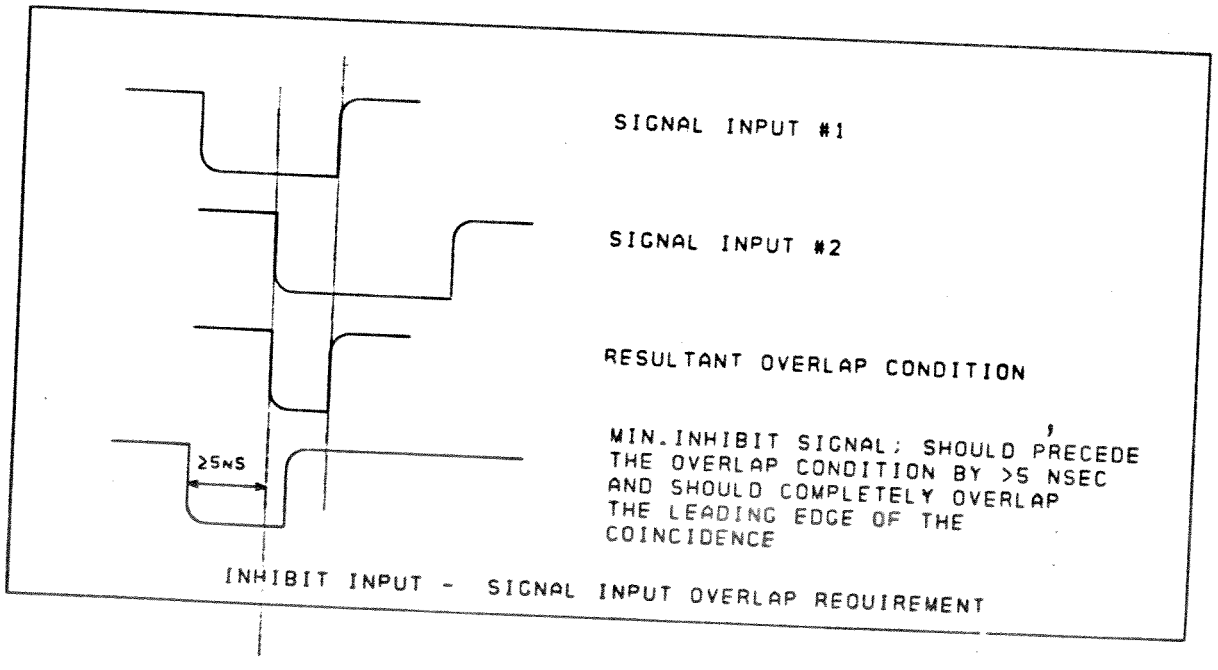
INPUT CHARACTERISTICS

Logic Inputs: The Models 465/466 have direct-coupled, 50 Ω impedance inputs which accept fast NIM logic signals (-0.6 V to -1.8 V). These inputs, typically driven from a discriminator or other logic unit, are protected both for transient and DC signals up to ±5 volts. Since the input reflections are less than 7% for signals of as little as 2 nsec risetime, even the maximum level signal in the NIM-specified range for a logic input (i.e. -1.8 volts) will reflect only approximately 125 mV, eliminating the probability of accepting multiple pulses corresponding to only one original input pulse.

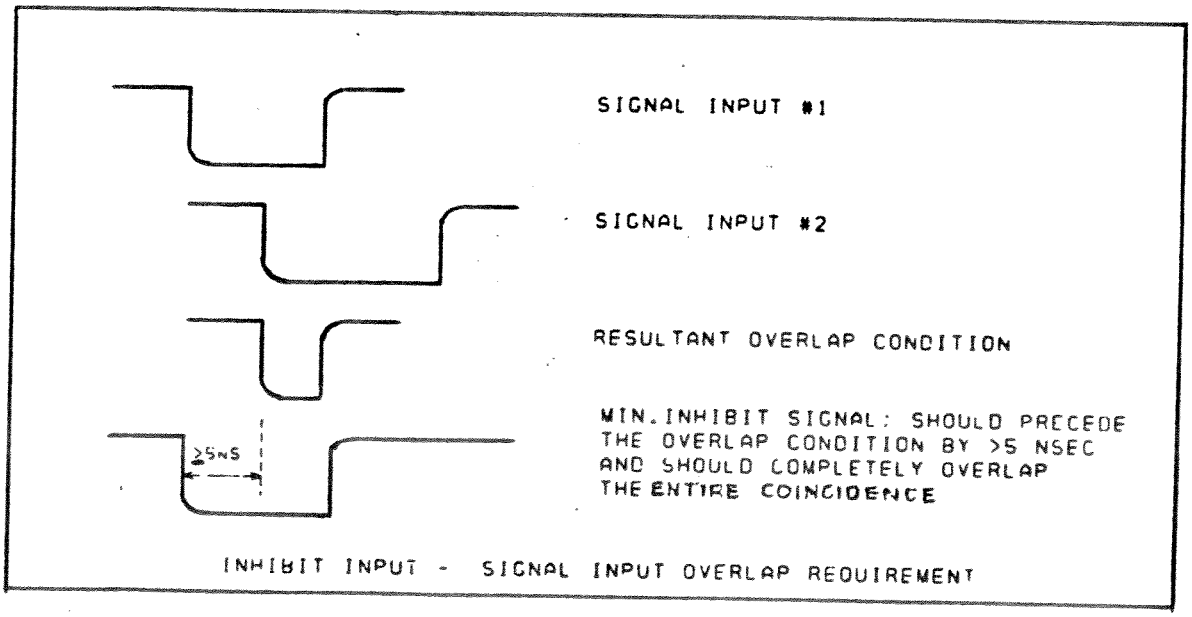
Model 466 Veto Inputs: The veto inputs of the Model 466 require NIM logical one input signals as described above. In order to inhibit (veto) a coincidence, the applied veto pulse must overlap the leading edge of the input signal that would otherwise cause the coincidence condition. Due to internal delays, the leading edge of the veto signal should precede the coincidence condition by at least 5 nsec. Consider the diagram below.



INHIBIT INPUT - SIGNAL INPUT OVERLAP REQUIREMENT

Model 465: Veto Input (for preset outputs only): The veto inputs of the Model 465 require NIM logical one input signals (ie, >-600 mV into 50 Ω). In order to inhibit (veto) a coincidence, the applied veto pulse must overlap the leading edge of the input signal that would otherwise cause the coincidence condition. See description and associated diagram in preceeding section (Model 466: Veto Inputs).

Model 465: Veto Input (for linear outputs only): The veto inputs of the Model 465 require NIM logical one input signals as described above. In order to inhibit (veto) a coincidence, the applied veto pulse must overlap the entire coincidence condition as shown in the diagram below. This requirement is necessary since this linear output is determined only by the output of the front end of the logic unit, as opposed to the preset outputs where the leading edge of the front end output triggers a preset width stage. In the latter case, if the leading edge is vetoed, the entire preset width output stage never sees it, thereby preventing any preset output. In the case of the linear outputs, any portion of the front end output that is not specifically overlapped by the veto pulse will appear at the linear output connectors.



INHIBIT INPUT - SIGNAL INPUT OVERLAP REQUIREMENT

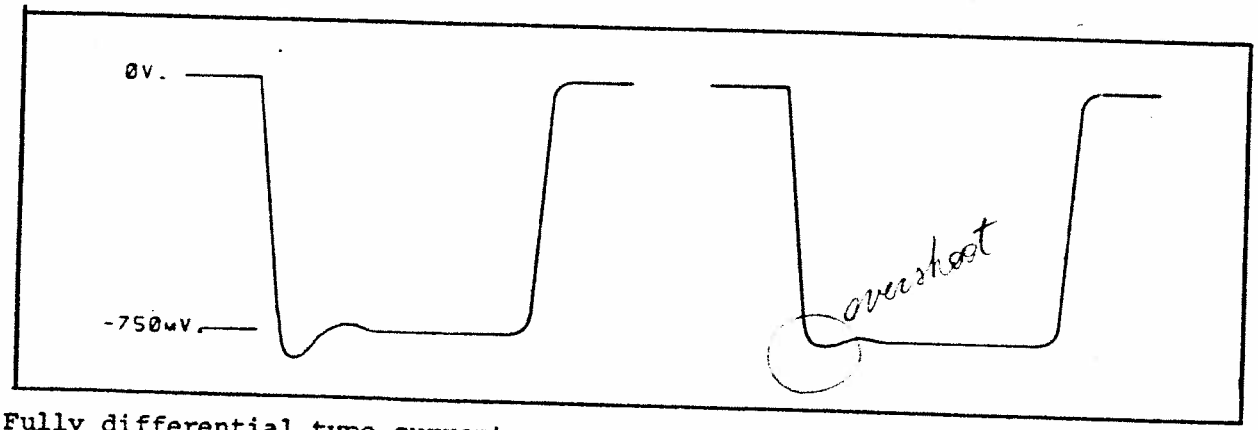
Inputs Select Switches: Any input will be removed from the coincidence requirement without removing its cable if the adjacent "Input Select Button" is in the OUT position.

Usage of 465/466 as a Triple 5-Fold Coincidence: In order to use the 465 or 466 as a 5-fold coincidence unit, a complementary fast NIM signal may be applied to the veto input. This signal will quiescently, then, hold the 465/466 in an off condition. When a pulse is applied to this input, it permits the 465/466 to give an output if the other selected inputs are in coincidence. Such application for the 465 and 466 is possible only at the sacrifice of usage of the veto input for a true inhibiting function.

OUTPUT CHARACTERISTICS

Bridged Negative Outputs: The Models 465 and 466 have two pairs of current source 50 Ω outputs, delivering -32 mA of current during the output and 0 mA quiescently. These outputs are fully differential type current source outputs. These outputs maintain a risetime of approximately 2.0 nsec and a reasonably clean shape, as long as care is taken to terminate at least one half of the other bridged output in that channel.

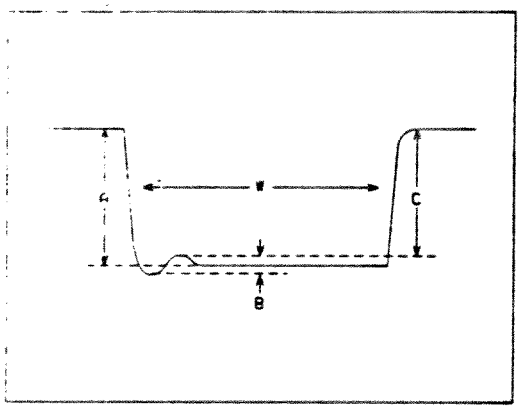
The actual shape of typical outputs from the 465 and 466 is approximated below.



Fully differential type current source output, adjacent output pair unterminated; tr ≈ 2.5 nsec; overshoot <15%.

Fully differential type current source output, output pair terminated; tr tr ≈ 2.0 nsec; overshoot <10%.

Using the typical output pulse shape following as a visual reference, LRS output shapes for the fully differential type preset outputs on the 465 and 466 are set up to adhere to the following restrictions, with adjancent output pair terminated into 50 Ω:



AMPLITUDE: -700mV<A<-850mV.

OVERSHOOT: B<10% OF A; C DOES NOT REACH -600mV

RISETIME: <2.5 NSEC.

FALLTIME: <2.5 NSEC. AT MINIMUM WIDTH.

MINIMUM WIDTH: WMIN (FWHM) <5.0 NSEC.

MAXIMUM WIDTH: WMAX (FWHM) = 1 μSEC.

Complementary Output: The single complementary output is actually the output from the collector of the other half of the differential pair supplying current to one pair of preset outputs. Although it is internally a double amplitude signal, it is subsequently internally back-terminated into 50 Ω, thereby maintaining a quiescent level of -16 mA, and logical 1 of 0 mA. Risetime and other characteristics are similar to that of the normal outputs.

Usage of Bridged Negative Outputs Driving a Single Cable: In applications where it is necessary to drive very long cable lengths from a logic unit output, it is common to use only one half of the bridged 32 mA output and to leave the other half unterminated. This effectively sends all 32 mA into one cable, giving nearly a double amplitude output. It is important to know that the 465 and 466 have clamp diodes that limit the output amplitude so as not to saturate the output transistors. This limit is approximately -1.4 volts. It cannot be assumed, therefore, that the -32 mA into one 50-ohm cable will give a -1.6 volt output signal.