

Agilent Technologies

Telegra M – Multi-Port Fax Load and Analysis System J3947A/J3948A

Product Overview



Telegra M – The world-wide standard for automated testing of fax systems, servers and networks carrying fax traffic.

Telegra M is a multi-port fax load and analysis system used to test multi-port fax networks, active and passive network devices, fax servers, and IP fax systems, all through analog FXO interfaces. The system is designed for test labs, as well as network and service operational testing, and is controlled by client PCs via direct connection, or remotely via Internet, LAN, or modem connections. Telegra M is the first product specifically designed to test, analyze and evaluate multi-port fax systems and networks, and networks carrying fax traffic.

Introduce new products and network services sooner

Telegra M helps you get products and services to market earlier with higher confidence. Find more problems faster by automating initial and regression testing. Locate subtle problems early in development or deployment when they are much less expensive to fix. Telegra M's comprehensive test capabilities enhance product and service quality, and reliability.

Identify network problems before your customer does

Increase customer satisfaction by constantly monitoring or actively measuring your network quality and reliability at various points to identify problems before your customer does. Analyze failed calls and quickly identify the cause through easy to use graphical interfaces that provide all the information you need on one screen.



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Innovating the HP Way

Telegra M is a must, if you are:

- Developing or testing multiport fax modem devices such as fax servers, fax broadcast systems, T.37 or T.38 gateways, or gateways for Voice over IP networks.
- Load testing fax servers, networks, or Internet fax products.
- Testing fax systems in QA or production test.
- Providing customer support on fax products, systems or networks.
- Developing Internet fax servers or systems.
- Developing or deploying cellular and satellite networks.
- Maintaining international network operations.
- Testing remote networks or servers.
- Supporting fax transmission on local, wide area, Internet, cellular, satellite or mobile networks.
- Testing line quality from the central office or customer premises.

Key Features

- Multiport, rack-mountable test system configurations supporting from four to virtually unlimited number of ports.
- Remote control of Telegra M ports by multiple client PCs over any LAN, WAN, the Internet, or via a modem connection.
- Generation and analysis of traffic to test compliance with all ITU-T Group III standards: V.34, V.17, V.33, V.29, V.27, and V.21 modulation, T.30 and V.8 handshaking, and T.4 and T.6 image encoding.
- Origination, reception or passive monitoring of fax calls at all ports simultaneously.
- Comprehensive test script libraries and network test suites for load testing, test automation, and regression testing.
- Editing tools to design your own scripts for special tests or customizing provided script.
- Statistical analysis of all calls to provide a quick review of the overall result as well as detailed analysis of selected individual calls.
- Rapid identification of errors and violations of standards through highlights in the call browser.
- Explanation of highlighted errors in plain English with suggestions for design improvements.
- Easy to read graphical display of send- and receive-message sequences and timing. Message details can be reviewed by clicking any message.
- Presentation of fax device capabilities and call configurations in easy to read table format.
- Display of captured or transmitted fax images including compression codes.
- Telegra M systems can be distributed to remote sites or laboratories and remotely controlled via LAN or modem connections. Multiple users can access individual ports in the same system, and can use the complete set of test capabilities.
- Definition and execution of any test via local or remote control through a LAN or modem connection.
- Network performance monitoring.

Buttons open up to nine types of analysis windows. Favorite windows configurations may be saved.

Image data is shown line by line. A button shows individual run length codes.

Fax device capabilities and call configurations from DIS/DCS messages are shown in table form.

Errors and violations of standards are highlighted in the call browser and described here in plain English with suggested improvements or corrective actions.

Overall call performance is shown for scan lines, non-ECM pages, ECM partial pages, and delays.

Call protocol is displayed in a graphic browser. Click any message to view its contents in other windows.

Fax images can be shown full screen, zoomed, and rotated.

Description of the call is taken from the test script.

Call Performance for C:\BK_LP_and_Telegra\Telegra Fax Training\Lab6_602.R

Bit	Field Name	Ans.	Capability	Org
(1)	Reserved	0	Ok	0
(2)	Reserved	0	Ok	0
(3)	Reserved	0	Ok	0
(4)	Reserved	0	Ok	0
(5)	Reserved	0	Ok	0
(6)	V8	0	No V8 Support	0
(7)	Octet Pref	0	256 Preferred	0
(8)	Reserved	0	Ok	0
(9)	Polling	0	No Polling	0
(10)	Fax Mode	1	Can Receive	1
(11-14)	Rate	1101	V17 29 27 33	000
(15)	Resolution	1	200 lines/inch	0
(16)	2D Coding	1	1D or 2D	0
(17-18)	Width	00	1728 pixels	00

Processed IMG Data

Field	Value
Total Lines	311
Bits Before Start	0
Bad Lines	0
Bits After End	30
Short Lines	0
Minimum Bits/Line	576
Total Fill	81664
Excess Fill	0
Image Width	1728
EOLs at End	6
Compression	1-D

Notes and Errors

This is the transmission of an image in V.17 mode at 14400 bits per second.

According to ITU-T Recommendation E.463 this image is error free.

Call Performance for C:\BK_LP_and_Telegra\Telegra Fax Training\Lab6_602.R

Field	Value
SCAN LINES	
Error-Free	311 100.00%
Single Error	0 0.00%
2-3 Errors	0 0.00%
4+ Errors	0 0.00%
Total Errors	0 0.00%
Total Lines	311 100.00%
Avg Length	589 bits
E463 NON-ECM PAGES	
Error-Free	1 100.00%
Errored	0 0.00%
Severely-Errored	0 0.00%
Page Count	1 100.00%
Avg Length	311 lines
ECM PARTIAL PAGES	
Block Count	0
FPR Count	0 N/A
Good Frames	0 N/A
Err'd Frames	0 N/A
Total Frames	0 N/A
DELAYS IN SECONDS	
Setup	4.628
Longest	4.628 0.14
Shortest	0.580 0.08
Average	2.002 0.09

Capabilities and Configuration

Manufacturer	Model	Not
Toshiba	916	

Descriptions

Lab session 6 - call 2 - CM in V.8 indicates no V.34 support - call continues in V.17 mode

Captured simulation: cus_orig\34-104 fs V.34/V.29 call with CM indicating no V.34 support

[comments]
- goes to V.8 routine on ANSAm or V.29 routine on CED
- if ANSAm not detected,

Exercise complete control over fax protocols

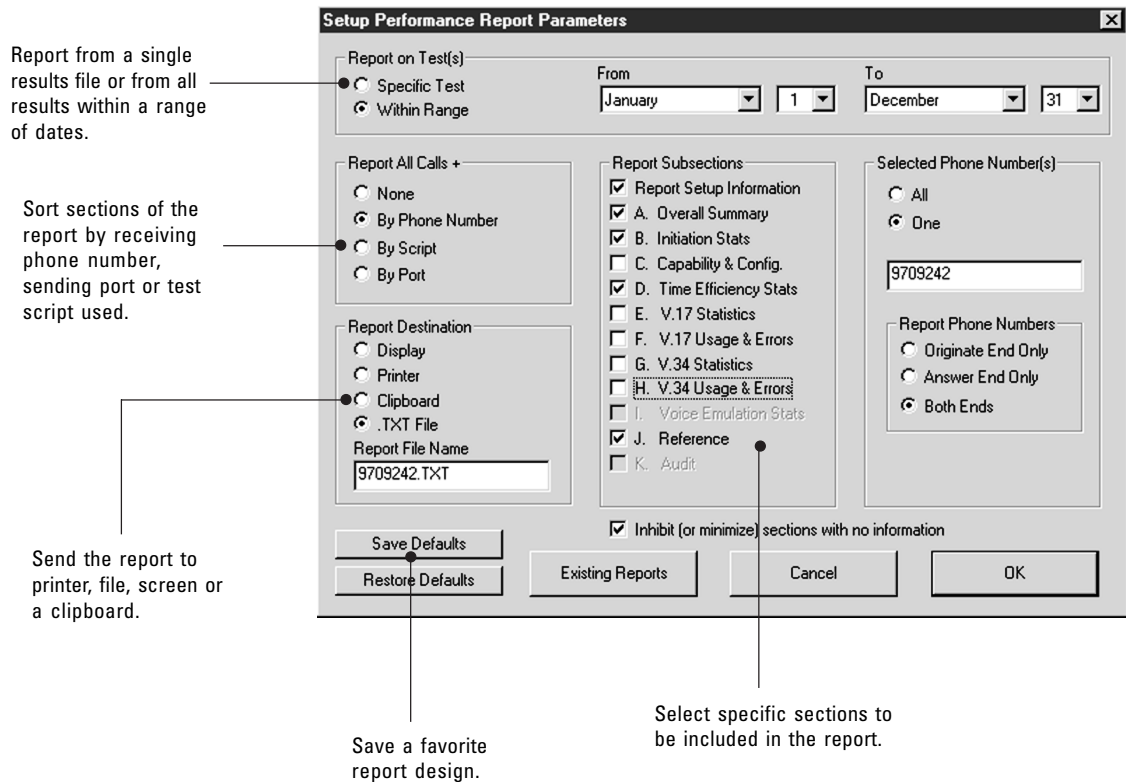
Telegra M products operate in two modes: call capture and call generation. Call capture monitors, records, and analyzes calls between two fax systems. Call generation automatically originates or answers calls using user designed test scripts or Agilent's Standard Test Library which can be modified by the user.

Telegra M supports all ITU-T Group III standards: V.34, V.17, V.33, V.29, V.27, and V.21 modulation, T.30 and V.8 handshaking, and T.4 and T.6 image encoding.

Telegra M features powerful regression testing. Fax calls with known behavior are captured and used as references. Subsequent calls are compared automatically with the references, and the differences noted. Calls may even be compared with multiple references at the same site.

Review massive test results automatically

TelegraM performance reports give a complete statistical analysis of calls from selected results files, saving the user from having to review large amounts of data. The report design dialog box, shown below, shows the range of optional content.



Performance reports measure reliability and pinpoint areas of performance needing attention. Time efficiency statistics help to benchmark economic use of system and network resources. Regression test reference statistics measure how the system compares with a previous release or model behavior.

Understand call failures completely

Fifteen years of continuous involvement with the design and testing of hundreds of fax models has resulted in a knowledge base of unequaled depth and detail. The Expert Notes and Errors window presents a detailed analysis of fax errors and other significant events in the call. In plain English, it explains how the call deviates from ITU-T and PTT standards or from practices necessary to achieve the highest possible level of compatibility recommends specific corrective actions.

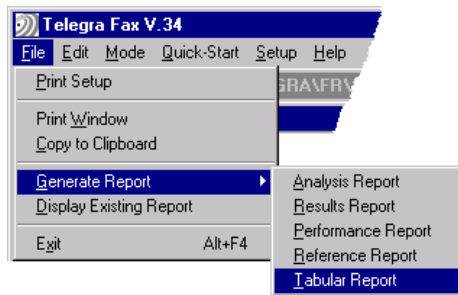
Generating a Tabular Report

A tabular report produces output that is suitable for importing into a spreadsheet such as Microsoft Excel. In general, a tabular report has a header and a body. In the body of a tabular report, user-specified spreadsheet fields are separated by tab characters.

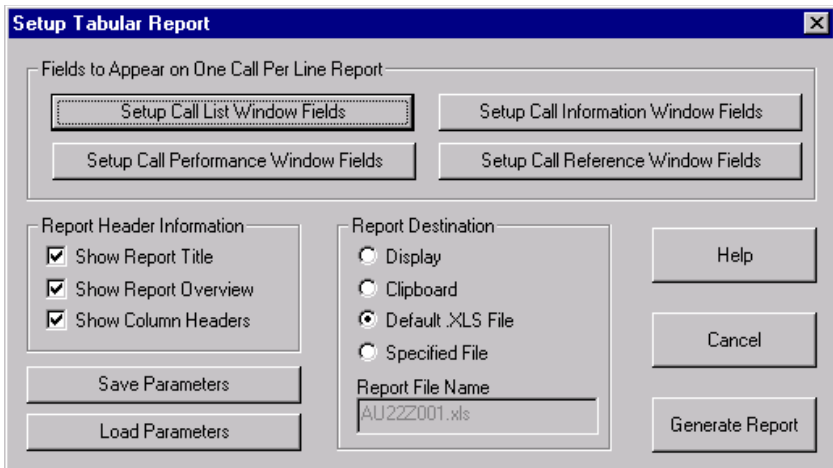
For the Result file tabular report, all fields that appear in the results window are available for inclusion in the tabular report. Header items are generated as single fields, which include both a description and a value. Items appearing in the body appear as values only. An option exists for generating a row of column labels at the top of the report.

To generate a tabular report:

1. First display a call results file.
2. Then select **File**, **Generate Report**, and **Tabular Report**, as shown here:



The Setup Tabular Report window is displayed, where you can select the specifics for the report, as shown here:



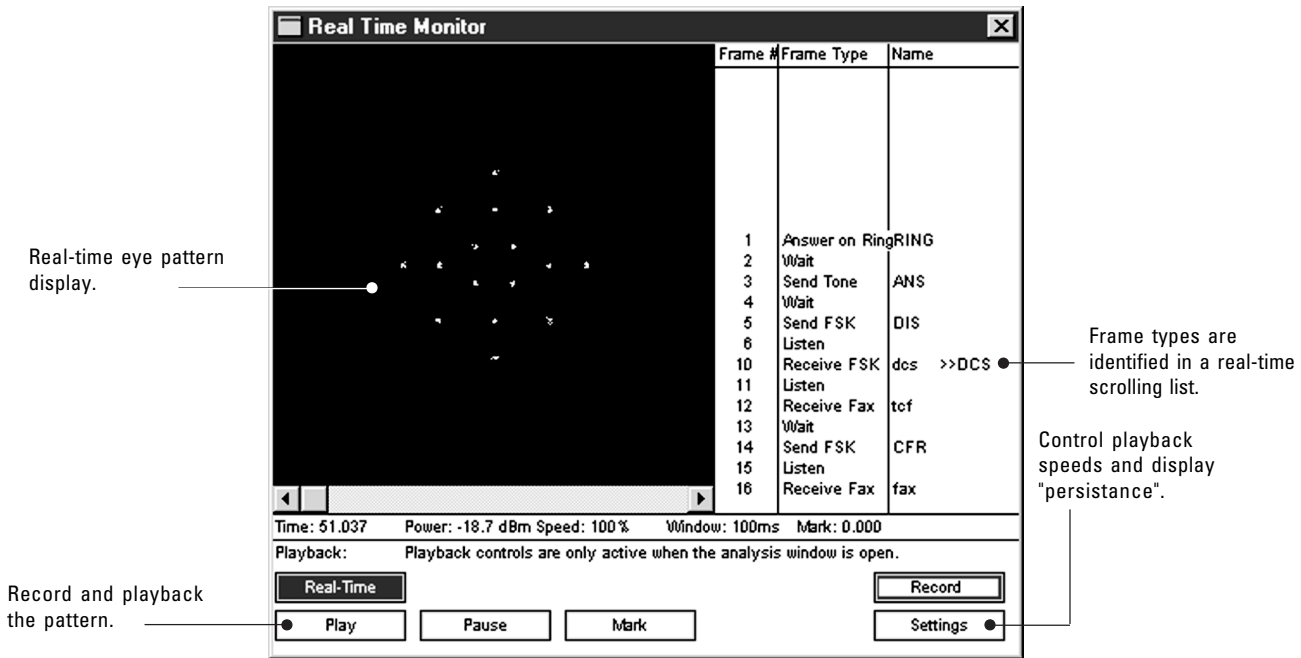
Telegra M software records, displays, and analyzes fax calls. Recorded calls are automatically named and indexed by port, month and date for easy retrieval. The protocol is displayed in list form or in a graphical browser that shows both originate and answer messages with a time base that can be zoomed and panned. Clicking on a message displays information about the message in up to nine other specialized analysis windows. For example, the Processed Image Data window decodes fax page images by line or by run length code within lines. Errors in the call are highlighted in red so it is easy to scan for problems.

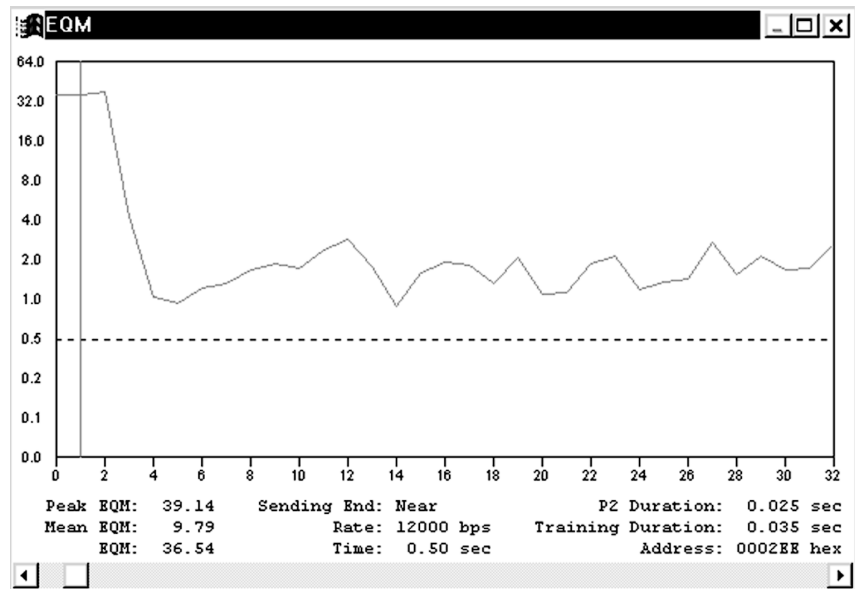
Emulate behavior of any fax device

Recorded fax calls may be converted into test scripts with a single command allowing the user to select either the originate or answer side of the call. This technique can also be used to generate regression test libraries. It also can be used to capture and emulate behavior of particular fax machine models, which is often a useful supplement to comprehensive worst case stress testing.

Watch analog fax signals in real time

Telegra M Real Time Monitor displays analog fax signals and corresponding fax protocol phases in real-time using an eye pattern constellation similar to an oscilloscope display. The fax signal may also be recorded and played back over a wide range of speeds for pinpoint analysis. The overall eye quality is also recorded during the call for each fax page transmitted, giving a moment by moment measure of how much the received signal phase and amplitude deviates from an ideal signal. The recorded quality data for any page can be displayed as a graph. The monitor and graph are useful in diagnosing line and analog signal impairments and correlating them with errors in fax calls, replacing additional expensive test instruments.





Test to the latest high speed V.34 fax standard

TelegraM offers the option to originate, answer, and capture calls using V.34 modulation at speeds up to 33.6 kbps in addition to operating at all lower speeds. Since V.34 operates in part in a full duplex mode, TelegraM does not operate in a passive capture only mode for V.34 calls, but must actively participate as either the originating or answering fax device. In the Call Phases chart view of the V.34 protocol, V.8 handshaking is shown hierarchically in phases that can be expanded into a sub-phase view or collapsed into an overview.

Design your own tests easily

A structured editor for test scripts that is fully integrated into the software allows the user to create and modify scripts. Scripts are created as a series of standard commands, using dialog boxes to select among eleven frame types, choose parameters, timing and power levels for the frame, edit binary and hex data, and manage flow of control. TelegraM test scripts give the user complete control over the content and timing of every phase of a facsimile call, down to the bit and millisecond level. The user can generate normal, difficult and abnormal calls and emulate any kind of fax system behavior. The scripts and suites in all TelegraM test libraries are provided in "source code" form so the user can understand and modify them.

Perform fully automated, unattended testing

Testing can be orchestrated with batteries of test calls by creating test suites using the integrated suite language. The user controls the flow of testing with labels and flow control statements and can run tests at a scheduled time or periodically. Powerful commands allow the user to manage large numbers of test ports across multiple systems and vary operating conditions between calls, without having to change the underlying scripts. All ports can work independently, or ports may be grouped to run the same test.

During testing, TelegraM logs the operation of suites in a results file, summarizing test results from all calls. The details of each call are captured in an individual analysis file. Automatic review and selective retention of analysis files permits thousands of calls to be made in unattended fashion without exhausting mass storage.

Test fax systems located anywhere, from anywhere

The client/server architecture allows the user to place TelegraM systems at remote sites, such as network nodes, customer premises or test laboratories and access them from any Windows® 98 or NT based PC. All Agilent Advisor features are available to the user through client software running on the user's PC. Clients talk to servers through a LAN, the Internet, an intranet, or any other TCP/IP network. This permits testing resources to be easily shared by several members of a project team. Quality assurance, production, and support staff can instantly share test capabilities and test results with engineering staff. Test ports can be placed at two or more remote nodes on a landline, cellular, or satellite network and the user can selectively test the paths between them. Network operations staff can monitor critical nodes in a network from the network operations center. Or users may just want the convenience of working from PCs in their offices or from notebook computers in the field. The user can control which clients are allowed to access TelegraM servers and all communications are encrypted for additional security.

Test Libraries

Agilent's test libraries are collections of test scripts and suites that are used by TelegraM to generate "originate" and "answer" test calls for testing functionality, compliance with a variety of different standards, and compatibility with thousands of releases of fax equipment models.

Standard test library

These tests are included with all TelegraM systems and exercise all areas of fax functionality. Suites include over 100 scripts in the following categories: Originate, Answer, ECM Originate, ECM Answer, ITU-T Test Images, Operator Interrupt and Single Ended Tests. A complete library of the eight test images defined in the ITU recommendations is included.

Telegra M Test Libraries

Telegra M system is powered by an extensive set of pre-defined fax call scripts selected from standard and optional test libraries. These calls incorporate the standard and the anomalous behavior prevalent in the installed base of over 100 million fax machines and PC fax cards and are designed to test to the industry standards, deviations to those standards, and known fax system problems that are in the market today. Telegra M V.17 embodies Agilent's worst case stress test philosophy ensuring that, upon successful test completion, the fax server, network device, analog or digital network will be able to communicate reliably and at a high completion rate with the largest population of fax cards, systems and networks in the world.

The Telegra Fax Test Libraries provide the following standard tests:

Functionality

Provides complete stress testing by sending a collection of test scripts that test all aspects of fax. These calls are provided in a special Telegra M V.17 Test Library. They have been selected from Agilent's Telegra D Standard Test Library, Design Verification Library, and include new test scripts that have been created by Engineering. Evaluation of results is reported using a simple percentage success rate with guidelines from Agilent.

Load

Provides load testing on all ports. You may skip individual calls that the system under test can not handle. Evaluation of results is reported using a simple percentage success rate with guidelines from Agilent.

Network

Provides complete testing of a network or fax server with a special set of end to end test scripts. These suites automatically configure half of the ports to originate calls and the other half to answer the calls made by the originate ports. These scripts are adapted from the powerful Telegra D Network Test Library and have been modified to handle an unlimited number of ports.

Special

Provides tests for special conditions such as "dial a fax server access code and then a fax number" or "test a list of phone numbers for fax capability".

The Following Test Libraries are included with the Telegra M Platform

T30 Design verification test library - worst case testing

This powerful library contains 167 scripts in 17 test suites that test fax systems for conformance with ITU-T recommendations T.30, T.4, and T.6, and for interoperability with fax machines exhibiting the most commonly found design errors and deviations from the standards.

ETSI conformance test library

Fax resellers and major suppliers to many European Union countries generally prefer to market systems that comply with the European Telecommunications Standard ETS 300-242. Tests cover T.30 protocol handling, scanning, print resolution, data rate, fall back, gap timing, TCF patterns, fax parameters, abnormal FSK message, preamble/sync anomalies, short image lines, etc.

French telecom standard 110 test library

Fax equipment resellers in France generally require manufacturers to comply with the French Test Standard NT/SPT/SCE/STD/110. These stringent standards include requirements that exceed and clarify interpretation of ITU-T standards. The library also includes TCF training patterns and test images used in the test.

Technical Specifications

Physical Characteristics

Dimensions: 43.8 W x 45.7 D x 17.8 H cm
(17.25 W x 18.00 D x 7.00 H inches)
Weight: 16 kg (35.30 pounds)

Temperature

Operating: +5°C to +40° C (+41° F to +104° F)
Non-operating: -20°C to +70° C (-4° F to +158° F)

Humidity

Operating and Non-operating: 15 to 95%

Regulatory compliances

EMC, Safety CE, UL/CUL
Telecomm: FCC 68, CS-03

Interfaces

- Analog 2-wire FXO interface.
- Two RJ-11 rear panel connectors per card.
- Standard analog, loop start, tip and ring interface, FCC part 68 approved.
- Line interface input impedance approximately:
 - Call Generate Mode: 600 ohms
 - Monitor Mode: >6000 ohms

PC System Requirements (PC not provided)

- PC running Windows® 98 or NT
- 50 MB free hard disk space
- VGA or Super VGA (recommended) color display, supported resolutions: 800x600, 1024x768, 1280x1024
- 10BaseT TCP/IP network interface card (NIC)

Related Literature

Telegra D	Product Overview	5968-5651E
Telegra R	Product Overview	5968-7723E

Warranty

Hardware: 1 year
Software: 90 day replacement only

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First Name _____
Last Name _____
Company Name _____
Job Title _____

Business Mailing Address _____

City _____
State/Province _____
Country _____
Zip Code _____

E-Mail Address _____

Phone Number _____
(incl. area/country code)

Fax Number _____

Do you have a budget set for this application?

- ☐ Yes
☐ No
☐ In process

What is your time frame to implement this product?

- ☐ 30 days ☐ 180 days
☐ 90 days ☐ Other – (please define) _____

Product(s) of Interest

- ☐ **The Agilent Advisor** – Integrated, High-Performance Troubleshooting for:
_____ Advisor LAN
_____ Advisor WAN
_____ Advisor ATM
- ☐ **The LAN Analyzer** – Scaleable Ethernet and Token Ring Test Solutions
- ☐ **Telegra Fax Test** – Fax Protocol and Low Generation Analysis
- ☐ **Telegra Voice Quality Tester** – Detailed Voice Analysis for Clarity, Echo and Delay using
PSQM and PAMS
- ☐ **Telegra Voice and Fax over IP** – Protocol Analysis
- ☐ **FASTest** – Automated Service Verification for PSTN and IP Networks

What is the main problem you
need to solve on your network?



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5968-5652E

Notes _____

Notes _____

Notes _____

This Product is Y2K Compliant

Agilent Ordering Information

J3947A	V.17 4- to 96 port rackmount fax bulk call generator and analyzer.
J3952A	V.34 analysis
J5447A	V.17, 4-port analog fax test system
J3952A	V.17, 8-port analog fax test system
J3952A	V.17, 12-port analog fax test system
Opt 202	V.34 analysis

Note:

For V.34 analysis, add Option 202 to each part number listed above.
For systems from 12-port to 96 port, order J5449A in multiples of 12-ports.
Example: For a 36-port system, order 3 each of the J5449A.

Fax Technology Training

H7211A/B	Customer Education and Training
Opt 171	Fax Technology and Testing
Opt 271	Advanced Fax Technology and Testing

Note: H7211A is open enrollment
H7211B is on-site

By internet, phone or fax, get assistance with all your Test and Measurement needs.

Online assistance:

<http://www.agilent.com/find/assist>

United States:
(Tel) 1 800 452 4844

Canada:
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(Fax) (905) 206 4120

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(Fax) (81) 426 56 7840

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(Fax) (305) 269 7599

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(Fax) (61 3) 9272 0749

New Zealand:
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(Fax) (64 4) 495 8950

Asia Pacific:
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