WOWSound Steam

Programming Guide

For Version 4

6-13-2016

This manual covers the setup and configuration of the Sound Components of the Version 4 WOWSound Steam decoder. All NMRA, Lighting and Motor Control programming are covered in the **TCS Comprehensive Programming Guide** available for download at:
www.tcsdcc.com

Table of Contents

Version Number 5

Audio AssistTM 5

4 CV Programming Overview 6

4 CV Write Operation 7

4 CV Read Operation 7

Prototype Mode vs. Traditional Mode 8

Calibrated Prototype Mode 8

Calibrating Prototype Mode using Audio Assist 8

Manually Adjusting the Calibration for Prototype Mode 9

BEMF Change Time 9

BEMF Low Calibration 9

BEMF High Calibration 10

Cylinder Cocks Shut Off Speed Step 10

Random Sound 1 Frequency 10

Random Sound 2 Frequency 11

Random Sound 3 Frequency 11

Random Sound 4 Frequency 11

Random Sound Overall Timer 11

Random Sound Cutout Speed 12

Whistle Set 12

Proto-Chuff Start Speed Step 12

Global Volume 13

Steam Locomotive Type 13

Automatic Sounds 14

Brake Grinding Sound Start Speed 14

Dual Mode Functions (Light & Sound Mode) 15

Chuff Rate Adjustment 15

Chuff Timing – Individual Speed Step 16
Rod Clank Set 16
Cylinder Cocks Auto Turn On Time 16
User Options 17
Articulated Chuff Slip Rate 17
Audio Auto Shutoff Time 18
Minimum Chuff Volume 18
Rotate Bell Pointer 18
Active Whistle Quill 19
Cylinder Cocks Set AudioAssist 19
Active Idling Sound AudioAssist 19
Chuff Volume Velocity Adjustment 20
Chuff Volume Forward Trim 20
Chuff Volume Reverse Trim 20
Rod Clank Volume Adjustments from BEMF 21
Rod Clank Volume Adjustments from Velocity 21
Rod Clank Cutout Speed 21
Throttle Mode 22
Switching Momentum Acceleration 22
Switching Momentum Deceleration 22
Mainline Momentum Acceleration 23
Mainline Momentum Deceleration 23
Sound Type Volume AudioAssist 23
Re-Map Sounds to Function Buttons 24
Individual Sound Volumes AudioAssist 24
Resets and Presets 25
WOWSound Brake Operation 25
Using a CAM (Optional) 26

If the AudioAssist logo appears after a title, that function is adjustable using Audio Assist™. It is recommended and easier to adjust these features using AudioAssist.

NOTE: Please view our instructional video about AudioAssist on our website.

Version Number

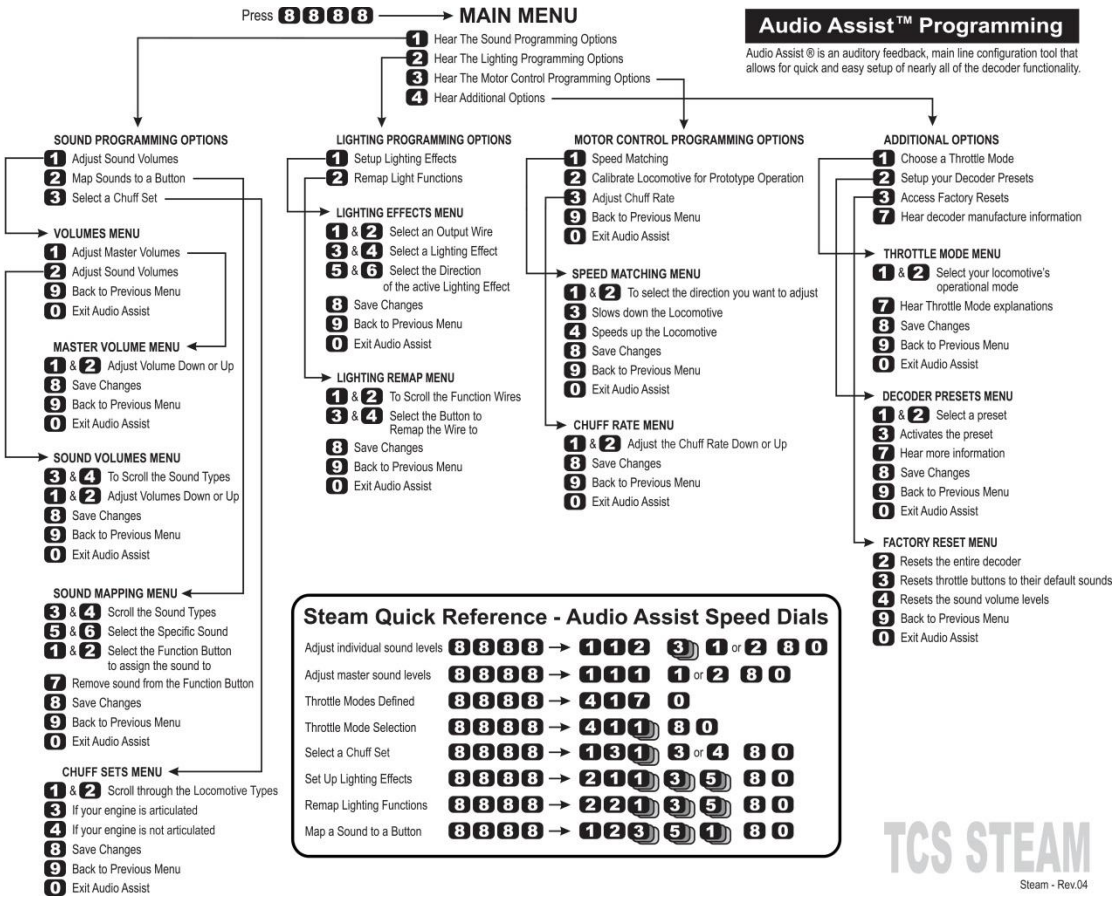
The WOWSound Version Number can be found by reading the value in CV 248. This is necessary when looking up information in the TCS WOWSound section of our website.

Audio AssistTM

Audio Assist is an auditory feedback, main line configuration tool that allows for quick and easy set-up of nearly all the sound functionality.

To enter Audio Assist, stop your locomotive on an operational track and press function button 8 in rapid succession 4 times. The decoder will start talking to you giving you a menu similar to a telephone answering machine. Just follow the verbal instructions to adjust or remap many of the sound options. When you have made a selection press 8 to save each selection and then press 0 to get "Goodbye" and exit.

NOTE: Please view our instructional video about Audio Assist on our website.



4 CV Programming Overview

All NMRA, Light and motor control CV are the same as in the TCS Standard line of decoders and can be found in the **TCS Comprehensive Programming Guide** downloadable from the TCS website. TCS uses 4 indexed CV's to program the sound features found in the WOWSound decoder line.

By using CV 201, CV202, CV203 and CV204 to adjust sound features, TCS is able to include thousands of different possibilities with the WOWSound decoders. What each of the 4 CV's represents in described in the following Table 1.

Table 1

Action	CV 201	CV 202	CV 203	CV 204
Assign Sounds to Buttons	1	Button #	Sound # High *	Sound # Low *
Individual Volume Change	2	Volume Level ***	Sound # High *	Sound # Low *
Chuff Timing	3	Speed Step	Course Adjustment	Fine Adjustment
Sound CV Change	4	CV#	CV Value High *	CV Value Low *
Factory Reset	5	None	None	Type of Reset (2-10)**
Sound Type Volume	6	Volume Level ***	Type # High *	Type # Low *

* Found in "List of Sounds" in the WOWSound section on our website

** Found in Factory Resets (see Table 2 below)

*** Found in "Sound Types" in the WOWSound section on our website

NOTE: Visit the WOWSound section of the TCS website for instructional videos, calculators and a list of sound CV's.

Table 2 **** Factory Resets**

Value	Reset Actions
2	All Decoder Settings (Motor, Light Sound)
3	Sound Button Mappings
4	Individual Volumes
5	Chuff Timing
6	Sound CV's
7	Sound Type Volumes
8	Loads Preset #1 (ver 3+ only)
9	Loads Preset #2 (ver 3+ only)
10	Loads Preset #3 (ver 3+ only)

NOTE: CV's 201, 202, 203 must be set before CV 204 is written. The Full programming operation takes place ONLY when CV 204 has been programmed.

4 CV Write Operation

1. Determine the type of programming action you wish to perform and enter the corresponding value from Table 1 in CV 201.
(Example: Assigning a sound to a button enter a value of 1 into CV 201)

2. If you are looking to perform any operation besides a factory reset enter the value of the specific field you are operating on into CV 202.
(Example: when mapping a sound to function button 12 enter a value of 12 into CV 202)

3. Enter the "High" or "Coarse" value (found in the appropriate table on our website) into CV 203
(Example: To assign "Strasburg #475 Air powered bell" enter a value of 1 into CV 203)

4. Enter the "Low" or "Fine" value (found in the appropriate table on our website) into CV 204
(Example: To assign "Strasburg #475 Air powered bell" enter a value of 1 into CV 204)
The full programming operation takes place ONLY when CV 204 has been programmed.

4 CV Read Operation

1. Simply add 100 to whatever value you would program into CV 201 to perform a write operation.
(Example: Using our example above add 100 to 1 for a value of 101. Program a value of 101 to CV 201)

2. Now enter the value of the specific field you want to read into CV 202. If you are reading Sound Type Volumes or Individual Sound Volumes, then you don't enter into CV202, but utilize CV203 instead.

(Example: Write a value of 12 into CV 202)

3. Now write ANY value to CV 204. (to trigger the read)
(Example: Write a value of 10 (it can be anything) into CV 204

4. Now you can Read the values of CV's 202, 203, and 204 on your programming track using CV read back.

Prototype Mode vs. Traditional Mode

The WOWSound Steam sound decoder comes from the factory set to **“Prototype Mode”**. This uses BEMF to set the Chuff Volume along with the snifter valves and Rod Clank depending on how hard the locomotive is working. This can be calibrated to the locomotive in Audio Assist. Acceleration CV 3 is set to a default value of 32 and Deceleration CV 4 is set to a default value of 96. This simulates the Prototype characteristics of a real locomotive meaning it will accelerate slowly with the prototypical loaded sounds. The locomotive will also take a very long time to come to a stop without the use of the **“Brake”** defaults to button 7 and **“Brake Release”** defaults to button 6. When you close the throttle the loco will coast while you hear Rod Clank and/or the Snifter Valves.

> In “T**raditional Throttle Mode**” operation the chuff volume will remain constant and at the level it is set at in the **"Chuff Sound type volume"** CV or in Audio Assist. When the throttle is closed, the chuff will decrease the snifters will come on (if enabled) snifter valve sounds are can be enabled in the "Automatic sounds" CV.

Calibrated Prototype Mode

Prototype Steam locomotives only “Chuff” when they are working hard. When they are moving around without a train or going downhill, they may not chuff at all. You would just hear the rods clanking or the snifter valves.

TCS Calibrated Prototype Mode uses BEMF (Back Electro Motive Force) to make your Steam locomotive’s chuff sound vary in volume and intensity based on how hard your locomotive is working at the time just like the prototype. When your locomotive is pulling a heavy train and/or going uphill the chuff will be at or near the full volume (user adjustable). When the locomotive is going downhill, the chuff volume decreases and may even go away until the locomotive hits level track and starts working again at which time the chuff volume will increase again.

Calibrating Prototype Mode using Audio Assist

Since no two locomotives run the same, Calibrated Prototype Mode can be calibrated to your locomotives unique operating characteristics by using a simple procedure in Audio Assist. This calibration is a two-step process that lets you set the “BEMF Low Calibration Point” and also set the “BEMF High Calibration Point”.

To calibrate your loco for Prototype Operation (Prototype Mode) using Audio Assist do the following:

1. Run the locomotive for 3 to 5 minutes to get everything warmed up.
2. Press Button 8, 4 times rapidly to enter Audio Assist
3. Press Button 3 for motor Control Programming Options
4. Press Button 2 to start the calibration process.

Once you have accessed the Calibration Menu you will be asked to run your loco at about speed step 20 on level track and Press Button 1. Audio Assist will start saying “Calibrating Please Wait” while the decoder calculates the “BEMF Low Calibration Point”. This is the point that the chuff volume will be low or gone because the loco is not working hard. You may want to try this with a light engine or a short train for best results.

Now Audio Assist will ask you to run the loco in a condition where it would be working hard. This is done by pulling a heaving train (uphill if you can) at speed step 20 and then press the 2 button. Audio Assist will start saying “Calibrating Please Wait” while the decoder calculates the “BEMF High Calibration Point”. This is the point where the chuff volume should be its loudest.

When you are done just press Button 0 to exit Audio Assist and you are done.

Manually Adjusting the Calibration for Prototype Mode

There are some locomotives that may need a little extra adjustment to get the best results from Prototype Mode. There are several adjustments that can be made using the WOWSound **4CV** indexed CV’s. (See 4CV Programming Overview on Page 6 of this Manual) There are 3 of these that may be the most useful to you. They are: BEMF Change Time, BEMF Low Calibration, and BEMF High Calibration.

BEMF Change Time

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Controls BEMF Change Time	4	29	0-127	0-255	**17**	**148**

This Controls how fast the chuff volume can go from 0 to full volume based on changes in load when in Prototype Mode. You may want to adjust this if the chuff volume is jumping from high to low and back again. Make your adjustments using CV203. The higher the value the slower the volume will change.

BEMF Low Calibration

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Set Low Point for BEMF Calibration	4	30	0	0-255	**0**	**10**

This is the Low BEMF Calibration point when calibrating for prototype load based chuff volume. If the loco is still chuffing when it is going downhill, increase the value in CV204 by 5 until it stops chuffing, then decrease it by 1 until it starts chuffing again. Now lower it by 1 and that should dial it in pretty close.

BEMF High Calibration

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Set High Point for BEMF Calibration	4	31	0	0-255	**0**	**40**

This is the High BEMF Calibration point when calibrating for prototype load based chuff volume. The higher the value in CV204, the harder the loco has to be working before the chuff goes to full volume.

Cylinder Cocks Shut Off Speed Step

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Cylinder Cocks Shut Off Speed Step	4	1	0	0-126	**0**	**16**

This sets when the Cylinder Cocks shut off after the locomotive starts. The higher the value in CV 204 the higher the Cylinder Cock Shut Off Speed Step.

Random Sound 1 Frequency

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Random Sound 1 Frequency	4	2	0	0-255	**0**	**215**

This sets how often Random Sound 1 plays. (Default Air Pump) The higher the value in CV 204 the more frequent the sound plays.

Random Sound 2 Frequency

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Random Sound 2 Frequency	4	3	0	0-255	**0**	**96**

This sets how often Random Sound 2 plays. (Default Shoveling) The higher the value in CV 204 the more frequent the sound plays.

Random Sound 3 Frequency

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Random Sound 3 Frequency	4	4	0	0-255	**0**	**64**

This sets how often Random Sound 3 plays. (Default Injector) The higher the value in CV 204 the more frequent the sound plays.

Random Sound 4 Frequency

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Random Sound 1 Frequency	4	5	0	0-255	**0**	**16**

This sets how often Random Sound 4 plays. (Default Safety) The higher the value in CV 204 the more frequent the sound plays.

Random Sound Overall Timer

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Random Sound Overall Timer	4	6	0-255	0-255	**3**	**0**

This sets the size of the time block for Random Sounds. The higher the value in CV 203 and CV 204 the larger the block of time for Random Sound calculations.

Random Sound Cutout Speed

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Random Sound Cutout Speed	4	7	0	0-126	**0**	**15**

This sets at what speed step the Random Sounds cutout. The higher the value in CV 204 the higher the speed step that the Random Sounds stop playing.

Whistle Set

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Whistle Set	4	8	0	Whistle #	**0**	**6**

This sets which Whistle Set plays in Long, Short and Whistle Quill. **Whistle Set number can be found in the WOWSound section of our website.**

Proto-Chuff Start Speed Step

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Proto-Chuff Start Speed Step	4	9	0	0-126	**0**	**0**

Proto-Chuff varies the chuff recordings making the overall chuff more realistic. This sets the speed step that the Proto-Chuff effect starts. The higher the value set in CV204 the higher the Proto-Chuff starting speed step.

Global Volume

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Global Volume	4	10	0	0-5 or 0-100	**0**	**100**

This sets the Global Volume of the WOWSound decoder. WOWSound ver 1 & 2 have a range of 0 to 5 with 5 being full volume. (WOWSound ver 3 has a range from 0 to 100 with 100 being full volume.)

Steam Locomotive Type

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Steam Locomotive Type	4	11	0	See Below	**0**	**0**

This sets the Steam Locomotive Chuff Type in version 4

Value CV 204	Locomotive Type
0	Baldwin 10 Wheeler
1	C&T K27 #463
2	C&T K27 #463 Alternate
3	C&T K36 #484
4	C&T K36 #484 Reverb
5	Heavy Steam
6	Medium Steam
7	Light Steam
8	Reading & Northern #425

*Starting in Version 3, Articulation is enabled in **User Options on Page 13**

Automatic Sounds

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Automatic Sounds	4	12	0-15	0-246	**15**	**135**

This sets which automatic and random sounds are active. See Below for values

Enable Random Sound #1	Enable Random Sound #2	Enable Random Sound #3	Enable Random Sound #4	Play Snifter Valves	Play Rod Clank	Idling Sound	Automatic Forward Whistle	Automatic Reverse Whistle	Automatic Stop Whistle	Automatic Direction Change Sound
1	**2**	**4**	**8**	**1**	**2**	**4**	**8**	**16**	**64**	**128**
Add values above for CV 203				**Add values above for CV204**						

Brake Grinding Sound Start Speed

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Brake Grinding Sound Start Speed	4	13	0	0-126	**0**	**15**

This sets the speed step that The Brake Grinding Sound is activated. The higher the value in CV 204 the higher the speed step the Grinding Sound will start.

Dual Mode Functions (Light & Sound Mode)

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Dual Mode Functions (Light & Sound Mode)	4	14	0-255	0-255	**2**	**3**

This sets which function buttons work in both Light Mode and Sound Mode. See below for values.

F0F 1	F0R 2	F1 4	F2 8	F3 16	F4 32	F5 64	F6 128
Add values above for CV 204							
F7 1	F8 2	F9 4	F10 8	F11 16	F12 32	F13 64	F14 128
Add values above for CV 203							

Chuff Rate Adjustment

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Chuff Rate Adjustment	4	16	0	0-200	**0**	**100**

Default is set at 100% chuff rate. Increasing the value in CV204 will speed up the chuff rate. Decreasing the value in CV204 will slow the chuff rate down. **(It is recommended and much simpler to use CV AudioAssist to make this adjustment)**

Chuff Timing – Individual Speed Step

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Chuff Timing – Individual Speed Step	3	Speed Step 0-126	0-255	0-255	**Varies**	**Varies**

The higher the value in CV203 & CV204 the faster the chuff rate. Use this adjustment only if you are a glutton for punishment. **(It is recommended and much simpler to use AudioAssist to make this adjustment)**

Rod Clank Set

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Select the Rod Clank Sound	4	17	0	Varies	**0**	**0**

CV 204 selects which Rod Clank sound is played AudioAssist **The Rod Clank sound number can be found in the WOWSound section of our webpage www.tcsdcc.com.**

Cylinder Cocks Auto Turn On Time

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Cylinder Cocks Auto Turn On Time	4	18	0-255	0-255	**1**	**0**

Determines how long the locomotive will need to be at 0 speed before the cylinder cocks sound will turn on automatically with the next speed command (Loco must come to a complete stop. 0 speed)

User Options

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
User Options	4	19	0-255	0-255	**56**	**248**

This sets which User Option is activated. See table below for values.

Use Cam	Mute on Startup	Enable Articulation Chuff Out of Sync	Enable "Rotate Whistle" Audio Feedback	Enable "Light Mode/Sound Mode" Audio Feedback	Enable Audio Auto Shutoff Timer	Using Digitrax Throttle with F2 momentary (Ver 3+)
1	4	8	16	32	64	128
Add Values above for CV 204						

Enable Chuff Articulation (Ver. 3)	Reverse Directional whistles	Power Braking Enabled	Enable Switching and Mainline momentum Feedback	Enable Johnson Bar Feedback	N/A	N/A
1	4	8	16	32	64	128
Add Values above for CV 203						

Articulated Chuff Slip Rate

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Articulated Chuff Slip Rate	4	20	0	0-255	**0**	**240**

Determines how fast the articulated chuffs will go into sync and out of sync with each other. The higher the value in CV 204 the faster it goes into and out of sync.

Audio Auto Shutoff Time

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Audio Auto Shutoff Time	4	21	0-255	0-255	**4**	**176**

Sets how long the locomotive must sit idle before the sound will shut off. The higher the value in CV's 203 & 204 the longer it will sit before the sound shuts off. (The default setting is approx. 3 min.)
NOTE: Audio Auto Shutoff Timer must be activated in "User Options" for this to work.

Minimum Chuff Volume

(Version 3 Decoders with a Date Code of 3/4/15 or later)

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Sets the Minimum Chuff Volume	4	23	0-255	0-255	**0**	**0**

Sets the lowest volume setting possible for the Chuff sound. The higher the value in CV203 & CV204 the louder the chuff will be.

Rotate Bell Pointer

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Controls which Bell is active	4	24	0	Varies	**0**	**0**

CV 204 selects which Rod Clank sound is played **The Rod Clank Type number can be found in the WOWSound section of our webpage.**

Active Whistle Quill

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Pick Whistle Quill	4	25	0	Varies	**0**	**7**

This selects the Whistle Quill variety. See table below for values.

Play Short Quill	Play Medium Quill	Play Long Quill	Play Quills in Random Order
1	2	4	128
Add Values above for CV 204			

Cylinder Cocks Set

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Controls which Cylinder Cocks Sound is active	4	26	0	1x	**0**	**1**

CV 204 selects which Cylinder Cocks sound is played **The Cylinder Cocks Type number can be found in the WOWSound section of our webpage.**

Active Idling Sound

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Controls which Idling Sound is active	4	27	0	0x	**0**	**0**

CV 204 selects which Idling sound is played **The Idling Sound Number can be found in the WOWSound section of our webpage.**

Chuff Volume Velocity Adjustment

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Set chuff Velocity Volume Change	4	32	0-7	0-255	**2**	**100**

This CV controls the effects accelerating and decelerating have upon the chuff volume. The higher the value the more drastic the change in volume from accelerating and decelerating.

Chuff Volume Forward Trim

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Set chuff Volume Forward Trim	4	33	0-126	0-255	**0**	**0**

This value is subtracted from the chuff volume only when the locomotive is going forward, this can be used to balance the chuff volume. if the locomotive is "stiffer" in the forward direction. The higher the value the quieter the chuffs will be when going forward

Chuff Volume Reverse Trim

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Set chuff Volume Forward Trim	4	34	0-126	0-255	**0**	**0**

This value is subtracted from the chuff volume only when the locomotive is going reverse, this can be used to balance the chuff volume. if the locomotive is "stiffer" in the reverse direction. The higher the value the quieter the chuffs will be when going reverse

Rod Clank Volume Adjustments from BEMF

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Set Rod Clank Volume Adjustment from BEMF	4	35	0	0-100	**0**	**30**

When the BEMF is at the low point calibration (Sound CV30) the rod clank will be on full volume. As the BEMF increases in percentage (of the range between the low and high calibration points) the rod clank will fade out, fading out completely when it reaches the percentage specified by this CV. For example if the low end calibration is 0 and the high end calibration is 100, at the default value of 30 in this CV the rod clank will be at full volume at BEMF level 0, and zero volume at BEMF levels 30+

Rod Clank Volume Adjustments from Velocity

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Set Rod Clank Volume Adjustment from Velocity	4	36	0	0-100	**0**	**50**

This CV controls how much of an effect decelerating has on the volume of the rod clank. The higher the value the greater the volume increases in rod clank from decelerating.

Rod Clank Cutout Speed

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Set Rod Clank Cutout Speed	4	37	0-127	0-127	**127**	**7**

This CV controls at what speed the Rod Clank will play. At speeds above the value in CV204 and below the value in CV203, the Rod Knock will not play

Throttle Mode

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Set Throttle Mode	4	42	0	0-1	**0**	**1**

A value of 0 activates traditional throttle operation. A value of 1 enables prototype throttle operation. In traditional throttle operation the chuff volume will remain constant and at the level it is set at in the "Sound type volume" CV or in . In Prototype throttle operation the chuff, snifters, and rod clank will all react realistically based on what the engine is doing. If the engine is coasting the chuffs will cut out and snifters and rod clank will play, if going up a hill all you will hear is the bark of the chuff as the engine works hard.

Switching Momentum Acceleration

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Switching Momentum Acceleration	4	50	0	0-255	**0**	**5**

This CV controls the acceleration rate while in switching mode, this value is written into CV3. The higher the value the longer it takes for a train to accelerate

Switching Momentum Deceleration

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Switching Momentum Deceleration	4	51	0	0-255	**0**	**5**

This CV controls the deceleration rate while in switching mode; this value is written into CV4. The higher the value the longer it takes for a train to accelerate

Mainline Momentum Acceleration

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Mainline Momentum Acceleration	4	52	0	0-255	**0**	**32**

This CV controls the acceleration rate while in Mainline mode, this value is written into CV3. The higher the value the longer it takes for a train to accelerate

Mainline Momentum Deceleration

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Mainline Momentum Deceleration	4	53	0	0-255	**0**	**96**

This CV controls the deceleration rate while in Mainline mode, this value is written into CV4. The higher the value the longer it takes for a train to accelerate

Sound Type Volume

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Sound Type Volume	6	Volume Setting	0	Sound Type #	**0**	**Varies**

This sets the Volume of a particular Sound Type. WOWSound ver 3+ has a Volume range from 0 to 100 with 100 being full volume. **The sound Type number can be found in the WOWSound section of our webpage.**

Re-Map Sounds to Function Buttons

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Re-Map Sounds to Function Buttons	1	Function 0 to 32	Sound # High Byte	Sound # Low Byte	Varies	Varies

You can re-map any sound to any button or the 4 random sound outputs. Function Buttons 0 – 28 with Random Sound 1 = 29, Random Sound 2 = 30, Random Sound 3 = 31, Random Sound 4 = 32. To remove a sound from a button, put a value of 255 in CV203 and a value of 255 in CV204. **Sound # High Byte & Low Byte Numbers can be found in the WOWSound section of our website.**

Individual Sound Volumes

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Individual Sound Volumes	2	Volume Setting	Sound # High Byte	Sound # Low Byte	0	Varies

You can set the volume of each sound independently. WOWSound ver 1 & 2 have a Volume range of 0 to 5 with 5 being full volume. WOWSound ver 3 has a Volume range from 0 to 100 with 100 being full volume. **Sound High Byte & Low Byte Numbers can be found in the WOWSound section of our website.**

Resets and Presets

Functionality	CV 201 Value	CV 202 Value	CV 203 Value	CV 204 Value	CV 203 Default Value	CV 204 Default Value
Individual Sound Volumes	5	0	0	Reset or Preset Type 2 - 10	**0**	**Varies**

Allows you to do several different Factory Resets depending on your needs. You can also call up one of 3 User Presets that you may have saved using .

User Presets are available in WOWSound decoders starting with Ver 3. They allow you to save 3 versions of you own sound settings for easy resets to settings other than the factory default values. User presets can only be setup using . Enter the value needed from the chart below into CV 204.

Value	Reset Actions
2	All Decoder Settings (Motor, Light, Sound)
3	Sound Button Mappings
4	Individual Volumes
5	Chuff Timing
6	Sound CV's
7	Sound Type Volumes
8	Loads Preset #1 (ver 3+ only)
9	Loads Preset #2 (ver 3+ only)
10	Loads Preset #3 (ver 3+ only)

WOWSound Brake Operation

The WOWSound Steam sound decoder uses a slightly different type of "Brake" than the TCS Standard decoders. WOWSound uses a separate "Brake" button (default is Button 7) and a separate "Brake Release" (default is Button 6).

Every time you press the "Brake" button there is a 20% brake application as well as a random brake squeal sound. If you continue to press the "Brake" button several more times there is an additional 20% brake application each time you press the button. With 5 presses of the "Brake" button you are in emergency and the loco stops very quickly. Anytime that you press the "Brake Release" button you will

hear the air release from the brakes while the brakes release and you can continue. Increasing the throttle setting will also release the brakes.

Pressing the “Brake Button” will apply the brake regardless of the throttle setting. So you can simulate “Power Braking” with passenger trains to keep the train stretched etc.

The “Brake” and “Brake Release” buttons can be re-mapped to any other buttons desired. See “Re-Map Sounds to Function Buttons”. While the default values for the Braking rates work very well for most people; they are adjustable using CV’s. See Chart below.

CV	Default Value	Brake Rate	
CV 183	32	Brake Rate 1 (1 press)	**The Larger the number the longer it will take to come to a complete stop.**
CV 184	26	Brake Rate 2 (2 presses)	
CV 185	16	Brake Rate 3 (3 presses)	
CV 186	8	Brake Rate 4 (4 presses)	
CV 187	3	Brake Rate 5 (5 presses)	

Using a CAM (Optional)

The Tan Wire in the auxiliary plug goes to the cam wiper. The cam itself is mounted on either the loco axle or Drive wheel with a cam kit (Third Party) that has continuity with either Rail A or Rail B. Activating the CAM is done in **“User Options”** on page 17.

Train Control Systems
P.O. Box 341
845 Blooming Glen Road
Blooming Glen, PA 18911
215-453-9145 Office
215-257-0735 Fax
tcs@tcsdcc.com email
www.tcsdcc.com web