

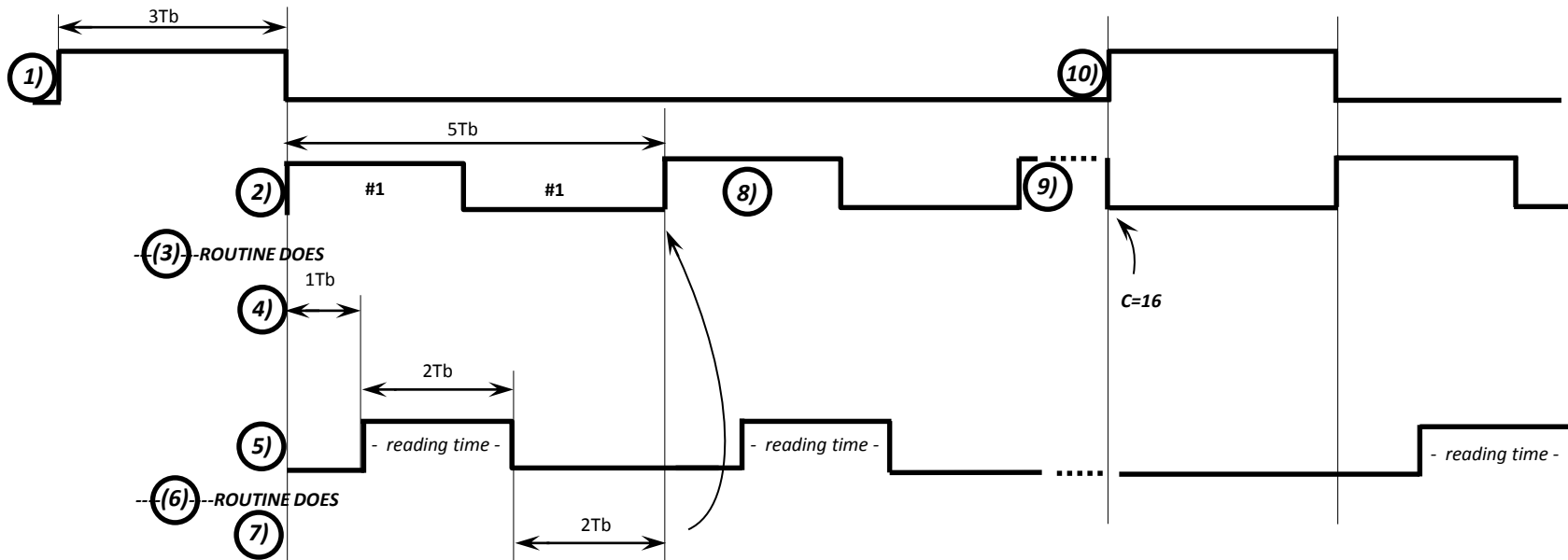
MULTIBEAM ACTIVITY DETECTOR - GUIDE TO DEVELOP DATA COLLECTION SOFTWARE.

DESIGN A VIRTUAL PANEL WHICH PERMITS:

- ACCESS TO MODIFY THE TIMEBASE (T_b), BY SELECTING ONE FROM: 0.01, 0.1, 1, or 10 MILLISECONDS. (Note: As example, T_b will be 0.2 mS FOR CLOCK = 1KHz)
- DISPLAY A RECORDING TABLE IN 16 COLUMNS, ONE PER TUBE, IN DIGITAL VALUES BY CONVERTING FROM BINARY READS, CHANNEL P0.0 TO P0.4.**
- WRITE A ROUTINE TO USE THE DATA ACQUISITION MODULE **NI USB-6501**, USED AS USB/PARALLEL HOST-MAD INTERFACE :

THE ROUTINE:

- 1). SEND ONE PULSE (HIGH) BY CHANNEL P1.0 (ACTING AS RESET), DURING $3T_b$.
- 2). SEND ONE SIMETRIC PULSE (#1) BY CHANNEL P1.1 (ACTING AS CLOCK) (50% DUTY CYCLE, TOTAL = $5T_b$), AND
- 3). INCREASE VIRTUAL COUNTER c (EACH IDENTICAL PULSE SENT FROM CHANNEL P1.1, WILL INCREASE THE COUNTER c UNTIL IT REACHES 16).
- 4). WAIT $1T_b$ WHEN STEP 2 START, THEN
- 5). READ CHANNELS P0.0, P0.1, P0.2, P0.3 AND P0.4 (ACTING AS DATA D0.x TO DV.x); ALL OF THEM ONE TIME AT ANY TIME DURING THIS $2T_b$ INTERVALL.
- 6). IF CHANNEL P0.4 IS:
 - "LOW", CONVERT THE 4-BIT DATA FROM CHANNELS P0.0 (LSB) TO P0.3, TO A DIGITAL VALUE (1 TO 16,) AND WRITE THIS NUMBER IN THE COLUMN CORRESPONDING TO "TUBE c " (c = # OF VIRTUAL COUNTER). **
 - "HIGH", WRITE "EATING" IN THE COLUMN IF: ALL CHANNELS P0.0 TO P0.3 ARE "LOW" AND IF THE "TUBE c " LAST WRITE POSITION # SAVED BEFORE WAS (DIGITAL) 1*; DO NOTHING IF OTHERS.
- 7). WAIT $2T_b$.
- 8). SEND NEXT SIMETRIC PULSE BY CHANNEL P1.1 (CLOCK) (50% DUTY CYCLE, TOTAL = $5T_b$).
- 9). REPEAT SEQUENCE FROM STEP 3 UNTIL COUNTER $c = 16$ (ALL 16-TUBES HAVE BEEN READ), THEN
- 10). GO TO STEP 1, REPEATING THE READING ROUTINE.



* THIS NUMBER WILL BE ADJUSTED (THROUGH THE VIRTUAL PANEL OR/AND BY SOFTWARE) IF THE FOOD INTERFERE THE LEAST SIGNIFICANT BEAM (LSB) AND ITS CONSECUTIVES.

** LATER WILL BE SHOWED THE TIME THAT THE FRUIT FLY DWELLS THE SAME POSITION, BY COMPARING THE CURRENT TIME AND LAST RECORDED AND DISCRIMINATE IT TO NO ACTIVITY (REST) .