Whenever high dose rate (HDR) source calibration is dependent on an external time standard, treatment accuracy is strongly contingent on the precision of the Afterloader's internal electronic timer. The recently published, "Code of Practice for Brachytherapy Physics: Report of the AAPM Radiation Therapy Committee Task Group No.56 (TG56)"\ states that a " temporal accuracy criterion of +/- 2% seems easily achievable." TG-56 recommends several techniques to measure the temporal accuracy of HDR remote afterloading systems. These measuring techniques involve the use of a hand held clock or stop watch to compare externally measured dwell times with source arrival and departure times on the printed treatment record. We have designed and constructed an instrument to accurately check the HDR remote afterloader temporal accuracy. The instrument utilizes an optical sensor, whereby the source starts and stops an external electronic timer. We have observed a temporal accuracy of our HDR Remote Afterloader unit of within 0.3 seconds (0.5% over one minute). This instrument can also be used to measure the transfer velocity of the HDR source and hence estimate transit dose.