

MTX5-D/MY4-AEC System Setup Manual

By using the MTX5-D and the MY4-AEC, you can configure a remote conferencing system. Please read this manual when you want to configure a remote conferencing system using the MTX5-D and the MY4-AEC. This manual provides a simple explanation of the setup procedure, using the project file that is preinstalled in MTX Editor. Understanding how the inputs and outputs of the MTX5-D and the MY4-AEC are related will allow you to configure a system that meets your needs. Please refer to the owner's manual on devices about the details, and refer to the "MTX Editor User's Manual" (PDF file) about the details of MTX Editor.

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Introduction

The MTX5-D/MY4-AEC system setup manual explains settings for when an MY4-AEC is installed in the MTX5-D's [SLOT].

As examples, we will provide simple explanations of the typical setups described below.

For detailed parameter settings, refer to "MTX Editor User's Manual."

When you install MTX Editor, the four example files described here will be found in the following folders.

- **32-bit operating system**

C:\Program Files\Yamaha\MTX Editor\V*.*\ProjectFile

- **64-bit operating system**

C:\Program Files(x86)\Yamaha\MTX Editor\V*.*\ProjectFile

. will be the version of the installed MTX Editor.

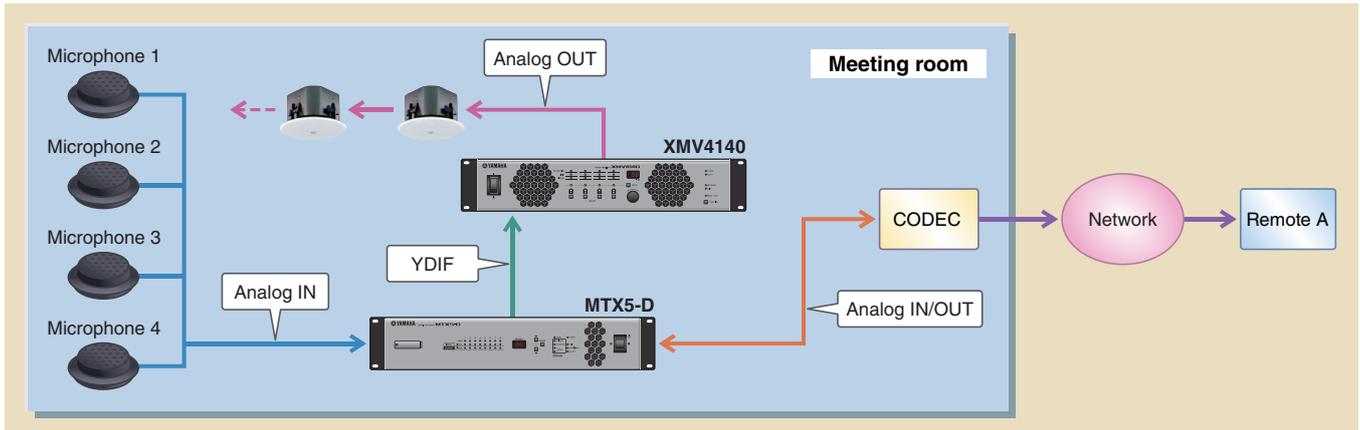
Example	File name
Example 1) One remote location, and four microphones in the meeting room	AEC 4Mic 1RemoteLocation-*.mtx
Example 2) One remote location, and eight microphones in the meeting room	AEC 8Mic 1RemoteLocation-*.mtx
Example 3) Four remote locations, and four microphones in the meeting room	AEC 4Mic 4RemoteLocation-*.mtx
Example 4) Dividing between two meeting rooms and conferencing with separate locations	AEC 2MeetingRoom 2RemoteLocation-*.mtx

-* is a management number. In some cases, there will be no -*.

■ Glossary

Glossary	Description
Local	Your own meeting room within the remote conferencing system. Also called "near-end."
Remote	The other party's meeting room within the remote conferencing system. Also called "far-end."
From Far-end	The input signal from the remote location (the other party)
Far-end Voice	The signal from the remote location reproduced via your local speakers
Near-end Mic.	The input signal from the microphone(s) of the remote location
Near-end Voice	The signal from the local microphone(s) reproduced via the local speakers
To Far-end	The signal of the local microphone(s), processed by echo cancellation and sent to the remote location
CODEC	A device for transmitting and receiving data via a digital communication network

Example 1) One remote location, and four microphones in the meeting room



This is an example of one remote location with four or fewer local microphones.

Use the AEC 4Mic 1RemoteLocation-*.mtx file.

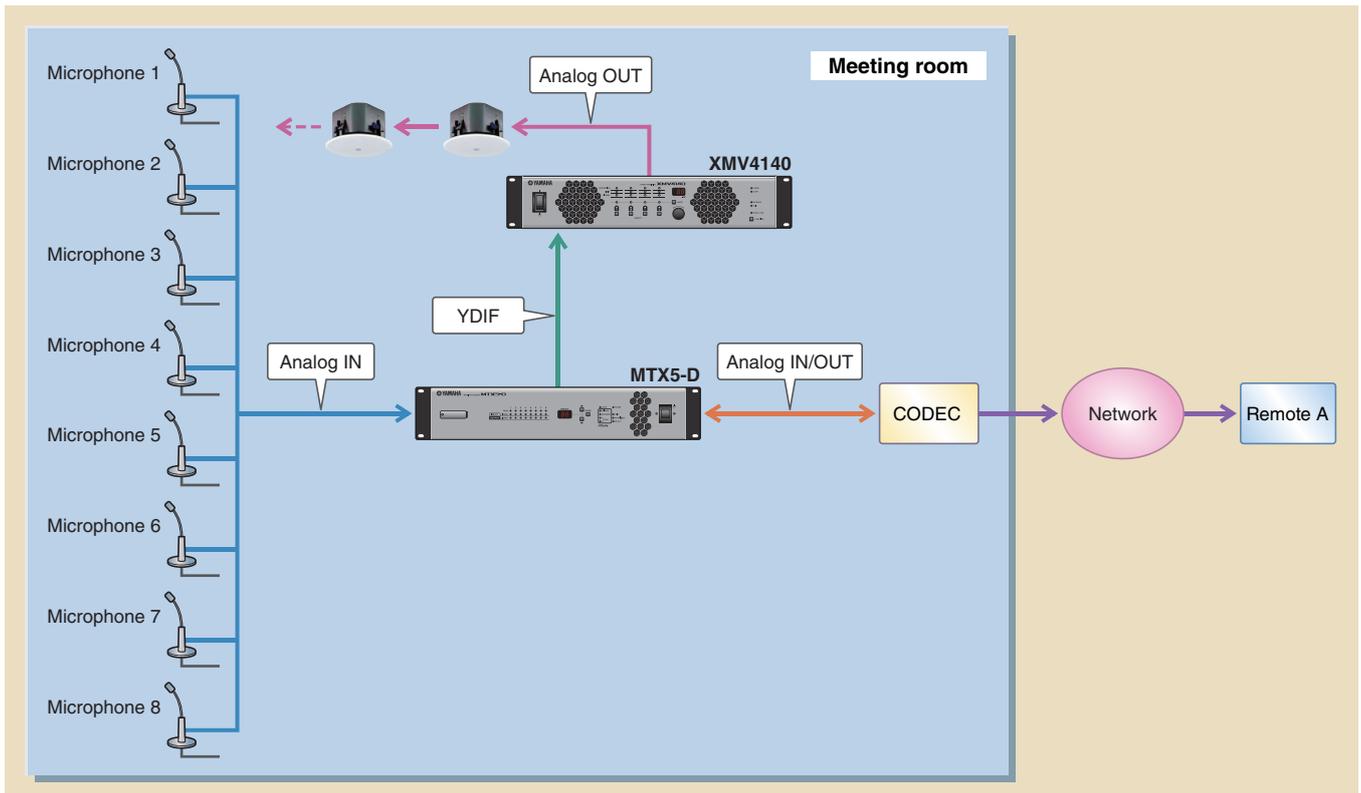
This example assumes that you're using the following equipment.

- MTX5-D × 1
- MY4-AEC × 1
- XMV4140 (Amplifier) × 1
- Microphones (Boundary microphones) × 4
- Speakers (the number needed)
- CODEC or other devices needed for communicating with the remote location × 1
- Communication network with the remote location × 1

The number of speakers is not specified; choose amplifiers that are suitable for your speaker setup. You will also need to provide the appropriate number of cables.

For details on this example, refer to [page 7](#) and following.

Example 2) One remote location, and eight microphones in the meeting room



This is an example of one remote location with between five and eight local microphones.

Use the AEC 8Mic 1RemoteLocation-*.mtx file.

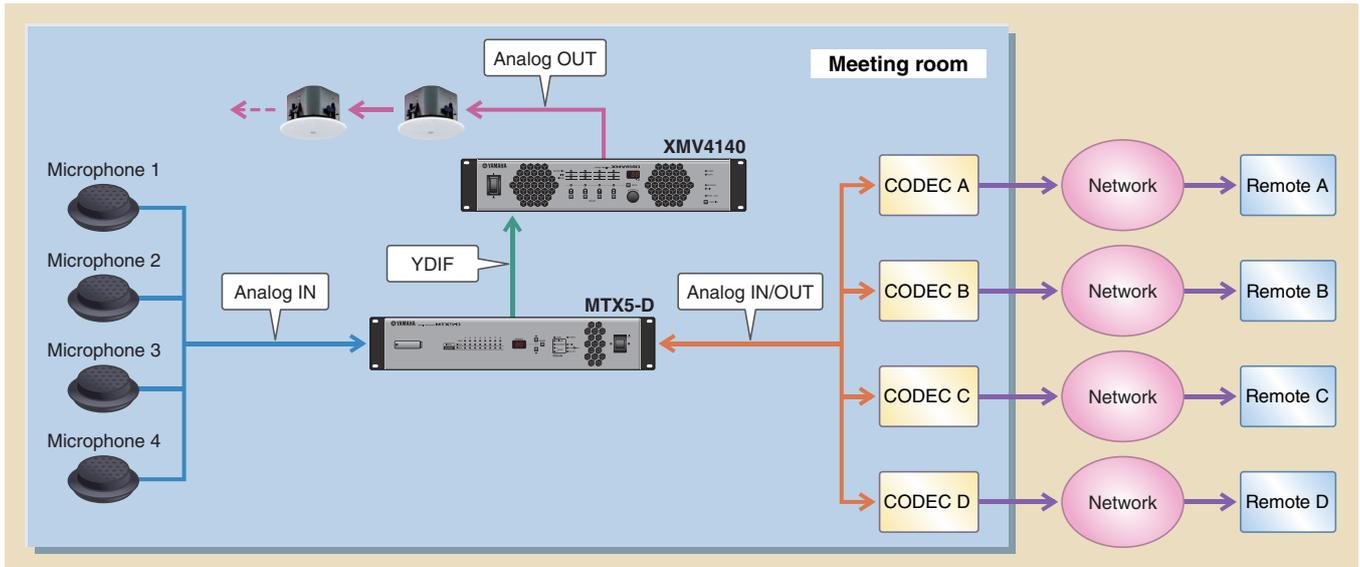
This example assumes that you're using the following equipment.

- MTX5-D × 1
- MY4-AEC × 1
- XMV4140 (Amplifier) × 1
- Microphones (Gooseneck microphones) × 8
- Speakers (the number needed)
- CODEC or other devices needed for communicating with the remote location × 1
- Communication network with the remote location × 1

The number of speakers is not specified; choose amplifiers that are suitable for your speaker setup. You will also need to provide the appropriate number of cables.

For details on this example, refer to [page 11](#) and following.

Example 3) Four remote locations, and four microphones in the meeting room



This is an example of multiple remote locations, with four or fewer local microphones.

Use the AEC 4Mic 4RemoteLocation-*.mtx file.

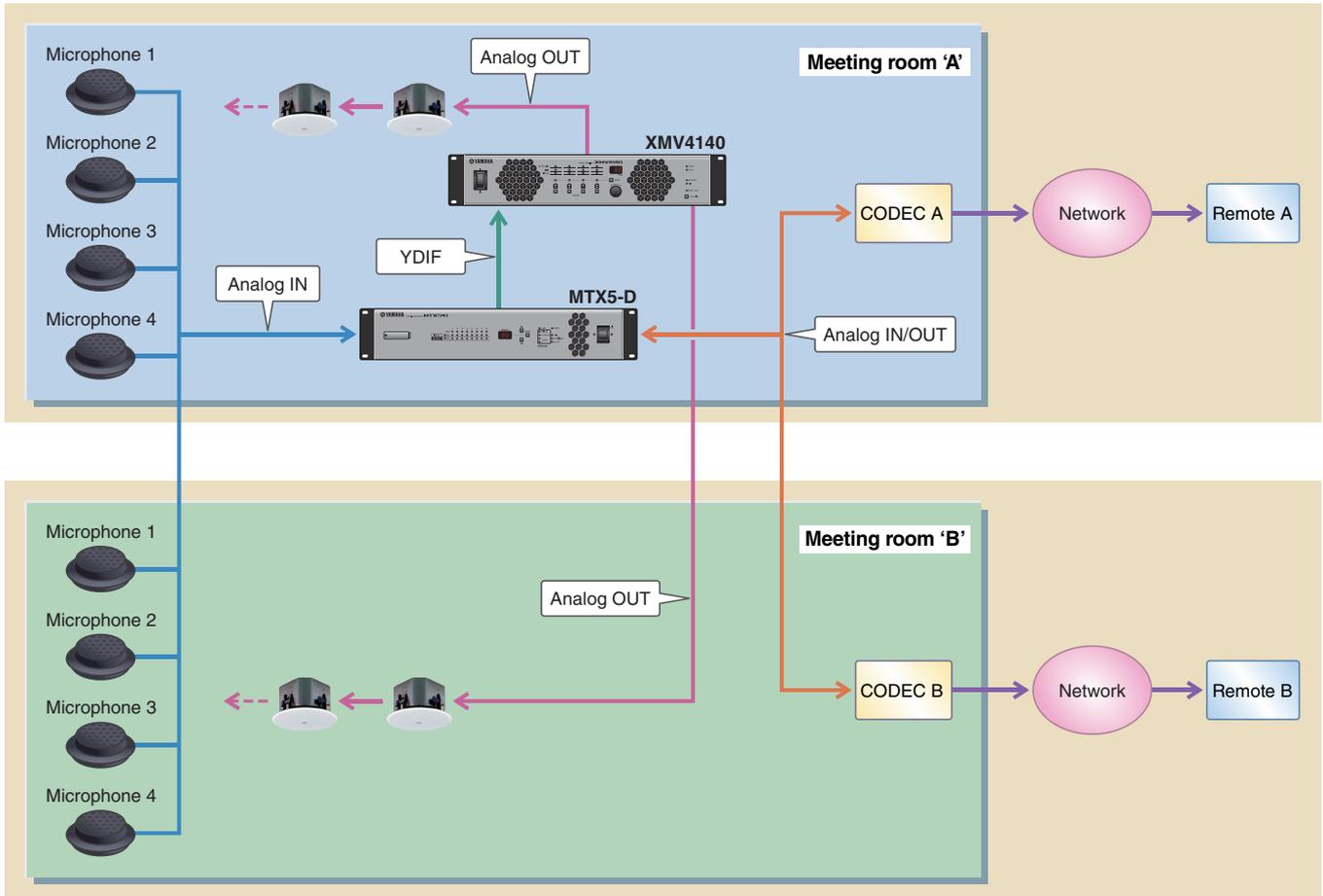
This example assumes that you're using the following equipment.

- MTX5-D × 1
- MY4-AEC × 1
- XMV4140 (Amplifier) × 1
- Microphones (Boundary microphones) × 4
- Speakers (the number needed)
- CODEC or other devices needed for communicating with the remote location × 4
- Communication networks with the remote location × 4

The number of speakers is not specified; choose amplifiers that are suitable for your speaker setup. You will also need to provide the appropriate number of cables.

For details on this example, refer to [page 15](#) and following.

Example 4) Dividing between two meeting rooms and conferencing with separate locations



This is an example in which participants are divided between two meeting rooms and are conferencing with separate locations.

Use the AEC 2MeetingRoom 2RemoteLocation-*.mtx file.

This example assumes that you're using the following equipment.

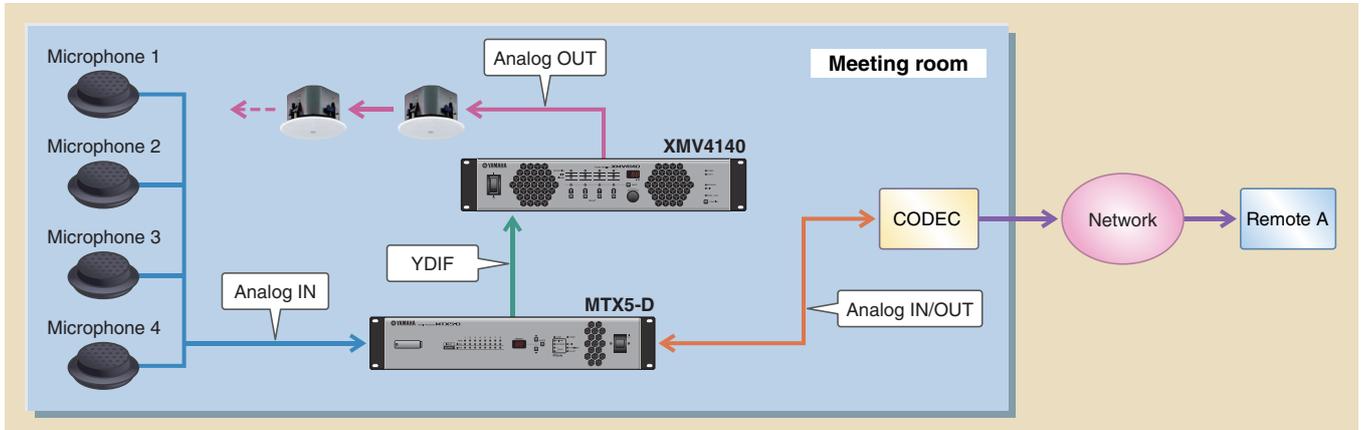
- MTX5-D × 1
- MY4-AEC × 1
- XMV4140 (Amplifier) × 1
- Microphones (Boundary microphones) × 8
- Speakers (the number needed)
- CODEC or other devices needed for communicating with the remote location × 2
- Communication networks with the remote location × 2

The number of speakers is not specified; choose amplifiers that are suitable for your speaker setup. You will also need to provide the appropriate number of cables.

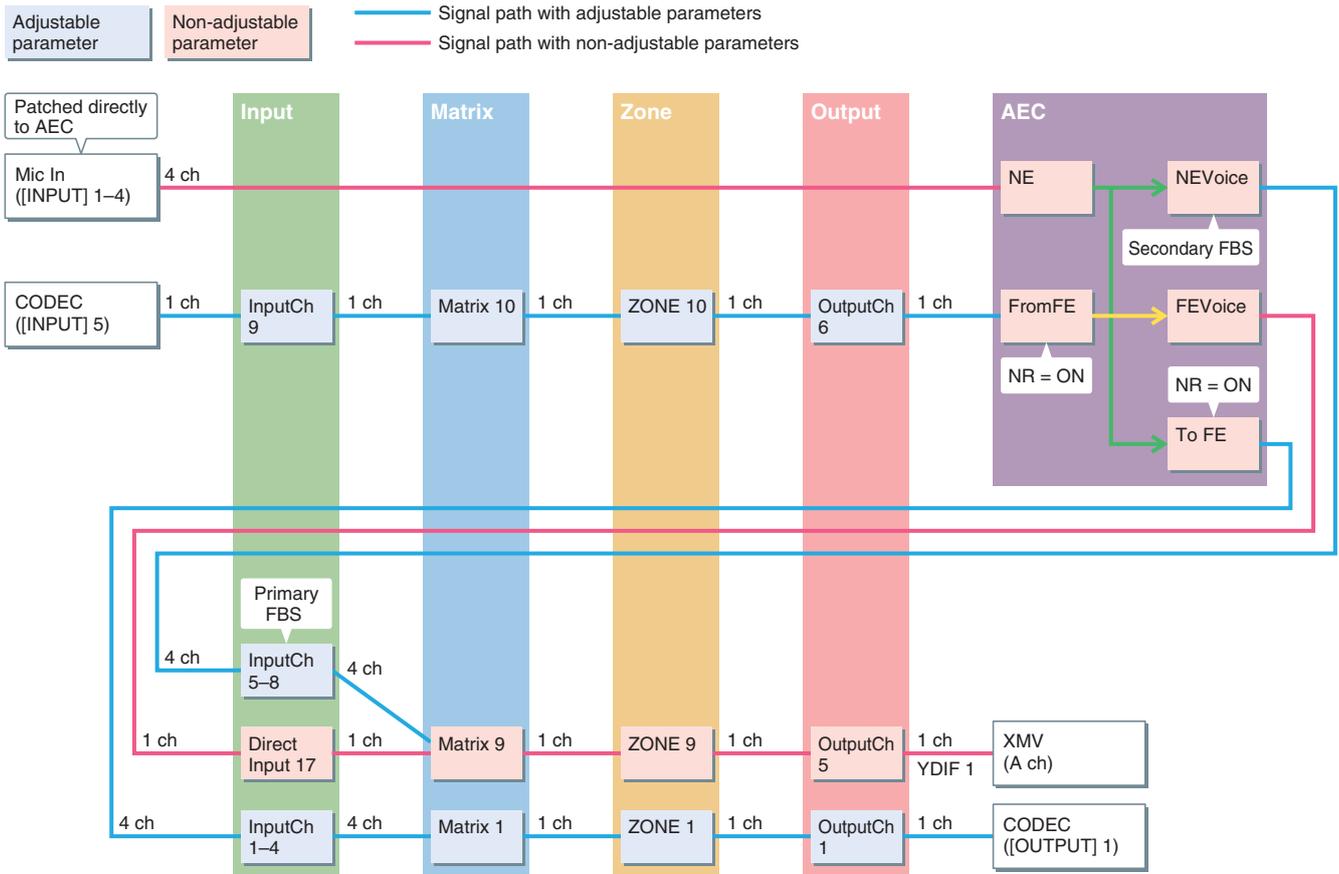
For details on this example, refer to [page 19](#) and following.

Example 1) One remote location, and four microphones in the meeting room

Here we explain the main points when adjusting the example setup shown below.



In this example, the signal flow is as follows.

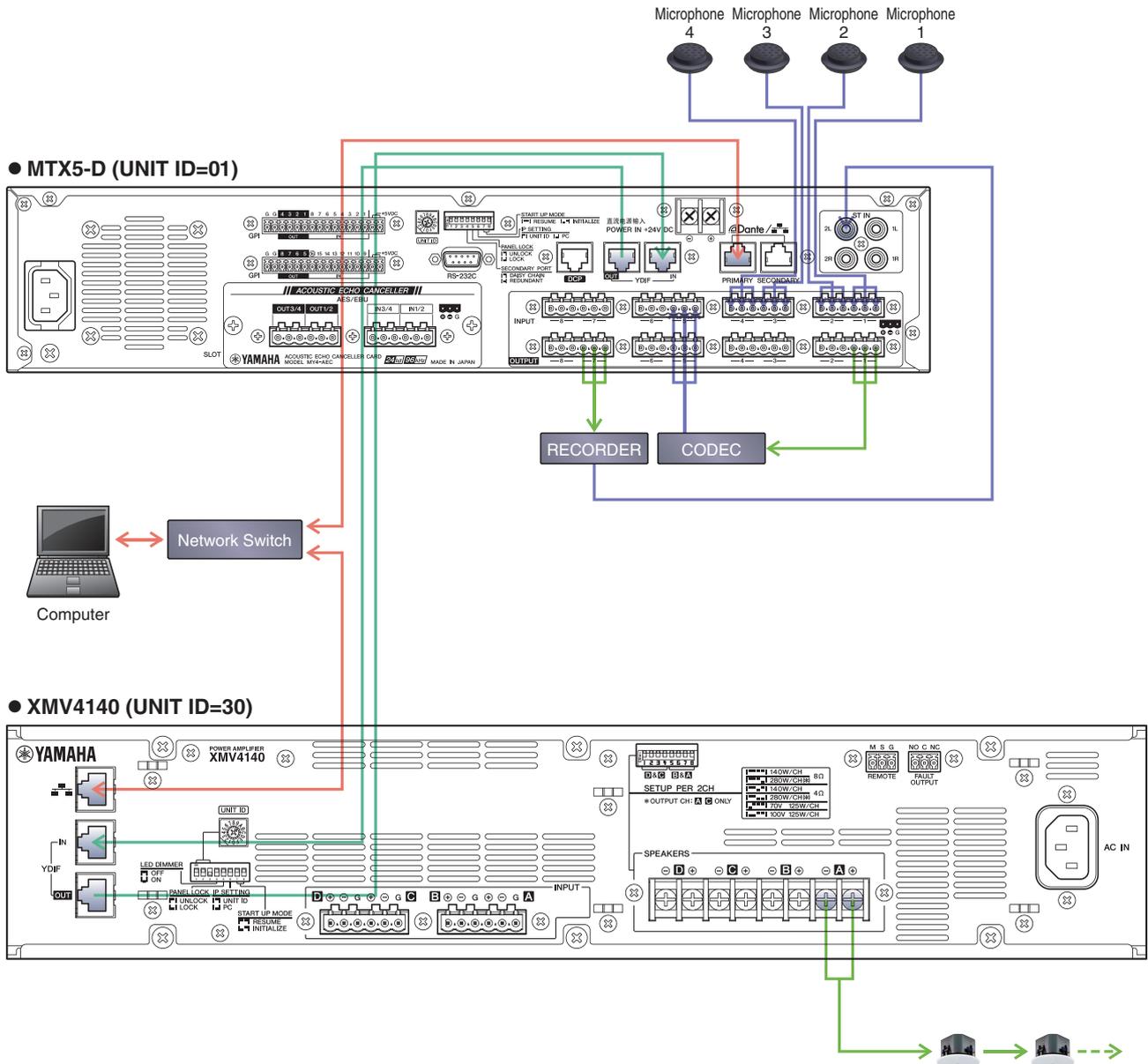


- NE: Near-end Mic
- FromFE: From Far-end
- NEVoice: Near-end Voice
- FEVoice: Far-end Voice
- TO FE: To Far-end
- NR: Noise Reduction

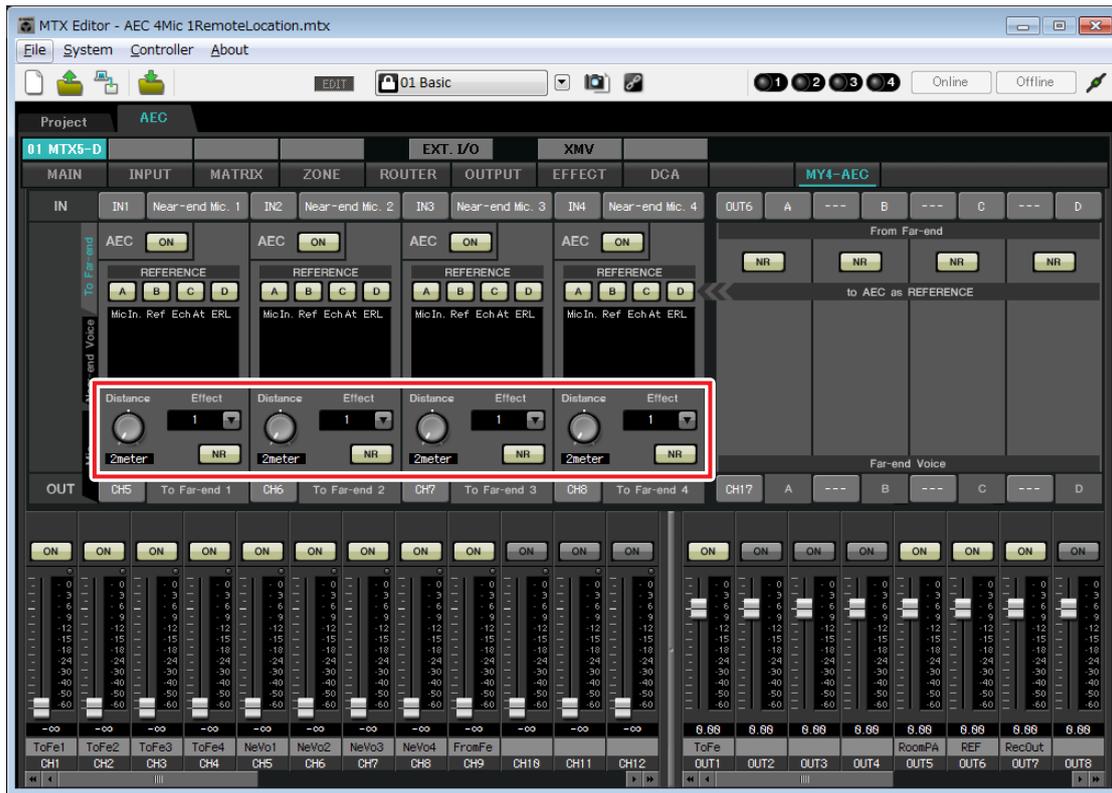
Example 1) One remote location, and four microphones in the meeting room

For locations that are listed as having “Non-adjustable parameter,” you should avoid using Dynamics-type components (Gate, Comp, Ducker) and adjusting the parameters of an operating system after it has been set up. Echo cancellation will no longer work effectively if you do so.

In this example, the connections are as follows.



■ Example settings for MTX Editor



• Distance setting

For a simple configuration in which the distance between the microphone and speaker is within two meters, there is no need to change this setting in MTX Editor.

If the distance between the microphone and speaker is greater than two meters, use the [Distance] knob to specify the distance.

• Echo cancellation depth setting

If there is a large amount of echo, use the [Effect] list box to adjust the depth of echo cancellation. Higher numeric values allow more echoes to be cancelled. However, this will degrade the audio quality correspondingly, so consider the trade-off as you adjust this.

• FBS setting

The MTX5-D provides two types of FBS: DYNAMIC and FIXED. In this project file, the DYNAMIC setting of the MTX5-D unit is turned on. As needed, use the “INPUT” screen to set the FBS setting to FIXED. For details on how to make this setting, refer to the “MTX Editor User’s Manual.”

NOTE

FBS is also provided by the MY4-AEC; however, because the FBS of the MTX5-D allows more flexible settings, you should use the FBS of the MTX5-D.

• To make echo cancellation work effectively

Do not use GATE, COMP, AGC, or LIMITER, and do not operate the faders or gain while the system is in use. Doing so will decrease the effectiveness of echo cancellation.

• XMV attenuator value

In this project file, the XMV’s attenuator value is set to -99. Use the “XMV” screen to set the CH A attenuator value to an appropriate value.

■ Examples of adjusting the settings

- **Adjusting the volume of the audio signal from the remote location**

Operate the fader of input channel 9. While you watch the level meter, adjust the input level so that the yellow indicator lights occasionally.

- **Adjusting the volume of a microphone of the local location**

In the “MY4-AEC” screen, click the [Near-end Mic.] button to access the parameter editing screen, and operate the [GAIN] knob. While you watch the Mic In. meter, adjust the HA gain so that the yellow indicator lights occasionally.

- **Adjusting the volume of the speaker of the local location**

Adjust the input level as described in “Adjusting the volume of the audio signal from the remote location” and “Adjusting the volume of a microphone of the local location,” above.

- **If you don’t want the audio from the local microphone to be output from the speaker**

In the “MATRIX” screen, turn off the sends of input channels 5 through 8.

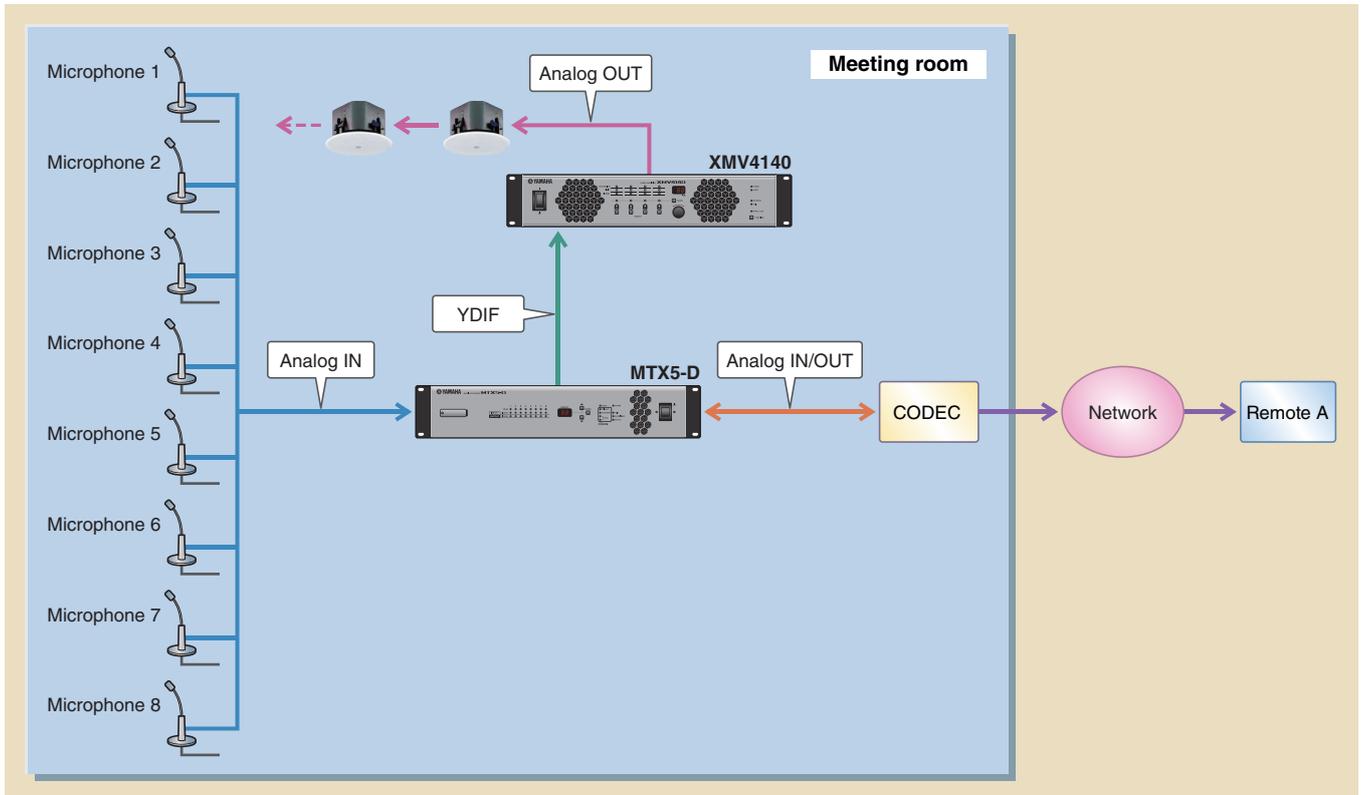
- **If you want to connect recording/playback device**

To record, connect your device to the MTX5-D’s “OUTPUT” 7 connector. To play back, connect your device to the MTX5-D’s “ST IN” 2L connector. When recording, turn on the [ON] button of input channel STIN2L. When playing back, turn on the [ON] button of output channel OUT7.

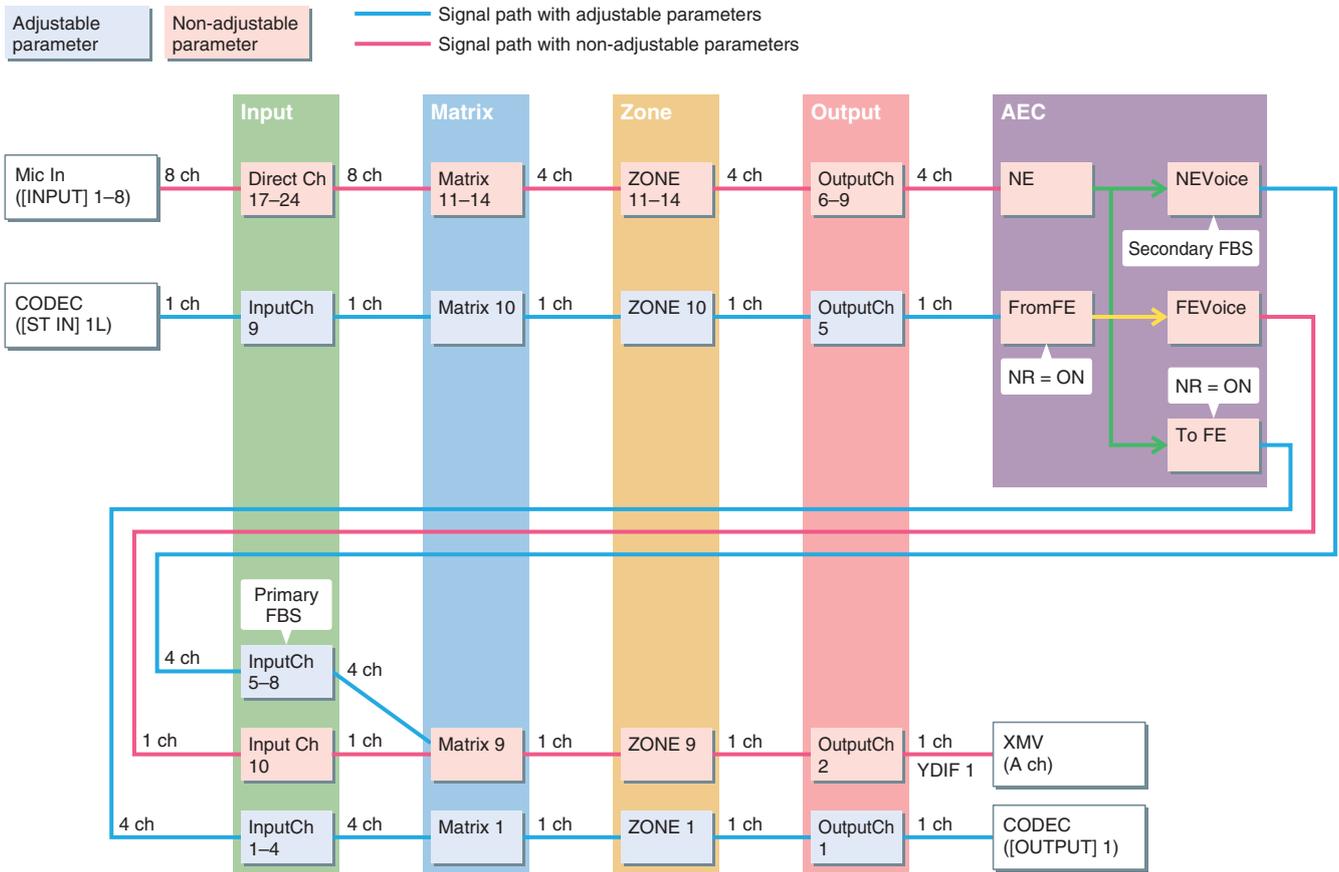
NOTE

Feedback may occur if you have connected a type of recording/playback device that outputs the input signal while recording is paused. If feedback occurs, click the [ON] button of input channel STIN2L to turn it off. When playing back, turn this button back on.

Example 2) One remote location, and eight microphones in the meeting room



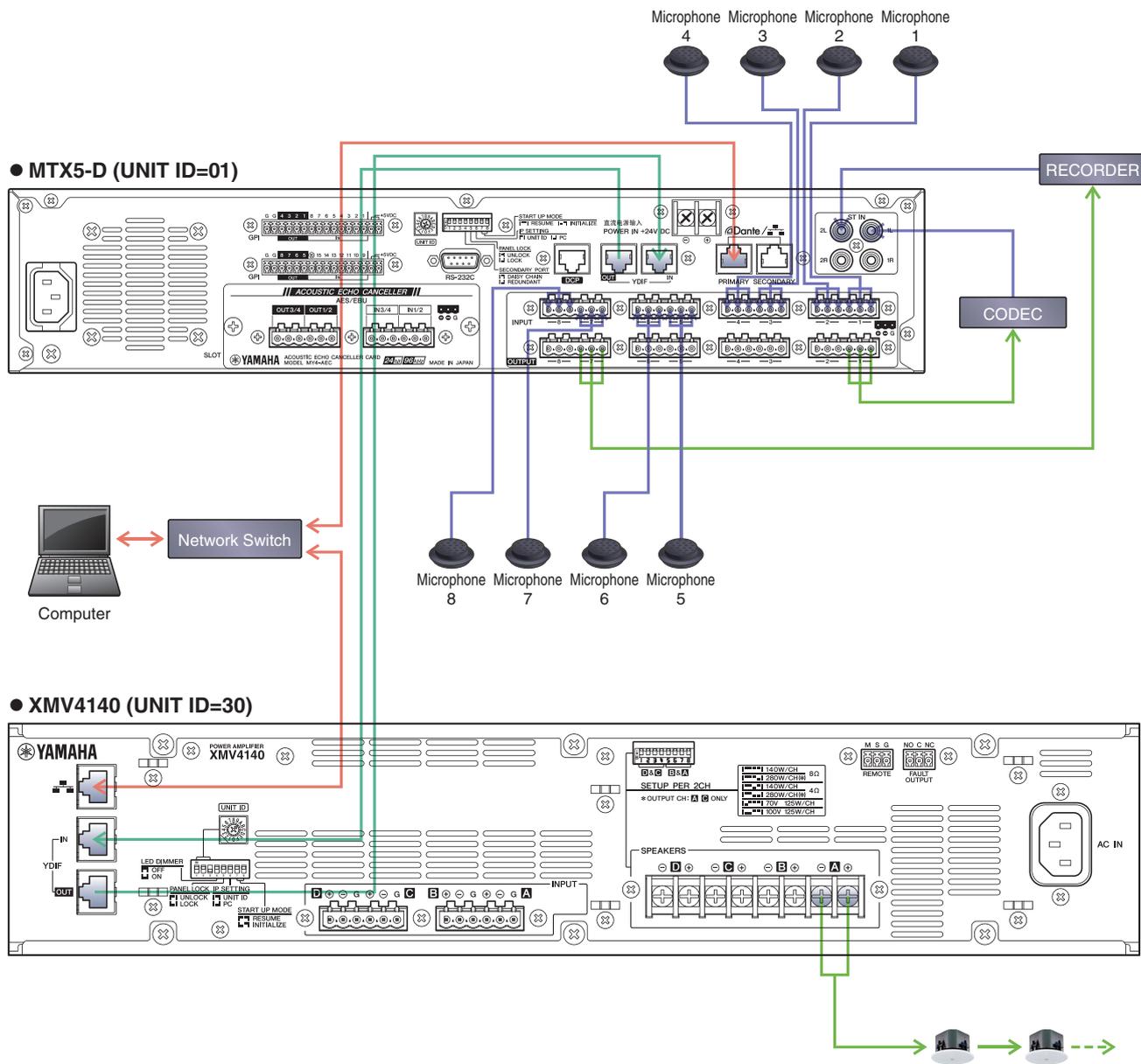
In this example, the signal flow is as follows.



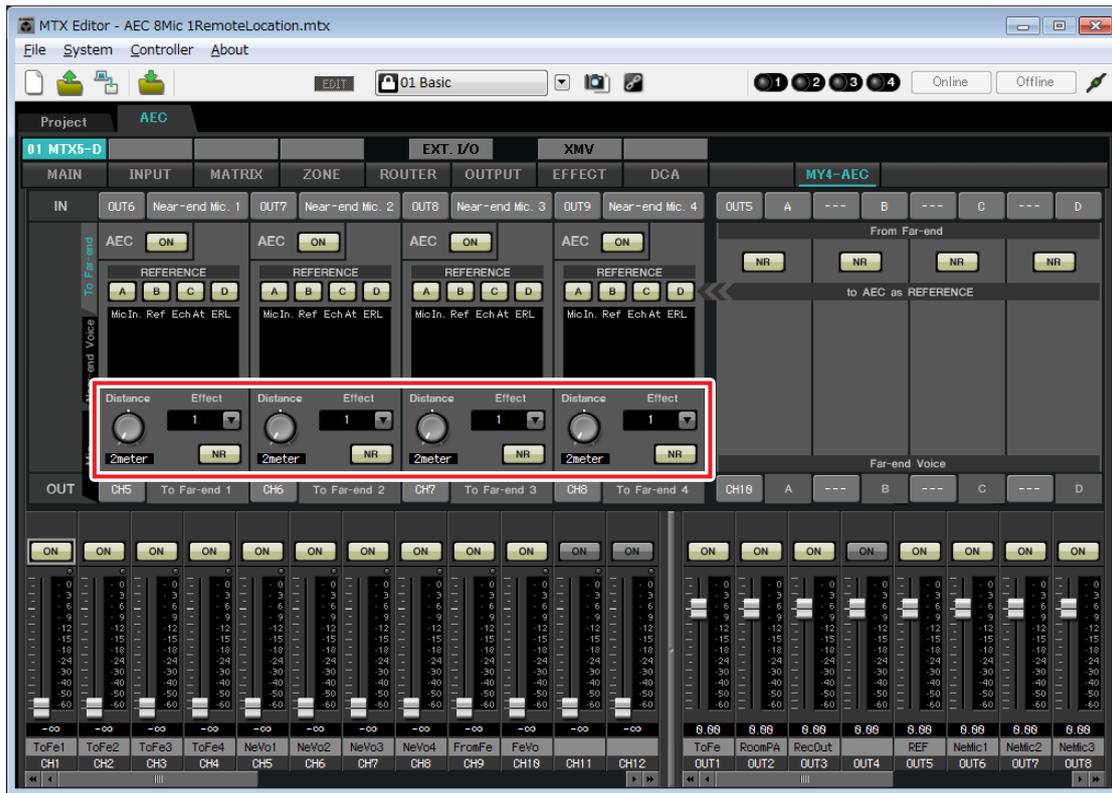
- NE: Near-end Mic
- FromFE: From Far-end
- NEVoice: Near-end Voice
- FEVoice: Far-end Voice
- TO FE: To Far-end
- NR: Noise Reduction

For locations that are listed as having “Non-adjustable parameter,” you should avoid using Dynamics-type components (Gate, Comp, Ducker) and adjusting the parameters of an operating system after it has been set up. Echo cancellation will no longer work effectively if you do so.

In this example, the connections are as follows.



■ Example settings for MTX Editor



• Distance setting

For a simple configuration in which the distance between the microphone and speaker is within two meters, there is no need to change this setting in MTX Editor.

If the distance between the microphone and speaker is greater than two meters, use the [Distance] knob to specify the distance.

• Echo cancellation depth setting

If there is a large amount of echo, use the [Effect] list box to adjust the depth of echo cancellation. Higher numeric values allow more echoes to be cancelled. However, this will degrade the audio quality correspondingly, so consider the trade-off as you adjust this.

• FBS setting

The MTX5-D provides two types of FBS: DYNAMIC and FIXED. In this project file, the DYNAMIC setting of the MTX5-D unit is turned on. As needed, use the “INPUT” screen to set the FBS setting to FIXED. For details on how to make this setting, refer to the “MTX Editor User’s Manual.”

NOTE

FBS is also provided by the MY4-AEC; however, because the FBS of the MTX5-D allows more flexible settings, you should use the FBS of the MTX5-D.

• To make echo cancellation work effectively

Do not use GATE, COMP, AGC, or LIMITER, and do not operate the faders or gain while the system is in use. Doing so will decrease the effectiveness of echo cancellation.

• XMV attenuator value

In this project file, the XMV’s attenuator value is set to -99. Use the “XMV” screen to set the CH A attenuator value to an appropriate value.

■ Examples of adjusting the settings

- **Adjusting the volume of the audio signal from the remote location**

Operate the fader of input channel 9. While you watch the level meter, adjust the input level so that the yellow indicator lights occasionally.

- **Adjusting the volume of a microphone of the local location**

Operate the faders of input channels 17 through 24. While you watch the level meter, adjust the input level so that the yellow indicator lights occasionally.

- **Adjusting the volume of the speaker of the local location**

Adjust the input level as described in “Adjusting the volume of the audio signal from the remote location” and “Adjusting the volume of a microphone of the local location,” above.

- **If you don’t want the audio from the local microphone to be output from the speaker**

In the “MATRIX” screen, turn off the sends of input channels 5 through 8.

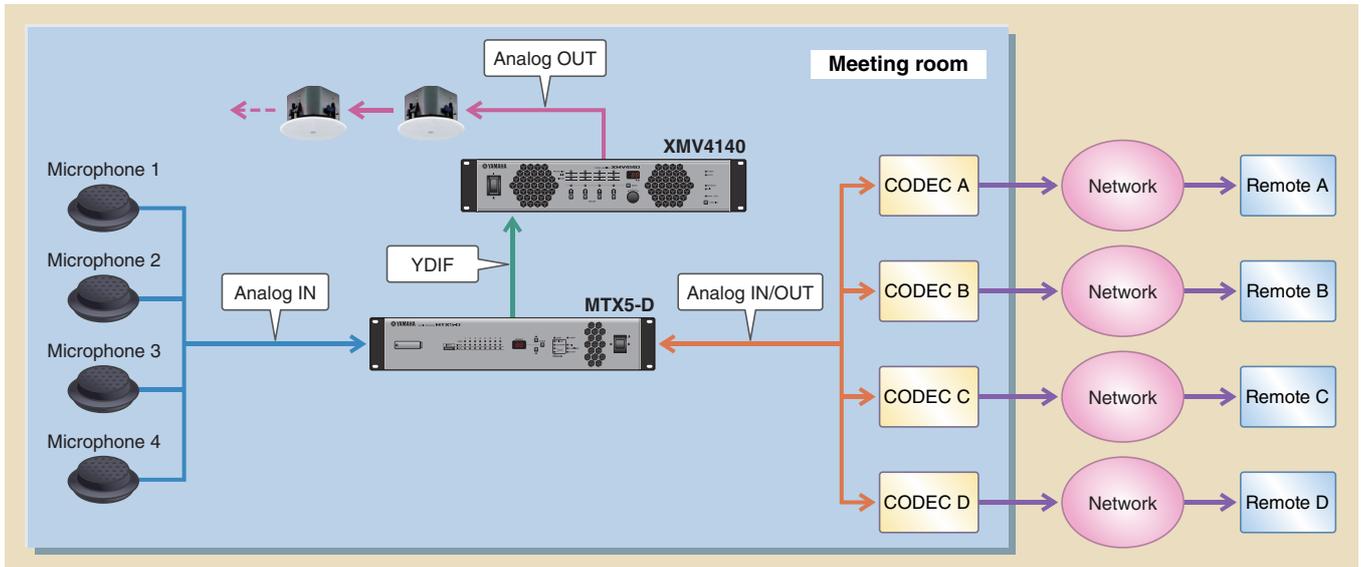
- **If you want to connect recording/playback device**

To record, connect your device to the MTX5-D’s “OUTPUT” 7 connector. To play back, connect your device to the MTX5-D’s “ST IN” 2L connector. When recording, turn on the [ON] button of input channel STIN2L. When playing back, turn on the [ON] button of output channel OUT7.

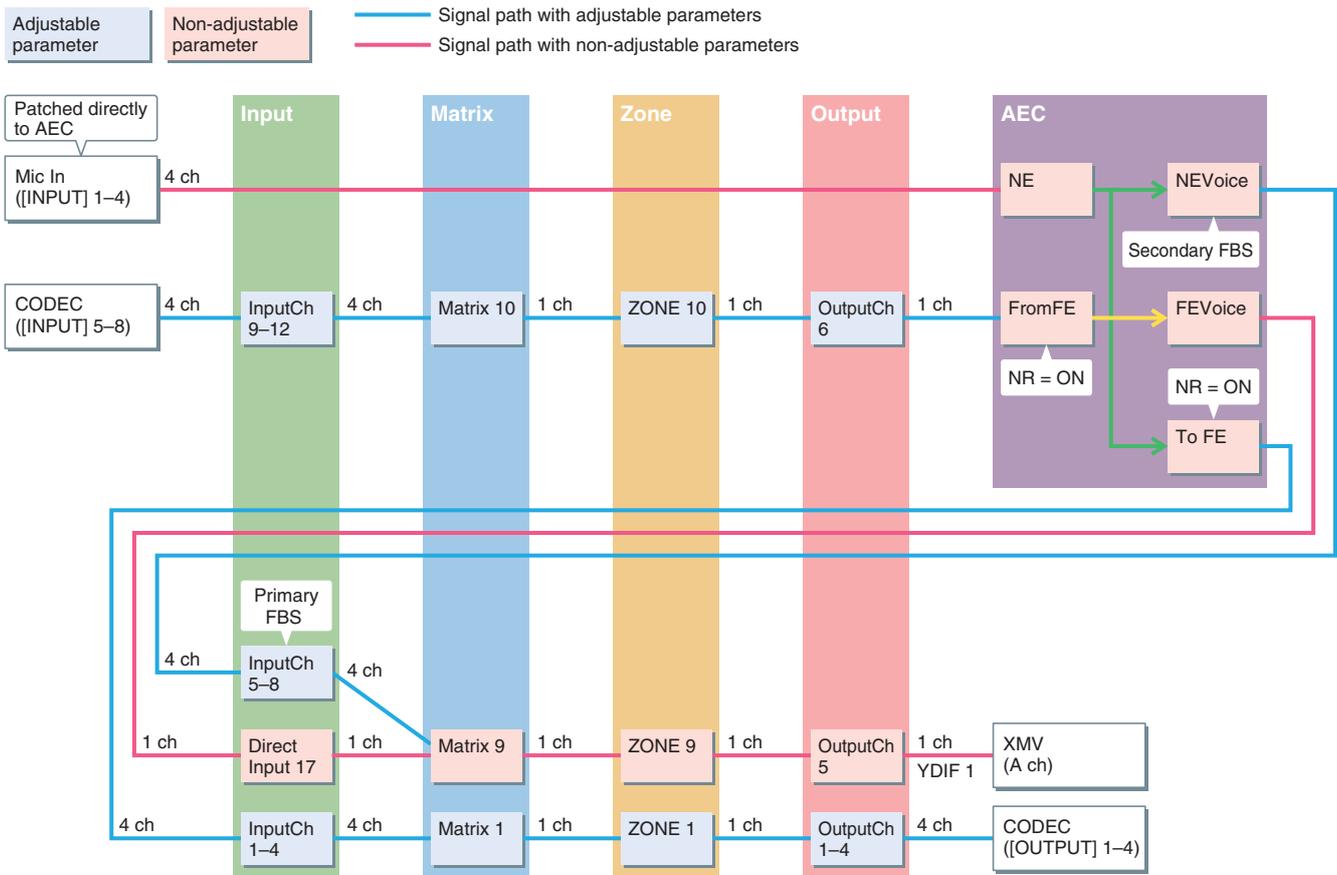
NOTE

Feedback may occur if you have connected a type of recording/playback device that outputs the input signal while recording is paused. If feedback occurs, click the [ON] button of input channel STIN2L to turn it off. When playing back, turn this button back on.

Example 3) Four remote locations, and four mics in the meeting room



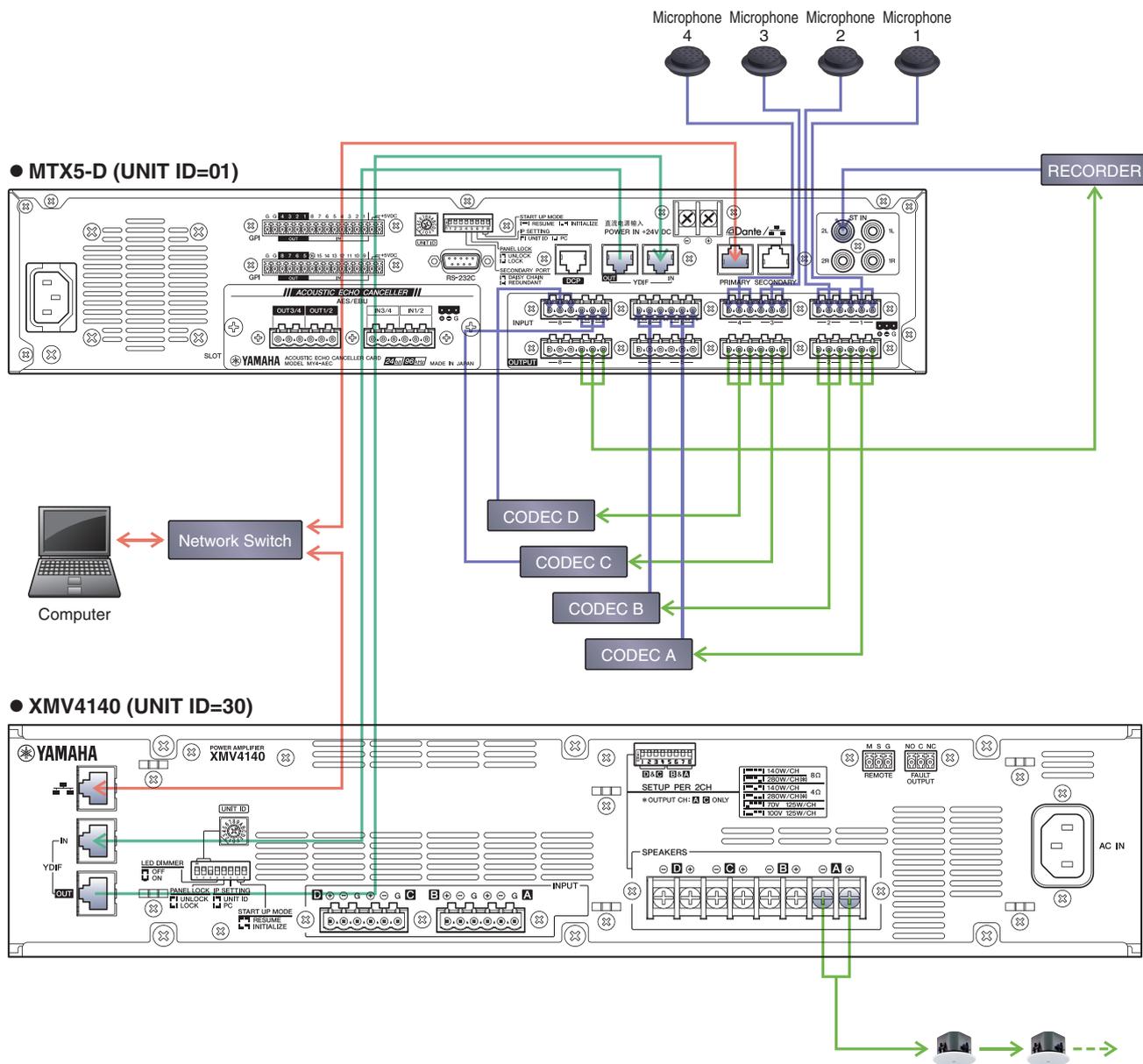
In this example, the signal flow is as follows.



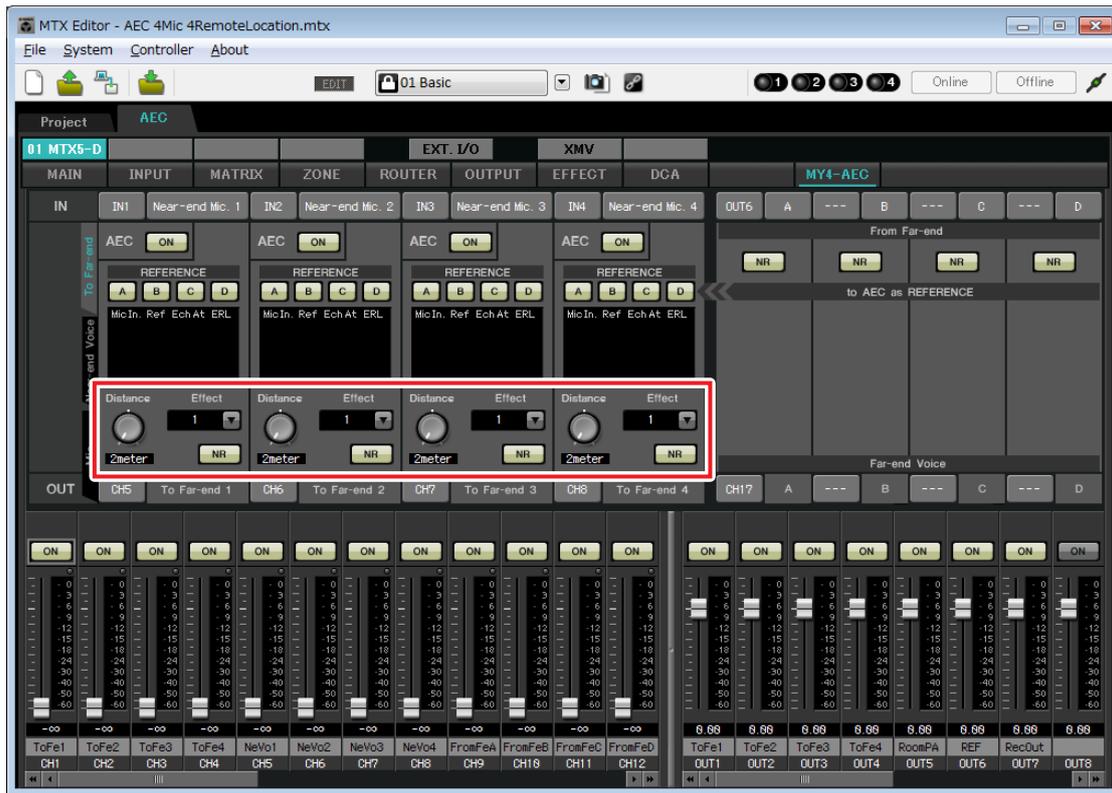
- NE: Near-end Mic
- FromFE: From Far-end
- NEVoice: Near-end Voice
- FEVoice: Far-end Voice
- TO FE: To Far-end
- NR: Noise Reduction

For locations that are listed as having “Non-adjustable parameter,” you should avoid using Dynamics-type components (Gate, Comp, Ducker) and adjusting the parameters of an operating system after it has been set up. Echo cancellation will no longer work effectively if you do so.

In this example, the connections are as follows.



■ Example settings for MTX Editor



• Distance setting

For a simple configuration in which the distance between the microphone and speaker is within two meters, there is no need to change this setting in MTX Editor.

If the distance between the microphone and speaker is greater than two meters, use the [Distance] knob to specify the distance.

• Echo cancellation depth setting

If there is a large amount of echo, use the [Effect] list box to adjust the depth of echo cancellation. Higher numeric values allow more echoes to be cancelled. However, this will degrade the audio quality correspondingly, so consider the trade-off as you adjust this.

• FBS setting

The MTX5-D provides two types of FBS: DYNAMIC and FIXED. In this project file, the DYNAMIC setting of the MTX5-D unit is turned on. As needed, use the “INPUT” screen to set the FBS setting to FIXED. For details on how to make this setting, refer to the “MTX Editor User’s Manual.”

NOTE

FBS is also provided by the MY4-AEC; however, because the FBS of the MTX5-D allows more flexible settings, you should use the FBS of the MTX5-D.

• To make echo cancellation work effectively

Do not use GATE, COMP, AGC, or LIMITER, and do not operate the faders or gain while the system is in use. Doing so will decrease the effectiveness of echo cancellation.

• XMV attenuator value

In this project file, the XMV’s attenuator value is set to -99. Use the “XMV” screen to set the CH A attenuator value to an appropriate value.

■ Examples of adjusting the settings

- **Adjusting the volume of the audio signal from the remote location**

Operate the fader of input channels 9 through 12. While you watch the level meter, adjust the input level so that the yellow indicator lights occasionally.

- **Adjusting the volume of a microphone of the local location**

In the “MY4-AEC” screen, click the [Near-end Mic.] button to access the parameter editing screen, and operate the [GAIN] knob. While you watch the Mic In. meter, adjust the HA gain so that the yellow indicator lights occasionally.

- **Adjusting the volume of the speaker of the local location**

Adjust the input level as described in “Adjusting the volume of the audio signal from the remote location” and “Adjusting the volume of a microphone of the local location,” above.

- **If you don’t want the audio from the local microphone to be output from the speaker**

In the “MATRIX” screen, turn off the sends of input channels 5 through 8.

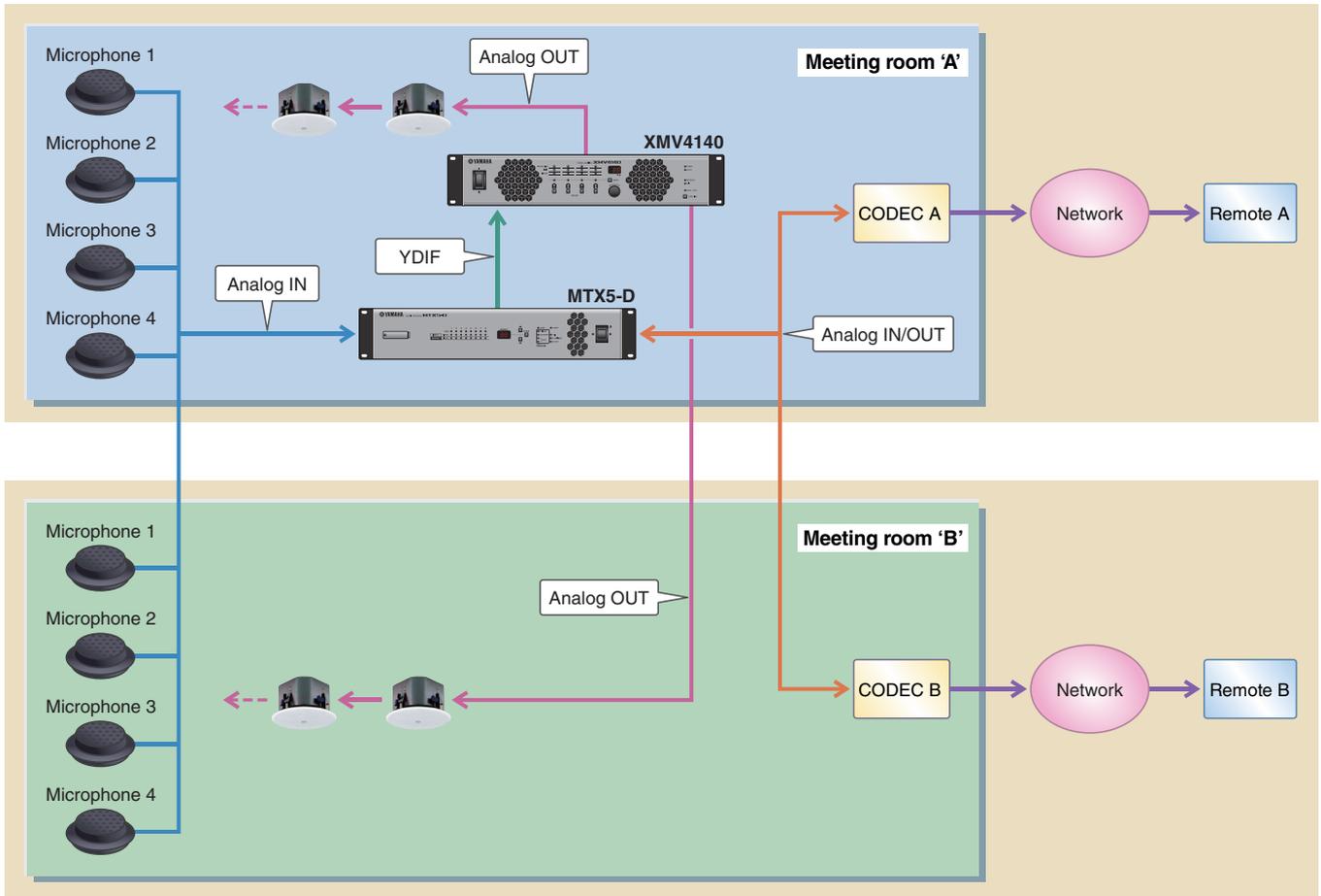
- **If you want to connect recording/playback device**

To record, connect your device to the MTX5-D’s “OUTPUT” 7 connector. To play back, connect your device to the MTX5-D’s “ST IN” 2L connector. When recording, turn on the [ON] button of input channel STIN2L. When playing back, turn on the [ON] button of output channel OUT7.

NOTE

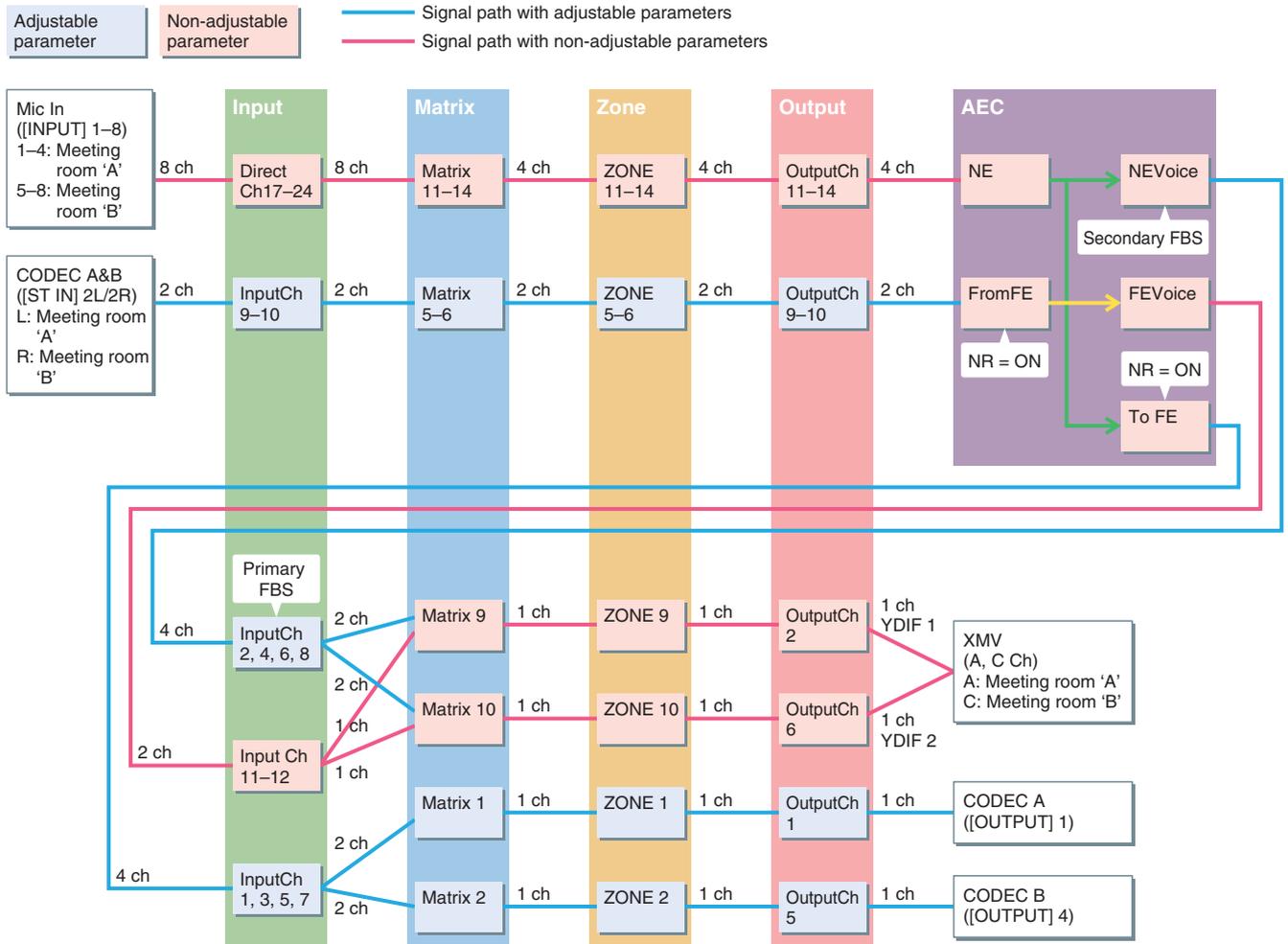
Feedback may occur if you have connected a type of recording/playback device that outputs the input signal while recording is paused. If feedback occurs, click the [ON] button of input channel STIN2L to turn it off. When playing back, turn this button back on.

Example 4) Dividing between two meeting rooms and conferencing with separate locations



Example 4) Dividing between two meeting rooms and conferencing with separate locations

In this example, the signal flow is as follows.

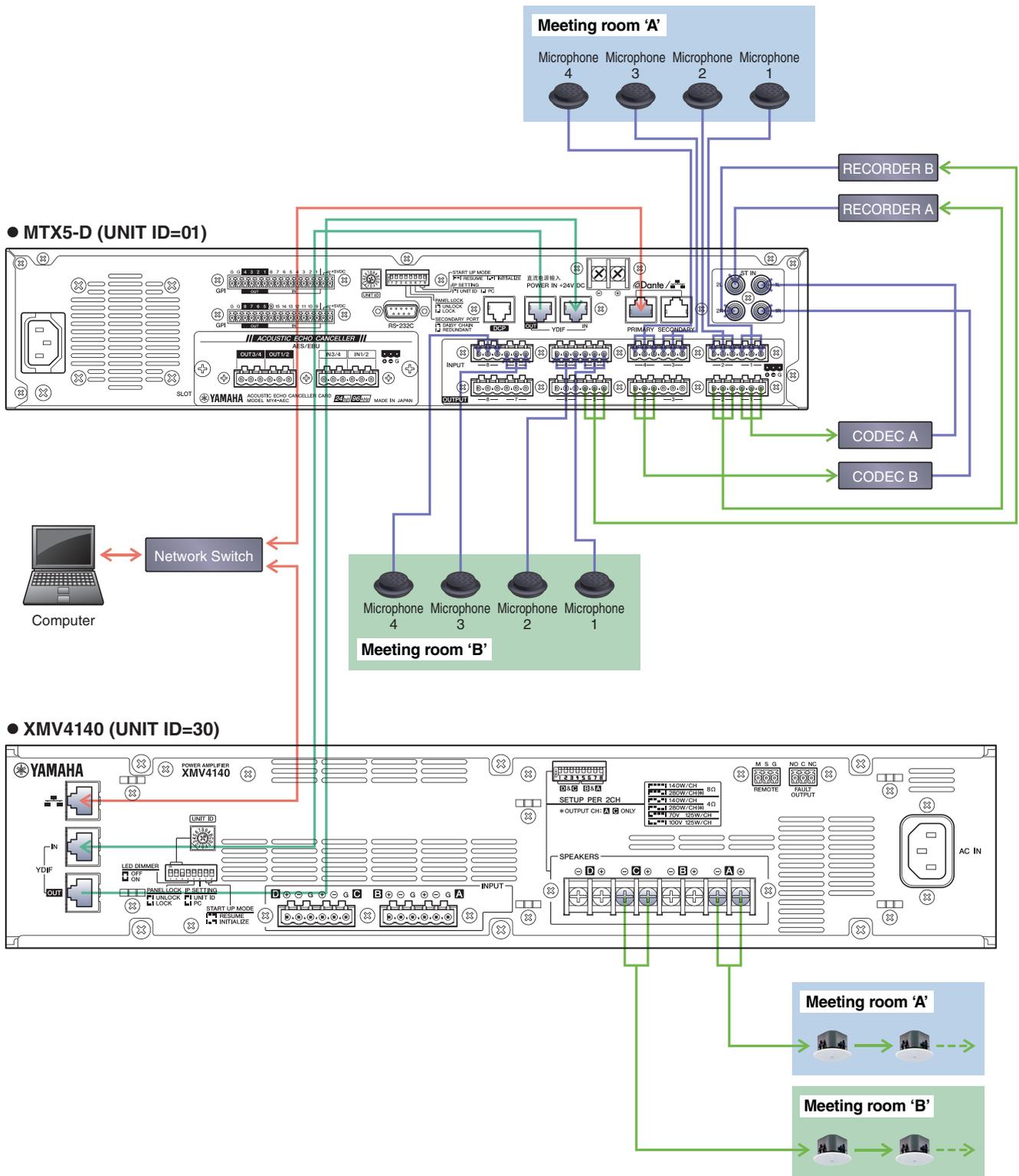


- NE: Near-end Mic
- FromFE: From Far-end
- NEVoice: Near-end Voice
- FEVoice: Far-end Voice
- TO FE: To Far-end
- NR: Noise Reduction

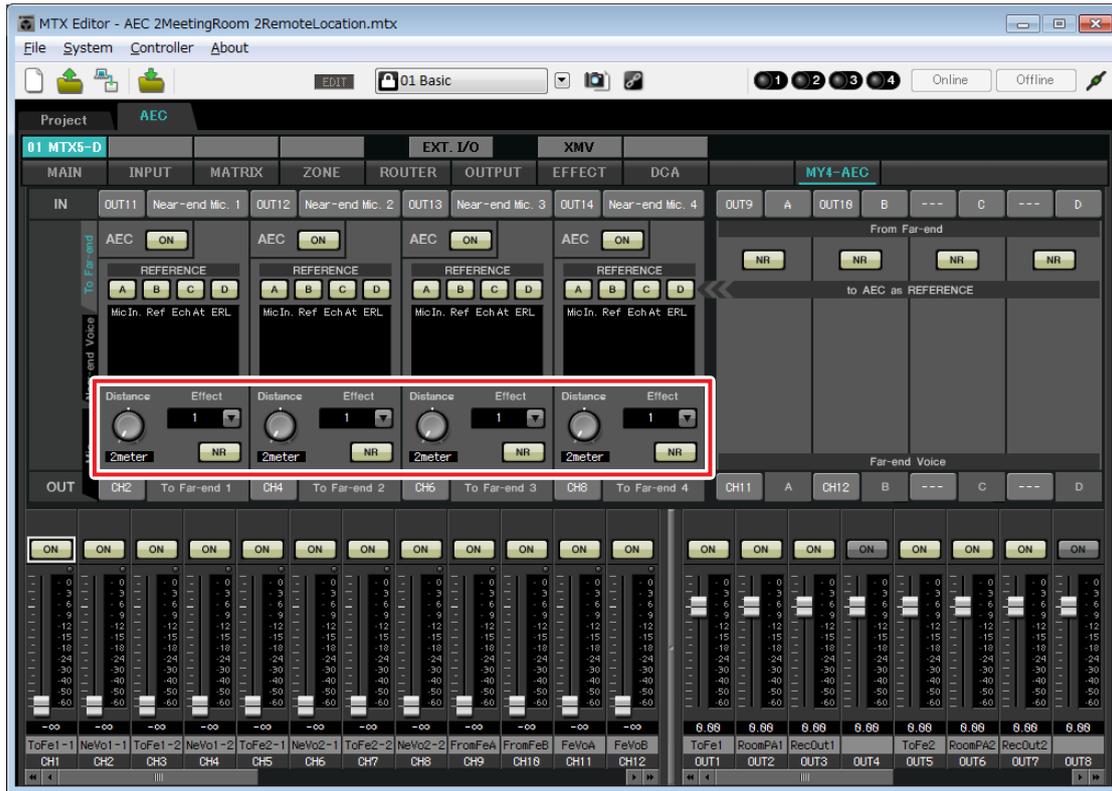
For locations that are listed as having “Non-adjustable parameter,” you should avoid using Dynamics-type components (Gate, Comp, Ducker) and adjusting the parameters of an operating system after it has been set up. Echo cancellation will no longer work effectively if you do so.

Example 4) Dividing between two meeting rooms and conferencing with separate locations

In this example, the connections are as follows.



■ Example settings for MTX Editor



• Distance setting

For a simple configuration in which the distance between the microphone and speaker is within two meters, there is no need to change this setting in MTX Editor.

If the distance between the microphone and speaker is greater than two meters, use the [Distance] knob to specify the distance.

• Echo cancellation depth setting

If there is a large amount of echo, use the [Effect] list box to adjust the depth of echo cancellation. Higher numeric values allow more echoes to be cancelled. However, this will degrade the audio quality correspondingly, so consider the trade-off as you adjust this.

• FBS setting

The MTX5-D provides two types of FBS: DYNAMIC and FIXED. In this project file, the DYNAMIC setting of the MTX5-D unit is turned on. As needed, use the “INPUT” screen to set the FBS setting to FIXED. For details on how to make this setting, refer to the “MTX Editor User’s Manual.”

NOTE

FBS is also provided by the MY4-AEC; however, because the FBS of the MTX5-D allows more flexible settings, you should use the FBS of the MTX5-D.

• To make echo cancellation work effectively

Do not use GATE, COMP, AGC, or LIMITER, and do not operate the faders or gain while the system is in use. Doing so will decrease the effectiveness of echo cancellation.

• XMV attenuator value

In this project file, the XMV’s attenuator value is set to -99. For meeting room ‘A’, access the “XMV” screen and set the CH A attenuator value to an appropriate value. For meeting room ‘B’, access the “XMV” screen and set the CH C attenuator value to an appropriate value.

■ Examples of adjusting the settings

- **Adjusting the volume of the audio signal from the remote location**

For meeting room 'A', operate the fader of input channel 9. For meeting room 'B', operate the fader of input channel 10. While you watch the level meter, adjust the input level so that the yellow indicator lights occasionally.

- **Adjusting the volume of a microphone of the local location**

For meeting room 'A', operate the faders of input channels 17 through 20. For meeting room 'B', operate the faders of input channels 21 through 24. While you watch the level meter, adjust the input level so that the yellow indicator lights occasionally.

- **Adjusting the volume of the speaker of the local location**

Adjust the input level as described in "Adjusting the volume of the audio signal from the remote location" and "Adjusting the volume of a microphone of the local location," above.

- **If you don't want the audio from the local microphone to be output from the speaker**

For meeting room 'A', turn off the sends of input channels 2 and 4 in the "MATRIX" screen. For meeting room 'B', turn off the sends of input channels 6 and 8 in the "MATRIX" screen.

- **If you want to connect recording/playback device**

For recording, connect your device to the MTX5-D's "OUTPUT" 2 connector and 5 connector (2 is meeting room 'A', and 5 is meeting room 'B'). For playback, connect your device to the MTX5-D's "ST IN" 2L/2R connectors (2L is meeting room 'A', and 2R is meeting room 'B'). When you record, turn on the [ON] button of input channels STIN2L/STIN2R. When playing back, turn on the [ON] button of output channels OUT3/OUT7.

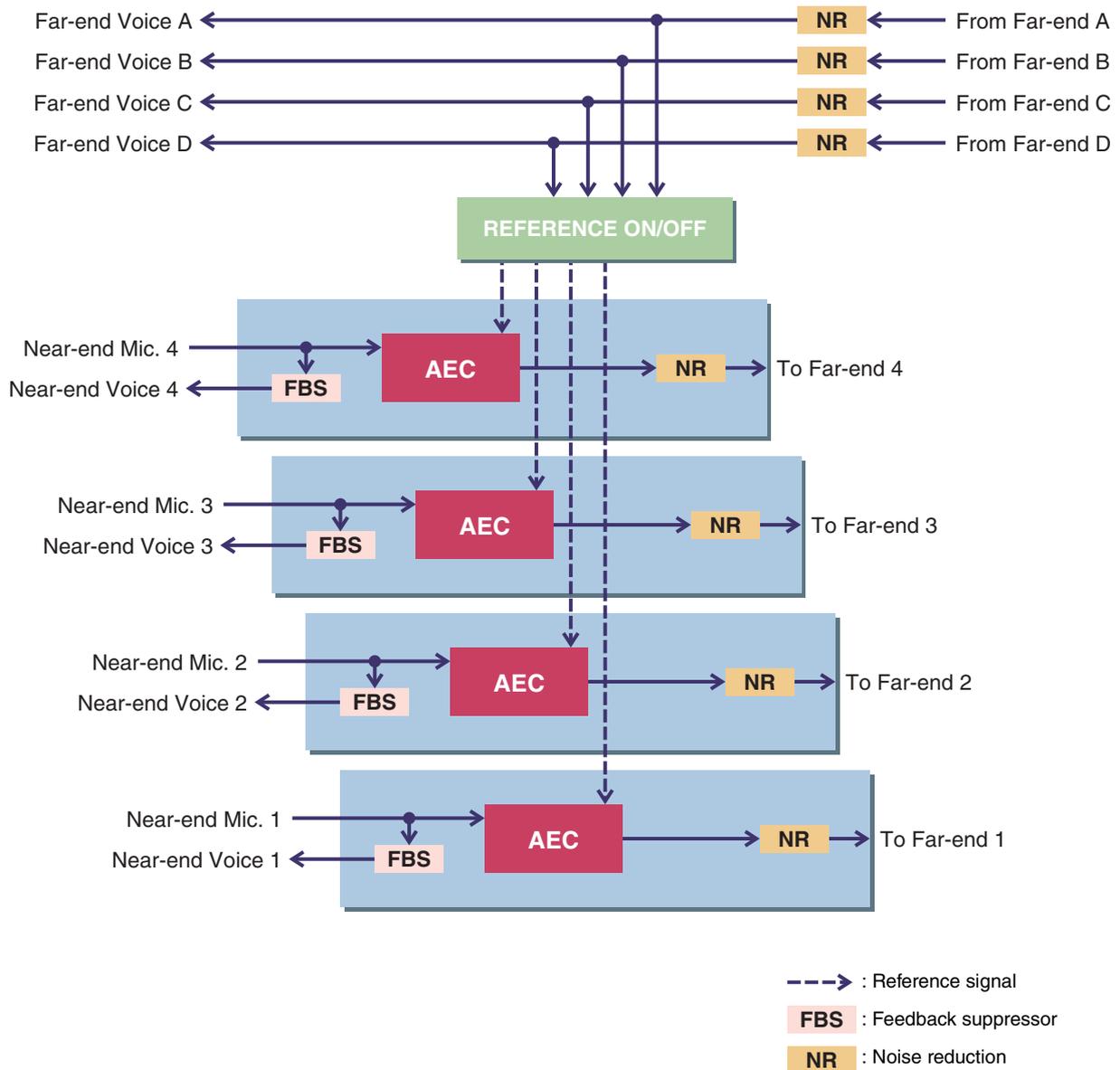
NOTE

Feedback may occur if you have connected a type of recording/playback device that outputs the input signal while recording is paused. If feedback occurs, click the [ON] button of input channel STIN2L/STIN2R to turn it off. When playing back, turn this button back on.

Appendix

■ Signal processing in the MY4-AEC

The MY4-AEC acoustic echo canceller (AEC) works by comparing the reference signal received from the far-end with the signal from the microphone in order to determine which components of the signal are echo, and then subtracts only the far-end echo component from microphone signal. The near-end sound is thus clearly transmitted to the far end without echo. The signal flow is as follows.



There are two NR (Noise Reduction) locations: From Far-end and To Far-end. Each has the following roles.

From Far-end	Reduces steady-state noise from sources such as a projector or air conditioning unit in the remote location.
To Far-end	Reduces steady-state noise from sources such as a projector or air conditioning unit in the local location.