

To Pull Down or Not to Pull Down

Introduction

Tests were performed on the dense stack with and without pull-down resistors on the preamps. The noise and postamp thresholds for each configuration were examined. These tests have been performed previously on a UV module but a dense stack, having 8 wire planes, will give a better understanding of a many channel system. The main problem with having no pull-downs is that the postamp internal test pulse gets reflected back from the preamp causing a double peaked test pulse

Results

	Pull-downs	No Pull-downs
Stable Postamp Thres.	140 - 150 mV	65 - 70 mV
Equiv. Thres. At Preamp	~7.5 mV	~3.5 mV

As indicated in the above table, removing the pull-downs from the preamps results in an operating threshold of about half the value with pull-downs. The tests were done by initially starting with a postamp threshold value where the system was in a state of oscillation. The threshold was then raised in steps until the system became stable. The system was observed over the course of a few hours to assure that stable operation was maintained.

Figure 1 shows the typical noise waveform at the output of a preamp with no pull-down resistors. Figure 2 is the waveform with the dense stack illuminated with a ^{55}Fe source.

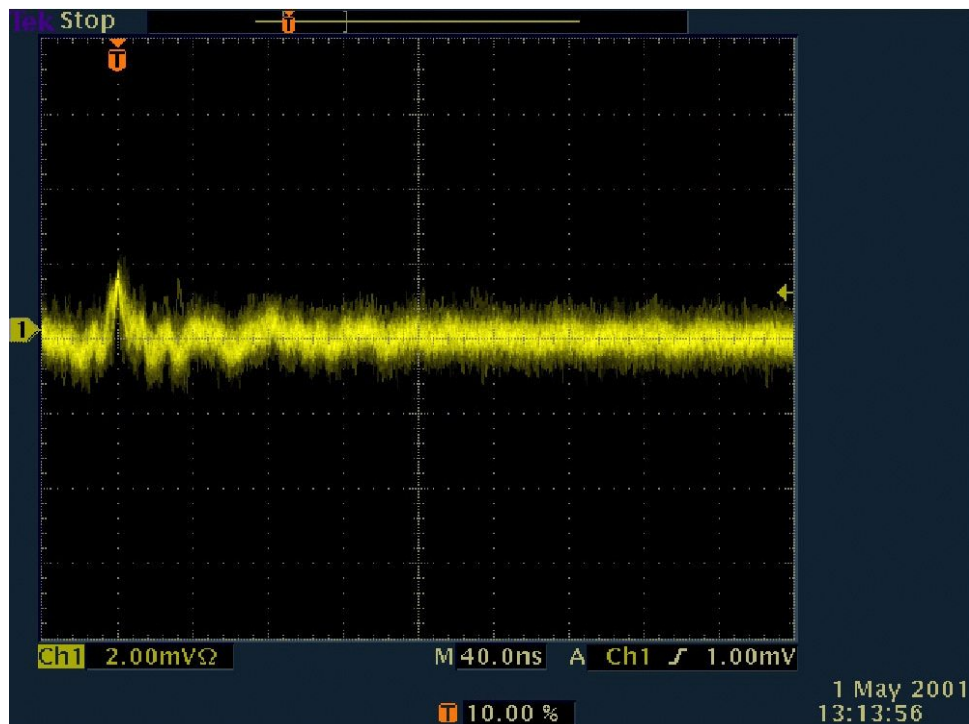


Figure 1

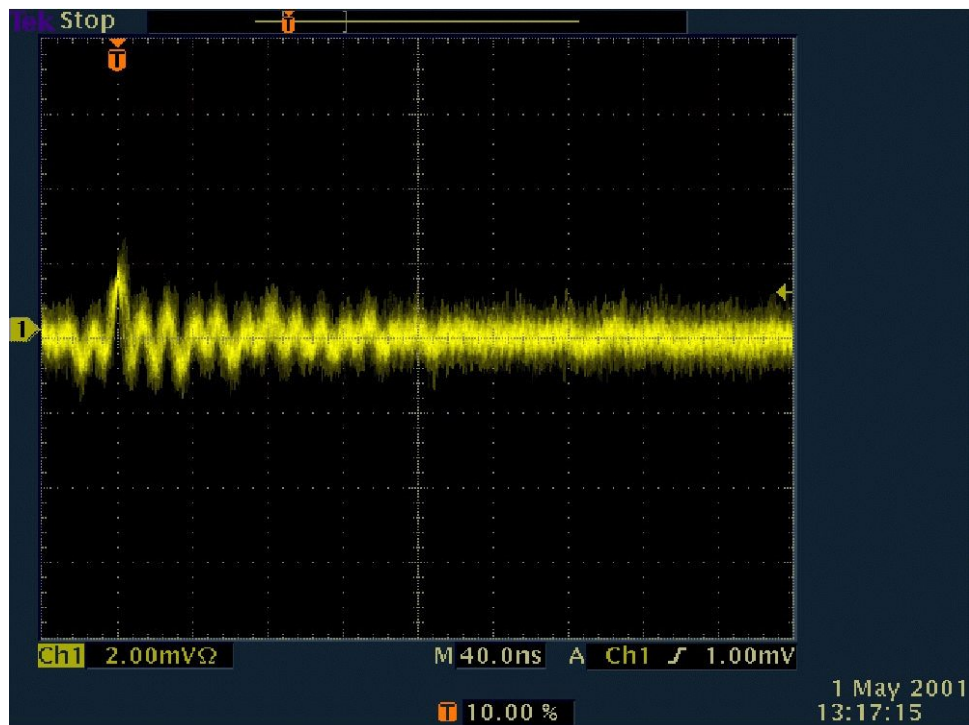


Figure 2

Figure 3 shows the typical noise waveform at the output of a preamp with pull-down resistors. Figure 4 is the waveform with the dense stack illuminated with a ^{55}Fe source.

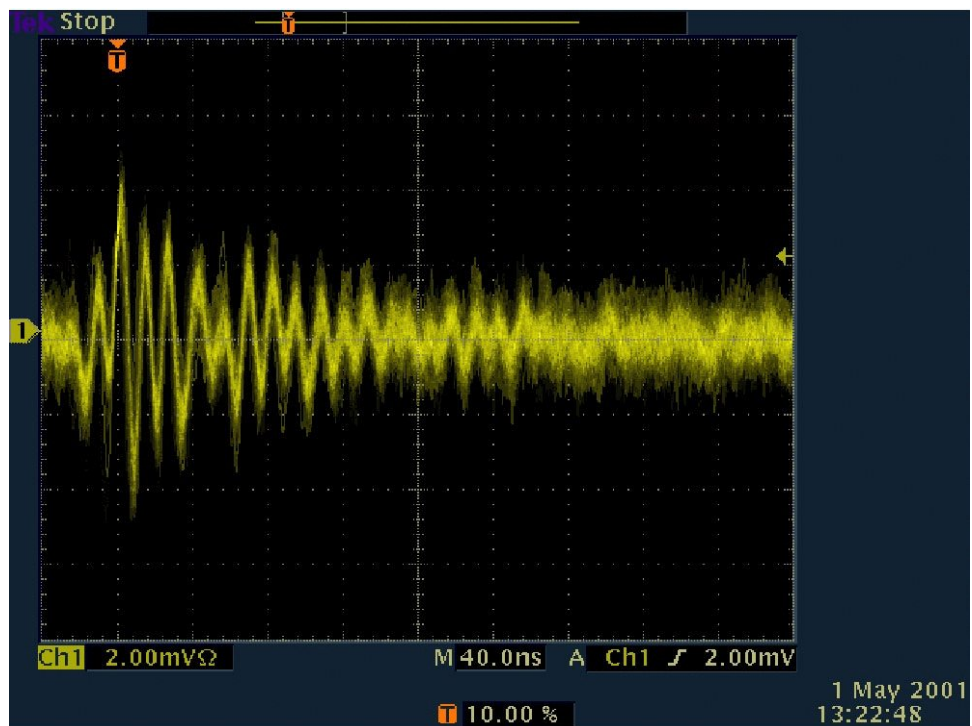


Figure 3

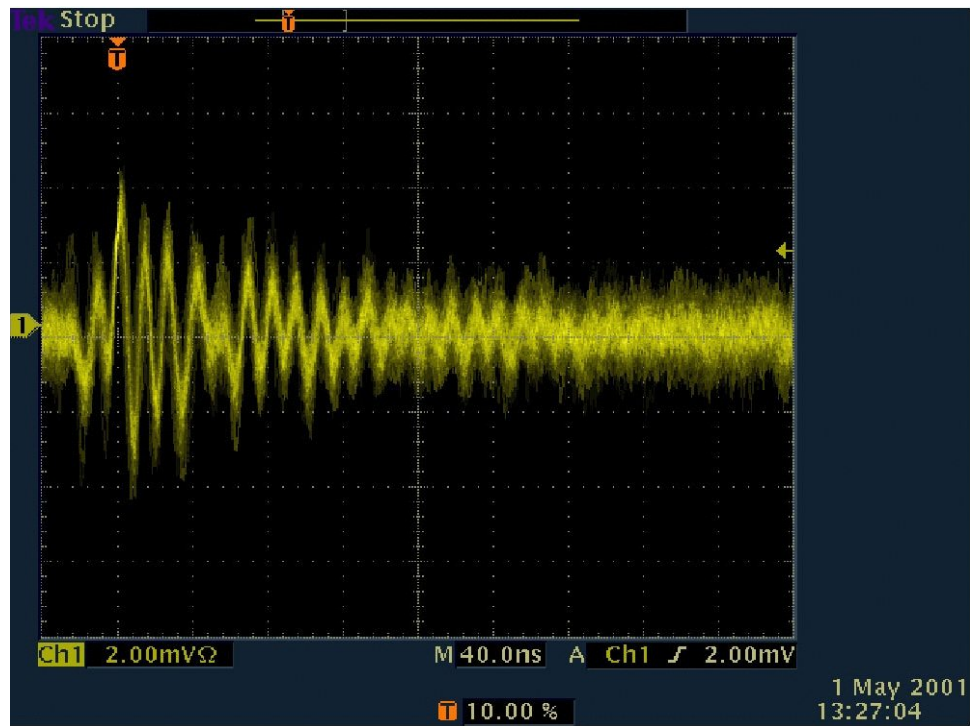


Figure 4

Conclusions

It is clear that having no pull-down resistors installed on the preamps results in more than a factor of two improvement in the noise at the output of the preamps and consequently, an equivalent reduction in the postamp threshold. But as previously stated, having no pull-downs causes the internal test pulse to have a double peak.

