

ME7842B

Tower Mounted Amplifier Test System (TMATS)
10 MHz to 6 GHz



See The True Performance of Your Tower Mounted Amplifier



SEE THE TRUE PERFORMANCE OF YOUR TOWER

ME7842B Tower Mounted Amplifier Test System (TMATS)

The result of working with a top infrastructure provider of Node B base station components, the ME7842B is a measurement system capable of simplifying the complexity of multi-port Tower Mounted Amplifier (TMA) test. With innovative instrumentation, flexible multi-port test set and easy-to-use software, TMATS has dramatically reduced TMA test times from hours to just minutes. The easy-to-use software, the Scorpion Navigator™, includes unprecedented features that enable integration into any manufacturing environment in about a week. This solution is now commercialized and ready to tackle your toughest TMA measurement requirements.



A typical TMATS station with optional power meter, AutoCal® module and computer can easily perform measurements typically requiring a rack of instruments. An optional modulated signal generator can also be connected to perform ACPR analysis.

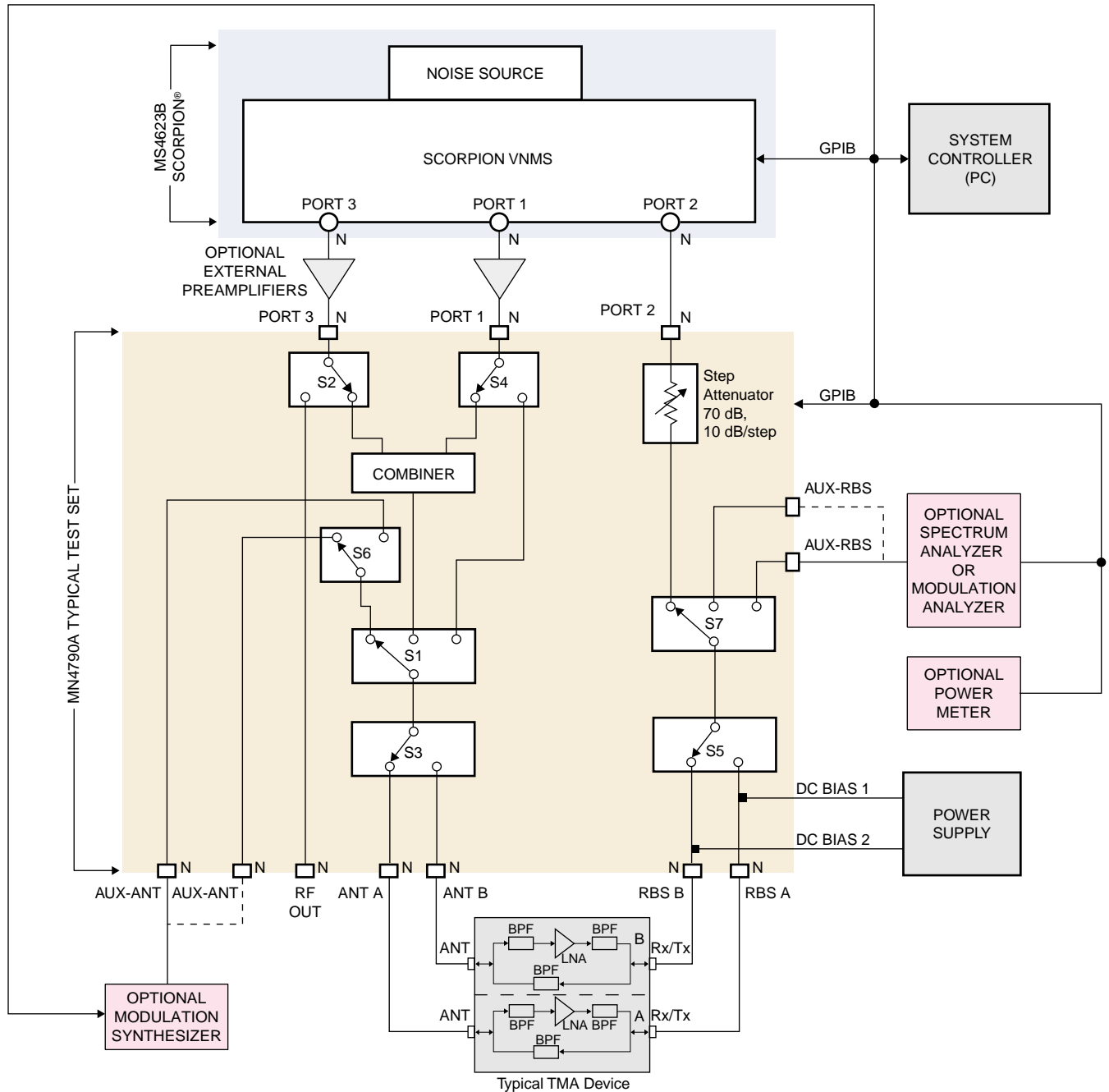
Key Benefits

- **Versatility to Characterize Most TMA Configurations (2 – 5 Ports)**
- **Consolidate Multiple Test Stations and Connections to Increase Productivity**
- **Improve Accuracy and Repeatability of S-Parameter, Harmonics, Gain Compression, Intermodulation Distortion (IMD), Noise Figure (NF), and Adjacent Channel Power Ratio (ACPR) Measurements**
- **Flexibility to Accommodate Future Requirements with Auxiliary Paths**
- **Scorpion Navigator™ Enables Test Executive Integration in About a Week**

MOUNTED AMPLIFIER WITH A SINGLE CONNECTION

TMATS Block Diagram Shows Versatility to Characterize Most TMA

The following block diagram depicts the standard MN4790A Test Set design and application when connecting to a TMA. Note the additional Auxiliary Connections that allow signals through the test set for user-defined requirements. Contact Anritsu for more optimized test set designs.



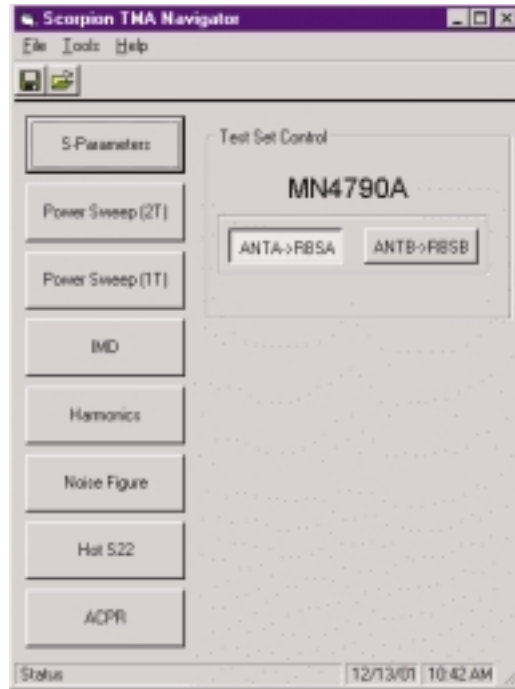
INNOVATIVE MEASUREMENT SOLUTION FEATURING...

Consolidate Test Stations

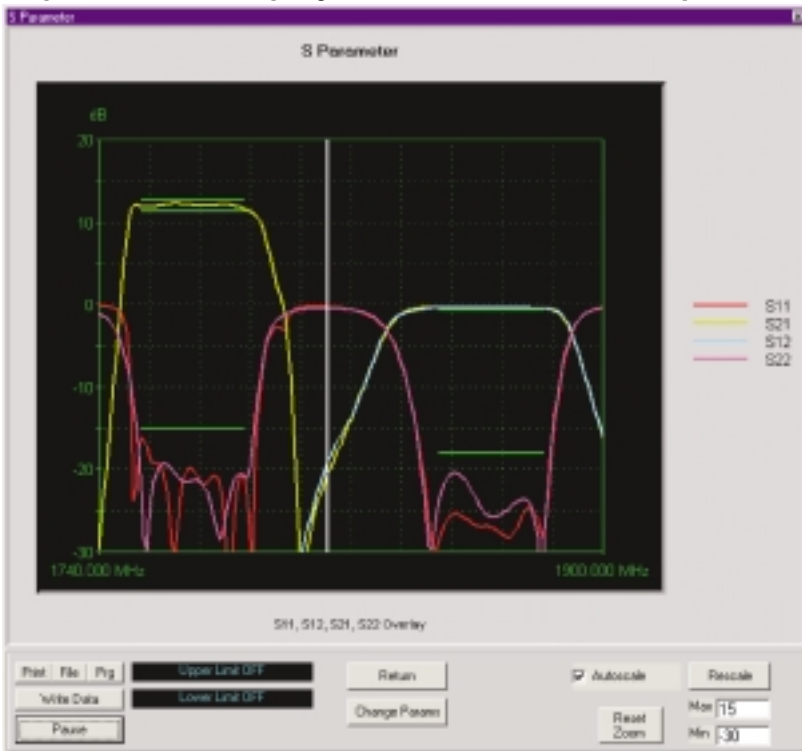
The Scorpion Navigator is optimized for testing both current and future TMA configurations. Once calibrated, simply choose the desired TMA path and the necessary measurement. That's all it takes to begin. Manual operation is simplified with a flexible and easy-to-use graphical user interface optimized for testing a TMA.

The standard list of measurements includes: S-parameters with clear pass/fail limit lines, compression, intermodulation distortion, harmonics, noise figure and adjacent channel power ratio.

All measurements provide easy-to-use menus and flexible display options so you can see the true performance of your TMA.

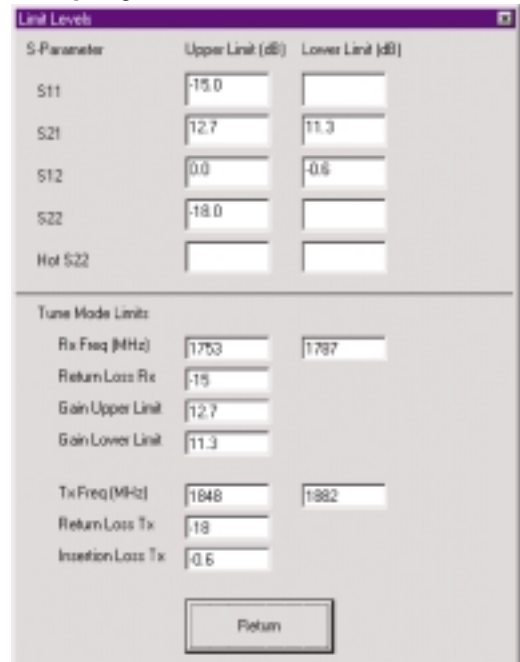


Sophisticated Displays Enable Hands-Free Operation



Measurement displays are easy-to-read and offer choices to output results, pause measurement, change parameters and auto-scale. This sophisticated user-interface reduces keystrokes and encourages more hands-on tuning rather than hands-on instrument operation.

Pass/Fail Menus Simplify Automation



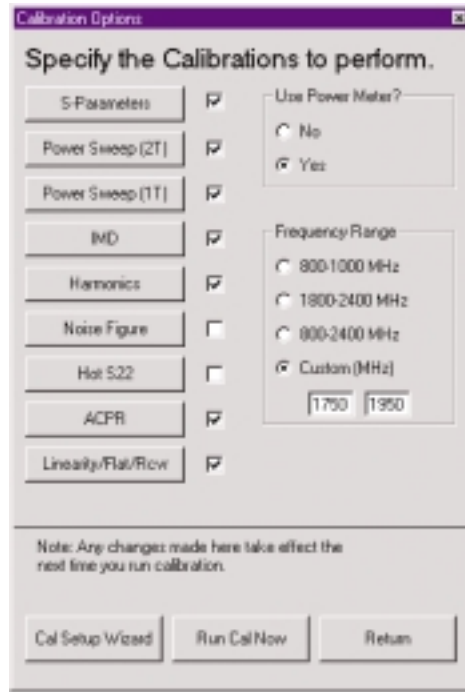
Use Pass/Fail limits lines to further increase your manufacturing productivity. These menus simplify the setup process and provide clear indications of pass or fail: green passes while red indicates additional tuning is required.

Increase Productivity

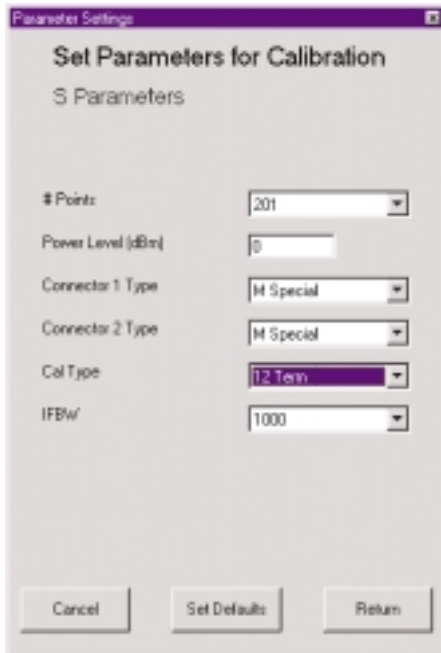
The Scorpion Navigator includes innovative utilities to simplify the time-consuming process of setup. Through informative block diagrams and easy-to-understand menus, the Scorpion Navigator will recommend setup parameters and help auto-setup for optimum performance depending on the performance of your TMA.

After specifying the TMA path, simply select the measurements and frequency range for your requirements and the Cal Setup Wizard will help with the rest of the setup. Additional flexibility is included to optimize the calibrations for further accuracy.

Select "Run Cal Now" and perform all of the calibrations so you can characterize your TMA with a single connection.

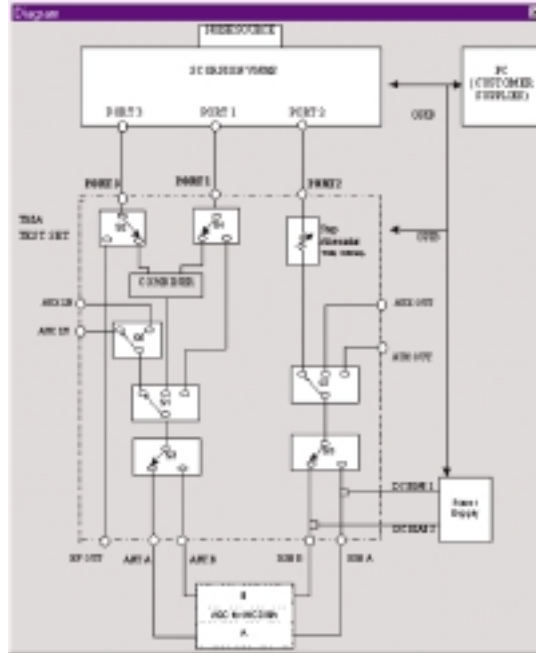


Flexible Calibrations Ensure Accuracy



Optimizing calibrations can involve too many details so the Scorpion Navigator includes flexible menus to help achieve your accuracy expectations. For S-parameters, you can specify connector types, calibration types and other useful parameters.

Block Diagrams Show Signal Flows



The Scorpion Navigator uses block diagrams to show signal flows through a TMA, which can be confusing to both designers and users. This user-friendly tool is useful for both setup and troubleshooting.

SINGLE CONNECTION APPROACH...

Improve Accuracy and Repeatability

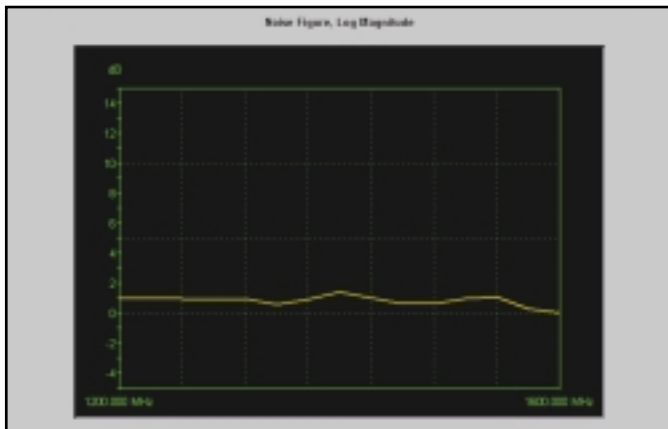
TMATS simplifies your most demanding single-tone and two-tone testing requirements using the Scorpion Vector Network Measurement System. You no longer have to purchase individual pieces of test equipment, design a test set, develop accurate calibration techniques or generate software to orchestrate your measurements. The single connection approach increases accuracy, repeatability and throughput while the Scorpion Navigator handles all the time-consuming setup, calibration, measurement and reporting responsibilities. TMA testing has never been easier.

For further specifications, reference the Scorpion VNMS Technical Specifications and Configuration Guide (part number 11410-00288).

Specifications

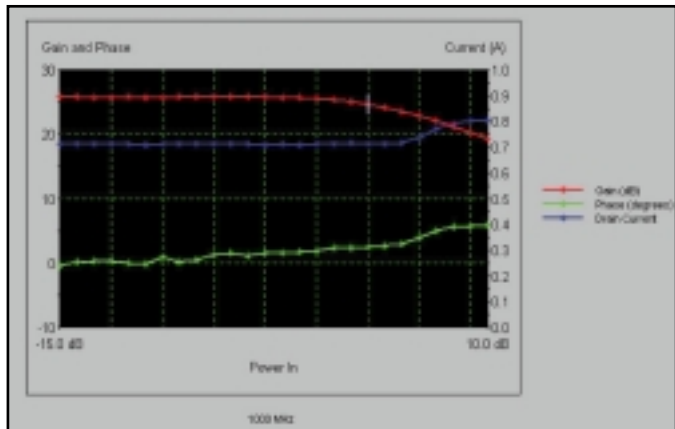
Characteristics	Specification
Frequency, Test Set	10 MHz to 6 GHz 500 MHz to 6 GHz for IMD
Maximum Power Level	+20 dBm
Input Power Range to DUT	0 dBm to -85 dBm
IMD (3rd Order) Dynamic Range	70 dB
IMD Accuracy	±1 dB max (at > -60 dBc Levels)
Port Power Accuracy	±0.1 dB typical (with flat power cal)
Dynamic Range	80 dB typical
Directivity	40 dB (10 MHz to 3 GHz, corrected) 35 dB (3 GHz to 6 GHz, corrected)
Source Match	35 dB (10 MHz to 6 GHz, corrected)
Isolation between DUT Ports ANTA ↔ ANT B RBSA ↔ RBS B ANTn ↔ RBSn	60 dB 60 dB 100 dB
Damage Level (test set)	> +27 dBm

Noise Figure



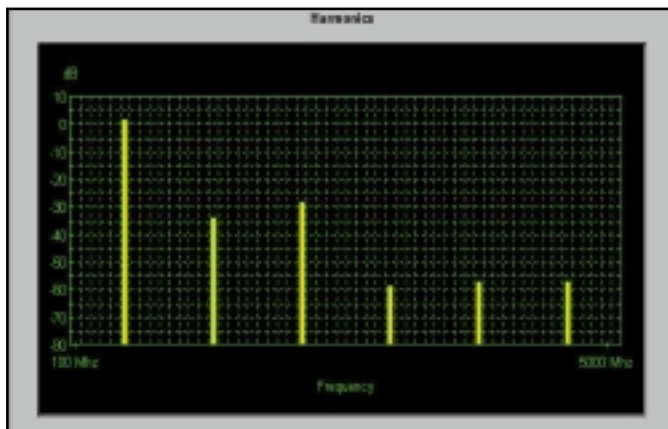
The Scorpion Navigator easily performs critical noise figure measurements.

Gain Compression



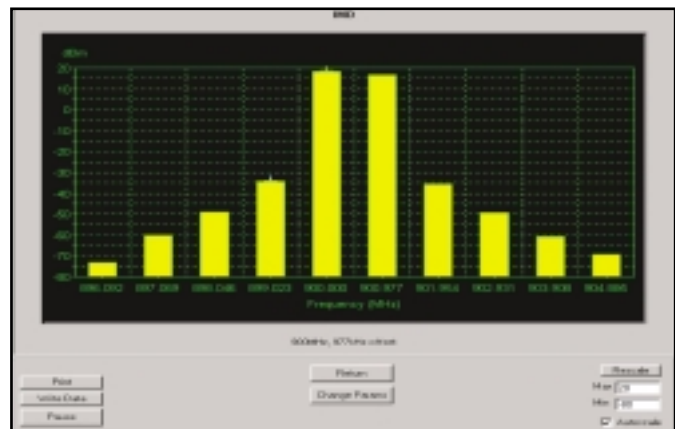
See gain, phase and current versus power for real-time compression measurements.

Harmonics



Without changing connections, see the harmonic performance for your TMA.

Intermodulation Distortion (IMD)

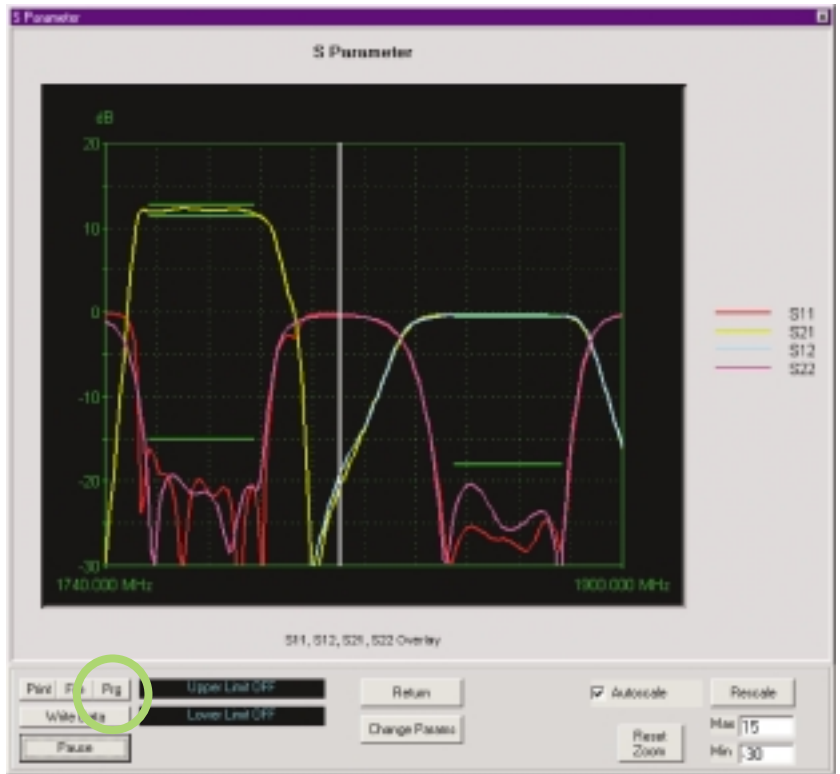


Measure not only the 3rd, but also the 5th, 7th and 9th order products.

Automation in About a Week

Integrating this solution into your existing Test Executive environment is easy. Use the Scorpion Navigator to manually set up your measurement parameters and begin taking measurements. Once you have finished prototyping the measurement with the Scorpion Navigator you can now simply integrate it into your existing test executive with a single press of a button.

By pressing the PRG button, a Visual Basic module that re-creates the currently displayed measurement will be automatically generated. This approach provides the essential software for performing the measurement with the flexibility to further customize with just a few more lines of code.



The PRG button is a powerful addition to the measurement user interface to enable further customizing of the already comprehensive measurement capabilities.

Ready-to-Use ActiveX Modules

The generated Visual Basic module uses ActiveX modules that can plug into a wide variety of popular software environments such as HP-Vee, Visual Basic, Microsoft Excel (including any Visual Basic for Applications (VBA) enabled software), VBScript, JavaScript, Visual C++, National Instrument's LabView, LabWindows and Test Stand.

Source Code is Included

As shown in this example, the Visual Basic module includes all the necessary code to duplicate calibrations, setups, measurements and outputs. The included comments enable someone with very little programming experience to quickly master the complexity of automating Tower Mount Amplifier testing. Automation can now take a week instead of months and sometimes years.

```
Project1 - Form1 [Code]
Command2 Click
Private Sub Command2_Click()
    Dim temp1 As Double, temp2 As Double
    Dim i As Long

    clsSc.openSession (6)           'Open GPIB Communication to Scorpion
    clsSw.openSession (4)          'Open GPIB session to SM5532E
    clsSc.recallCalFile "Davedemo" 'Recall a .CAL file
    clsSw.setSwitch 9              'Set SM5532E to J1 to J5

    clsSc.initSP                  'Setup for S Parameter measurement
    clsSc.SP = 21                 'S21
    clsSc.startFreq = 850         'Start Freq = 850 MHz
    clsSc.stopFreq = 900         'Stop Freq = 900 MHz
    clsSc.applyFPCal = 0         'Flat Panel Calibration is On
    clsSc.sourcePow = 0           'Set Source Power to 0 dBm
    clsSc.applySPSettings         'Apply the above settings
    temp1 = clsSc.getDataMin      'get Max S21
    temp2 = clsSc.getDataMax      'get Min S21

    'Display data on form
    Text1(0) = Format(temp1, "0.00")
    Text1(1) = Format((temp2 - temp1), "0.00")
    Text1(2) = Format(temp2, "0.00")

    clsSc.saveS2P "aaa"           'Write last sweep to S2P Format
    clsSc.closeSession           'Close GPIB comm session
End Sub
```

An example of the Visual Basic module generated when selecting the PRG button.

Call Anritsu now to schedule a demo so you can begin seeing the true performance of your TMA.

Ordering Guide

The ME7842B System consists of the following:

Item	Part Number	Description
1	MS4623B	Scorpion®, 10 MHz to 6 GHz
2	MS4600/3B	Scorpion® 6 GHz Internal Source with 3 rd Test Port
3	MS4600/4B	Scorpion® 6 GHz Noise Figure
4	MS4600/8	Scorpion® Harmonic Measurement Application
5	MS4600/13	Scorpion® Intermodulation Distortion Application
6	MS4600/24	Scorpion® Processing Upgrade
7	MN4790A	TMATS Test Set
8	ND57610	Accessories & Interconnect Kit includes Scorpion® Navigator Software

*ME7842B standard connector type is N-female.

Options

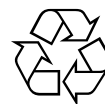
Anritsu can configure and optimize a custom test set for your specific requirements. Contact Anritsu for more information on your requirements.

Calibration Kits, Cables and Noise Sources

Model/Order No.	Name
Calibration Kits	
3753R	Type N RF Calibration Kit (9 GHz)
3753R/1	Adds a set of five Phase Equal Insertables (PEIs)
3753R/3	Adds additional N (female) and N (male) terminations
AutoCal®	
36581NNF/2	AutoCal, 2-Port N, 10 MHz to 9 GHz
36584NF	AutoCal, 4-Port N, 10 MHz to 9 GHz
Economy Cables	
806-109	Type N Male to 7/16 Male, 60 cm
15NN50-0.3B	Type N Male to Male Cable, 30 cm
15NN50-0.6B	Type N Male to Male Cable, 60 cm
15NNF50-0.3B	Type N Male to Female Cable, 30 cm
15NNF50-0.6B	Type N Male to Female Cable, 60 cm
Noise Sources	
NC346A	5 dB ENR Noise Source, 3.5 mm connector
NC346B	15 dB ENR Noise Source, 3.5 mm connector

Related Literature	Part Number
Brochures	
Scorpion Family Brochure	11410-00289
Scorpion Technical Specifications	11410-00288
Synthesizer MG3690A Brochure	11410-00262
PATS Brochure	11410-00263
2-Port AutoCal Brochure	11410-00189
4-Port AutoCal Brochure	11410-00294
Power Meter Brochure	15000-00004
Application Notes	
CDROM, Scorpion Literature	10920-00040
2-Port AutoCal Automatic Calibrator	11410-00258
4-Port AutoCal Automatic Calibrator	11410-00298
Noise Figure	11410-00210
Noise Figure Accuracy	11410-00227
Noise Figure Corrections	11410-00256
Intermodulation Distortion	11410-00213
Harmonics	11410-00222
Frequency Translated Group Delay	11410-00236
Global Power Sweep	11410-00243
Multiple Source Control	11410-00244
Reflectometer Measurements-Revisited	11410-00214
Time Domain	11410-00206
Frequency Accuracy	11410-00208
Adjacent Channel Power Ratio (ACPR)	11410-00264
What is Your Measurement Accuracy?	11410-00270
Embedding/De-embedding	11410-00278
Three and Four Port S-parameter Measurements	11410-00279
Arbitrary Impedance	11410-00284
Hot S22 and Hot K-factor Measurements	11410-00295
Manuals	
MS462XX Operation Manual	10410-00203
MS462XX Programming Manual	10410-00204
MS462XX Maintenance Manual	10410-00205
MS462XX GPIB Quick Reference Guide	10410-00206
Measurement Guide	10410-00213
Application Guide	10410-00214
PATS Operation Manual	10410-00225
TMATS Operation Manual	10410-00244
Software Utilities and Drivers	
Scorpion Command Encyclopedia	2300-364
Power Tools	2300-218
LabView Drivers	2300-358
Exact Uncertainty	2300-361
Mixer Measurements Assistant (NxN)	2300-232

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