

KENS data acquisition system

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§ 1 Introduction

Some parts of the KENS data acquisition system have been reported in KENS REPORT 1.1) Here, we wish to outline the manner in which the flow of data is controlled. We include photographs of the computer system, the camac system and some specially designed modules which were completed in April 1980. For an outline of the general philosophy of the system and for further details of the functions of each module, readers are referred to the previous paper.¹⁾

§ 2 System configuration

The system configuration is shown in Fig. 1. The data from 5 spectrometers (SAN, LAM, MAX, TOP, HIT) are accepted, manipulated and stored by this system. The data from the two-dimensional position sensitive detector of SAN are input through the specially designed multi-dimensional

time analyzer (MDTA) interface. The CAMAC system is adopted for the interface. The central process unit (CPU) of the computer is OKITAC SO/model 60. The peripherals are magnetic disc (DK), magnetic tape (MT), electric typewriter (ET) photo-tape reader (PTR), line printer (LP), graphic display (GD), hard copy (HC) and dotted line printer (DLP).

§ 3 Flow of the data and their control signal

A chart depicting the flow of data and corresponding control signal is shown in Fig. 2. The thick and thin arrows refer to the data and control signal respectively. The data flow can be managed by the operation of switches on the control panel (CP). Each spectrometer has its own dedicated control panel.

3 - 1 Count Start

When a START button is pushed, an interruption signal is sent to the branch driver (BD) through the interruption module (IT). The CPU central process unit (CPU) accepts the signal from the BD, and recognises the status of the interruption and sends a count-start-signal both to the time analyzer (TA) and to the monitor module (MM) through BD. The booster trigger signal is directed to the trigger control module (TC) which distributes the booster trigger signal to the TA and the MM. When the count-start-signal from the CPU synchronizes with the booster trigger signal, the TA and the MM are opened and measurement commences. The neutron data from each spectrometer are

stored in direct access buffer memory (8 KW RAM) in the TA Monitor signals are counted by a 12 bits-scaler in the MM. During the measurement, the data in the TA are copied to the CPU memory, edited there and copied to the X-Y-display control module (XYD) through the BD so that the raw data may be displayed on the cathode ray tube (CRT). The portion of the data in the TA to be displayed and the scale are selected by rotary switches. It is also possible to display previous data which is stored on magnetic disc (DK) by using a combination of the DISPLAY/OUTPUT AREA button and DETECTOR switch. The status of these switches is read by the digital input/output module (DIO), and, if required, data are transferred from the DK to the CPU memory. After editing the data are output as before.

3 - 2 Count Stop

Operation of the STOP button sends a stop signal which follows the same path as the start signal above. When this signal is received the TA and MM gates are closed and, the data stored in the TA are transferred to a file on disc as specified by the ACCUMULATION AREA button.

3 - 3 Data Clear

Data clear is executed by pushing the DATA CLEAR button on the CP. The data-clear-signal follows the same course as above although to prevent the data being erased accidentally,

several limitations are imposed. When the measurement is in progress or when the status of the DISPLAY/OUTPUT AREA and ACCUMULATION AREA switches differ, the DATA CLEAR button has no effect. Moreover, only the data currently being displayed on the CRT can be cleared.

3 - 4 Data Output

The output device such as the line printer (LP), magnetic tape (MT) and dotted line printer (DP) can be selected by pushing the respective button. A data-output -signal is then sent as above and the data currently being displayed on the CRT is output to the chosen peripheral. Typical examples of LP and DP output are shown in Figures 3 and 4. In addition to the neutron intensity data some relevant experimental parameters such as the delay time, channel width, monitor value etc. are also included.

A reference

- 1) KENS REPORT I, KEK Internal 80-1 (1980) 163-180

Figure Captions

- Fig. 1. The system configuration.
Fig. 2. Flow of the data and their control signal.
Fig. 3. An example of LP output.
Fig. 4. An example of DP output.

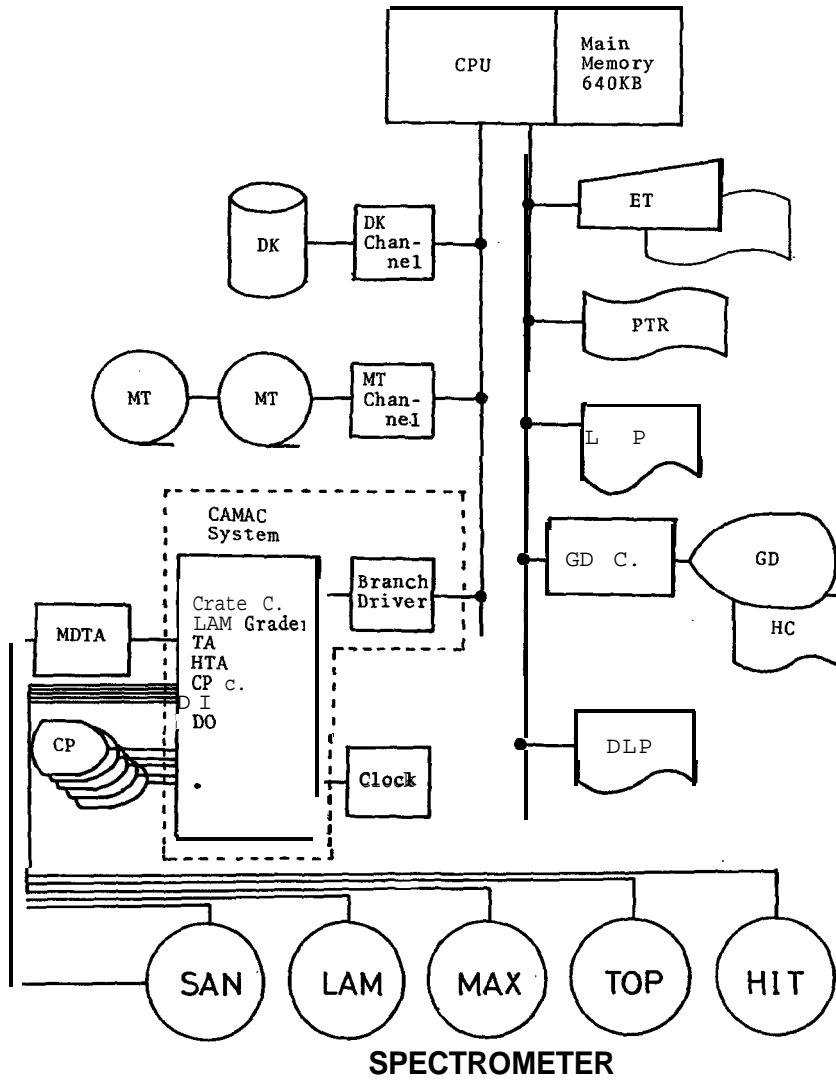


Fig.

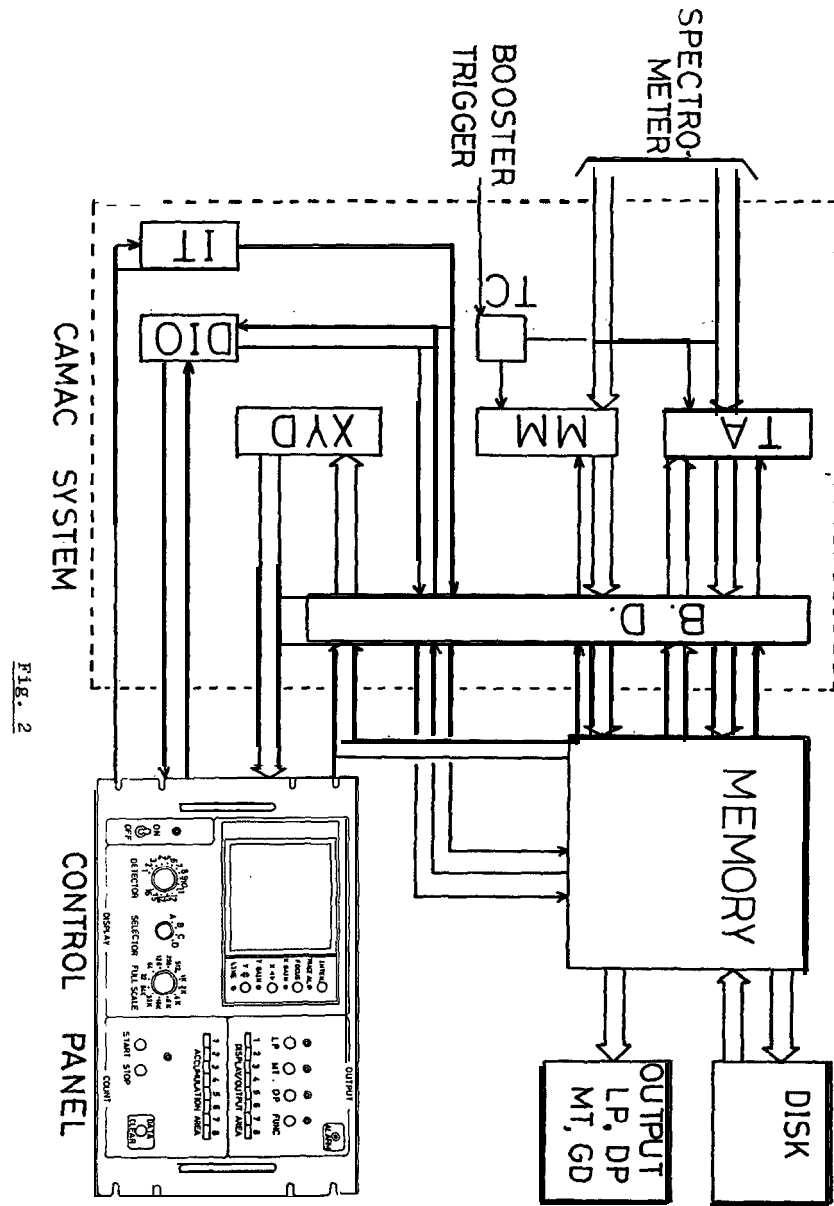


FIG. 2

LAM

START : 80 - 12 - 13 / 20 : 57
 STOP : 80 - 12 - 14 / 1 : 20
 CH. WIDTH : 32 - 32 - 32 - 32
 DELAY TIME : 1
 NO. OF CH. : 512
 NO. OF DET. : 8
 COMMENT : PAA NO.2

MONITOR 0
 DETECTOR - 2
 DATA AREA - 4

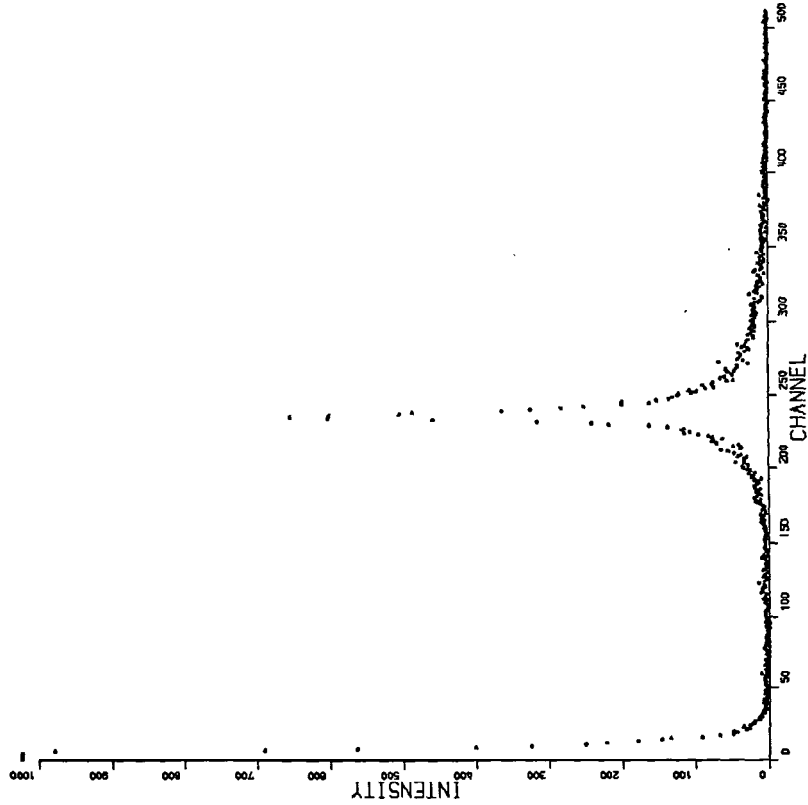


Fig. 4

L	AAA	M	4	DATE :	80.12.13	STAR :	20:57	AREA :	4	NET :	253	CH. WIDTH :	32- 32- 32- 32	
L	A	A	MM	MONIT :	0	STOP :	1:20	DETEC :	2	DEL :	1	COMMENTS :	PAA NO.2	
L	AAAA	MM	4	0	50	133	155	200	251	300	353	400	450	510
1	39143	4	5	5	36	104	20	9	3	1	1			
2	13525	6	6	7	28	93	18	8	4	3	1			
3	4246	5	6	5	33	108	18	5	4	3	1			
4	2222	5	5	6	45	85	22	9	5	4	5			
5	1474	7	4	5	35	75	15	4	4	4	5			
6	779	7	3	3	33	90	18	3	3	3	5			
7	591	4	2	6	30	77	21	108	7	2	3			
8	544	7	4	6	42	76	20	9	7	1	2			
9	431	5	4	5	8	57	18	10	5	1	1			
10	325	12	6	8	48	49	19	4	1	4	1			
11	251	5	4	6	56	65	23	11	5	3	2			
12	223	3	9	7	45	60	19	10	3	2	12950			
13	180	6	7	9	39	50	14	3	4	0				
14	147	3	6	12	7	51	11	3	1	1				
15	135	3	5	.	59	55	18	11	4	5				
16	92	7	12	11	41	67	8	3	3	2				
17	66	4	10	7	10	58	9	3	1	1				
18	50	4	10	8	77	44	5	5	5	4				
19	44	2	10	12	75	42	25	8	2	2	0			
20	49	5	6	5	63	43	18	5	5	4				
21	3	2	2	6	5	77	27	15	9	2	2			
22	27	1	8	10	82	67	12	6	2	1	1			
23	36	2	14	8	96	34	16	8	3	1				
24	28	5	7	7	115	42	16	10						
25	25	5	9	9	137	40	8	4	3	1				
26	21	4	4	12	118	38	15	7	1	1				
27	23	6	9	15	115	38	10	5	4	1				
28	14	3	7	18	138	41	12	11	1	1				
29	14	1	4	12	163	32	11	4	2	2				
30	3	5	2	20	218	26	14	6	2	2				
31	12	4	9	16	241	28	13	1	1	1				
32	11	3	6	11	315	36	8	3	5	2				
33	7	5	4	14	458	52	19	5	3	2				
34	2	3	4	17	602	12	17	4	5					
35	2	5	5	15	554	30	11	12	2					
36	7	2	12	6	3	30	8	4	3	3				
37	6	4	4	19	504	28	9	4	2					
38	6	2	5	19	497	20	10	3	5	2				
39	4	2	6	16	354	23	14	4	2	3				
40	9	1	11	14	325	21	7	2	4	0				
41	5	3	5	15	285	28	11	7	3	1				
42	9	0	8	19	2	24	6	7	0	2				
43	5	5	2	11	200	19	12	3	2	2				
44	4	4	5	24	163	22	10	5	3					
45	4	0	4	2	230	25	6	3		3				
46	7	6	6	27	153	13	15	2	5	1				
47	3	1	7	19	136	22	9	5	2	2				
48	7	3	6	25	131	2	9	2	3					
49	4	5	4	29	124	20	10	4	0	2				
50	3	5	6	34	122	23	7	7	4	1				

Fig. 3