CommBox Joey Editor

Programming Manual

For Version 2.7.26
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Introduction to Joey Editor

CommBox Joey Editor is a full-featured application that allows you to create custom applications for Joey series control panels without needing any conventional programming skills.

This document will concentrate on the Joey Micro series. It will introduce you to the software and in tutorial fashion take you through the necessary steps to create a typical custom application.

What you will need

- In addition to the Joey software you will need **Code Manager**. This is available for download from the same location ([www.commbbox.com.au/joeytools](http://www.commbbox.com.au/joeytools)) The Code Manager installer contains the serial and IR device library as well as the tools needed to create and test new device driver (.TCS) files for IR and RS232 controlled devices.
- A programming cable – CommBox part number ZTC0202.
- Suitable cables to connect the devices you wish to control. CommBox can supply a range of ready-made RS232 cables and IR couplers.
- Professionalism – includes having a clear definition of the job at hand, obtaining any device interface information before you start and testing the final application before you go on site. Professionalism saves time, money and leads to repeat business.

The steps to creating a custom Joey application

- Design and construct your user interface – **Edit Graphics**. (For most models this step may include printing the custom key overlay you have created.)
- Define the actions under each key – **Edit Behaviour**
- Downloading the new application to the Joey.

Edit Graphics

Choosing your model

First, start Joey Editor (or click New) and choose the model you wish to use.

*For this tutorial, we will choose Joey Micro 9.*

You may not see as many devices as are shown here. By default, Legacy Support (support for superseded models) is not installed.

However, there are instructions in the Model folder for adding Legacy Support if you need to re-program an old Joey.

If you are opening an existing .jy file, it doesn't matter which model you choose, that decision will be made by the .jy file you open.
Drag the Graphics Toolbox out of the way to get a clear view of the Joey's screen. “Mouse over” the Toolbar buttons to see what each one does.

Drag and drop a background onto the screen

You can use the Add Bitmap button in the Graphics Toolbox to do this one at a time, but there is a quicker way that works particularly well if your system has a two-screen extended desktop.

Open Windows Explorer in another window (or on the 2nd screen) and browse to the Library as shown on the following page.
Choose the background you want to use and drag it onto the Joey's screen.

Next, in the Graphics Toolbox, click on "scr" (screen).

The background you selected will fill the screen area, like this.
Drag and Drop buttons onto the screen

In Windows Explorer, browse to the button style library you wish to use, Control-Click (multiple select) your desired choice of buttons and Drop them onto the screen.

For this tutorial, choose:
- Off
- Volume Up
- Volume Down
- IPOD
- Pic Mute
- Pic UnMute
- PC
- Laptop
- DVD

You will have a jumble of buttons, like this:

Control – click (multiple select) all the buttons so they look like this:
Click on “btn” (button) this time in the Graphics Toolbox and the buttons will resize and snap into position, like this:

**Transparency**

To restore the rounded corners on the buttons, select them all as before and tick “transparency” as shown here.

This is the result.
Move buttons
into their final positions using drag and drop. They will snap into place on the button grid.

Alternative styles
may be selected by choosing from different button folders.
Graphics Toolbox

Graphics Toolbox is used for a wide range of graphics-related operations, including:

- Adding and deleting bitmaps
- Adding, editing and deleting text objects
- Controlling scaling, positioning and transparency of bitmaps
- Adjusting object layers (to affect visibility)

To **add a bitmap**, click Add Bitmap and a file requester appears. Browse to the desired object and click Open.

When adding a bitmap you have the option of scaling it as a button **(btn)** to fit the Joey screen **(scr)**, as a **1:1** (i.e. no scaling, original size) or Pixel for Pixel. This last option is mainly used for dithered objects on Joey touchscreen models.

**Transparency** will take whatever colour in the bitmap that matches that of the top left-hand pixel, remove it, and display what's underneath. This is normally used to get rounded corners on button objects.

To **delete** an object, you can select it on the Joey screen or in the Graphics Toolbox Layers list.

**SNAP** and **GRID** are there to help you line objects up accurately.

**Text objects**

Click **Add Text**. The work TEXT appears on the Joey screen in the currently-selected font, size and colour. You can type over and the word TEXT will be replaced with your text. Or, if you are editing an existing object, click it and use Delete and/or Backspace to erase what's there.

It helps to use **Align Left** when editing and choose another attribute when you are finished.

When printing underlays for Joey Micros, there is an issue with some printers omitting lines in multi-line text. You can work around this by using separate text objects.
Edit Behaviour

Choose Edit Behaviour mode using the radio button on the toolbar. In this mode you determine how the buttons that you put on the screen in the previous step will actually work.

Hot Keys

Joey supports multiple “screens” which you can jump to from keys. In the case of Joey Micro a LED can be lit to indicate which “screen” (or menu) you are in. The functionality of these screens will be explained later, but what we are interested in now is whether we always want the same key to do the same thing regardless of the screen that’s selected. Keys that work like this are called Hot Keys. Most of the time, we want Hot Keys. Otherwise we’ll have to program each key on every screen. To avoid this (it’s tedious and mistake-prone) we should make as many keys as possible “Hot Keys”.

Unless a toggle function or extra control layers are needed, it’s best to start by making all keys Hot Keys. If you need to change one or more keys to Normal keys later, that’s no problem.

If you “mouse over” a key, a green or yellow circle will appear. Green means “Normal key”, Yellow means “Hot key”.

How to make all keys Hot Keys

Click the yellow circle on the toolbar.

The Hot Key selector will appear.
Control – click all the keys in the right-hand column.

Click the “<<” button.

All the keys will move into the Hot Keys column. They will now appear Yellow if you mouse over them.

Click OK.

*Did I forget to program a key?*

If you hold the “CTRL” key on your keyboard with the mouse over the Joey screen, circles will appear on all the keys. They will be **Yellow** if they are programmed as a Hot Key, **Green** if programmed as a Normal key and **Grey** if Not Programmed.
Creating Screens

On Joey Micros, named screens are used to light LEDs to indicate, for example, the source that has been selected.

Each screen should be given a meaningful and unique name.

Use the Current Screen drop-down to rename Screen 1 to Off and create the other four screens as shown in this example.

Never create blank fields by deleting the text in the field. This does NOT delete the screen. Use Delete Unused Resources to do that.

Go to screens and LED state

This is where you set up the functionality of the LEDs.

We'll start by programming the Off key.

- Choose the OFF screen using the Current Screen drop-down as in the previous step.
- Double-click the OFF key. A key actions definition window opens.
- Click the Go to screen radio button.
- Choose the Off screen in the drop-down. This will cause the Off screen to be chosen when the Off key is pressed.
- Using the LED State drop-down, choose On. This will cause the LED on the Off key to light when the Off screen is active.

Don’t forget to tick Print Circle wherever you are activating a LED – this will cause a white dot to be left on the printout so that the LED can be seen when it’s lit.

The remaining functionality will be added in later steps. For now, we’ll program the other four screens for screen goto and LED functionality.
Next, we’ll program the PC key.

- Choose the PC screen using the Current Screen drop-down as in the previous step.
- Double-click the PC key. A key actions definition window opens.
- Click the Go to screen radio button.
- Choose the PC screen in the drop-down. This will cause the PC screen to be chosen when the PC key is pressed.
- Using the LED State drop-down, choose On. This will cause the LED on the PC key to light when the PC screen is active.

Get the idea?

As before, don’t forget to tick Print Circle wherever you are activating a LED – this will cause a white dot to be left on the printout so that the LED can be seen when it’s lit.

Repeat these steps for the Laptop, DVD player and Aux Audio screens and keys.

You will want the Laptop key to Go To the Laptop screen, and, when in that screen, light the LED on the Laptop button. The same goes for the DVD player and Aux Audio (Ipod) screens and keys.

When you are finished, you should be able to single-click each of the 5 keys you have programmed and its LED will light, just as it would on the actual Joey.
Controlling devices with Joey

So far, we have created a set of keys that will light LEDs when pressed. Next, we'll make them actually control something. In order to do this, we first have to design our system and then understand what we are controlling.

**Designing the system**

In this scenario we have:

- An Epson projector
- A motorised screen
- A Dynalink HDMI switcher and audio extractor
- A Cat5 HDMI extender
- A Bluray or DVD player (using analog audio outputs)
- A CommBox AVBox

GND and Power connections are not shown for clarity.
Programming the Volume keys.

- Double-click the Volume Up key.
- Click the Codeset button and choose AVBox Standard.
- Click “Volume Up” in this list.

The command appears in the Transmit code sequence window.

- Repeat, using “Volume Down” for the Volume Down key.
A simple macro – the Off key

When we press the OFF key, we want the following sequence to occur:

- Screen up (see Relay Output below)
- Audio Off
- Picture muted
- A “grace” timeout of 15 seconds.
- Projector OFF

Here are the steps to building this macro.

- Double-click the OFF key.
- Click the Codeset button. Choose Load New Codeset and navigate to the “Epson EB series” codeset in the Codeset library. Click OK.

The list of available commands will appear. You should now have two such lists on your desktop, one for the AV box you loaded previously and this one. It’s then just a matter of clicking on the commands in sequence to build the macro as shown here.

Note that in this case the audio is switched off by selecting an unused input on the AVBox.

Don’t forget to include Set Port commands so that the following serial command gets routed to the port to which the projector is connected. With early model Joey Micros this made no difference but the 32 bit Joeys now have addressable RS232 ports.

Relay Output

The Screen Up function is performed by turning OFF the Relay Output that is connected to the Trigger input of the motorised screen.

Why do this?

If OFF is pressed accidentally, the user will have 15 seconds to re-select the source. Doing so cancels the timer and avoids the disruption caused by a lamp cool-down and warmup cycle.
**Aux Audio and Picture Mute keys**

These are simple single-command keys and are programmed as shown here:

**Aux Audio (Ipod) key**

**Picture UnMute key**

**Picture Mute key**
**Source Select keys**

This view shows how you can set up your desktop to make it quick and easy to build macros. In the Epson codeset, the Source command strings are split into two parts. This is done purely for convenience – it allows all commands to fit into a single Codeset file.

This is the macro for the “PC” key.

The idea behind this and the other similar macros is to provide a quick response if the projector is already on, but also allow for the possibility that it is off. For this reason the Source Select commands are repeated after allowing time for the projector to warm up. This is needed because most projectors will ignore a Source Select command until warmup is completed.

The “Timer” command runs in the background, allowing other keys to be pressed while it is running.
Changing macros to suit new hardware

This is the DVD player source macro.

In the example shown here we will consider what to do if our DVD player does not have an HDMI output. Instead, we will connect it directly to the projector’s Composite Video input and make the necessary adjustment (Video 1 instead of HDMI 1) to the macro.

Smooth Volume Control when using RS232

In this alternative Volume Control macro, we are using the projector’s audio system instead of the AVBox.

To get a smooth volume control when using RS232, we need to “pad out” the timing so that the commands are not sent too quickly. We use an IR command (any IR command will do) as a “time waster”.

On some projectors, when using RS232 for volume control, the Volume state is not displayed on-screen.

Defining keypress behaviour with -BEGIN LOOP-

Notice the BEGIN LOOP command in the above macro.

By default, an RS232 command is sent once only when a key is pressed, but an IR command is sent repeatedly while ever the key is held down. BEGIN LOOP is used to alter that behaviour. Placed at the end of a sequence, Begin Loop will cause an IR command to be sent once only. This is useful for sending numbers and navigating menus where you don’t want the command repeated.
Replacing Codesets

If a piece of equipment (such as a projector) is being changed, you can swap out its codeset in your Joey program using the **Replace Codeset** function.

In many cases, particularly if you are using codesets from the library, there may well be few or no other changes needed.

The screenshots here show the steps to replace a codeset.

**Non-matching codesets**

If this window appears, scan the lists to see whether there are any differences that affect your application. If there are, make a note of them, you will have to edit the affected keys after accepting the replace.

As you can see, for our purposes most of the commands line up. However, both codesets use two-part strings. You can’t see the “Header” in the Hitachi codeset on the screenshot, you’d have to scroll down to the end of the list.

In this case, the “Header” command replaces the “Source” command for all the Source Select commands, but you will have to manually add a “Header” in front of all the other projector commands.

**New codeset is shorter than the old one**

If the new codeset is shorter than the old one AND the old codeset has commands that are used in your application that extend beyond the end of the new codeset list, you should cancel the Replace operation. If you go ahead, the editor may crash and you may be left with a corrupted .jy file.
Device Options

*Inactivity time-out and the PIR sensor*

Joey Editor includes a function for switching off equipment such as projectors or displays when there has been no activity detected in the room for a pre-determined time.

Activity can simply be key presses. But in many cases this will not be enough, so you have the option of connecting an ordinary inexpensive security-grade PIR sensor to the RJ45 socket on the Access Port. (The connections are shown on the access port itself.)

The PIR will generate a dummy key press whenever movement is detected. This resets Joey's no-activity timer to its starting value.

To use this feature, all you have to do is set it up in Device Options, as follows:

- **Select the Inactivity Timeout.**

- **Click Edit Actions.** A Timeout Actions window opens. This is the same as a key actions window. Normally you would fill it in so that it's the same as the Off key.
**Key sounds**

You can change the noise keys make in the Device Options dialog.

**Geek tip:** The option you choose here creates a token for 1 of 3 sampled sounds. If you want louder beeps, you can edit the token using **Advanced Functions > Edit Source**. Changing the number away from the token will cause the number to be used as the pitch in a “beep” routine.

**Vibrate**

The capacitive touch Joey Micro models will vibrate when a programmed key is touched. This functionality is not user programmable.

**Resources**

Resources are graphics, complete screens and codesets that are stored in the .jy file when you save it.

**Removing unused resources**

If you replace, delete or simply decide not to use a resource it remains in the .jy file unless you purge it. It's a good idea to do this when you have finished with an application, it will make the file smaller. You cannot remove a resource if it's referenced anywhere in your application.

**Exporting resources**

A Joey file created by someone else may contain a graphic or codeset you'd like to use in your application. Or, you may want to export a codeset so that you can modify it to fix a problem or build a replica of it to control a different device.

Choose Export Resource from the File menu, choose your resource and click Export. Choose where you wish to save your file.

**A time-saving tip:**

If you export a resource, modify it and save it, Joey will notice you have done so and will ask you if you want to replace the existing resource. This feature is very useful when you are debugging the RS232 interface of a device, for example.
Downloading to Joey
You will need a ZTC0202 programming cable. These are available from CommBox.

If you don’t have one and wish to make your own, here are the connections:

**Programming cable pinouts**

<table>
<thead>
<tr>
<th>DB9 female</th>
<th>3.5mm TRS (stereo earphone) plug</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Tip</td>
</tr>
<tr>
<td>3</td>
<td>Ring</td>
</tr>
<tr>
<td>5</td>
<td>Sleeve</td>
</tr>
</tbody>
</table>

Connect the programming cable to the Programming Port on the Access Port and either a “real” or USB serial port on your PC.

**Start the download**
by clicking the green arrow on the toolbar.

Downloading to a Joey Micro will take 5 to 10 seconds.

If the download step fails, you’ll get a message like the one shown here.

To fix this, you’ll need to choose the correct serial port.
Setting up your Serial Port

Use the “Communications” drop-down to choose your serial port. A correct choice will display the major firmware revision number for the connected Joey.

Sometimes, USB serial ports can cache garbage data, causing the connection to fail. Try choosing another port, then the correct one again.

If that fails, click the Reset button to send a Device Reset command to the Joey. This will cause it to restart. Reselecting the port after that should work.

File Locations and Auto Backup

While you are in Preferences, you should take the opportunity to set up your default File Locations. This will speed up your work by reducing the amount of file navigation you'll need to do.

The Configuration folder you choose must have read-write access so that you can save files to it.

Unless you have a good reason not to, deselect “Save a backup...”
Using the Relay Driver outputs

In this tutorial, we used the Relay Output to control a screen using its trigger input. More relay driver functionality is available.

The Joey Editor includes native support for the CommBox Multimedia Port, a product which is now obsolete. However, you can still use its four relay driver outputs for other purposes. On the ZTT1810 Access Port, they are broken out to screw terminals labelled Relay Drivers 1, 4, 5 and 6. These numbers refer to the pin numbers on the 10 way ribbon cable (which must of course be connected to use the relay driver outputs).

**Electrical characteristics of the Relay Driver outputs.**

Each Relay Driver output is an open collector NPN transistor with a backswing protection diode connected to +12v. Each can sink 100mA to ground when activated. The load must not exceed +12v DC – preferably use the +12v source that's adjacent on the screw terminals. There is no short circuit protection so use care that your switched loads can never be shorted to 12v. Doing so will damage the driver IC in the Joey.

**Programming the Relay Drivers – the limitations.**

Firstly, be aware that you can only directly program the relay drivers to be ON or OFF. Momentary or Toggle functions are not supported but can be achieved by tricks that will be described later.

Secondly, Relay Drivers 5 and 6 can only be accessed as a pair. You can set them to one of four possible states.

We use Relay Drivers 5 and 6 to control a CommBox USB host switch.

**Using the Trigger input on motorised screens**

Trigger inputs on screens are normally isolated from ground, using an optoisolator. Before connecting to the Access Port, use an ohm-meter to check that your screen's trigger connections do NOT connect to ground.

Connect the ( - ) trigger input to Relay Driver 1.
Connect the ( + ) trigger input to +12v.
Relay driver handles

Relay driver numbers and their corresponding “handles” are shown here.
The use of Relay Output 1 is as shown.
Choosing the No Change option allows you to leave a relay driver undisturbed while changing others.

Relay Driver 4 is accessed as follows:

Relay Drivers 5 and 6 are accessed as shown in the table:

<table>
<thead>
<tr>
<th>Selection</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>AV 1</td>
<td>Off</td>
<td>Off</td>
</tr>
<tr>
<td>AV 2</td>
<td>On</td>
<td>Off</td>
</tr>
<tr>
<td>AV 3</td>
<td>Off</td>
<td>On</td>
</tr>
<tr>
<td>AV 4</td>
<td>On</td>
<td>On</td>
</tr>
</tbody>
</table>
Programming Momentary Operation
using the No-Activity Timeout facility.

Suppose you want to use relay drivers 1 and 4 to interface to two momentary contact pushbuttons. These might be used to operate a screen or lighting controls. They are used for operating the DC motor on CommBox motorised stands.

So far, you know how to turn them on, but the system you are controlling assumes the user will release the key after about a second. The Joey will not emulate this behaviour unless you take some extra steps.

Joey includes a facility that is normally used to turn off a projector after no key presses or PIR movement detector inputs have been detected for a period of time – typically about 2 hours. You can re-purpose this facility to quickly turn off your relay drivers so that they perform a momentary function. Of course, doing so means that you can no longer use it for room time-out purposes. If your installation includes a projector and motorised screen and you need the room timeout, see Using the Trigger Input on motorised screens for alternative connection methods that don't require the use of momentary operation.

Step 1 – select the Timeout Options.

A dialog will open where you can choose your timeout.

Choose the smallest delay you can select – 10 seconds.

This is really too long for most practical applications but we will fix this later.

Step 2 – Edit Actions

After setting the timeout, click the Edit Actions button. A similar dialog appears to that used for Key Actions.
In the Multimedia Port section, turn OFF Relay Drivers 1 and 4 as shown here.

At this point in your programming, you can turn on Relay Drivers 1 and 4 with a key and they will turn off again after 10 seconds. To reduce this time (as you would need to do if using the keys to operate a motorised stand) you’ll need to bypass the GUI and edit the source code directly.

**Step 3 – Edit Source**

Choose the function as shown:

You will be warned to be careful.
Don't change anything else unless you know what you are doing!
Save your changes and download.
The Relay Drivers 1 and 4 will now turn off 1 second after the key is released.

See the manual “Using the Relay Drivers” for more information on connections.