

I2000A FAST FREQUENCY GPIB OPERATION

AN 00-03



OVERVIEW

High-volume, microwave product manufacturers are continually seeking to reduce production test times while maintaining high-quality component test, thus reducing the overall cost of the product. The reduction of a few seconds per unit tested can result in significant savings when production volumes are high. The List Mode of the I2000A provides fast frequency switching and is easily configured over the GPIB.

DESCRIPTION OF OPERATION

Fast frequency switching is achieved using the List function. Using the general purpose interface bus (GPIB), the List table may be configured for all necessary parameters specified in the setup. The List function is comprised of programmed test points, a trigger setting and mode of operation. Each point specifies frequency, power, modulation and dwell time. The total number of points per list is based upon the amount of memory available in the synthesizer. The I2000A Frequency Synthesizer has approximately 980 Kbytes available for List mode. Each point requires 32 bytes. Theoretically, one list table can store greater than 30,000 points.

ATE test times can be optimized by making use of the Lock\Level BNC connector out of the rear panel. While a frequency switch occurs, the signal will remain low. When phase lock and leveling is achieved, the Lock/Level signal will switch to a TTL high level. The rising edge of the Lock/Level signal can be used to synchronize measurements with fast measurement instruments, such as the Giga-tronics 8650A Universal Power Meter, without intervention of the controller.

The I2000A can change frequency and power level with less than 500 μ s switching time , provided the List table power settings are programmed within the top 25 dB range.



Application NOTE

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GPIB CONFIGURATION FOR I2000A FAST FREQUENCY SWITCHING

Several commands are structured to specify which list and point is to be created or modified. The structure is **<command> <table number> <point number>**

The following command: LF 1 3 5.32 GZ sets the frequency for point 3 of List table 1 to 5.32 GHz.

The program example (using BASIC and National Instruments™ function calls) describes the general requirements for defining and initiating a fast frequency operation. The example sets a 5 GHz start frequency, 100 points, with a 20 MHz frequency increment between points at the same power setting and a fixed dwell time of 1 millisecond.

```
Rem giga% is GPIB address for I2000A synthesizer
listI$ = "3" 'specifies list table 3
freqstart = 5 'Start frequency set to 5 GHz
freqmod = freqstart
freqstartI$ = Str$(freqmod)
ibwrt giga%,"LC 3" 'Clear list table 3
ibwrt giga%,"LA 3 0" 'writes the first point of list table 3
For point = 1 To 100 'loop to set 100 points in list table
    pointI$ = Str$(point) 'convert numeric to string
    ListLevel$ = "LL " + listI$ + pointI$ + " 0 DM" 'set level to 0 dBm
    listfreqI$ = "LF " + listI$ + pointI$ + freqstartI$ + " gz"
    listdwell$ = "LT " + listI$ + pointI$ + " 1 MS" 'Set point dwell to 1 ms.
    listadd$ = "LA " + listI$ + pointI$ 'string for new list point
    ibwrt giga%, ListLevel$ 'writes output level to point in list table List I
    ibwrt giga%, listfreqI$ 'writes frequency to point in list table List I
    ibwrt giga%, listdwell$ 'writes dwell time to point in list table List I
    freqmod = freqmod + 0.02 'increment frequency by 20 MHz
    freqstartI$ = Str$(freqmod) 'convert new frequency to string
    if point = 100 then goto runlist 'skip point 101
    ibwrt giga%, listadd$ 'add the next point to the list
Next
runlist:
ibwrt giga%,"LS? 3" 'Perform List table calculations
ibwrt giga%,"TR 1" 'set list trigger to GPIB
ibwrt giga%,"LI" 'set list mode to run continuously
ibwrt giga%,"LR 3" 'activate list mode
```

