

# VME ALC - SVX Abort Logic Card

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## Introduction

The ALC is a VME 6-U custom made card specifically designed for CDF. Its main function is to "OR" the beam permits of the BLM-based system and the newly-installed diamond system at CDF.

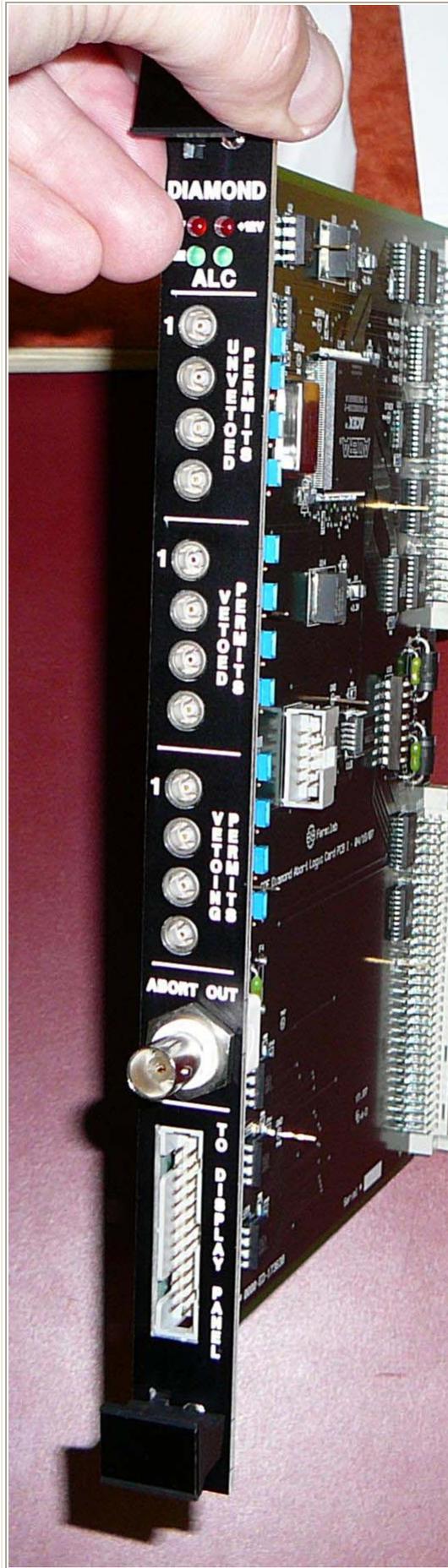
Because there are specific situations in which the beam-permit of the diamond-based system should be ignored, the card includes vetoing functionality for some of its inputs.

In addition, the card interfaces with a rack mounted display-panel for alarm sounds and acknowledgement.

More detailed information of the diamond-based CDF abort system can be found at [DiamondHardware.ps](#)

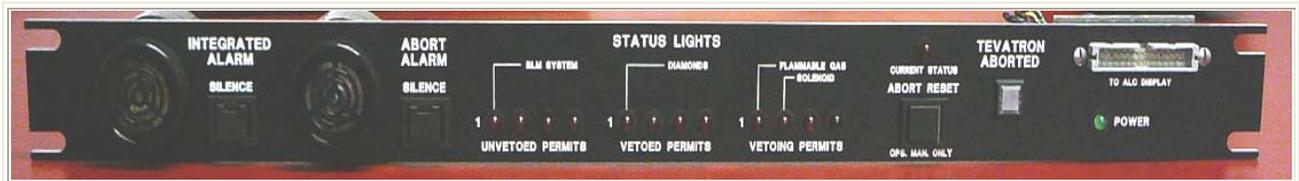
## Physical description

A picture of the ALC and its display panel follows together with a brief physical description of both.



The front panel shown at the left features Inputs, output and jumpers.

- Inputs:**  
 There are 12 TTL-compatible lemo inputs. The upper group of four are labeled "unvetoed permits", the second group of four are labeled "vetoed permits", the following three inputs are labeled "vetoing permits". The last input lemo is not labeled, but is called the "external integrated alarm" input. The writing to the VME registers can also simulate the "external integrated alarm" input.
- Outputs:**  
 One output is provided via the BNC connector labeled "Abort Out", and is intended to hold the beam permit according to the ALC logic. The other output is the 24-pin connector at the left of the "to display panel" label, and provides communication from the ALC to the display panel shown below.
- Jumpers:**  
 To each lemo connector corresponds one internal jumper connected to a 3-pin base. The 12 jumpers can be seen in light blue on the right side of the picture. These jumpers allow to disregard specific inputs when they are not being used.  
 When the jumper is set shorting the two higher pins the corresponding lemo input is irrelevant for the behavior of the ALC.  
 When the jumper is set shorting the two lower pins the signal of the corresponding lemo input is passed to the ALC logic.
- DIP switch:**  
 An 8-bit DIP switch is used to select the VME physical address of the card.



The display panel consist of a set of actuators and indicators. From left to right, from top to bottom, are:

- "Integrated alarm" buzzer and associated lighted "Silence" pushbutton
- "Abort alarm" buzzer and associated lighted "Silence" pushbutton
- Twelve "Status lights" associated to the 12 lemo inputs
- "Current status" LED
- "ABORT RESET" pushbutton
- "TEVATRON ABORTED" light
- 24-pin connector
- "POWER" LED

## Card operation

The logic of the card is such that the BNC output adheres to the following rules:

- Whenever a rising edge is detected in the "external integrated alarm" input the "Integrated Alarm" buzzer will sound and the light in the push-button starts blinking. The pressing of the "Silence" push-button will silence the buzzer and bring the light to a solid state. This behavior can also be generated by writing to the VME registers in the ALC cards.
- Whenever a "unvetoed permit" logic level drops to zero the output drops to zero, regardless of the state of other inputs.
- Whenever a "vetoed permit" input drop to zero, the output drops to zero only if none of the "vetoing permits" is logic zero.
- If a "vetoing permit" drops to zero all the "vetoed permits" are immediately masked off, and will be unmasked only 20 seconds after all the "vetoing permits" are back to logic one.
- If the output drops to zero the following happens :
  - The signal levels present in all 12 input lemo connectors is latched and displayed in the status lights.
  - The "TEVATRON ABORTED" light will turn on.
  - The "Abort Alarm" buzzer will sound and the light in the push-button starts blinking. The pressing of the "Silence" push-button will silence the buzzer and bring the light to a solid state.
- The "current status" LED represents the current status the "Abort Out" output would have according to the current permit inputs.

- The pressing of the "Abort Reset" in the display panel will only have effect if the "current status" LED is off. In that case the pressing will silence the buzzers, turn off their lights, and unlatch all of the status lights.

## VME functions

The following table represent the functions associated with the VME backplane. In the addresses below the "xx" must be replaced with the address selected in the DIP switch.

VME Address	Function
xx00 0000 to xx00 009F	Read only. ALC Board ID Block. Contains ASCII string with board type and FPGA revision date.
xx00 00A0 to xx00 00DF	Read/write. Scratch pad RAM. Read/Writeable RAM locations used for testing VME interface.
xx00 A000 & xx00 A002	Do not write to these locations.Used for remote programming of FPGA configuration device.
xx01 0000	Read only. "Status light" status-bits. Bits that are one correspond to display panel LED's that are lit. Bits 14 & 15 are not used and always read zero.
xx01 0002	Read/write. Integrated Abort Alarm. Bit 0: Write a value of 0001 to trigger alarm. Bit 1: Write a value of 0002 to clear/reset alarm. Bits 2-7 are not used.