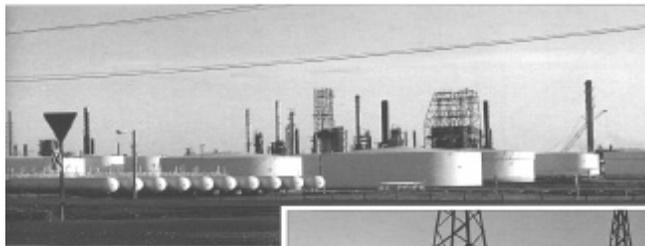**Signalcrafters**
TECH, INC

SIGNALCRAFTERS INTRODUCES AN

Automated Communications
Path Testing System

PROFIT FROM AN

AUTOMATED COMMUNICATIONS PATH TESTING SYSTEM

- REDUCE SERVICE COSTS AND DOWNTIME

- COMPATABLE: HARD-WIRE, T1, MICROWAVE, 2-WIRE AND 4-WIRE

- COMPREHENSIVE FREQUENCY/AMPLITUDE TESTING OF INBOUND AND OUTBOUND COMMUNICATIONS LINES

- MAINTAIN OVERALL SYSTEM INTEGRITY BY ISOLATING FAILED REMOTE STATIONS OR COMMUNICATIONS LINES FROM THE SYSTEM

- VERIFY THE CONDITION OF SELDOM USED "EMERGENCY" LINES VIA AUTOMATIC, PROGRAMMED TESTING

- PERSUASIVE TEST REPORTS CONVINCE SERVICE PROVIDERS OF LINE PROBLEMS

- SELECTABLE OPERATION:

  o AUTO-POLL WITH AUTO TEST
  o SINGLE REMOTE POLL WITH AUTO TEST
  o SINGLE REMOTE POLL WITH SELECTIVE TEST/CONTROL

- SIMPLE WINDOWS BASED SOFTWARE MAKES SET-UP, OPERATION, TESTING AND REPORT GENERATION EASY

Signalcrafters presents a solution to expensive and time consuming communications line testing.

INTRODUCTION

Signalcrafters Automated Communications Path Testing System is a PC based, automatic loopback, communication path testing system that helps diagnose and isolate problems on communication paths. And all of this is controlled from the master station.

With this system productivity increases, costs decrease and downtime is reduced. No longer must you dispatch your limited resources to a distant remote site just to perform a simple line test. And no longer must you connect various pieces of test equipment; manually adjust frequencies; monitor levels; record multiple readings; and then transfer this data to a spreadsheet for analysis and report generation.

You will find our password protected Windows based software is intuitive and easy to use. Pull down menus, lookup windows and concise data entry fields speed system set-up and testing operations. Our remote station designation fields accept numeric, alpha and alphanumeric inputs, so you can continue to use your present remote's ID. Special test functions have clear text descriptions to ease selection, as an example, to initiate a full path test on a selected remote requires only four mouse clicks and less than 15 seconds.

A full communications line test, performed by the Signalcrafters equipment and software, consists of automatically frequency sweeping, at a defined level the outbound line. At the remote each frequencies level is measured and this information is transmitted to the master's memory. The remote then performs the same test on the inbound line and the master records the results. The master is now ready for report generation. You have full control of the testing process whether you multiplex the communications lines or the phone company does. Additional tests, such as compression detection and intermodulation measurement and more are also possible.

Upon test completion several reports are available in graphical and tabular form that quantify the lines condition. These reports can be invaluable in: proving a test was performed; whether the line was within specifications; comparing the results to prior tests to spot a line degradation trend; and most importantly to convince your communications service provider that a problem exists.

Our versatile software allows you to control when the testing will be performed, how the testing will be initiated and what will be performed.

In the "Auto-Poll Full Test" mode the master will automatically sequence through each remote and perform a full test on each outbound and inbound communications line, at your pre-programmed intervals.

In the "Single-Poll Full Test" mode an operator would instruct a full test be performed on a single selected communications line.

In the "Manual Test" mode an operator would select a single communications line and select which test or action to perform. For example, measure the outbound level at the remote end or remove (amputate) a remote station.

Our equipment can be configured to various communications systems and iterations, for example: simple hard wired, leased lines, T1, microwave, 2-wire and 4-wire.

Maintaining the integrity of your system can be difficult if one of your remote sites or line segments is malfunctioning. With our system you can "amputate" this remote's equipment from the system with a command from the master station. A serviceperson, when available, can then travel to the site to correct the problem.

Our system can also become an important part of your safety/emergency program. For example, seldom used critical dedicated circuits such as those used to notify government agencies neighboring nuclear generating facilities, can be automatically tested on a regular basis to ensure their integrity and provide test compliance documentation.

SYSTEM EQUIPMENT
The following is a brief description of the key Signalcrafters' chassis mounted plug-in modules utilized in a typical system: (Please refer to the last page for additional equipment requirements and information.)

Model 5493A-M:
DTMF Modem, located at the master site, this DTMF transmitter/receiver connects to a leased phone or other dedicated telecommunications medium. Operating in conjunction with the PC, Signalcrafters monitoring software (Path Monitor), it encodes the ACSII characters to DTMF and decodes the DTMF to ASCII.

Model 5212A-M:
Loopback Module, located at the remote site, this DTMF transmitter/receiver connects to a leased phone or other dedicated telecommunications medium. It is capable of communications path switching; frequency response measurement; test tone generation and communication path isolation.

Model 2452:
Relay Module, located at the master site, this card switches the communications line between the master equipment and our test module.

Model RS-232:
RS-232 Interface Card, Located at the master site, this interface connects the PC's RS-232 port to the Model 5493A-M.
Note: If you connect with the USB port, Model RS-232 card is not needed.

PATH MONITOR APPLICATIONS:

The following are two typical block diagrams of the Signalcrafters Automated Communications Path Testing System:

In figure 1 there are four remote stations and one master station. The four remote communication lines come to the master station and go into two Signalcrafters Model 2452 Relay Modules. Under normal operation the paths lead to the Master Communication Equipment. But when a test is initiated the computer will give a command to the Signalcrafters Model 5493A-M modem, which instructs the Model 2452 Relay Module to switch the selected communication path to the Model 5493A-M modem for testing.
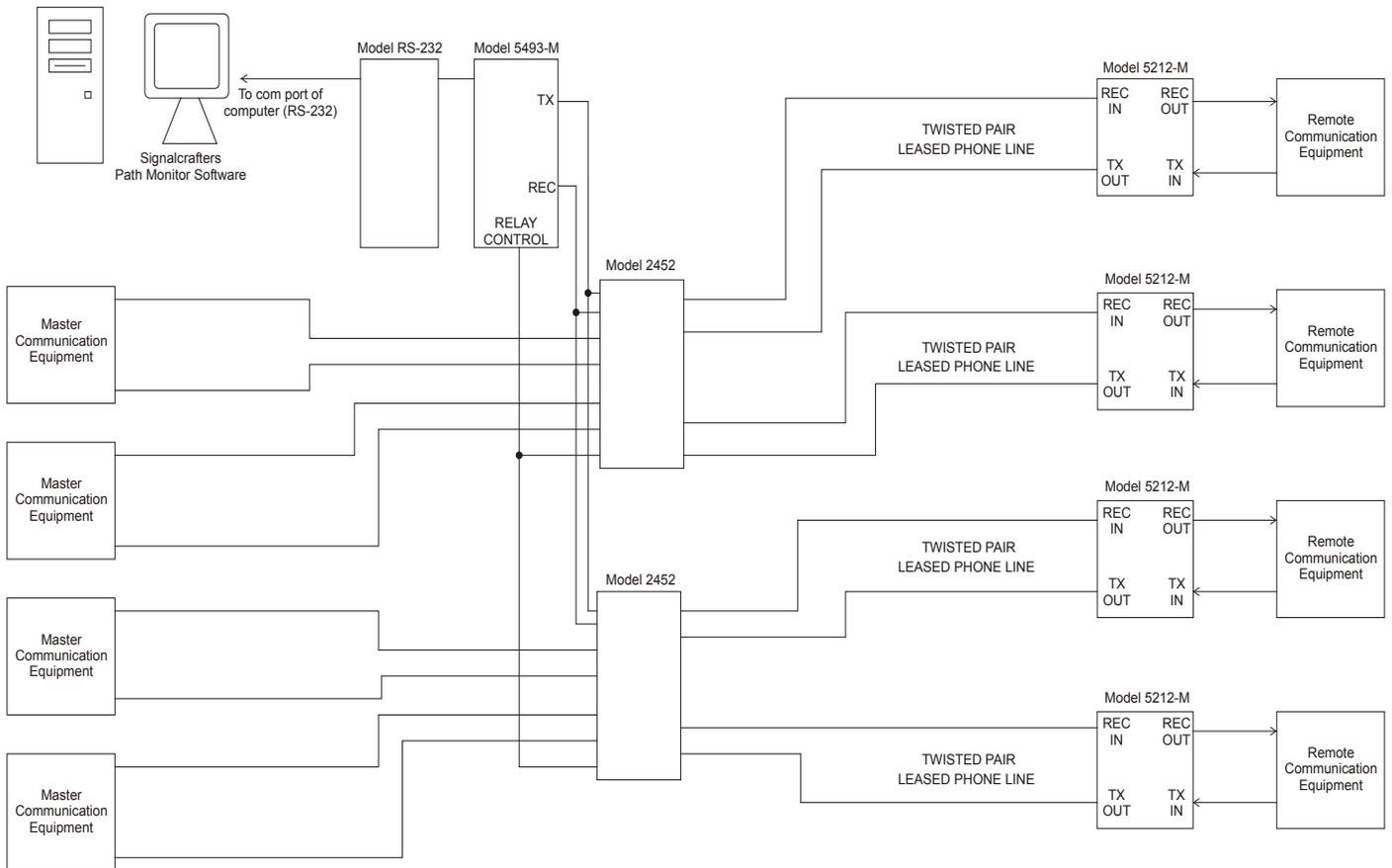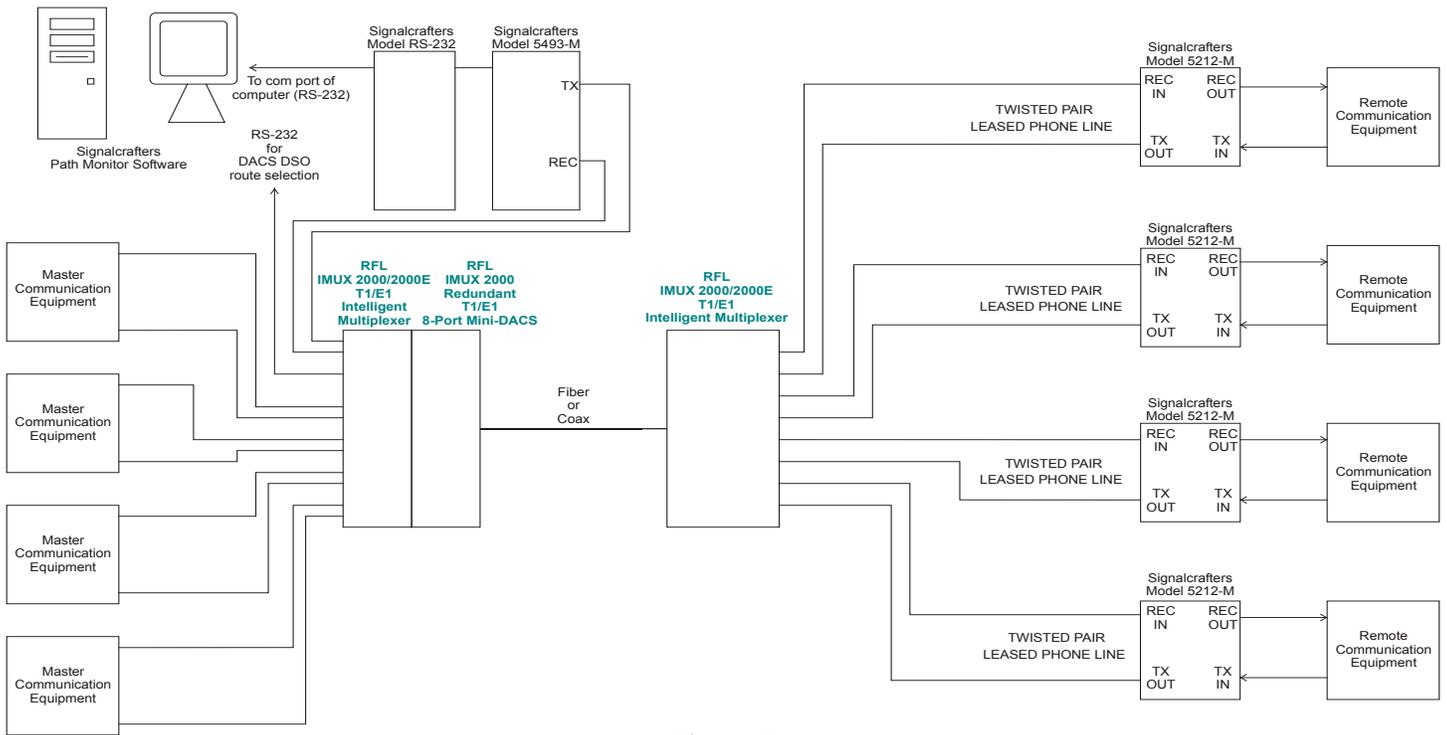

Figure 1

Figure 2

Figure 2 again shows four remote stations and one master station, however this time a T1 multiplexer is utilized and the relay modules are not required. The four remote communication lines come to the master station and go into a T1 Multiplexer. Under normal operation the paths lead to the Master Communication Equipment. But when a test is initiated the computer will instruct the T1 Multiplexer to route to the port that the Signalcrafters Model 5493A-M Modem is connected to so the communication path can be tested.

OPERATION
Signalcrafters Path Monitor Software utilizes Windows to perform complex tasks with ease. Menu options enable the operator to select circuit test mode, history and exception data, report file management and add, delete or change site path, and user data. Our software runs on a PC which connects via a USB port or a RS-232 serial port.

Using an addressed signaling protocol, the system regularly polls each pre-selected communications path for testing. A series of step-sweep tones from 404Hz to 2804Hz is sent from the master location to the Signalcrafters Model 5212A-M Loopback Module at the remote end. The tones are sent in 200Hz increments and their amplitude is operator selectable. When received at the remote location, the tone frequencies, amplitudes and noise are measured. The loopback then reverses roles and transmits tones to the Master Site to test the inbound path. Test results are communicated to the master location where the PC processes the data into history and exception files for analysis.

The Path Monitor Software displays the send and receive frequencies, outbound and inbound loss and loopback noise data for each circuit tested. The data from the previous test of this circuit are simultaneously displayed for comparison. The Path Monitor Software also displays histograms of system performance and then graphs the min, max, mean, and data from the path tests, refer to figures 3 (Inbound Test) and 4 (Outbount Test). Regular testing permits the user to characterize the circuit's performance over time. Figure 5 show an Exception Report (Error Report).
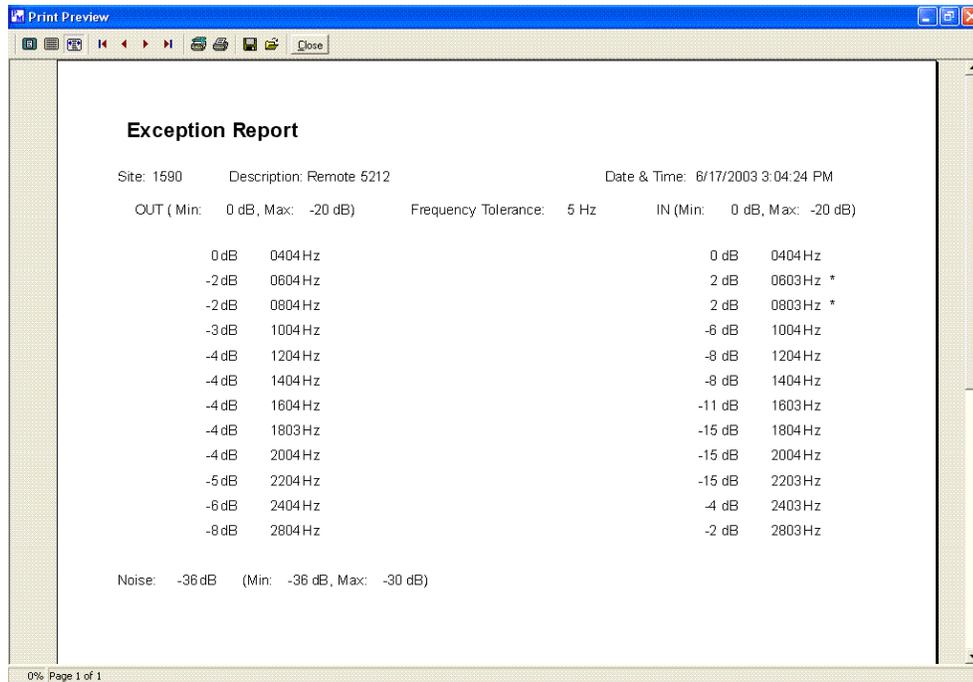

Figure 3

Figure 4

Figure 5

In addition to the above automated tone generation and inbound/outbound measurement test, other tests/commands can be initiated at the master site, such as:

·   Check mid-band and high frequency loss
·   Detect compressions and level compression versus frequency
·   Intermodulation measurements
·   Remove or reconnect a remote from the line
·   Noise measurements
·   Long term round-trip measurements and round-trip impairments
·   DTMF identification of the remote's address and selected function.

COMMENTS

The above is a brief introduction to the capabilities of the Signalcrafters' Automated Communications Path Testing System. For more information or to discuss your particular application please contact us at the below number. More information, including full specifications and manuals are available on our Web site, along with our other communications and instruments products .

An example of the testing system, rack mounted , using a laptop PC.

Hardware Requirements: To run the Signalcrafers Path Monitor software, the following items are required:
Pentium™or higher microprocessor
VGA Graphics Card/Monitor
Printer (to print reports) and compatible printer port on the PC and appropriate cable.
512 MB of RAM
10 MB of Hard Drive Space
1 USB port or 1 Serial Port (RS-232 Converter may be required on some PC's)
101 Enhanced Keyboard
Mouse or equivalent
CD-ROM
Cable, USB or an RS-232 type for connection from PC to Model RS-232 (DE-9-M-F or similar).
Windows™2000 or XP.

Signalcrafers Hardware:
Model 5493A-M Modem
Model 5212A-M Loopback
Model 2452 Relay Module
Model 6500 Power Supply
Model RS-232 Module
Chassis: Various 19" rack mount and shelf mountable chassis are available. Our modules are also compatible with Wescom 400 series and Tellabs type 10 mounting shelves.

Signalcrafters
TECH, INC

Signalcrafters Tech, Inc.
57 Eagle Rock Ave
East Hanover, NJ 07936
(973) 781-0880
(800) 523-5815
Fax: (973) 781-9044
http://www.signalcrafters.com