16 MHz Arbitrary Function Generator
AFG310 • AFG320

**Features and Benefits**
- Two Functions in One Instrument
  - Function Generator
  - Arbitrary Waveform Generator
- AFG320 Offers Two Independent Channels
- Load Waveforms Directly from any Tektronix Digital Oscilloscope via the GPIB Interface
- Windows-based WaveWriter™ Waveform Editing Software Package Included for Convenient Creation and Editing of Arbitrary Waveforms
- All Functions Including Waveform Creation and Editing Accessible via the Front Panel
- Optional Rack Mount Kit for System Applications

**Applications**
- Design and Test
- Automotive
- Industrial
- Biomedical
- Sensor Simulation
- Manufacturing Test

**AFG310/320 FUNCTION GENERATOR**
The AFG300 Series is an excellent 16 MHz function generator with built-in arbitrary waveform capabilities. The instruments support standard waveforms including sine, square, triangle, ramp, pulse, DC, and noise. In addition, it has a frequency sweep function and three operating modes: Continuous, Triggered, and Burst.

**ARBITRARY WAVEFORM GENERATION**
With a sampling rate of 16 MS/s, 12-bits vertical resolution, and a non-volatile memory that holds four 16,384-point waveforms, the AFG300 Series are powerful tools for simulating complex waveforms. Waveshapes can be downloaded directly from a Tektronix DSO, created with the included WaveWriter™ for Windows waveform editing software package, or entered via the front panel.

**WAVEFORM IMPORT FUNCTION**
The AFG300 Series supports waveform import function to receive waveforms from Tektronix DSOs (TDS Series and 2400 Series) and arbitrary waveform generators (AWG 2000 Series and AFG 2000 Series) via GPIB. This capability makes the AFG300 Series perfect accessories for Tektronix DSOs.

**Output Channels**
AFG310: 1.
AFG320: 2.

**Standard Waveforms**
- Sine, square, triangle, ramp, pulse, DC, and Noise.

**Arbitrary Waveforms**
- Waveform Length: 10 to 16384 points.
- Vertical Resolution: 12 bits.
- Sample Rate: 16 MS/s.
- Non-volatile Memory: Four 16 K waveforms.

**Output Frequency**
- Sine, Square: 0.01 Hz to 16 MHz.
- Triangle, Ramp: 0.01 Hz to 100 kHz.
- Noise (Gaussian): Maximum 8 MHz bandwidth
- Arbitrary Waveform:
  - Repetition rate: 0.01 Hz to 1.6 MHz
  - Resolution: 7 digits.
  - Accuracy: 50 ppm

**AFG300 Series**
AFG300 Series are powerful tools for simulating complex waveforms. Waveshapes can be downloaded directly from a Tektronix DSO, created with the included WaveWriter™ for Windows waveform editing software package, or entered via the front panel.

**WAVEFORM CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Output Characteristics</th>
<th>Amplitude (into 50 Ω): 50 mV&lt;sub&gt;p-p&lt;/sub&gt; to 10 V&lt;sub&gt;p-p&lt;/sub&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Accuracy: ±(1% of setting + 5 mV) at 1 kHz, no offset.</td>
</tr>
<tr>
<td></td>
<td>Flatness (at 1 V amplitude relative to 1 kHz):</td>
</tr>
<tr>
<td></td>
<td>&lt;100 kHz: ±1%.</td>
</tr>
<tr>
<td></td>
<td>100 kHz to 1 MHz: ±1.5%.</td>
</tr>
<tr>
<td></td>
<td>1 MHz to 16 MHz: ±3%.</td>
</tr>
<tr>
<td>Offset (into 50 Ω):</td>
<td>505 mV&lt;sub&gt;p-p&lt;/sub&gt; to 10 V&lt;sub&gt;p-p&lt;/sub&gt; amplitude: peak amplitude + offset is limited to +5V or -5V.</td>
</tr>
<tr>
<td></td>
<td>50 mV&lt;sub&gt;p-p&lt;/sub&gt; to 500 mV&lt;sub&gt;p-p&lt;/sub&gt; amplitude: -0.75 V to +0.75 V.</td>
</tr>
<tr>
<td></td>
<td>Accuracy: ±(1% of setting + 5 mV).</td>
</tr>
<tr>
<td>Resolution: 5 mV.</td>
<td>Resolution: 7 digits.</td>
</tr>
<tr>
<td>Output Impedance: 50 Ω.</td>
<td>Resolution: 1 degree.</td>
</tr>
<tr>
<td>Isolation:</td>
<td>42 V peak maximum relative to earth ground.</td>
</tr>
<tr>
<td></td>
<td>Phase: Range: ±360 degrees.</td>
</tr>
<tr>
<td></td>
<td>Resolution: 1 degree.</td>
</tr>
</tbody>
</table>

Certified for CE Marking.

Product(s) complies with IEEE Standard 488.1-1987, and with Tektronix Standard Codes and Formats.

See Tektronix on the World Wide Web: http://www.tek.com

Tektronix Measurement products are manufactured in ISO registered facilities.
16 MHz Arbitrary Function Generator
AFG310 • AFG320

CHARACTERISTICS (CONT'D)

Sine Wave Spectral Purity –
Harmonic Distortion:
DC to 20 Hz: –70 dBc.
20 Hz to 100 kHz: –60 dBc.
100 kHz to 1 MHz: –45 dBc.
1 MHz to 16 MHz: –35 dBc.
Total Harmonic Distortion:
20 kHz: 0.09% at 1 V amplitude.

Signal Characteristics –
Square:
Rise/Fall Time: ≤20 ns.
Overshoot: <2%.
Pulse:
Rise/Fall Time: <100 ns.
Duty Cycle: 1% to 99% of period.
Triangle, Ramp Pulse, Arbitrary:
Jitter: 2 ns at 100 kHz.

Modulation –
AM:
Source: External only.
Carrier: Up to 16 MHz.
Modulation: Any internal waveform plus Arb.
Frequency: DC to 20 kHz.
Depth:
1 V: 100%.
0 V: 0%.
–1 V: 0%.
2 Vp-p, for 100% modulation.
FM:
Source: Internal only.
Modulation: Sine, Square, Triangle, Arb.
Frequency: 0.01 Hz to 10 kHz.
Deviation: 0.01 Hz to 8 MHz.
FSK (frequency shift keying):
Source: Internal only.
Mode: Trigger, Burst.
Frequency range: 0.01 Hz to 16 MHz.
Key rate: 0.01 Hz to 50 kHz.
Number of keys: 2.

Frequency Sweep –
Type: Linear or logarithmic.
Direction: Up or down.
Start/Stop Frequency: 0.01 Hz to 16 MHz.
Time: 1 ms to 100 s.
Mode: Continuous, Trigger, Burst.

Operating Mode –
Continuous: The selected waveform is output continuously.
Triggered: One period of the selected waveform is output each time a trigger occurs.

Burst: The selected waveform is output with a specified number of cycles each time a trigger occurs.
Carrier frequency: Up to 16 MHz.
Count: 1 to 60,000 cycles/burst (100 s maximum except sine wave or square wave) or infinite.
Start phase: –360 to +360 degrees.

External AM modulation:
Sync Output: TTL level.
External AM modulation: 2 Vp-p = 100% modulation.
10 kHz input impedance.

GPIB Interface (IEEE 488.2).

AFG310  •  AFG320

16 MHz Arbitrary Function Generator

Includes:
Calibration Data Report - Opt. D1
RECOMMENDED ACCESSORIES

AFG310
Single-channel Programmable Arbitrary Function Generator.

AFG320
Dual-channel Programmable Arbitrary Function Generator.

For further information, contact Tektronix:

World Wide Web: http://www.tek.com; ASEAN Countries (65) 356-3900; Australia & New Zealand 61 (2) 9888-0100; Austria, Eastern Europe, & Middle East +43 2236 8000 0; Belgium +32 (2) 715.89.70;
Brazil and South America (51) 3741-8360; Canada 1 (800) 661-5625; Denmark +45 (44) 850 700; Finland +358 (9) 4783 400; France & North Africa +33 1 69 86 81 81; Germany +49 (221) 94 77 400;
Hong Kong (852) 2585-6999; India (91) 85-2275577; Italy +39 2 25086 501; Japan (SonyTektronix Corporation) 81 (3) 3448-3111; Mexico, Central America, & Caribbean 52 (5) 666-6332;
The Netherlands +31 25 56 65555; Norway +47 22 07 07 00; People’s Republic of China (91) 6256 1230; Republic of Korea 52 (2) 539-5299; South Africa (27 11)651-5220; Spain & Portugal +34 (91) 372 6000;
Sweden +46 (8) 477 65 00; Switzerland +41 (41) 729 36 40; Taiwan 886 (2) 2722-9622; United Kingdom & Ire +44(0)1682 403000; USA 1 (800) 426-2200.

From other areas, contact: Tektronix, Inc. Export Sales, P.O. Box 500, M/S 50-255, Beaverton, Oregon 97077-0001, USA 1 (503) 627-6877.

Copyright © 1998, Tektronix, Inc. All rights reserved. Tektronix products are covered by U.S. and foreign patents, issued and pending. Information in this publication supersedes that in all previously published material. Specification and price change privileges reserved. TEKTRONIX and Tek are registered trademarks of Tektronix, Inc. All other trade names referenced are the service marks, trademarks, or registered trademarks of their respective companies.

ORDERING INFORMATION

AFG310
Single-channel Programmable Arbitrary Function Generator.

AFG320
Dual-channel Programmable Arbitrary Function Generator.

INTERNATIONAL POWER PLUG OPTIONS
Opt A1 to A5.

TEKTRONIX MEASUREMENT SERVICE
Tektronix CAL and REP Service programs allow you to pre-purchase genuine Return to Tektronix Service. Ask your Distributor for details.

For further information, contact Tektronix:

World Wide Web: http://www.tek.com; ASEAN Countries (65) 356-3900; Australia & New Zealand 61 (2) 9888-0100; Austria, Eastern Europe, & Middle East +43 2236 8002 0; Belgium +32 (2) 715.89.70;
Brazil and South America (51) 3741-8360; Canada 1 (800) 661-5625; Denmark +45 (44) 850 700; Finland +358 (9) 4783 400; France & North Africa +33 1 69 86 81 81; Germany +49 (221) 94 77 400;
Hong Kong (852) 2585-6999; India (91) 85-2275577; Italy +39 2 25086 501; Japan (SonyTektronix Corporation) 81 (3) 3448-3111; Mexico, Central America, & Caribbean 52 (5) 666-6332;
The Netherlands +31 25 56 65555; Norway +47 22 07 07 00; People’s Republic of China (91) 6256 1230; Republic of Korea 52 (2) 539-5299; South Africa (27 11)651-5220; Spain & Portugal +34 (91) 372 6000;
Sweden +46 (8) 477 65 00; Switzerland +41 (41) 729 36 40; Taiwan 886 (2) 2722-9622; United Kingdom & Ire +44(0)1682 403000; USA 1 (800) 426-2200.

From other areas, contact: Tektronix, Inc. Export Sales, P.O. Box 500, M/S 50-255, Beaverton, Oregon 97077-0001, USA 1 (503) 627-6877.

Copyright © 1998, Tektronix, Inc. All rights reserved. Tektronix products are covered by U.S. and foreign patents, issued and pending. Information in this publication supersedes that in all previously published material. Specification and price change privileges reserved. TEKTRONIX and Tek are registered trademarks of Tektronix, Inc. All other trade names referenced are the service marks, trademarks, or registered trademarks of their respective companies.

8/98  ES06S  788-12019-2  © Tektronix, Inc.  A r b i t r a r y  F u n c t i o n  G e n e r a t o r s