

SECTION I

GENERAL INFORMATION

1-1. INTRODUCTION.

1-2. This section contains general information concerning the -hp- Model 3437A System DVM. Included is an instrument description, specifications, information concerning instrument and accessory information, and safety considerations.

1-3. DESCRIPTION.

1-4. The Model 3437A is a Microprocessor controlled 3½ digit, successive approximation system voltmeter, capable of sampling voltages at rates up to 5700 samples per second.

1-5. Chassis isolated input terminals, a wideband input amplifier, auto-zero, auto-polarity, sample and hold, and 100% overrange on each of the input voltage ranges (.1 volt, 1 volt, and 10 volts) provide floating measurement capability (± 20 V) over the frequency range of DC through 1.0 MHz.

1-6. Hewlett-Packard Interface Bus is standard. All front panel functions are programmable. The output data format is selectable between an ASCII (8 byte) and Packed (2 byte) format. The packed data format allows the controller additional data storage as well as allowing the input voltage to be sampled at rates up to 5700 samples per second.

1-7. The 3437A digital delay logic is capable of delaying an external trigger from 0 to 1 second (100 ns steps), and of generating up to 9999 triggers (for each trigger received) at rates of 1 Hz through 5700 Hz. The internally generated triggers provide a burst sampling capability (up to 9999 samples) at a maximum rate of 5700 sampled per second. Figures 1-1 and 1-2 illustrate the delayed measurement and burst sampling capabilities of the 3437A.

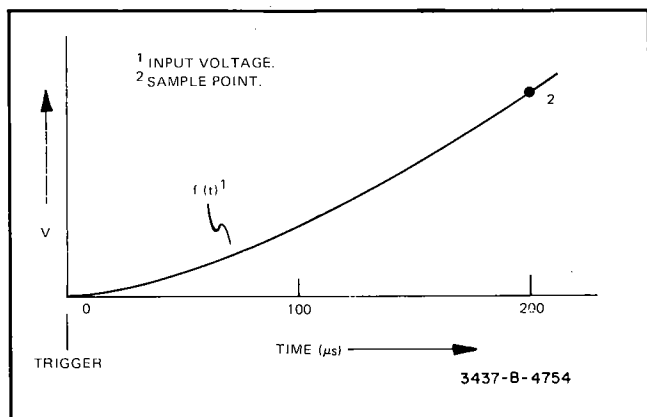


Figure 1-1. NRDGS = 1 DELAY = 200 μ s.

1-8. (Figure 1-1) 200 μ s after being triggered, the 3437A will sample and (after conversion) display the instantaneous value of the input voltage. If the 3437A is addressed to talk, the sampled input voltage will be output onto the HP-IB.

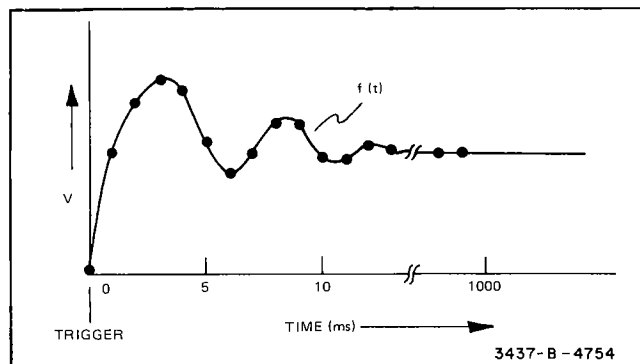


Figure 1-2. NRDGS = 1000 DELAY = 1 ms.

1-9. (Figure 1-2) When triggered, the 3437A will sample the input voltage 1000 times at 1 ms intervals. Between samples, the instantaneous value of the sampled input voltage is converted and output onto the HP-IB.

1-10. The Binary Program mode provides a means of programming the 3437A using an abbreviated program code. When interrogated in the Binary Program mode. The 3437A responds by writing 7 bytes (completely describing the programmed state of the instrument) onto the HP-IB. The controller can use these 7 bytes as an abbreviated program code to reprogram the 3437A to its previous configuration.

1-11. Model 3437A applications include:

- a. Fast multipoint data-acquisition.
- b. Repetitive-waveform analysis.
- c. Low frequency transient characterization.
- d. Low frequency True RMS measurements.

1-12. SPECIFICATIONS.

1-13. Instrument specifications are listed in Table 1-1. These specifications are the performance standards or limits against which the instrument is tested. Any change in the specifications due to manufacturing, design, or traceability to the U.S. National Bureau of Standards will be covered by revised pages, a change sheet, or both, to this manual. Addi-

Table 1-1. Specifications.

VOLTAGE MEASUREMENT CHARACTERISTICS.				Accuracy	
Range	Bandwidth (3dB)		Display*	± 0.008% Delay + Delay offset	
10 Volt	1.0 MHz	± 19.98 (max)	± 99.99 (ovrld)	Repeatability (Jitter)	
1 Volt	1.1 MHz	± 1.998	± 9.999	For NRDGS equal to 0 or 1	
.1 Volt	40 kHz	± .1998	± .9999	Delay	
Static Accuracy (90 days, 23°C ± 5°C)				Jitter	
10 Volt Range		± 0.05% of Reading	± 1.6 Digits	0 or 100 ns	2 ns
1 Volt Range		± 0.03% of Reading	± 1.6 Digits	200 ns to 50 ms	10 ns + .002% of Delay
.1 Volt Range		± 0.06% of Reading	± 1.8 Digits	> 50 ms	110 ns
Static Accuracy (1 year, 23°C ± 5°C)				NUMBER OF READINGS. (For each trigger received.)	
10 Volt Range		± 0.05% of Reading	± 2.0 Digits	From 0 to 9999	
1 Volt Range		± 0.03% of Reading	± 2.0 Digits	INPUT CHARACTERISTICS.	
.1 Volt Range		± 0.06% of Reading	± 2.2 Digits	Input Impedance	
Static Accuracy Temperature Coefficient (0°C to 50°C)				Range	
± 0.002% reading/°C ± 0.05 digits/°C				Impedance	
Dynamic Accuracy				10 Volt 1 MΩ (± 20%) < 75 pF	
Range	Step Input	mV within Final Value		1 Volt > 10 ⁸ Ω < 75 pF	
10 Volt	10 V	± 200 mV		.1 Volt > 10 ⁸ Ω < 75 pF	
10 Volt	10 V	± 30 mV		Maximum Input Voltage (All ranges)	
1 Volt	1 V	± 20 mV		HI to LO < ± 30 V Peak	
1 Volt	1 V	± 3 mV		LO to CHASSIS < ± 42 V Peak	
.1 Volt	.1 V	± 200 μV		PROGRAMMABILITY.	
DELAY CHARACTERISTICS.				(In accordance with IEEE - 488-1975)	
Delay				AH1 Acceptor PP0 Parallel Poll	
For NRDGS equal to 0 or 1				C0 Controller RL1 Remote/Local	
0 to .9999999 sec in 100 ns steps				DC1 Device Clear SR1 Service Request	
For NRDGS > 1				DT1 Device Trigger SH1 Source	
Data Format	Delay between readings			L4 Listener T5 Talker	
ASCII	277.8 μs to .9999999 sec			COMMON MODE REJECTION RATIO.	
Packed	175.4 μs to .9999999 sec			≥ 75 dB (1 kΩ unbalance in low input lead at 60 Hz)	
Offset (actual delay with 0 delay programmed)					
100 ns ± 25 ns					

*Display will indicate overload if input is unterminated (.1 volt range).

Table 1-2. Supplemental Characteristics.

MAXIMUM READING RATE. ¹		Operating Temperature	
ASCII	3600 Readings per second	0°C to 50°C	
Packed	5700 Readings per second	Storage Temperature	
¹ Actual reading rate is given by:		-40°C to 75°C	
ASCII	$\frac{3600 \times 7 \text{ Byte Listen Rate}}{3600 + 7 \text{ Byte Listen Rate}}$	Humidity Range	
Packed	$\frac{5700 \times 2 \text{ Byte Listen Rate}}{5700 + 2 \text{ Byte Listen Rate}}$	< 95% RH (0°C to 40°C)	
Where Listen Rate = Data acceptance rate of listener		Dimensions	
GENERAL.		212.7 mm wide x 88.9 mm high x 527.1 mm deep	
Power Requirements		Weight	
100 V, 120 V, 220 V, 240 V (+ 5% -10%, 48-440 Hz)		Net 5.6 kg	
≤ 42 VA		Shipping 7.6 kg	
		Model Number and Name	
		3437A System Voltmeter	