Set up for Missing Energy – Initial operation of T20/T105
M. Ross
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The missing energy interlock integrates the signals from the structure input (SLED out) and output with a characteristic time constant of 1 microsecond. The test points show the integrated signals: A is the structure input and B is the structure output. The difference (3rd test point) should be close to zero for a properly operating structure. Use the gain control to make the pulses roughly equal (it changes the gain of the structure output - B - only). The pulse shapes should be almost the same. The threshold is set by attenuating the output signal (between 10 and 20%) to simulate 'missing energy'.

1) Use test points for monitoring channel A and B; 50 Ohm, 100mV(100 MW total 25 ns), DC coupled and externally triggered.
2) Trace shape and timing should be the same. Set the ground levels of each of the two scope channels equal. Adjust the gain control (channel B) to make the two pulses equal to within 10mV.
3) Use the difference monitor channel. The first microsecond of the waveform should be within 50mV of ground. (Offsets of A and B cause the level shift. They should be less than 50mV)
4) Insert 3dB (For RF pulses 50ns and greater use 1dB) into the B channel (B<0.7A). Set threshold to just trip (flickering LED).
5) The structure output appears more sensitive to noise from the modulator (50mV) than the input. Turn off the RF momentarily and make sure that the missing energy interlock is not tripped with the RF off.

The above procedure generates a trip based on A-B>threshold. For short pulse operation, the threshold is about 0.5 Joule of lost energy. For long pulse operation (200 MW total at 251 ns), the threshold will be increased to 1 Joule, using a 1 dB attenuator instead of a 3 dB attenuator