Product Note 29

"MATLAB-TUNE", "VEE-TUNE" and "GPTC" A Comparison

These three software packages permit the use of Focus' microwave tuners as *fully calibrated and programmable modules* in User defined, programmed and operated ATE setups, for various load pull and noise measurements.

This note compares the capability as well as software and hardware requirements of these packages for their successful operation.

MATLAB-TUNE is a collection of functions callable from MATLAB® that permit to create test routines using microwave tuners as fully precalibrated programmable components in a test setup together with any other GPIB instrument. MATLAB's mathematical capability permits de-embedding, data storage and plot generation and printouts. *MATLAB-TUNE* operates under DOS and Windows operating system [see PN-26 and AN-26].

VEE-TUNE is a Windows software package in form of a dynamic link library (DLL) that operates within *HP-VEE*® (Hewlett Packard Visual Engineering Environment) Iconic Programming Language. It permits to initialize and move up to two tuners, calibrate the tuners and tune to any required impedance point. It also permits to compute s-parameter, loss and motor positions of both tuners at any tuneable impedance and frequency. *HP-VEE*® itself permits complex mathematical operations and GPIB communication in order to monitor and acquire measurement data and generate plots and data files [see PN-25].

GPTC *(General Purpose Tuner Controller)* is a GPIB programmable User Interface that permits to use calibrated tuners as fully characterized modules in microwave test setups. It operates in DOS and permits to calibrate and control two tuners, tune to any impedance and compute tuner loss. The PC controlling the tuners can operate either as a system controller or as peripheral. Any other computer (PC, Apple etc..) with a standard GPIB interface can control GPTC. Operation is either by local keyboard, via GPIB commands or from a **LEARN** file, in which the User can save test procedures to be repeated automatically [see PN-16].

The following table summarizes the capability of each system together with the external hard- and software components needed to operate the test setup.

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Feature / Utility	MATLAB-TUNE	VEE-TUNE	GPTC
Control Tuner Position	Yes	Yes	Yes
Initialize Tuners	Yes	Yes	Yes
Tune to Required Impedance	Yes	Yes	Yes
Calibrate Tuners on all Network Analyzers	Yes	Yes	Yes
Operate with any Computer (other than PC)	No	No	Yes
Compute Tuner Loss	Yes	Yes	Yes
Manual Tuner Control via keyboard	User made	User made	Yes
LEARN procedure	via MATLAB	Via VEE	Direct
Smith Chart Display of Γ	Yes	Yes	No
Operation from UNIX computer	No	No	Yes
Operation from APPLE computer	No	No	Yes
XY Plot generation	Yes	Yes	No
Contour generation	Yes	Yes	Not directly
Operate in WINDOWS	Yes	Yes	No
Operate in DOS	Yes	No	Yes
Cascade Twoports	Yes	Yes	No

Table 1: Comparison of Capability

Other Requirements	MATLAB-TUNE	VEE-TUNE	GPTC
Extrenal Software Package *Required*	MATLAB	HP-VEE	None
GPIB Interface	Yes	Yes	Yes
Tuner Controller in *System PC*	Yes	Yes	Optional
Windows Operating System	Optional	Yes	No
External System Controller (Computer)	No	No	Optional

Table 2: Comparison of External Requirements