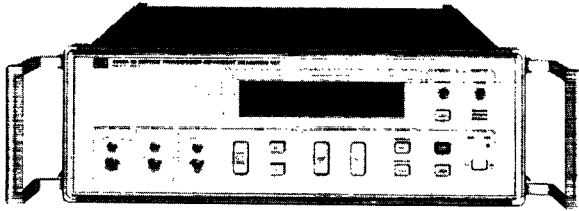


# DATA COMMUNICATIONS TEST EQUIPMENT

## In-Service Transmission Impairment Measuring Set

Model 4948A

- Voice-grade data circuit testing - without disturbing traffic
- True preventive maintenance
- Network management information - without special modems
- Suitable for North American and CCITT environments



HP 4948A



### Description

The HP 4948A is a unique Transmission Impairment Measuring Set (TIMS) which lets you test data circuits carrying voice grade modem traffic while they are still in service.

A simple connection to the data circuit carrying the modem signal, at a voice frequency access point, is all that is required for the HP 4948A to measure the impairments that have been added between signal generation and the measurement point.

The HP 4948A is very simple to use: with one keystroke the HP 4948A can automatically identify the modem type and measure all the transmission impairments simultaneously. It remembers all the previous test conditions so no time need be wasted setting up a test, and flexible printout capabilities let you document test results with ease.

### The HP 4948A Simplifies Testing

The in-service capability of the HP 4948A opens up new test strategies. The HP 4948A lets you see if the analog signal is good where you are testing. Because you are measuring on the live modem signal, only one instrument need be used, which removes the problem of co-ordinating an end-to-end test. This speeds up the fingerpointing that helps you establish who has the responsibility to repair a fault in today's multi-vendor networks.

You can respond to trouble reports immediately without taking the line from service. All the impairments are measured at once so you can quickly and easily recognize the problem. The HP 4948A sees the line like a modem sees it (same bandwidth, same response) letting you identify the impairments that are really causing data errors. And with the HP 4948A's long term data logging capabilities, you can even track down difficult, intermittent faults.

With the HP 4948A you can implement a preventive maintenance policy and routinely check lines against a benchmark. While the circuits are still operating, carrying traffic, you will see any degradations and be able to clear problems before they cause data errors. Testing can be done at convenient times, even when the circuits are being heavily used and the network is under most stress.

All the capability of the HP 4948A can be remotely controlled and so it can be used to build a network monitoring system. The HP 4948A is an economic means of producing data for private network management - even for small systems, or systems using a variety of modem types.

### Networks

You can use the HP 4948A at any point along a datacommunications circuit. In multi-point circuits, testing the host-to-slave link is as easy as for point-to-point circuits. To test the slave-to-host link, only one slave modem must be transmitting data while the HP 4948A analyzes the signal.

### Measurement Capability

Level Frequency S/N Phase Jitter [4-20Hz, 20-300Hz] Amplitude Jitter [4-20Hz, 20-300Hz]	Dropouts Gain Hits Phase Hits Impulse Noise	On modem signals only: Attenuation Distortion Delay Distortion
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The results are all computed simultaneously, with the received signal constellation available from the rear panel XY outputs.

### Compatible Modems

The HP 4948A has been designed to operate with many of the common high speed modems in use to-day.

Compatible Modem Types (4-Wire)	
Data rate	Examples
9600 bps	CCITT V.29, AT&T 209, AT&T 2096 V.29 with 1800Hz carrier 4x4 QAM with 1700Hz carrier
4800 bps	CCITT V.27, AT&T 208, AT&T 2048
2400 bps	CCITT V.26 A&B, AT&T 201 B&C

NOTE: It is expected that further schemes will be added to this list.  
AT&T is a trademark of the American Telephone and Telegraph Company.

### Measuring Impairments on a Modem Signal

The HP 4948A measures the effects of the same line impairments that are measured by a conventional, intrusive TIMS. A TIMS measures the effects on a simple known signal (tone) but the HP 4948A measures the effects on the full bandwidth of the data signal with level and frequency properties dependant on the transmitting modem and the data. In addition, the HP 4948A measures impairments at its data detection point - as a modem would see them. From these measurements the HP 4948A predicts conditions on the line and presents its results in conventional form. In most practical situations, the results from the HP 4948A are very similar to those from a TIMS. However, they cannot be directly equated because of the different techniques involved.

### Data Logging

Result data can be stored in the test set's own internal non-volatile memory for later interrogation and printout. The HP 4948A can be left unattended for long periods monitoring a line. This lets you look back at intermittents after they have occurred, or comprehensively characterize a circuit's performance over time.

### Out-of-Service Testing

The HP 4948A can transmit and measure on a tone, so it can interwork with tone sources and conventional test sets. It can also transmit a simulation of a high-quality modem signal of each of the compatible modem types. This allows out-of-service testing and circuit benchmarking with another HP 4948A.

### Ordering Information

	Transmit & Receive Connectors	
	WECO 310 & Bantam	Siemens 3-pin
Stand-alone front connectors adjustable legs	HP 4948A Standard	HP 4948A Option 003
For rack mounting front connectors flat base	HP 4948A Option 001	HP 4948A Option 004
For rack mounting rear connectors flat base	HP 4948A Option 002	HP 4948A Option 005

**Option 908:** 19" rack mount kit

**Option 910:** Extra set of manuals

**9211-2661:** Hard transit case

**HP 4948A In-Service Transmission Impairment Measuring Set \$12,700**