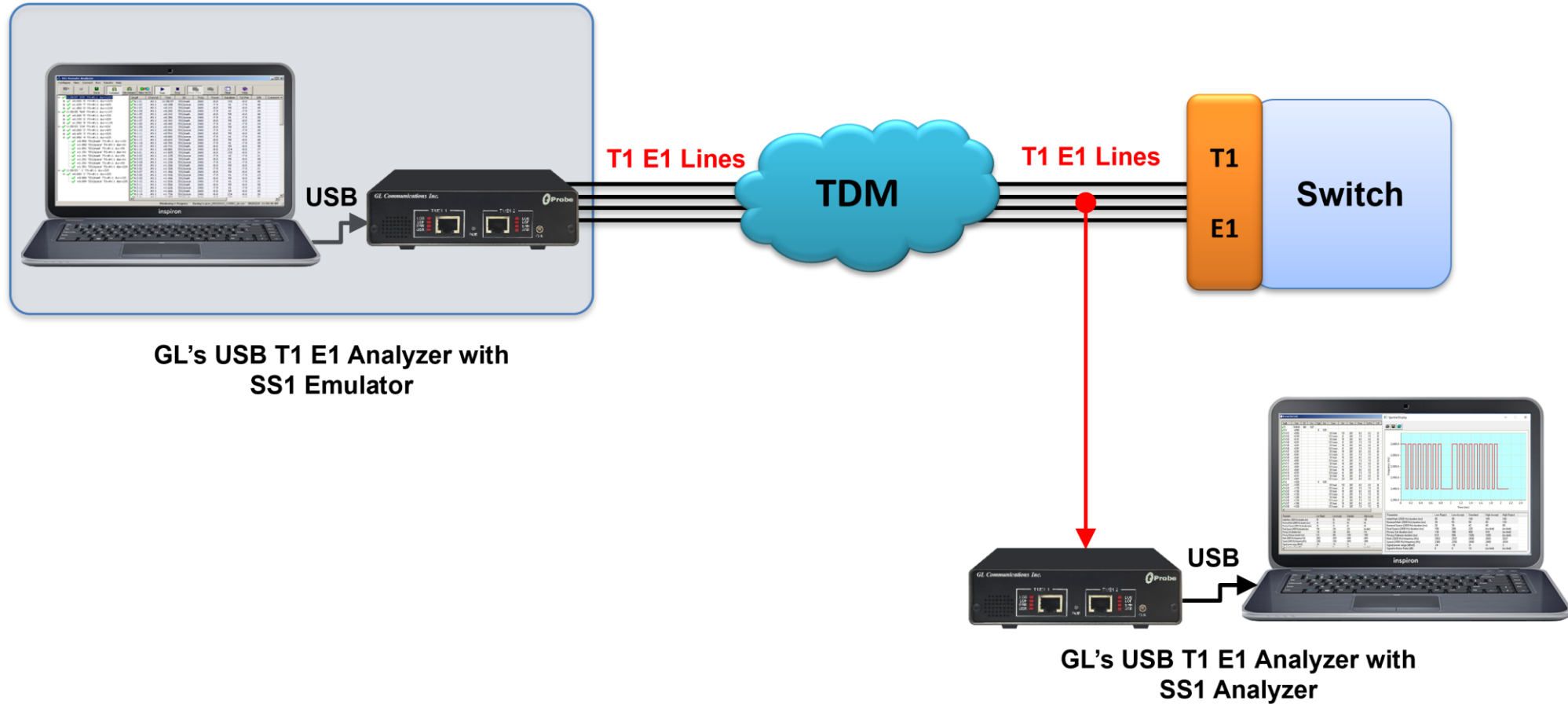

Selective Signaling – 1 / 4 (SS1/SS4) Emulation and Analysis



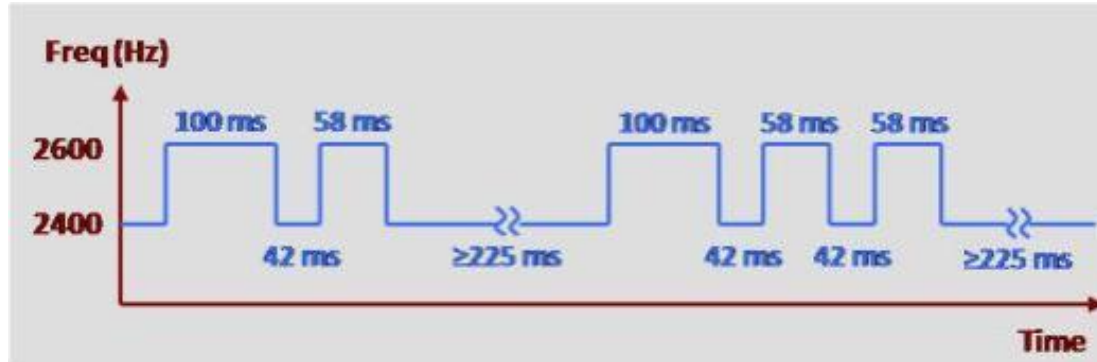
818 West Diamond Avenue - Third Floor, Gaithersburg, MD 20878
Phone: (301) 670-4784 Fax: (301) 670-9187 Email: info@gl.com
Website: <https://www.gl.com>

Real-time/Remote SS1/SS4 Emulator & Analyzer



SS1/SS4 Protocol

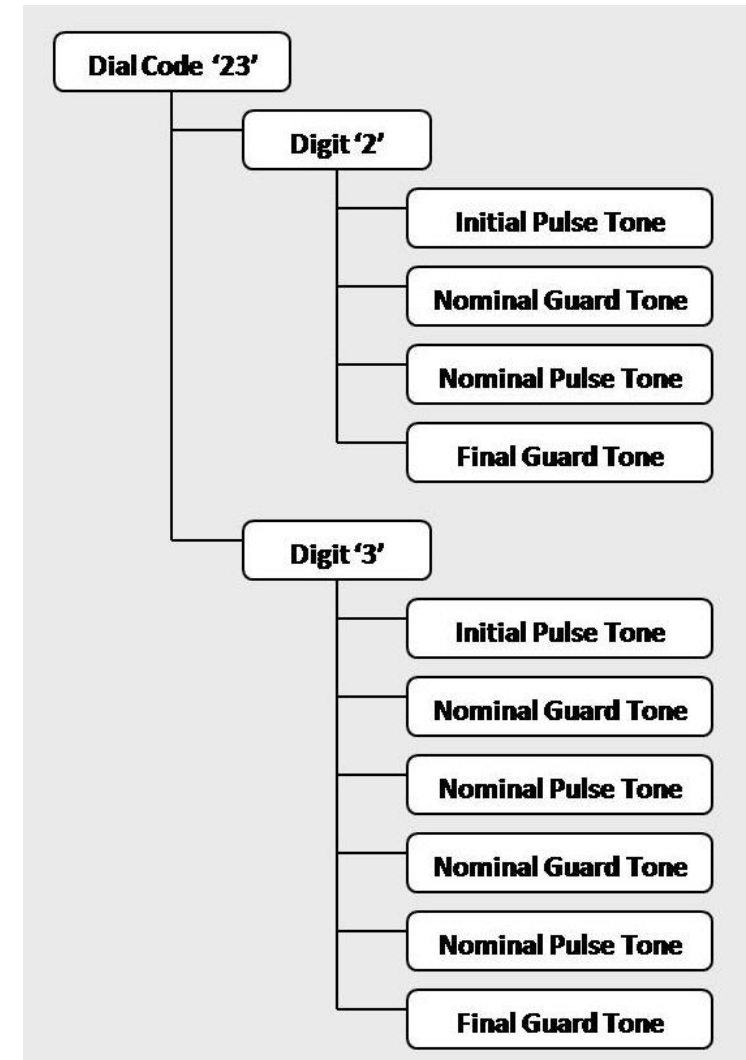
'23' as a Waveform



Tone Specifications

| Tone | Frequency | Duration |
|--------------------|-----------|----------|
| Initial Pulse Tone | 2600 Hz | 100 ms. |
| Nominal Pulse Tone | 2600 Hz | 58 ms. |
| Nominal Guard Tone | 2400 Hz | 42 ms. |
| Final Guard Tone | 2400 Hz | 225 ms. |

'23' as a Tree Structure



Highlights

- Real-time and File-based analysis using SS1/SS4 Analyzer
- Generate and introduce SS1/SS4 Dial Codes on Transmit Channels using SS1/SS4 Dialer
- Control 'mark' & 'space' frequency, duration, and power during transmission of SS1/SS4 Tones
- Dual monitoring capability allowing multiple instances of SS1/SS4 analyzer to simultaneously tap East and West direction traffic
- 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
- Save analyzer results to Microsoft® Access and Microsoft® Excel file formats
- Operate the SS1/SS4 Analyzer either remotely from the data acquisition site, or on the local PC
- Allows easy review of faulty dial code sequence while capture is ongoing
- Spectral Graph feature presents a captured dial code as a graphical waveform

SS1/SS4 Emulator ("SS1 Dialer")

SS1 Dialer #1:0

18:49:51 '23' TS=#1:0 dur=950

- +0.000 '2' TS=#1:0 dur=425
 - +0.000 'Mark' TS=#1:0 dur=100
 - +0.100 'Space' TS=#1:0 dur=42
 - +0.142 'Mark' TS=#1:0 dur=58
 - +0.200 'Space' TS=#1:0 dur=225
- +0.425 '3' TS=#1:0 dur=525
 - +0.425 'Mark' TS=#1:0 dur=100
 - +0.525 'Space' TS=#1:0 dur=42
 - +0.567 'Mark' TS=#1:0 dur=58
 - +0.625 'Space' TS=#1:0 dur=42
 - +0.667 'Mark' TS=#1:0 dur=58
 - +0.725 'Space' TS=#1:0 dur=225

18:49:47 '45' TS=#1:0 dur=1350

Speed Dial

| | | |
|----|------|---|
| 1 | '23' | x |
| 2 | '45' | x |
| 3 | Hank | x |
| 4 | | + |
| 5 | | + |
| 6 | | + |
| 7 | | + |
| 8 | | + |
| 9 | | + |
| 10 | | + |

Run Step Load Save

Clear Display Clear Selection

Dial Mode: 2-Digit Direct Dial

Hide Setup

Mark: Frequency: 2600 Hz, Initial Duration: 100 ms, Nominal Duration: 58 ms

Space: Frequency: 2400 Hz, Nominal Duration: 42 ms, Final Duration: 225 ms

Power: -8 dBm

Tx Channel: Port: Port #1, Timeslot: 0, VF Audio:

Timeout: Remote Timeout: 6 Sec

Space Transmits as Tone

Space Transmits as Idle

Save Setup Load Setup

SS1/SS4 Dialing

Dial Modes –

- Key & Send
- 2-Digit Burst
- 3-Digit Burst
- 2-Digit Direct Dial
- 3-Digit Direct Dial

The screenshot shows the SS1 Dialer #1:0 interface. The title bar is labeled "SS1/SS4 Dialer Title Bar". The main display area is labeled "Dialer Keypad & Digit Display" and shows a numeric keypad with digits 1-9, *, 0, and #, along with "Clear" and "Send" buttons. The keypad is currently displaying "1234569870". To the right of the keypad is a "Speed Dial" section with 10 rows, each containing a label (e.g., dial1, dial2) and a "+" button. The "Dial Modes" section is located below the keypad, showing a dropdown menu currently set to "2-Digit Direct Dial". At the bottom right, there is a "Hide Setup" button and a "Show / Hide Setup" label. On the left side, a "Dial History / Script" window displays a list of dialing events with timestamps and durations. Below this window are "Run", "Step", "Load", and "Save" buttons, collectively labeled "Dial History / Script Function Buttons". A "Clear Display" button is also present below the history window.

SS1/SS4 Dialer Title Bar

Dialer Keypad & Digit Display

Dial History / Script

Speed Dial

Dial Modes

Dial History / Script Function Buttons

Show / Hide Setup

SS1/SS4 Dialer Setup

The screenshot shows the SS1/SS4 Dialer Setup interface with several callout boxes pointing to specific features:

- Mark ("Pulse-Break") Tone Parameters:** Points to the Mark section, which includes Frequency (2600 Hz), Initial Duration (100 ms), and Nominal Duration (58 ms).
- Space ("Guard") Tone Parameters:** Points to the Space section, which includes Frequency (2400 Hz), Nominal Duration (42 ms), Final Duration (225 ms), and two options: "Space Transmits as Tone" and "Space Transmits as Idle".
- Remote Switch Timeout:** Points to the Timeout section, which includes Remote Timeout (6 Sec).
- Tone Power:** Points to the Power section, which includes a slider and a value of -8 dBm.
- Save & Load Setups:** Points to the Tx Channel section, which includes Port #1, Timeslot 2, and VF Audio checkbox, along with Save Setup and Load Setup buttons.

- Setup Dial Code with Pulse-Break ("mark") and Guard Tone ("space") frequencies, duration, power, and other parameters related to form SS1 Digits
- Spaces can be transmitted either as guard tones or quiet intervals
- Transmit on either digital time slots (channels) via VF Audio
- Digit timeout imposed in Direct Dial modes

SS1/SS4 Analyzer

Shortcut
Toolbar

SS1 Remote Analyzer

Configure View Connect Run Results Help

Setup Load Save Connect Disconnect View WCS Run Stop Real-Time From File Clear Help

Tree View

Tone View

| Seq# | Channel | Time | ID | Freq | Power | Duration | Tot Pwr | S/N | Comment |
|----------|---------|----------|-----------|------|-------|----------|---------|-----|---------|
| ✓ 4-1-01 | #1:1 | 11:58:57 | SS1/mark | 2601 | -8.0 | 100 | -8.0 | 40 | |
| ✓ 4-1-02 | #1:1 | +0.100 | SS1/space | 2401 | -7.9 | 41 | -7.9 | 40 | |
| ✓ 4-1-03 | #1:1 | +0.141 | SS1/mark | 2601 | -8.0 | 59 | -8.0 | 40 | |
| ✓ 4-1-04 | #1:1 | +0.201 | SS1/space | 2401 | -7.9 | 41 | -7.9 | 24 | |
| ✓ 4-1-05 | #1:1 | +0.241 | SS1/mark | 2601 | -8.0 | 59 | -8.0 | 40 | |
| ✓ 4-1-06 | #1:1 | +0.301 | SS1/space | 2401 | -7.9 | 41 | -7.9 | 20 | |
| ✓ 4-1-07 | #1:1 | +0.341 | SS1/mark | 2601 | -8.0 | 59 | -8.0 | 40 | |
| ✓ 4-1-08 | #1:1 | +0.401 | SS1/space | 2401 | -7.9 | 41 | -7.9 | 24 | |
| ✓ 4-1-09 | #1:1 | +0.441 | SS1/mark | 2601 | -8.0 | 59 | -8.0 | 40 | |
| ✓ 4-1-10 | #1:1 | +0.501 | SS1/space | 2401 | -7.9 | 41 | -7.9 | 20 | |
| ✓ 4-1-11 | #1:1 | +0.541 | SS1/mark | 2601 | -8.0 | 59 | -8.0 | 40 | |
| ✓ 4-1-12 | #1:1 | +0.601 | SS1/space | 2401 | -7.9 | 41 | -7.9 | 24 | |
| ✓ 4-1-13 | #1:1 | +0.641 | SS1/mark | 2601 | -8.0 | 59 | -8.0 | 40 | |
| ✓ 4-1-14 | #1:1 | +0.701 | SS1/space | 2401 | -7.9 | 41 | -7.9 | 20 | |
| ✓ 4-1-15 | #1:1 | +0.741 | SS1/mark | 2601 | -8.0 | 59 | -8.0 | 40 | |
| ✓ 4-1-16 | #1:1 | +0.801 | SS1/space | 2401 | -8.0 | 224 | -8.0 | 27 | |
| ✓ 4-2-01 | #1:1 | +1.025 | SS1/mark | 2601 | -8.0 | 100 | -8.0 | 31 | |
| ✓ 4-2-02 | #1:1 | +1.125 | SS1/space | 2401 | -7.9 | 42 | -7.9 | 21 | |
| ✓ 4-2-03 | #1:1 | +1.166 | SS1/mark | 2601 | -8.0 | 59 | -8.0 | 40 | |
| ✓ 4-2-04 | #1:1 | +1.226 | SS1/space | 2401 | -7.9 | 41 | -7.9 | 23 | |
| ✓ 4-2-05 | #1:1 | +1.266 | SS1/mark | 2601 | -8.0 | 59 | -8.0 | 40 | |
| ✓ 4-2-06 | #1:1 | +1.326 | SS1/space | 2401 | -7.9 | 41 | -7.9 | 21 | |
| ✓ 4-2-07 | #1:1 | +1.366 | SS1/mark | 2601 | -8.0 | 59 | -8.0 | 40 | |
| ✓ 4-2-08 | #1:1 | +1.426 | SS1/space | 2401 | -7.9 | 41 | -7.9 | 23 | |
| ✓ 4-2-09 | #1:1 | +1.466 | SS1/mark | 2601 | -8.0 | 59 | -8.0 | 40 | |
| ✓ 4-2-10 | #1:1 | +1.526 | SS1/space | 2401 | -7.9 | 41 | -7.9 | 21 | |
| ✓ 4-2-11 | #1:1 | +1.566 | SS1/mark | 2601 | -8.0 | 59 | -8.0 | 40 | |
| ✓ 4-2-12 | #1:1 | +1.626 | SS1/space | 2401 | -7.9 | 41 | -7.9 | 23 | |
| ✓ 4-2-13 | #1:1 | +1.666 | SS1/mark | 2601 | -8.0 | 59 | -8.0 | 40 | |
| ✓ 4-2-14 | #1:1 | +1.726 | SS1/space | 2401 | -8.0 | 224 | -8.0 | 26 | |

Monitoring in Progress Saving to pcm_05032010_115851_dc.csv 05/03/10 11:59:45 AM

Dial Code View or “Tree View”

Dial Code Record

Digit Record

Tone Record

“Collapse” branches of the protocol tree by clicking on “-” boxes

“Expand” branches of the protocol tree by clicking on “+” boxes

| Time | Duration | Content | File | Duration |
|----------|-------------|---------|------------------------------|----------|
| 14:56:39 | '256' | | File=SS1_06242020_145629.pcm | dur=1975 |
| +0.000 | '2' | | File=SS1_06242020_145629.pcm | dur=425 |
| +0.000 | 'SS1/mark' | | File=SS1_06242020_145629.pcm | dur=100 |
| +0.099 | 'SS1/space' | | File=SS1_06242020_145629.pcm | dur=42 |
| +0.141 | 'SS1/mark' | | File=SS1_06242020_145629.pcm | dur=59 |
| +0.200 | 'SS1/space' | | File=SS1_06242020_145629.pcm | dur=224 |
| +0.425 | '5' | | File=SS1_06242020_145629.pcm | dur=725 |
| +0.425 | 'SS1/mark' | | File=SS1_06242020_145629.pcm | dur=100 |
| +0.525 | 'SS1/space' | | File=SS1_06242020_145629.pcm | dur=41 |
| +0.566 | 'SS1/mark' | | File=SS1_06242020_145629.pcm | dur=59 |
| +0.625 | 'SS1/space' | | File=SS1_06242020_145629.pcm | dur=41 |
| +0.666 | 'SS1/mark' | | File=SS1_06242020_145629.pcm | dur=59 |
| +0.726 | 'SS1/space' | | File=SS1_06242020_145629.pcm | dur=41 |
| +0.766 | 'SS1/mark' | | File=SS1_06242020_145629.pcm | dur=59 |
| +0.825 | 'SS1/space' | | File=SS1_06242020_145629.pcm | dur=41 |
| +0.866 | 'SS1/mark' | | File=SS1_06242020_145629.pcm | dur=59 |
| +0.925 | 'SS1/space' | | File=SS1_06242020_145629.pcm | dur=224 |
| +1.150 | '6' | | File=SS1_06242020_145629.pcm | dur=825 |

Tone Parameters

- Implements a wider range of values, which place lower and upper bounds on the FAIL range
- Measurements falling outside this range disqualify a signal from being an SS1 Signaling Tone

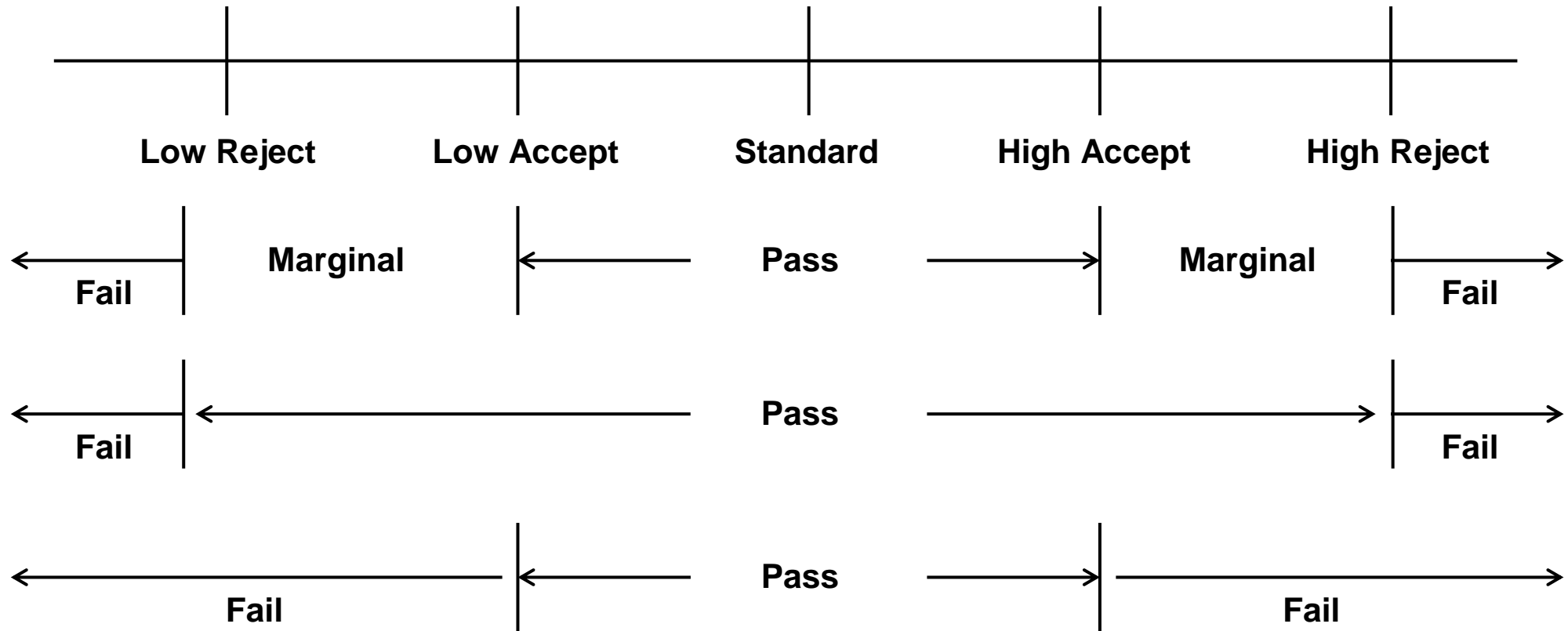
The screenshot shows the 'SS1 Setup' dialog box with the 'SS1 Tone Parameters' tab selected. The 'Parameter Set' is 'Strict Tx/Rx Settings'. A table lists various parameters with their values for different rejection/acceptance levels. Below the table are buttons for 'Set Dial Code Option', 'Save/Load Parameter Sets', 'Parameter Scoring', and 'Restore Default Settings'. At the bottom are 'OK', 'Cancel', 'Apply', and 'Help' buttons.

| Parameter | Low Reject | Low Accept | Standard | High Accept | High Reject |
|---|------------|------------|----------|-------------|-------------|
| Initial 2600 Hz pulse-break duration (ms) | 95 | 95 | 100 | 105 | 160 |
| Nominal 2600 Hz pulse-break duration (ms) | 30 | 55 | 58 | 65 | 120 |
| Nominal 2400 Hz guard tone duration (ms) | 20 | 35 | 42 | 45 | 90 |
| Final 2400 Hz guard tone duration (ms) | 150 | 200 | 225 | (no limit) | (no limit) |
| Privacy Set duration (ms) | 130 | 390 | 400 | 410 | (no limit) |
| Privacy Release duration (ms) | 610 | 995 | 1000 | 1005 | (no limit) |
| 2600 Hz pulse-break frequency (Hz) | 2563 | 2597 | 2600 | 2603 | 2637 |
| 2400 Hz guard tone frequency (Hz) | 2366 | 2392 | 2400 | 2408 | 2434 |
| Signal power range (dBm0) | -24 | -10 | -8 | -6 | 3 |
| Signal-to-Noise Ratio (dB) | 0 | 8 | 10 | (no limit) | (no limit) |

Current
Parameter Set

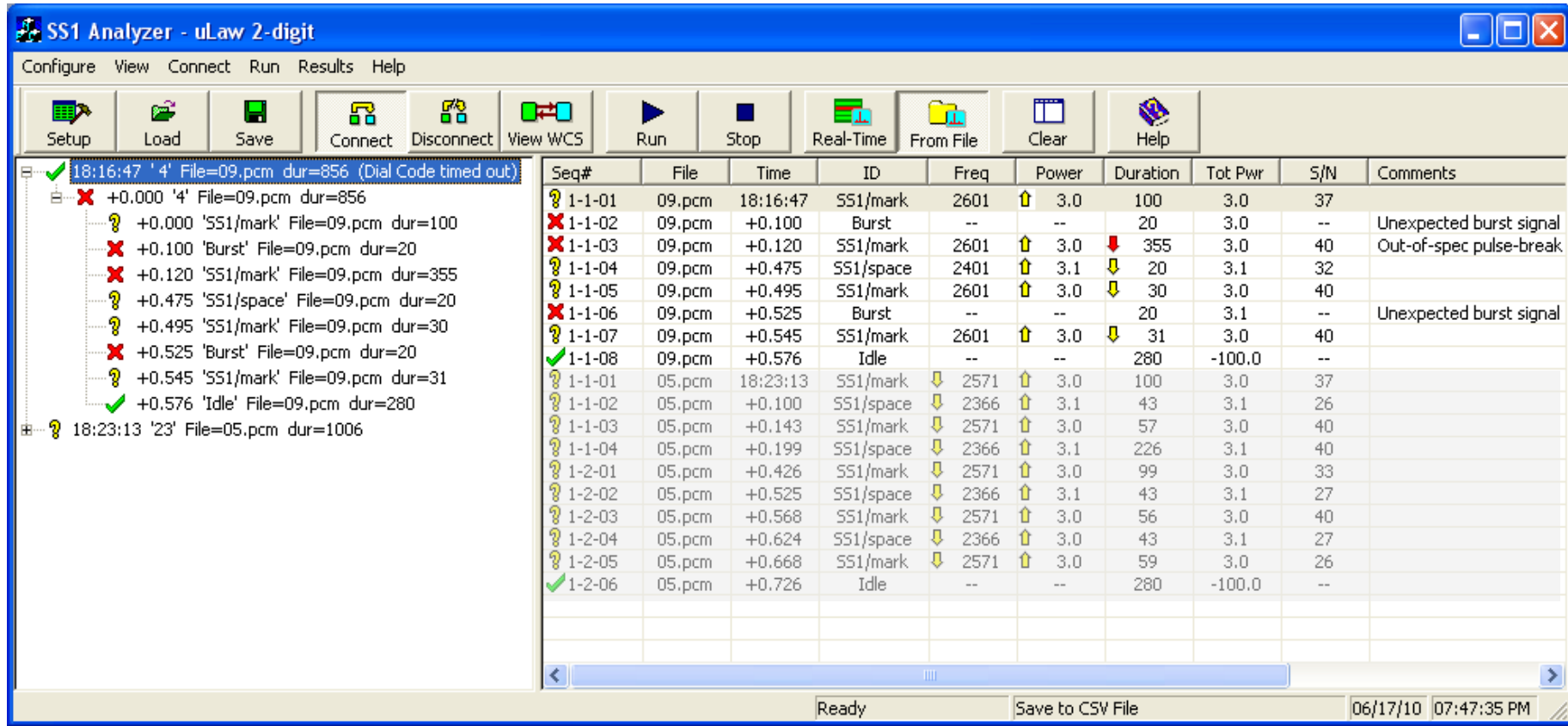
Table of Tone
Parameters

Parameter Scoring Options



- Pass/Marginal/Fail option - evaluates tones and their associated digits and dial codes records as PASS, MARGINAL, or FAIL
- Pass/Fail: Marginal=Pass option causes all MARGINAL scores to be reported as PASSes
- Pass/Fail: Marginal=Fail option causes all MARGINAL scores to be reported as FAILures

Things Do Go Wrong!



The screenshot shows the SS1 Analyzer interface with a table of analysis results. The table columns are: Seq#, File, Time, ID, Freq, Power, Duration, Tot Pwr, S/N, and Comments. The results are grouped by time and file. The first group (File=09.pcm) shows several 'Burst' and 'Out-of-spec pulse-break' errors. The second group (File=05.pcm) shows various signal measurements.

| Seq# | File | Time | ID | Freq | Power | Duration | Tot Pwr | S/N | Comments | |
|---------------|--------------------|-------------|-----------------------|-----------|-------|----------|---------|--------|-------------------------|-------------------------|
| 18:16:47 '4' | File=09.pcm | dur=856 | (Dial Code timed out) | | | | | | | |
| + | +0.000 '4' | File=09.pcm | dur=856 | | | | | | | |
| ? | +0.000 'SS1/mark' | File=09.pcm | dur=100 | | | | | | | |
| X | +0.100 'Burst' | File=09.pcm | dur=20 | | | | | | Unexpected burst signal | |
| X | +0.120 'SS1/mark' | File=09.pcm | dur=355 | | | | | | Out-of-spec pulse-break | |
| ? | +0.475 'SS1/space' | File=09.pcm | dur=20 | | | | | | | |
| ? | +0.495 'SS1/mark' | File=09.pcm | dur=30 | | | | | | | |
| ? | +0.525 'Burst' | File=09.pcm | dur=20 | | | | | | Unexpected burst signal | |
| ? | +0.545 'SS1/mark' | File=09.pcm | dur=31 | | | | | | | |
| + | +0.576 'Idle' | File=09.pcm | dur=280 | | | | | | | |
| 18:23:13 '23' | File=05.pcm | dur=1006 | | | | | | | | |
| ? | 1-1-01 | 09.pcm | 18:16:47 | SS1/mark | 2601 | 3.0 | 100 | 3.0 | 37 | |
| X | 1-1-02 | 09.pcm | +0.100 | Burst | -- | -- | 20 | 3.0 | -- | Unexpected burst signal |
| X | 1-1-03 | 09.pcm | +0.120 | SS1/mark | 2601 | 3.0 | 355 | 3.0 | 40 | Out-of-spec pulse-break |
| ? | 1-1-04 | 09.pcm | +0.475 | SS1/space | 2401 | 3.1 | 20 | 3.1 | 32 | |
| ? | 1-1-05 | 09.pcm | +0.495 | SS1/mark | 2601 | 3.0 | 30 | 3.0 | 40 | |
| X | 1-1-06 | 09.pcm | +0.525 | Burst | -- | -- | 20 | 3.1 | -- | Unexpected burst signal |
| ? | 1-1-07 | 09.pcm | +0.545 | SS1/mark | 2601 | 3.0 | 31 | 3.0 | 40 | |
| + | 1-1-08 | 09.pcm | +0.576 | Idle | -- | -- | 280 | -100.0 | -- | |
| ? | 1-1-01 | 05.pcm | 18:23:13 | SS1/mark | 2571 | 3.0 | 100 | 3.0 | 37 | |
| ? | 1-1-02 | 05.pcm | +0.100 | SS1/space | 2366 | 3.1 | 43 | 3.1 | 26 | |
| ? | 1-1-03 | 05.pcm | +0.143 | SS1/mark | 2571 | 3.0 | 57 | 3.0 | 40 | |
| ? | 1-1-04 | 05.pcm | +0.199 | SS1/space | 2366 | 3.1 | 226 | 3.1 | 40 | |
| ? | 1-2-01 | 05.pcm | +0.426 | SS1/mark | 2571 | 3.0 | 99 | 3.0 | 33 | |
| ? | 1-2-02 | 05.pcm | +0.525 | SS1/space | 2366 | 3.1 | 43 | 3.1 | 27 | |
| ? | 1-2-03 | 05.pcm | +0.568 | SS1/mark | 2571 | 3.0 | 56 | 3.0 | 40 | |
| ? | 1-2-04 | 05.pcm | +0.624 | SS1/space | 2366 | 3.0 | 43 | 3.1 | 27 | |
| ? | 1-2-05 | 05.pcm | +0.668 | SS1/mark | 2571 | 3.0 | 59 | 3.0 | 26 | |
| + | 1-2-06 | 05.pcm | +0.726 | Idle | -- | -- | 280 | -100.0 | -- | |

- Out-of-spec measurements are indicated by arrows, showing the direction of deviation
- Digits and dial codes containing out-of-spec measurements are marked as such:
 - “?” indicates MARGINAL
 - “X” indicates FAIL

Real-Time Port/Timeslot Selection

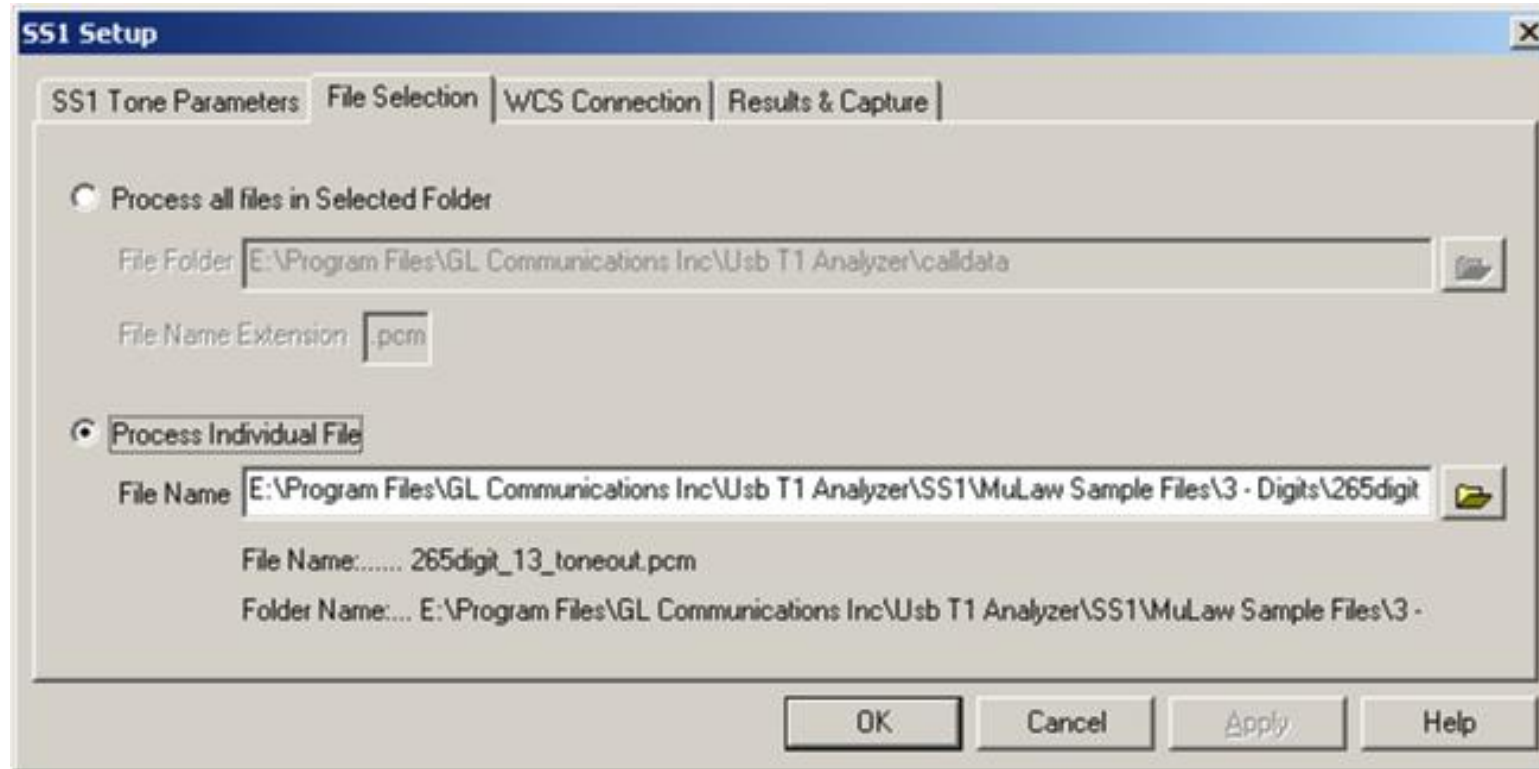
The image shows a software dialog box titled "SS1 Setup" with a close button (X) in the top right corner. The dialog has four tabs: "SS1 Tone Parameters", "Port/Timeslot Selection" (which is active), "WCS Connection", and "Results & Capture".

Under the "Port/Timeslot Selection" tab, there is a "Select Capture Port" section with a dropdown menu currently set to "Port #2". Below this is a "Select Timeslot" section containing a 3x8 grid of buttons numbered 0 through 23. The button for timeslot 1 is highlighted with a dark border.

Below the grid is a checkbox labeled "Insert VF onto Selected Timeslot" which is checked. At the bottom of the dialog, there are four buttons: "Discard Changes", "OK", "Cancel", "Apply", and "Help".

- Internally, signal data is always captured on a TDM channel or “timeslot”
- GL’s T1 cards provide VF Input and Output jacks through which audio signals can be inserted onto a TDM channel
- This Setup tab only available when Real-Time monitoring has been selected

Offline Analysis File Selection



- In Offline analysis, specify the file(s) on which to perform SS1/SS4 analysis. File formats supported are A-law or μ -law PCM files
 - Analyze all files in a folder with a given file name extension, or
 - Analyze a specific file
 - This Setup tab is only available when File Input has been selected

Results and Capture

SS1 Setup

SS1 Tone Parameters | Port/Timeslot Selection | WCS Connection | Results & Capture

Save Results

Select Output Tables: Tone Details Digit Details Dial Codes

CSV File Output

Results File Folder: C:\Program Files\GL Communications Inc\Probe T1 Analyzer\SS1

Table Name Prefix: SS1

Dial Code Table Name Suffix: _dc

Digit Table Name Suffix: _dig

Tone Table Name Suffix: _ton

File name Suffix

Database Output

Probe Name:

Capture Channel Traffic

Capture Traffic

Traffic File Folder: C:\Program Files\GL Communications Inc\Probe T1 Analyzer\calldata

File Name Prefix: SS1

OK Cancel Apply Help

Output Result Files

Dial Code Table

| | A | B | C | D | E | F |
|----|---------|--------|----------|-----------|------|-------|
| 1 | DC Seq# | File | Time | Dial Code | Dur | Score |
| 2 | 1 | 01.pcm | 17:54:27 | 23 | 1006 | PASS |
| 3 | 2 | 02.pcm | 18:03:39 | 45 | 1406 | PASS |
| 4 | 3 | 03.pcm | 18:22:41 | 67 | 1806 | PASS |
| 5 | 4 | 04.pcm | 18:22:57 | 89 | 2206 | PASS |
| 6 | 5 | 05.pcm | 18:23:13 | 23 | 1006 | PASS |
| 7 | 6 | 06.pcm | 18:23:29 | 45 | 1406 | FAIL |
| 8 | 7 | 07.pcm | 18:23:45 | 67 | 1797 | PASS |
| 9 | 8 | 08.pcm | 18:24:01 | 89 | 2326 | PASS |
| 10 | 9 | 09.pcm | 18:16:47 | 4 | 856 | FAIL |
| 11 | 10 | 10.pcm | 18:19:27 | 44 | 1460 | FAIL |
| 12 | 11 | 10.pcm | 18:19:28 | 1 | 401 | PASS |
| 13 | 12 | 11.pcm | 18:21:31 | 67 | 1565 | FAIL |
| 14 | 13 | 12.pcm | 18:24:47 | 89 | 2506 | PASS |
| 15 | 14 | 13.pcm | 18:25:05 | 23 | 1006 | PASS |

Digit Table

| | A | B | C | D | E | F | G | H |
|----|---------|----------|--------|----------|--------|-------|------|-------|
| 1 | DC Seq# | Dig Seq# | File | Time | Offset | Digit | Dur | Score |
| 2 | 1 | 1 | 01.pcm | 17:54:27 | 0 | 2 | 425 | PASS |
| 3 | 1 | 2 | 01.pcm | | 0.425 | 3 | 581 | PASS |
| 4 | 2 | 1 | 02.pcm | 18:03:39 | 0 | 4 | 625 | PASS |
| 5 | 2 | 2 | 02.pcm | | 0.625 | 5 | 781 | PASS |
| 6 | 3 | 1 | 03.pcm | 18:22:41 | 0 | 6 | 825 | PASS |
| 7 | 3 | 2 | 03.pcm | | 0.825 | 7 | 981 | PASS |
| 8 | 4 | 1 | 04.pcm | 18:22:57 | 0 | 8 | 1025 | PASS |
| 9 | 4 | 2 | 04.pcm | | 1.025 | 9 | 1181 | PASS |
| 10 | 5 | 1 | 05.pcm | 18:23:13 | 0 | 2 | 426 | PASS |
| 11 | 5 | 2 | 05.pcm | | 0.426 | 3 | 581 | PASS |
| 12 | 6 | 1 | 06.pcm | 18:23:29 | 0 | 4 | 624 | FAIL |
| 13 | 6 | 2 | 06.pcm | | 0.624 | 5 | 782 | FAIL |
| 14 | 7 | 1 | 07.pcm | 18:23:45 | 0 | 6 | 820 | PASS |
| 15 | 7 | 2 | 07.pcm | | 0.82 | 7 | 977 | PASS |
| 16 | 8 | 1 | 08.pcm | 18:24:01 | 0 | 8 | 1085 | PASS |
| 17 | 8 | 2 | 08.pcm | | 1.085 | 9 | 1241 | PASS |
| 18 | 9 | 1 | 09.pcm | 18:16:47 | 0 | 4 | 856 | FAIL |

Output Result Files

Tone Table

Microsoft Excel - SS1_06172010_190516_ton.csv

File Edit View Insert Format Tools Data Window Help

Type a question for help

Arial 10 B I U

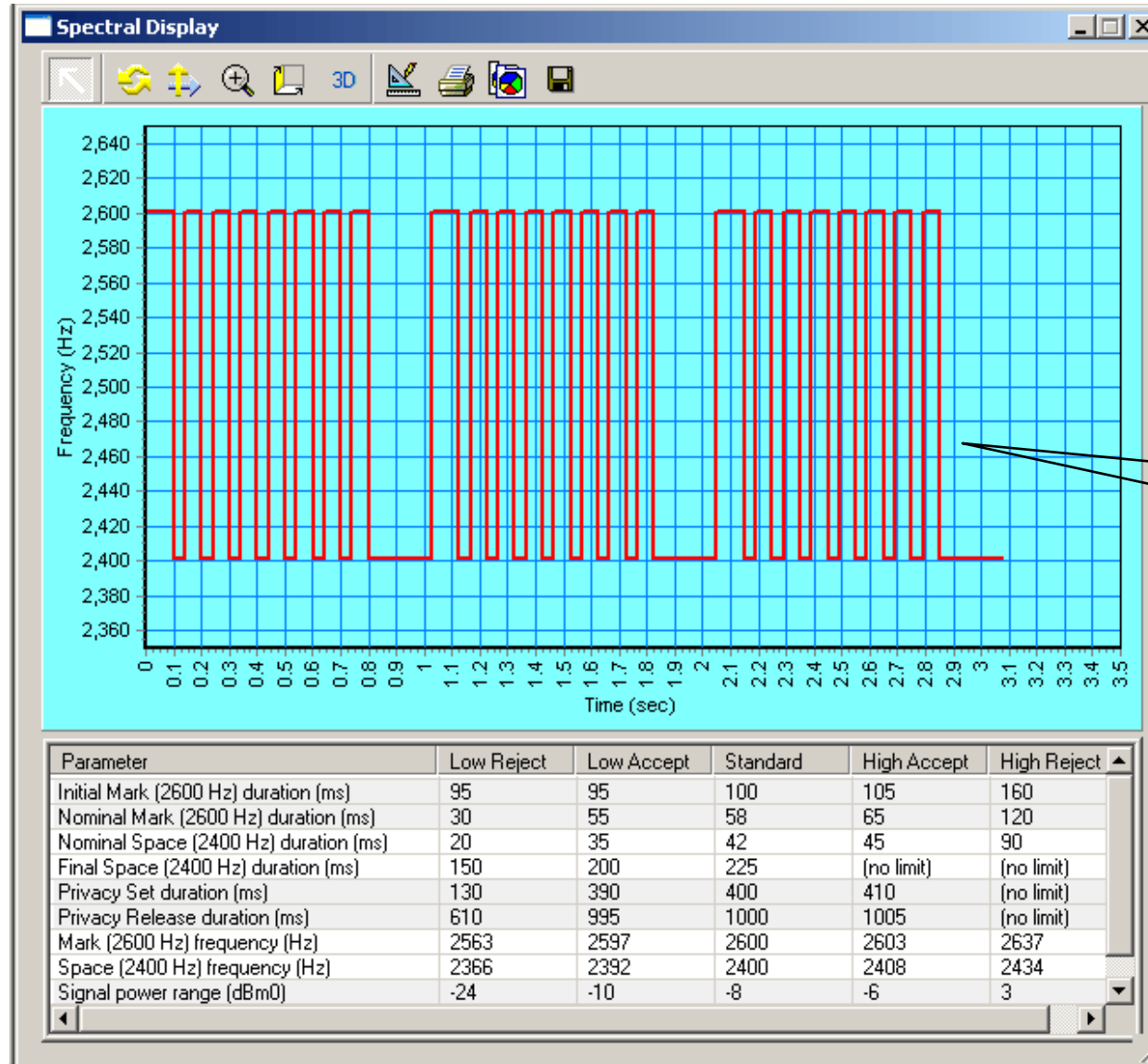
A1 DC Seq#

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q |
|----|---------|----------|----------|--------|----------|--------|----------|------|--------|------|--------|-----|--------|-----|---------|---------|-------|
| 1 | DC Seq# | Dig Seq# | Ton Seq# | File | Time | Offset | ID | Freq | FScore | Pwr | PScore | Dur | DScore | S/N | SNScore | Tot Pwr | Score |
| 2 | 1 | 1 | 1 | 01.pcm | 17:54:27 | 0 | SS1/mark | 2601 | PASS | 3 | PASS | 100 | PASS | 37 | PASS | 3 | PASS |
| 3 | 1 | 1 | 2 | 01.pcm | | 0.1 | SS1/spac | 2401 | PASS | 3.1 | PASS | 41 | PASS | 40 | PASS | 3 | PASS |
| 4 | 1 | 1 | 3 | 01.pcm | | 0.141 | SS1/mark | 2601 | PASS | 3 | PASS | 59 | PASS | 40 | PASS | 3 | PASS |
| 5 | 1 | 1 | 4 | 01.pcm | | 0.201 | SS1/spac | 2401 | PASS | 3 | PASS | 225 | PASS | 40 | PASS | 3 | PASS |
| 6 | 1 | 2 | 1 | 01.pcm | | 0.425 | SS1/mark | 2601 | PASS | 3 | PASS | 100 | PASS | 36 | PASS | 3 | PASS |
| 7 | 1 | 2 | 2 | 01.pcm | | 0.525 | SS1/spac | 2401 | PASS | 3.1 | PASS | 41 | PASS | 28 | PASS | 3 | PASS |
| 8 | 1 | 2 | 3 | 01.pcm | | 0.566 | SS1/mark | 2601 | PASS | 3 | PASS | 59 | PASS | 40 | PASS | 3 | PASS |
| 9 | 1 | 2 | 4 | 01.pcm | | 0.626 | SS1/spac | 2401 | PASS | 3.1 | PASS | 41 | PASS | 40 | PASS | 3 | PASS |
| 10 | 1 | 2 | 5 | 01.pcm | | 0.666 | SS1/mark | 2601 | PASS | 3 | PASS | 60 | PASS | 40 | PASS | 3 | PASS |
| 11 | 1 | 2 | 6 | 01.pcm | | 0.726 | Idle | | | -100 | | 280 | PASS | | | -100 | PASS |
| 12 | 2 | 1 | 1 | 02.pcm | 18:03:39 | 0 | SS1/mark | 2601 | PASS | 3 | PASS | 100 | PASS | 37 | PASS | 3 | PASS |
| 13 | 2 | 1 | 2 | 02.pcm | | 0.1 | SS1/spac | 2401 | PASS | 3.1 | PASS | 41 | PASS | 40 | PASS | 3 | PASS |
| 14 | 2 | 1 | 3 | 02.pcm | | 0.141 | SS1/mark | 2601 | PASS | 3 | PASS | 59 | PASS | 40 | PASS | 3 | PASS |
| 15 | 2 | 1 | 4 | 02.pcm | | 0.201 | SS1/spac | 2401 | PASS | 3.1 | PASS | 41 | PASS | 40 | PASS | 3 | PASS |
| 16 | 2 | 1 | 5 | 02.pcm | | 0.241 | SS1/mark | 2601 | PASS | 3 | PASS | 59 | PASS | 40 | PASS | 3 | PASS |
| 17 | 2 | 1 | 6 | 02.pcm | | 0.301 | SS1/spac | 2401 | PASS | 3.1 | PASS | 41 | PASS | 40 | PASS | 3 | PASS |
| 18 | 2 | 1 | 7 | 02.pcm | | 0.341 | SS1/mark | 2601 | PASS | 3 | PASS | 59 | PASS | 40 | PASS | 3 | PASS |
| 19 | 2 | 1 | 8 | 02.pcm | | 0.401 | SS1/spac | 2401 | PASS | 3 | PASS | 225 | PASS | 40 | PASS | 3 | PASS |
| 20 | 2 | 2 | 1 | 02.pcm | | 0.625 | SS1/mark | 2601 | PASS | 3 | PASS | 100 | PASS | 37 | PASS | 3 | PASS |
| 21 | 2 | 2 | 2 | 02.pcm | | 0.725 | SS1/spac | 2401 | PASS | 3.1 | PASS | 41 | PASS | 40 | PASS | 3 | PASS |
| 22 | 2 | 2 | 3 | 02.pcm | | 0.766 | SS1/mark | 2601 | PASS | 3 | PASS | 59 | PASS | 40 | PASS | 3 | PASS |
| 23 | 2 | 2 | 4 | 02.pcm | | 0.826 | SS1/spac | 2401 | PASS | 3.1 | PASS | 41 | PASS | 40 | PASS | 3 | PASS |
| 24 | 2 | 2 | 5 | 02.pcm | | 0.866 | SS1/mark | 2601 | PASS | 3 | PASS | 59 | PASS | 40 | PASS | 3 | PASS |
| 25 | 2 | 2 | 6 | 02.pcm | | 0.926 | SS1/spac | 2401 | PASS | 3.1 | PASS | 41 | PASS | 40 | PASS | 3 | PASS |
| 26 | 2 | 2 | 7 | 02.pcm | | 0.966 | SS1/mark | 2601 | PASS | 3 | PASS | 59 | PASS | 40 | PASS | 3 | PASS |
| 27 | 2 | 2 | 8 | 02.pcm | | 1.026 | SS1/spac | 2401 | PASS | 3.1 | PASS | 41 | PASS | 40 | PASS | 3 | PASS |
| 28 | 2 | 2 | 9 | 02.pcm | | 1.066 | SS1/mark | 2601 | PASS | 3 | PASS | 60 | PASS | 40 | PASS | 3 | PASS |
| 29 | 2 | 2 | 10 | 02.pcm | | 1.126 | Idle | | | -100 | | 280 | PASS | | | -100 | PASS |
| 30 | 3 | 1 | 1 | 03.pcm | 18:22:41 | 0 | SS1/mark | 2601 | PASS | 3 | PASS | 100 | PASS | 37 | PASS | 3 | PASS |
| 31 | 3 | 1 | 2 | 03.pcm | | 0.1 | SS1/spac | 2401 | PASS | 3.1 | PASS | 41 | PASS | 40 | PASS | 3 | PASS |

SS1_06172010_190516_ton/

Ready

Spectral Display



Graphical Waveform
of the Dial Code

Tone
Parameters

Review Dial Code Details

| Seq# | Time | DC | Dur | Digit | Dur | Tone | Dur | Freq | Power | Tot Pwr | S/N | Comments |
|----------|----------|-----|------|-------|------|-----------|-----|------|-------|---------|-----|----------|
| ✓ 4 | 16:08:04 | 888 | 1027 | | | | | | | | | |
| ✓ 4-1 | +0.000 | | | 8 | 1025 | | | | | | | |
| ✓ 4-1-01 | +0.000 | | | | | SS1/mark | 100 | 2601 | -8.0 | -8.0 | 30 | |
| ✓ 4-1-02 | +0.100 | | | | | SS1/space | 41 | 2401 | -7.9 | -7.9 | 23 | |
| ✓ 4-1-03 | +0.141 | | | | | SS1/mark | 59 | 2601 | -8.0 | -8.0 | 40 | |
| ✓ 4-1-04 | +0.201 | | | | | SS1/space | 41 | 2401 | -7.9 | -7.9 | 24 | |
| ✓ 4-1-05 | +0.241 | | | | | SS1/mark | 59 | 2601 | -8.0 | -8.0 | 40 | |
| ✓ 4-1-06 | +0.301 | | | | | SS1/space | 41 | 2401 | -7.9 | -7.9 | 23 | |
| ✓ 4-1-07 | +0.341 | | | | | SS1/mark | 59 | 2601 | -8.0 | -8.0 | 40 | |
| ✓ 4-1-08 | +0.401 | | | | | SS1/space | 41 | 2401 | -7.9 | -7.9 | 24 | |
| ✓ 4-1-09 | +0.441 | | | | | SS1/mark | 59 | 2601 | -8.0 | -8.0 | 40 | |
| ✓ 4-1-10 | +0.501 | | | | | SS1/space | 41 | 2401 | -7.9 | -7.9 | 23 | |
| ✓ 4-1-11 | +0.541 | | | | | SS1/mark | 59 | 2601 | -8.0 | -8.0 | 40 | |
| ✓ 4-1-12 | +0.601 | | | | | SS1/space | 41 | 2401 | -7.9 | -7.9 | 24 | |
| ✓ 4-1-13 | +0.641 | | | | | SS1/mark | 59 | 2601 | -8.0 | -8.0 | 40 | |
| ✓ 4-1-14 | +0.701 | | | | | SS1/space | 41 | 2401 | -7.9 | -7.9 | 23 | |
| ✓ 4-1-15 | +0.741 | | | | | SS1/mark | 59 | 2601 | -8.0 | -8.0 | 40 | |
| ✓ 4-1-16 | +0.801 | | | | | SS1/space | 224 | 2401 | -8.0 | -8.0 | 28 | |
| ✓ 4-2 | +1.025 | | | 8 | 1025 | | | | | | | |
| ✓ 4-2-01 | +1.025 | | | | | SS1/mark | 100 | 2601 | -8.0 | -8.0 | 34 | |
| ✓ 4-2-02 | +1.125 | | | | | SS1/space | 41 | 2401 | -7.9 | -7.9 | 25 | |
| ✓ 4-2-03 | +1.166 | | | | | SS1/mark | 59 | 2601 | -8.0 | -8.0 | 40 | |
| ✓ 4-2-04 | +1.226 | | | | | SS1/space | 41 | 2401 | -7.9 | -7.9 | 30 | |
| ✓ 4-2-05 | +1.266 | | | | | SS1/mark | 59 | 2601 | -8.0 | -8.0 | 40 | |
| ✓ 4-2-06 | +1.326 | | | | | SS1/space | 41 | 2401 | -7.9 | -7.9 | 25 | |
| ✓ 4-2-07 | +1.366 | | | | | SS1/mark | 59 | 2601 | -8.0 | -8.0 | 40 | |
| ✓ 4-2-08 | +1.426 | | | | | SS1/space | 41 | 2401 | -7.9 | -7.9 | 30 | |

| Parameter | Low Reject | Low Accept | Standard | High Accept | High Reject |
|---------------------------------------|------------|------------|----------|-------------|-------------|
| Initial Mark (2600 Hz) duration (ms) | 95 | 95 | 100 | 105 | 160 |
| Nominal Mark (2600 Hz) duration (ms) | 30 | 55 | 58 | 65 | 120 |
| Nominal Space (2400 Hz) duration (ms) | 20 | 35 | 42 | 45 | 90 |
| Final Space (2400 Hz) duration (ms) | 150 | 200 | 225 | (no limit) | (no limit) |
| Privacy Set duration (ms) | 130 | 390 | 400 | 410 | (no limit) |
| Privacy Release duration (ms) | 610 | 995 | 1000 | 1005 | (no limit) |
| Mark (2600 Hz) frequency (Hz) | 2563 | 2597 | 2600 | 2603 | 2637 |
| Space (2400 Hz) frequency (Hz) | 2366 | 2392 | 2400 | 2408 | 2434 |
| Signal power range (dBm0) | -24 | -10 | -8 | -6 | 3 |
| Signal to Noise Ratio (dB) | 0 | 0 | 10 | (no limit) | (no limit) |

Review Dial Code

Tone Parameters

Dual VF Tx Rx

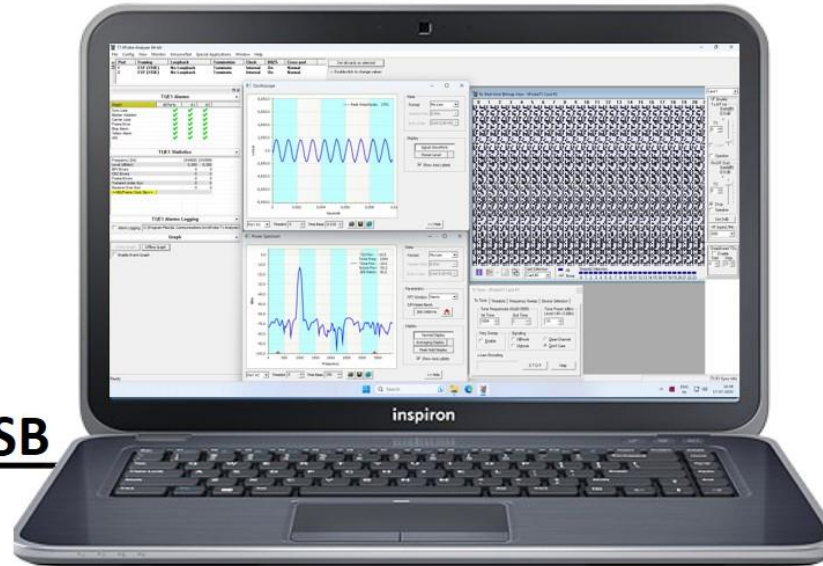
Dual VF Tx Rx

- Bantam Interface Connectivity for VF- Inputs and VF- Outputs
- Support two VF interfaces per card
- Each VF interface supports independent Tx/Rx
- Multiple cards supported per system
- Mode 1: VF1 (Tx/Rx) and VF2 (Tx/Rx)
- Mode 2: VF Tx and VF Rx

tProbe™ T1 E1 Analyzer



USB



Dual VF Tx Rx GUI

The screenshot displays the 'Dual VF Tx/Rx' software interface. At the top, there is a menu bar (File, View, Actions, Windows, Help) and a toolbar with icons for About, Configure, VF1/VF2, VF Tx/Rx, Analyzer, Dialer, GoldWave, Help, and Exit. A 'Site Name' field is set to 'Site1'.

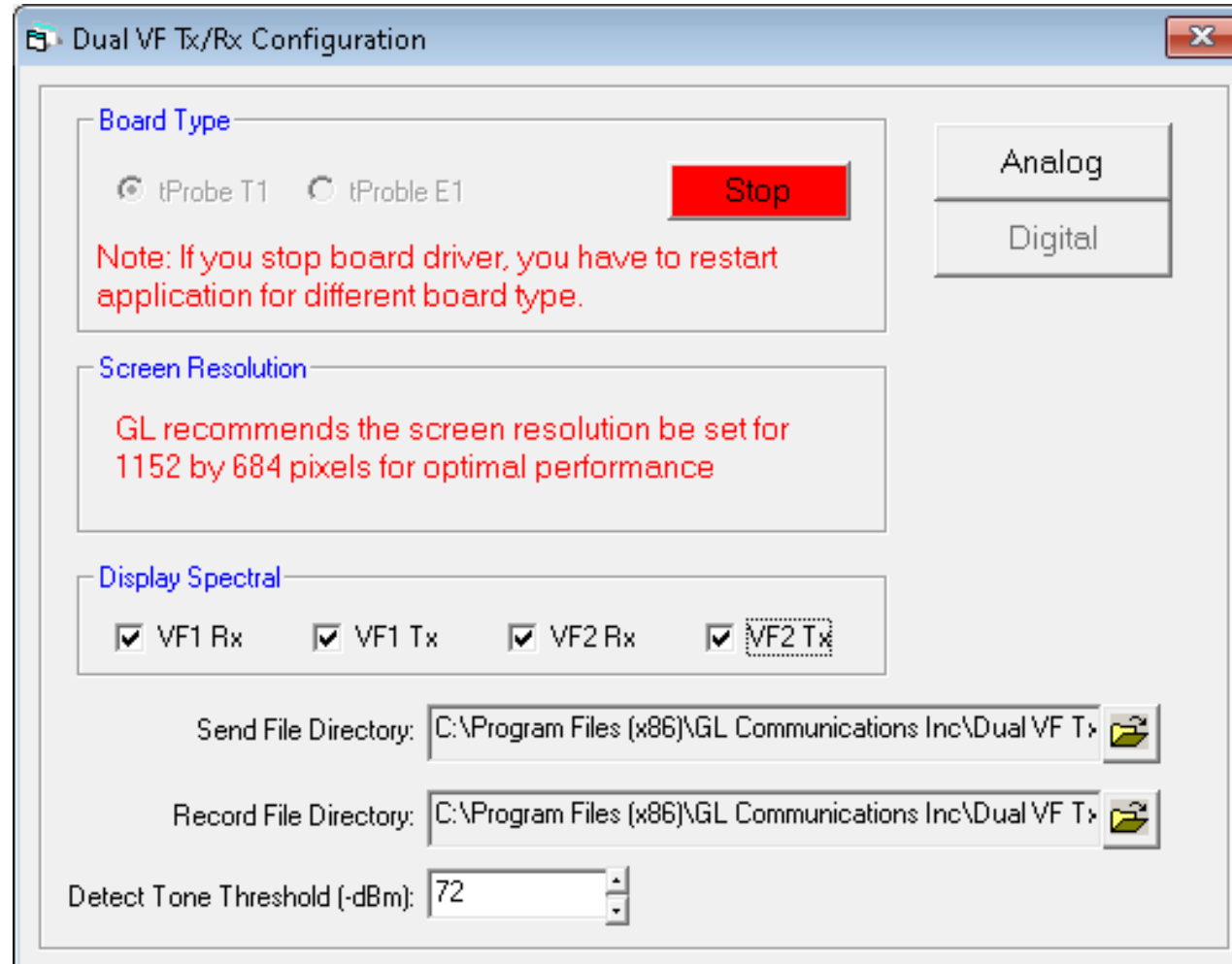
The interface is divided into four main quadrants, each representing a channel:

- VF2 In (Rx):** Shows a spectrum plot with a red signal line. Controls include 'Recorder: Start', 'Tx File', 'Rx Signal', 'Tx Tone', 'Rx Record', and 'Tx Digits' checkboxes.
- VF2 Out (Tx):** Shows a spectrum plot with a red signal line. Controls include 'Tx Tone', 'Tx Digits', and 'Tx File' tabs. The 'Tx Tone' section has fields for 'Tone1' (Freq: 1004 Hz, Power: -10 dBm) and 'Tone2' (Freq: 0 Hz, Power: -10 dBm). It also includes a 'Start' button, a list of frequencies (201Hz, 402Hz, 803Hz, 1004Hz, 2505Hz), and 'On Time' (1 sec) and 'Off Time' (0 sec) settings.
- VF1 In (Rx):** Shows a spectrum plot with a blue signal line. Controls include 'Recorder: Start', 'Tx File', 'Rx Signal', 'Tx Tone', 'Rx Record', and 'Tx Digits' checkboxes.
- VF1 Out (Tx):** Shows a spectrum plot with a blue signal line. Controls include 'Tx Tone', 'Tx Digits', and 'Tx File' tabs. The 'Tx Tone' section has fields for 'Tone1' (Freq: 1004 Hz, Power: -10 dBm) and 'Tone2' (Freq: 0 Hz, Power: -10 dBm). It also includes a 'Start' button, a list of frequencies (201Hz, 402Hz, 803Hz, 1004Hz, 2505Hz), and 'On Time' (1 sec) and 'Off Time' (0 sec) settings.

At the bottom of the window, there are status indicators: 'Board driver started', 'Analog Configured', the date '12/12/2013', and the time '6:44 PM'.

Analog Interface Configuration

- Board Type option allows Dual VF Tx Rx application to automatically connect to the T1 E1 devices when invoked, displaying the board in use
- Audio traffic and files can be saved to the directory used for transmit and receive traffic. The tone threshold value for Tone detection can be set up to 80 dBm



VF Tx/Rx Actions

The image shows two software windows side-by-side. The left window is titled 'VF2 Out (Tx)' and has three tabs: 'Tx Tone', 'Tx Digits', and 'Tx File'. The 'Tx Tone' tab is active and shows settings for two tones. Tone1 is set to 2505 Hz with a power of -10 dBm. Tone2 is set to 0 Hz with a power of -10 dBm. There is a green 'Stop' button. Below the tone settings are buttons for 201Hz, 402Hz, 803Hz, 1004Hz, and 2505Hz. The 'Tones Duration' section has a checked box for 'Continuous Tx Tone', with 'On Time (sec)' set to 1 and 'Off Time (sec)' set to 0. The 'Frequency Sweep (Tone1 only, Tone2 = 0Hz)' section has an unchecked 'Enable' box, with 'Stop Freq (Hz)' set to 4000, 'Step Freq (Hz)' set to 100, 'On Time (sec)' set to 1, and 'Off Time (sec)' set to 1.

The right window is titled 'VF1 In (Rx)' and has three tabs: 'Rx Tone', 'Rx Digits', and 'Rx File'. The 'Rx Tone' tab is active and shows a table of detected tones. The table has two columns: 'Freq (Hz)' and 'Power (dBm)'. The first row shows 'Tone1: 2506' and 'Power (dBm): -9.90'. The second row shows 'Tone2: Idle'. Below the table is a 'Detected Tones:' section with a 'Clear' button. A table lists detected tones with columns for 'Timestamp' and 'Detected Tones'. The table contains six rows of data. At the bottom, there is a section 'Capture Detected Tones Event to file:' with a green 'On' button and a text field containing 'C:\Users\GLIN147\Desktop\test.txt'.

| Timestamp | Detected Tones |
|---------------------|--|
| 24-06-2020 15:19:29 | T1 (202 Hz, -11.6 dBm) T2 (604 Hz, -46.1 d |
| 24-06-2020 15:19:39 | T1 (202 Hz, -11.6 dBm) T2 (604 Hz, -46.0 d |
| 24-06-2020 15:19:50 | T1 (403 Hz, -10.6 dBm) T2 (1206 Hz, -51.4 |
| 24-06-2020 15:20:18 | T1 (804 Hz, -10.2 dBm) T2 (2409 Hz, -58.1 |
| 24-06-2020 15:20:49 | T1 (1005 Hz, -10.1 dBm) T2 (1263 Hz, -56.8 |
| 24-06-2020 15:21:24 | T1 (2507 Hz, -9.9 dBm) T2 (2017 Hz, -60.4 |

- In VF Tx /Rx operational mode, Tx/Rx functions are supported on a single VF port (either VF1 or VF2)
- Sending and receiving traffic functions such as Tones, Digits, and Files are possible

VF1 and VF2 (Tx / Rx) Actions

- In VF1/VF2 operational mode for each VF interface supports independent Tx/Rx between VF1 (Tx/Rx) and VF2 (Tx/Rx) simultaneously
- The transmit actions on one VF port will be received on another VF port
- The sending and receiving traffic functions such as Tones, Digits, and Files are possible
- The VF Tx/Rx Tones, Digits, and Files status and the spectral can be viewed for sending VF ports in the VF Status and Spectral Display

The image shows two software windows side-by-side. The left window is titled 'VF2 Out (Tx)' and has tabs for 'Tx Tone', 'Tx Digits', 'Tx File', 'Rx Tone', 'Rx Digits', and 'Rx File'. The 'Tx Tone' tab is active and highlighted with a red box. It displays settings for two tones: Tone1 (2505 Hz, 10 dBm) and Tone2 (0 Hz, 10 dBm). There is a 'Stop' button and a list of frequency options (201Hz, 402Hz, 803Hz, 1004Hz, 2505Hz). Below, there are 'Tones Duration' settings with 'Continuous Tx Tone' checked, and 'On Time (sec): 1' and 'Off Time (sec): 0'. At the bottom, there are 'Frequency Sweep' settings with 'Enable' unchecked, 'Stop Freq (Hz): 4000', 'Step Freq (Hz): 100', 'On Time (sec): 1', and 'Off Time (sec): 1'.

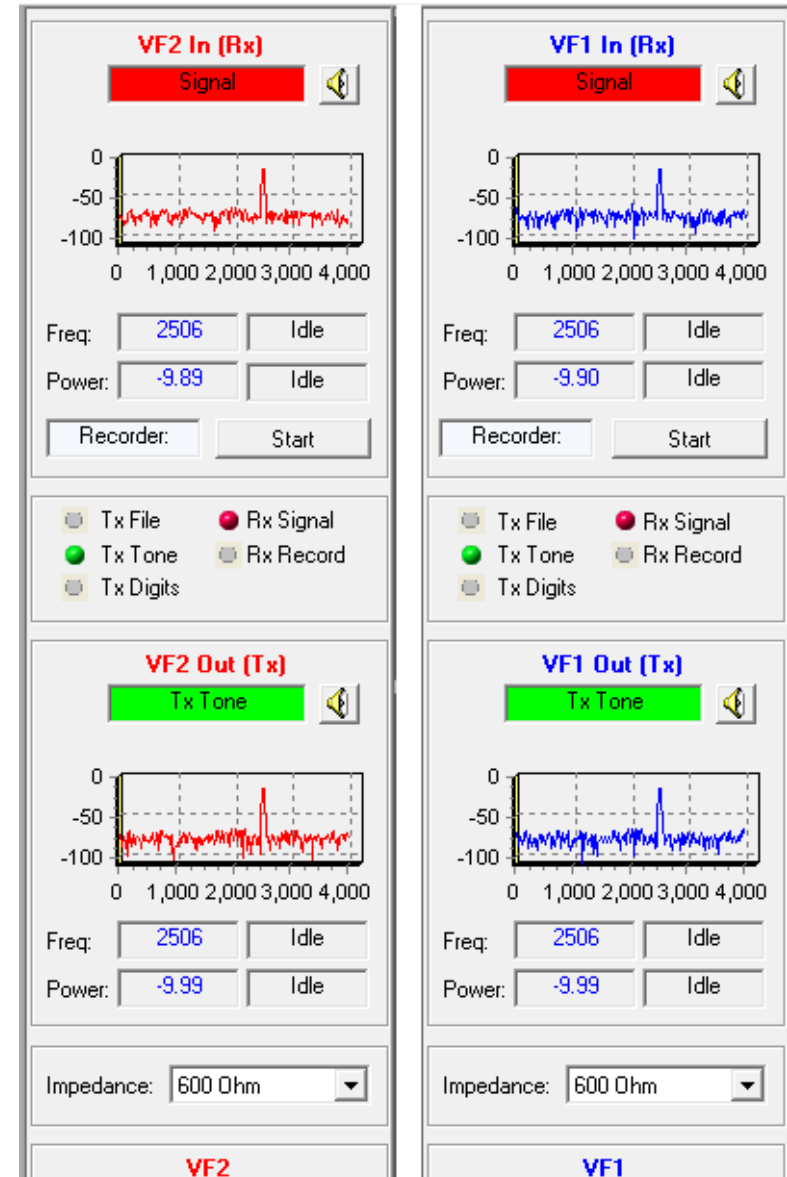
The right window is titled 'VF1 Out (Tx)' and has tabs for 'Tx Tone', 'Tx Digits', 'Tx File', 'Rx Tone', 'Rx Digits', and 'Rx File'. The 'Rx Tone' tab is active and highlighted with a red box. It displays 'Tone1: 2506 Hz, -9.90 dBm' and 'Tone2: Idle'. Below is a 'Detected Tones' section with a 'Clear' button and a table:

| Timestamp | Detected Tones |
|---------------------|--|
| 24-06-2020 15:43:29 | T1 (202 Hz, -11.6 dBm) T2 (604 Hz, -46.1 d |
| 24-06-2020 15:43:40 | T1 (403 Hz, -10.6 dBm) T2 (1206 Hz, -51.5 |
| 24-06-2020 15:43:53 | T1 (804 Hz, -10.2 dBm); 9500.0 msec |
| 24-06-2020 15:44:09 | T1 (1005 Hz, -10.1 dBm) T2 (1263 Hz, -56.9 |
| 24-06-2020 15:44:22 | T1 (2507 Hz, -9.9 dBm); 7499.3 msec |

At the bottom of the right window, there is a 'Capture Detected Tones Event to file:' section with a green 'On' button and a file path: 'C:\Users\GLIN147\Desktop\test.txt'.

VF Status and Spectral Display

- The Side panels display
 - Tx/Rx status for the tone, digits, voice transmitted/received on any particular VF port
 - Frequency, Power count status of the VF In and Out
 - Data transmitted or received on a specified VF port graphically (spectral Power (dBm) Vs Frequency (Hz))
 - Sending/Receiving Speakers for Tx/Rx ports
 - Multiple impedance options for audio In and Out ports



Dual VF Tx Rx with SS1/SS4 Dialer

The screenshot displays the 'Dual VF Tx/Rx' software interface. The main window has a menu bar (File, View, Actions, Windows, Help) and a toolbar with icons for About, Configure, VF1/VF2, VF Tx/Rx, Analyzer, **SS1 Dialer** (highlighted with a red box), GoldWave, Help, and Exit. The Site Name is set to 'Site1'.

The central 'SS1 Dialer #1:1 (Audio)' window is open, showing a list of dialing events:

- 16:15:44 '2468' TS=#1:1 dur=2900
 - +0.000 '2' TS=#1:1 dur=425
 - +0.425 '4' TS=#1:1 dur=625
 - +1.050 '6' TS=#1:1 dur=825
 - +1.875 '8' TS=#1:1 dur=1025

The dialer includes a numeric keypad (1-9, *, 0, #), 'Clear' and 'Send' buttons, and a 'Dial Mode' dropdown set to 'Key & Send'. Below the keypad are 'Run', 'Step', 'Load', and 'Save' buttons. There are also 'Clear Display' and 'Clear Selection' buttons.

Configuration parameters for Mark, Space, Power, and Tx Channel are visible:

- Mark:** Frequency: 2600 Hz, Initial Duration: 100 ms, Nominal Duration: 58 ms
- Space:** Frequency: 2400 Hz, Nominal Duration: 42 ms, Final Duration: 225 ms
- Power:** -8 dBm
- Tx Channel:** Port #1, Timeslot 1, VF Audio checked

Buttons for 'Save Setup' and 'Load Setup' are present. The status bar at the bottom shows 'Board driver started', 'Analog Configured', '24-06-2020', and '16:19'.

Dual VF Tx Rx with SS1/SS4 Analyzer

Dual VF Tx/Rx

File View Actions Windows Help

GL About Configure VF1/VF2 VF Tx/Rx **SS1 Analyzer** SS1 Dialer GoldWave Help Exit Site Name: Site1

VF2 In (Rx)

Idle

0 -50 -100

0 1,000 2,000 3,000 4,000

Freq: Idle Idle

Power: Idle Idle

Recorder: Start

Tx File Rx Signal
Tx Tone Rx Record
Tx Digits

VF2 Out (Tx)

Idle

0 -50 -100

0 1,000 2,000 3,000 4,000

Freq: 596 Idle

Power: -71.73 Idle

Impedance: 600 Ohm

VF2

SS1 Analyzer - #2:1 (Audio)

Configure View Connect Run Results Help

Setup Load Save Connect Disconnect View WCS Run Stop Real-Time From File Clear Help

| Seq# | Channel | Time | ID | Freq | Power | Durati... | Tot Pwr | S/N | Comments |
|--------------------|---------|----------|-----------|------|-------|-----------|---------|-----|----------|
| 16:15:46 '68' | #2:1 | dur=1850 | | | | | | | |
| 16:15:45 '24' | #2:1 | dur=1050 | | | | | | | |
| +0.000 '2' | #2:1 | dur=425 | | | | | | | |
| +0.000 'SS1/mark' | #2:1 | dur=100 | SS1/mark | 2601 | -8.1 | 100 | -8.0 | 16 | |
| +0.100 'SS1/space' | #2:1 | dur=41 | SS1/space | 2401 | -8.0 | 41 | -7.8 | 15 | |
| +0.141 'SS1/mark' | #2:1 | dur=60 | SS1/mark | 2601 | -8.0 | 60 | -8.0 | 28 | |
| +0.201 'SS1/space' | #2:1 | dur=224 | SS1/space | 2401 | -7.8 | 41 | -7.8 | 24 | |
| +0.201 'SS1/space' | #2:1 | dur=224 | SS1/space | 2401 | -8.0 | 41 | -7.8 | 15 | |
| +0.301 'SS1/space' | #2:1 | dur=224 | SS1/space | 2401 | -8.0 | 41 | -7.8 | 15 | |
| +0.341 'SS1/mark' | #2:1 | dur=60 | SS1/mark | 2601 | -8.0 | 60 | -8.0 | 27 | |
| +0.401 'SS1/space' | #2:1 | dur=24 | SS1/space | 2401 | -7.8 | 41 | -7.8 | 24 | |
| +0.425 '4' | #2:1 | dur=625 | | | | | | | |
| +0.425 'SS1/mark' | #2:1 | dur=100 | SS1/mark | 2601 | -8.0 | 60 | -8.0 | 17 | |
| +0.525 'SS1/space' | #2:1 | dur=41 | SS1/space | 2401 | -8.0 | 41 | -7.8 | 15 | |
| +0.566 'SS1/mark' | #2:1 | dur=60 | SS1/mark | 2601 | -8.0 | 60 | -8.0 | 28 | |
| +0.626 'SS1/space' | #2:1 | dur=41 | SS1/space | 2401 | -7.9 | 224 | -7.9 | 28 | |
| +0.666 'SS1/mark' | #2:1 | dur=60 | SS1/mark | 2601 | -8.0 | 41 | -7.8 | 20 | |
| +0.726 'SS1/space' | #2:1 | dur=41 | SS1/space | 2401 | -7.9 | 41 | -7.8 | 20 | |
| +0.766 'SS1/mark' | #2:1 | dur=60 | SS1/mark | 2601 | -8.4 | 59 | -8.0 | 10 | |
| +0.826 'SS1/space' | #2:1 | dur=224 | SS1/space | 2401 | -8.5 | 41 | -7.8 | 8 | |
| +1.066 'SS1/mark' | #2:1 | dur=60 | SS1/mark | 2601 | -8.0 | 60 | -8.0 | 20 | |
| +1.126 'SS1/space' | #2:1 | dur=41 | SS1/space | 2401 | -7.9 | 41 | -7.8 | 20 | |
| +1.166 'SS1/mark' | #2:1 | dur=59 | SS1/mark | 2601 | -8.4 | 59 | -8.0 | 10 | |

Monitoring in Progress Not Saving 06/24/20 04:16:48 PM

VF1 In (Rx)

Signal

0 -50 -100

0 1,000 2,000 3,000 4,000

Freq: 596 Idle

Power: -65.13 Idle

Recorder: Start

Tx File Rx Signal
Tx Tone Rx Record
Tx Digits

VF1 Out (Tx)

Idle

0 -50 -100

0 1,000 2,000 3,000 4,000

Freq: Idle Idle

Power: Idle Idle

Impedance: 600 Ohm

VF1

Board driver started Analog Configured 24-06-2020 16:16

Goldwave Capabilities

- Dual VF Tx Rx includes Goldwave capabilities to view and analyze send and receive audio files
- Any chosen mono and stereo files that have been recorded can be viewed, heard, and analyzed using Goldwave

The screenshot displays the 'Dual VF Tx/Rx' software interface. The main window is titled 'GoldWave' and shows an audio waveform for the file 'VF1_Site1_06102020_121919.pcm'. The waveform is displayed on a grid with a time axis from 0:00 to 0:16 and a vertical axis from -0.5 to 1.0. The audio signal is shown in green. The interface includes a menu bar (File, Edit, Effect, View, Tool, Options, Window, Help) and a toolbar with various editing and playback functions. A digital display shows '00:00:00.0'. The interface is divided into four quadrants for monitoring: 'VF2 In (Rx)', 'VF2 Out (Tx)', 'VF1 In (Rx)', and 'VF1 Out (Tx)'. Each quadrant has a small waveform display and control buttons for frequency and power. The 'VF1 In (Rx)' quadrant shows a frequency of 596 and power of -65.07. The 'VF2 Out (Tx)' quadrant shows a frequency of 596 and power of -71.48. The bottom status bar indicates 'Board driver started', 'Analog Configured', '24-06-2020', and '16:19'. A watermark 'GL Communications' is visible in the bottom left corner.

Thank you