Controls in EUROGAM

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1 INTRODUCTION

This paper deals with the controls of the EUROGAM array during an experiment. Those controls suppose that the array is in correct order of function setups and checkings having been previously done. (see Edoc 067 "Diagnostic procedure for EUROGAM D. Brightly and P. Coleman-Smith and also Edoc 043 on EUROGAM diagnostic software M.M. Aleonard). Those controls will need informations available in different files (or structure) in the setups and checkings phases. The aim of the controls is to check that all counters, the electronics and the software are running correctly. There are several kinds of controls:

- count rate controls (check all detectors,...)
- gain and shift control
- data flow controls (event builder, tape...)
- H V

2 COUNT RATE CONTROLS

Count rate controls should be performed at given time interval. Two options could be possible: erase after read or not erase. If data are not erased control of the data rate will be performed by substraction of the previous readout. The time interval will be selectable; standard values could be suggested (10 mn, 30 mn ...). It is most likely that the acquisition should be stopped while reading scalers and histograms. Sequence: stop trigger unit - read data - restart trigger unit.

Controls can be performed via the following:

2.1 Scalers

Scalers are available in the trigger unit located in the VXI crate:

- fast trigger
- validations
- fast trigger rejection while busy
- fast trigger accepted

The systematic use of scalers on all CFD output from Ge cards does not seems necessary as long as informations can be obtained in the histograms. However a VME scaler unit would be useful for diagnostics?

2.2 Histograms

Two kinds of histograms are available from the histogrammer unit or the sorter unit. While in the histogrammer we have raw and no gain matched data the sorter can provide corrected data besides these data are filtered in the event builder then the sorter.

Note: the histograms to be used for controls should not be reselected without a security check even in the sorter unit. Also: in the histogrammer spectra are those events selected by the master trigger unit.

The histogrammer is the only point where BGO can be checked since that in most experiments their output does not go further than the event builder.

The A.C. and pile up rejected spectra could also be checked here if the space needed is too big it is worth counting the A.C. and pile up data of Ge **in the event builder crate** idem for histogram of BGO hits deduced from the pattern. (At this point the spectrum is not necessary). This histogram of each BGO hit is necessary to help control the threshold or problems on the shields. To avoid smearing spectra over a wide energy range control of the CFD threshold can be performed by integrating spectra up to 200 kev only for Ge low gain. Calculation of peak to background ratio in each Ge need to be done either in the histogrammer if the trigger filtering is enough to get clean spectra or in the sorter unit. These peaks can be a inixing of several channels but the background need to be "clean" around. These features needs 45 (phase 1) Ge A.C and p.u. rejected spectra with not too strong filtering (just Multiplicity window?) to get enough counts for control. Control of the target yield is obtained from the scalers in the trigger unit, but effect of beam misalignemment may be checked also by counting background in low energy for the rear detectors.

3 CONTROL MANAGING

An organisation of all the controls has to be done. There are several aspects: settings histograms needed for control, starting the controls, visualisazation on a screen in such a way that a quick glance gives an overview of the status of the experiment.

3.1 Software utilities

Software facilities have to be provided for automatic checkings (at given time interval) and passing results to a graphic interface for errors or to update histograms display.

Facilities also are needed to give parameters for parametrization of controls: selection of peaks... This includes a user interface to get a spectrum of selected regions with markers set but also to have an automatic correction *on option* of gain matched (doppler corrected) histogrammer. This interface could be some interface between the spectrum server and the client. This facility is absolutely necessary to avoid tedious scanning of spectra with a different gain in the histogrammer and the sorter.

The control facility must check gain shifts on some 2 - 4 peaks in each Ge. A.C. and P.u rejected spectrum. Control of the resolution may not be easy in beam, use of a source each day was a suggestion. Note that, this imply changing the trigger setup!

3.2 Graphic for controls

The screen should present histograms of counts rate in detectors, A.C. qualities of each detector control of events rates (scalers and tapes rate) and status (running , errors) of histogrammer sorter, trigger. On request a fast scanning of reference peaks (small energies regions) should be available. On request access to more detailed informations on hight voltages(histograms) and trigger programming. Presentation should emphasis anomalies (change to red) if the limits of evolution of parameters can be fixed.