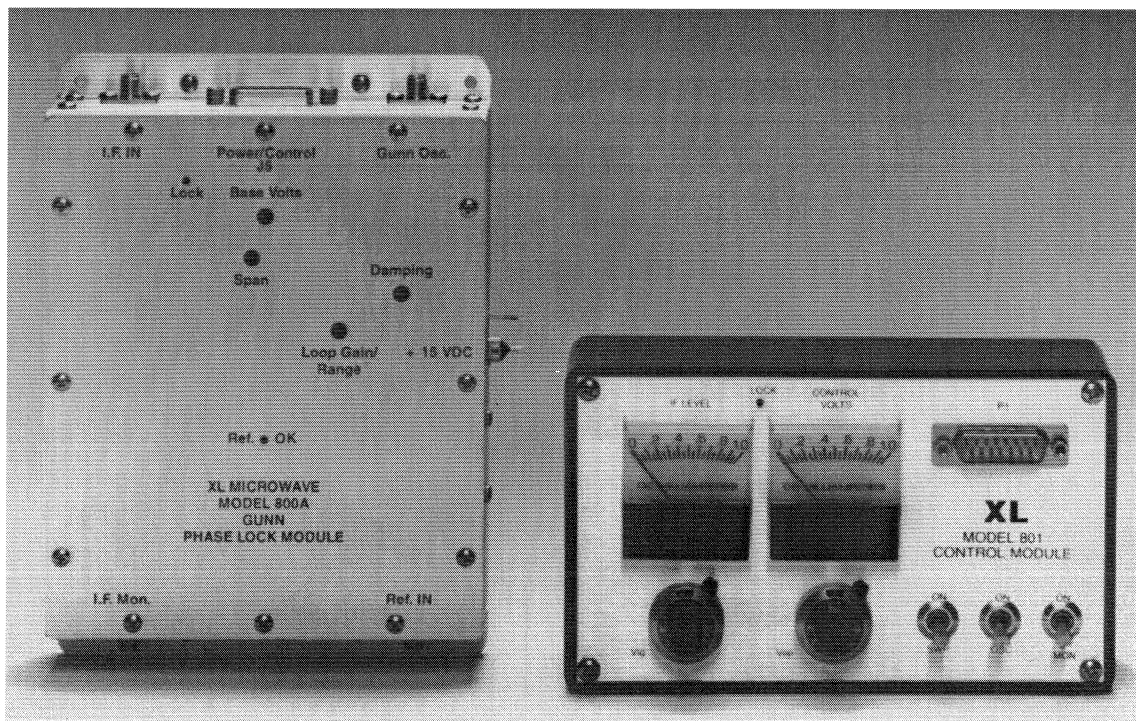


Model 800A

Gunn
Phase-Lock
Module

Model 801

Control Unit

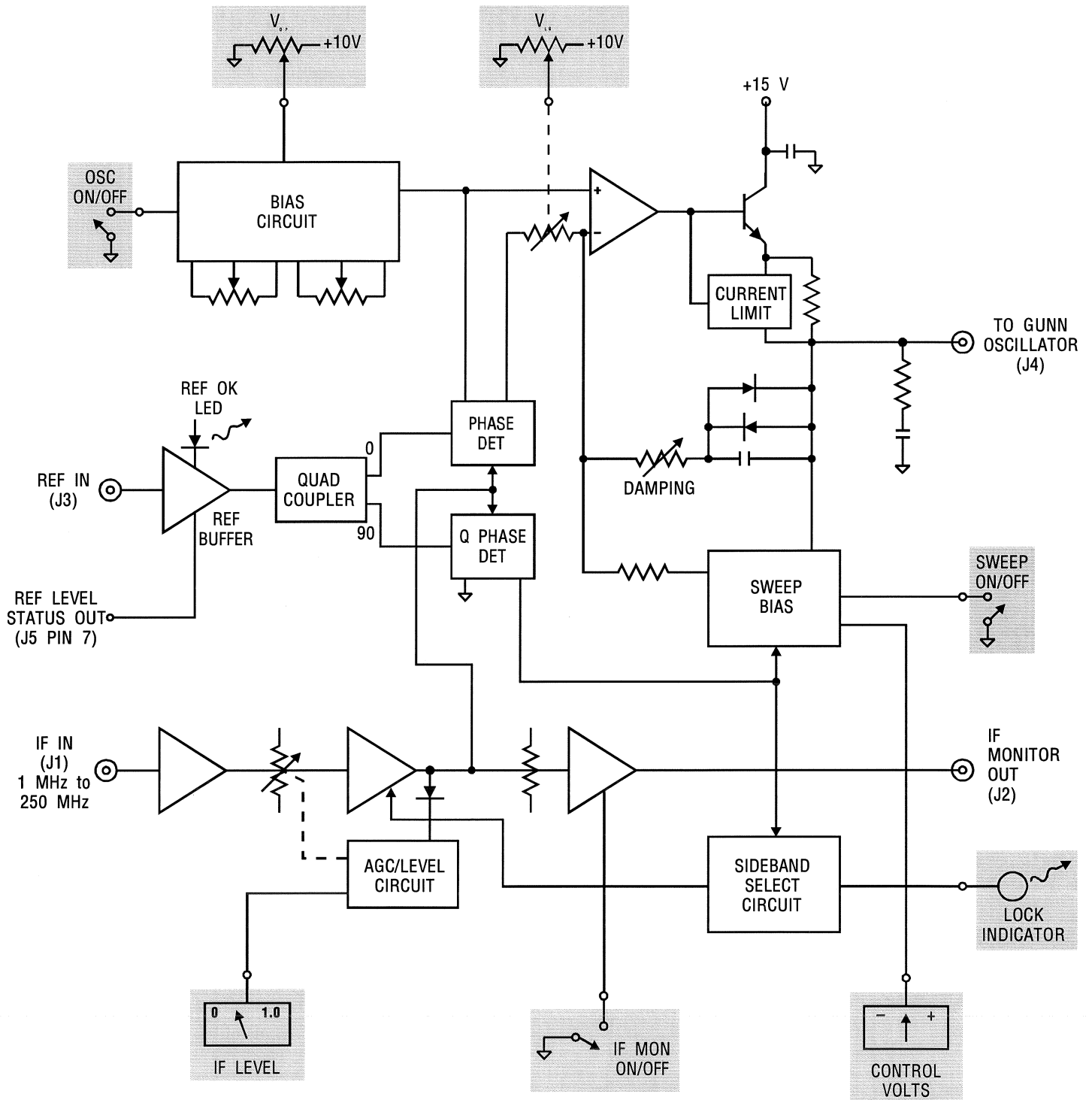


- Wideband, low-cost, millimeter Phase-Lock module
- Phase-Lock to your reference for maximum stability
- Modular design for reduced cost
- Automatic sideband select and locking indicator
- Power Regulator for driving Oscillator (included)
- RF control volts and IF Level Indicators (Model 801)

ISO 9001 CERTIFIED

pendulum
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Incorporating XL Microwave

Models 800A and 801 Block Diagram



NOTE: SHADED AREAS
INDICATE CIRCUITS
BUILT INTO MODEL 801
CONTROL UNIT

Models 800A and 801 Operation

The Model 800A Gunn Phase Lock Module contains the necessary circuitry to lock a Gunn Oscillator to the harmonic of a lower frequency reference (\pm offset) with high spectral purity and ease of use.

The Model 800A includes a bias circuit that sets the operating point of the Gunn Oscillator, thereby supplying power to the oscillator. The external control voltage (0 to 10 volts) is scaled to a range of 7.5 VDC to 10.5 VDC, (2.5 VDC to 5.5 VDC optional).

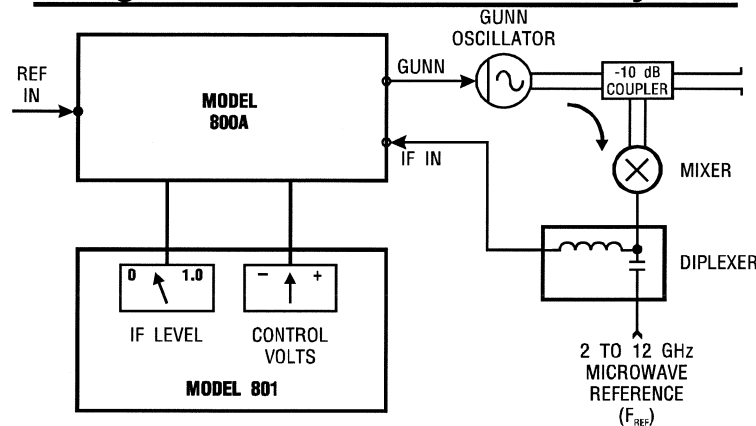
The reference frequency buffer amplifies and limits the input (10 MHz to 100 MHz) to drive the two phase detectors. It operates over the range of 0 dBm to +10 dBm. The IF amplifier covers the range of 1 MHz to 200 MHz and has a noise figure of approximately 4 dB. Locking can occur for an IF level of approximately -70 dBm or greater. This is the level at which the AGC circuit begins to operate and it is also the threshold of the IF level indicator. A separate buffer amplifier is supplied to monitor the IF signal on a spectrum analyzer.

The sweep bias circuit injects a current into the integrator amplifier in a manner that sweeps the operating voltage ± 0.4 volts above and below the nominal operating voltage that was set by the bias circuit. Since Gunn Oscillators typically have a voltage tuning characteristic, this sweeps the oscillator frequency back and forth.

If the IF frequency ($F_{OSC} - N * F_{REF}$) becomes equal to the reference frequency and the IF level is large enough, locking will occur. After lock, the sideband select circuit checks to see if the lock is on the proper sideband (nominally the upper sideband). If it is, the lock indicator is turned on. If it is the wrong sideband, the IF amplifier is turned off momentarily so that the sweep resumes.

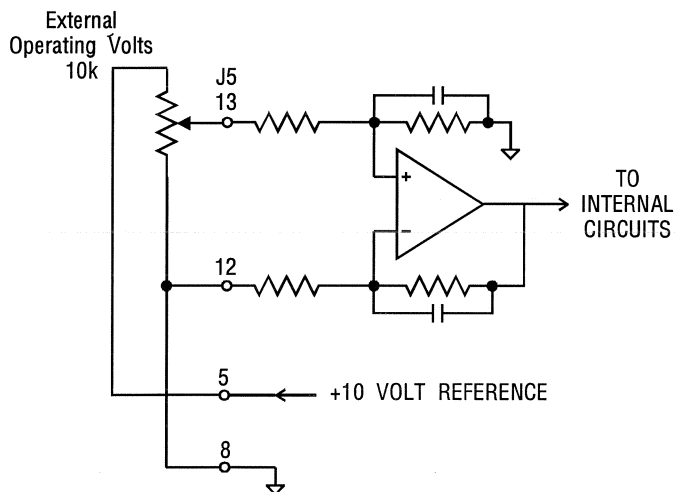
The Model 801 Control Unit is available to monitor and control the IF level, RF control voltage and on/off of the sweep, oscillator and IF monitor. The unit also has a lock monitor.

Using Models 800A and 801 in a System

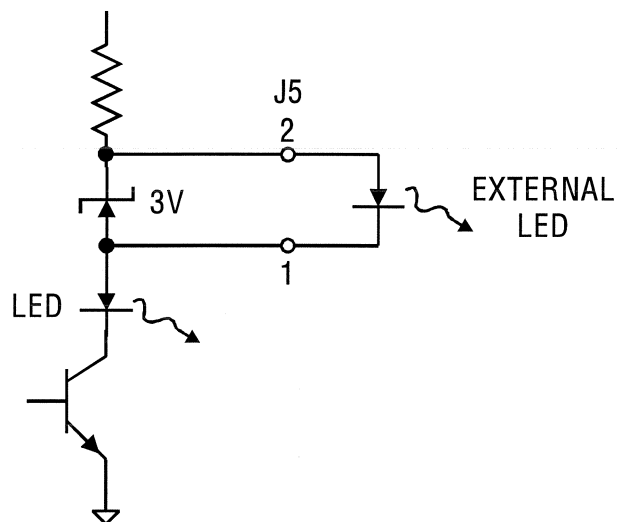


System Installation

The operating voltage and loop gain controls are controlled by a 0 to 10 volt reference voltage and are scaled internally.



The internal 10 volt reference may be used to control the 800A (or an external 0 to 10 volt signal may be used instead)...in either case, both of the differential amplifier inputs must be used. The common mode voltage on both inputs must be less than 10 volts. The status and control bits are TTL compatible, and an external LED Lock indicator may be wired to the unit as illustrated below.



Specifications

MODEL 800A GUNN PHASE LOCK MODULE:

IF IN (J1):	Control connector to Model 801 Control Unit or customer system. 1 MHz to 200 MHz, -70 dBm to -20 dBm. Impedance = 2Ω DC / $50\Omega \geq 1$ MHz.
IF MON OUT (J2):	1 MHz to 200 MHz (nominal -30 dBm). Noise Figure: 4 dB (typical).
REF IN (J3):	10 MHz to 100 MHz, 0 dBm to +10 dBm. Impedance = 50Ω AC / ∞ DC.
GUNN OUT (J4):	7.5 VDC to 10.5 VDC, 1.5 A to Gunn Oscillator (2.5 VDC to 5.5 VDC, optional).
+15 (IN):	Requires +15 VDC ± 1 V, 100 mA, plus Oscillator current (2 Amps max.).
DAMPING:	Adjusts transient response of phase-lock loop.
LOOP BANDWIDTH:	Approximately 1 MHz.
SPAN:	Adjusts range of voltage to Gunn Oscillator 7.5 VDC to 10.5 VDC (2.5 VDC to 5.5 VDC, optional).
BASE VOLTS:	Adjusts minimum oscillator voltage (setable from 2.5 VDC to 7.5 VDC).
WEIGHT:	23 oz. (652 g.).
SIZE:	7 in. x 5 in. x 1.5 in. (17.8 x 12.7 x 3.8) L x W x H (cm).
CHASSIS MOUNTING HOLE CENTERS:	6.375 in. x 4.5 in. (16.2 x 11.4) L x W (cm).

MODEL 801 CONTROL MODULE:

WEIGHT:	14 oz. (397 g.), not including cable.
SIZE:	6.25 in. x 3.75 in. x 2 in. (15.9 x 9.5 x 5.1) L x W x H (cm).
CABLE:	1-meter cable supplied.

SUPPLEMENTAL SPECIFICATIONS:

ISO 9001:	Pendulum's Quality System for design and manufacture of millimeter wave, microwave, and RF control, test and measurement equipment is registered and certified to ISO 9001:2000.
Montreal Protocol:	Nil Return.

Pendulum Instruments, Inc.
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