

# Micro 23

## 23 GHz Stability Rebuild

Providing Microwave Technology Solutions

Microwave Advances has developed phase-lock loop designs that will allow new and existing 23 GHz microwave transmitters to meet recent changes to the FCC stability standards. Existing licensees and new applications in the TV broadcast, cable, common carrier, public safety, and other qualified fields operating in the 21 to 23 frequency band will be exposed to tighter FCC frequency tolerances. The new Micro 23 will meet or exceed video, data, or digital traffic performance of the original unit.

### Micro 23

23 GHz Stability Rebuild

A phase-lock loop designed to meet 23 GHz FCC stability standards

#### Features:

- Rock solid frequency stability to 0.001% from previous 0.03%
- Cost includes incidental and minor repairs necessary when troubleshooting and repairing the unit including the option of purchasing more significant repairs while the unit is being rebuilt

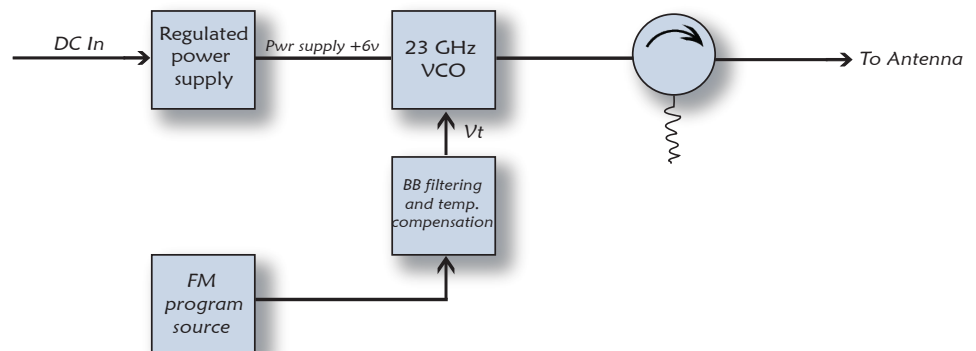
#### Benefits:

- System-wide compliance at a much lower cost
- Eliminates need to purchase entire new microwave systems
- Eliminates drift and meets new channel requirements

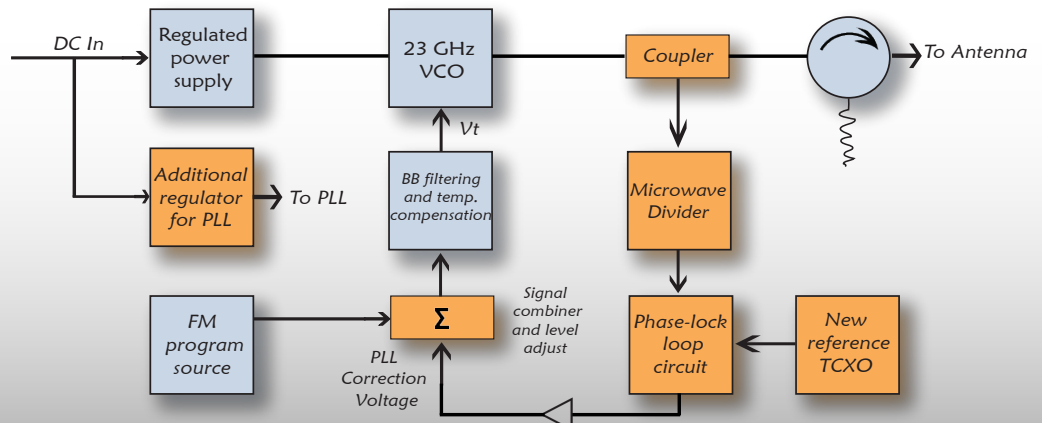
#### Applications:

- Existing licensees and pending applicants authorized prior to April 1, 2005 who meet the 0.03% specification but who cause harmful interference to other licensees
- Analog systems whose channel bandwidth is greater than 30 Mhz up to 50 Mhz who are not at the 0.03% frequency tolerance standard
- Analog systems whose channel bandwidth is 30 Mhz or less and are not at the 0.003% frequency tolerance standard
- Optionally, companion receivers can benefit from a similar phase lock stability and may be upgraded for improved video S/N, C/N, or fade margin
- Rechanneling a radio to a new frequency within a limited frequency range may be possible while rebuilding the radio. Please call for additional information
- Existing licensees and pending applicants should consider an upgrade to 0.001% stability to protect their existing channel (analog) or if changing to digital modulation. Channel frequency change may apply

#### Existing LO Configuration - TX



#### New Configuration - TX



# Micro 23-2

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### Frequency Stability Improvement Rebuild for Legacy 23GHz Equipment to Meet New FCC-Mandated Frequency Specifications

The FCC made changes to the frequency stability and tolerance requirements in 2005 for equipment operating under CFR47 Part 101, on the 21.2 – 23.6 Ghz band. The old requirements were between 0.03% and 0.05%, depending on the service, and now the requirement is typically  $\pm 0.03\%$ ,  $0.03\%$ ,  $.001\%$ , subject to specific modulation modes, rates, etc. of the specified channel. Many older radios still in active service, such as the M/A-Com 23VFM, 23DR, 23CC, and 23VX, among others, are not able to meet the new requirement and so must be retired from service when existing licences expire. This will require the user to purchase new equipment, which may be very expensive.

We offer a less expensive alternative for applicants or existing licensees who are facing this problem. Many of these older radios are still capable of years of service. For those users who at this time do not require the newest digital modulation formats, there will be significant savings with existing equipment modified to meet the new FCC requirement rather than buying new radios.

Our rebuild service consists of adding a phase-locked loop stabilization circuit to the existing local oscillator(s) in the transmitter, and optionally, in the receiver as well\* ( see technical notes below). The units are then tested and returned to the customer. We can, in some cases, do frequency changes if requested by the customer when this work is done.

Custom modifications are also available for those with unique requirements; please refer to the notes below.

#### TECHNICAL NOTES

We will usually require both the TX and RX radios to be shipped to us, even when stabilizing only the TX sections. Duplex radios are an obvious example, but even for a simplex link, sending us the receiver will allow us to more completely test the units with the actual receive equipment. There may also be minor adjustments needed to both TX and RX units that have been in service for a long time. Most minor adjustments will be done at no extra cost.

We can do channel changes, as long as the frequency change is small. Larger changes may require filter changes or (in some cases) more extensive RF alignment. Occasionally there may be equipment limitations which prevent a channel change; please contact us with your requirements.

In many cases, only the transmitter will require the phase-lock loop addition. In some radios the receiver is designed with an AFC to track the transmitter's signal. Therefore, once the transmitter is stabilized, the receiver will also be stabilized. In other radios, such as the M/A 23VFM, the IF bandwidth is wide – typically 40MHz. This was done to allow for the frequency drift of the original design even without any AFC. Stabilizing the transmitter will only improve this parameter since only the receiver LO may now drift.

If there are any special considerations, such as equipment which has been impaired by excessive Receiver drift, etc., we can in most cases also stabilize the receiver if an ordinary realignment does not solve the problem. There may also be cases in which fully stabilizing both ends of the link will allow narrower bandwidth, or will more completely fill the assigned channel nearer its edges, since far less allowance is now needed for frequency errors.

If you have such a requirement, please contact us.

There may be some applications which require a fully synthesized (frequency- agile) radio modification. We do have the capability to add this feature, at additional cost, within the limits of the local oscillator in the equipment. For applications where the existing FCC spurious/harmonic specifications are not required, we may be able to replace the existing LO assembly completely if it will help extend the frequency range or fulfill any other customer-specified requirement.

For all custom work, please contact us with your requirements.

Rebuild Radio Subject to FCC Verification



36 Mt. Lebanon Street Pepperell MA 01463  
978.433.3636(tel) 978.433.3657(fax)  
www.microwaveadvances.com

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A phase-lock loop  
designed to meet  
23 GHz FCC stability  
standards

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