Release Notes
v7.10.19 for 96x Multi-Channel Test Unit

This document describes a new software release (v7.10.19) for the 96x. This software supersedes Version 7.4.27 and is available now.

NEW FEATURES

1. **Return Loss and Multiple Noise Measurements Simultaneously Reported by Measure Tone Function** — The following measurements are added to the Measure Tone results structure:
   a. RTL_dB: return loss in dB
   b. Noise power with 3K-filter in dBrn
   c. Noise power with Cmsg-filter in dBrnC
   d. Noise power with Cmsg-Notch-filter in dBrnC
   e. Noise power with Psophemetric-filter in dBm
   f. SNR (Signal-Noise-Ratio) in dB.

   All measurements are available simultaneously.

2. **T.30 Fax test support for all modem types specified in ITU-T Recommendation T.30** — These newly expanded modem types and rates are:
   a. V27ter @ 2400bps
   b. V27ter @ 4800bps
   c. V29 @ 7200bps
   d. V29 @ 9600bps
   e. V17 @ 7200bps
   f. V17 @ 9600bps
   g. V17 @ 12000bps
   h. V17 @ 14400bps

3. **New T.30 test parameters EVM (Error Vector Magnitude) and Symbol Error Count** — The 96x Fax Receive function (when working with the 96x Fax Transmit function) now performs actual channel equalization, then reports the EVM (Error-Vector-Magnitude) and Symbol Error Count (similar to bit error count) during the initial training stage and for each page received. The measured EVM and error count are only shown inside the log file in order to minimize disruption to the current GUI design.

   EVM (Error Vector Magnitude) is a parameter that characterizes how good (or how bad) the modulation quality is. Typically, EVM should be less than 4%. If it exceeds 5%, then the channel or equipment under test is bad.

   Once symbol errors are detected, then no matter how good or bad EVM is, the symbol error supercedes. If there are no symbol errors, then EVM indicates how much more channel capacity the device has for further rate increase.

4. **Synchronous, Interleaved Capture of ISDN Messages from Each Direction** — Now, when a pair of PCM interfaces is configured to Dual Monitor mode, you can go to the lower numbered interface, double-click on the D-channel, click on the "Msgs" button and see the back-and-forth messages on one screen, where they can also be logged.

Each message is time stamped with the date and time of day, with resolution to the second. For directly connected (USB) 96x's, the date/time information comes from the host PC. For remote-controlled units, the information comes from the remote control processor in the 96x.

Each message carries an additional elapsed time stamp generated by the 96x DSP processor, with resolution to the millisecond.

5. **New 23-Tone Test** — Added the 23-Tone test, a powerful transmission measurement technique that was developed by Bellcore and Sage Instruments and is now part of the IEEE 743 specification. The 23-Tone test is designed to make a variety of transmission impairment measurements across the full channel spectrum in a very short period of time. The test signal consists of 23 equally spaced, phase coherent tones ranging from 203 Hz to 3328 Hz. The phase relationships of the tones have been selected to create a signal that simulates the probability density of modern high speed modems such as V.29, V.32 and V.34. A single 23-Tones burst lasting only a few seconds can yield the following measurements:

   – Attenuation Distortion @ 23 frequencies
   – Group Delay Distortion @ 22 frequencies
   – Signal-to-Noise
   – Signal-to-Total Distortion
   – Second and third order intermodulation distortion

   The 23-Tone test can be purchased by ordering *Option 4000: Advanced TIMS - IEEE-743 23 Tones.*

6. **CLI (Command Language Interface) — New Multi-Pattern BER Test**: The 966R CLI "bertpat" command now provides a generalized method of creating custom, multiple pattern BER (bit error rate) tests, and allows up to four such custom tests to be defined.

   A user can define each custom test to be a complex BERT sequence that can contain up to five distinct sub-patterns. To provision a BERT pattern with such a sequence, you must create a custom binary string in the form described below. A user may define up to four such custom BERT tests.

   A concatenated string of:
   NP+PT1+PT_len1+PT2+PT_len2+PT3+PT_len3+PT4+PT_len4+PT5+PT_len5+CRC

   Where:
NP	=	subtract 2 from the number of bit patterns in the sequence, and express as a 2-bit binary number
PT1	=	pattern #1, expressed as an 8-bit binary number
PT_len1	=	subtract 1 from the number of times to repeat bit pattern #1, and expressed it as a 9-bit binary number
PT2	=	pattern #2, expressed as an 8-bit binary number
PT_len2	=	subtract 1 from the number of times to repeat bit pattern #2, and expressed it as a 9-bit binary number
PT3	=	pattern #3, expressed as an 8-bit binary number
PT_len3	=	subtract 1 from the number of times to repeat bit pattern #3, and expressed it as a 9-bit binary number
PT4	=	pattern #4, expressed as an 8-bit binary number
PT_len4	=	subtract 1 from the number of times to repeat bit pattern #4, and expressed it as a 9-bit binary number
PT5	=	pattern #5, expressed as an 8-bit binary number
PT_len5	=	subtract 1 from the number of times to repeat bit pattern #5, and expressed it as a 9-bit binary number
CRC	=	CRC checksum, calculated as follows: PT1 xor PT2 xor PT3 xor PT4 xor PT5, expressed as an 8-bit binary number

7. **HTML (Web) Log-File Viewing and Uploading Buttons** — "View Log" and "Download Log" buttons have been added to the "resource" (test configuration) views.

8. **HTML (Web) Log-File Hot Link** — In the "interface" (span) view, there is now a "Log File" column, and the log file name is a hot link. Clicking on the hot link opens a standard dialog box which asks if you want to view or download the log file.

9. **HTML (Web) Digit Receiver** — The HTML interface now supports the 'Digit Analyzer' function present in the Windows GUI program

ENHANCEMENTS

1. **ISDN D-channel Support for Switching Machine Maintenance Messages** — ISDN D-channel switching machine maintenance messages will now be displayed when in monitor mode, and responded to when in terminate mode

2. **ISDN 'Sending Complete' Messages** — Recently our 960B encountered a series of ISDN-switches that do not comprehend the "sending complete" information element. Now, if the ISDN number type is selected as "Abbreviated", the 96x will not send the "sending complete". Otherwise, it will be sent.

3. **HTML (Web) ISDN D-Channel Hide Layer 2 Messages**— A user can now elect to hide Layer 2 messages, making it easier to follow call setup and tear down messages

4. **HTML (Web) Can Now Configure Test Interfaces** — Currently, only PCM interfaces are supported

5. **Miscellaneous GUI Enhancements**
   a. Some detached result dialog boxes (SIP monitor, V90 monitor, T.38) are now resizable

6. **Support for Additional SIP call Parameters:**
   a. **User Display Name** — This is the string that will be added to the "From" tag, and displayed at the called IP phone terminal. For example, the Display Name could be "John Smith from Sage".

   b. **Multiple "BYE" Messages** — Add an 'Advanced' tab in the 'Configure SIP Call dialog box. It contains a field that controls how many times we will send the "BYE" message to assure call disconnection. The default is 1, and the maximum is 6.

   c. **IMS Authentication Field (for User Control of Whether a SIP Message Is in the IMS Format)** — When a user wants to test an IMS server, the user must explicitly set the normal username string to "+15678" where "5678" is the actual phone number or username, and he/she must also explicitly set this new IMS authentication field to priv5678@private.net. Normally, the username strings used in making the call and authentication response are the same. But in IMS mode, they are not, hence this new field.

      Note: With this enhancement, the previous jitter buffer "back door" method of setting the jitter buffer size to end in "1", is now discontinued.

   d. **Proxy's Server's String Name** — Numerical IP address strings are not allowed in some SIP messages. Now, a user can enter the proxy server's string name such as "yahoo.com". Note that this does not remove the need to enter the server's absolute IP address. In the case of testing an IMS server, the user must set this field to "ims.sbc.com".

      Note: With this enhancement, the previous jitter buffer "back door" method of setting the jitter buffer size to end in "2", is now discontinued.

e. **In T.38 Fax Mode, User Control of Second "INVITE" Message** — Some products expect the responder (Called side) to transmit the second "INVITE" which triggers the switch to T38 mode, while others expect the calling end to do so. When in T.38 mode, a check box in the 'Fax Test Configuration Dialog' box controls whether or not this SIP end will send the second INVITE message.

   Note: With this enhancement, the previous jitter buffer "back door" method of setting the jitter buffer size to end in "3", is now discontinued.

7. **PESQ Transmit/Receive log header changes** — In the results log file for the PESQ one-way test (PESQ Transmit & PESQ Receive), units of measure have been added to certain header titles

   The new comma-delimited header is shown below, as it appears in the results file:
   Date,Time,Test Name,Span Name,Channel(s),Destination, cmpJitter(ms), expJitter(ms), gain(dB), bandwidth(%), noise(dBrnC), codec, mos, lq, pesq, ie, more mos

   For comparison, the old comma-delimited header is shown below, as it appeared in the results file:
   Date,Time,Test Name,Span Name,Channel(s),Destination, cmpJitter, expJitter, gain, bandwidth, noise, codec, mos, lq, pesq, ie, more mos

CORRECTIONS

1. **Digit Analyzer missing digits** — The Digit Analyzer could miss leading digits when the Digit Sender function was on a CAS, Immediate Start, NT interface, and the Digit Analyzer function was on a CAS, Immediate Start, TE interface. This no longer happens.

2. **In CLI (command line interface) mode, "DSP Test Died" Message** — When a PCM span is configured as dynamic ISDN ("ISDN/Dyn") with "dynamic" responders. Stopping a far end director would result in the responder error message ""DSP test died". This no longer happens.

3. **INMD Test: Occasional incomplete audio file capture/false echo detection** — This no longer happens

4. **DS0/Fractional BERT test: Custom patterns greater than 32 characters** — When a user entered a custom BERT test pattern consisting of more than 32 characters, then later viewed the pattern, the displayed pattern was incorrect. However, the correct pattern was being transmitted. The displayed pattern is now correct.

5. **Telneting from a Unix or Linux workstation requires logging in twice** — From a Unix or Linux workstation, Telnet access required the user to log in twice; the first log in returned a "login incorrect" error message. This no longer happens.

KNOWN DEFECTS

1. **G.168 Test #9 is Missing a 30 second Wait Period** — The 960B does not wait the requisite 30 seconds before starting Test 9.