QUICK START GUIDE

DC and DCC Operation of Atlas Gold Series HO Scale FM H16-44 Diesel Locomotives

Equipped with ESU LokSound
Select Sound-Decoders

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for ESU Firmware Version 4.14.9202

Congratulations on your purchase of an Atlas Master™ Gold Series HO-scale model of an FM H16-44 locomotive that is factory-equipped with an ESU LokSound Select sound-decoder. This sound-decoder provides the highest quality sound plus state-of-the art motor control. Your locomotive can run on either conventional DC (with basic features) or on NMRA Digital Command Control (with full features).

This *Quick Start Guide* gives an overview of the features of the LokSound Select sound-decoder installed in the Atlas HO Gold Series FM H16-44 locomotive when the locomotive is operated either on DC or on DCC power. In addition to the *Quick Start Guide*, you can download from the Atlas website the current version of the Atlas *User Manual* [1], which gives more detailed information about both DC and DCC operation of Atlas locomotives that are equipped with LokSound Select sound-decoders. However, please note that some updates to the LokSound Select sound-decoder software (compared to the software described in the Atlas *User Manual)* have been made for Gold Series FM H16-44 locomotives. In particular, certain DCC functions operate differently from the way they operated in earlier Atlas HO Gold Series locomotives with LokSound Select sound-decoders. Information specific to the Gold Series HO FM H16-44 locomotives is included in this *Quick Start Guide*.   In particular, use the table on page 4 of this *Quick Start Guide* that is entitled *DCC Function Key Operation for Atlas HO-scale Gold Series H16-44 Locomotives* instead of Table 1 in the *Atlas User Manual*.

DC Operation of your Atlas HO-scale Gold Series FM H16-44 Locomotive

Using a standard variable-voltage DC power pack, turn the DC throttle up slowly until you begin to hear locomotive sounds (around 5 volts). You will hear the diesel engine *Start-Up* sound sequence that is sometimes accompanied by *Cold Start/Failed Start* sounds. For an explanation of *Cold and Failed Starts*, please see the section on page 5 entitled *Automatic Cold and Failed Starts.*

The locomotive will **NOT** move before the *Start-Up* sequence has been completed. The headlight facing the direction in which the locomotive will move turns on in its *Dim* state. Once the start-up sequence has been completed, turn up the throttle voltage up (to about 7 volts) until the locomotive starts to move. Note that you must turn the throttle to a higher setting than you would to make a non-sound locomotive start to move. The locomotive starts moving slowly due to built-in inertia from the *BEMF* (Back EMF) motor control. The headlight in the direction of movement will turn from *Dim* to *Bright*; the headlight facing the opposite direction will continue to be *Off*. Note that it is NOT necessary to turn on the headlights in the DCC mode for these headlights to operate in the DC mode.

In Analog (DC) operation, the bi-color LED *Classification Light*s automatically show *green* in the direction that the locomotive is traveling and red in the opposite direction. No input from the user is required.

Atlas HO Gold Series H16-44 locomotives have simulated *Cold and Failed Starts* that operate automatically and randomly as described in the section on pages 5-6 that is entitled *Automatic Cold and Failed Starts*.

On a DC-powered layout, an Atlas HO-scale Gold Series FM H16-44 locomotive will *automatically* produce sounds that are appropriate for its current state of operation. For example, the *Startup* sound sequence plays before the locomotive begins to move, and *Brake Squeals* play as the locomotive grinds to a halt. However, it is not possible to trigger individual sounds (such as the *horn* or *bell*) manually with DC track power. If you wish to have manual control of sounds, Atlas suggests that you invest in a *Basic DCC System* which will allow you to control all available sounds and other special effects in your

locomotive and yet be essentially as simple to operate as a DC power pack. *Basic DCC Systems* that are currently available include the:
- NCE DCC Twin,
- MRC Prodigy Explorer DCC,
- TECH 6 Sound Controller 2.0
- MRC TECH 6 Sound Controller 6.0 (usable in smaller scales, but primarily intended for O-scale and larger).

Moreover, one can change certain operational characteristics of the locomotive when operating on DC power, using the same DCC programming that is used to change these characteristics in DCC operation. See Reference [1] for details. However, in certain cases, a *Standard* (full-featured) *DCC System*, as opposed to a *Basic DCC System*, may be needed to make some of these changes.

DCC Operation of your Atlas HO-scale Gold Series FM H16-44 Locomotive

- **Start-Up Behavior**
  As shipped from the factory, this locomotive behaves as follows at start-up:
  - Locomotive sounds will start up immediately after DCC power is applied to the track. You will first hear the sounds of a diesel locomotive starting up from a powered-down state, followed by normal idling sounds and (after the DCC throttle is advanced) running sounds.
  - Even if you advance the DCC throttle, the locomotive will NOT move until **AFTER** the entire *Start-Up sound sequence* (which normally lasts about 25 seconds) has played.

  If the above behavior at startup is acceptable, there is nothing more that you need to do. If, however, you would like your locomotive to behave differently, see Example 3 in Appendix 4 of Reference [1] to change the behavior described in the first Dash item and Example 1 in Appendix 4 of this same reference to change the behavior described in the second Dash item.

  Atlas HO Gold Series H16-44 locomotives have simulated *Cold and Failed Starts* that operate automatically and randomly as described in the section on pages 5-6 that is entitled *Automatic Cold and Failed Starts*.

  If the prototype locomotive on which your model is based normally operates *Long Hood Forward*, to mimic this behavior, but your model locomotive operates in the opposite way, add "1`" to the current value of CV29. (See Table 7 in Reference [1] for more details.)

- **DCC Functions Available in Atlas HO-Scale Gold Series FM H16-44 Locomotives**
  The ESU LokSound Select sound-decoder provides a number of different DCC functions that can be triggered by pressing the appropriate key (e.g., press the "4" key to trigger DCC Function #4) on your DCC controller. The following table lists the DCC functions available in the ESU LokSound Select sound-decoder installed in Atlas Gold Series HO-scale FM H16-44 locomotives.

DCC Function Key Operation for Atlas HO-scale Gold Series H16-44 Locomotives

Function Key	Locomotive Behavior when Press Function Key	Function Behavior (Latching or Non-latching)	Works Only with Engine Sounds On	Works Only When Moving
F0	Front and Rear Headlights are directional.	Latching	No	No
F1	Bell (1st push on/2nd push off)	Latching	No	No
F2	Horn blows until push F2 key again	Latching	No	No
Horn	Horn blows only while Horn key held down	Non-Latching		
F3	Two Coupler Clank sounds alternate	Non-Latching	No	No
F4	Diesel Fans (1st push on/2nd push off)	Latching	Yes	No
F5	Dynamic Brake Fan (1st push on/2nd push off) Only active when prime mover sound on	Latching	Yes	Yes
F6	Front & Rear Classification Lights (1st push on/2nd push off)	Latching	No	No
F7	Switching Mode (1st push on/2nd push off)	Latching	No	No
F8	Audio Mute and Start Up/Shut Down	Latching	No	No
F9	Manual Notching Up sounds (1st push on/2nd push off)	Latching	Yes	No
F10	Manual Notching Down sounds (1st push on/2nd push off)	Latching	Yes	No
F11	AUX3 Function Output (not used in Gold Series H16-44.)	Latching	-	-
F12	Dim Headlight (1st push dim/2nd push bright)	Latching	No	Yes
F13	AUX4 Function Output (not used in Gold Series H16-44.)	Latching	-	-
F14	Talking Defect Detector sounds	Detector sounds play each time F14 is pressed	No	No
F15	Cab Radio Communication sounds	Radio communication sounds play each time F15 is pressed	No	No
F16	Rail-joint Clank sounds (1st push on/2nd push off). Only active when prime mover sound on	Latching	Yes	Yes
F17	Brake Set/Release sounds on/off*	Non-Latching	Yes	Yes
F18	Sanding Valve sounds (1st push on/2nd push off)	Latching	Yes	No
F19	Short Air Let-off sounds	Press F19 twice	No	No
F20	Air Compressor sounds (1st push on/2nd push off)	Latching	Yes	No
F21	Pop Valve sounds (1st push on/2nd push off)	Latching	No	No

*Please note that the F17 key only activates or deactivates the *Brake Set/Release* sound **capability**; it does **NOT** activate these sounds. If the capability is *On*, you will hear Brake Set/Release sounds only when the locomotive starts or stops.

- **Default Headlight Operation in Atlas HO-scale Gold Series H16-44 Locomotives**

  Since H16-44s were road locomotives, their headlights would normally be turned on only in the direction that the locomotive was moving. Furthermore, the switch controlling the headlight of a prototype locomotive is normally set to its *dim* position when the locomotive is standing still. The following table illustrates how Atlas's model H16-44 locomotive mimics this behavior.

Light	Forward	Stopped after Forward	Reverse	Stopped after Reverse
Front Headlight	Bright	Dim	Off	Off
Rear Headlight	Off	Off	Bright	Dim

  When the locomotive is first powered up, you may need to press the *F0* (or *Headlight)* key on your DCC system one or two times to turn on the directional front or rear headlight.

- **Classification Light Operation in Atlas HO-scale Gold Series H16-44 Locomotives on DCC Power**

  When operating with DCC power, the user can turn on or off the auto reversing *Classification Lights*. Some additional information on DCC operation of the *Classification Lights.*is included below:

  - The ESU LokSound Select decoder has six function outputs*: Head Light*, *Backup Light*, *AUX1*, *AUX2*, *AUX3*, and *AUX4*. As their names imply, the *Head Light* and *Backup Light* outputs are designed to control the LEDs used for the front and rear headlights, respectively. In these locomotives, it is possible to *dim* a Bright Headlight using DCC function **F12**.
  - Decoder outputs *AUX1* and *AUX2* are designed to control the bi-color LEDs used for the front and rear classification lights. Decoder outputs *AUX1* and *AUX2* are auto-reversing so that the bi-color LEDs show *green* in the direction that the locomotive is traveling and *red* in the opposite direction. The only control over these classification lights is *On* or *Off*. DCC Function **F6** turns both the front and rear classification lights *On* or *Off*.   *Please note that it is **NOT** possible to turn the rear classification lights Off while leaving the front classification lights On, or vice versa.*
  - If you are using an NCE Power Pro DCC system, you need to change the value of one parameter in your Power Pro command station to get proper operation of the H16-44 headlights and directional marker lights. The *Function Repeat Rate* must be changed from 0 to 1. Refer to the NCE System Reference Manual for instructions on how to change the value of this parameter.

- **Automatic Cold and Failed Starts**

  The Atlas HO Gold Series H16-44 locomotive has special simulated *Cold and Failed Starts* that operate automatically and randomly as follows. The *Cold Start* sequence will happen the first time that you turn the locomotive on. Occasionally (more frequently in DC than in DCC operation), during this *Cold Start sequence*, the Prime Mover will (intentionally) fail to start and automatically retry the starting procedure. If the prime mover fails to start on the first try, the LokSound Select software is set up so that the Prime Mover always starts on the second try. Once the locomotive is started and then is turned off, a timer will begin (in DCC, but not in DC). If the diesel engine is started again before this timer expires, it will start with a *Warm Start* (which always works). However, if the timer has expired, the engine will start the cycle over again with a *Cold Start*. The randomness of *Cold Start failures* is designed to mimic the fact that prototype diesel engines fail to start at random times.

  Note that for both DC and DCC, the *Startup Sounds*, **without any *Cold Start Failure***, last about 25 seconds. However, **when there is a *Cold Start failure***, the combination of the original *Startup*

Sounds plus the sounds of a *Cold Start failure* can last about 60 to 75 seconds. **Also note that the probability of a *Cold Start failure* occurring is much higher in DC than it is in DCC**

- ## DCC Programming Locations

  Most DCC systems allow you to program a Configuration Variable (CV), such as the DCC address of a locomotive, in either of two places:
    - On a special section of track not connected in any way to your layout and called the Program Track. (In DCC terminology, programming locomotives on the program track is called *Service Mode Programming*.)
    - Anywhere on the Main Line (regular track) of your layout. [In DCC terminology, programming a locomotive on the main line of your layout is called either *Programming on the Main (POM) or Operations Mode (Ops Mode)* programming.]

  In almost all cases, the ESU LokSound Select decoder installed in your FM H16-44 locomotive can be programmed on your program track **WITHOUT** a Program Track Booster connected between the program track output of your DCC system and your physical program track. However, if you do need a Program Track Booster, Atlas recommends the PTB-100 from SoundTraxx.

- ## Programming a New DCC Address for Your Locomotive

  The decoder in every Atlas Gold Series locomotive comes from the factory set to use the short address "3." However, in order to control (independently) several locomotives on the same track at the same time, it is necessary that each locomotive have a unique DCC address. A convenient choice for the DCC address is the road number printed on the side of the locomotive's cab. Frequently, the number on the side of the cab is a 3- or 4-digit number, either of which is treated in DCC as a Long (or 4-digit) Address.

  If your DCC system allows you to program 4-digit addresses on the main line (many DCC systems do), Atlas recommends that you take advantage of this capability by programming the address of your Gold Series locomotive on the main line using Operations Mode (Ops Mode) programming.

- ## Air Horn Selection

  For the FM H16-44, the default horn is a Nathan Single Chime (i.e., CV48 = 69). If you wish to use a different air horn, you may choose from the 16 air horns that are listed in the following table. To select a horn, write into CV48 the value listed to the right of the name of that horn in this table.

Air Horn Name	CV48 Value
Dual Leslie A200/A125	64
Leslie Single Chime	65
Nathan M5	66
Nathan P3	67
Leslie A125	68
Nathan Single Chime	69
Leslie A200	70
Leslie S3L	71
Nathan M3H	72
Nathan M3	73
Hancock Air Whistle	74
Wabco E2	75
Leslie Supertyfon	76
Nathan M3H (duplicate)	77
Leslie A125 (duplicate)	78
Nathan K3	79

- **Resetting your Lok-Sound Select Equipped Loco to Factory Default Values**

Resetting the firmware in the LokSound Select sound-decoder to its factory-built configuration can resolve many problems that sometimes occur with firmware-controlled electronics.   In fact, we have found that at least 20 to 25 percent of the problems with Gold Series locomotives that we receive for repair at Atlas can be resolved simply by resetting the sound-decoder.   Hence, the very first step you take to resolve a problem should be to reset the LokSound Select sound-decoder in your locomotive using the following procedure:

- Place the locomotive on your program track and write the value 8 into CV8.
- Cycle power to the decoder first off and then on again by:
  - Tipping the locomotive to one side so that all the wheels on the opposite side are off the rail,
  - Holding the locomotive in this tipped position for 5 to 10 seconds,
  - Slowly lowering the locomotive back down until all wheels are once again on the program track rails.

The second dashed item listed above (power cycling) is **extremely** important; do **not** omit it.

REFERENCES

[1]. *User Manual: DC and DCC Operation of Atlas Gold Series Diesel Locomotives equipped with ESU LokSound Select Sound-Decoders,* Version 1.27, 26 May 2015 (or later). Download from Atlas model website:
> http://www.atlasrr.com/
Choose *Support*, *DCC Support*, and then double click on the listing for this document.

[2]. *LokSound Select User Manual for Diesel and Steam Decoders,* Third Edition (or later), May 2012. You can download the ESU *LokSound Select User Manual* document from the ESU website:
> http://www.esu.eu/en/start/
by first selecting *DOWNLOADS.* Then click on *Instruction Manuals.* Next, click on *Digital Decoders.* Finally, single-click on the *Download* icon in the box labeled *LokSound Select Users Manual.*

Appendix: Body-Removal Instructions for Atlas HO-Scale FM H16-44 Locomotives

When reading these instructions, please refer to the exploded diagram and parts list that was packed with your Atlas HO FM H16-44 locomotive.

Removing the Plastic Body Shell from an Atlas HO-scale FM H16-44 Locomotive
1. The Atlas HO scale H15/16-44 shell and sill unit (combined) are held to the chassis by friction only.
2. Remove the fuel tank.
3. Remove the handrails from their holes in the cab to avoid breaking these handrails should the cab separate from the sill unit,
4. The best way to remove the shell/sill/cab combination is to simply grab with one hand the part of the die-cast chassis from which you removed the fuel tank in Step 2 and grab the plastic body shell/sill/cab assembly with the other hand. Some careful, but vigorous, tugging and rocking should separate the two parts.
   a. To avoid breaking the tabs that hold the cab to the body, it may also be necessary to spread the cab and body away from the die cast chassis.
   b. There is no need to remove the coupler boxes, cab, etc. The locomotive should come apart with the body shell, sill unit, and cab all attached to each other.

Reassembling an Atlas HO-scale FM H16-44 Locomotive
1. Reinstall the fuel tank.
2. When putting the shell back on the chassis, please check to ensure that the mounting tabs that hold the shell and sill unit together are all in place as these sometimes pop out of alignment when removing the shell.
3. Also check that the air hose detail is not interfering with the coupler.
4. With the above parts in place, the shell/sill/cab unit should simply slide back over the chassis

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