CONTROL/WAVEFORM PROGRAMS

PROG NO	DESCRIPTION AND USE
10	**Waveform Generation** Parameter of 1 to 999 defines time in milliseconds between each code output. A parameter of 0 gives a time of approximately 80 microseconds between codes. Maximum of 1024 codes accepted. Decimal codes from 0 to 255 are entered into successive memory locations using "ENTER". " > " and " < " move through memory for code entry/modification. After entering required codes "START" initiates output. Pressing "RESELECT DISPLAY" halts output and enables a new parameter to be entered.
11	**Control Sequence Generator** Operates similar to program 10. Parameter of 1 to 999 defines the time in seconds between each code output.
12	**Ramp Generator** No parameter. "ENTER" initiates ramp output with an approximate periodic time of 2.6 microseconds.

VELA MARK 2

STANDARD EPROM

QUICK REFERENCE CARD

28, Lake Street,
Leighton Buzzard, Beds.

GENERAL ADVICE

VOLTAGE LIMITS:

a) Don't exceed ±40 v on the analog or ±25 v on pulse inputs.
b) Don't try to use VELA to measure the voltage of its own power supply, i.e. use one supply for experiment and another separate one for powering VELA.

POWER SUPPLIES:

a) Too low a supply voltage causes erratic operation, failure to input programs properly and a tendency for programs to halt operation.
b) Plugging/unplugging other mains operated equipment near VELA can cause power spikes on the mains causing VELA to stop running a program.
c) Certain thyristor operated power supplies cause problems as per (b) above.

SETTING UP EXTERNAL CIRCUITS:

Make use of program 00—Digital Voltmeter to check sensors, connections batteries, etc. Make use of program 04 — frequency meter, and observe pulse LED to check light gates, radioactive pulses, etc.

TRIGGERING:

Pulses that are negative with respect to ground will not trigger data capture/start timing etc.

DATA LOGGING PROGRAMS

STARTING DATA LOGGING

a) Manual: Press "START"

b) Automatic External: Place pulse switch to the left side position. Apply a voltage greater than 1 Volt to input.

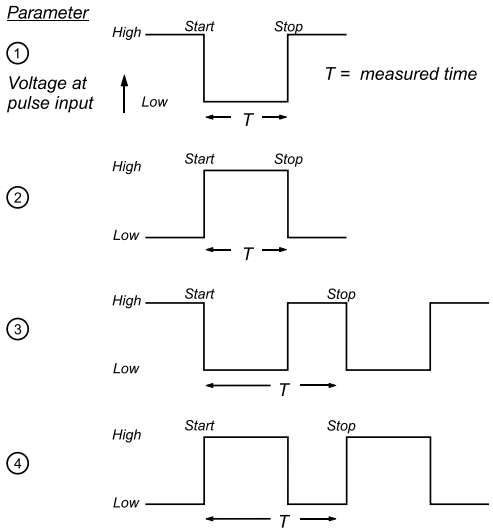
c) Automatic Internal: Place pulse switch to right side position. When voltage on channel 1 exceeds a threshold, data logging starts.

STOPPING DATA LOGGING

Programs 02 and 03 can be stopped during execution by pressing "STOP".

PROG NO	DESCRIPTION AND USE
00	**Four channel Digital Voltmeter**—Useful for checking connections and sensors; to change channel press "CH2" or "CH3" or "CH4".
01	**Fast Single Channel Transient Recorder** 4K samples are stored. Parameter between 0 and 999 determines inter-sample time. '0' selects flat-out at 34 micro–seconds. A parameter of '1' gives 50 microseconds, '2' 100 microseconds, '3' 150 microseconds, etc. 1K samples displayed on scope/micro/chart recorder at any one time; to look at second K press "RESELECT DISPLAY" followed by "CH2" etc. i.e. "CH2" selects second block.
02	**Medium Speed 4 Channel Transient Recorder** 1K samples are stored per channel. Parameter between 1 and 999 determines inter-sample time in milliseconds, e.g. Parameter of 20 selects 20 milliseconds between samples. Each 'sample' stores the value from all four channels.
03	**Slow Speed Data Recorder** 1K samples are stored per channel. Parameter between 1 and 999 determines inter-sample time in seconds, e.g. Parameter of 5 selects 5 seconds between samples. Each 'sample' stores the value from all four channels.
15	**Data Transfer to Micro when Battery Back-up of Memory is used** Apply power to VELA. Run appropriate software in micro. Type '15' followed by "CH1" to transfer channel 1. Use "RESELECT DISPLAY" for next channel.

TIMING AND FREQUENCY: PROGRAMS

PROG NO	DESCRIPTION AND USE
04	**Frequency Meter (<20KHZ)** No parameter needed. Use pulse input and pulse switch to left side position. If signal is of amplitude <1V then apply it to channel 1 input; select range of ±250 mV and pulse switch to right side position.
05	**Single Channel Timer** Records interval between 'start' and 'stop' signals —i.e. voltage changes on the pulse input, or between manual pressing of "START" and "STOP". Parameter determines start/stop sequence. 
06	**Multi-channel Timer** Records state of 8 input data lines and times with millisecond resolution any state changes occurring on these lines. No parameter. After pressing "ENTER" display shows state of sensors for checking their operation. Press "START" to start timing. After pressing "STOP" display shows sensor pattern. Timing can be read by repeatedly pressing ">"

RADIOACTIVITY PROGRAMS

PROG NO	DESCRIPTION AND USE
07	**Pulse Counting** (typical use: radioactive decay) Counts, records and displays pulses arriving in a time period by the parameter from 1 to 999 seconds, e.g. a parameter of 10 records number of pulses arriving in each successive 10 second interval. Program initiated by "START" Display shows sample number and count in that particular interval. An oscilloscope gives an updated graph (e.g. radioactive decay).
08	**Statistics of Interpulse Times** (Typical use: examining distribution of interpulse times from a radioactive source.) Parameter of 1 to 999 defines the time range in tens of milliseconds, e.g. a parameter of 5 defines first "interval" from 1 to 50ms. Program initiated by "START" VELA's display shows total number of particles counted. An oscilloscope gives an updated distribution graph.
09	**Statistics of Random Events** (Typical use: examining a distribution graph, "number of occasions" versus "counts per sampling interval" from a radioactive source.) Parameter of 1 to 999 defines sampling interval in seconds during which pulses are counted. Program initiated by "START". VELA's display shows total number of samples taken. An oscilloscope gives an updated distribution graph (e.g. a normal distribution histogram). After pressing "STOP" operation can be continued by pressing "START".