SYSTRON DONNER
Member THORN EMI Group

1626B

INSTRUMENT DIVISION

UNIVERSAL MICROWAVE FREQUENCY SYNTHESIZER TEST SYSTEM

A multi-function microwave frequency synthesizer, sweeper, power meter and pulsed rf signal source all in one portable instrument

Features

- **0.1 GHz to 26 GHz Frequency Range**
- **1 MHz Resolution over Full Range**
- **±1dB Output Level Flatness to 18 GHz**
- **Output Power +5dBm with 99dB of attenuation**
- **Built-in Digital Display Power Meter**
- **Internal Sweep Generation**
- **Internal Pulse Modulation**
- **GPIB Interface**
- **MIL-T-28800 Construction**

Applications

- **Communications Receiver Alignment and Calibration**
- **Radar Systems Test and Alignment**
- **EW/ECM Simulation**
- **Microwave Component Characterization**
- **Broadband Benchtop Signal Source**
- **Metrology Labs**
- **Stable L.O. Applications**
- **ATE System Building Block**

TECHNOLOGY THAT REFLECTS THE FUTURE

Introduction

Systron Donner now offers state-of-the-art performance in broadband synthesis to 26 GHz. In response to the ever-increasing demand for microwave test instrumentation featuring higher frequencies and greater capability, the Model 1626B synthesizes precise frequencies from 0.1 to 26 GHz while providing external power measurement, digital sweep and remote programming capability.

The 1626B employs advanced thin film technology developed at Systron Donner to achieve an indirect synthesis technique which provides optimal performance in a single 5¼ inch rack mounted chassis.

The external power measurement feature, coupled with digital sweep, enables broadband frequency characterization of microwave components as well as complex microwave systems and sub-systems. The addition of pulse modulation featuring superior pulse waveform characteristics transforms the 1626B into an advanced EW, radar test, calibration and simulation source.

A versatile IEEE-488 interface is provided for the remote control of frequency, sweep range, sweep rate, and output level control over an 11 dB range using 1.0dB increments, thus making the 1626B a state-of-the-art building block for ATE applications.

The 1626 is a reliable performer in numerous U.S. Government field applications and now sets the standard for advanced microwave synthesizer test equipment.

Description

The Model 1626B Microwave Synthesized test set is a portable, self-contained 0.1 to 26.0 GHz synthesized signal source with full generator capabiliites. The microwave output may be swept, leveled, attenuated, modulated, and phase locked to an internal or external 1 MHz reference. Both the frequency and power level of the output signal are continuously displayed on a built-in digital frequency meter and digital power meter. All controls, inputs, outputs and displays, with the exception of the power cord, line fuses, remote programming connector, address switches and pen lift, are accessed from the front panel.

RF Output

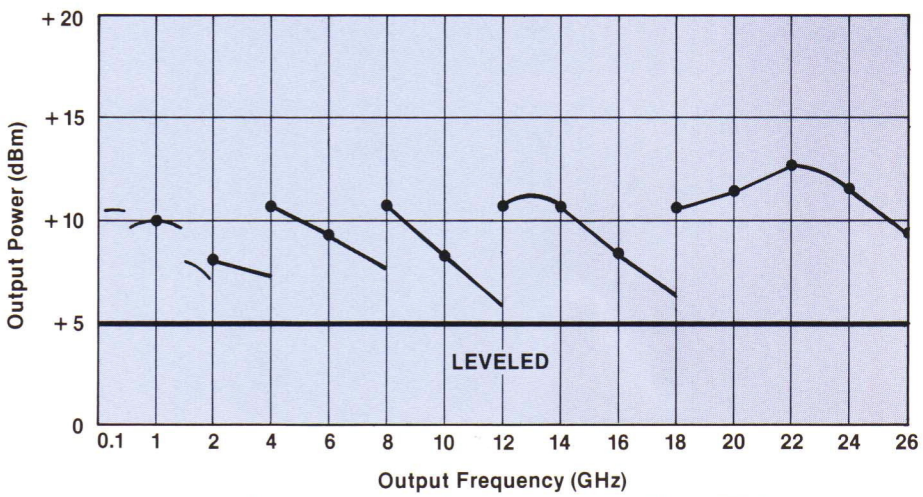
The output frequency is settable from 0.1 to 26 GHz in 1 MHz steps with CW/START, GHz leverwheel switches on the front panel.

Sweep Control

The output rf may be swept upward 10 MHz to 9.999 GHz from a fixed CW/START, GHz frequency by setting the ΔF, GHz leverwheel switches from 0.010 to 9.999 GHz. The two sweep rates, 1 kHz or .1 kHz are selected with two front-panel pushbuttons. A momentary pushbutton is also provided for manually incrementing the CW/START, GHz frequency in single 1 MHz steps. Another momentary pushbutton manually resets the sweep back to the CW/START, GHz frequency. The SWEEP OUT BNC connector on the front panel supplies a 0 to 10V ramp for controlling external devices.

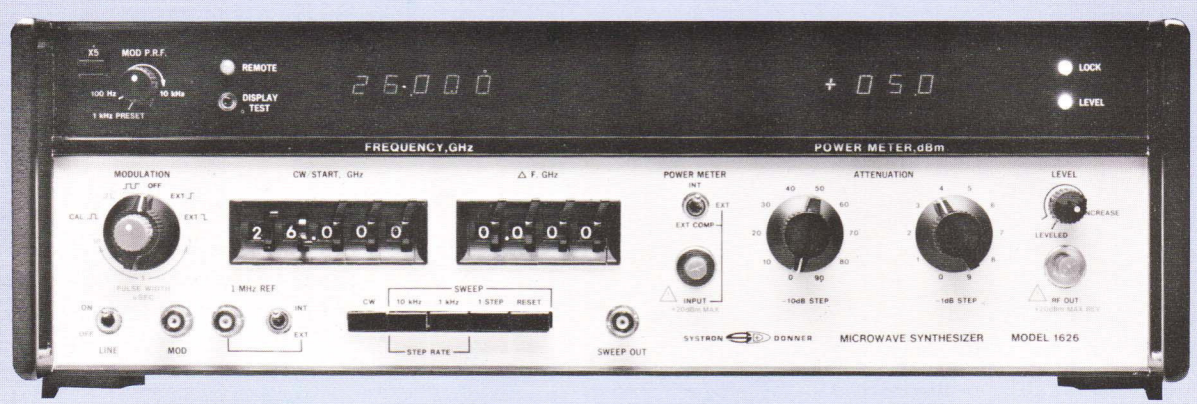
Output Level, Power Meter

A built-in microwave digital power meter continuously displays the rf output level in dBm. The INT full display range is +19 to −99 dBm. This meter will also measure the power of an external



Maximum power output typically available at 25°C

Front Panel Controls, Indicators and Connectors



microwave source from +10 to −30 dBm. Attenuation of the output is provided by two decade step attenuators: these 10 to 90 dB and 0 to 9 dB attenuators provide a full 0 to 99 dB attenuation range. A LEVEL vernier control provides a leveled +5 dBm rf reference output. This control also provides unleveled 0 to 10 dB continuous overrange up to the maximum available output.

Spectral Purity

The 1626B optimizes frequency stability and spectral purity. Systron Donner's patented (U.S. Patent No. 3,895,312) synthesis techniques offer the lowest possible fractional frequency deviation and optimum phase noise characteristics without overly complex circuitry. Internal filtering obtains exceptionally low harmonics. Harmonics, subharmonics and spurious signals are specified at −55 dBc.

Pulse Modulation

Model 1626B may be pulse modulated both internally and externally. Two types of internal pulse modulation may be selected: square wave or pulse. The 1 kHz square wave modulation provides rf bursts at 50% duty cycle. The pulse modulation provides a variable duration rf burst from 0.1 to 10 μs.

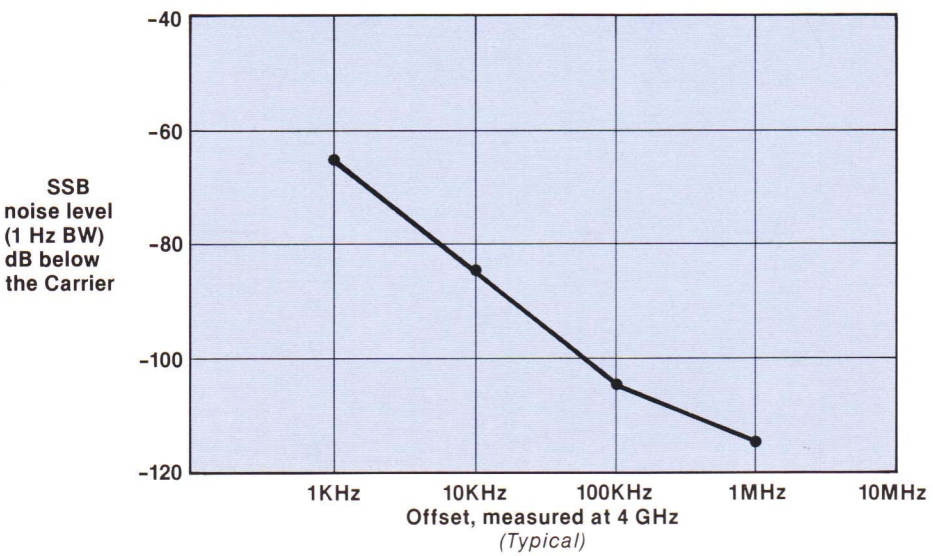
The pulse modulation may be removed by selecting OFF. An external sync TTL output signal is provided on the MOD input BNC connector when using internal modulation. When external modulation is selected, the MOD input BNC connector accepts an external TTL-compatible modulation signal, either leading- or trailing-edge triggered.

Reference

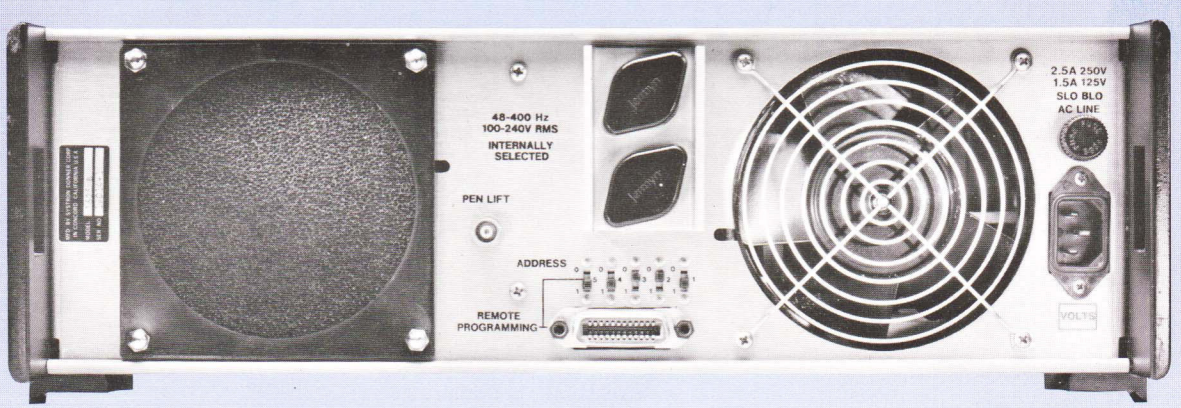
The internal 1 MHz reference is available on the 1 MHz REF BNC as an output when INT is selected and the same BNC will accept an external 1 MHz signal as a reference input for the synthesizer when EXT is selected.

Programmability

The Model 1626B may be remotely operated using the installed General Purpose Interface Bus (GPIB). This interface permits remote operation of the 1626B from a data bus that conforms to IEEE Std 488-1978. With the exception of the 10 dB attenuator, MOD PRF and pulse width vernier, all front panel functions are programmable, thus making the 1626B ideal for ATE systems applications.



Rear Panel Controls and Connectors



SPECIFICATIONS

Frequency

FREQUENCY RANGE: 100 MHz to 26 GHz.
FREQUENCY RESOLUTION: 1 MHz.
FREQUENCY AGING RATE: 1 ppm/year.
REFERENCE OUTPUT: 1 MHz, 2 V p-p into 50Ω.
EXTERNAL REFERENCE INPUT: 1 MHz, 1 V rms.
RESIDUAL FM: ≤1 kHz or 0.0001% of frequency, p-p (30Hz to 10 kHz bw).
SWITCHING TIME: In band, <25ms, cross band <50ms.

Spectral Purity

HARMONICS AND SUBHARMONICS: < −50 dBc.
SPURIOUS (Nonharmonically Related): < −50 dBc at >10 kHz offset.

RF Output

OUTPUT LEVEL: (15° C to 35° C)
+5 dBm leveled, ≥ +5 dBm typical unleveled.
LEVELING ACCURACY:
±1 dBm, 0.1 to 18 GHz.
±2 dBm below 60 dB step
±2 dBm, 18 to 26 GHz.
±2.5 dBm below 60 dB step
OUTPUT LEVEL DISPLAY: 3½ digit LED display, 0.1 dB resolution.
+19 dBm to −99 dBm.
OUTPUT ATTENUATOR: 90 dB in 10 dB steps; 9 dB, in 1 dB steps.
LEVEL ADJUST: 0 to 10 dB continuous overrange control up to maximum available power.
OUTPUT CONNECTOR: WPM-3 (SMA compatible).
OUTPUT IMPEDANCE: 50Ω nominal.

Power Measurement

FREQUENCY RANGE: 100 MHz to 26 GHz.
INPUT LEVEL: +10dBm to −30 dBm.
MEASUREMENT DISPLAY: 3½ digit LED display 0.1 dB resolution.
INPUT CONNECTOR: WPM-3 (SMA compatible).
INPUT IMPEDANCE: 50 Ω nominal.
ACCURACY:
±1.5 dB, +10 dBm to −10 dBm
±2 dB, −10 dBm to −30 dBm.

Sweep

RANGE: Minimum 10 MHz, maximum 9.999 GHz, selectable in 1 MHz increments over full range (no band limits).
FREQUENCY STEP SIZE: 1 MHz.
STEP RATE: 1 kHz, 100 Hz or single step.
SWEEP OUT: 10 V ramp for any sweep width >10 MHz.
PEN LIFT: 1 V min., transisitor switched-to-ground during retrace.

Modulation

PULSE MODULATION INTERNAL RATE: Fixed 1 kHz and variable 100 Hz to 50 kHz.
DURATION: CAL pulse position, 1 μs calibrated; or variable pulse width, 0.1 μs to 10 μs.
EXTERNAL INPUT: 100 Hz to 50 kHz prf, 0.1 μs min. pw, TTL levels.
SYNC OUTPUT: Modulation waveform, TTL levels.
ON/OFF RATIO: ≥30 dB.
RISE/FALL' ≤25 ns.
PULSE OVERSHOOT/UNDERSHOOT: 2 dB maximum, settles to within ±1 dB in 100 ns.

General

OPERATING TEMPERATURE RANGE: 0° to 50° C.
WEIGHT: 58 lbs (26.3 kgm).
DIMENSIONS: W × D × H; 16.75" (425 mm) × 24.25" (616 mm) × 5.25" (133 mm).
POWER: 100/115 and 200/230 V ac ±10%, 48 to 400 Hz, 250 W.
PROGRAMMABILITY: IEEE Std 488–1978 Interface. This provides remote control of frequency, sweep range, sweep rate, pulse/square-wave modulation, 1 dB step attenuator, and output level adjust.

Ordering Information

1626B, 0.1–26 GHz:
Option 18, deletes 18 to 26 GHz operation
075206, 6 ft SMA 26 GHz Cable
075208, 1.5 ft SMA 26 GHz Cable
075579, 6 ft Type N 18 GHz Cable
067834, Rack Mount Slide Assembly
075496, Equipment Carrying Case

Specifications subject to change without notice.

SDTMID004820016

SYSTRON DONNER INSTRUMENT DIVISION
Member THORN EMI Group
2727 Systron Drive
Concord, CA 94518
Tel 415/676-5000
TWX 910-481-9479