



## Process Automation Toolkit (PAT)



# Introduction

Process Automation Tool Kit (PAT) provides an innovative method to automate test procedures for the Freedom's family of communications analyzers. For many years the Automatic Test Equipment (ATE) environment has required engineers to have two major areas of expertise: intimate knowledge of the device under test (DUT) and software programming skills to automate test procedures.

Over the years many control interfaces have been developed: GPIB, GPIB, IEEE488, USB, RJ45, etc. These interfaces have been coupled with numerous software control packages as HP Basic, Basic, Fortran, Atlas, and C ++, just to name a few.

Instrument drivers were developed in an effort to simplify and accelerate software development by reducing the need for the test engineer to learn each and every command for multiple instruments. These drivers, coupled with such software development tools as Labwindows, Labview, and Visa Plug&Play, have until now been the only option for those looking to attain some level of automation.

PAT represents a major step forward. It enables the user to develop test procedures using a highly intuitive control interface by simply selecting from a library the function required and inserting it into the DUT test script. No programming skills are required.

Connection to the analyzer is RJ45 Ethernet, either directly from a PC or over a LAN network. Test scripts are executed from the PAT control interface and test results can be saved to USB or a network location.

# Software Installation

Software location: <http://freedomcte.com/upgrades/>

Download and install the software.

## Analyzer Connection Options

Direct Connection to RJ45 Ethernet socket. Network

connection through RJ45 Ethernet socket.





# Initial Operating Instructions

Connect the Analyzer using the RJ45 Ethernet port to the control PC. This may be direct or on the same LAN as the control PC.

On the PC select the PAT Automation desktop shortcut.  
The PAT software will now search for the connected analyzer.  
(see fig. 1)

When the search is successful the IP address of the connected Analyzer will populate the display. (see fig. 2-3)

The Programmable actions area will also populate at this time.  
(see fig. 3)

Selection from the Programable Actions libraries is achieved by clicking on the desired action

This will open up the selections available in this action section.  
(see fig. 4-8)

Startup Display (fig. 1)



R8100 Analyser Found & IP Address (fig. 2)



(fig. 3)



(fig. 4)



(fig. 5)



(fig. 6)

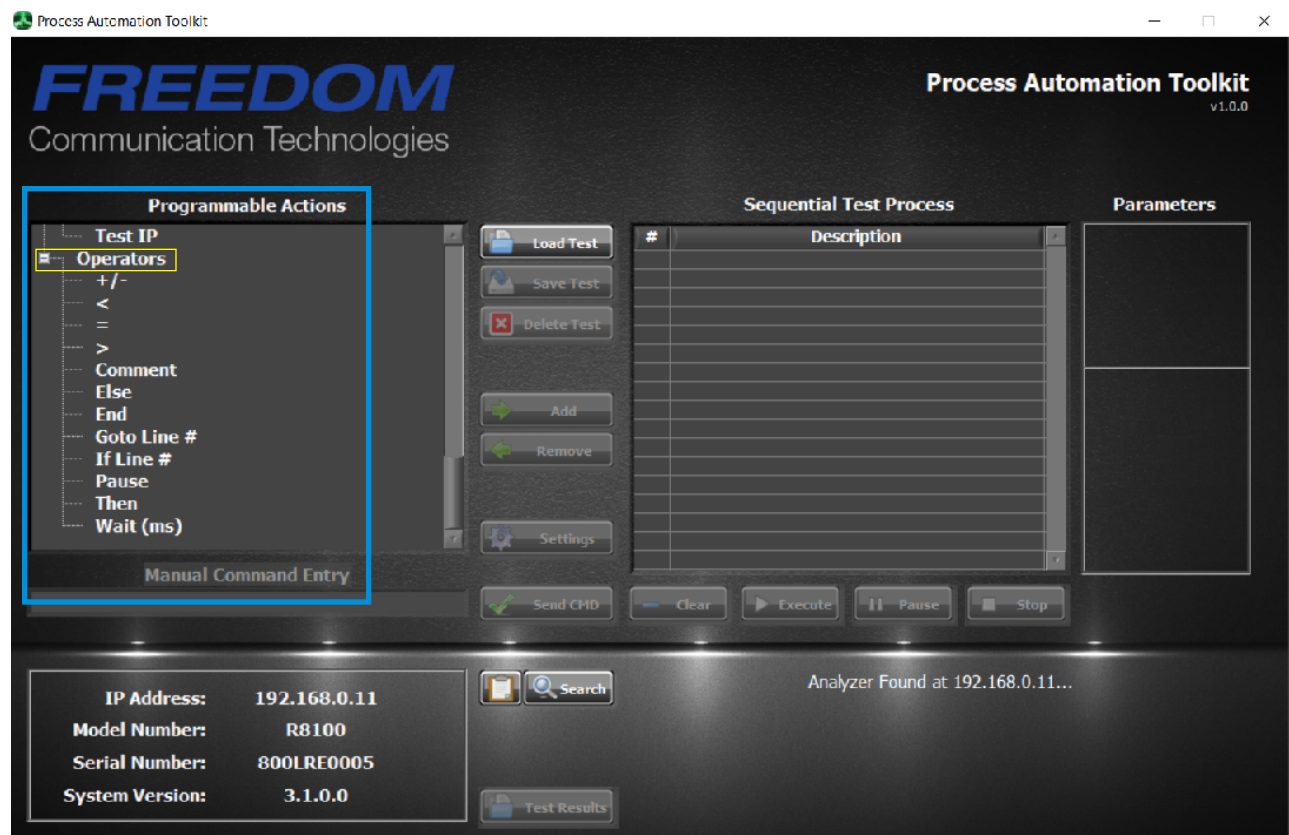




(fig. 7)



(fig. 8)



**Add**

Select a command from the library,  
Press Add to add to the test script

**Remove**

Select a line in the script, Press Remove  
to remove that line from the script.

**Clear**

Clears all line entries from the script.

**Send CMD**

**Selected command**

Select a line in the script to send the command to the  
Analyzer for immediate execution.  
After adding a command to the script, test by Send CMD.  
Analyzer will return Pass/Fail in results area.

**Get**

Selectable drop menu Get/Set Get reads  
the parameter from the Analyzer.

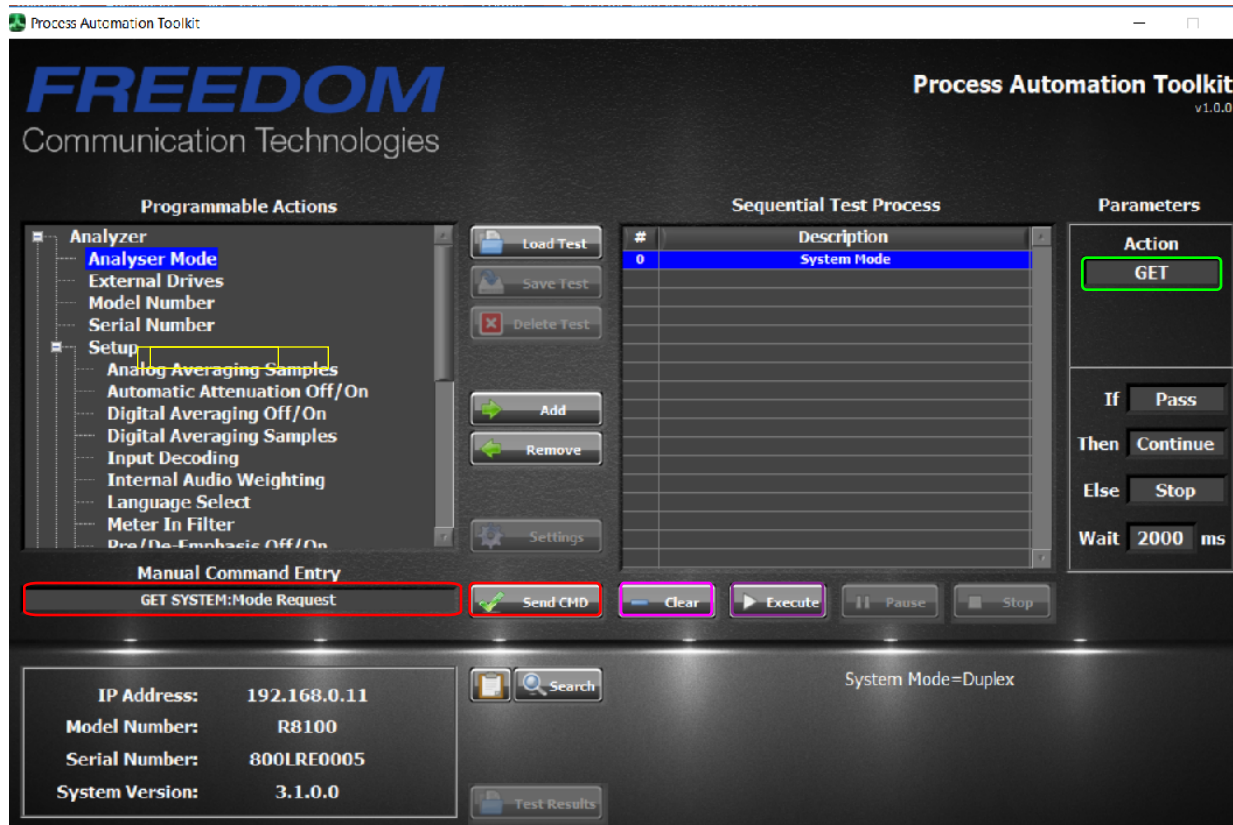
**Set**

Selectable drop menu Get/Set.  
Set writes the parameter to the Analyzer.

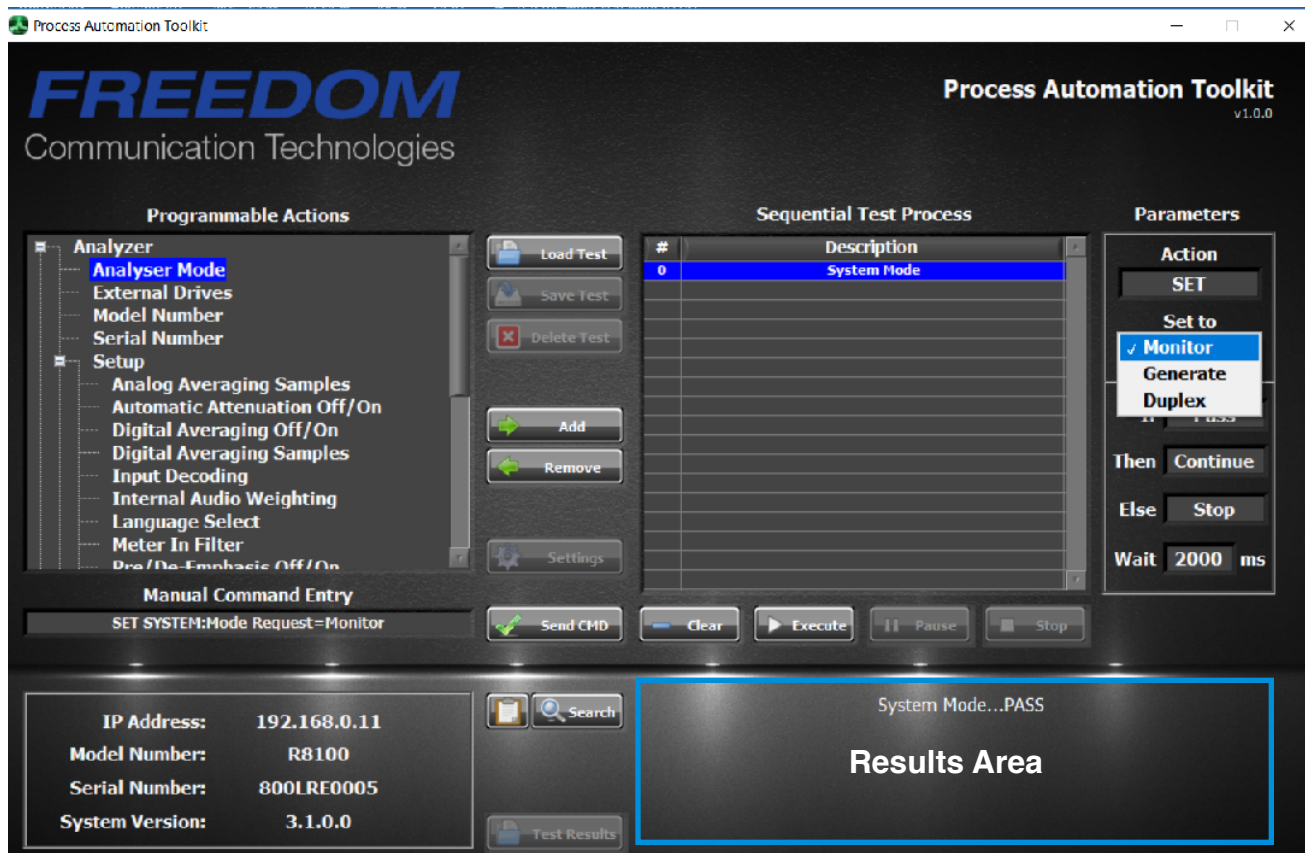
**Execute**

Runs the test script automatically.

(fig. 9)

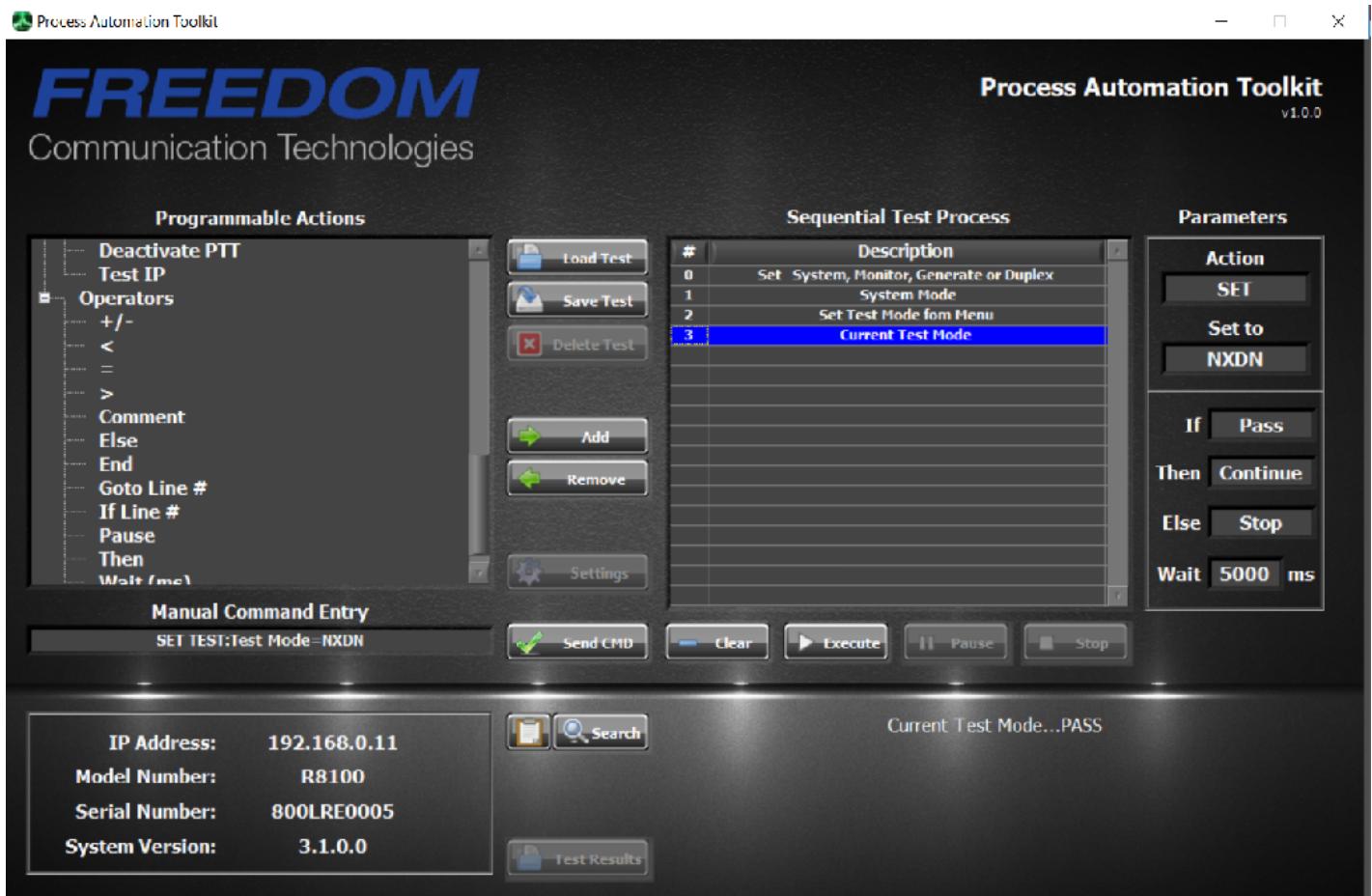


(fig. 10)





(fig. 11)



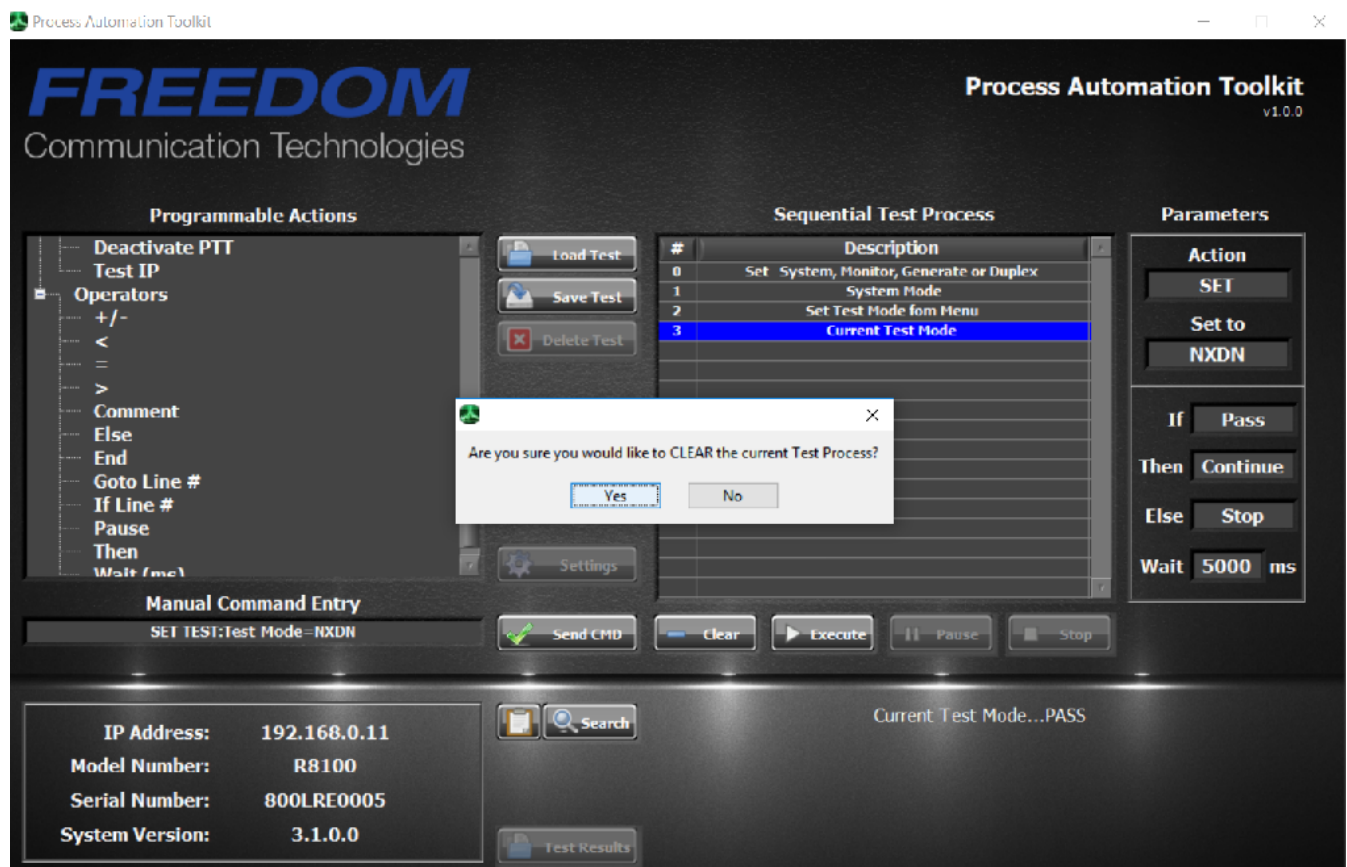
## Command Control and Timing



Each of the Analyzers commands control and timing is pre-set by PAT software. This panel shows those pre-set parameters

The Wait ms parameter may be operator modified but could result in erratic results.

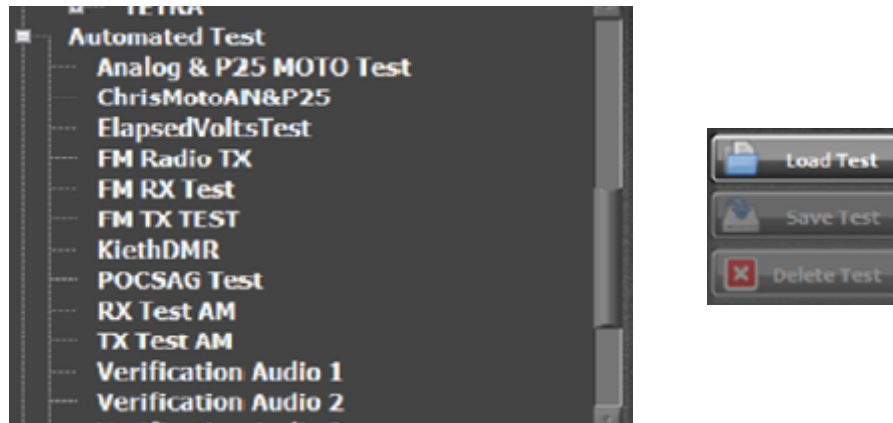
(fig. 12)



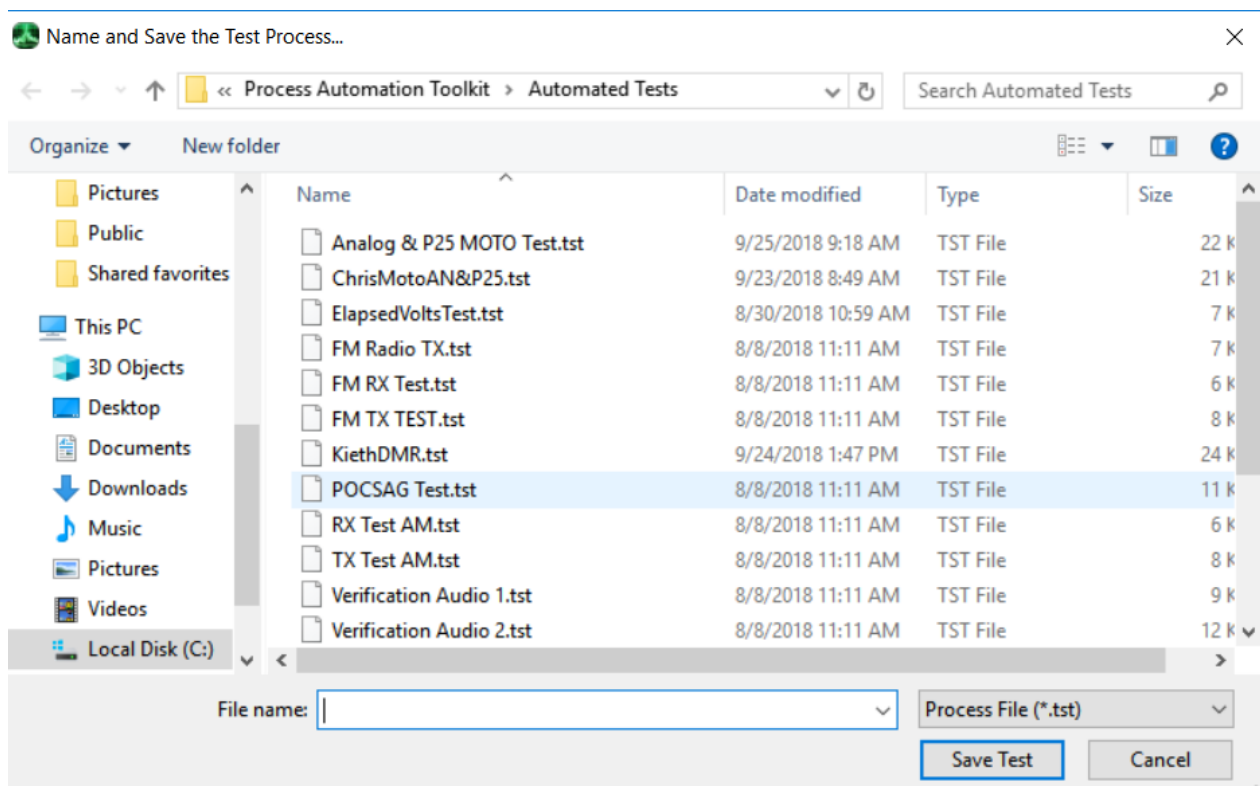
(fig. 13)



# Automated Test Library



Test scripts may saved and loaded from a built in folder achieve.



(fig. 14)



(fig. 15)





(fig. 16)



# Running a Test Script

1. Press Execute
2. If a PAUSE is present, respond to the requested action  
Running test results are displayed.
3. At the end of the test the results are displayed in a CSV format.
4. These results may be saved to a log file folder, and exported to a USB drive

Sequential Test Process = KiethDMR	
#	Description
0	Basic Set Up
1	SET Current Test Mode to Standard
2	SET System Mode to Monitor
3	SET RF Monitor Port to RF In/Out
4	SET Bandwidth to 25 kHz (Wide)
5	Modulation Type to FM
6	SET Monitor Frequency to 851.0125
7	Copy Frequency to Generator
8	SET RF Attenuation to 40 dB
9	SET System Mode to Monitor
10	Analog Transmitter Tests
11	Select Radio Channel 2
12	Press and hold PTT
13	Wait (ms) 2000
14	GET Input Level
15	GET Meter
16	RF Measured Power



```
BER Result=51.23457
Release PTT
SET System Mode to Generate...PASS
Select Test Pattern to 1031 Hz Tone...PASS
Modulation Mode Off/On to Continuous...PASS
Tone Heard
```

(fig. 17)

