

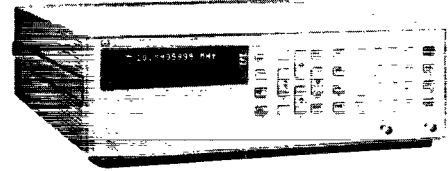


## Synthesizers

Synthesizers provide sinewaves with the focus on a very high frequency stability and excellent level accuracy. You can choose among different output impedances. The HP 3335A generates sinewaves up to 81 MHz and the HP 3336A/B/C has modulation capabilities.

## Synthesized Function Generators

Synthesized function generators combine the frequency stability of a synthesizer with the feature set of the function generator. The HP 3324A has good synthesizer performance and versatile sweep modes that are phase continuous over the full frequency range. In addition, the HP 3325B provides various modulation capabilities and excellent synthesizer performance. The HP 3326A plays a special part because of its two channels, which can be combined in various ways to produce two-tone signals or calibrated two-phase signals.



## Which Function Generator Do You Need?

HP's function generators and synthesizers are the best solution for most applications. The tables shown on these two pages will help you determine the right one for your application. The instruments are split into categories, depending on their main specifications. For an explanation of the instrument's full range of capabilities, see the following information.

## HP Function Generators Summary II

HP Models	SYNTHESIZED FUNCTION GENERATORS			SYNTHESIZERS	
	3324A	3325B	3326A	3335A	3336A/B/C
Sinewave					
Min. Frequency	1 mHz	1 $\mu$ Hz	DC	200 Hz	10 Hz
Max. Frequency	21 MHz	21 MHz	13 MHz	81 MHz	21 MHz
Frequ. Stability	10 <sup>-7</sup> /month	10 <sup>-7</sup> /month	10 <sup>-7</sup> /month	10 <sup>-6</sup> /day	1.5x10 <sup>-6</sup> /day
Frequ. Resolution	1 mHz	1 $\mu$ Hz	1 $\mu$ Hz	1 MHz	1 $\mu$ Hz
Waveforms					
Square	1 mHz to 11 MHz	1 $\mu$ Hz to 11 MHz	dc to 13 MHz		
Triange	1 mHz to 11 kHz	1 $\mu$ Hz to 11 kHz			
Ramp	1 mHz to 11 kHz	1 $\mu$ Hz to 11 kHz			
Pulse			dc to 13 MHz		
Modulation					
AM		int/ext	int/ext		ext
FM					
PM		int/ext	int/ext		ext
PWM			ext		
Sweep					
Lin.	int	int	int	int	int
Log.	int	int			
Discrete	int	int	int		
VCO					
Level Range - 50 $\Omega$	10 V (p-p)	10 V (p-p)	10 V (p-p)	- 87 to + 13 dBm	- 71 to + 8 dBm
Level Resolution	4 digits	4 digits	4 digits	0.01 dB	0.001 dB
Level Accuracy	$\pm$ 0.9 dB	$\pm$ 0.9 dB	$\pm$ 1.0 dB	$\pm$ 0.1 dB	$\pm$ 0.08 dB
DC Offset-50 $\Omega$	$\pm$ 5 V	$\pm$ 5 V	$\pm$ 5 V		
Output impedance- $\Omega$	50	50	50	50/75/124/ 135	50/75/124/ 135/150/600
Spurious	- 55 dBc	- 70 dBc	- 70 dBc	- 75 dBc	- 70 dBc
Phase noise	- 50 dBc	- 60 dBc	- 66 dBc	- 58 to - 70 dBc	- 64 dBc
Notes	60 MHz TTL clock, multi-interval and multi-marker sweep	Modulation source can be used separately	2 channels, two-tone and two phase signals		
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## Broad Application Range

If your applications involve a large variety of measurements, one of HP's standard function generators is the right solution.

## Simulating Real Life Signals

HP's Arbitrary Function Generators are dedicated for the simulation of real-life signals, ranging from disk drive or video test signals to mechanical vibration simulation. Applications such as VOR, FM stereo, and communications signalling are covered by the Multifunction Synthesizer HP 8904A.

## Versatility and Speed

Many applications require standard waveforms over the full frequency range up to 50 MHz and with versatile operating modes. These requirements can be fulfilled with the HP 8116A and HP 8165A. The HP 8165A can be recommended especially for those applications requiring 50 MHz in conjunction with good frequency stability.

## Highly Accurate Reference Sources

Applications such as PLL-testing, calibration of measurement instruments, and testing of Frequency Division Multiplex equipment are ideally suited for HP's synthesizers. The very stable frequency source and the excellent level accuracy make these synthesizers the right choice if a reference source is required.

## Accuracy and Versatility

Synthesized function generators are for those applications that require a combination of an accurate frequency source and a versatile function generator. Sweeping over the entire frequency range without any phase discontinuity makes these generators ideal for such applications as simulation of rotation signals and filter testing. Even the calibration of phase measuring instruments is possible by programming a certain phase offset between two generators or using the HP 3326A's two outputs.