New Features

CAS2200 vrs 1.31

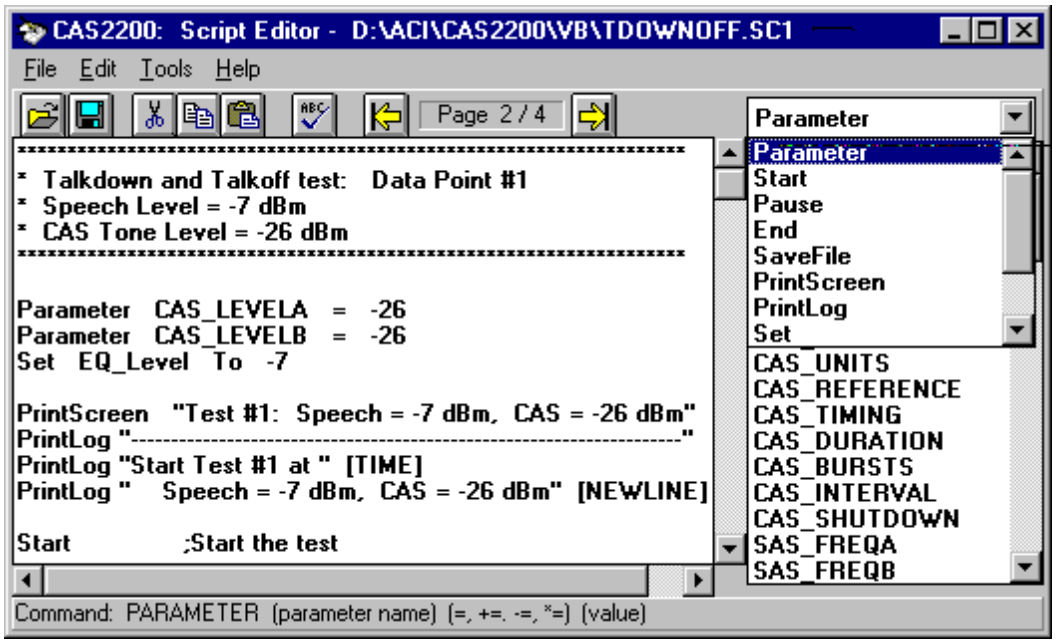
CAS Detector Test Software

1) Scripting Language Support

The new scripting language capability gives the user a method to automate complex or lengthy test procedures. A script program is composed from a series of commands that can modify, change, and control various aspects of how the CAS detector is tested. Since these tests are generally very long in length and quite repetitive, they lend themselves to automation via a scripting language.

Script programs can be composed with the built in editor or any other ASCII text editor and loaded into the built in script editor for execution. Once a script program has been created or loaded from a file off the disk, selecting the [SCRIPTING] [RUN SCRIPT PROGRAM] menu command will start the execution of the script program.

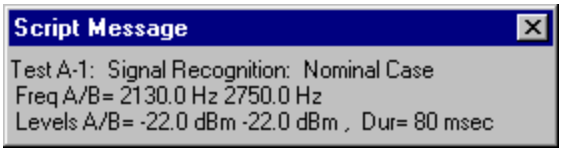
The built in script editor contains some features to simplify the composing of script programs. This includes a script command builder, which minimizes the requirements of remembering the syntax of the scripting commands. Also, the script editor includes a syntax checker that can be used to verify that the syntax is what the script interpreter expects to see. This is very useful, since it can be quite troublesome to have the script interpreter flag a syntax error in the middle of an extremely long test.



The previous figure shows and example of the script editor. To display the editor from the main program window, select the [VIEW] [SCRIPT LANGUAGE EDITOR] option from the menu, or just simply press the F2 key. The editor contains a small set of menu commands, toolbar of commonly used functions, text area for composing the script program, command builder controls at the right of the window, and a hint line at the bottom.

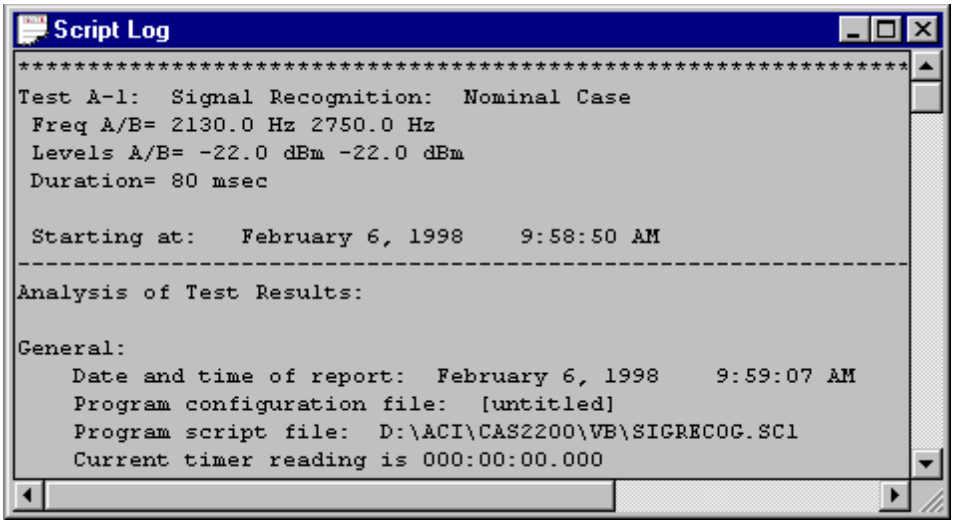
Script Message Screen and Log File

The script program has the capability to display various messages to the user operating the program. This is useful for explaining what function the script program is performing along with various results of the tests. The messages are generated by the PRINTSCREEN command and produce a window displayed in the center of the screen with the desired message. In the following example, at the beginning of each sub-test, the PRINTSCREEN command is used to display what sub-test is being executed and the parameter settings for the CAS tone.



The script messages can be cleared from the screen with the CLEAR command, and automatically disappear when the script program ends.

For recording the analysis and conditions of various tests, the script log is more powerfull than the message window. The script log is a text buffer which is limited in size only by the amount of free hard drive space. As script program executes, the results and status of the various tests can be sent to the log window by using the PRINTLOG command.



The PRINTLOG command has the same format and capabilites as the PRINTSCREEN command, with the only difference that the output is sent to the log file. At the end of all the tests, the SAVEFILE command can be used to save the contents of the script log to a file.

Selecting the [VIEW] [SCRIPT PROGRAM LOG] from the menu displays the log file. However, if the size of the script log exceeds 32 kbytes, only the last 32 kbytes is displayed. This does not effect the SAVEFILE command, which saves the log file in its entirity. The CLEAR command should be used to clear the script log at the beginning of the script program; otherwise, the log file can progressively grow to an extremely large size as successive script program are executed. The script log can be manually cleared by selecting the [SCRIPTING] [CLEAR SCRIPT LOG] menu command.

Script Commands

START	Starts timer in order to perform a single test
PAUSE	Suspends operation of the script program
END	Ends operation of the script program

PARAMETER	Changes any of the program settings
SAVEFILE	Saves either the program configuration or script log
PRINTSCREEN	Displays a text string on the screen for user prompting
PRINTLOG	Writes a text string to the log file
WAIT	Suspends the script program for a specified time
SET	Used to set relative equalizer levels
CLEAR	Used to clear various program objects
RECORD	Used to record various test results
CAV2	Controls a CD player via Sony's CAV-2 interface

For more detailed explanations and syntax structures for each command, refer to the on-line help file included with the CAS2200 program (version 1.31).

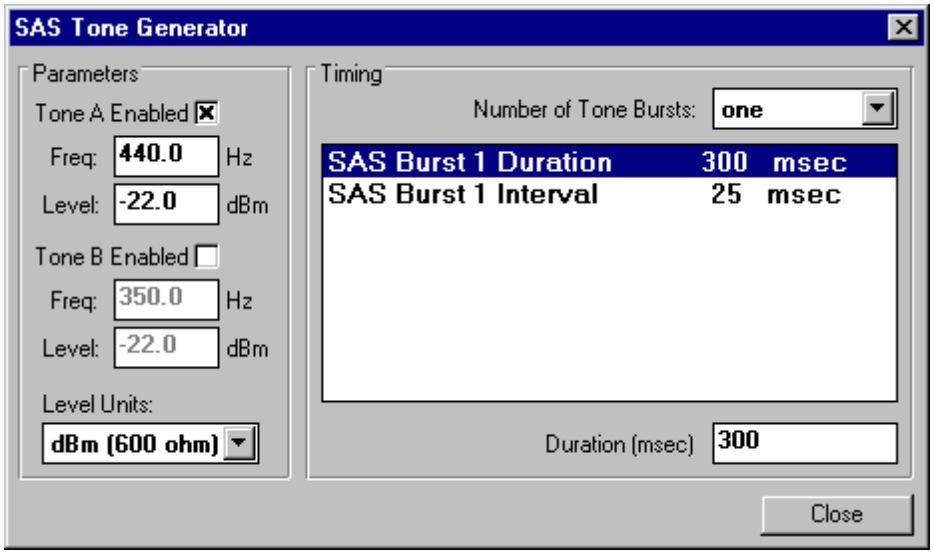
2) Controlling Sony CD Changers

The CAV-2 is a product from Sony that allows a PC to control the operation of CD players and other consumer audio/video products. By using the CAV2 script command, the script program can control the operation of Sony CD changers via the CAV-2. This helps to automate talkoff and talkdown testing when using the Bellcore speech material CD's in conjunction with a Sony CD changer such as the CDP-CX255. The script programs are able to control which disk is played by the CD changer, as well as other basic CD functions like pause, stop, next track, and previous track.

The CAV-2 connects to the PC via a serial port. Sending command data to the CAV-2 causes it to re-interpret and pass on those commands to the CD player in one of two methods. The first is via its built in IR emitter. In this mode, the CAV-2 emulates the IR remote control for the CD player. The second method is via a hardwire link known as Control A1. In this case the CAV-2 is directly connected to the CD player, which eliminates any potential IR interference issues. In conjunction with the two communication methods, two different command sets can be used. These are termed CD1 and CD2. Some products will operated with a fixed command set, while others will have a control allowing the user to select between CD1 and CD2. The FORMAT scripting keyword is used to define the communications method and command set.

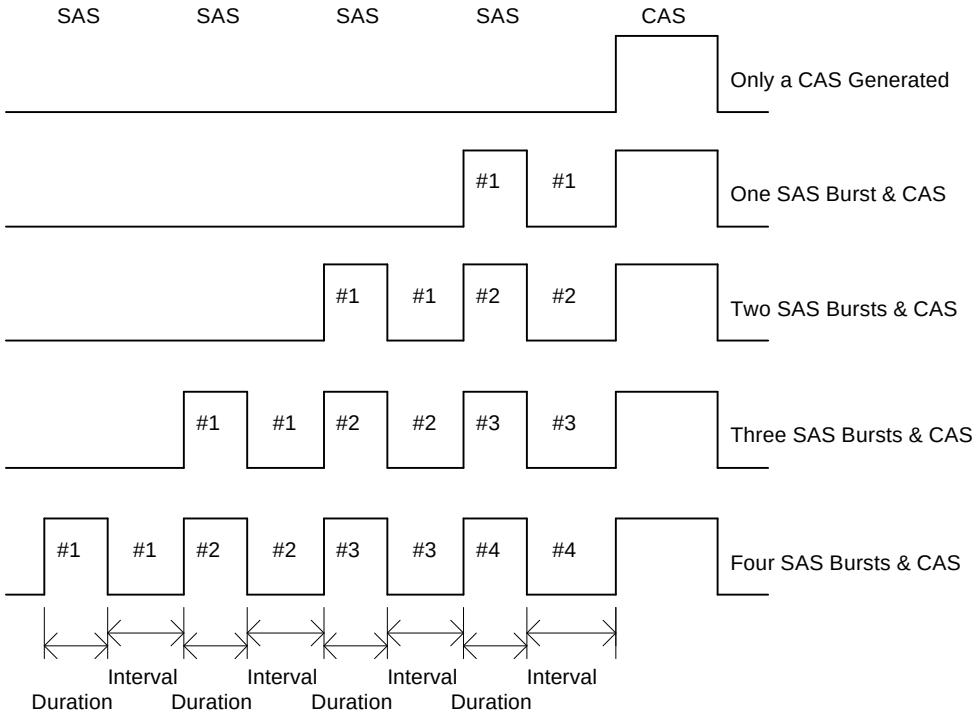
3) SAS Tone Generation

A programmable Subscriber Alerting Signal (SAS) can now be generated in conjunction with the CAS tone. The SAS tone is normally a 440 Hz tone that lasts for approximately 300 msec; however in some circumstances, it may be broken up into a series of tone bursts. The SAS tone will always precede the CAS tone by some time interval. The frequencies, levels, and timing parameters can all be changed over a wide range in order to properly simulate every possible SAS and CAS tone pattern. All of the SAS tone parameters can be changed by selecting the [SETTINGS] [SAS TONE GENERATOR] command from the menu. This displays the following window, from which changes can be made.



The SAS tone can consist of up to two simultaneous tones (Tone A and Tone B); however, normally only Tone A is enabled. Each tone's frequency can range from 50 Hz to 10,000 Hz with the level ranging from 0 to -70 dBm or dBV. The right side of the above window is used to set the timing parameters of the SAS tone. The top drop-down list box is used to select the number of tone bursts that make up the SAS tone. This can range from zero (no SAS tone generated) to four SAS tone bursts. Depending on the selected number of tone bursts, a list of all the burst duration's and intervals is displayed. The duration specifies the amount of time the SAS tone will be generated for, while the interval specifies the time delay between the end of the previous SAS tone burst and the next. The last interval time shown specifies the time between the end of the SAS and the beginning of the CAS tone. To change any of the duration or interval times, click the mouse on the selected time. The current time value is displayed in the lower right text box. Simple type in a new value in the range of 0 to 1000 msec and press the ENTER key to accept the new value.

The following diagram shows the relationship between the duration times and the interval times given the number of SAS tone bursts.



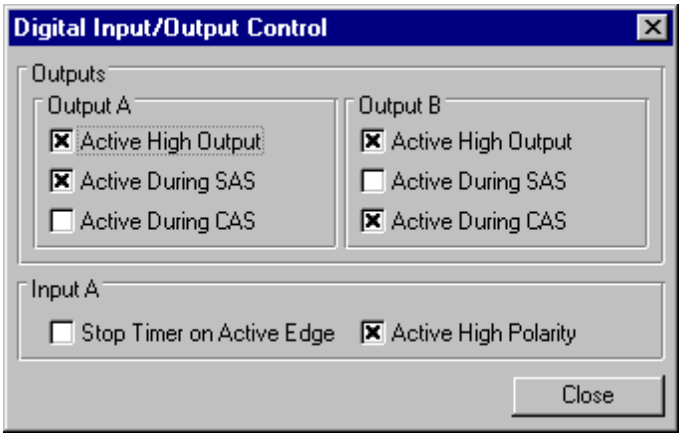
The relationship between the timer and CAS tone generator is unaffected by the number of SAS tone bursts generated or their timing. If the CAS tone generator is set to produce a CAS tone burst every four seconds, then the first CAS tone will be generated at a timer value of 0.000 seconds, while the next CAS tone will occur at a timer value of 4.000 seconds, and so on. The settings of the SAS tone generator will have no effect on this timing relationship between the CAS tone and the timer. Since the timer will start counting at the same time as the first CAS tone is generated, this means that the first SAS tone will occur before the timer starts counting. For example, if the duration of all the SAS tone durations and intervals is 2 seconds, then when pressing the START timer button the timer's start will be delayed by 2 seconds. This is done to keep the relationship between the timer and the CAS generator fixed, which is important in order to properly classify the signals captured by the data logger.

Also, it is possible that the sum of the SAS tone duration and interval times exceeds the interval between CAS tones. In this case the CAS tone will always take precedence and the SAS tone pattern will be truncated to insure that the CAS tone timing matches its set parameters.

4) Auxiliary Digital Outputs and Inputs

The DB9 pin connector at the rear of the Telephone Signal Processing Card (TSPC) provides access to digital output and input signals that can be used for various functions. Two output signals can be used for monitoring the timing of the CAS and SAS tones, while two input signals are used for detecting the response of the CAS tone detector and forcing a stop to any test in progress.

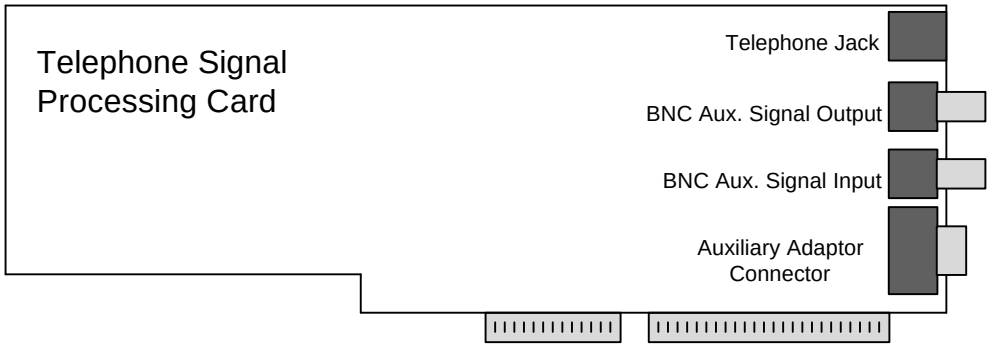
Changing the default settings for the digital I/O port is done by selecting the [SETTINGS] [DIGITAL I/O FUNCTIONS] menu command. Alternatively, double clicking the mouse on the image of the DB9 connector displays the window controlling the digital I/O functions.



Each digital output (output A and output B) and be independently controlled in terms of their active polarity and under what conditions they will be asserted. For the default settings, both output A and output B are set to active high outputs. Output A will be asserted when the SAS signal is being generated and output B will be asserted when the CAS signal is being. These outputs find the most use in synchronizing external test and measurement equipment, or acting as triggers for external equipment.

One of the digital inputs is reserved for recording the signal from the CAS detector, while the second digital input can be used to force a halt to any test in progress. Input A can be set to stop the timer on either a rising or falling edge. If the input is set to an active high polarity, then at its rising edge, any test in progress will be stopped. Likewise, if the input is set to an active low polarity, then at its falling edge, and test in progress will be stopped. In order to properly detect the rising of falling edges, input A must be held at its de-asserted level for a least 300 msec before the transition to the asserted level.

The DB9 female connector that supplies the digital input and output pins is located at the bottom rear of the TSPC card. Along with the digital I/O pins, the connector provides a +5 Volt output (at 250 mA max), ground pin, and digital output enable pin.



The digital outputs are only active when Pin 7 is connected to ground. This serves as a output port enable. The outputs are driven from 5V 'HC CMOS logic. Pin 3 is defined as Output A, while pin 4 is Output B. The two available inputs are at pins 8 (Input A) and 9 (CAS detect input). The input voltages should be limited to ground and +5V in order to prevent damage to the internal 'HC CMOS buffers. Both Input A and Input B have 10 kohm resistors to ground in order to prevent floating inputs. The pin assignment for the DB9 connector is as follows:

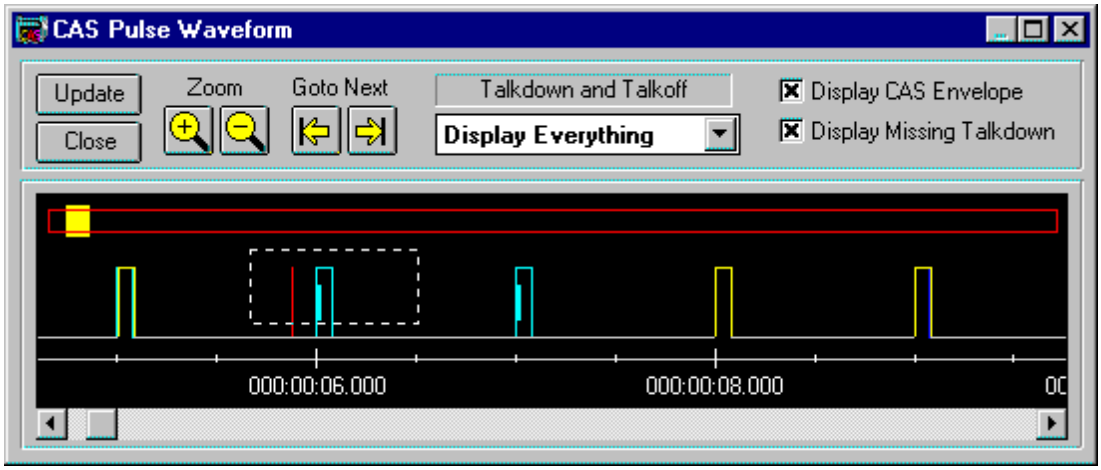
Pin 1: +5V (can draw up to 0.25A from this pin) (internally fused)
Pin 2: Reserved Output (do not use)
Pin 3: External Output A ('HC CMOS 5V output)
Pin 4: External Output B ('HC CMOS 5V output)
Pin 5: Ground
Pin 6: Reserved Output (do not use)
Pin 7: Digital Output Enabled (connect to ground to enable outputs)
Pin 8: External Input A ('HC CMOS 5V input)
Pin 9: CAS Detect Input ('HC CMOS 5V input)

5) Waveform Display Enhancements

A number of improvements have been made to the CAS Pulse Waveform display. A new option allows the display to highlight where a "Talkdown Event" has occurred. As opposed to displaying every pulse detected that is due to the CAS tone generator, the point in time where no pulse was detected can be highlighted. This is the more rare event, as generally the vast majority of CAS tones will be detected, but usually we are more interested in examining where and why the CAS tone was not detected.

Also, two new commands will pan the waveform display to the right or left until it finds another detected pulse. The "Goto Next" buttons act as a smart pan, locating and centering on the screen the next pulse either to the right or left of the current position. Also, in order to make zooming into a specific area easier, the mouse can be used to isolate areas of interest. By drawing a box anywhere on the waveform, the display will zoom into the outlined area drawn. This is a fast way to zoom into an area of interest. The mouse can also be used to zoom out to full scale by pressing the right mouse button.

The following figure shows the mouse being used to zoom into the detected pulse located at a time index of 6 seconds.



Other changes to the waveform display window include the ability to scale the window to any size and being able to print out the waveform shown.

6) Other Miscellaneous Changes

Support of up to 100,000 Pulses

The Data Logger capacity has been increased to store up to 100,000 pulses from its previous limit of 16,000 pulses. With the increase, the Data Logger can now store 96 hours worth of testing with a CAS pulse generated every 4 seconds.

Data Logger de-glitching option

An optional de-glitching algorithm in the Data Logger can be enabled or disabled along with specifying a threshold de-glitching time. When enabled, any positive or negative pulses that are less in duration than the threshold time are eliminated. This option is very useful with CAS detectors that can generate a large amount of short spurious pulses. With the de-glitching algorithm enabled, the short pulses are not stored in the data loggers memory which would only serve to reduce the maximum possible test time by storing and processing the glitches.

Flexible SAS/CAS level reference point

The signal levels specified with the CAS and SAS tone generators can now be referenced to either the telephone interface tip and ring leads, or the external BNC output connector. This gives an easy way to specify accurate signal levels for either outputs as opposed to just the telephone interface tip and ring leads.

Longer CAS tones duration and interval times

The maximum limits for the CAS tone duration and interval have been increased from 30,000 msec to 1,000,000 msec.