T1 E1 Analyzer – Special Applications

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T1 E1 Special Applications

- Record / Playback
  - Playback File,
  - Record Data to File
  - Record from Multiple Cards
  - Automated Record / Playback
  - Automated Continuous Capture
- Call Capture and Analysis
  - Multiple Call Capture
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  - Multiple Call Capture
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  - Delay Attenuate Timeslots - Single channel
  - Digital Echo Canceller Simulator
  - GLC View - Waveform Viewer
- Multi-Channel BERT
- Protocol Identifier and Classifier
- Voice Quality Assessment

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T1 E1 Special Applications (Contd.)

- Protocol Analysis
  - HDLC, Physical Layer Analyzer, ISDN, SS7, Frame Relay, GR-303, ATM, DDS, GSM, MLPPP, TRAU, GPRS, CDMA, V5.x, CAS, UMTS, E1 Maintenance Data Link, T1 Facility Data Link, SS1, DCME
- Protocol Emulation
  - E1 Maintenance Data Link, T1 Facility Data Link, ISDN, ISUP, MAP, CAS
  - GSM, HDLC, TRAU, SS1
  - Multilink Frame Relay, Multi-link PPP, ATM IMA
- Windows Client / Server Modules

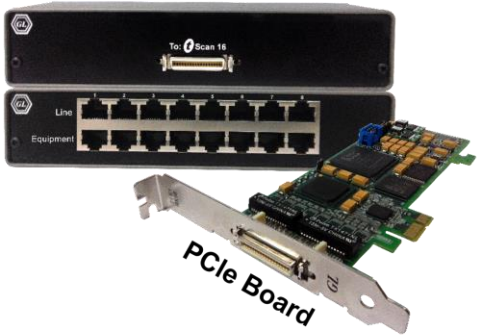
Supported T1 E1 Platforms

tProbe™ - Portable USB based T1 E1 VF FXO FXS and Serial Datacom Analyzer

Quad / Octal T1 E1 PCIe Card

Dual T1 E1 Express (PCIe) Board

tScan16™ with
16-port T1 E1 Breakout Box



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Supported T3 E3 Platforms

Front Panel

Back Panel

Portable USB based
Dual T3 E3 Analyzer Unit

2U Rack T3 E3 Analyzer

T3 T1 E3 E1 Multi-Tester Rackmount

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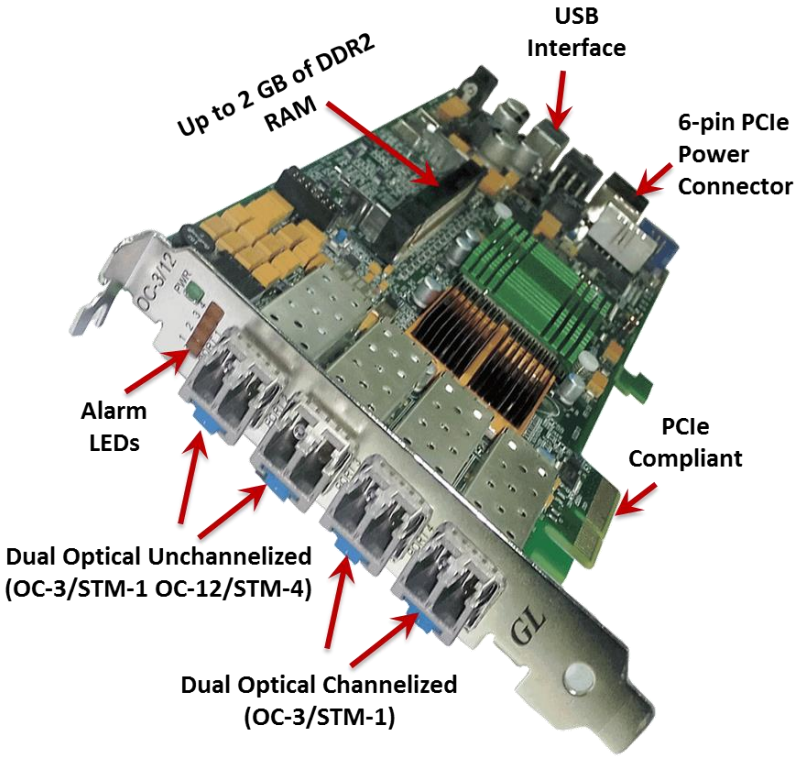
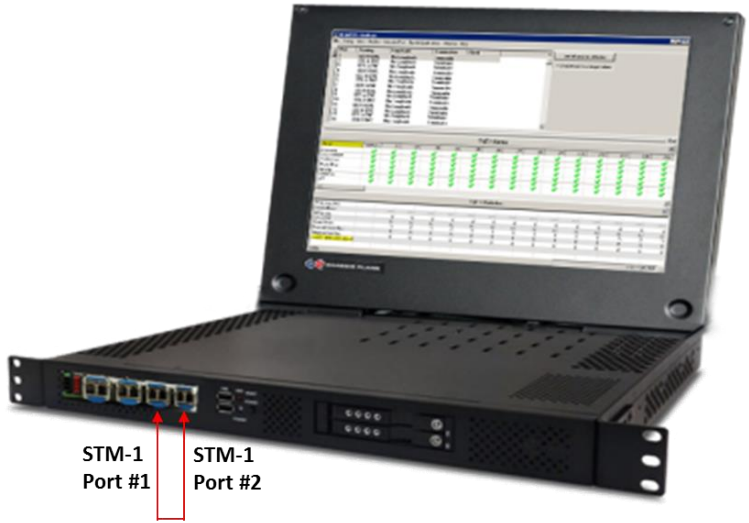
Supported LightSpeed1000™ Platforms



OC3 / OC12 PCIe Card LightSpeed1000 ™

Channelized LightSpeed1000™



Optical Cable

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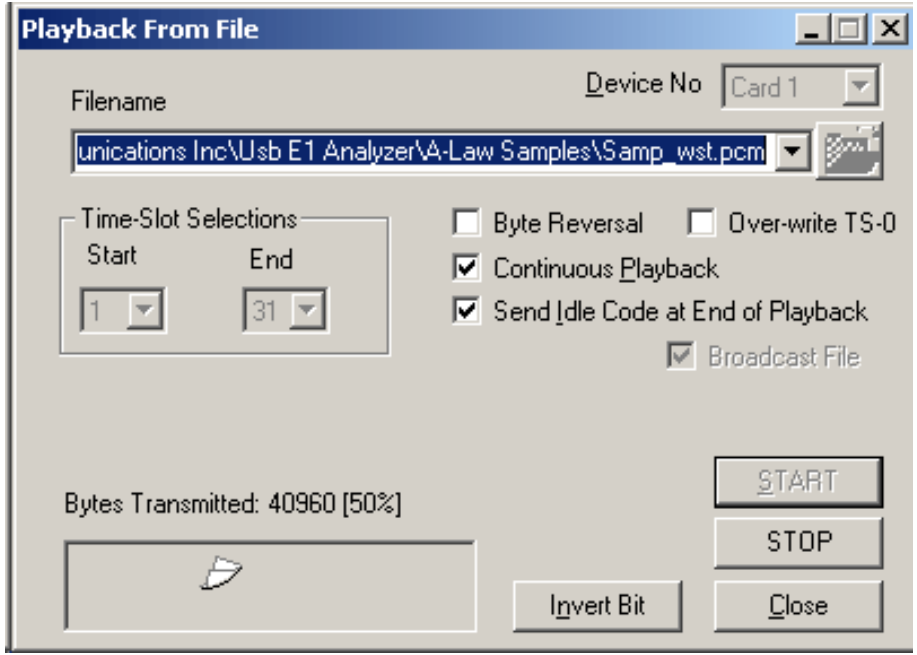
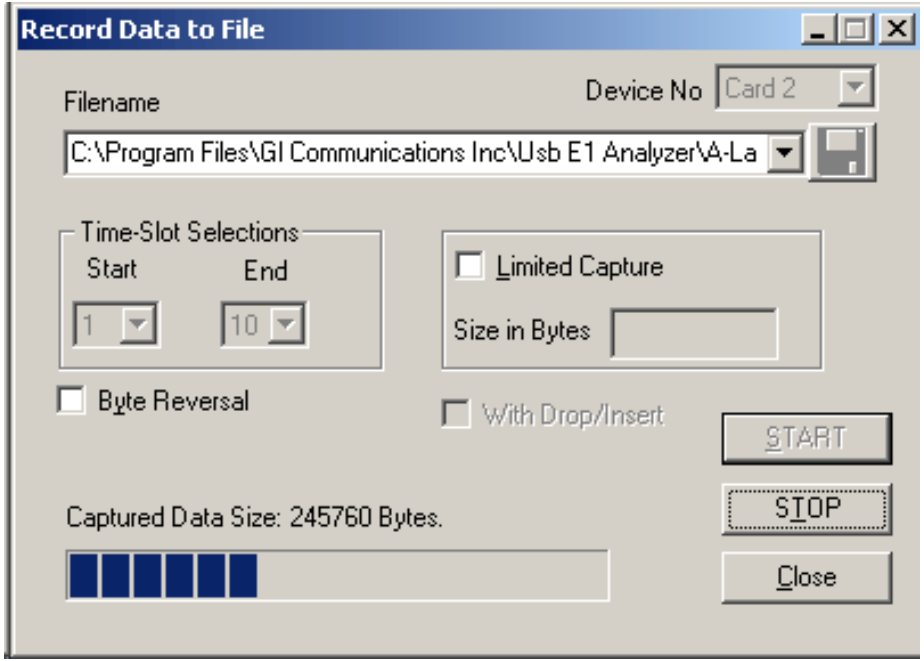
Playback from File



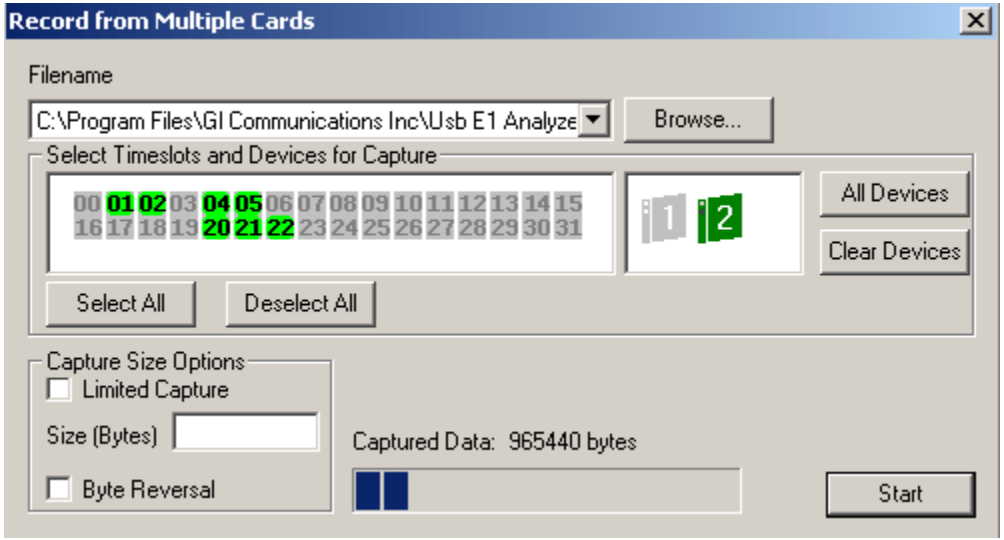
- Continuous transmission of data files (*.pcm or *.raw) on contiguous timeslots
- Repeated transmission of a single file without any data loss

Record Data to File



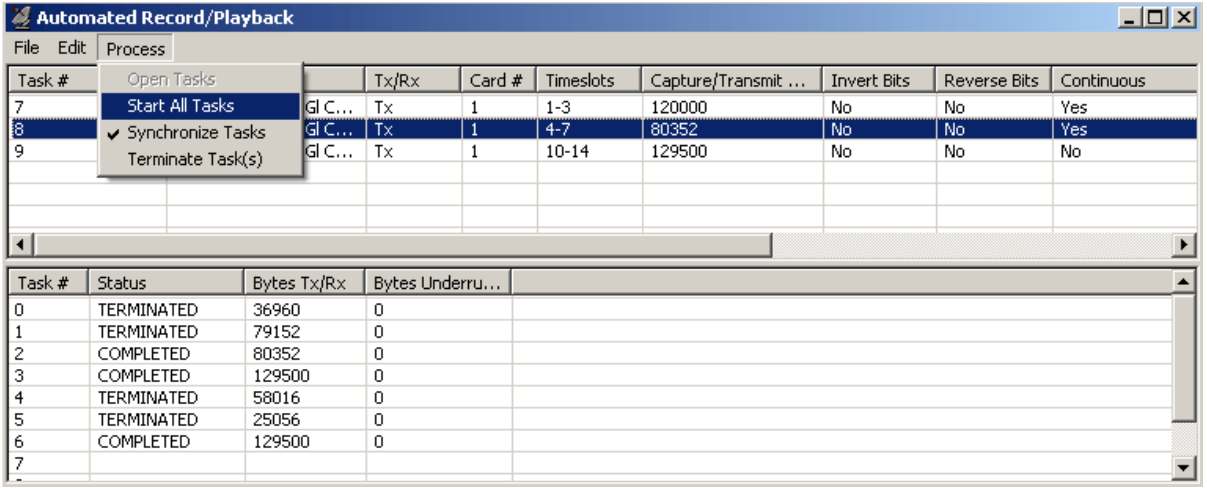
- Limited capture (specific number of bytes) to a file from all or selectable contiguous timeslots
- Synchronized capture, and capture in normal or reverse order

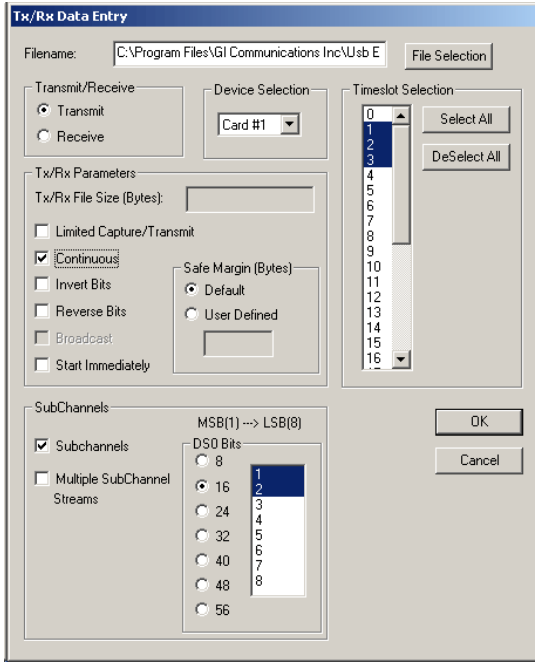
Record from Multiple Cards



- Capture data on non-contiguous timeslots
- Bytes may be captured in reverse or normal order
- Limited capture (specific number of bytes) to files from all or selected timeslots

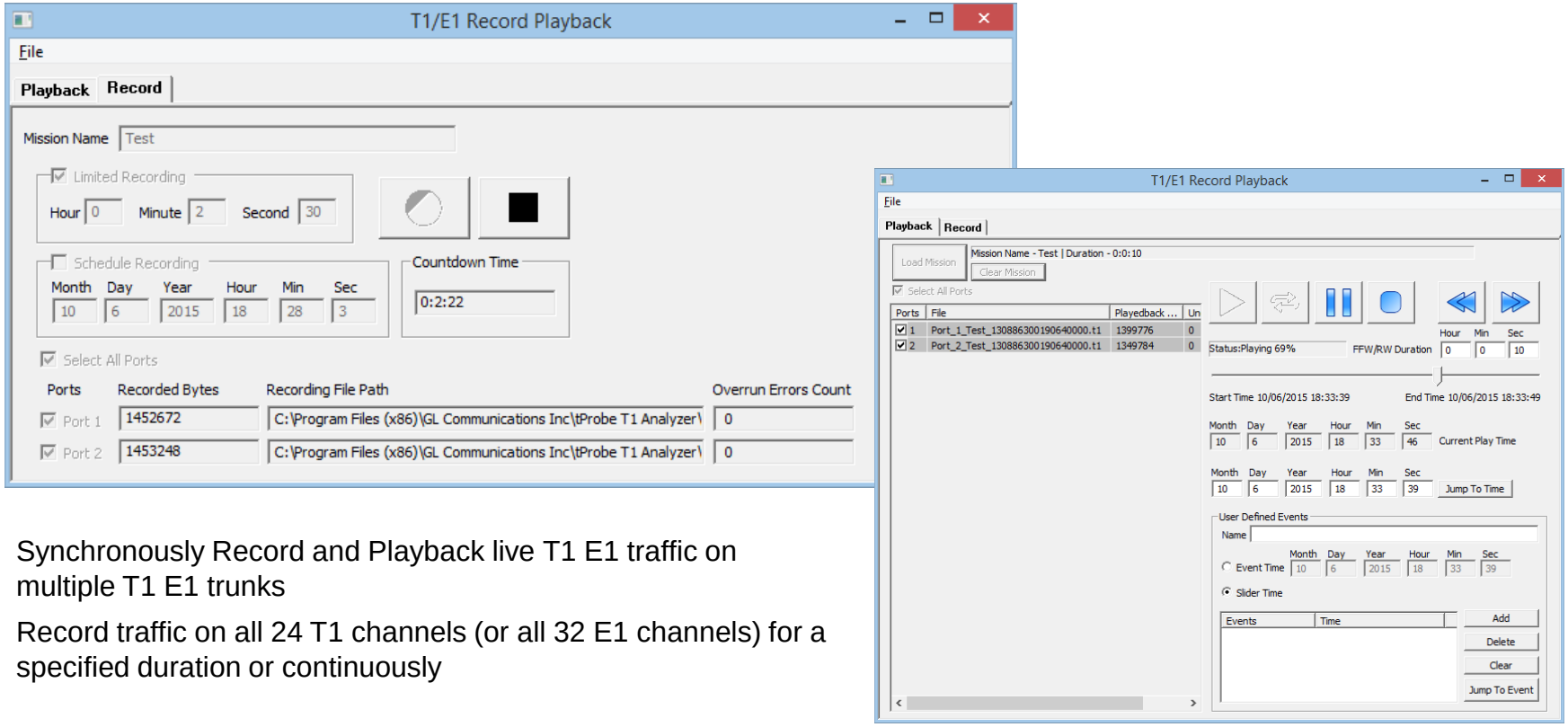
Automated Record Playback





- Permits to run several transmit or receive operation tasks synchronously
- Supports subchannel and multiple subchannel streams for transmission and reception

Synchronous Trunk Record Playback



- Synchronously Record and Playback live T1 E1 traffic on multiple T1 E1 trunks
- Record traffic on all 24 T1 channels (or all 32 E1 channels) for a specified duration or continuously

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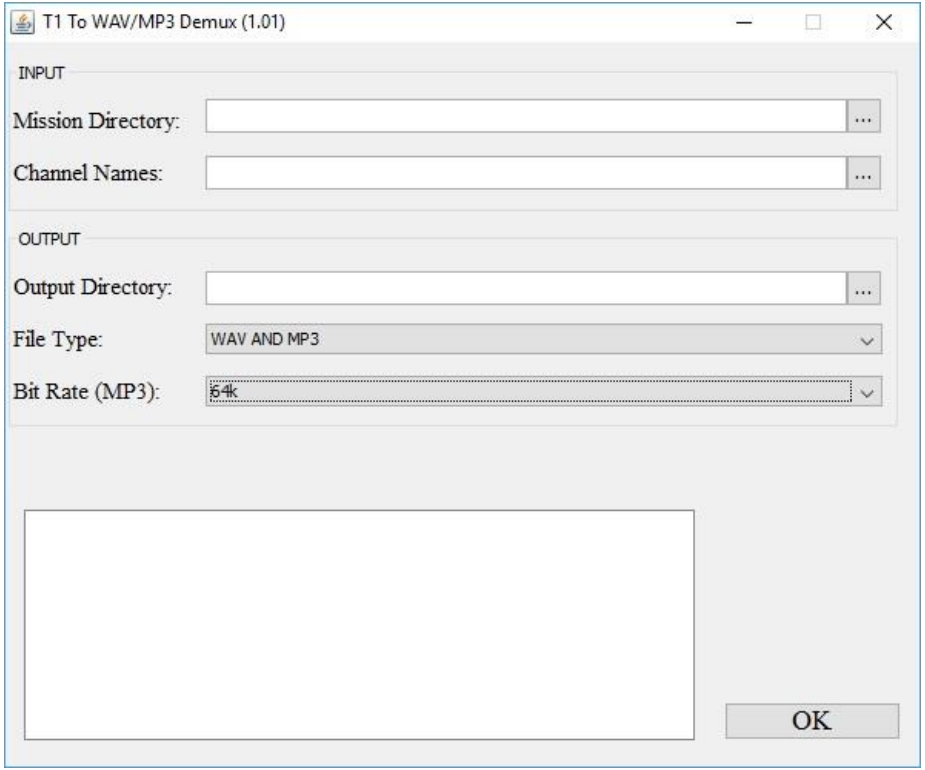
T1 Demux

- Provides options to split the T1 file containing the T1 trunk traffic into 24 individual files containing each time slot traffic, and then recorded in “WAV” or “WAV and MP3” format at user-defined bit rates configuration



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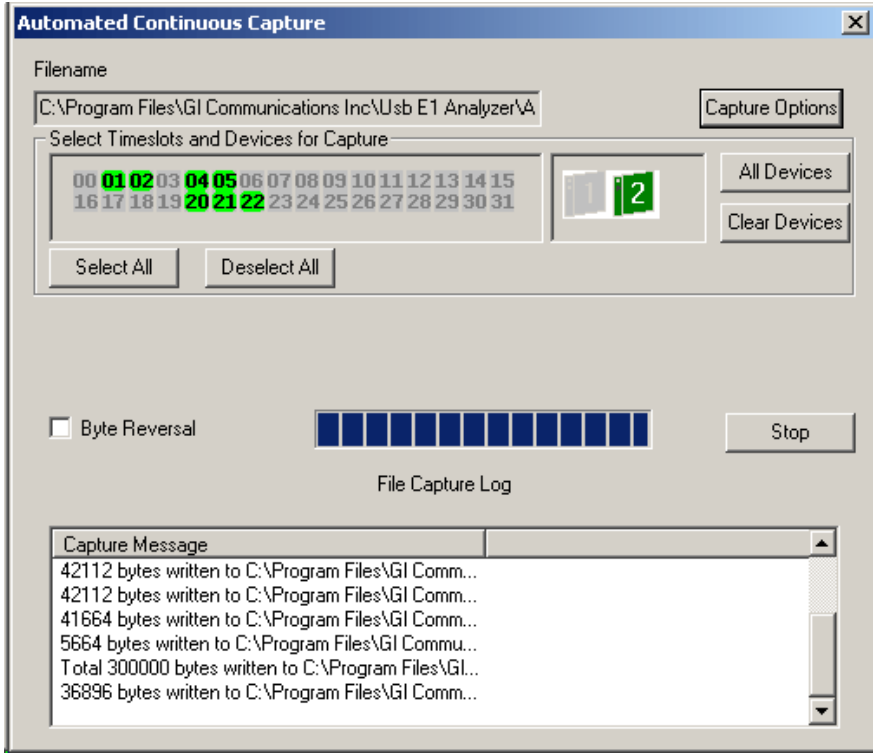
Automated Continuous Capture

- Continuous capture of data (*.ala, *.ula, *.pcm, *.wav, *.ber) to different files
- Seamless chunks of data capture to files with specified size, or time limit

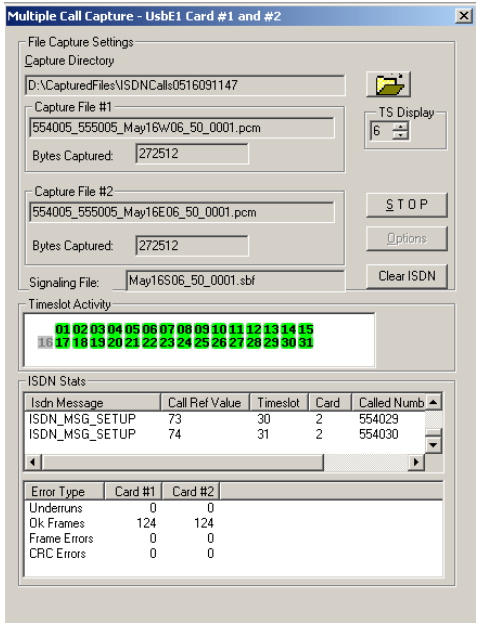


Call Capture and Analysis

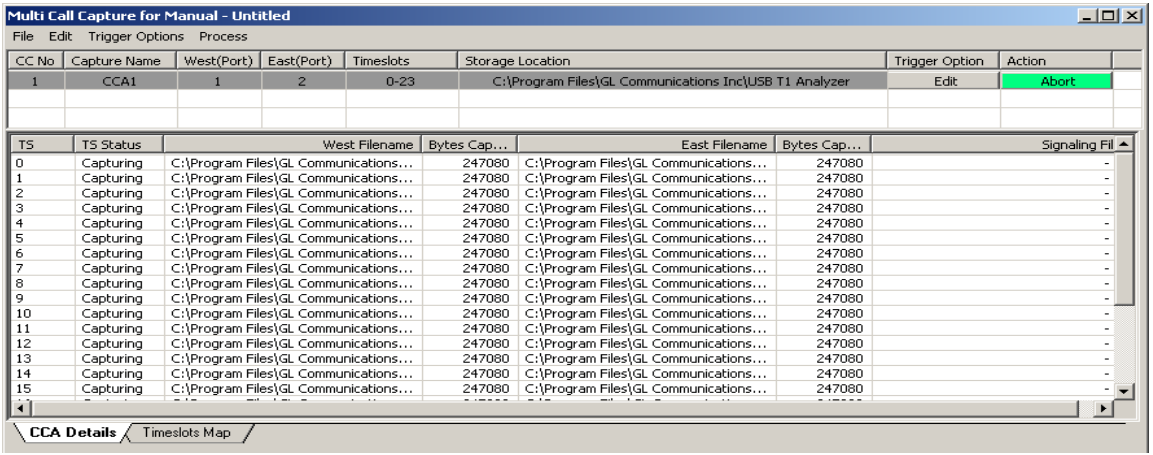
- Calls can be captured manually or captured automatically from both directions (east and west) of transmission using trigger action feature
- File naming conventions based on the types of capture (MFC-R2, Signaling, ISDN, SS7, Manual)
- The call capture application supports following types of triggers for auto capturing of call
  - Signaling based triggers - CAS -R1, wink start, MFC-R2
  - ISDN and SS7 message-based triggers
  - Traffic activated triggers –
    - Voice based on a minimum power level
    - Tones of specified frequency - Ring back tone, Dial tone, Busy tone, and DTMF digits
    - Fax traffic - V.32 / V.17, V.27, V.29
    - Modem traffic - V.22 forward/reverse channel, V.34 and V.90 uplink, Binary V.90 downlink, FSK
    - Any traffic based on any power level

Multiple Call Capture

Call Capture and Analysis



Multiple Call Capture and Analysis



- Used to record calls directly from T1/E1 lines
- Calls can be captured manually or captured automatically from both directions (east and west) of transmission using trigger action feature

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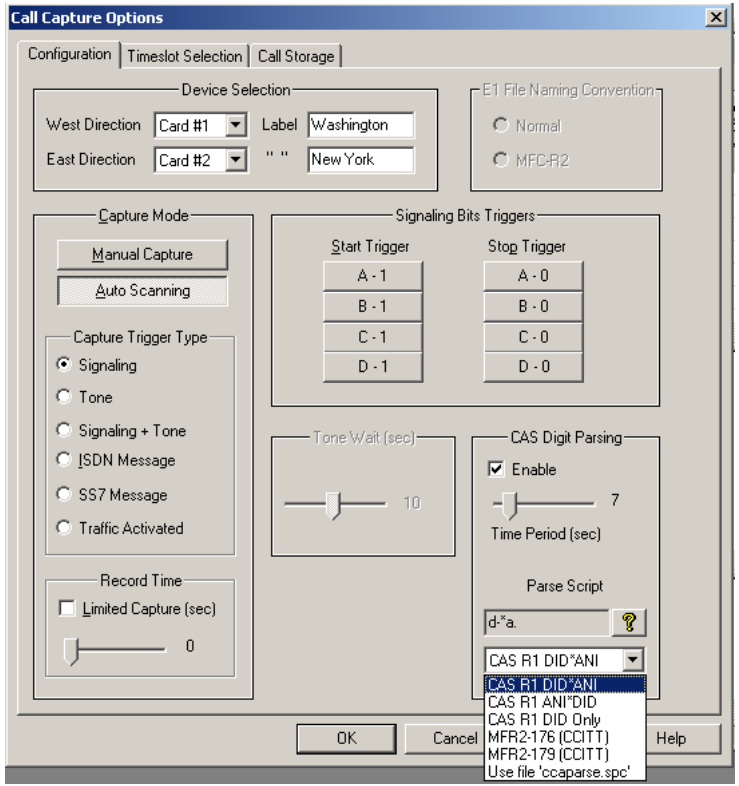
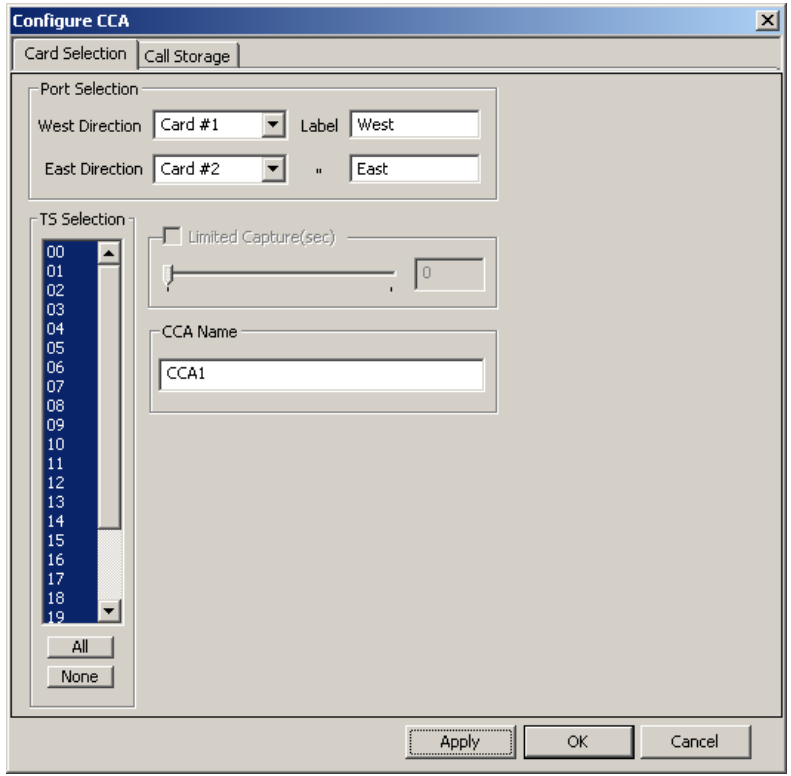
Configuration

Call Capture and Analysis

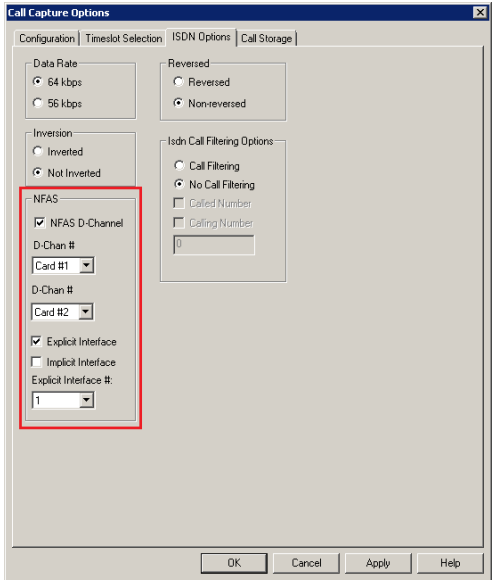


Multiple Call Capture and Analysis

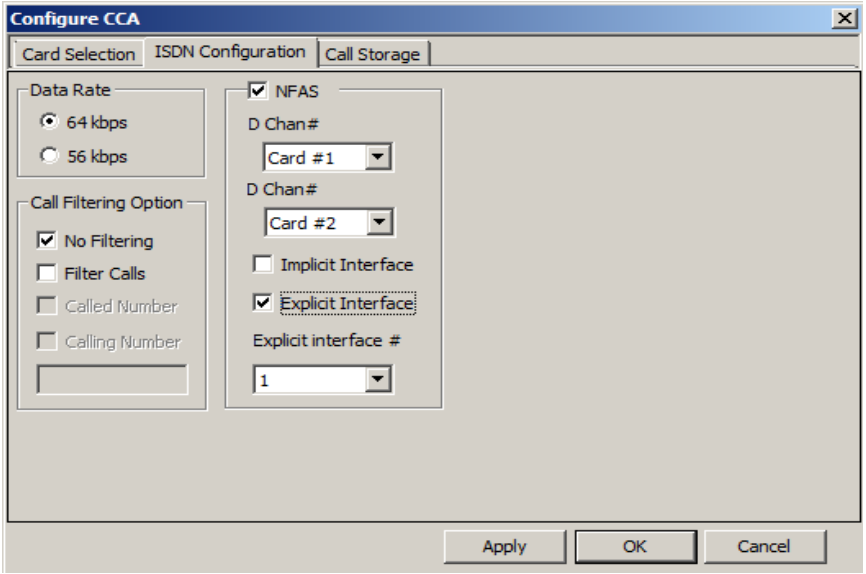


ISDN Call Triggering Options

Call Capture and Analysis



Multiple Call Capture and Analysis



- **NFAS D-Channel** - enables NFAS feature during ISDN call capturing on the trunk that contains the D-Channel or the signaling
- **Filtering** – capture ISDN messages with the called/calling number that matches the filtering criteria

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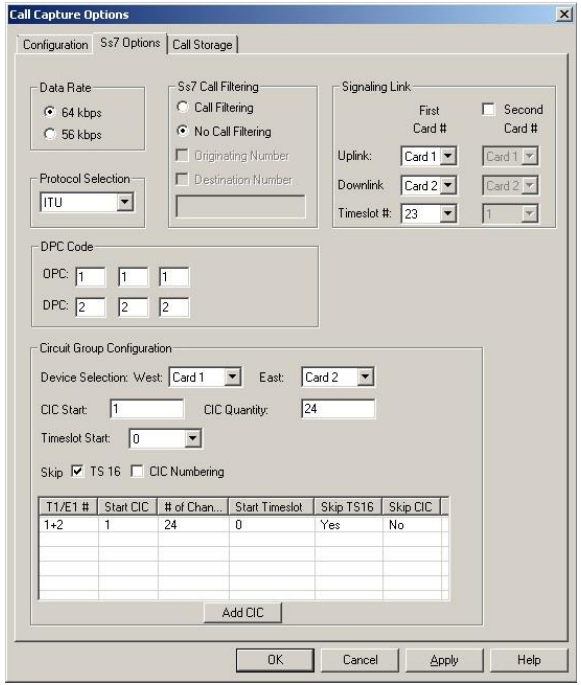
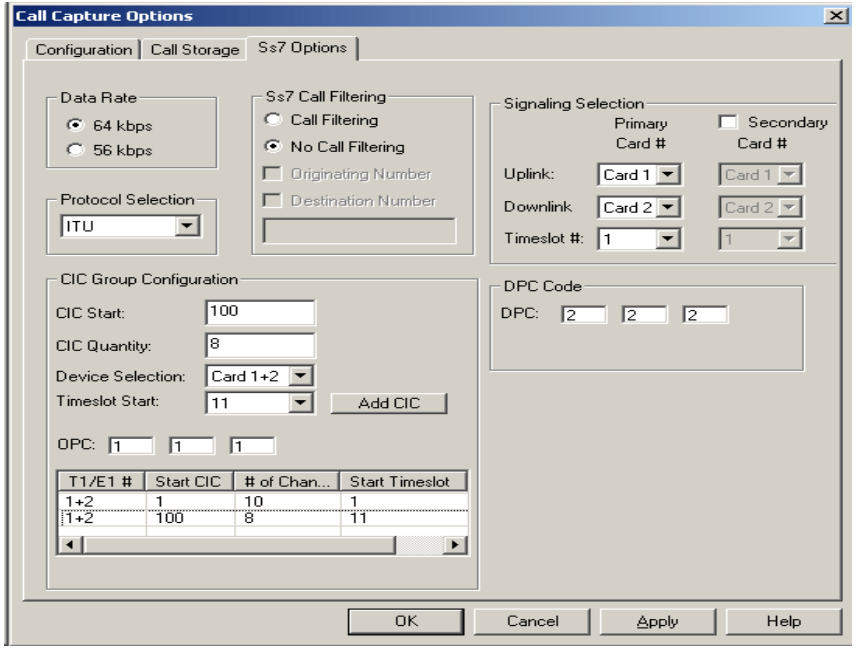
SS7 Call Triggering Options

Call Capture and Analysis



Multiple Call Capture and Analysis



- Provides options to set SS7 parameters such as Data Rate, Call Filtering, Signaling Selection, and CIC (Circuit Identification Codes) Group Configuration

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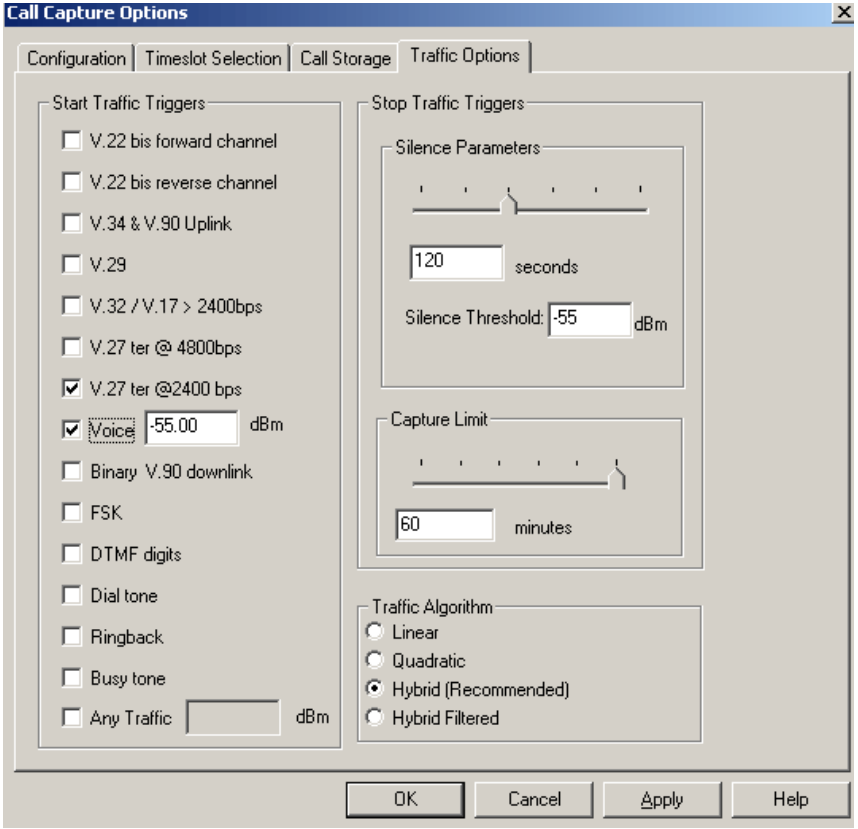
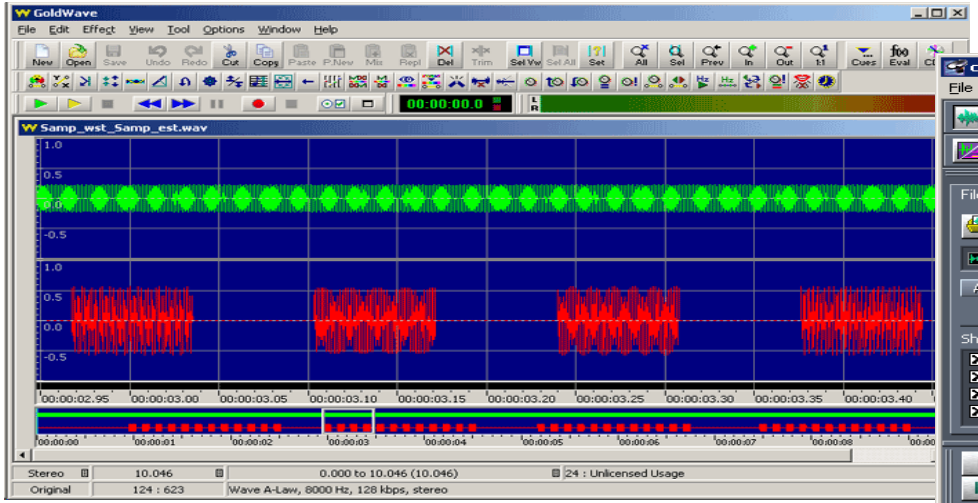
Traffic Activated Triggering Options

- Provides start traffic and stop traffic trigger options
- Triggers capturing on any of supported traffic, or to trigger on a specified power level
- Capture can be terminated either by specifying the silence parameters or specifying time of capture limit

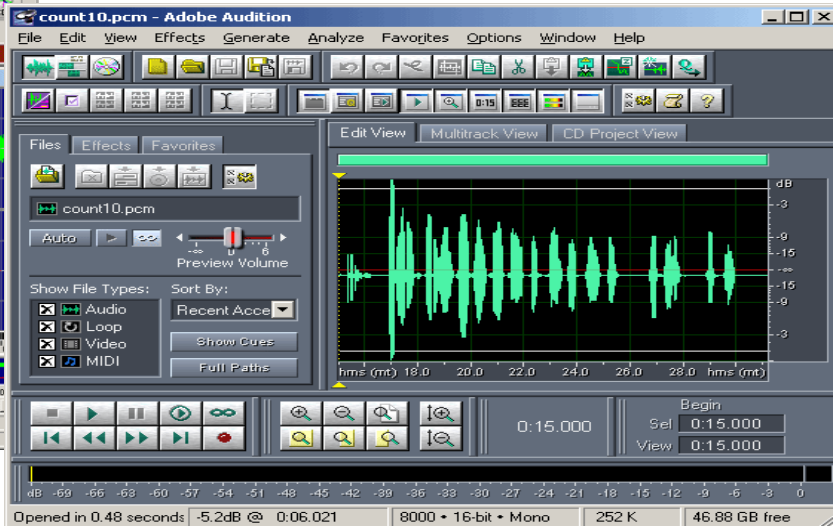


View PCM File

Goldwave



Adobe Audition



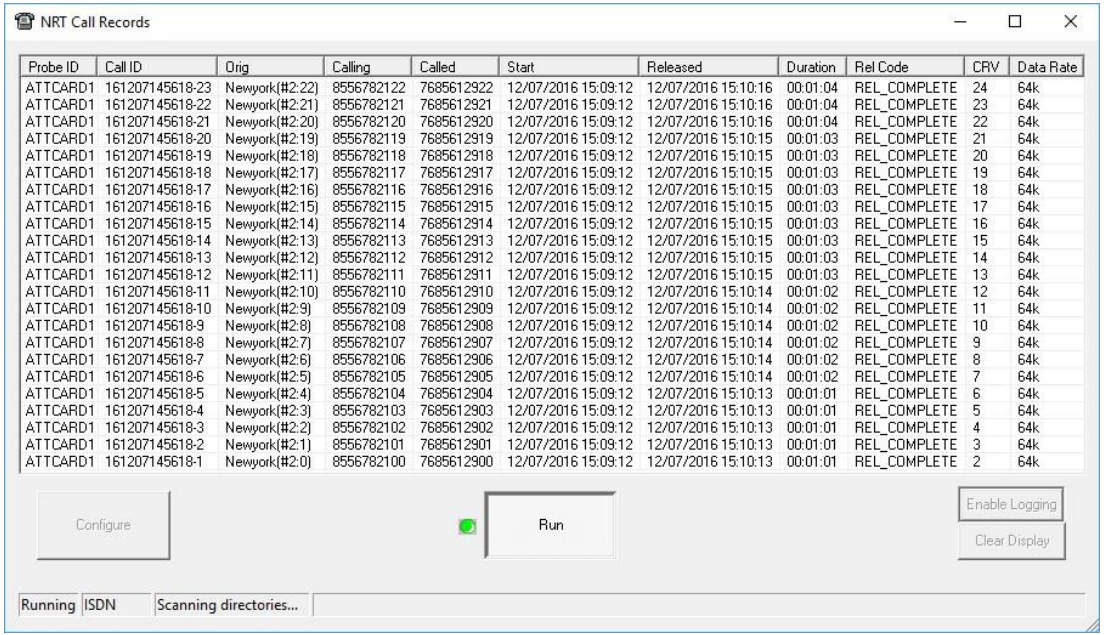
- Adobe Audition or Goldwave are used for viewing captured files

Call Data Records

- Compiles the output of CCA (Call Capture and Analysis) application and (optionally) VBA (Voice Band Analyzer) application and generates the following 2 types of reports –

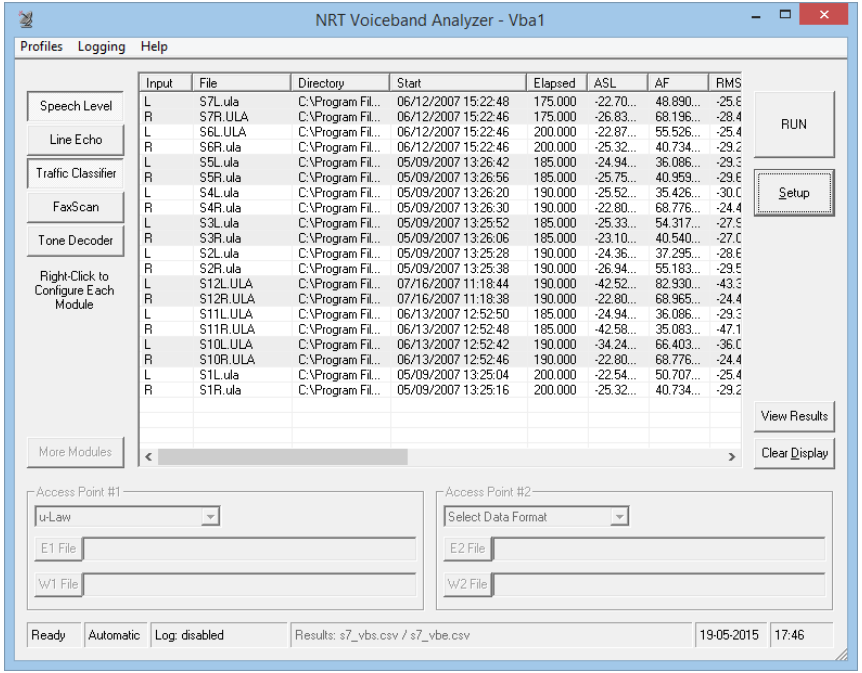
  - Call Side Report - contains a single summary line for each call with inbound and outbound ports, channel #, time of seizure and release, and other summary information

  - Call Detail Report - contains a single summary line for each call with inbound and outbound ports, channel #, time of seizure and release, and other summary information



Probe ID	Call ID	Orig	Calling	Called	Start	Released	Duration	Rel Code	CRV	Data Rate
ATTCARD1	161207145618-23	Newyork(#2:22)	8556782122	7685612922	12/07/2016 15:09:12	12/07/2016 15:10:16	00:01:04	REL_COMPLETE	24	64k
ATTCARD1	161207145618-22	Newyork(#2:21)	8556782121	7685612921	12/07/2016 15:09:12	12/07/2016 15:10:16	00:01:04	REL_COMPLETE	23	64k
ATTCARD1	161207145618-21	Newyork(#2:20)	8556782120	7685612920	12/07/2016 15:09:12	12/07/2016 15:10:16	00:01:04	REL_COMPLETE	22	64k
ATTCARD1	161207145618-20	Newyork(#2:19)	8556782119	7685612919	12/07/2016 15:09:12	12/07/2016 15:10:15	00:01:03	REL_COMPLETE	21	64k
ATTCARD1	161207145618-19	Newyork(#2:18)	8556782118	7685612918	12/07/2016 15:09:12	12/07/2016 15:10:15	00:01:03	REL_COMPLETE	20	64k
ATTCARD1	161207145618-18	Newyork(#2:17)	8556782117	7685612917	12/07/2016 15:09:12	12/07/2016 15:10:15	00:01:03	REL_COMPLETE	19	64k
ATTCARD1	161207145618-17	Newyork(#2:16)	8556782116	7685612916	12/07/2016 15:09:12	12/07/2016 15:10:15	00:01:03	REL_COMPLETE	18	64k
ATTCARD1	161207145618-16	Newyork(#2:15)	8556782115	7685612915	12/07/2016 15:09:12	12/07/2016 15:10:15	00:01:03	REL_COMPLETE	17	64k
ATTCARD1	161207145618-15	Newyork(#2:14)	8556782114	7685612914	12/07/2016 15:09:12	12/07/2016 15:10:15	00:01:03	REL_COMPLETE	16	64k
ATTCARD1	161207145618-14	Newyork(#2:13)	8556782113	7685612913	12/07/2016 15:09:12	12/07/2016 15:10:15	00:01:03	REL_COMPLETE	15	64k
ATTCARD1	161207145618-13	Newyork(#2:12)	8556782112	7685612912	12/07/2016 15:09:12	12/07/2016 15:10:15	00:01:03	REL_COMPLETE	14	64k
ATTCARD1	161207145618-12	Newyork(#2:11)	8556782111	7685612911	12/07/2016 15:09:12	12/07/2016 15:10:15	00:01:03	REL_COMPLETE	13	64k
ATTCARD1	161207145618-11	Newyork(#2:10)	8556782110	7685612910	12/07/2016 15:09:12	12/07/2016 15:10:14	00:01:02	REL_COMPLETE	12	64k
ATTCARD1	161207145618-10	Newyork(#2:9)	8556782109	7685612909	12/07/2016 15:09:12	12/07/2016 15:10:14	00:01:02	REL_COMPLETE	11	64k
ATTCARD1	161207145618-9	Newyork(#2:8)	8556782108	7685612908	12/07/2016 15:09:12	12/07/2016 15:10:14	00:01:02	REL_COMPLETE	10	64k
ATTCARD1	161207145618-8	Newyork(#2:7)	8556782107	7685612907	12/07/2016 15:09:12	12/07/2016 15:10:14	00:01:02	REL_COMPLETE	9	64k
ATTCARD1	161207145618-7	Newyork(#2:6)	8556782106	7685612906	12/07/2016 15:09:12	12/07/2016 15:10:14	00:01:02	REL_COMPLETE	8	64k
ATTCARD1	161207145618-6	Newyork(#2:5)	8556782105	7685612905	12/07/2016 15:09:12	12/07/2016 15:10:14	00:01:02	REL_COMPLETE	7	64k
ATTCARD1	161207145618-5	Newyork(#2:4)	8556782104	7685612904	12/07/2016 15:09:12	12/07/2016 15:10:13	00:01:01	REL_COMPLETE	6	64k
ATTCARD1	161207145618-4	Newyork(#2:3)	8556782103	7685612903	12/07/2016 15:09:12	12/07/2016 15:10:13	00:01:01	REL_COMPLETE	5	64k
ATTCARD1	161207145618-3	Newyork(#2:2)	8556782102	7685612902	12/07/2016 15:09:12	12/07/2016 15:10:13	00:01:01	REL_COMPLETE	4	64k
ATTCARD1	161207145618-2	Newyork(#2:1)	8556782101	7685612901	12/07/2016 15:09:12	12/07/2016 15:10:13	00:01:01	REL_COMPLETE	3	64k
ATTCARD1	161207145618-1	Newyork(#2:0)	8556782100	7685612900	12/07/2016 15:09:12	12/07/2016 15:10:13	00:01:01	REL_COMPLETE	2	64k

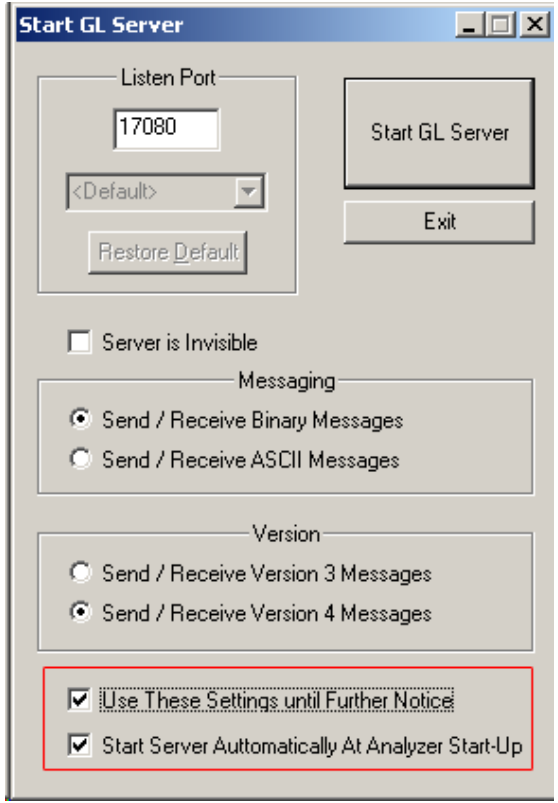
Voiceband Analyzer



- VBA works in conjunction with GL's TDM, Packet, and Wireless non-intrusive capture products, such as T1 and E1 Call Capture and Analysis, PacketScan™, and PPP Analyzer products

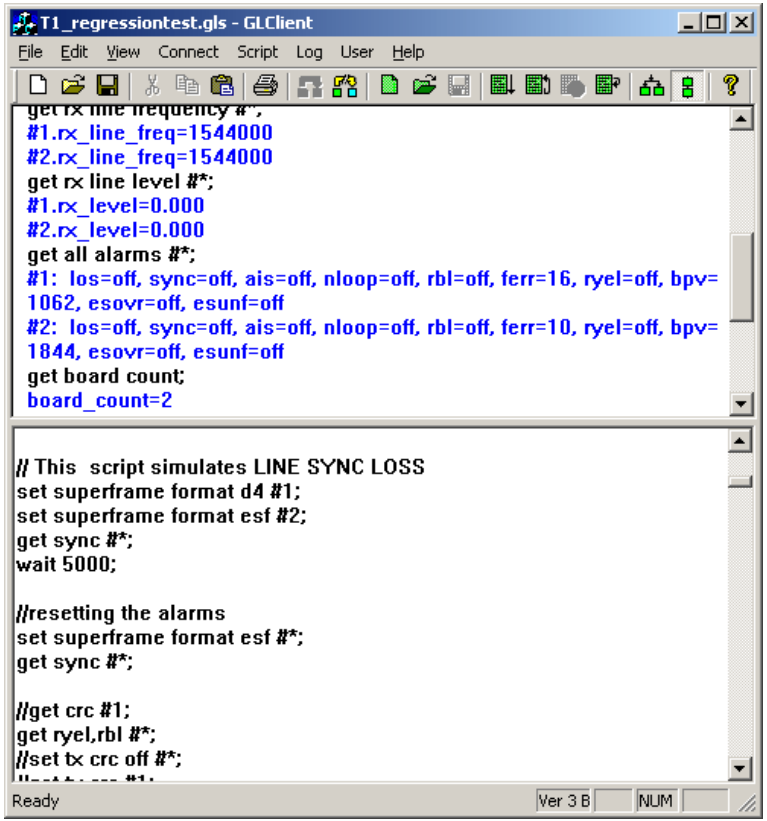
Connecting to the Server

- **Listen Port**: This is the TCP/IP port on which the server should listen for incoming connection requests from clients
- **Send / Receive Binary Messages**: Indicates that the server is to communicate with clients using binary messages
- **Send / Receive ASCII Messages**: Indicates that the server is to communicate with clients using ASCII (text-based) messages
- **Send / Receive Version 3 Messages**: Indicates that the server is to communicate with clients using version 3 messages
- **Send / Receive Version 4 Messages**: Indicates that the server is to communicate with clients using version 4 messages
- **Use these settings Until Further Notice**: This option to use the current configuration settings as default settings at analyzer startup
- **Start Server Automatically At analyzer Startup**: It will start the WCS server at analyzer startup by default



T1/E1 Client

- In the lower workspace area, the client users key in commands or load in commands from previously saved files
- The upper log area displays the script and the server responses



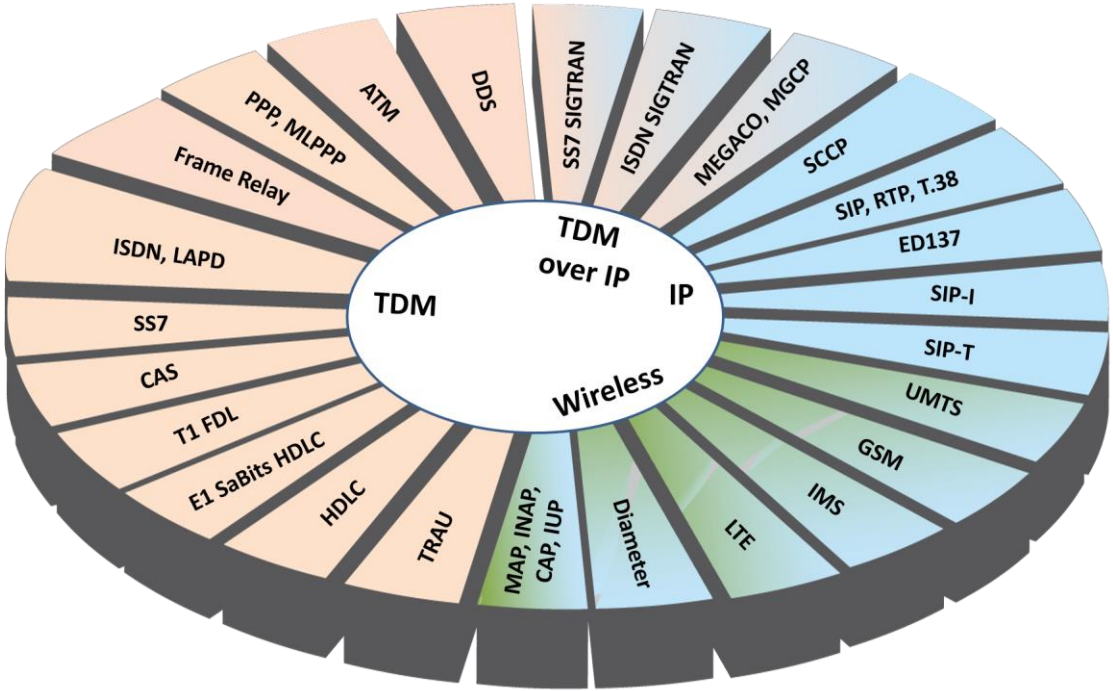
Features

Remote operation	✓
Automation	✓
Multi-site connectivity	✓
Simultaneous testing of high capacity T1/E1 systems through a single Client	✓
Integration of T1/E1 testing into more complex testing systems	✓
Intrusive / Non-Intrusive T1/E1 Testing	✓

Applications

- File based Record / Playback
- Transmit / Detect digits
- Channel Associated Signaling (CAS) Simulation
- FAX Simulation
- Jitter Measurement, Pulse Mask
- DSP Functionality
- Dynamic DSP Capability
- ISDN Emulation
- Multi-Channel HDLC Emulation and Analysis
- File based HDLC Record / Playback and Remote Record / Playback
- File based High Throughput HDLC Record / Playback
- PPP, MLPPP, and Multi-Channel (MC) Emulation and Analysis
- File based TRAU Record / Playback
- Multi-Channel TRAU Tx / Rx Emulation and Analysis
- File based HDLC Record / Playback over SA-bits
- File based Record / Playback over FDL
- Multi-link Frame Relay Emulation
- Inverse Multiplexing for ATM Emulation
- Multi-Channel BER Testing
- T1 E1 Traffic Classifier
- SS7 Decode Agent
- ISDN Decode Agent
- SS1 Protocol Emulation

Protocol Analysis



- GL Communications provides a host of protocol analyzers and simulators for testing a variety of protocols
- Analysis may be done both in real-time and off-line

GL Communications

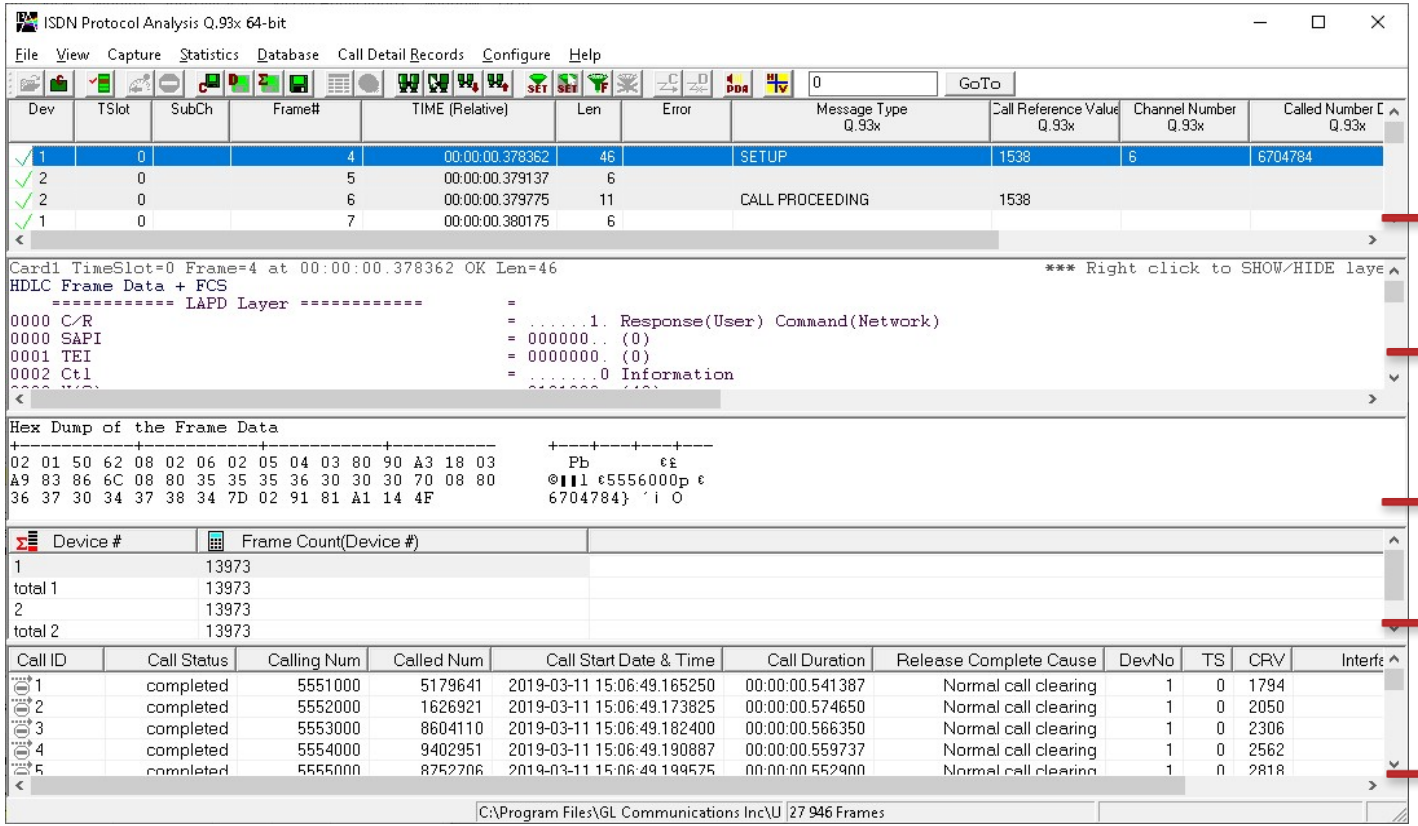
Protocol Analysis and Emulation

- HDLC Analysis and Emulation
  - HDLC Analysis, Playback, Impairment, Tx and Rx Utility
  - Client –Server based HDLC Emulation modules
- ISDN Analysis and Emulation
  - ISDN Analysis
  - ISDN Emulator (GUI)
  - Client-Server based ISDN Emulation module
  - Scripted Emulator using MAPS™
- T1 Facility Data Link
  - Facility Data Link Analysis
  - Facility Data Link Playback
  - Client-Server based FDL Emulation module
- E1 Maintenance Data Link
  - E1 Maintenance Data Link Analysis and Playback
  - Client-Server based SaBits HDLC Emulation module
- TRAU Analysis and Emulation
  - TRAU Analysis, Traffic Playback, TRAU ToolBox
  - TRAU Tx/Rx Test (GUI Based)
  - Client-Server based TRAU Emulation modules
- Multilink PPP Analysis and Emulation
  - MLPPP Analysis
  - MC-MLPPP Emulator (GUI Based)
  - Client-Server based MLPPP Emulation module
  - Scripted Conformance Test Tool using MAPS™

Protocol Analysis and Emulation (Contd.)

- Multilink Frame Relay Analysis and Emulation
  - Frame Relay Analysis
  - Multilink Frame Relay Emulator (GUI Based)
  - Client-Server based MFR Emulation module
- ATM IMA Analysis and Emulation
  - ATM IMA Analysis
  - ATM IMA Emulator (GUI Based)
  - Client-Server based ATM IMA Emulation module
- CAS
  - Emulation using (GUI Based)
  - DTMF, MF, MFC-R2 Emulation using GUI and Client-server
  - Scripted Emulator using MAPS™
- SS7(C7) Analysis and Emulation
  - SS7 Analysis
  - Scripted ISUP Emulator using MAPS™
  - Scripted MAP Emulator using MAPS™
- GSM Analysis and Emulation
  - GSM Analysis
  - Scripted GSM A Emulator using MAPS™
  - Scripted GSM Abis Emulator using MAPS™
- SS1 Analysis and Emulation
  - SS1 Signaling Analysis
  - SS1 Emulator (Dialer)
- Other Protocol Analyzers
- GR-303, DDS, V5.X, GPRS, CDMA 2000, UMTS, DCME

Protocol Analysis



Summary view

Detail view

Hex Dump view

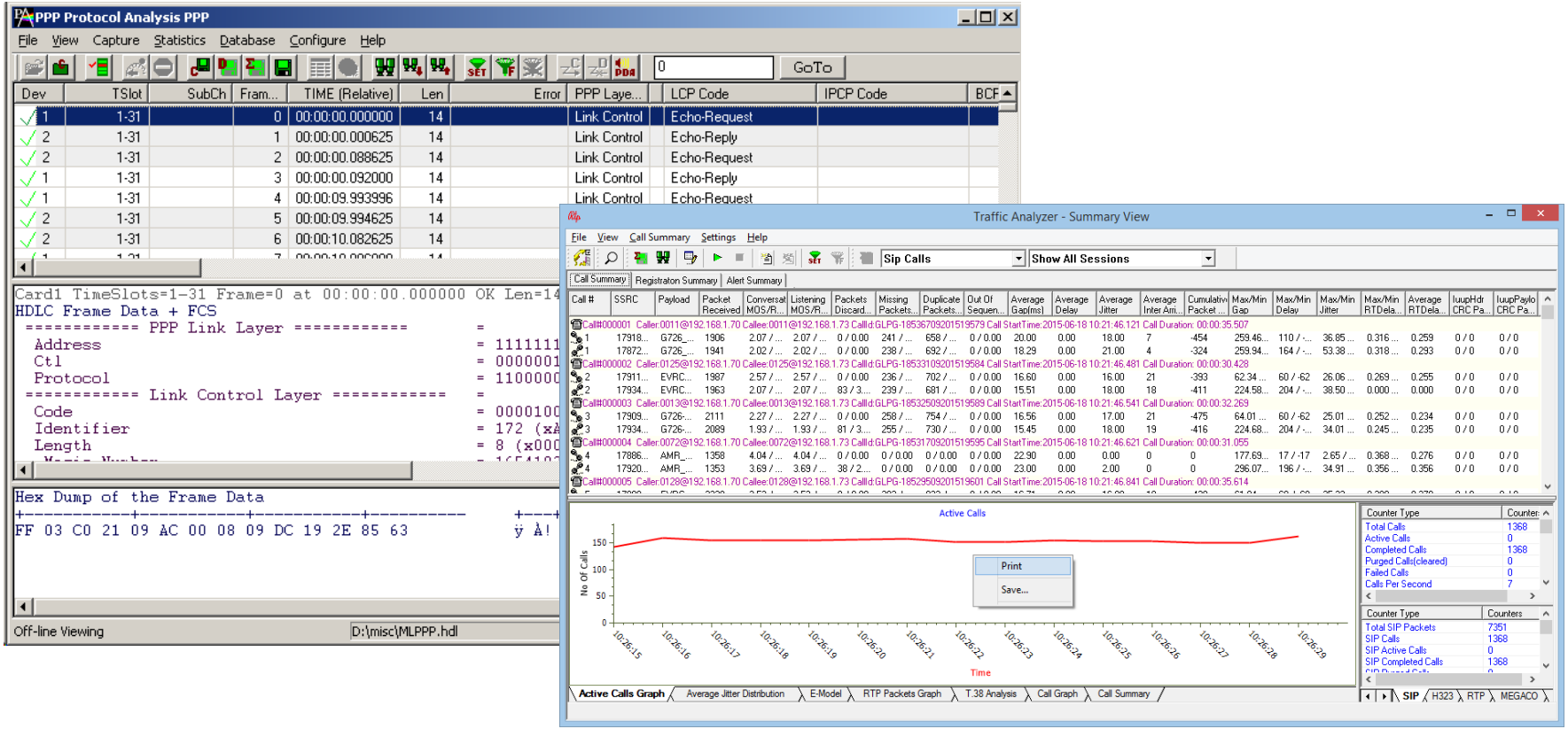
Statistics view

Call trace view

Key Features

- Consolidated GUI – Displays summary of all decodes, detail and hex-dump view of each frame, statistics view, and call detail record views
- Perform real-time / offline / remote analysis
- Supports various protocol standards for proper decode
- Capture options such as channel selection, CRC, bit reversion, bit inversion, scrambler and more for real-time capture
- Fine tune results with filtering and search capability
- Export decode results to ASCII or CSV files
- Any protocol field can be added to the summary view, filtering, and search features providing users more flexibility to monitor required protocol fields
- Trace File Saving Options
- Extensive statistics computation capabilities
- Call Detail Records for ISDN, Frame Relay, ATM, SS7, GR303, GSM, GPRS, CDMA, UMTS, and V5.x
- Network Monitoring
- Remote Access Capability
- Option to create multiple aggregate column groups and prioritize the groups as per the requirement to display the summary results efficiently
- Allows the user to create search/filter criteria automatically from the current screen selection

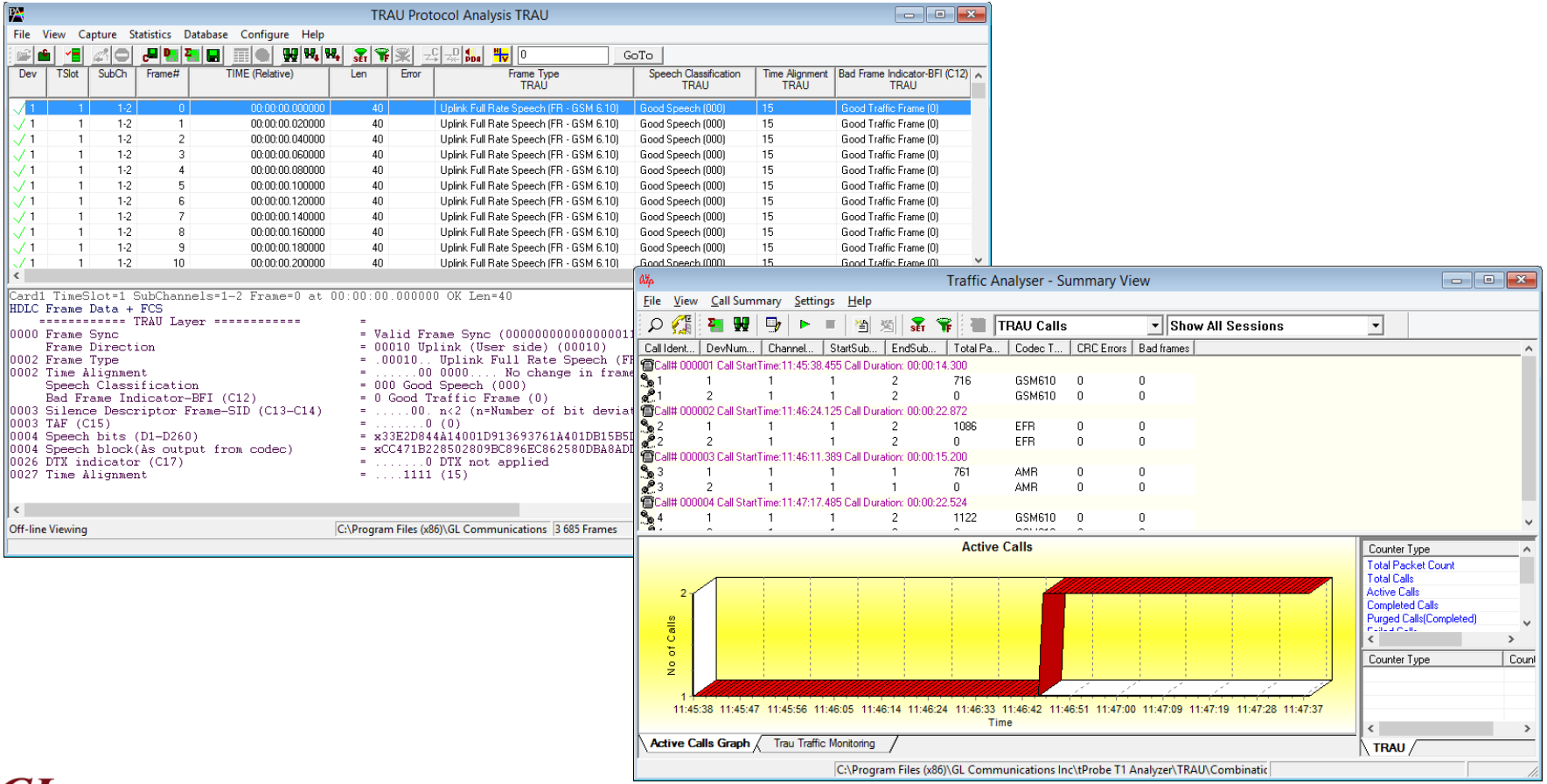
Packet Data Analysis (PPP Protocols)



Key Features

- Supported protocols - SIP (Session Initiation Protocol RFC 2543 and RFC 3261), Megaco RFC 3525, Megaco RFC 3015, MGCP, T.38, H323/H225, and RTP
- Full RTP Analysis with audio capture/playback supported for all common codecs
- Supports saving the selected calls from traffic analyzer into *.HDL or *.PCAP formats
- T.38 Analysis - User can decode T.38 frames received over VoIP calls and can have ladder diagram for T.38 traffic flow, reassemble the fragmented data and to identify the T.30 message from it
- Displays summary of signaling, audio, and video parameters of each call
- Video parameters such as Source/Destination Video Channels, Media Type, SSRC, Average Delay/Gap, Packet Counts, Media Delivery Index (MDI- (Delay Factor : Media Loss Rate), and Frame Rate are calculated are displayed for all video calls

Packet Data Analysis (TRAU Protocols)

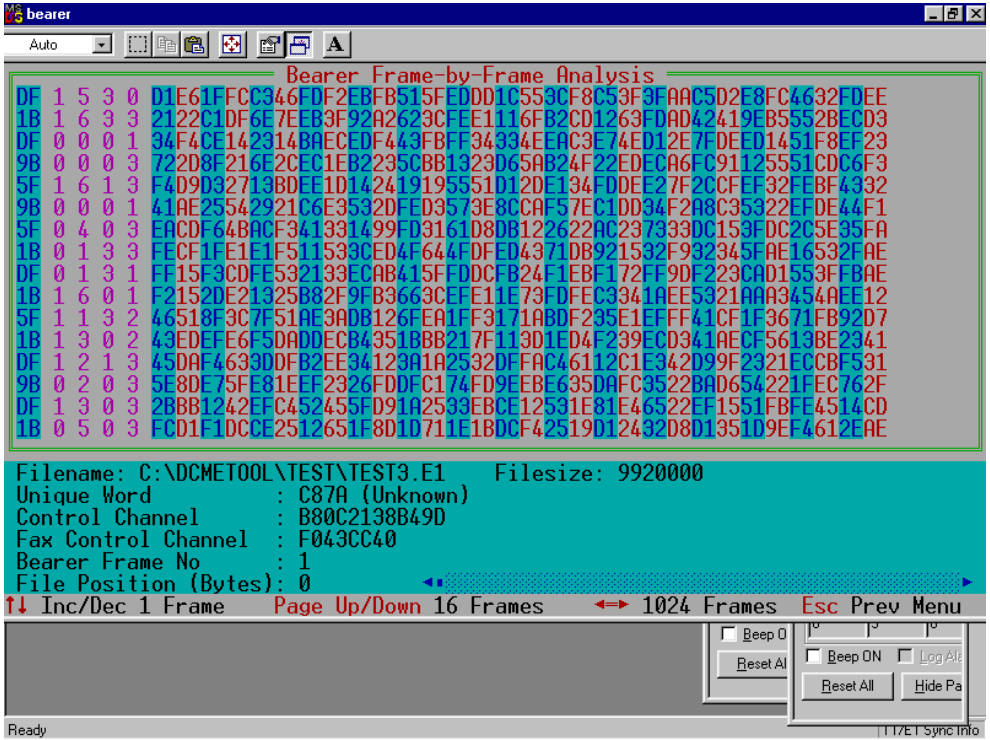


Key Features

- View summary of data transmission in each direction including call identity, device number, channel Number, start sub channel, end sub channel, total packets, codec type CRC errors and bad frames
- Split and compare the two sessions of a call in Detail View
- Includes separate statistical counts on total packets, calls, and captured frames, and so on
- Provides graphs to view active calls over the duration of the call and TRAU Traffic Monitoring to analyze and classify traffic types in a real-time GSM network
- Extracts speech data from TRAU frames, play the speech data on PC soundcard, or record voice to a file, after decompressing TRAU speech data to 16-bit linear PCM

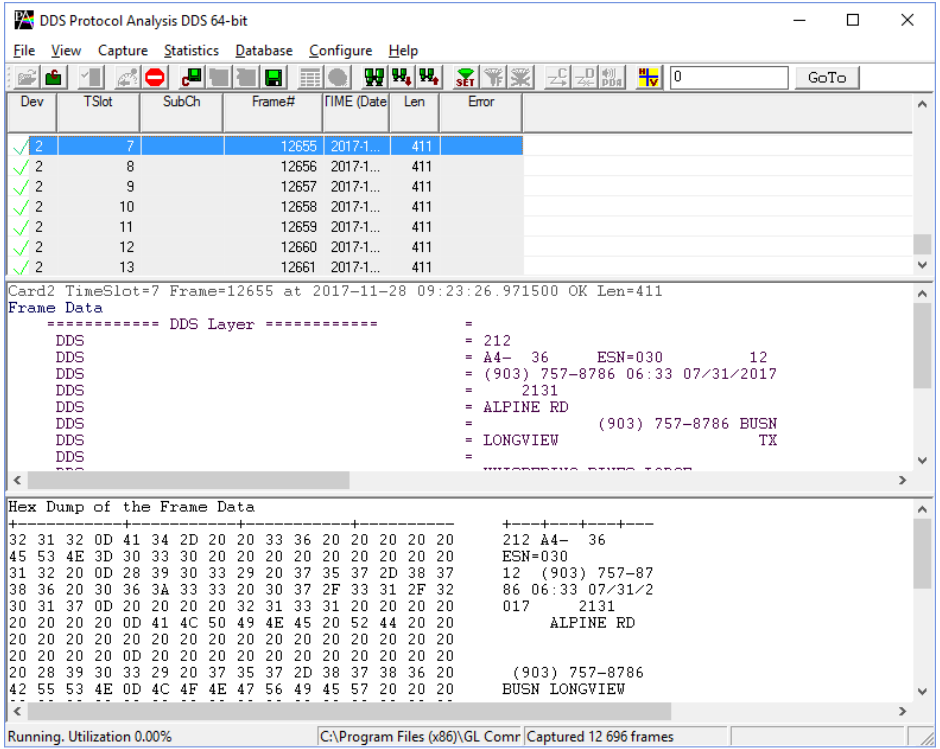
DCME Analyzer

- Real-time and post processing of the DCME bearer signal
- Verification of channel mapping and implementation timing of the DCME protocol
- Bit level analysis and verification of facsimile data sub-multiplexing on DCME bearer

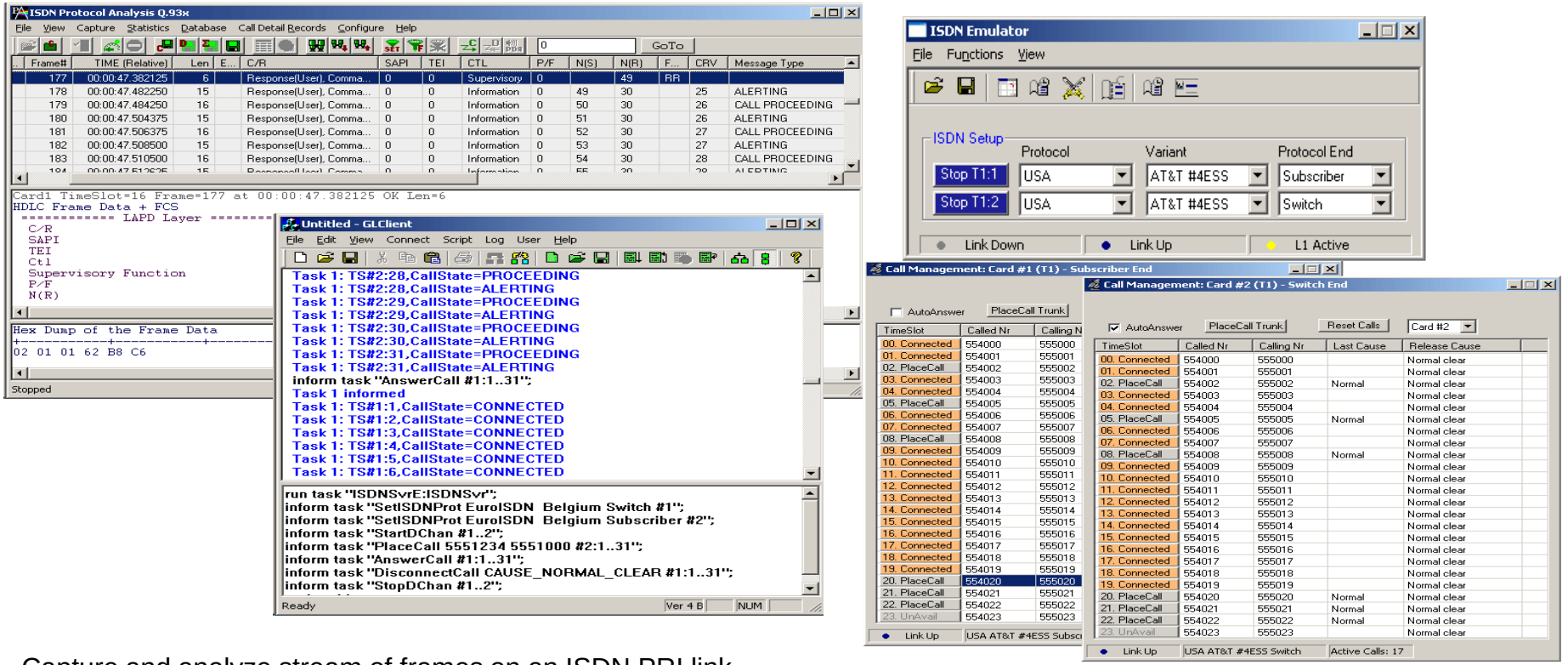


DDS Protocol Analyzer

- Conventional Digital Signal Services (DDS) data channel may utilize multiple, all, or a fractional timeslot of the T1 line, with the transmission rates of 2.4 kbps, 4.8 kbps, 9.6 kbps, 19.2 kbps, and 56 kbps
- Users can capture and analyze DDS frames using either real-time or offline analyzers, and record all into a trace file



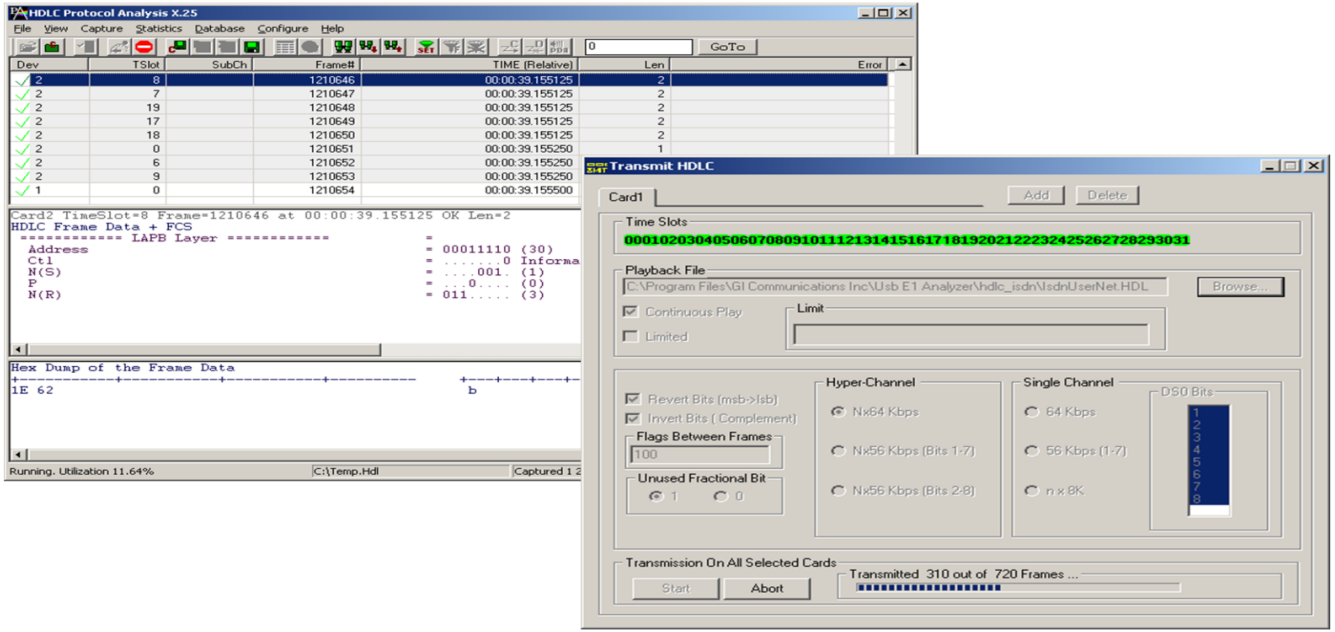
ISDN Analysis and Emulation



- Capture and analyze stream of frames on an ISDN PRI link
- Simulate Switch and Subscriber

GL Communications

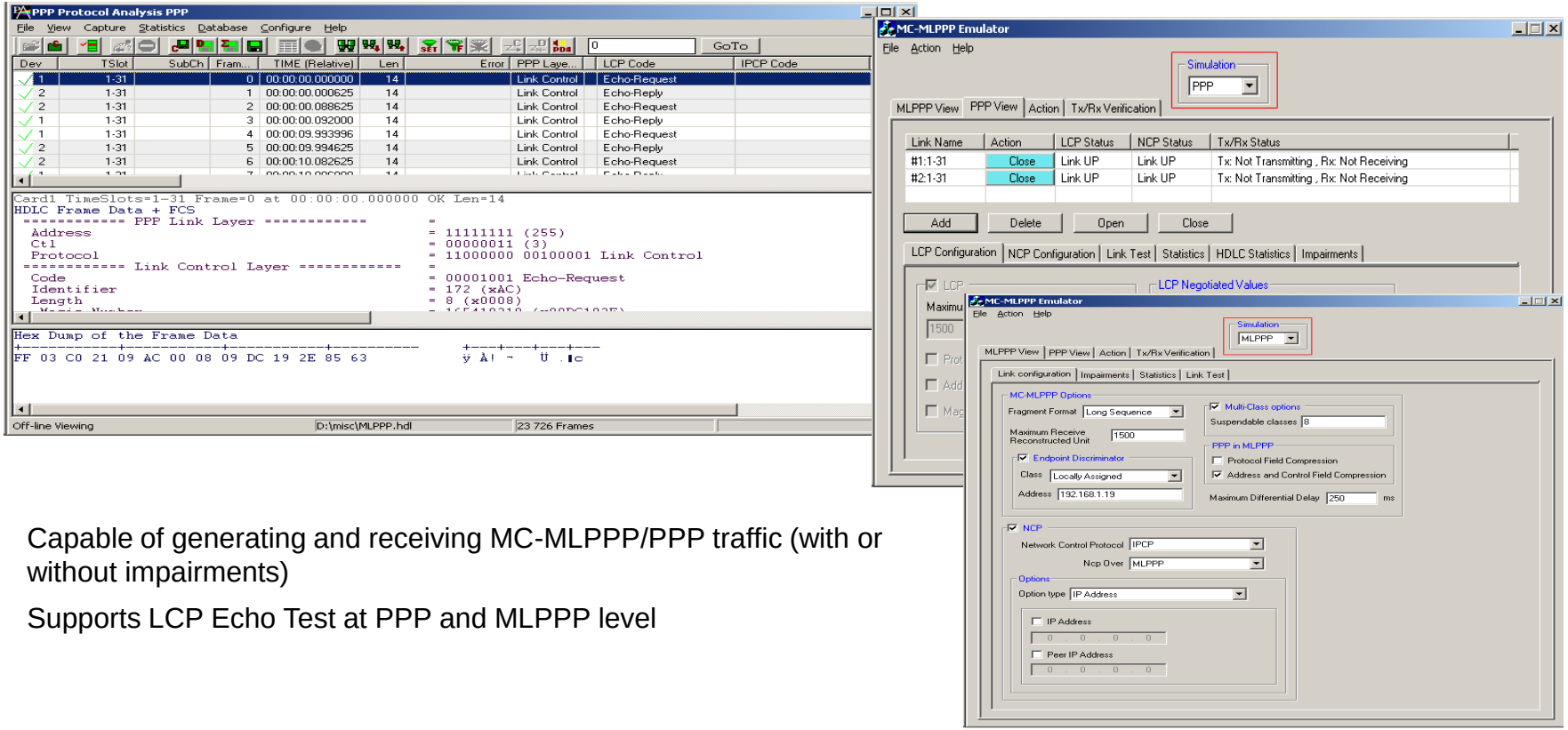
HDLC Analysis and Emulation



- Provides the capability to capture, and analyze HDLC data on a full duplex T1 or E1 line
- Supports decoding of frames with FCS of 16 bits and 32 bits, or none
- Captured frames can later be used for traffic simulation using HDLC Transmit/Receive/Playback application

GL Communications

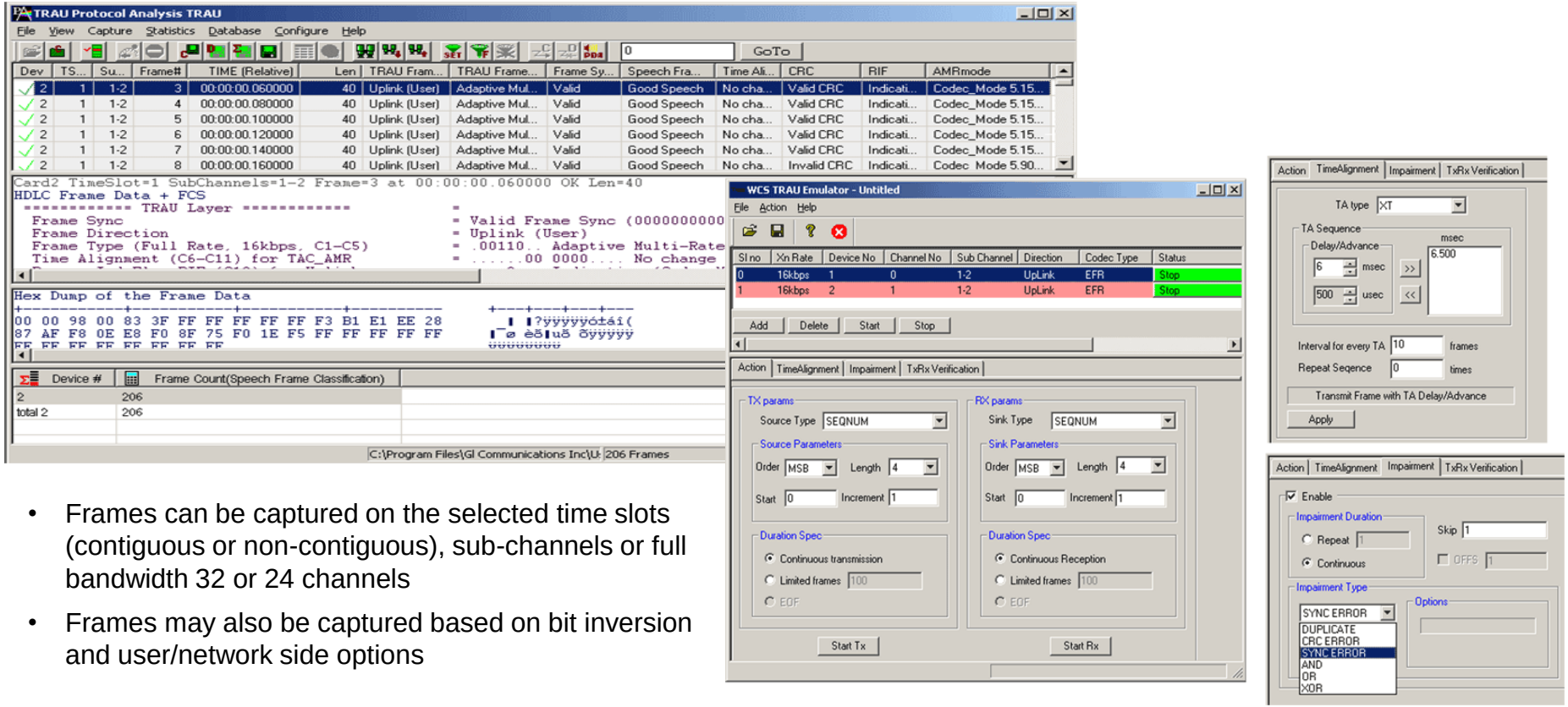
MLPPP Analysis and Emulation



- Capable of generating and receiving MC-MLPPP/PPP traffic (with or without impairments)
- Supports LCP Echo Test at PPP and MLPPP level

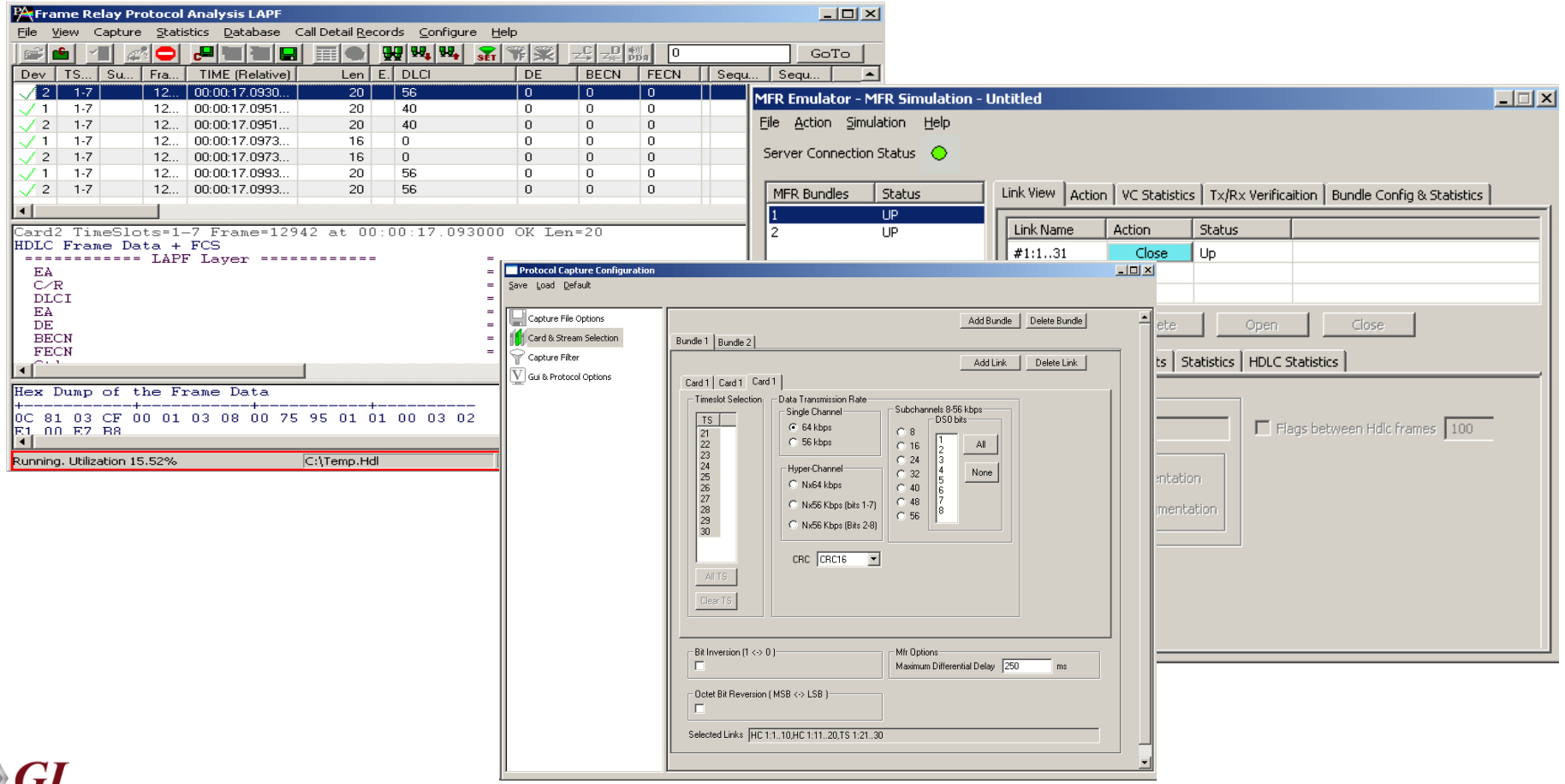
GL Communications

TRAU Analysis and Emulation



- Frames can be captured on the selected time slots (contiguous or non-contiguous), sub-channels or full bandwidth 32 or 24 channels
- Frames may also be captured based on bit inversion and user/network side options

Multilink Frame Relay Analysis

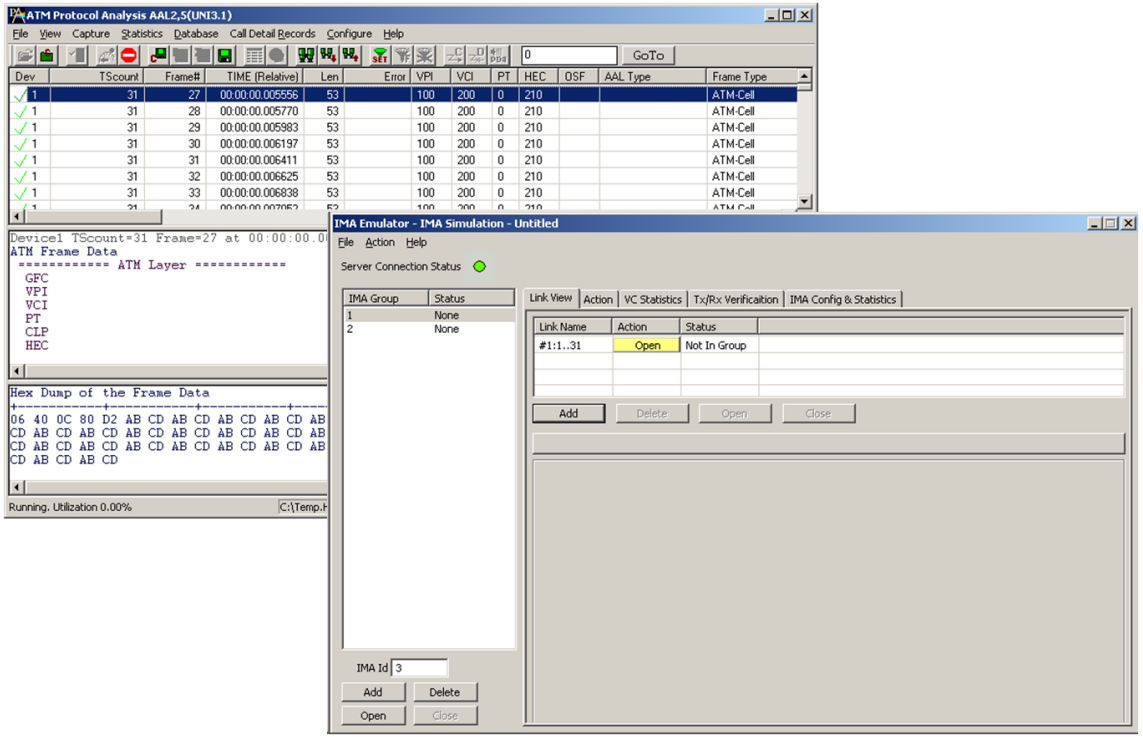


Frame Relay Analysis

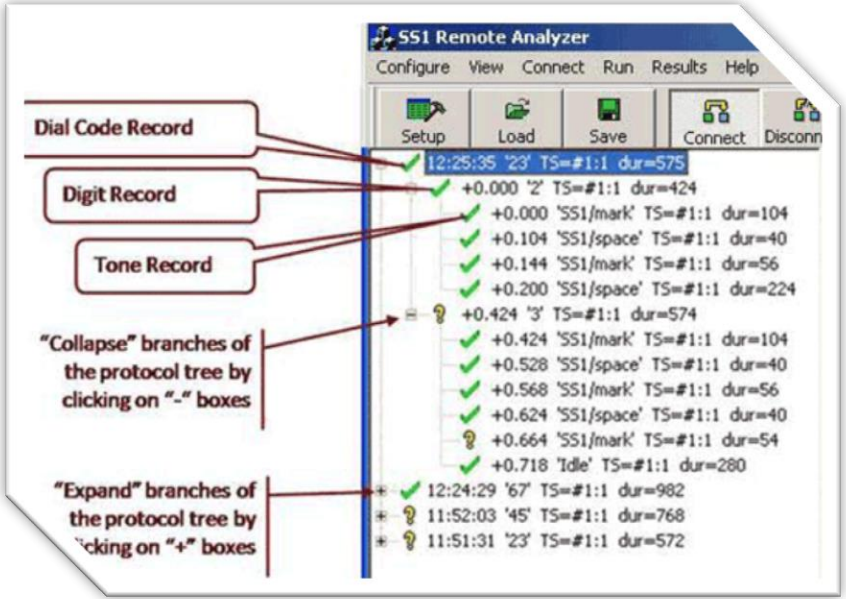
- Each MFR bundle is created by selecting groups of timeslots on various cards
- Supports reassembly and decoding of multiple MFR bundles simultaneously. Each MFR bundle will reassemble packets from FR links
- Streams can be captured on the selected time slots (contiguous or non-contiguous), sub-channels (fractional DS0 to DS1), hyper-channels(n x 64 kbps, or n x 56 kbps), or full bandwidth (56kbps, or 64kbps)
- Frames may also be captured based on their FCS (16 bits, 32 bits, none), bit inversion, octet bit reversion, user/network side options
- Capture frames based on maximum differential delay
- Recorded trace file can then be analyzed offline, exported to ASCII file, or printed

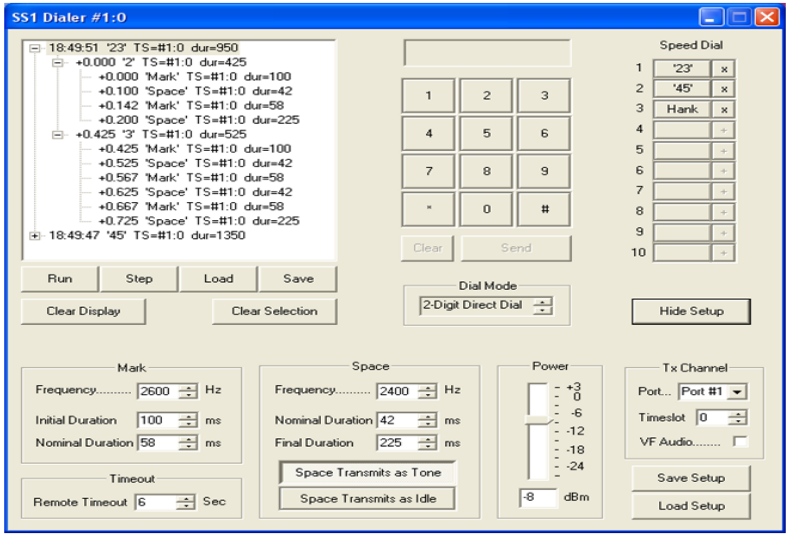
ATM IMA Analysis and Emulation

- Supports 16 T1/E1 ports
- Support for Full or Fractional Timeslots for ATM Link
- Supports IMA Frame Length ranging from 32, 64, 128, or 256



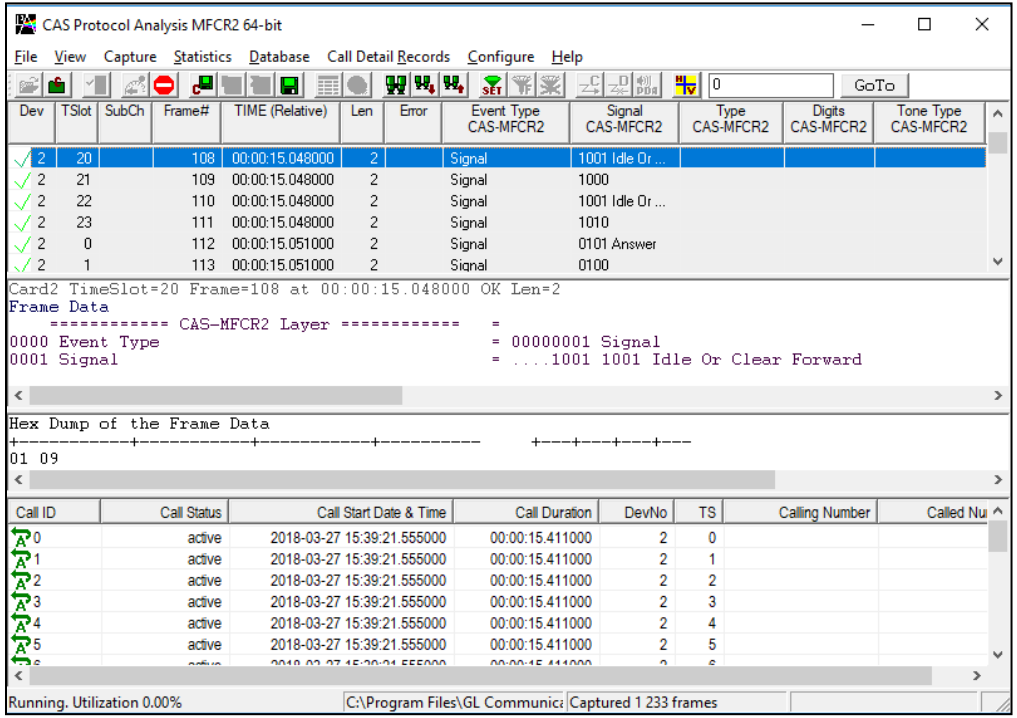
SS1 Signaling Analysis and Emulation

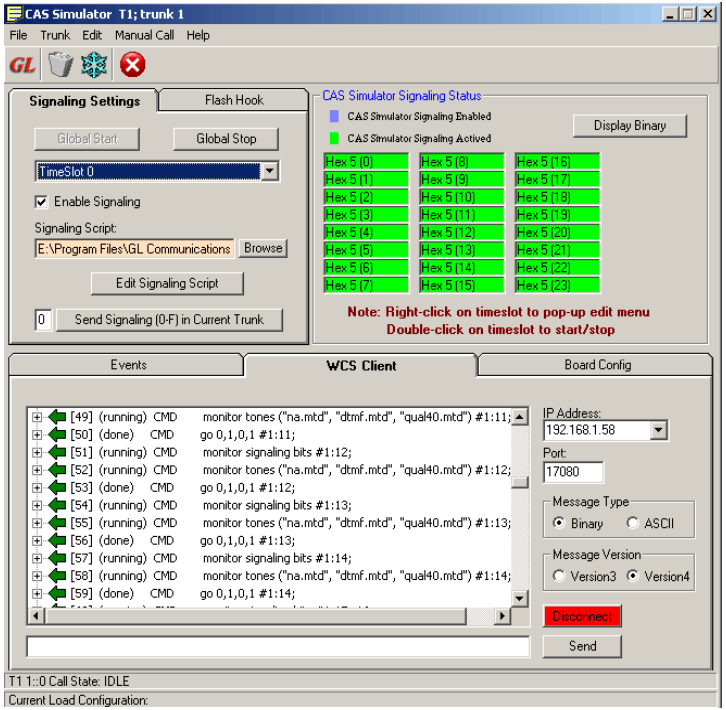




- Generate and introduce SS1 Dial Codes on Transmit Channels using SS1 Dialer
- Analyzer can capture either TDM or audio signals
- Analyzer can analyze either 2-digit or 3-digit dial codes
- Analyzer displays received dial codes, including the characteristics of the underlying tones

CAS Analysis and Simulator





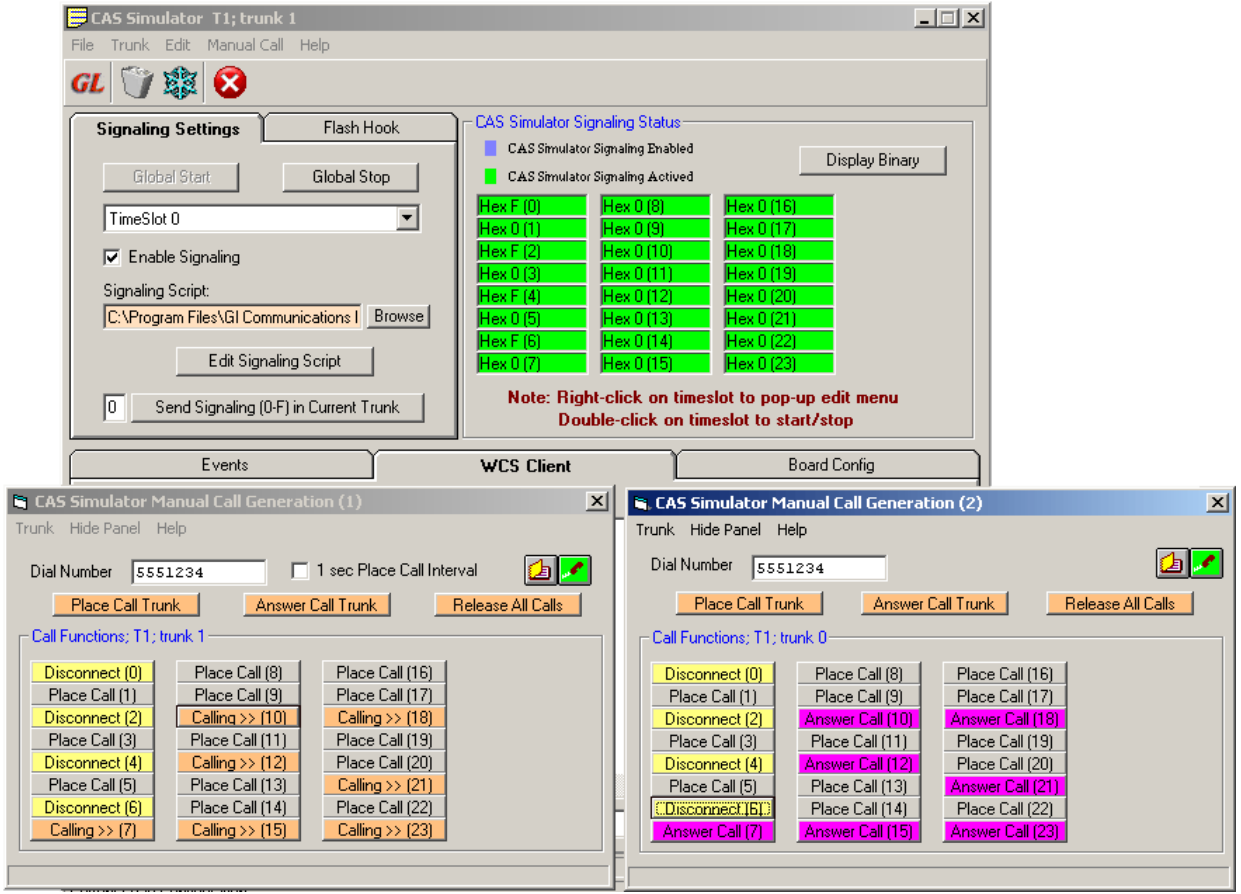
- It is a method of signaling in telephone networks where each channel or timeslot carrying speech also carries with it the signaling and addressing to set up and tear down that same channel

GL Communications

Key Features

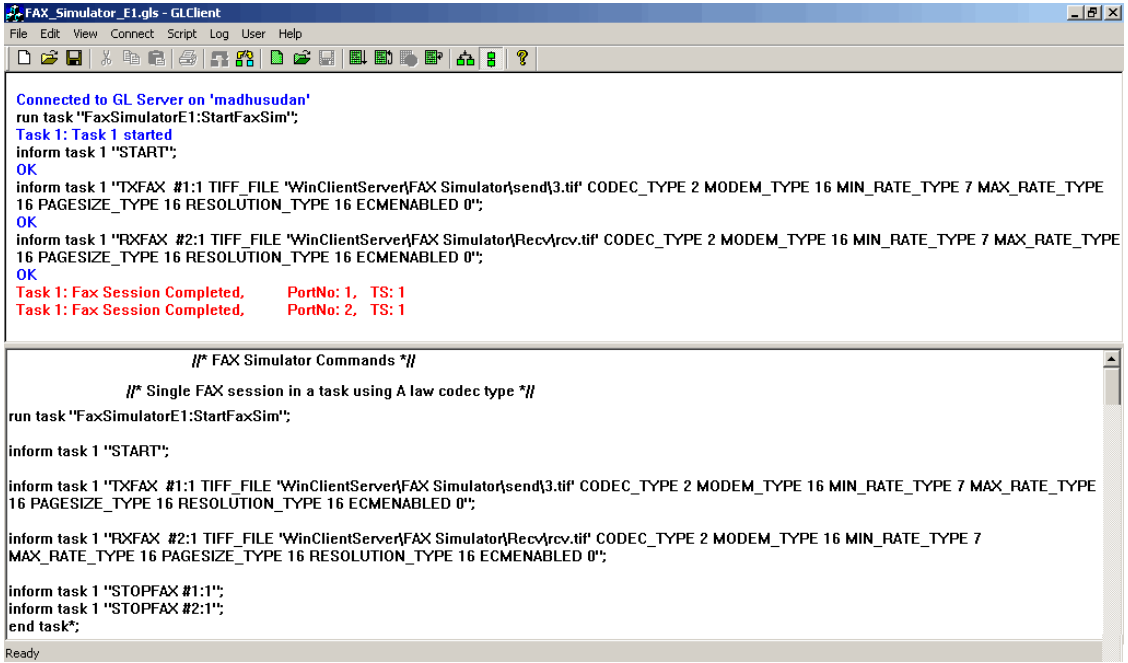
- Uses client-server technique and provides GUI as well as scripted CAS protocol simulation platform
- Network (NT) and Terminal (TE) - Side Support
- Implements ITU-T Signaling
- Called number and calling number identification
- Customized signaling for each channel through scripts

CAS Simulator



GL Communications

Fax Simulator



- High speed data transmission used for high transfer rates of High Speed (HS) fax page data (9600 to 14400 bps)
- High speed data transmission, fax page data (1200 to 2880 bps). Used for Sync/Async data transmission

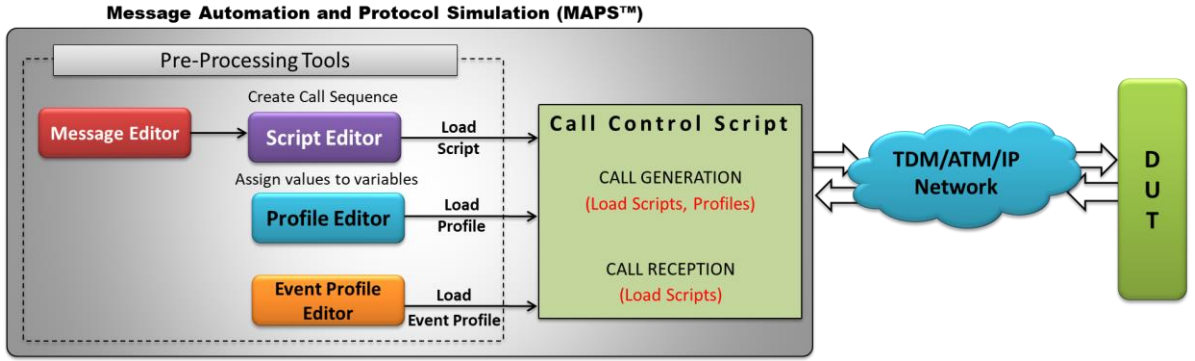
GL Communications

MAPS™ – Script Based Emulation

- Script based protocol simulation and conformance test tool - covers solutions for both protocol simulation and protocol analysis
- Supports a variety of protocols such as ISUP, MAP, CAS, ISDN, MLPPP, GSM A, GSM Abis, etc.
- Includes various ready-to-use test plans and test cases to support the testing of a required real-time scenario
- Provides the unlimited ability to edit messages and control scenarios (message sequences)
- "Message sequences" are generated through scripts; Generate and respond to calls / messages
- Impairments can be applied to messages to simulate error conditions
- Supports transmission/detection of various TDM traffic such as, digits, voice file, single and dual tones

Working Principle

- The message templates form the backbone of MAPS™ application
- Message templates are created using an utility Message Editor with user-selected protocol fields and default values for each protocol field
- The protocol fields can be accessed by scripts as variables using import / export files
- Scripts comprises of sequence of commands that performs the required operation using pre-defined message templates
- Script Editor is another powerful utility of MAPS, in which sequences of message templates can be grouped together in an order to create call flow (scripts)



- Profile consists of values assigned to the variables. Profiles can be created using a utility called Profile Editor where the values can be assigned to the variables
- Event Profiles consists of values assigned to the variables during run-time. Event Profile Editor allows you to create Event Profiles for user-defined events in a script. The value in the profiles can be changed during script execution
- MAPS™ provides the ability to create any number of scripts to simulate a real-time scenario with MAPS™ and DUT

Supported Protocols

- MAPS™ – Script Based Emulation
- Testing binary based protocols over T1 E1
  - ISDN
  - SS7 (ISUP, INAP, MAP, CAP, IUP)
  - GSM A, Abis
  - MLPPP Conformance
  - CAS
- Testing protocols over IP
  - SIP, SIP-I
  - MEGACO, MGCP
  - ISDN SIGTRAN (ISDN over IP)
  - SS7 SIGTRAN (SS7 over IP)
  - GSMAoIP (GSM A over IP)
  - LTE (S1, eGTP)
  - UMTS (IuCS, IuH, IuPS)
  - UMTS GnGp

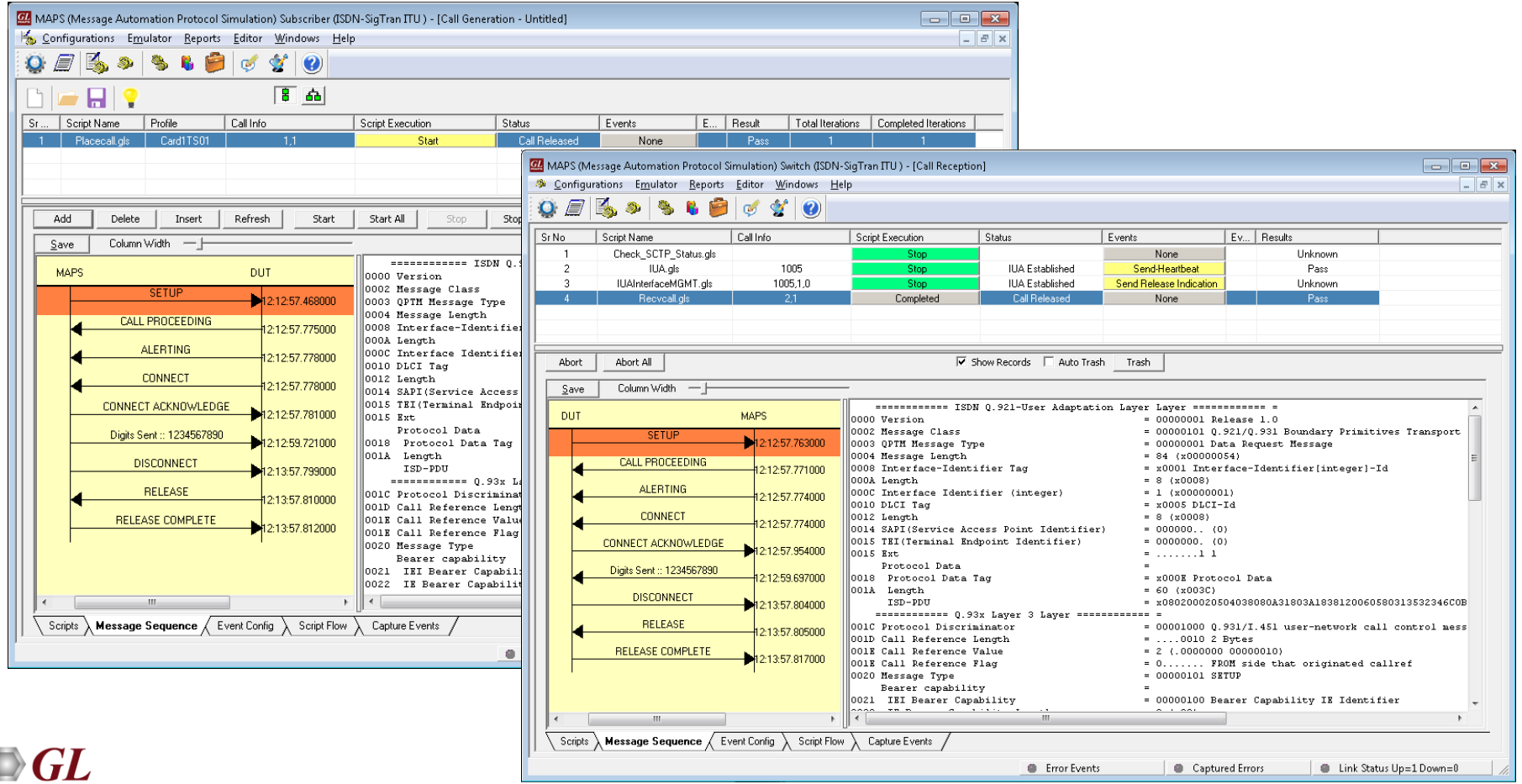
Call Generation

- Interactive GUI to view status, results, call information, total iterations to be done, and number of completed iterations
- Uses profiles to change the field values in the messages during the course of a call
- Events allow redirection of script execution on-the-go. The custom parameters in the events can also be changed during script execution using event profiles
- Impairments can be applied to messages to simulate error conditions
- Provides protocol trace with full message decoding, custom trace, and graphical ladder diagrams of call flow with time stamp while simulation is running
- Call flow graph allows to easily verify the messages exchanged between MAPS™ and DUT
- Support for Bulk Call Simulation with option to configure stress/load testing parameters such as Call per second (CPS), Busy hour call attempts (BHCA), Max Simultaneous Calls and Burst parameters
- Provides the associated captured events and error events during call simulation

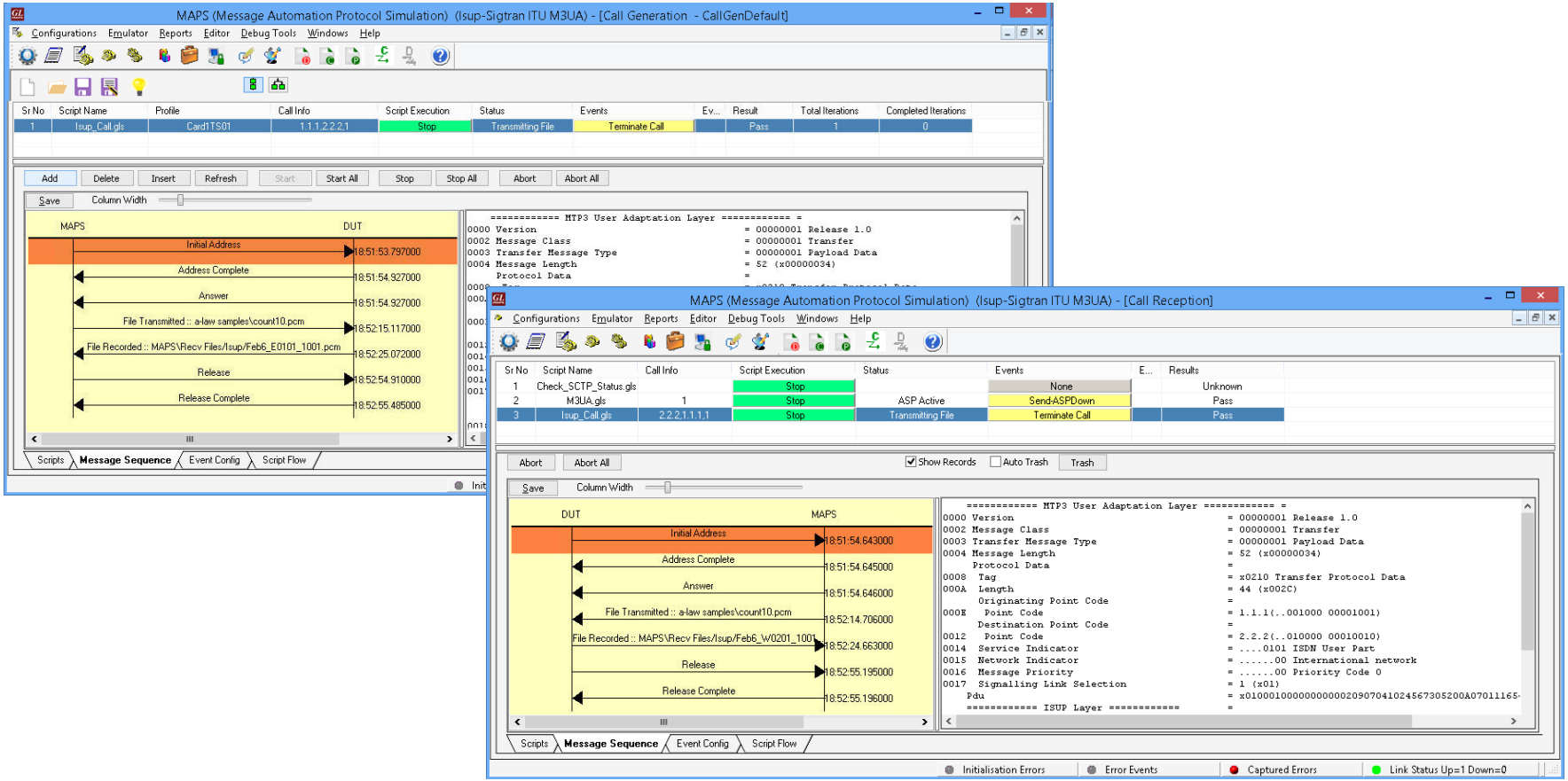
Call Reception

- Once the calls are successfully established, the received call instances are displayed in the Call Reception window automatically
- Triggers the execution on reception of pre-defined messages. To receive calls, the scripts are configured against the messages to be received
- Provide the result of the test with detail protocol decode and ladder diagram

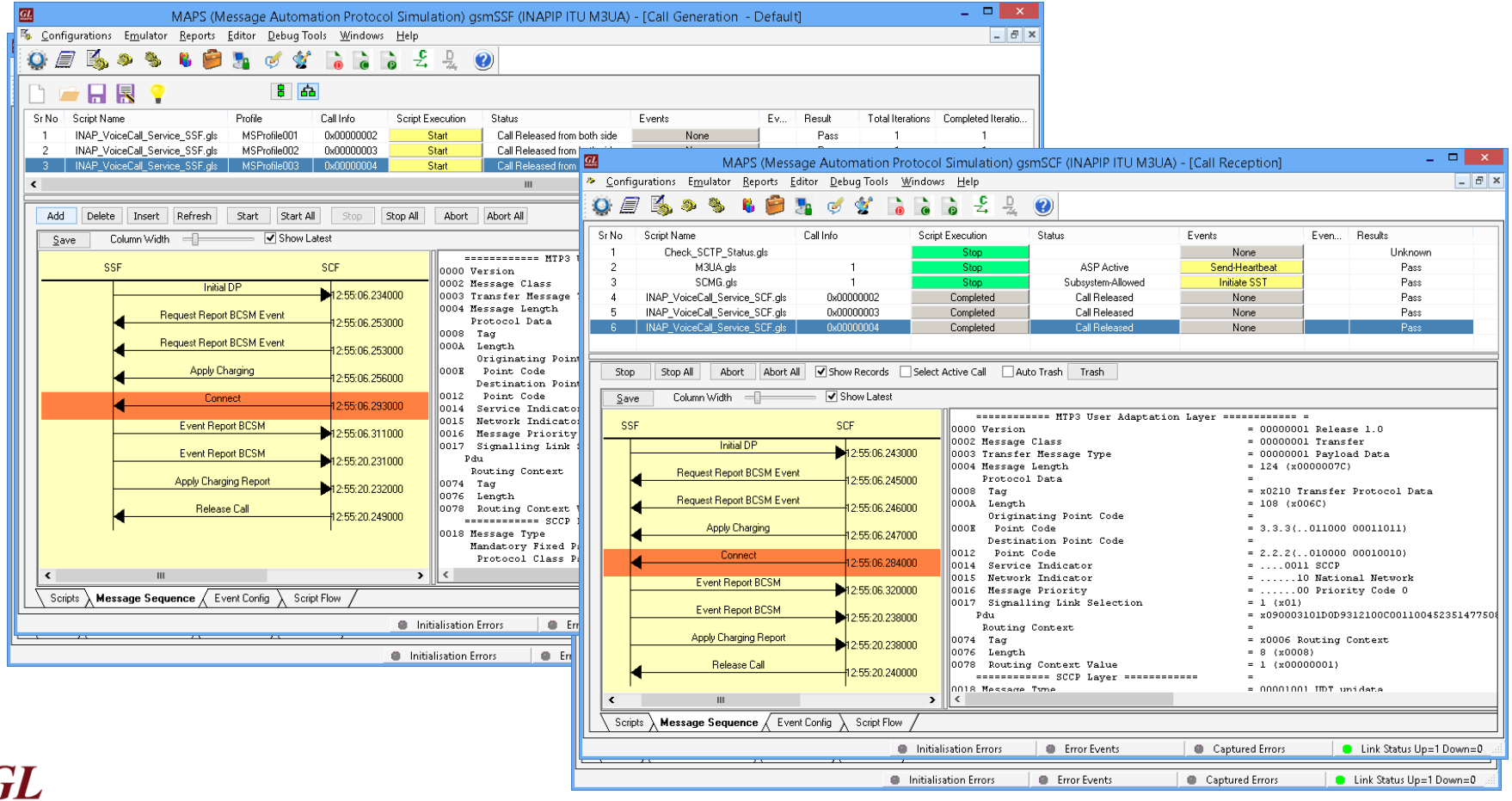
Call Generation and Reception (ISDN-Sigtran ITU)



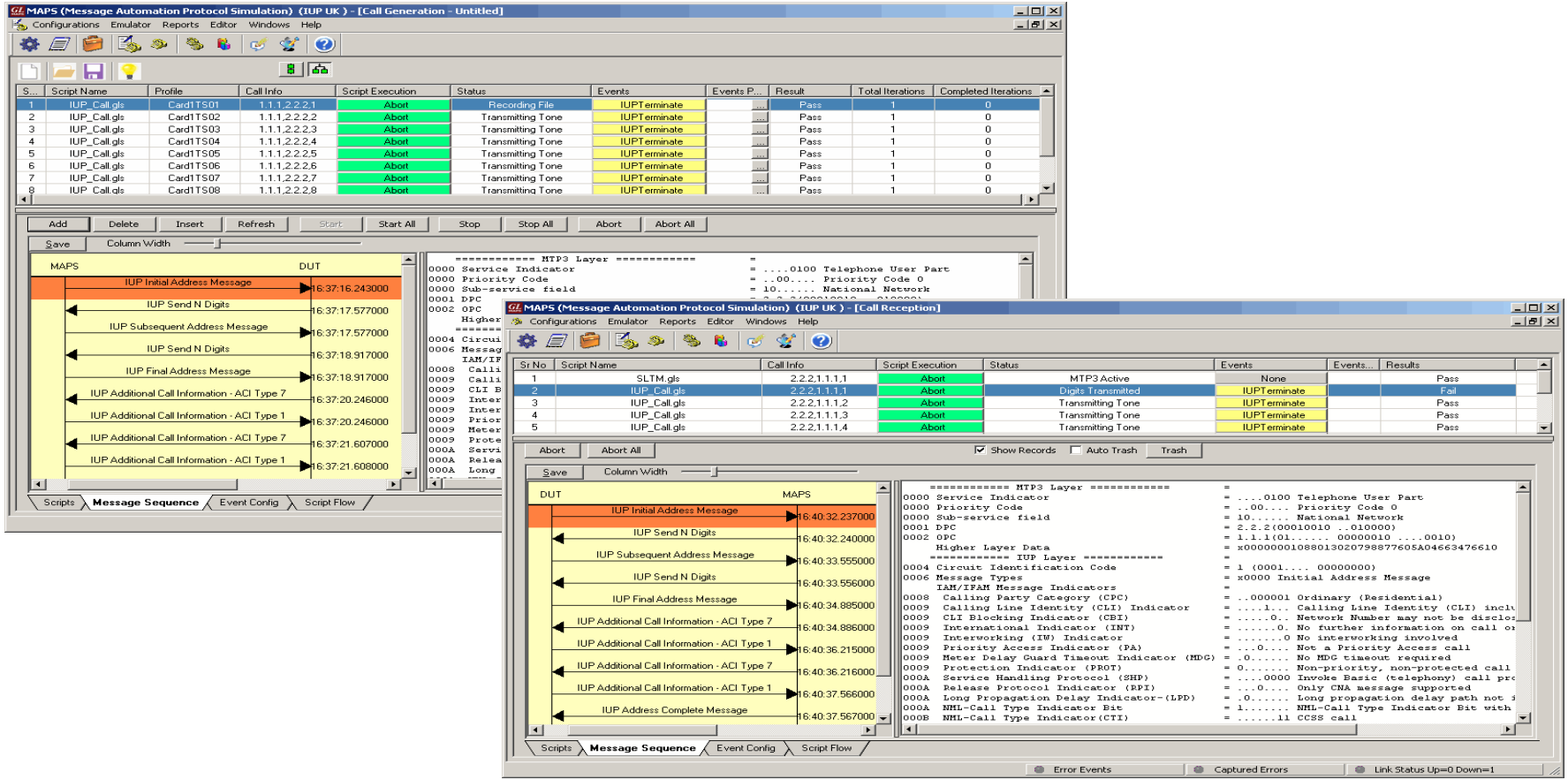
Call Generation and Reception (ISUP Sigtran)



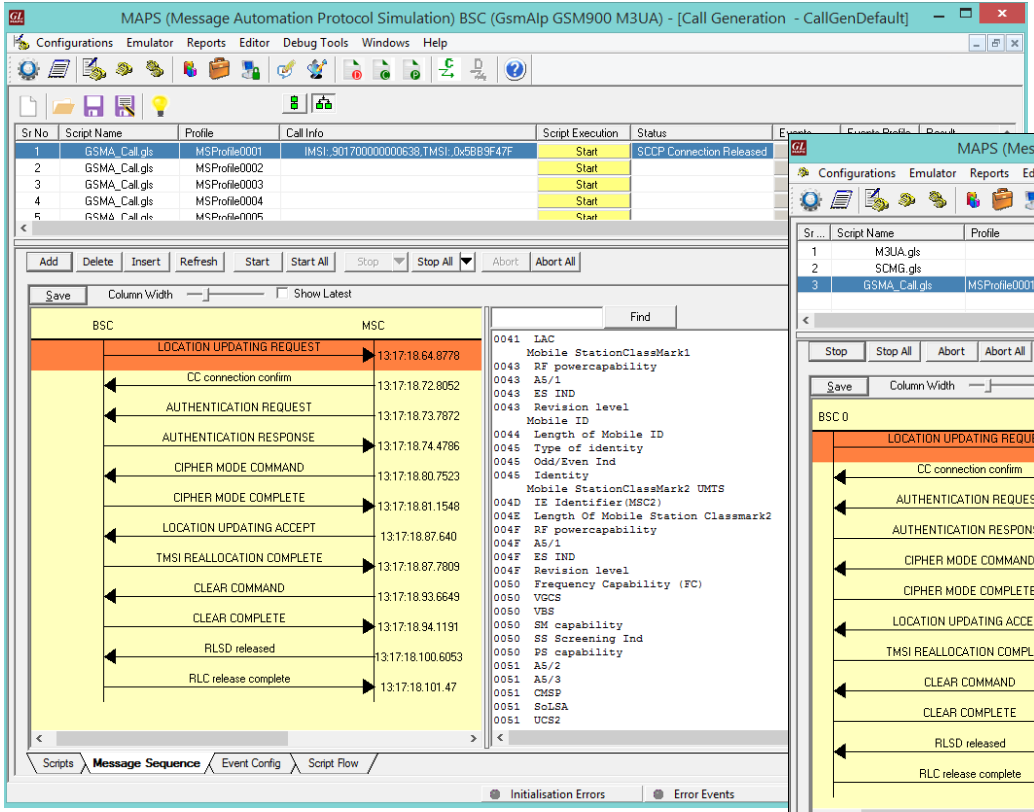
Call Generation and Reception (INAPIP ITU)



Call Generation and Reception (IUP)

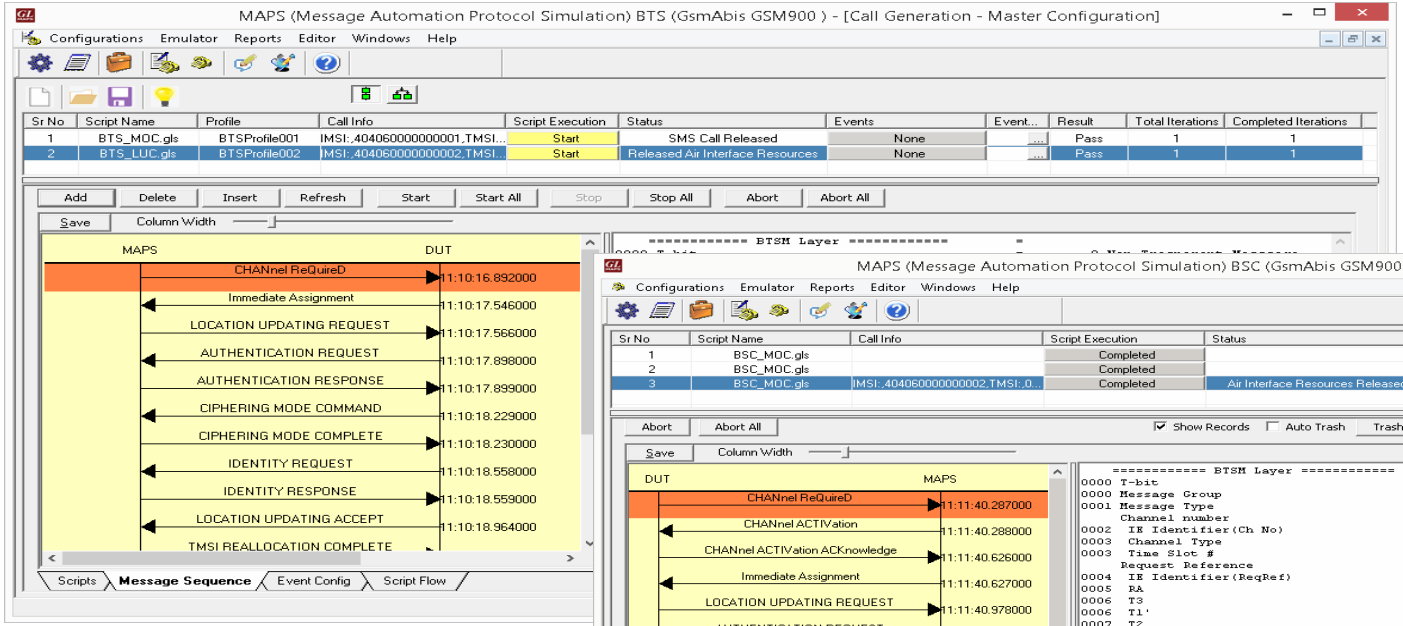


Call Generation and Reception (GSMoIP)

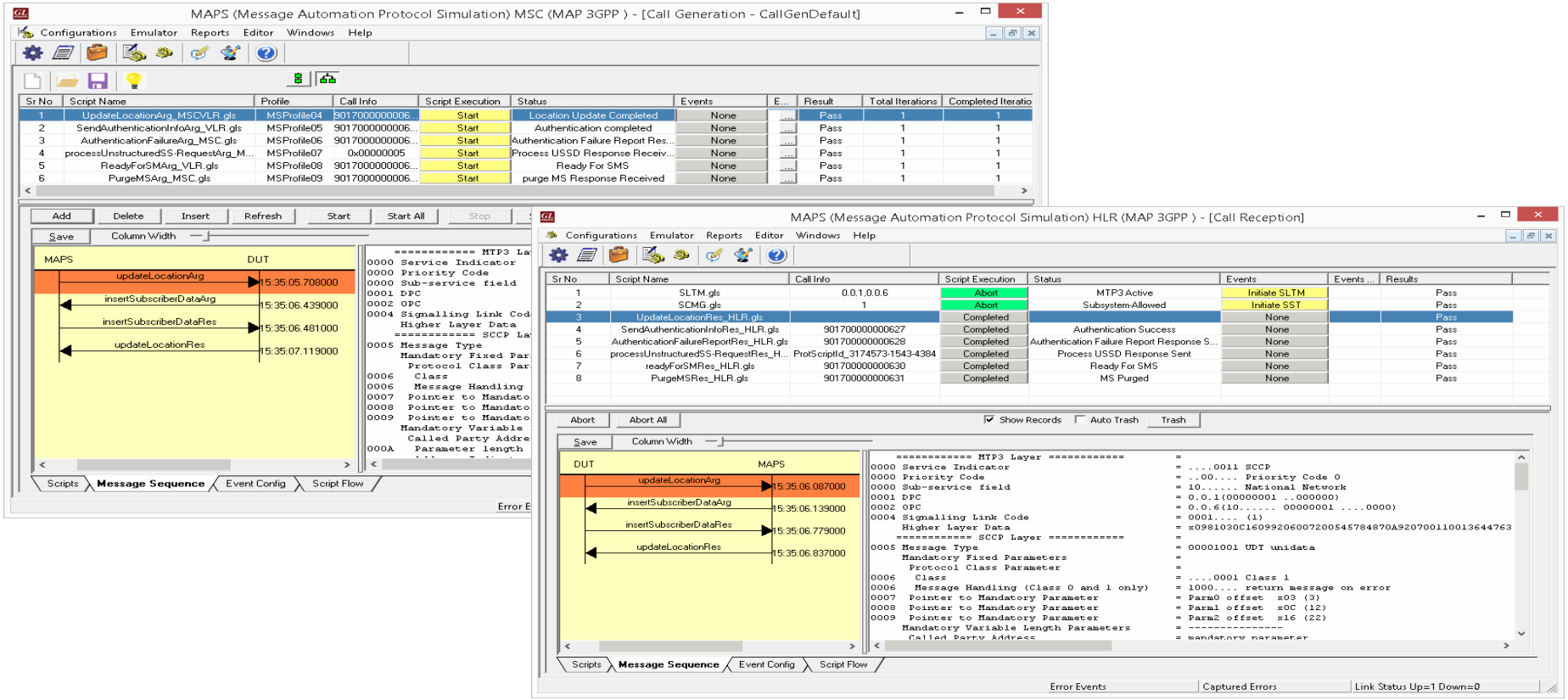


GL Communications

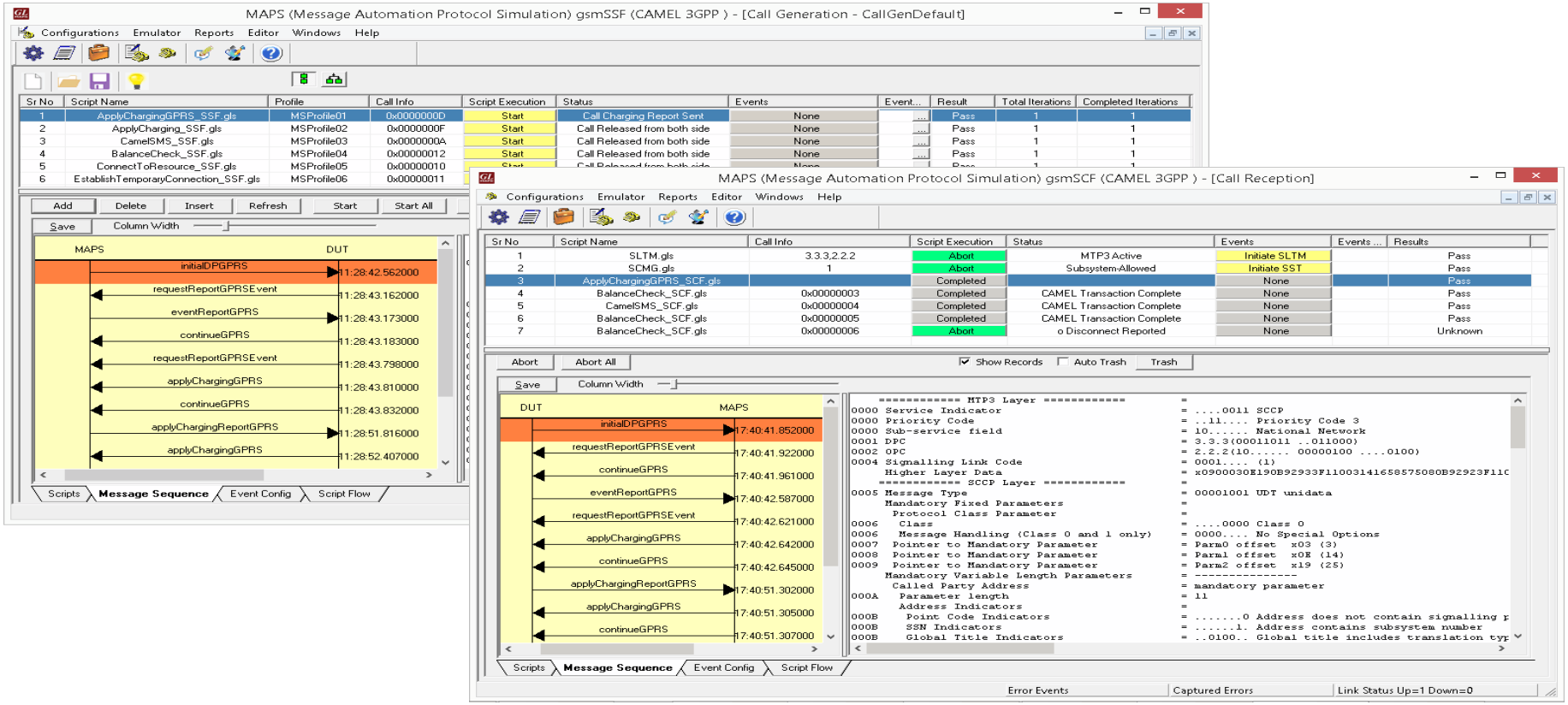
Call Generation and Reception (GSM Abis)



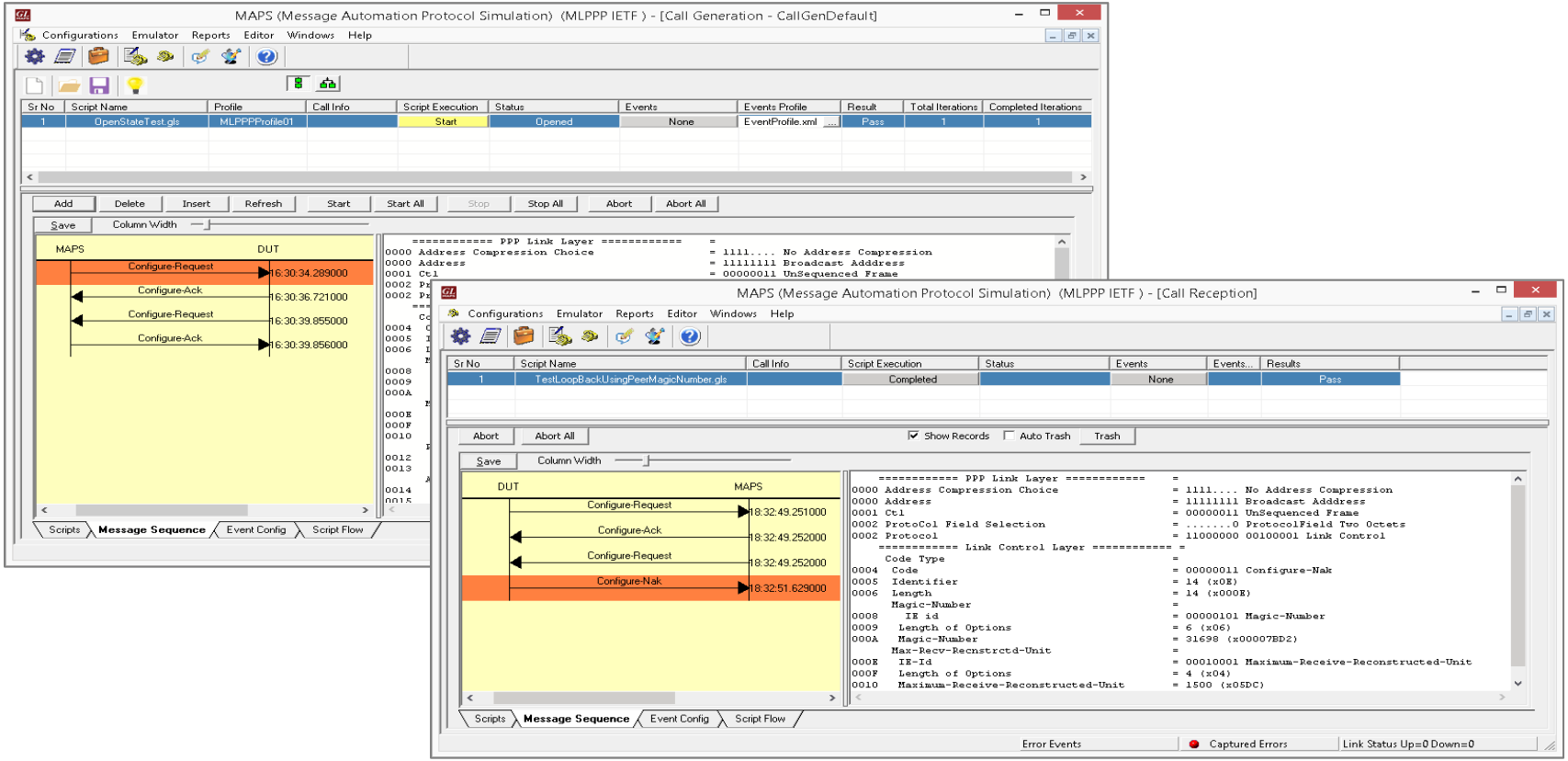
Call Generation and Reception (MAP)



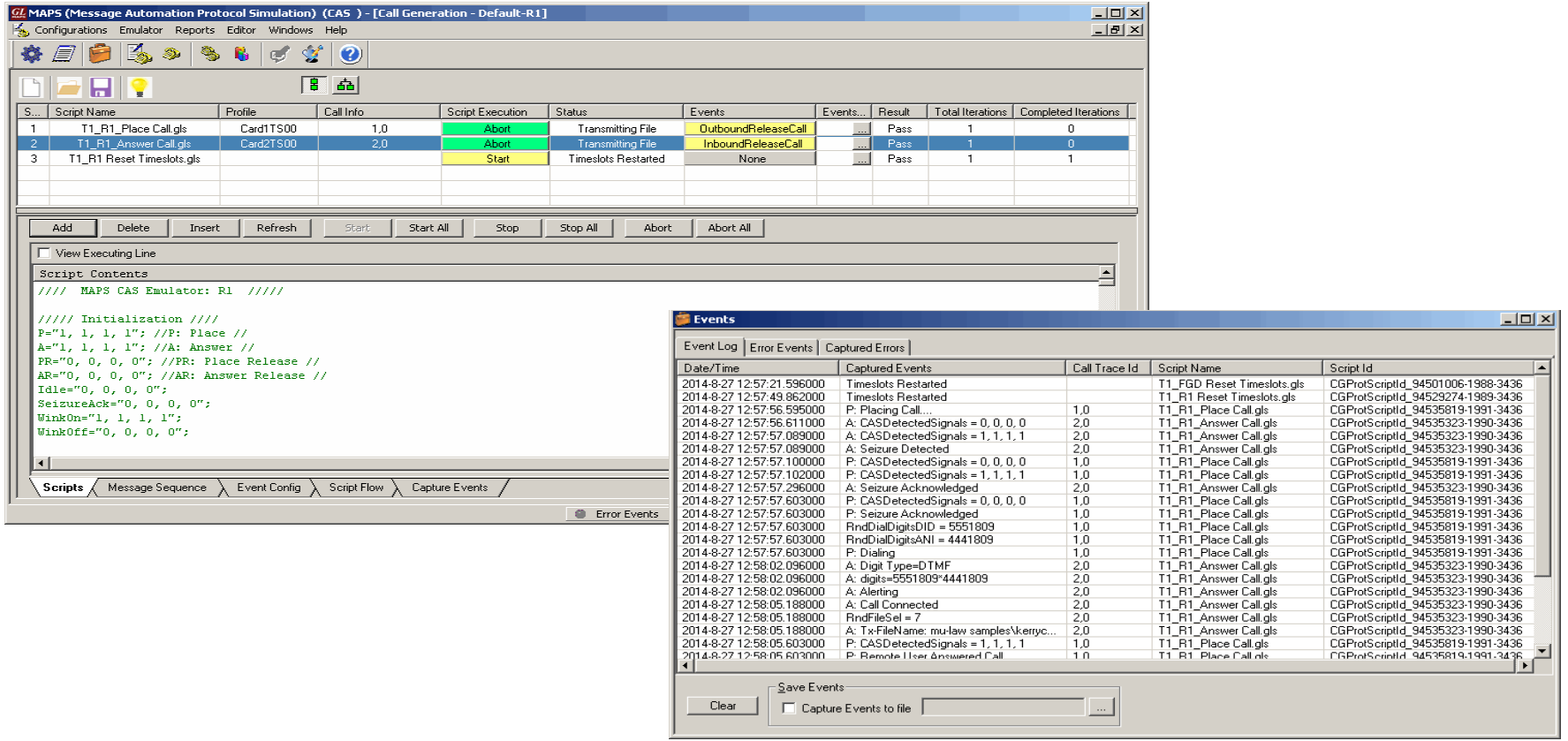
Call Generation and Reception (CAP)



Call Generation and Reception (MLPPP)

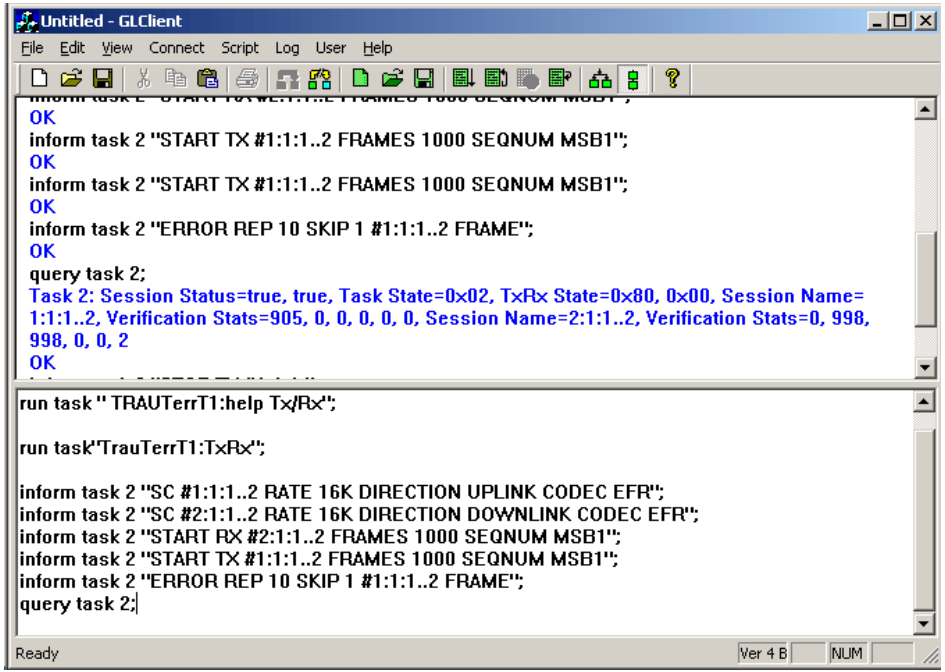


Call Generation and Reception (CAS)



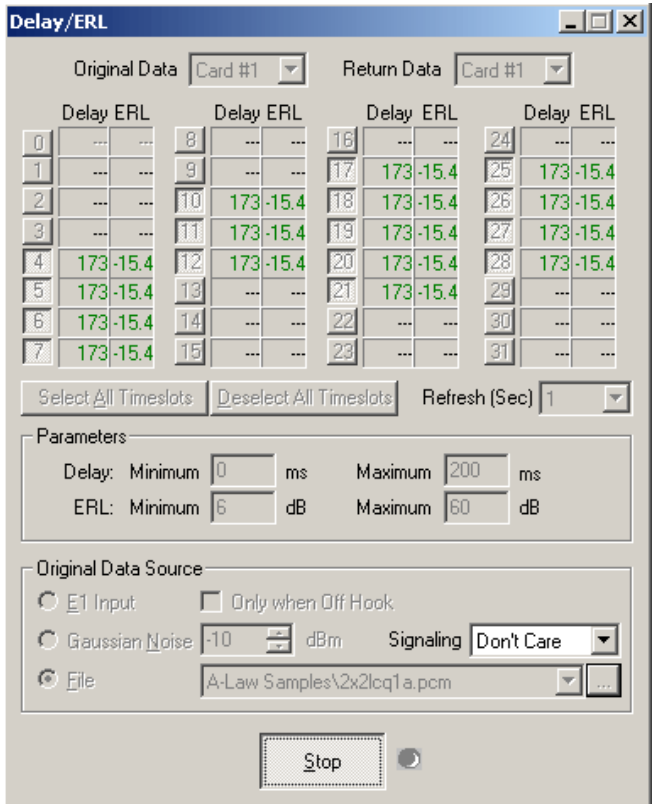
Protocol Emulation using Client-Server Scripts

- Provides various modules for analysis and emulation of protocols such as CAS, SS7, ISDN, HDLC, Multilink PPP, TRAU, ATM IMA, and Multi-Link Frame Relay
- Best suited for remote script-based operations
- Easy control of T1/E1 servers through software clients via TCP/ IP / UDP



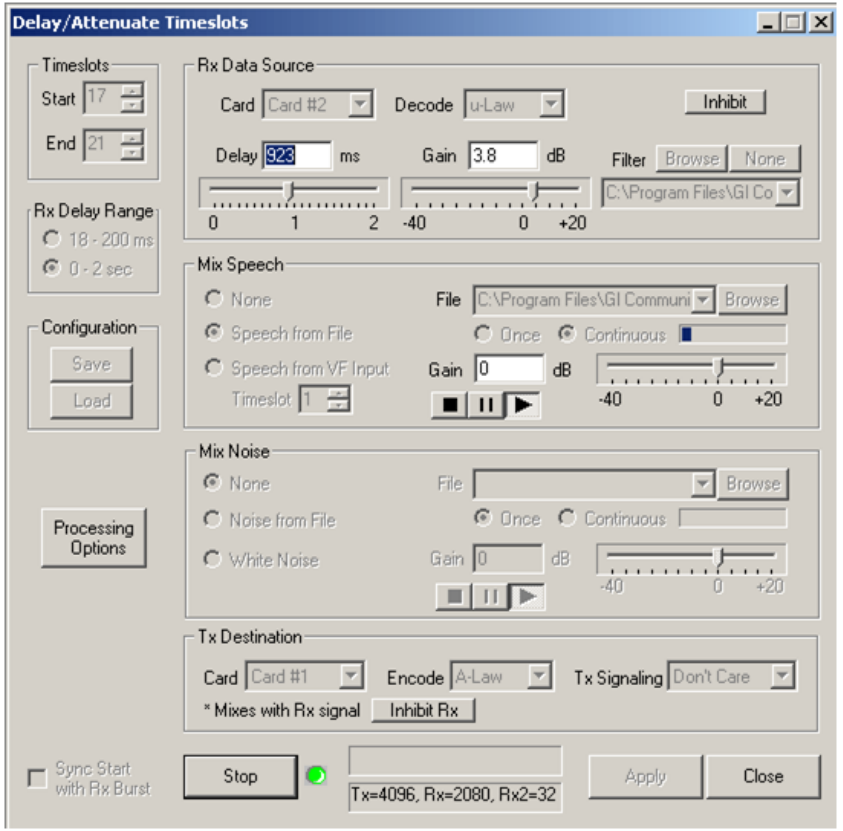
Measure Loop Delay/ERL

- Capability to measure and display loop delay and echo return loss (ERL) on one or more time slots
- Non- Intrusive and Intrusive modes of operations

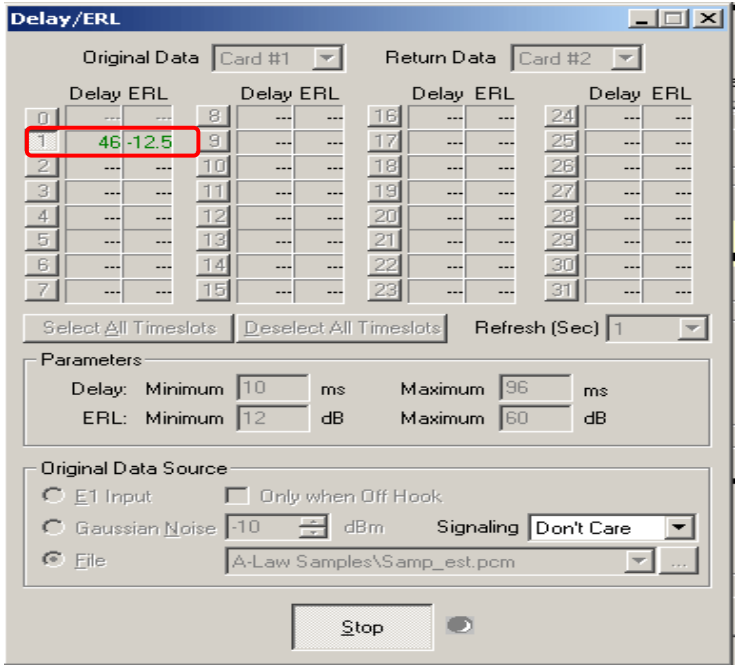


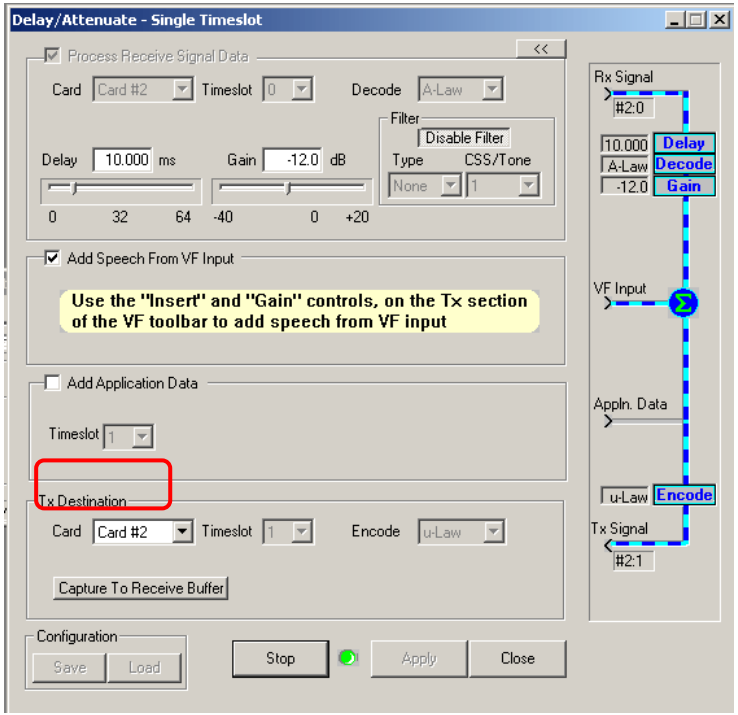
Delay Attenuate Timeslots

- Apply delay, attenuation, and/or filtering to a received signal on any number of timeslots
- Mix in additional signals (Speech and/or Noise) from a number of sources (Files, VF input, internal generation)



Delay Attenuate - Single Channel

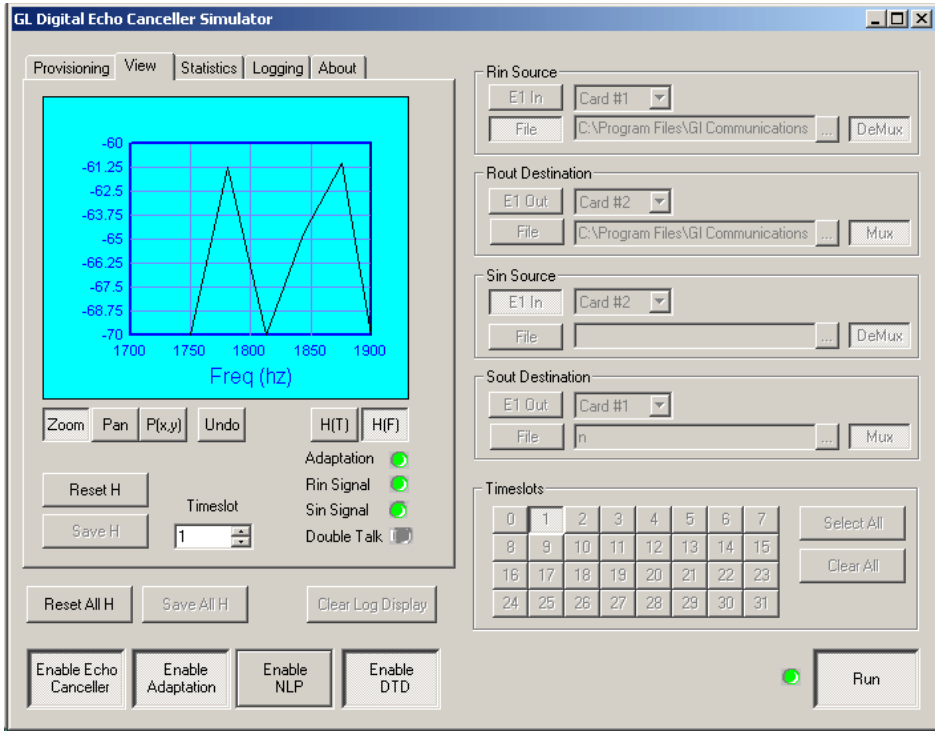




- Transmission of data, voice or file on single timeslot
- Receive and transmit on only one of the boards; launch multiple instances to work on a second card

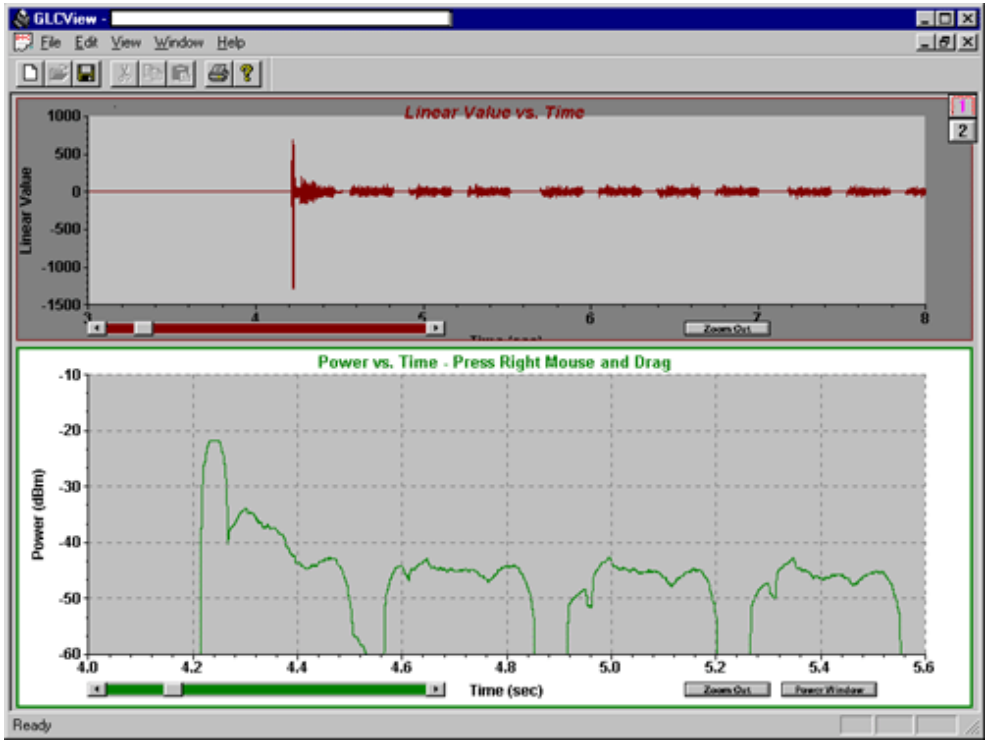
DEC Simulator

- Supports bidirectional voice traffic between the two ends of a connection
- Interfaces directly with A-Law or μ-Law encoded signals
- Continuous reporting of echo path delay, ERL, and dispersion



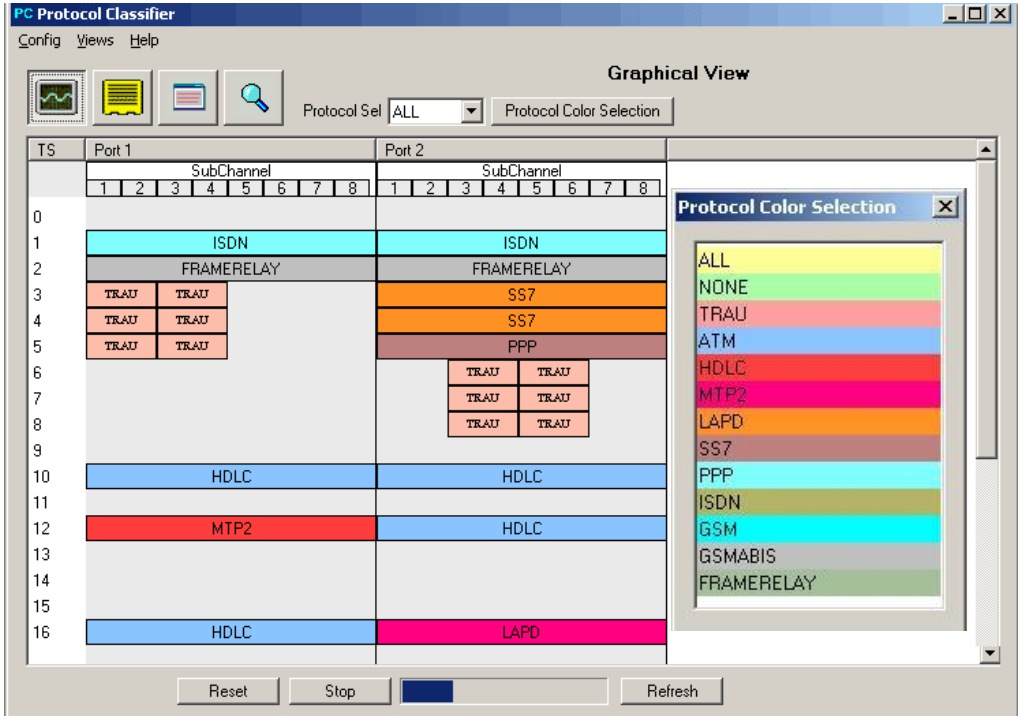
GLC View

- View pre-captured raw data files



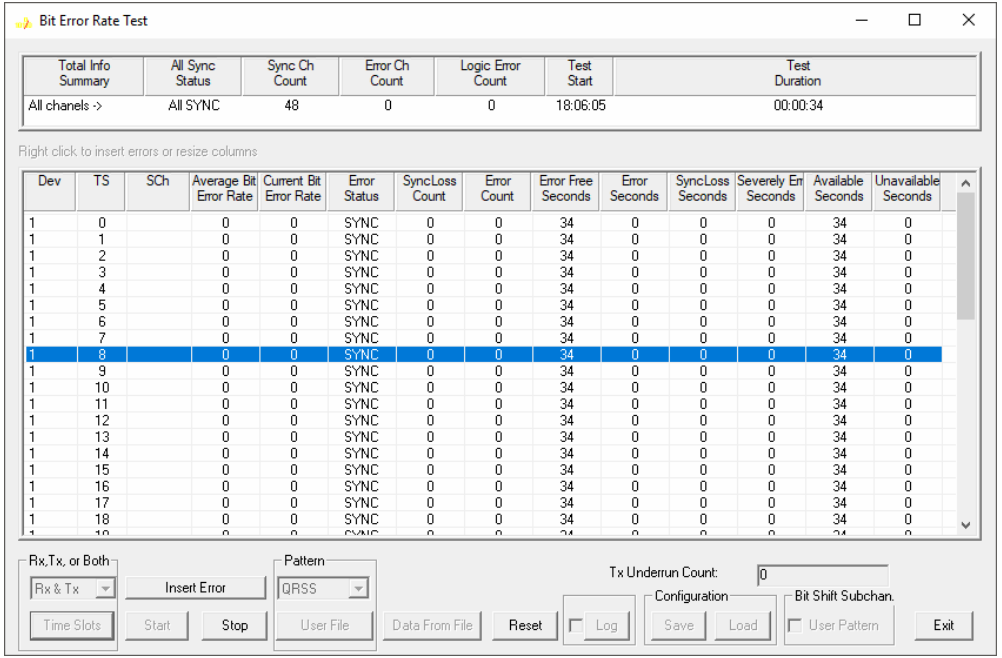
Protocol Identifier

- Classifies frames into different protocols based on signaling over unknown T1/E1 lines



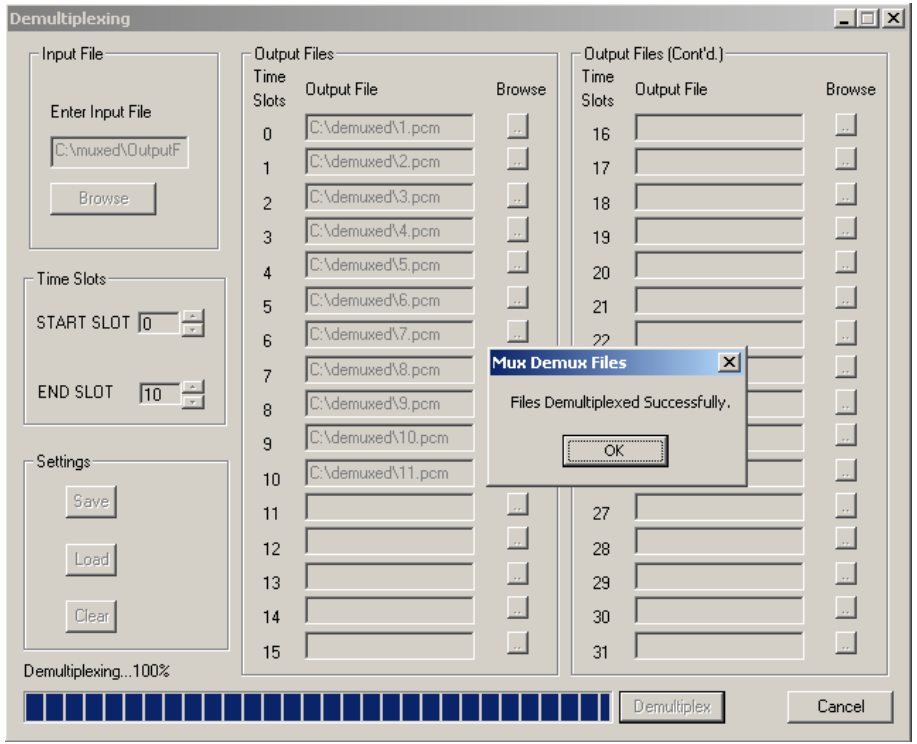
Multichannel BERT

- Measures the correctness of data transmitted and received on T1/E1 lines according to the repetitive pattern file
- Works real-time with data currently being received on T1/E1 lines, or off-line with a data stream that has been captured



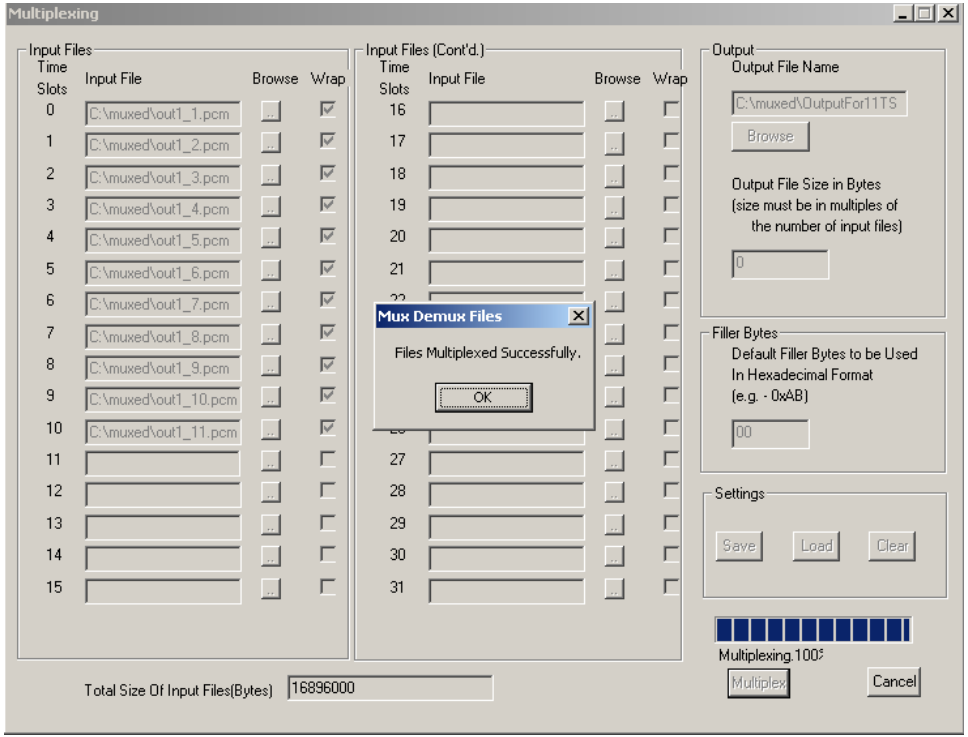
Multiplex / Demultiplex

- De-multiplex one aggregate file into individual timeslots



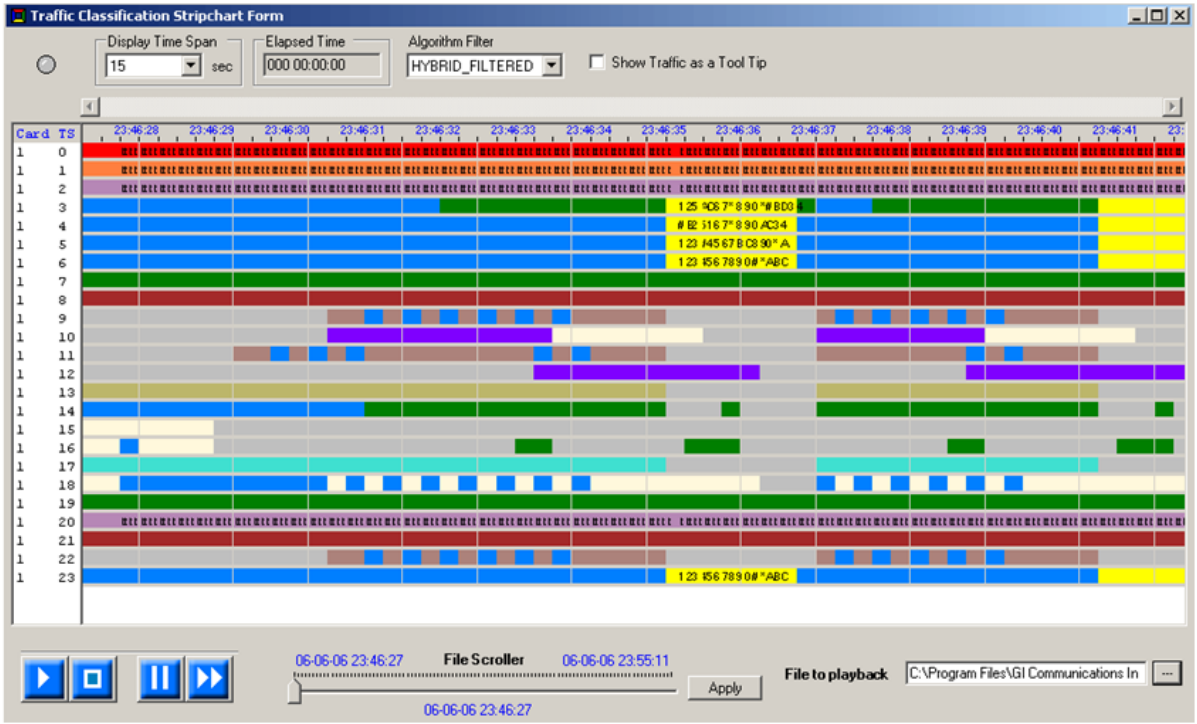
Multiplex / Demultiplex (Contd.)

- Multiplex files on different timeslots (up to 32 files) into one aggregate output file



Traffic Classifier

- Traffic Classifier is an application that can analyze the traffic on a T1 or E1 line
- It can analyze and classify various traffics such as voice, fax, data, tones (dial tone, ring-back tone, busy tone etc) as well as identify dialing digits and other events happening on a T1/E1 network



Thank you