StageAID

X32 Practical Workflow

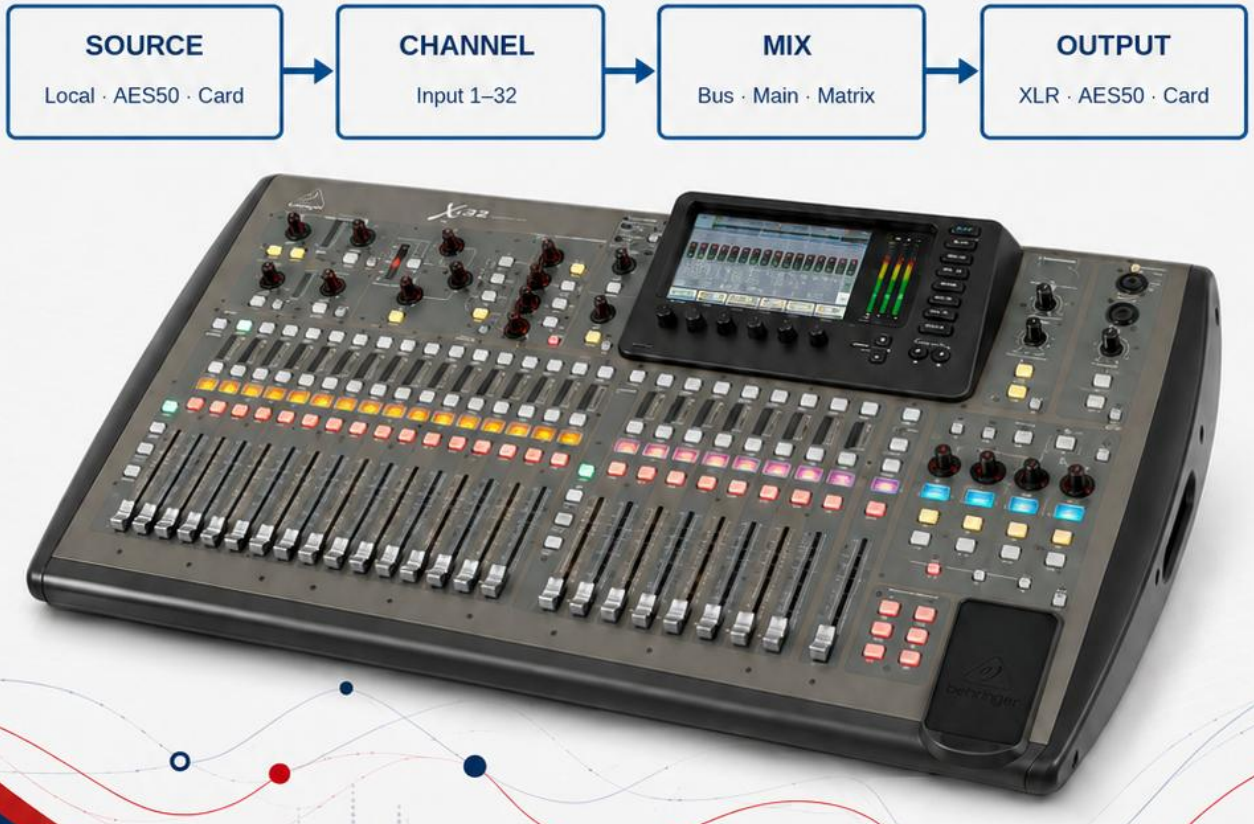
Advanced Workflows

Understanding Routing

Assign inputs, buses, outputs and AES50 safely

Workflow 3 of more than 20

Supplement to the StageAID Behringer X32 Practical Manual



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Workflow 3: Understanding Behringer X32 Routing

Assign inputs, buses, outputs and AES50 safely · Series: X32 Advanced Workflows · Supplement to the StageAID Behringer X32 Practical Manual

Requirements and goal of the workflow

- Behringer X32 Full-Size with firmware 4.x and 48 kHz.
- Basic knowledge of the channel strip, mix bus and Main L/R; the basic terms are explained in the StageAID Practical Manual.
- For the AES50 examples: a compatible S16 stagebox and a tested, shielded Cat5e/etherCON cable.
- For the Card examples: an installed X-USB/X-Live card or another suitable expansion card.
- A simple patch list: source, X32 channel, bus/Main, logical OUT, physical output.

Important: This workflow explains routing as a signal path. It does not replace the topics of gain staging, monitor mixing or effects; it shows how their signals reach the correct destination in the first place.

What this is about

The X32 can show signal levels at several points at the same time and still remain silent at the loudspeaker. That is exactly why routing often seems more complicated to beginners than it technically is: there is no single “routing” function, but several consecutive assignments. On the input side, you define which physical or digital source feeds a channel. On the output side, you define which internal signal reaches which physical output.

The most important change in thinking is therefore: always name the source and destination first. Then build the path between them in the same order in which the signal travels through the console.

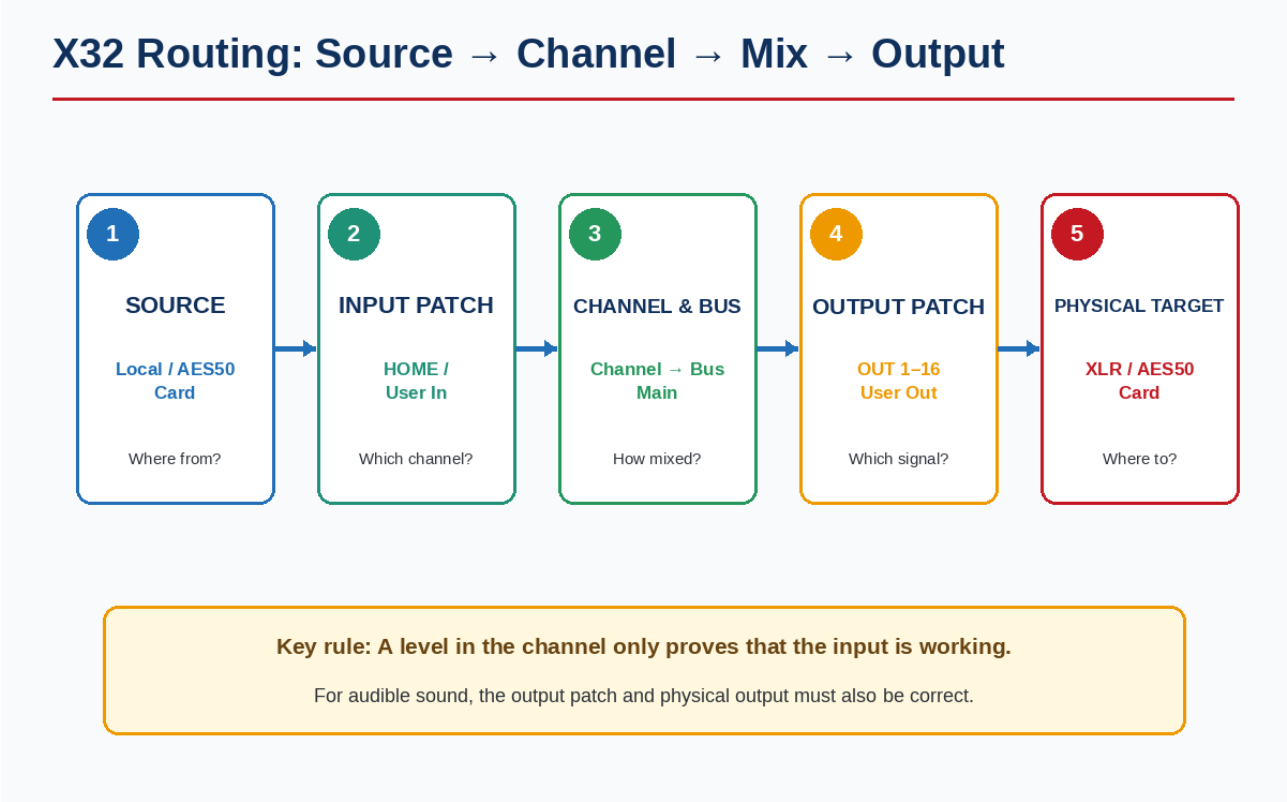

Figure 1: Routing as a chain of source, input patch, mixing, output patch and physical destination.

Key rule: A level in the input channel only means that the first part of the chain is working. For sound at the loudspeaker, the bus/Main, output patch and physical output must also be correct.

Input routing: Reading HOME / Inputs correctly

On the ROUTING page, the 32 fully featured input channels are fed in four blocks of eight: 1–8, 9–16, 17–24 and 25–32. Depending on the setup, the sources can include the local XLR inputs, AES50-A, AES50-B, Card or User In. This is the X32’s classic block routing.

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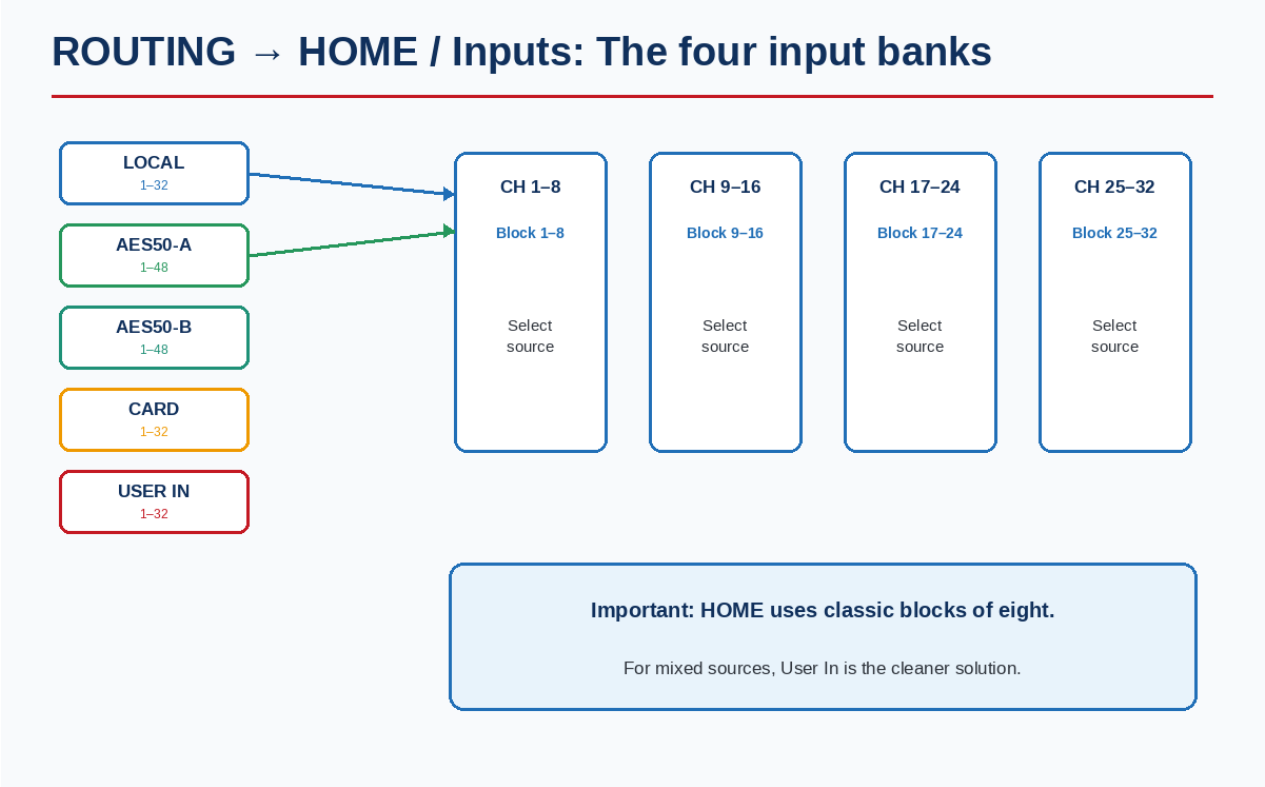

Figure 2: The four X32 channel blocks and typical source families.

Why block routing makes sense at first

For many productions, the fixed eight-channel logic is actually helpful. For example, an S16 supplies its inputs 1–16 as AES50-A 1–16. If channels 1–16 are also assigned to AES50-A 1–16, the assignment remains immediately easy to read. It only becomes problematic when sources from different areas need to be mixed within one block of eight.

Practice: As long as a complete block of eight comes from the same source family, stay with normal input routing. User In is not a mandatory step, but a tool for mixed patches.

Single channel instead of a block of eight: Source on the Config page

For a single channel, the source can also be selected on its Config page. This is practical for a quick correction. For larger patches, the ROUTING page is clearer because the assignments of several channels remain visible together. The important point is that both operating methods ultimately change the source of the channel strip; they are not two separate signal paths.

User In: Deliberately break up block boundaries

With firmware 4.x, User In was introduced as a flexible intermediate layer. Instead of taking over a complete channel block from Local, AES50 or Card, you can assemble your own User In block from individual sources. Under HOME, for example, channels 1–8 are then simply assigned to User In 1–8.

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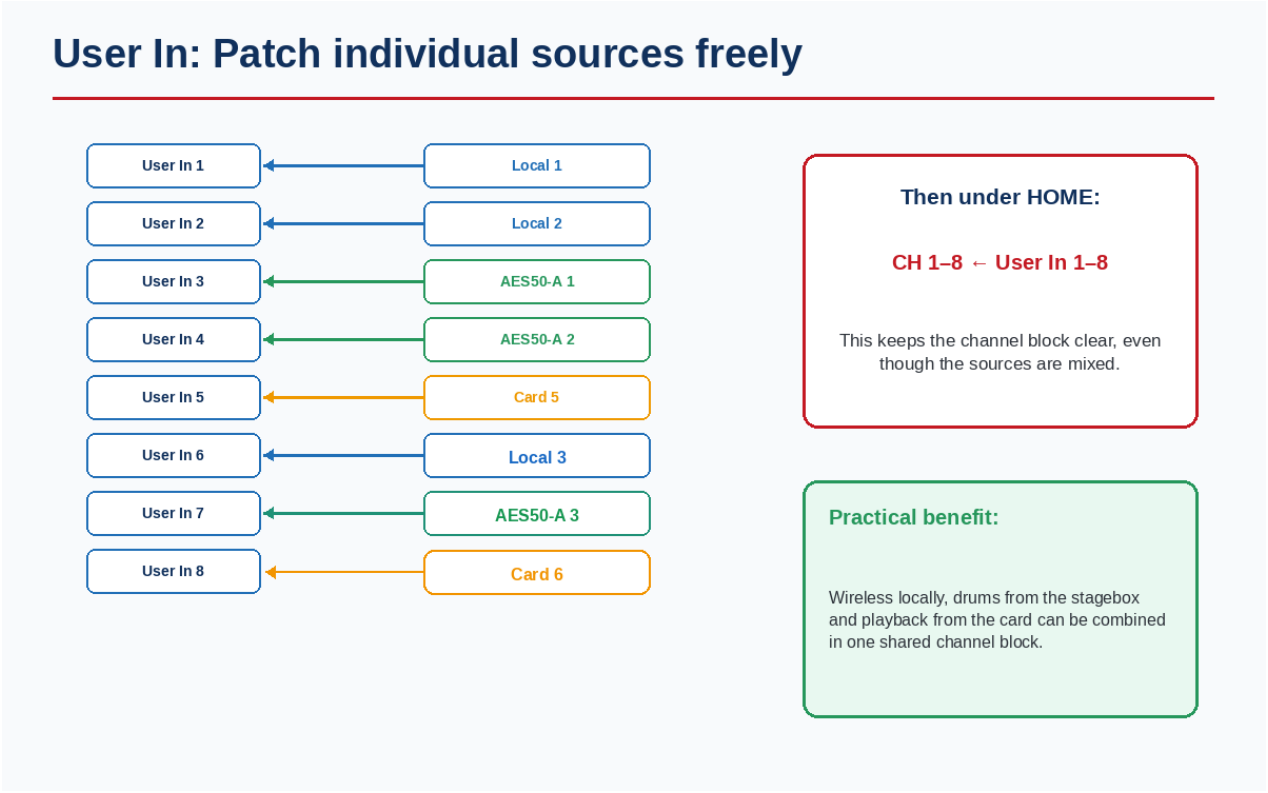

Figure 3: User In combines individual sources into a new, freely assembled input pool.

Typical example: Wireless, stagebox and playback in one block

1. User In 1 = Local 1 for the local wireless receiver.

2. User In 2 = Local 2 for the presenter microphone.

3. User In 3/4 = AES50-A 1/2 from the S16 stagebox.

4. User In 5 = Card 5 for playback from the computer.

5. Under ROUTING → HOME, channels 1–8 are assigned to User In 1–8.

Avoid: Building User In unnecessarily complex and then failing to document it. Flexible patches are only better when the channel name, source and position are recorded clearly.

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Buses and Main: Routing is not the same as mixing

A common misconception arises when input routing, bus sends and output routing are treated as one and the same. A channel receives its source through input routing. The mix then determines how much of that channel reaches Main L/R or a bus. Only after that is the completed bus or Main routed to an output.

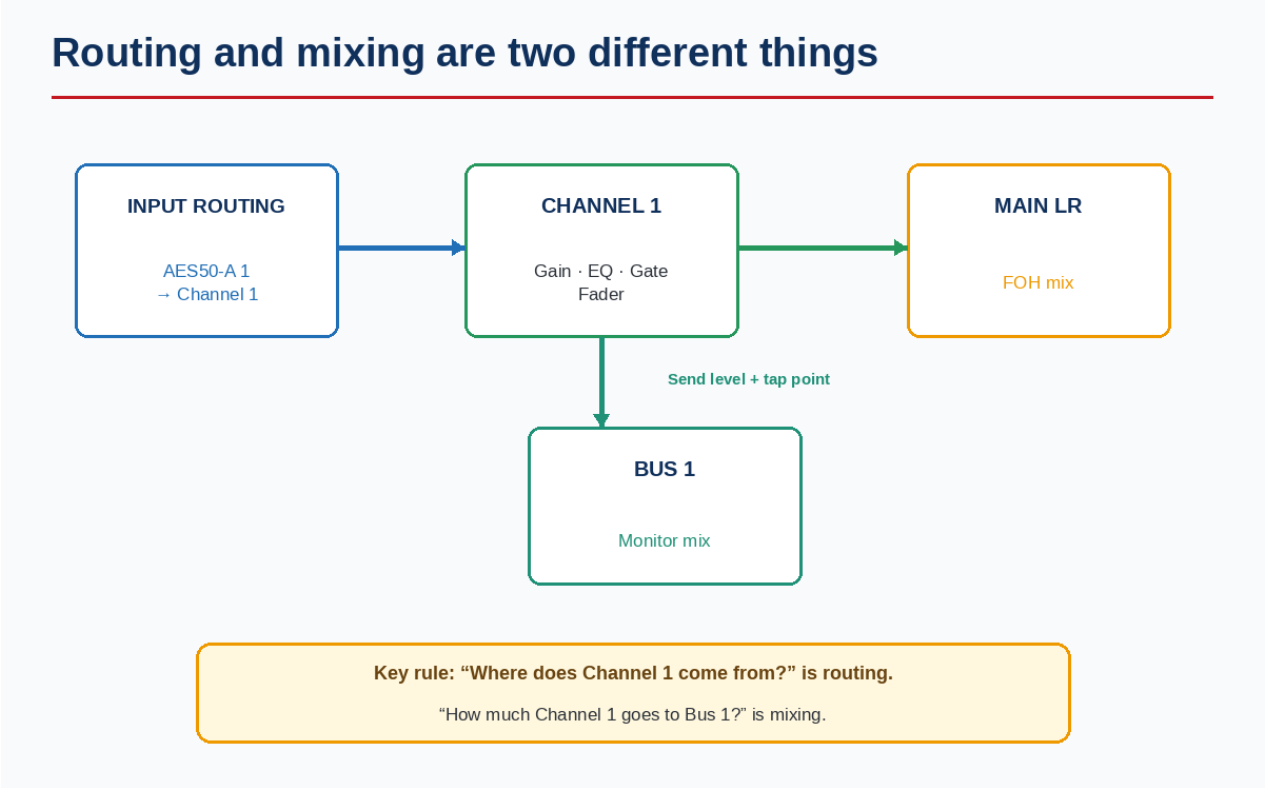

Figure 4: Input routing determines the channel source; bus sends determine the amount in each mix.

Pre-fader and post-fader are part of mixing

A send from a channel to a monitor bus is often set to pre-fader so that movements of the FOH channel fader do not change the monitor mix. This is not a change to the input routing. It is simply the choice of tap point within the already routed channel strip.

Key rule: Routing answers “where from?” and “where to?”. Fader, send and tap point answer “how much?” and “at which point in the channel strip?”.

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Output routing: OUT 1–16 and XLR Out

On the output side, the X32 also works with two layers. Under ROUTING → Analog Out or OUT 1–16, a logical output is created first: OUT 1 can be Mix Bus 1, for example, OUT 15 Main L and OUT 16 Main R. Only in the XLR Out section is it defined which of these logical OUT channels appears at the physical XLR sockets.

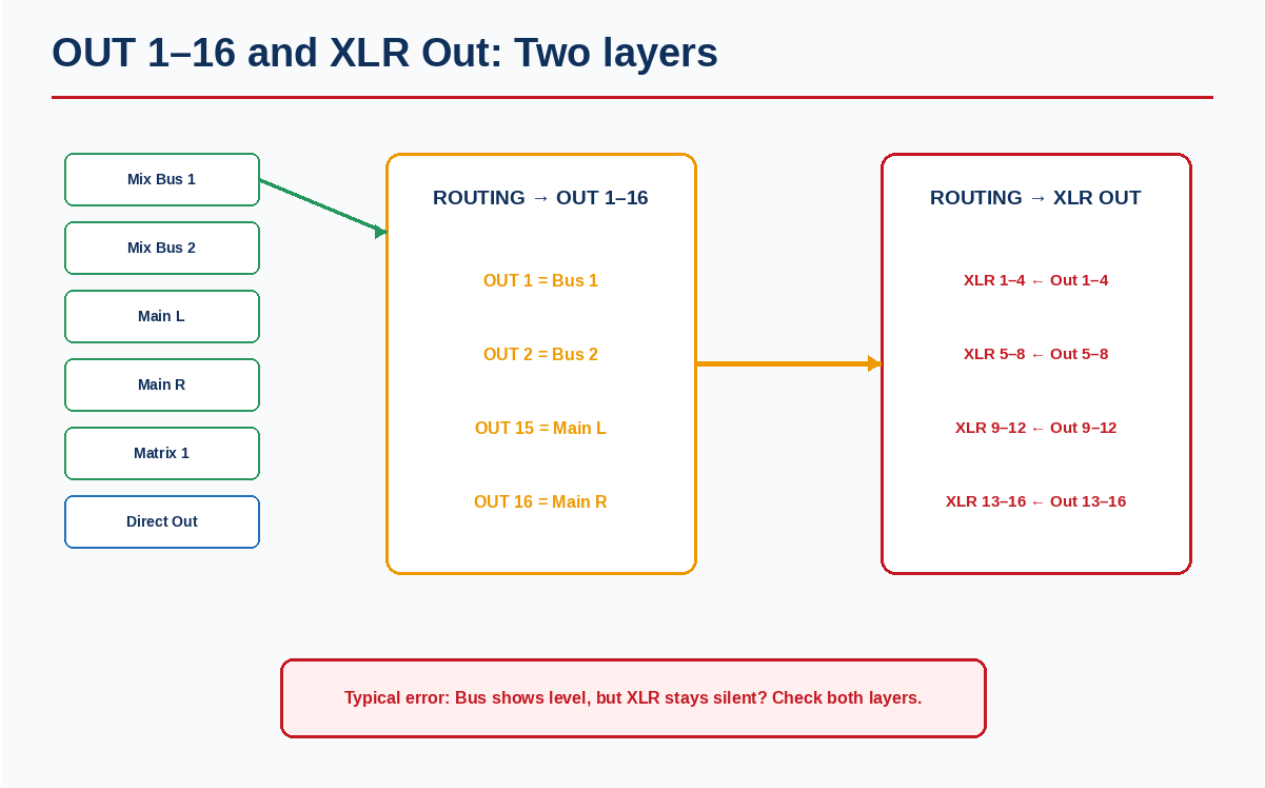

Figure 5: A logical output and a physical XLR socket are separate routing layers.

Factory default - and why it can be misleading

In the factory default, the system appears simpler because OUT 1–14 typically correspond to the mix buses with the same numbers, OUT 15/16 correspond to Main L/R, and the XLR outputs point 1:1 to these OUT channels. As soon as a scene, guest setup or special routing changes this assignment, looking at only one page is no longer enough.

Typical error: Bus 3 shows a level and OUT 3 is correct, but the physical socket being used is not assigned to OUT 3. Therefore, if the output signal is missing, always check both layers.

Tap point at the logical output

At the logical OUT, you also define the point at which the signal is tapped. For a monitor bus, post-fader is often useful because the bus master and its mute should control the complete path. A Direct Out, however, may be tapped at a different point depending on its purpose. The tap point is therefore part of the output definition, not the physical socket assignment.

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AES50 outputs and stageboxes

If the signal is not output at the X32 itself but at an S16, another layer is added: the required OUT or User Out block must be assigned under ROUTING → AES50-A or AES50-B to the appropriate AES50 channels. The stagebox then converts these digital channels back into analog XLR outputs.

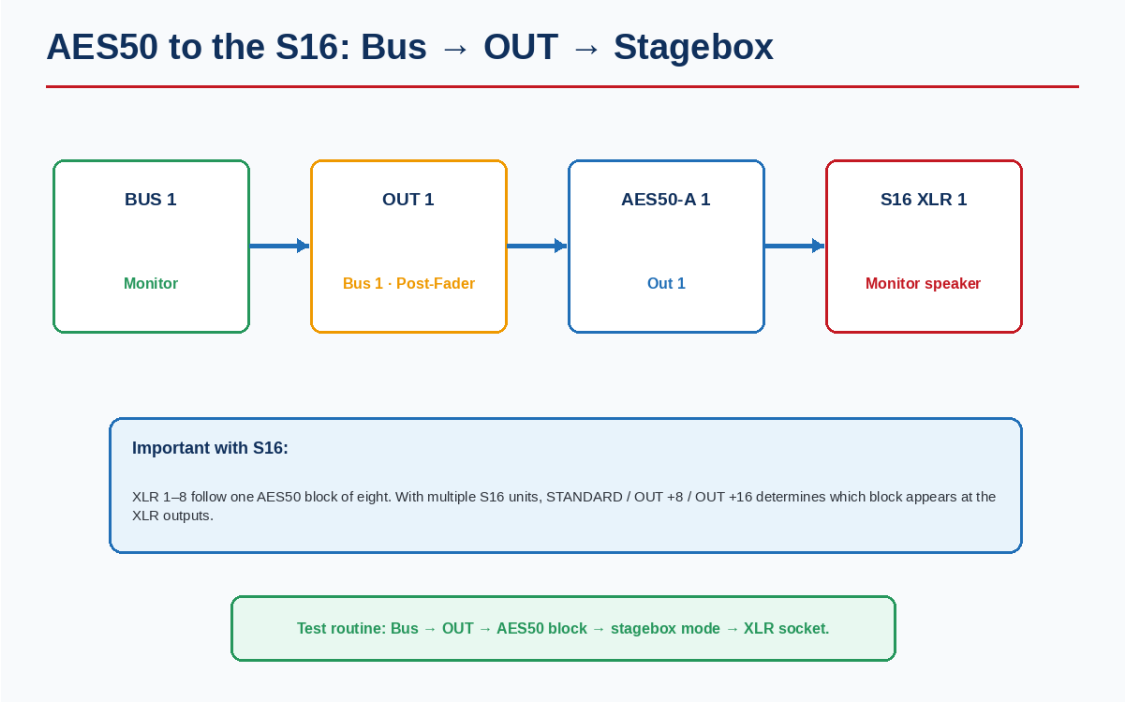

Figure 6: Example path from Bus 1 via OUT 1 and AES50-A 1 to S16 XLR socket 1.

With multiple S16 units: The inputs of cascaded S16 units shift automatically in blocks of 16. The local XLR outputs, however, are assigned to the required AES50 block of eight using STANDARD / OUT +8 / OUT +16.

Card In / Card Out for recording and playback

The expansion card also has an input and an output side. Card Out describes which signals the X32 sends to the computer or recorder. Card In describes the signals returning from the computer, which can then be assigned to channels through input routing. Anyone who confuses these directions will often see a working USB connection but no audio signal at the expected point.

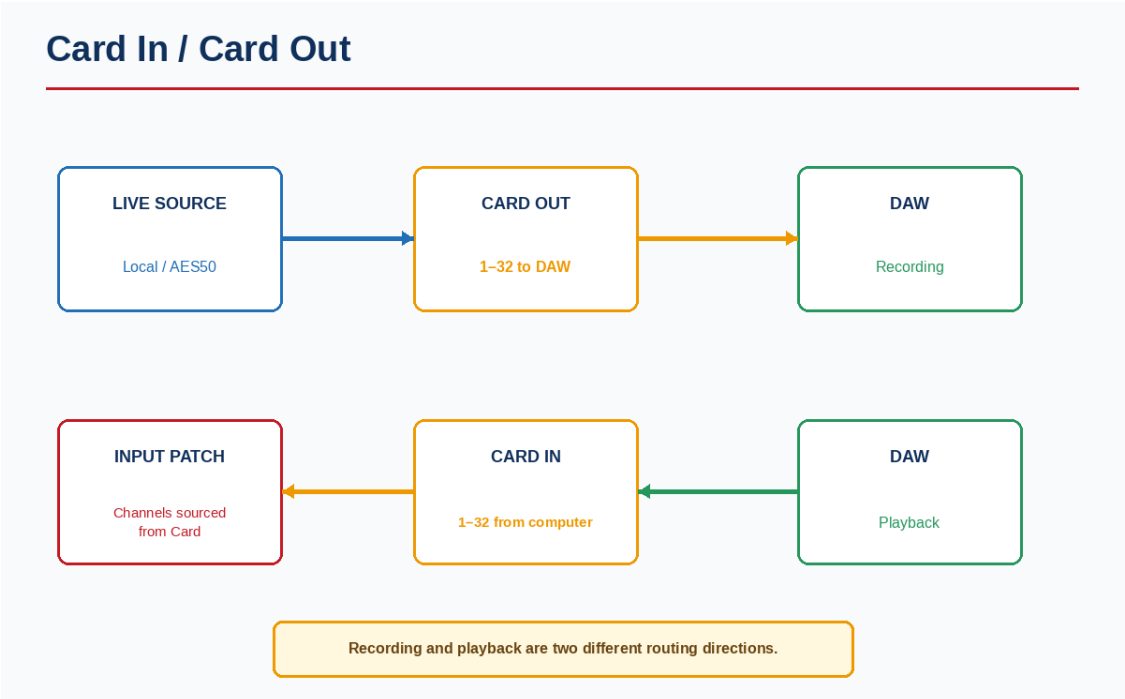

Figure 7: Card Out leads to the DAW; Card In returns from the DAW to the console.

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Multitrack recording: As direct and transparent as possible

For simple multitrack recording, Local or AES50 inputs can be assigned directly to Card Out, for example. If a processed signal is to be recorded instead, a different tap point must be selected deliberately. Documentation is essential: “Card 1 = Kick” is more useful than a complex, unlabeled User Out setup.

Playback or virtual soundcheck

On the return path, the channel is no longer fed from Local or AES50, but from Card. The change between the live source and playback should therefore be prepared and saved unambiguously. An incorrect input assignment after the soundcheck is a classic reason why a microphone is suddenly missing during the later live operation.

Safety: Before switching Live ↔ Card, always save the current scene and fully test the return to the live patch once.

User Out: Flexible output blocks

User Out is the counterpart to User In. Individual output sources can be assembled into a custom block and then passed on, for example, to AES50, Card or a physical output block. This is particularly useful when signals from different areas are required in a fixed order.

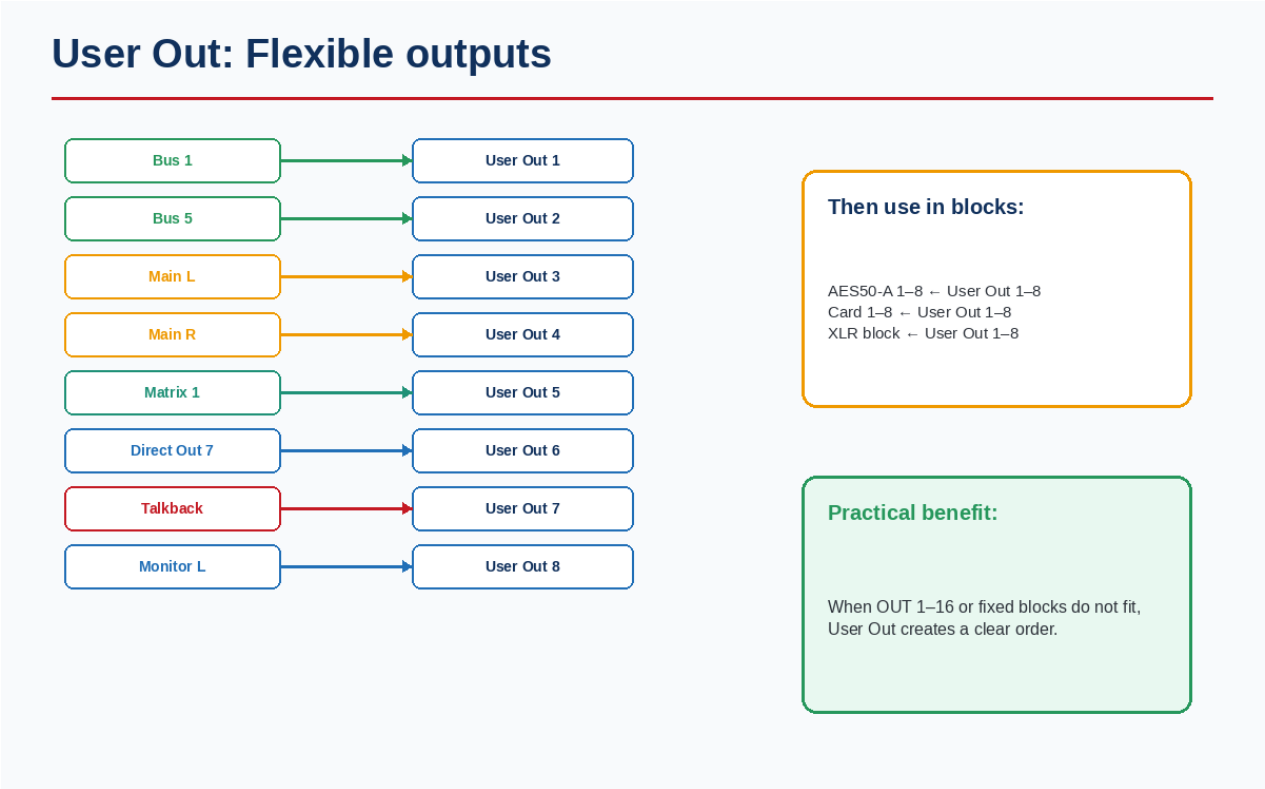

Figure 8: User Out collects different output sources in a freely defined order.

When User Out is useful

- A stagebox needs to receive buses, Main L/R and a matrix in one common block of eight.
- For recording or broadcast, individual Direct Outs and mixes are required in a fixed order.
- The classic OUT 1–16 slots are already occupied and should not be rebuilt solely for an additional output.
- A complex setup should remain readable through a clearly documented User Out list.

Avoid: Adding User Out as an extra layer even though OUT 1–16 already contain exactly the required signals. More flexibility does not automatically mean more clarity.

Practical example: Microphone to stage monitor

The following example connects the most important routing layers in one complete signal path. A microphone is connected to S16 Input 1. It should arrive at X32 Channel 1 and feed a stage monitor through Bus 1 and S16 XLR Out 1. The monitor mix should remain independent of the FOH channel fader.

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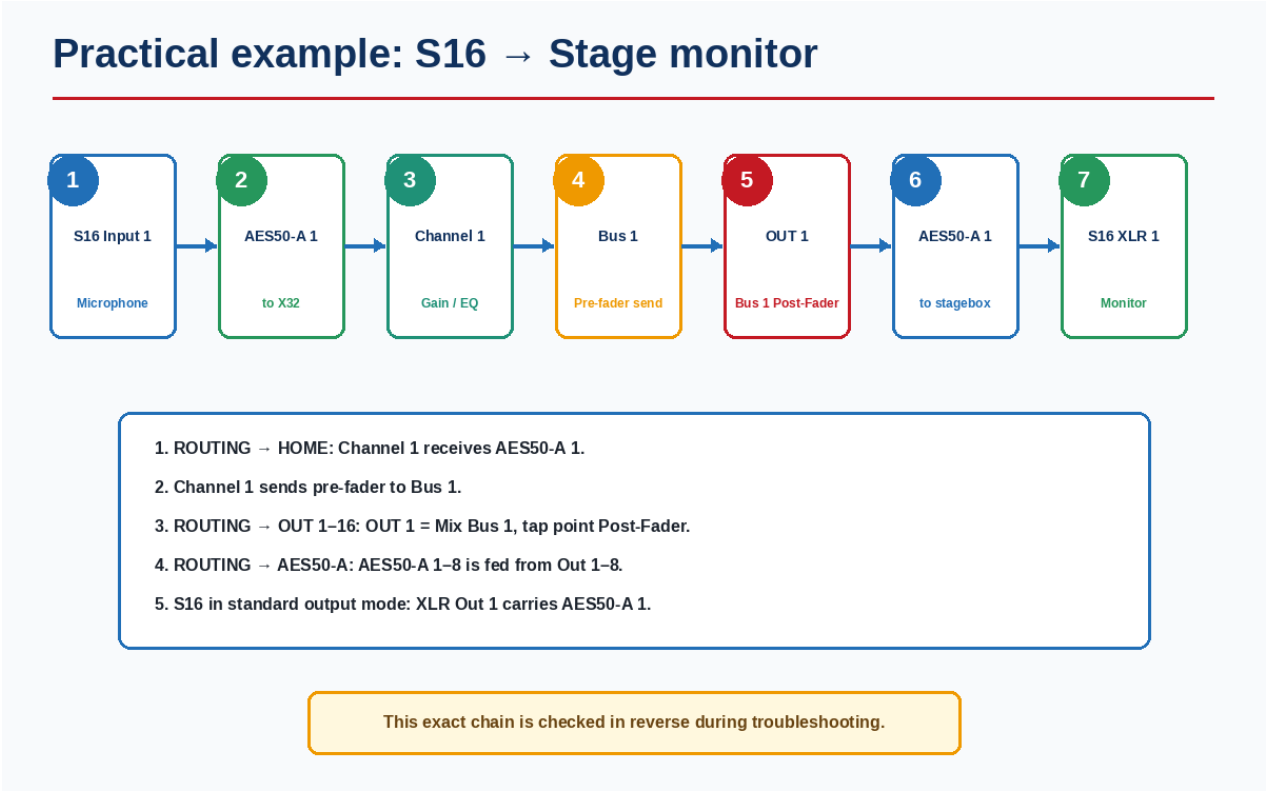

Figure 9: Complete path from the S16 input socket to the analog monitor output.

Step by step

1. Connect S16 AES50-A to X32 AES50-A; set the X32 as clock master to INTERNAL / 48 kHz.
2. ROUTING → HOME: Feed channels 1–8 from AES50-A 1–8. This places S16 Input 1 on Channel 1.
3. Select Channel 1, set the gain correctly and label the channel clearly.
4. Send Channel 1 to Bus 1; for a musician's monitor, set the send to pre-fader.
5. Label Bus 1 "Mon 1"; initially keep the bus master down or muted.
6. ROUTING → OUT 1–16: Assign OUT 1 to Mix Bus 1 and select a suitable tap point, typically post-fader.
7. ROUTING → AES50-A: Feed AES50-A 1–8 from Out 1–8.
8. S16 in standard output mode: XLR Out 1 carries AES50-A 1.
9. Connect the monitor, unmute Bus 1 and raise the level carefully.
10. For the test, move the FOH channel fader: the pre-fader monitor send must not change.

Troubleshooting in this example: If there is no sound, do not change the gain, bus send and AES50 routing at the same time. Check the path in this order: Channel → Bus → OUT 1 → AES50-A 1 → S16 XLR 1.

Quick guide: Routing in 12 steps

1. Define the source: Local, AES50 or Card?
2. Define and label the target channel.
3. Use normal HOME routing for uniform blocks of eight.
4. Use User In only for mixed sources.
5. Check the channel meter and gain.
6. Set the bus/Main assignment and send level.
7. Define the logical output under OUT 1–16.
8. Choose the tap point of the logical output deliberately.
9. Define the physical destination: XLR, AES50 or Card.
10. For AES50, check the correct block of eight and stagebox mode.
11. Test each signal path individually before opening the PA.
12. Save the scene and patch list.

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Quick checklist

- ☐ Source and destination clearly identified
- ☐ Input patch checked
- ☐ Channel / bus / Main shows the expected level
- ☐ OUT 1–16 correct
- ☐ Physical destination correct
- ☐ AES50/Card direction correct
- ☐ User In/Out documented
- ☐ Scene and patch list saved

Troubleshooting along the signal path

Routing faults are found fastest when you do not search by menu name, but by the last point where the signal is definitely present. The X32 meters are signposts: as soon as a meter no longer responds, the fault is usually immediately before it.

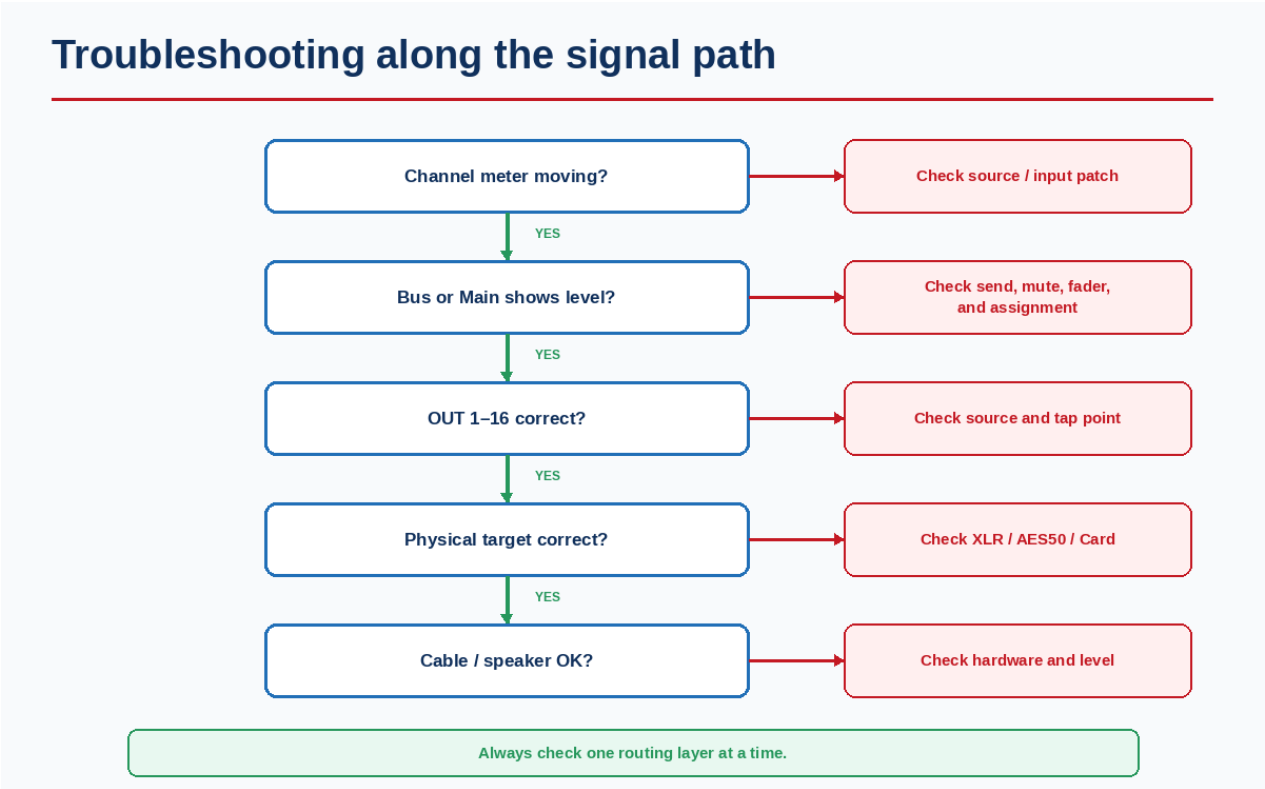

Figure 10: Troubleshooting from the input meter to the loudspeaker.

Case 1: No level at the input channel

- Check the source, cable and physical socket.
- Check ROUTING → HOME or the channel Config page: does the source match the input being used?
- For AES50, check the link, sync, port and channel block.
- For Card returns, check whether the channel is actually using Card as its source.

Case 2: Channel shows a level, but bus or Main does not

- Check the channel mute, DCA and mute groups.
- Check the Main assignment or bus send.
- Check the fader, send level and tap point.
- Make sure the correct fader layer is displayed.

Case 3: Bus/Main shows a level, but the physical output remains silent

- OUT 1–16: Is the required bus, Main or matrix really assigned there?
- XLR Out or AES50/Card: Is the logical output being passed to the correct destination?

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- For an S16, check the correct output block and the specific XLR socket.
- Check the cable, power amplifier/powered speaker, mute and input level at the destination device.

Emergency rule: During a running show, never rebuild the entire routing because you are unsure. First identify the last point where the signal is definitely present, then check exactly one layer.

Common errors and reliable routing rules

Common errors

- Treating input routing and output routing as a single function.
- Mixing up blocks of eight: accidentally assigning AES50-A 17–24 to channels 9–16.
- Configuring User In or User Out but failing to switch the corresponding HOME/AES50/Card block to User.
- The bus shows a level, but OUT 1–16 is assigned to a different source.
- OUT 1–16 is correct, but the physical XLR block points to different OUT channels.
- Confusing Card Out and Card In.
- Misinterpreting S16 OUT +8/+16 as an input shift - the setting only affects the analog outputs.
- Failing to check after Scene Recall whether the routing and output patch were recalled.
- Running complex User routing without a patch list.

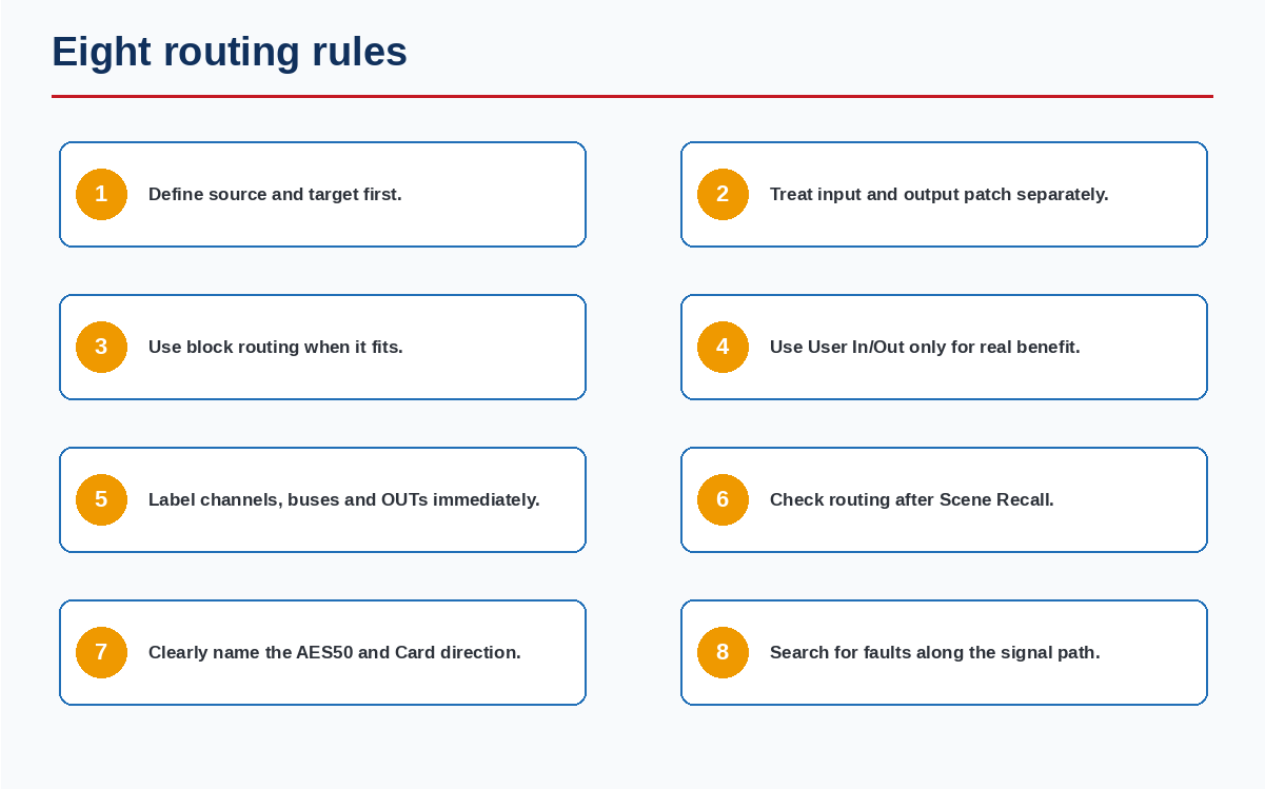

Figure 11: Eight basic rules for transparent X32 routing.

Realistic assessment: X32 routing is not fundamentally illogical. It simply has several layers. Anyone who consistently separates source, internal mix and physical destination will find faults much faster and can also document complex AES50/Card setups clearly.

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Glossary A–Z

The terms are intentionally explained briefly and with a practical focus. The blue references lead to the point where each term is used in the workflow.

AES50: Bidirectional digital audio connection. The X32 has two ports, A/B, each providing up to 48 audio channels per direction at 48 kHz. → AES50 & Stageboxes

Analog Out / OUT 1–16: Logical output layer. Here you define which internal signal an OUT channel carries and at which tap point it is taken. → OUT 1–16 & XLR Out

Block of eight: Classic routing group of eight channels, for example 1–8 or 9–16. → HOME / Inputs

Bus / Mix Bus: Internal mix of several input channels, for example for monitoring, subgroups or effects. → Buses & Main

Card In: Audio signals returning to the X32 from the computer/recorder through the expansion card. → Card In / Card Out

Card Out: Audio signals sent by the X32 to the computer/recorder through the expansion card. → Card In / Card Out

Direct Out: Direct signal tap from an individual channel that can be used as an output source. → OUT 1–16 & XLR Out

HOME / Inputs: Routing page for assigning sources to the 32 input channels, traditionally in blocks of eight. → HOME / Inputs

Input patch: Assignment of a physical or digital source to an X32 channel. → HOME / Inputs

Local: Physical input or output sockets directly on the X32. → HOME / Inputs

Main L/R: Main stereo mix for the FOH sound. → Buses & Main

Output patch: Assignment of an internal signal to a logical OUT and then to a physical output. → OUT 1–16 & XLR Out

S16: Digital stagebox with 16 microphone inputs, eight XLR outputs and AES50 connectivity. → AES50 & Stageboxes

Tap point: The point at which a signal is taken within a channel, bus or output signal path, for example pre-fader or post-fader. → Buses & Main

User In: Firmware 4.x routing layer that freely combines individual sources into a custom input pool. → User In

User Out: Flexible output layer that combines individual internal or digital sources into a freely defined output pool. → User Out

XLR Out: Physical output layer: it determines which logical OUT or other routing block appears at the local XLR sockets. → OUT 1–16 & XLR Out

See also

StageAID Behringer X32 Practical Manual

Basics of layout, signal flow, output routing, monitor paths, scenes and troubleshooting.

Additional Advanced Workflows will only be linked once the corresponding StageAID article has been published.

Editorial note: This practical workflow is part of the StageAID “X32 Advanced Workflows” series and an independent supplement to the Behringer X32 Practical Manual. Product and brand names are used solely for clear identification. The illustrations are our own simplified representations. Menu names may vary slightly depending on the firmware version; if in doubt, the installed firmware and the official manufacturer documentation apply.

Technical basis: StageAID Behringer X32 Practical Manual Basic Version 1.1, Behringer X32 product documentation / firmware 4.x, and the established X32 routing logic for User In/Out. Status: July 2026.