

Automatic Source-Locking Microwave Frequency Counter: The EIP 578.

The 578 provides fully automatic phase-locking of virtually any electrically tunable signal source to the same accuracy and long-term stability as the time-base oscillator in the counter.

EIP's 578 at a glance.

- ☐ Source Locking
 - Frequency range of 10 MHz to 26.5 GHz (110 GHz optional)
 - Resolution of 10 kHz
 - 200 msec phase lock time
- ☐ GPIB Standard
- ☐ Keyboard controlled frequency limit selection
- ☐ Power measurement to 0.1 dB resolution
- ☐ Power measurement accuracy to 0.5 dB, typical
- ☐ - 30 dBm sensitivity
- ☐ 10 watt (+ 40 dBm) damage protection
- ☐ 10 dB automatic amplitude discrimination
- ☐ 250 ms acquisition time
- ☐ Up to 400 MHz/sec tracking speed
- ☐ 20 MHz P-P FM tolerance up to a 10 MHz rate

The ability of EIP's 578 to accurately set and stabilize the frequency of nearly any frequency generator often eliminates the need for an expensive, synthesized signal generator or a single-function, stand-alone "lockbox". Source-locking operates in 10 kHz increments, from 10 MHz to the maximum operating range of the counter (26.5 GHz to 110 GHz). Over this range, the counter acts as a system controller, exercising broadband control in phase-locking the signal source to the desired frequency.

For signal sources which are not equipped with an external sweep input, phase locking is accomplished by using just the FM input. In this case, the source is tuned manually (or under GPIB control) to within 20 MHz of the desired frequency. From there, phase-locking is accomplished by the counter's phase-lock output.

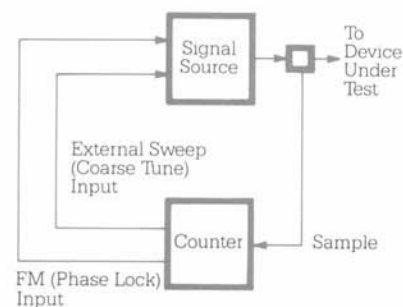
Automatic Broad-Band Tuning. Once the source and counter are connected as described above, operation is straightforward and automatic. The operator simply presses the "lock frequency" key and enters the desired frequency, to 10 kHz resolution, on the keyboard. The "GHz" or "MHz" terminator key completes the data



input and activates the counter to lock the signal source to the desired frequency. For example, if the signal source covers the range from 1 GHz to 26.5 GHz, and has both external sweep and FM inputs, the counter will automatically lock the source to any selected frequency within that entire range.

New Efficiency for GPIB-based System Integration. In a GPIB system, the 578 offers new efficiency in controller programming. First, the signal source does not need to be equipped with GPIB capability. Second, programming steps can be eliminated by letting the counter control the frequency directly over the entire microwave range. Third, a single command string to the counter locks the source. Since the counter does its own monitoring and correction, the controller needs not check the frequency or issue correction commands. The ability to rapidly step and lock the signal source also saves time, as indicated by these representative examples:

Frequency Step	Typical Lock Time
1 MHz	200 ms
10 MHz	300 ms
1 GHz	500 ms



Only three interconnections are required to coarse tune and phase-lock an electrically-tunable source:

1. Sample of source output.
2. External sweep (coarse tune) input.
3. FM (phase lock) input.

Frequency Storage & Recall Makes the 578 Ideal for

Production Testing. For repetitive tests, the operator does not need to set the desired frequency each time. Up to nine locking frequencies can be stored for easy recall. This also reduces the typical lock time to 300 ms for step sizes greater than 10 MHz.

