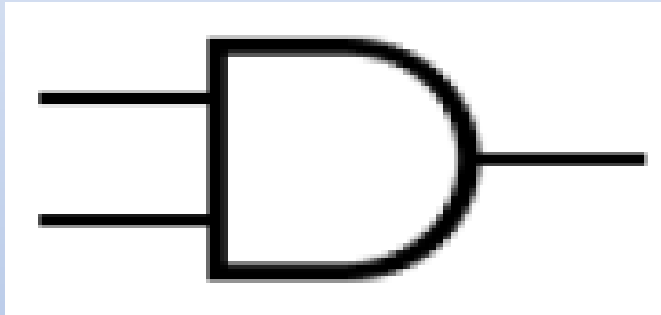
Truth Table



Input	Output
0	1
1	0

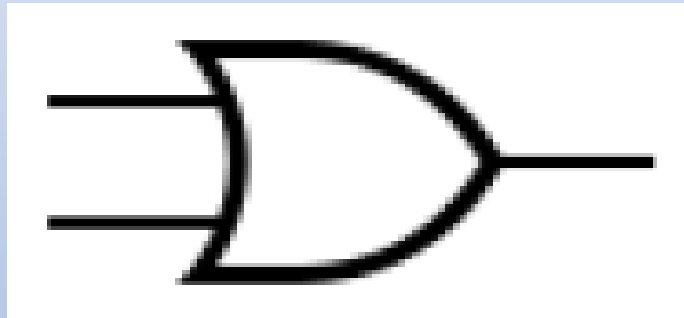
True / False	Number Value	Voltage Description
False	0	Low
True	1	High

“AND” Gate



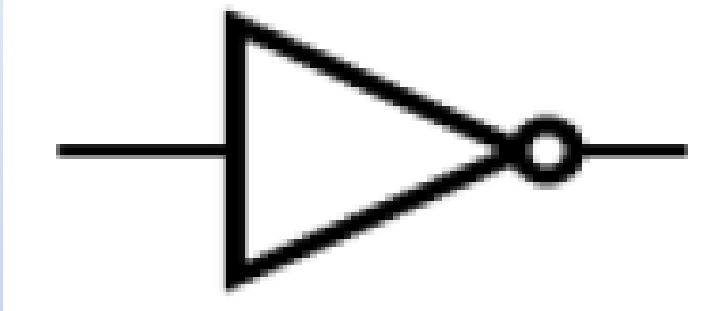
Inputs		Output
0	0	0
0	1	0
1	0	0
1	1	1

“OR” Gate



Inputs		Output
0	0	0
0	1	1
1	0	1
1	1	1

“INVERT” gate

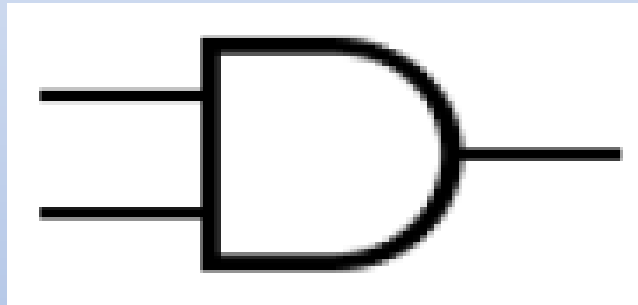


Input	Output
0	1
1	0

“INVERTING” latch

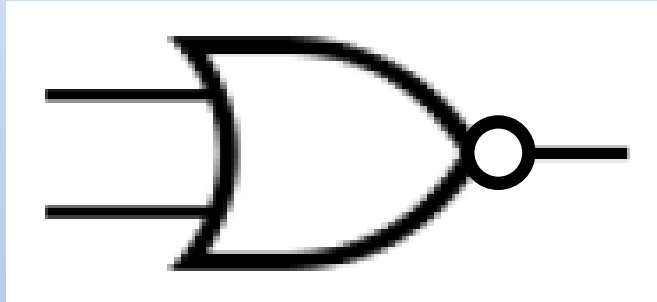


“NAND” Gate



Inputs		Output
0	0	1
0	1	1
1	0	1
1	1	0

“NOR” Gate



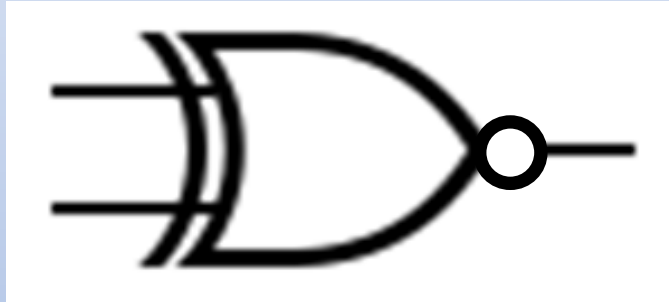
Inputs		Output
0	0	1
0	1	0
1	0	0
1	1	0

“XOR” Gate



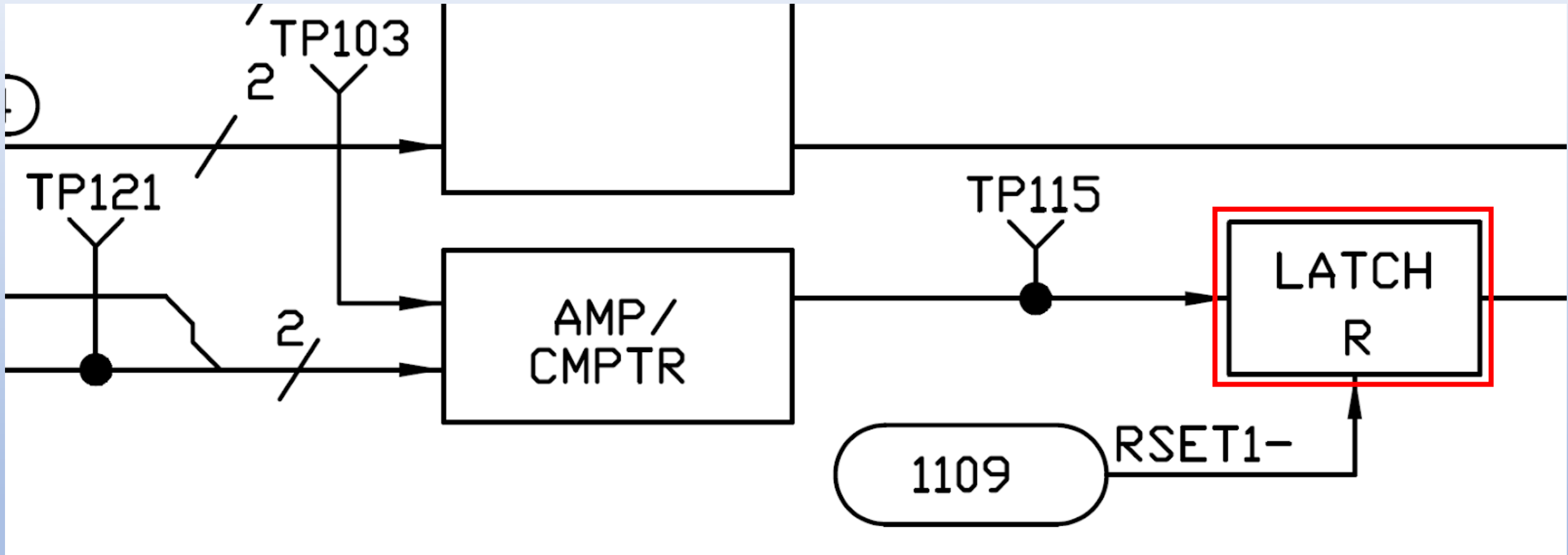
Inputs		Output
0	0	0
0	1	1
1	0	1
1	1	0

“XNOR” Gate

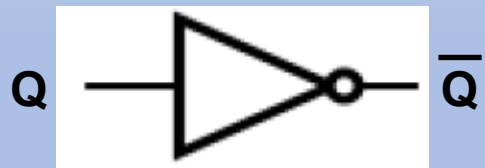
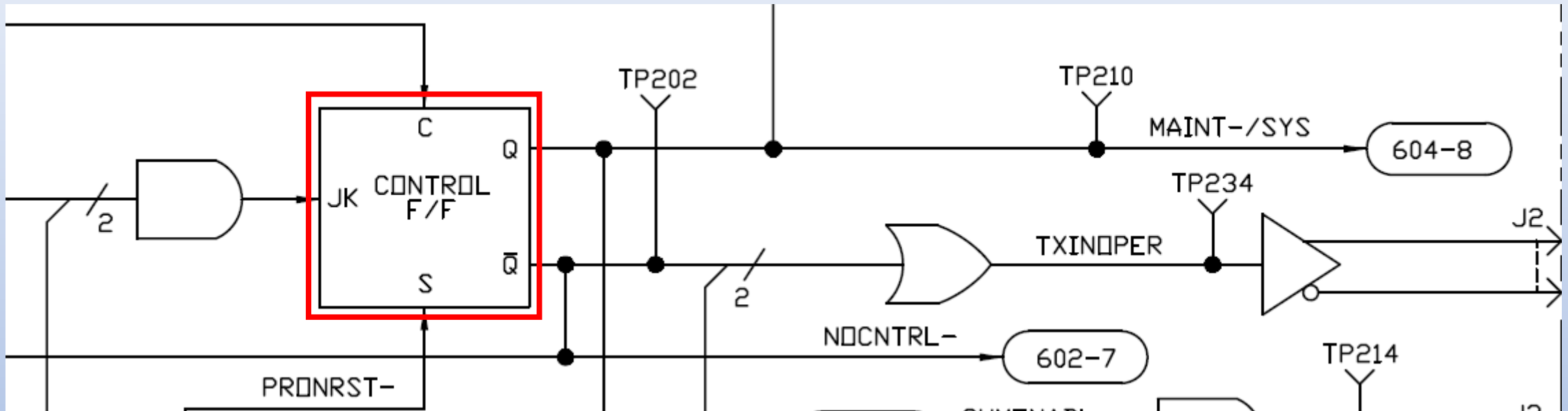


Inputs		Output
0	0	1
0	1	0
1	0	0
1	1	1

Latches



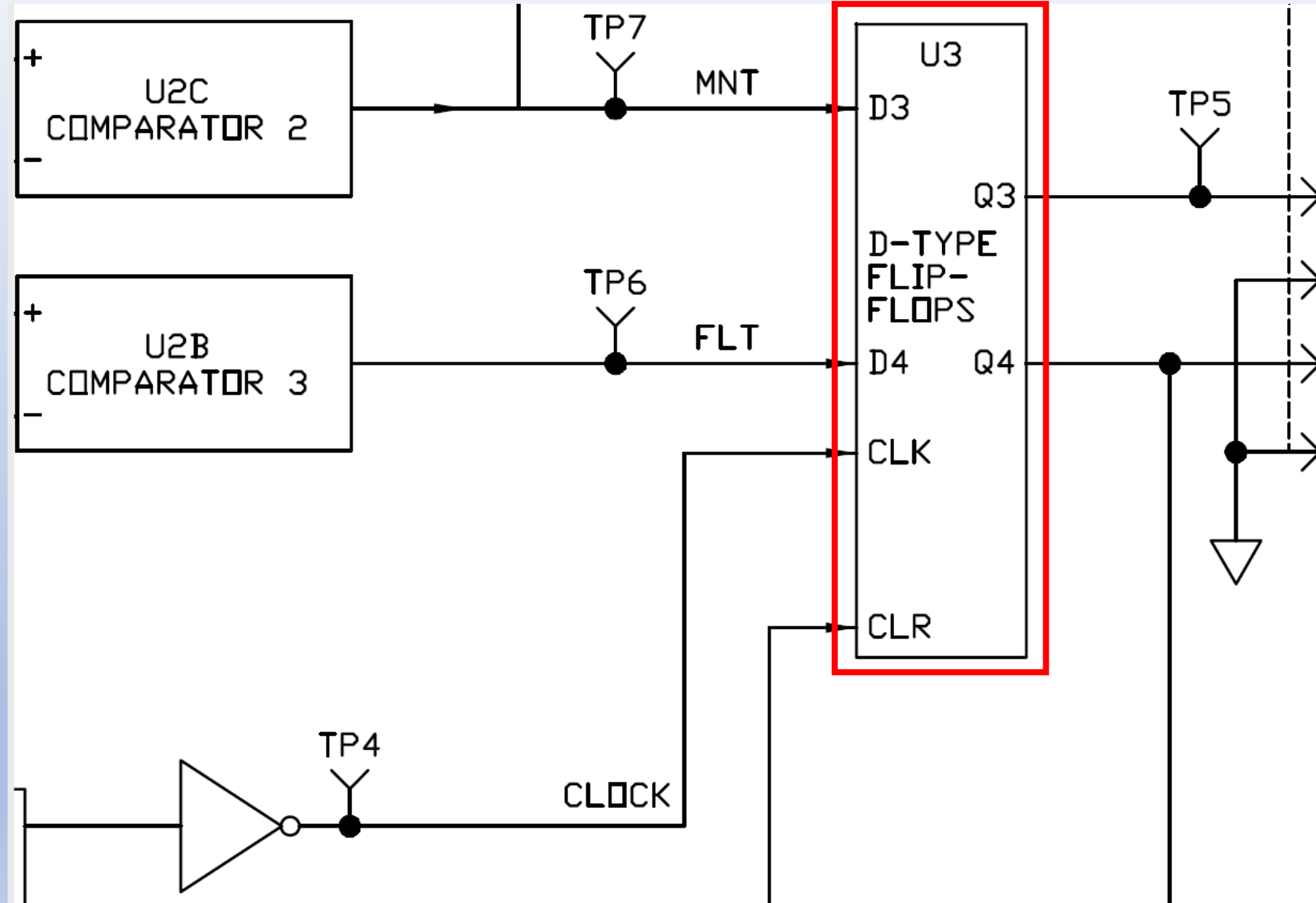
J/K flip flop



“C” is the clock input
“C” can on “clock” (action)
only when “J & K” is true/high

“S” sets the initial condition of the
flip/flop. This is normally when the
circuit is reset or turned on.

D-Type Flip-Flop



Signal Names in the RADAR

“Note that, generally speaking, TTL level logic signals that switch low (near zero V) when they are active have bars at the ends of their names. Thus, the KLYOC- signal is normally high (approximately +4.0V) unless an overcurrent condition is detected, in which case it switches low. **The double barname (KLYOC--) used inside Transmitter Control, Monitoring, and Interface CCA A3A3 by the card engineer merely distinguishes two different KLYOC- signals used for different purposes.** One KLYOC- signal is used internally; the other KLYOC- signal is output through a non-inverting driver as signal KLYOC--.”

For signal tracing “KLYOC-” and “KLYOC--” are the same. They are not inversions of each other.