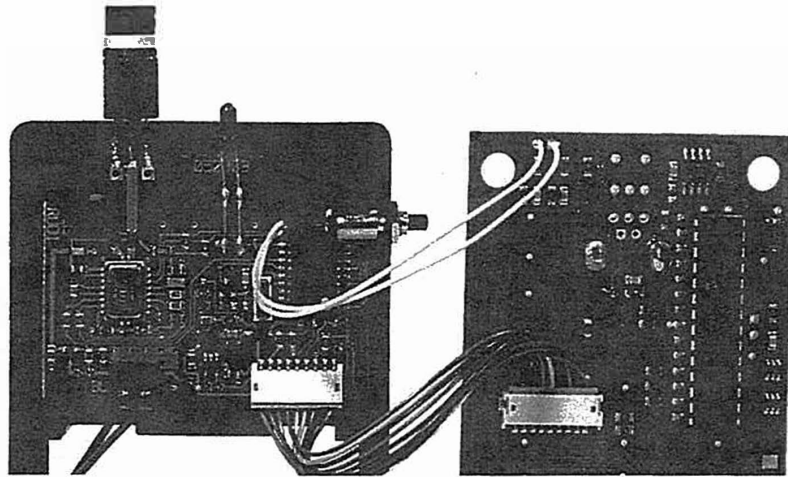


Photo of shift button installed in radio cab



Warranty

This product is fully factory tested and warranted against manufacturing defects for a period of 1 year. As the circumstances under which this product is installed can not be controlled, failure of the product due to installation problems can not be warranted. This includes misuse, miswiring, operation under conditions beyond the design range of the product. No guarantees are expressed or implied as to the suitability of the product for its intended use by the purchaser.

For warranty or non-warranty replacement contact NCE Customer Service at 585-265-0230 between 9AM and 4PM Eastern US time or send the cab to:

NCE Warranty Center
82 East Main St.
Webster, NY 14580

Spare Parts:

Spare parts for your cab may be ordered from the list below. \$5 US will be added to your order for US priority mail and packaging. Check or credit card will be accepted.

Description	Price (US \$)
Replacement Potentiometer	Free (call)
Cab04e/05 top with overlay	\$8.00
Cab04e/05 rear cover w/battery door	\$7.00
Cab04e/05 screws (set of 4)	\$2.00
Cab04e/05 battery holder	\$1.50
Rubber keypad for Cab04e/05	\$8.00

Address all parts orders to :

NCE Spare Parts
82 East Main St.
Webster, NY 14580



CAB-04e

Intermediate Cab



We have recently discovered that Cab04 or Cab05 Radio Cabs when set to address 49 will cause a system hang-up. Avoid this address. Suggested cab addresses for the Intermediate Cabs are 19-47.

Operations Manual

For Cab version 3.1

To the right is an illustration of the CAB04e Intermediate Cab. Following is a description of the various controls and indicators of the cab.

ADDRESS TOGGLE SWITCH

The CAB-04e can act as *two* independent cabs depending on which way (to the left or right) the toggle is thrown. This way one CAB-04e can act as two separate cabs controlling two different trains. The 'left' side cab can have one cab address and the 'right' side cab can have a completely different cab address and a completely different cab setup.

STATUS LED

To the left of the speed control knob is the cab status LED. It will briefly flash whenever a key is pressed or will glow continuously to indicate when data entry is required.

SPEED KNOB

This knob controls the speed of the locomotive. The knob turns a digital encoder inside the plastic case. If the cab is set to yard mode the knob is "center off", turning it to the left goes faster in reverse, turning it to the right goes faster in forward.

DIRECTION KEYS

Pressing the FWD key will cause the Loco to move in a forward direction. The REV key will cause the Loco to move in a reverse direction. These buttons are disabled when the cab is in "yard" mode (use the knob to change direction).

OPTION KEY

This button comes factory set to act as a direction toggle. Each push of this button will change the direction of the locomotive.

This button can be set up to act as any button you wish (see SETTING UP YOUR CAB).

The OPTION button can also be set as a "Special" shift (we call it "sticky" shift) button. This will give all the other buttons on the cab an alternate use (see page 6).

HORN

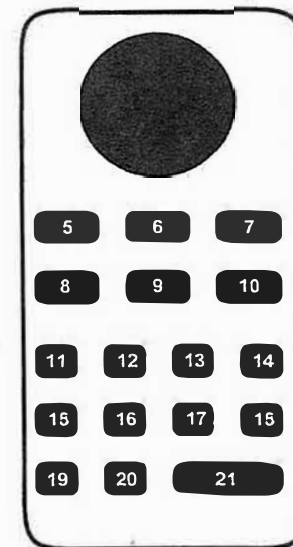
This button is factory set to operate Function 2 which is the de-facto standard for the horn/whistle feature of DCC sound systems. Unlike other keys which toggle functions on and off this key is momentary, activating the function only as long as the button is held down. If you want Function 2 to toggle on and off use the "2" button.



Setting the alternate button values:

Alternate button settings apply to both "halves" of the cab

- 1) Turn on the DCC system
- 2) Unplug your cab from the Cab Bus
- 3) Press and hold down the SELECT LOCO button while plugging in the cab. The cab will now enter its internal setup program. This is indicated by a flashing LED on the cab.
- 4) Press "6" to enter shifted key setup mode. Notice the flashing of the LED slows to indicate it's ready to accept a button number to program.
- 5) Enter the *button number* followed by ENTER (see diagram of button numbers on the right) Only button numbers 0 through 21 will be accepted. If you get an error press SEL LOCO to clear the error and reenter the correct number. Notice the LED flash changes pace when you press ENTER indicating the cab is now waiting for a value for the button.
- 6) Enter the new *button value* (from the OPTION button table on the previous page) followed by the ENTER key. Only button values of 0 and 64 through 128 are accepted. Other values will cause an error. If you get an error press SELECT LOCO to clear the error and reenter the correct value. You can cancel the process at any time by unplugging the cab.
- 7) To set the alternate values for other buttons repeat this process from step 2.



Cab04e button number diagram

Another method to activate the alternate button values.

Inside the cab at the top of the printed circuit board are two holes marked "SHIFT" (not the solder pads marked "SHIFT 2"). If a momentary contact pushbutton is connected to these holes it will act like the shift key on a computer keyboard. While the new "shift" button is held down any key pressed will use its alternate value.

Connection of a pushbutton to these holes will not void the cab warranty *provided the installation is performed in a competent manner.*

We installed a Radio Shack part number 275-1571 pushbutton on the right hand side of the cab about 5/8 inch (16 mm) from the top of the cab. See the installation photo on the next page. The photo shows installation in a Cab04pr (radio equipped) but should work just fine in a non-radio version.

If you set the OPTION key to EMERGENCY STOP (76)

Pressing the E-STOP key once will stop the active loco/consist for this Cab only. Speed will be immediately set to zero (no momentum). Loco is restarted by changing the speed or direction.

WHOLE LAYOUT EMERGENCY STOP

Note* This feature is only available when the cab is used with a Power Pro command station. Pressing E-STOP three times in quick succession will bring the *entire* layout to a stop. The Status LED will light and is cleared only by pressing the ENTER key. Only the Cab that executed the Emergency Stop can clear it. Each Loco or Consist can now be restarted by sending it a command, such as a speed step increase or decrease, or by toggling a Function output. If the E-Stop does not clear, press E-Stop until the status LED lights, then press ENTER again. NCE Power-Pro systems with software dated 21 December, 2004 and newer have an option to disable the Whole Layout Emergency Stop.

Operation with the OPTION button set to the "SPECIAL" SHIFT

Every button on the cab can have an alternate action (like the shifted number keys on your computer or typewriter). You can activate this alternate action by setting the OPTION button to the "SPECIAL" SHIFT value (128). Then, when you press OPTION nothing will happen until you press a second button. When you press the second button its alternate identity will be used.

Example: The MACRO button has RECALL as its alternate action. To use RECALL instead of MACRO press OPTION then press MACRO. This has the same action as the RECALL button on your ProCab.

Factory defaults for alternate button values

We have already programmed some alternate button values at the factory. These values are illustrated in the table below. The factory settings for these values can be changed (see Setting Alternate Button Values on the next page). These settings apply to both "halves" of the cab.

Button Number	Button Value	Description
5	111	Momentum
6	125	Nothing - Cancels special shift action
7	76	Emergency Stop
8	93	28/128 speed mode
9	122	F13-F28 control
10	66	Recall
11	81	1
12	82	2
13	83	3
14	84	4
15	85	5
16	86	6
17	87	7
18	88	8
19	89	9
20	90	0
21	64	Enter

NUMBER KEYS

The keys 0 through 9 serve two purposes. First, when operating a locomotive if a number key is pressed it toggles the corresponding function on the loco (if that function is connected and supported by the locomotive decoder). The second purpose is for entering numeric data that is required for selecting a locomotive or other device. Use the 0 key for Headlight and the 1 key for Bell if you have a sound system.

HEADLIGHT

The "0" button (the headlight is Function 0) toggles the Headlight on and off.

ENTER

Used to confirm numeric input.

SELECT LOCO

This selects the locomotive/consist to operate. When this key is pressed, the Status LED will light indicating that a numeric entry is expected. Enter the loco/consist number, then press ENTER.

MACRO

Macros are explained in detail in our system reference manual. When this key is pressed, the Status LED will light indicating that a numeric entry is expected. Enter the macro number, then press ENTER. Macros are used to control one or more accessory decoders with a single command. In operation this is much easier than using the ProCab "Select Accy" button to control switches.

SETTING UP YOUR CAB04e

Just as every locomotive has a separate number (address in DCC terms) each cab needs a separate address so the command station can distinguish one cab from another. Each CAB04e is shipped from the factory with the addresses of 5 and 6. When the address toggle switch is in the left position the cab address is 5. In the right position the factory default address is 6. If this is not your first CAB04e you will have to change the addresses before using the cab.

To change the cab address:

- 1) Turn on the DCC system.
- 2) Unplug your CAB04e from the cab bus.
- 3) Position the toggle switch to the left or right depending on the address you wish to change.
- 4) Plug the cab back in while holding down the SELECT LOCO button.
- 5) Release the SELECT LOCO button. The cab will now enter its internal setup program indicated by a flashing LED.
- 6) Press "1" to enter cab address setup mode. The LED flash rate slows to indicate the cab is ready for you to enter a new cab address.
- 7) Type in the desired cab address followed by the ENTER key.
- 8) If you enter cab address 00 the entire cab will reset to its factory settings. If you enter address 01 the entire cab will revert to its original factory settings *except* for any shifted keys you have already programmed into the cab (the OPTION key will be set to act as DIRECTION). Valid cab addresses are 2 to 63. If you enter a number outside this range the LED will flash rapidly indicating an error. Press SELECT LOCO to clear the error and go back to step 2. This finishes setting the cab address.
- 9) Repeat the process with the address toggle in the opposite position for the "other" cab address.

Table of values for OPTION button and "Shifted" buttons

To change between REGULAR and YARD modes:

- 1) Turn on the DCC system.
- 2) Unplug your CAB04e from the cab bus
- 3) Plug the cab back in while holding down the SELECT LOCO button.
- 4) Release the SELECT LOCO button. The cab will now enter its internal setup program indicated by a flashing LED.
- 5) Press "2" to enter Yard or Normal select mode. The LED flash rate slows to indicate the cab is ready for you to select which mode
- 6) Press "1" for Yard mode or press "2" for Normal mode. If you enter a number outside this range it will not be accepted and the cab will continue to wait for "1" or "2".

To change BALLISTIC TRACKING rate (CAB04e only):

- 1) Turn on the DCC system.
- 2) Unplug your CAB04e from the cab bus
- 3) Plug the cab back in while holding down the SELECT LOCO button.
- 4) Release the SELECT LOCO button. The cab will now enter its internal setup program indicated by a flashing LED.
- 5) Press "3" to enter the ballistic tracking rate setup mode. Notice the flashing of the LED slows indicating it is ready to accept the new data.
- 6) Ballistic tracking provides a means the speed will ramp up/down quickly if the knob is turned fast and it will ramp up/down slowly if the knob is turned slowly. This gives you very fine control by turning the knob slowly yet allows quickly changing speed if you want by turning it fast. The factory setting is 3. Lower numbers lower the sensitivity and higher numbers increase the sensitivity to how fast the knob is turned. If you enter a number outside this range it will not be accepted and the cab will continue to wait for a number in the range of 0 to 7.

Setting the OPTION key:

Each "half" of the cab can have different OPTION key settings

- 1) Turn on the command station
- 2) Unplug your cab from the command station
- 3) Press and hold down the SELECT LOCO button while plugging in the cab. The cab will now enter its internal setup program. This is indicated by a flashing status LED.
- 4) Press "4" to enter OPTION key setup mode. Notice the flashing of the LED slows indicating it's ready to accept the new key value.
- 5) Enter a new value for the OPTION key from the table on the next page, followed by the ENTER key. If you enter a number less than 64 or greater than 128 the LED will flash rapidly indicating an error. If you get an error press SELECT LOCO to clear the error and go back to step 2.

Value	Key Name	Value	Key Name
64	Enter	97	Program on Main
65	Program	98	Set Clock
66	Recall	99	Use program track
67	Direction toggle	100	Setup command station
68	Setup consist	101	Setup Procab
69	Add loco to consist	102	Setup macros
70	Delete loco from consist	103	Setup old consist
71	Kill consist	104	Setup advanced consist
72	Select loco	105	Display LCD lines 3 and 4
73	Horn button down	106	Forward
74	1 Speed step faster	107	Reverse
75	1 Speed step slower	108	Select Signal
76	Emergency Stop	109	reserved
77	Bell	110	reserved
78	Select Accy	111	Momentum
79	Expn (Expansion) key	112	F10
80	Headlight, Zero key	113	F11
81	F1, number 1 key	114	F12
82	F2, number 2 key	115	reserved
83	F3, number 3 key	116	reserved
84	F4, number 4 key	117	reserved
85	F5, number 5 key	118	reserved
86	F6, number 6 key	119	reserved
87	F7, number 7 key	120	reserved
88	F8, number 8 key	121	reserved
89	F9, number 9 key	122	F13-F28 control
90	4/10 speed steps faster	123	Alt momentary button down
91	4/10 speed steps slower	124	Alt momentary button up
92	Macro	125	"no key" pressed
93	28/128 speed select	126	reserved
94	Brake	127	do not use
95	Horn button up	128	"Special" shift key
96	Assign Loco to Cab	129	reserved

Notes on OPTION key settings:

Some of the possible values for the OPTION key are impractical as they require many visual prompts on the LCD of a ProCab. In the above table the most practical key values are listed in bold type.

If you are adventurous you can try some other key values. We use Programming On The Main fairly often.

1. Set the option key value to 97
2. Use Programming on the Main with your ProCab and record the key strokes to access CV programming. (PROGRAM ON MAIN, ENTER, ENTER, 2, CV#, CV value, ENTER [the last ENTER exits programming])
3. Press OPTION on the Cab04e and notice the LED will light indicating data entry mode. Press the keys you recorded in step 2.