DAQ6U Program Manual

(Data Acquisition program of DSP for the 32ch TMC-VME Module)

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by Yasuo Arai
KEK, National Laboratory for High Energy Physics
1-1 Oho, Tsukuba, Ibaraki 305, JAPAN
yasuo.arai@kek.jp

(See also http://www-atlas.kek.jp/~araiy/)

1. Introduction

TMCDAQ is a data acquisition program which controls data acquisition in the module; reads TMC data, calculate time difference between start/stop signal and hit signal, stores them to the Dual Port Memory (DPM), handshake with a VME master.

This program is prepared for the user who does not want to write their own program in DSP assembler. Thus the program is general purpose, and user can select following options;

- Common start or common stop mode.
- Measure both rising and falling edge data, or one edge only.
- Subtract offset value.
- Display data in a terminal.
- Select recording depth.
- Control from terminal or through the Dual Port Memory.

Present version of the program does not handle multiple event buffer.

Assembler program of the DSP is more complecated than that of normal microprocessor. The DSP (DSP56002) can do up to 3 commands in parallel. Furthermore the hardware interface is also programable, since most of the logic is implemented in a programmable logic chip (Lattice ispLSI). Thus the specification written here may be changed without notice.

DPM Data Format

DSP Addr.	VME Addr.	15 Contents 0	symbol
$4000	x+0	Data Ready Flag	dready
$4001..F	x+2..$1E	(reserved)	
$4010	x+$20	Total No. of Word	ntotal
$4011	x+$22	Status	status
$4012	x+$24	Start/Stop Time	t0
$4013	x+$26	Last Write Pointer value	lastwp
$4014	x+$28	Module ID. (11b) | Ch No.(5b)	
$4015	x+$2A	F/R| 0 | data (12b)	
$4016	x+$2C	Module ID. (11b) | Ch No.(5b)	
$4017	x+$2E	F/R| 0 | data (12b)	
:	:	:	
:	:	(up to 4022 data)	
:	:	:	
:	:	Module ID. (11b) | Ch No.(5b)	
:	:	F/R| 0 | data (12b)	
$4010+ntotal	x+$20+ntotal*2	End of Data ($5555)	
:	:	:	
:	:	:	
$5F80	x+$3F00	RUN Flag	drun
$5F81	x+$3F02	Common Start/stop	dcstsp
$5F82	x+$3F04	Recording Depth	dcount
$5F83	x+$3F06	Serial I/F Display Flag	ddisp
$5F84	x+$3F08	(Subtract Offset Flag)	(dsuboff)
$5F85	x+$3F0A	Edge Select Flag	dedge
$5F86	x+$3F0C	Module ID	dmodule
$5F87	x+$3F0E	(reserved)	
$5F88	x+$3F10	(Ch 0 Offset)	doffset
$5F91	x+$3F22	(Ch 1 Offset)	
:	:	:	
$5FA7	x+$3F4E	(Ch 31 Offset)	
$5FA8-FF	x+3F50-FE	(reserved)	

x --- Base Address

[Comments on parameters in the data format]

dready: Data ready flag.
[DSP view] =0 data buffer is empty. ready to measure next event.
=1 data still exist. wait until dready=0.
[VME view] =0 no data in the buffer. wait until dready=1.
=1 data exists. ready to read.

ntotal: Total No. of word(16 bit word)

status: Status
bit0 = There is no recording of common start/stop signal.
bit1 = Data buffer overflow.
bit2 = No End-of-Data mark

t0: Common start/stop time

lastwp: Last Write Pointer value
Last write pointer value of the TMC chip.

F/R : Falling edge/Rising edge data flag.
=0 for rising edge data
=1 for falling edge data

drun: DAQ run flag
=0 VME master is not ready. Make module to initial state.
=1 VME master is ready. Following parameters are effective.

dcstsp: Common Start/stop mode
=0 common stop mode
=1 common start mode

dcount: Time range count
Recording Time = 32 ns x Dcount (max. 126)

ddisp: Serial port display flag
= N (0-31) display Ch N data to terminal
= 98 display error message only
= 99 display all channel data
= 100 no display

(dsuboff: Subtract offset flag) NOT SUPPORTED NOW (96.4.22)
= 0 subtract default values
= 1 don't subtract offset value.
= 2 subtract offset value stored in the offset area

dedge: Edge detection flag
= 0 rising and falling edge measurement
= 1 rising edge measurement
= 2 falling edge measurement
= 3 rising and falling edge but remove 1st falling edge.

dmodule: Module ID appended to the channel number.

(doffset: channel offset values) NOT SUPPORTED NOW (96.4.22)
These offset are subtract from data of each channels according to the ‘dsuboff’ flag.

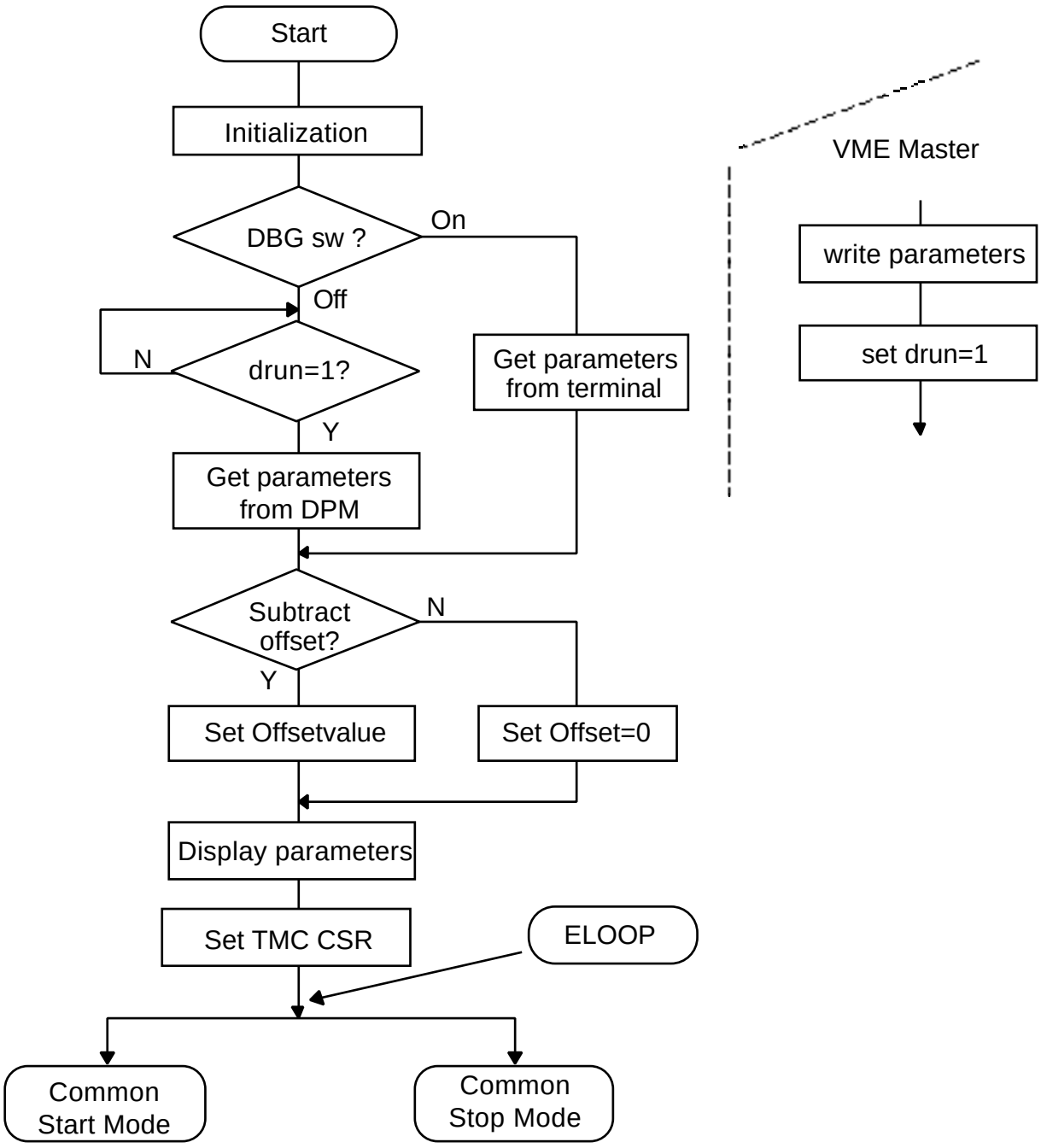

Fig. 1 DAQ6U program flow (1/4)

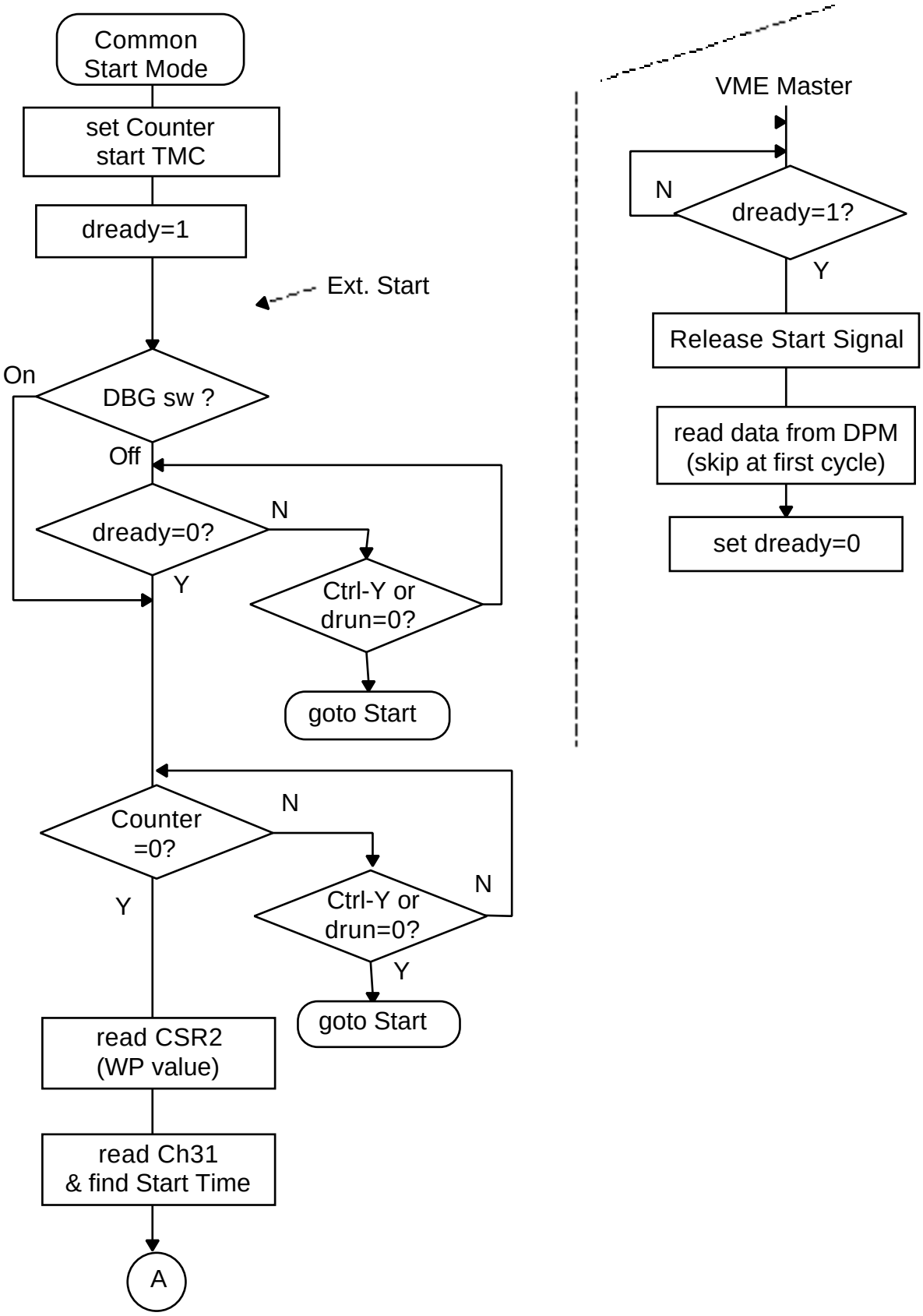

Fig. 1 DAQ6U program flow (2/4)

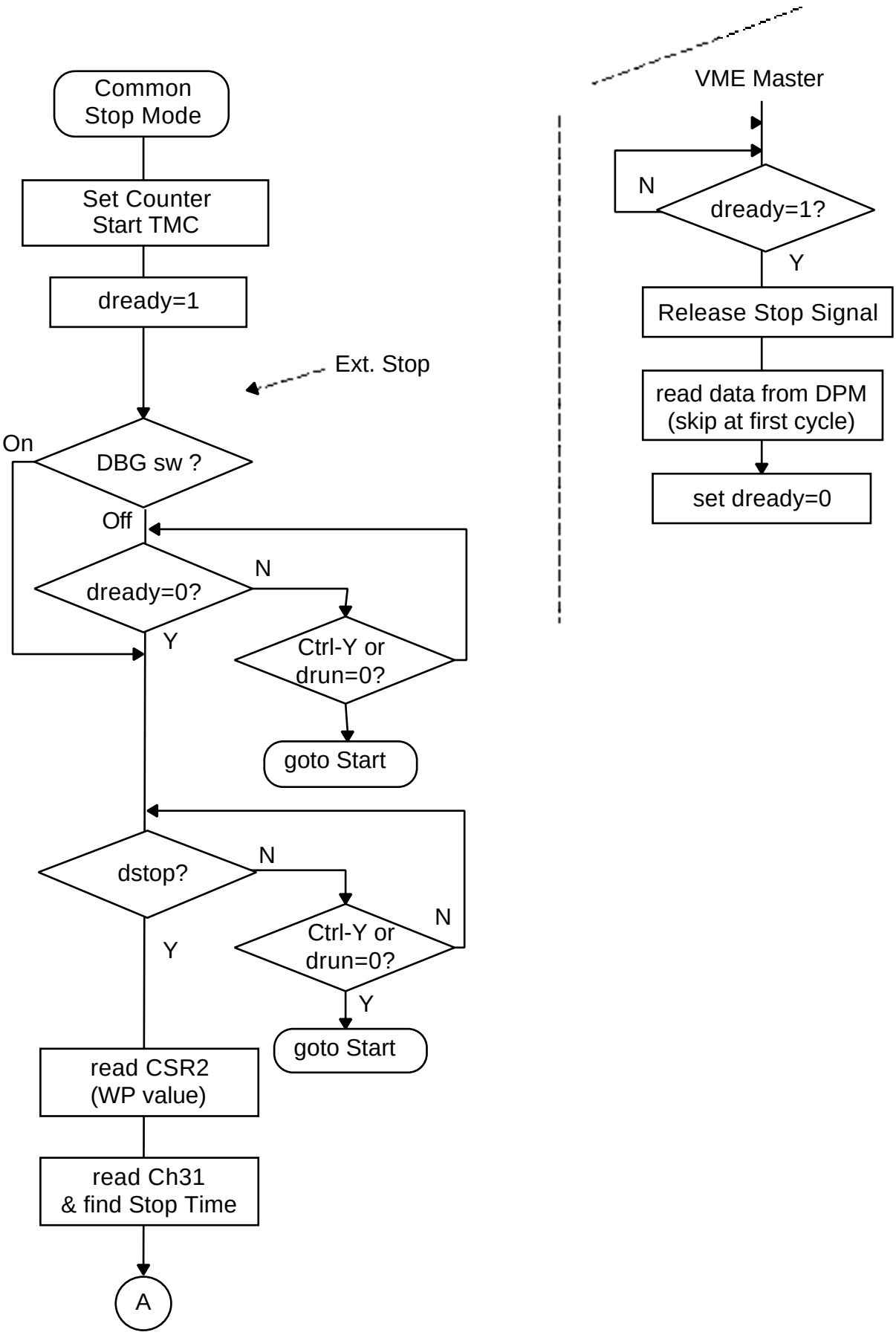

Fig. 1 DAQ6U program flow (3/4)

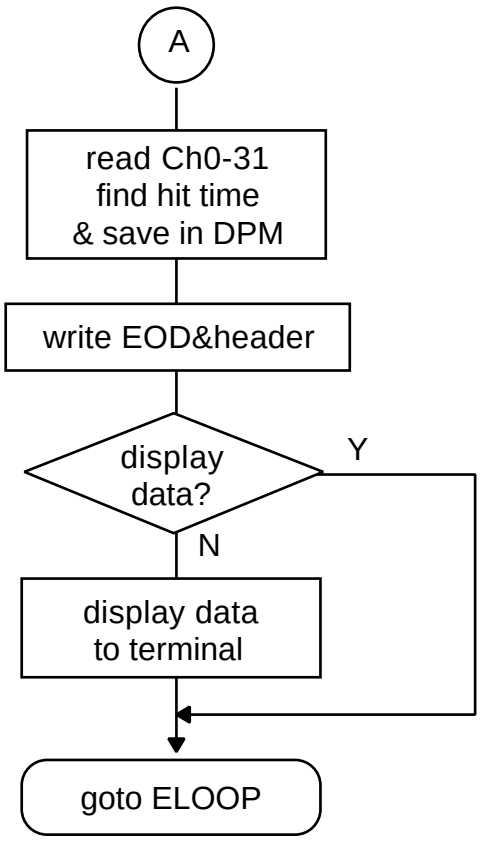

Fig. 1 DAQ6U program flow (4/4)