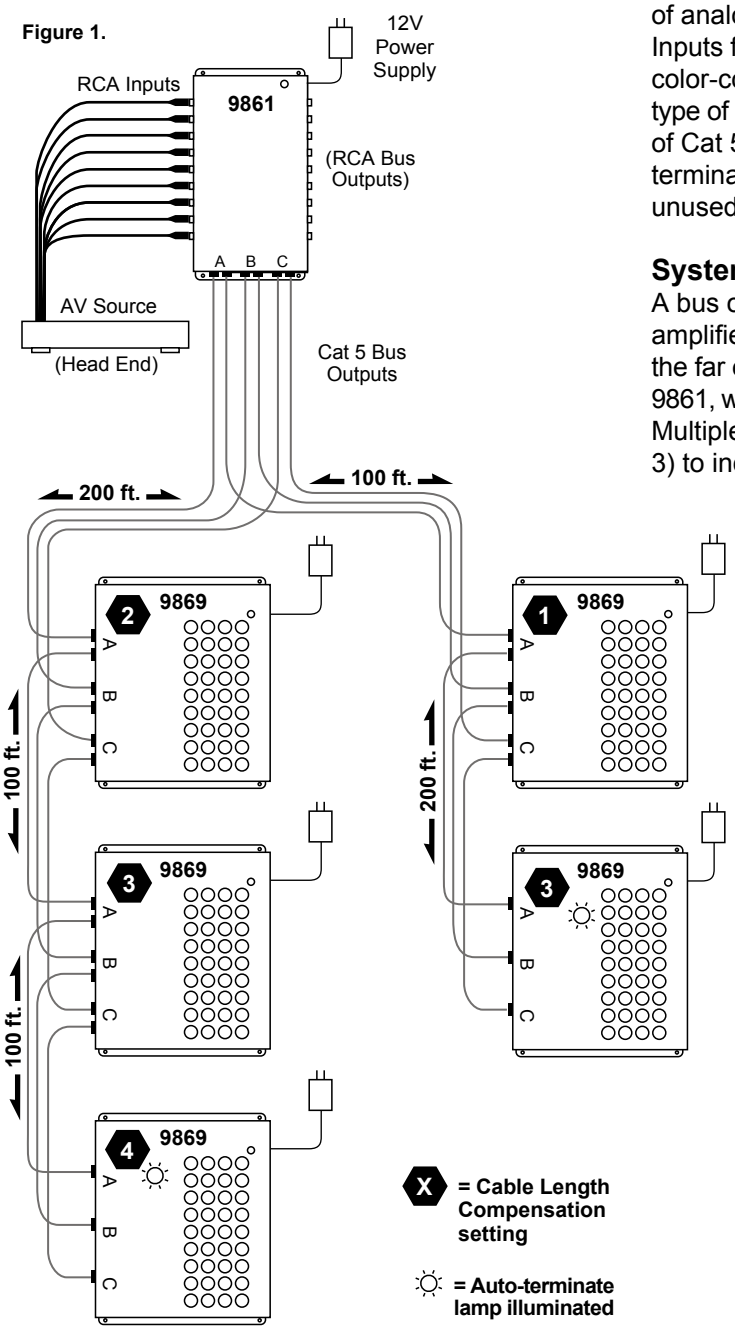
Using the 9860 Series Category 5 Distribution Amplifiers

WARNINGS

- Read these instructions before installing or using this product.
- To reduce the risk of fire or electric shock, do not expose this unit to moisture.
- This product must be installed by qualified personnel.
- Do not open the cover – there are no user-serviceable parts inside.
- Do not expose this unit to excessive heat.
- Clean the unit only with a dry or slightly dampened soft cloth.

Figure 1.



The 9860 Series Distribution Amplifiers employs Category 5 UTP cable to transmit audio and video long distances and distribute the output to multiple HDTVs. An adjustable electronic equalizer compensates for the normal losses of Cat 5 cable, making the video performance of this system independent of cable length up to 1,000 feet.

The home-run architecture of the 9860 Series simplifies distribution systems by allowing multiple copies of the signal to originate at the head end, making maintenance and remodeling less confusing.

The 9860 System acommodates digital audio, two pairs of analog audio, and composite and component video. Inputs from the source and outputs to the displays are on color-coded RCA jacks. Depending on the number and type of signals to be distributed, either two or three lengths of Cat 5 cable are needed per bus run. Automatic termination eliminates any need to manually terminate unused RJ-45 (Category 5) jacks.

System Design

A bus originates at the head end unit and passes from amplifier to amplifier, and is automatically terminated at the far end. Figure 1 shows the dual outputs of the Model 9861, which enable two buses to originate from one source. Multiple 9861s can be used at the head end (see Figure 3) to increase capacity.

How to Design a 9860 Series Signal Distribution Network

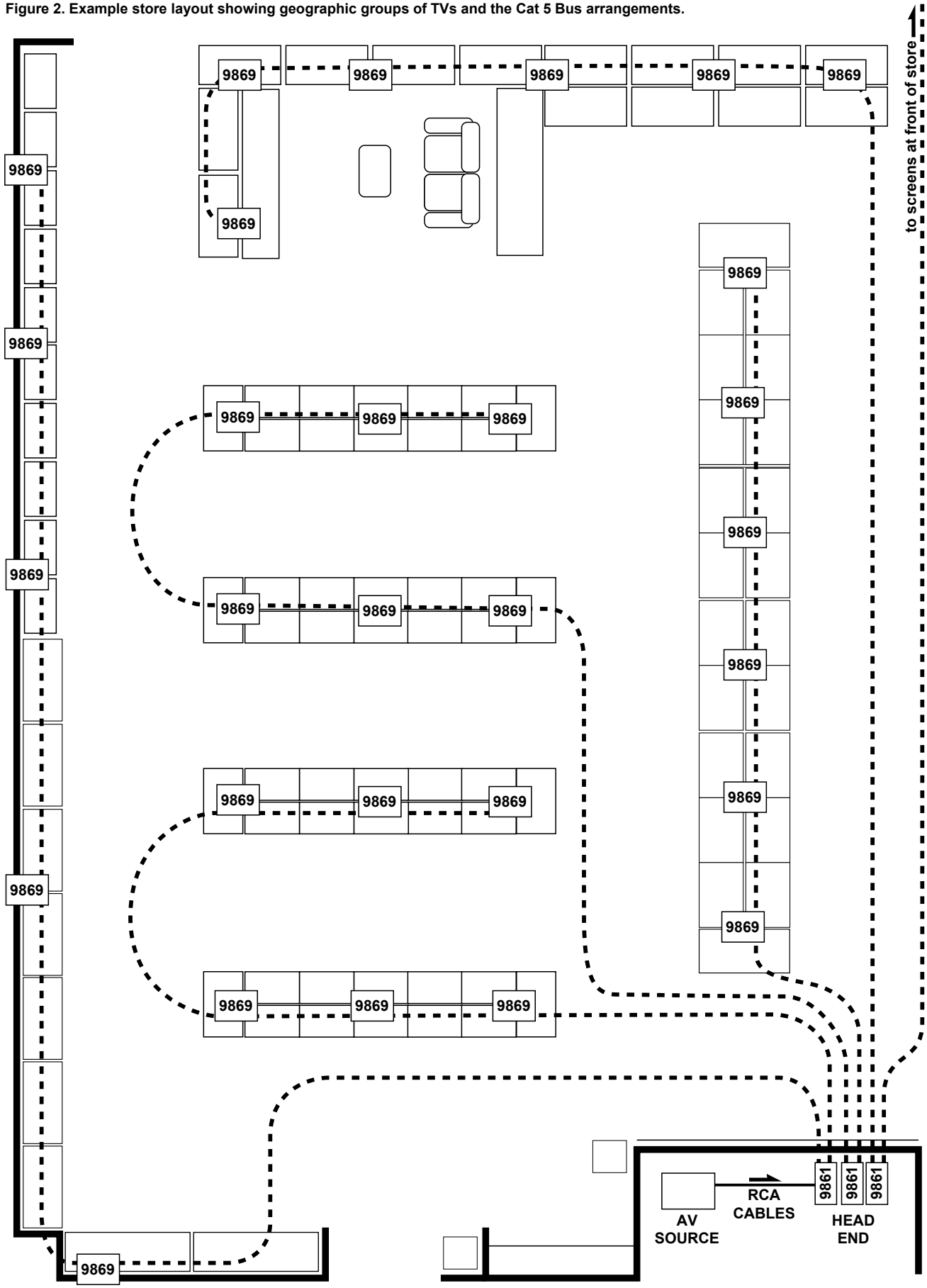
1. Determine the number and locations of television displays being served.
2. Place one 9869 amplifier for every four television displays.
3. Divide the amplifiers into geographic groups, with not more than 10 amplifiers in each group (See Figure 2 for example).
4. Determine which of the 9 output channels are to be supported. If neither composite video nor analog audio-B channels are needed, Cat 5 bus cable "C" can be eliminated (See table below). Cable A and B are always required.

Signal Assignments in Category 5 Cables

Cable	Signals Carried
A	Digital Audio, Analog Audio A
B	Component Video
C	Composite Video, Analog Audio B

5. Join the Unbuffered Bus ports of the amplifiers in each group with either 2 or 3 runs of Cat 5 cable, as determined above.

Figure 2. Example store layout showing geographic groups of TVs and the Cat 5 Bus arrangements.

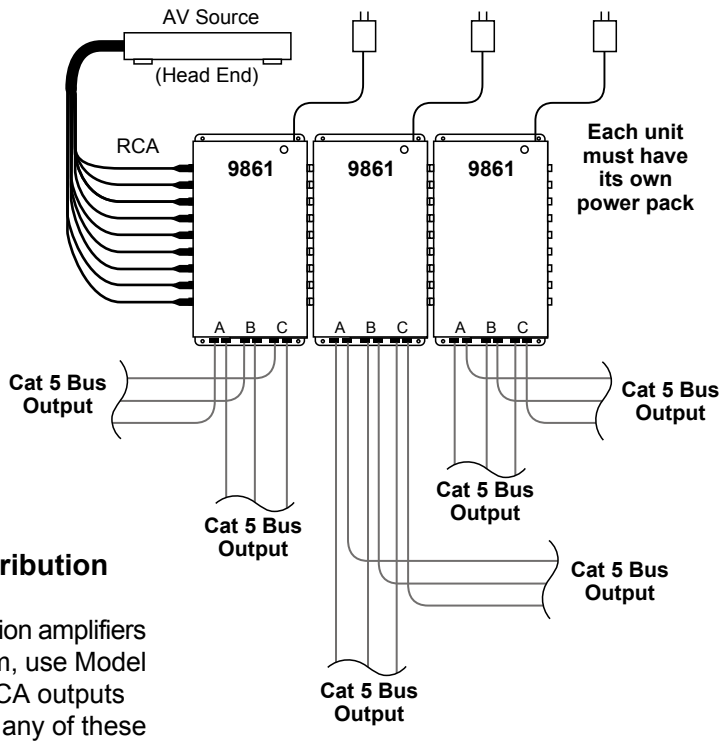


6. Feed the Unbuffered Bus port of a 9869 at the end of a group with a homerun of 2 or 3 Cat 5 cables from a 9861 output. To determine how many 9861s you will need, divide the number of geographic groups by two.
7. Determine the total bus cable length from EACH AMPLIFIER back to the 9861 output that sources it. Use this distance to set the cable length compensation dial during installation: 0 for up to 99 feet, 1 for 100 to 199 feet, etc.

Increasing Head End Capacity

Figure 3 shows how to stack 9861s to increase head end capacity. An unlimited number of 9861s can be stacked in this manner using a KIT 46 for each additional 9861. KIT 46 contains the RCA male-to-male adapters used to join two 9861s.

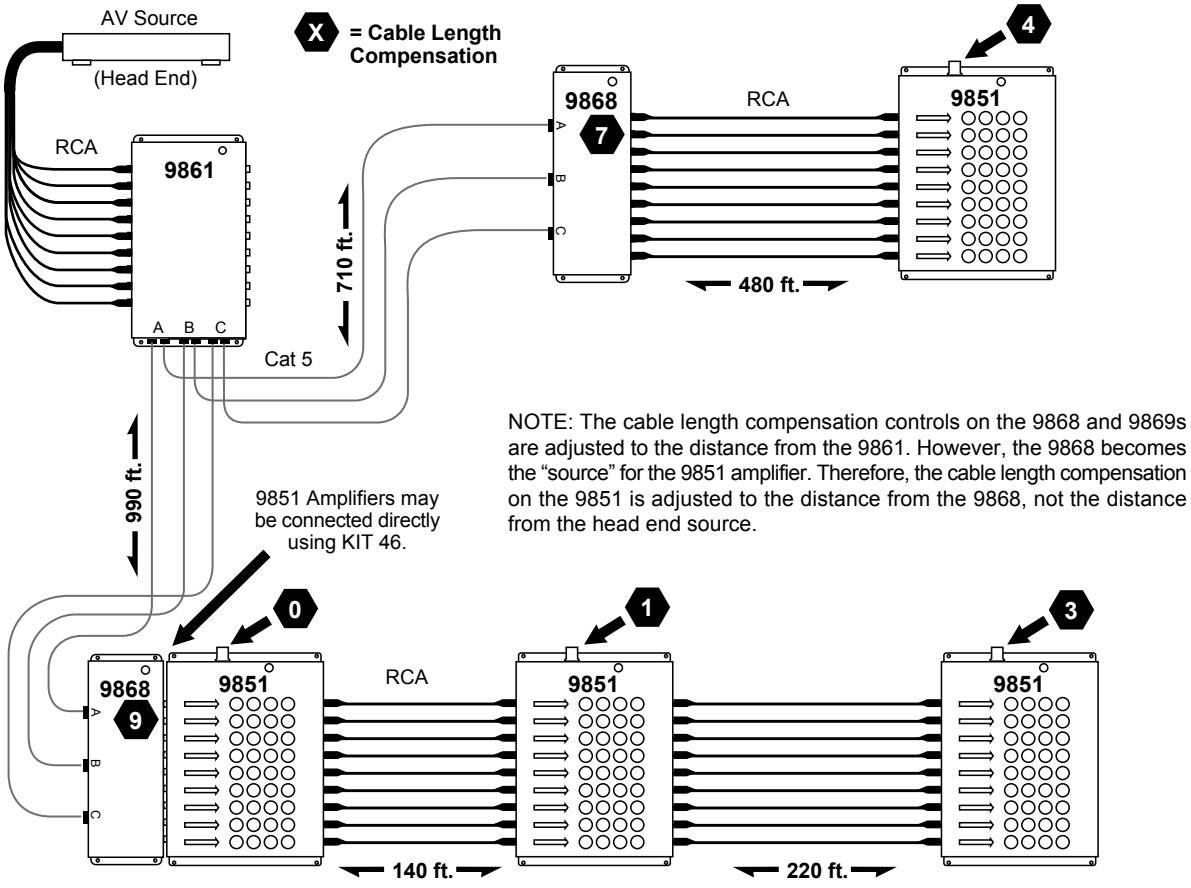
Figure 3. Three 9861 Drivers joined by Kit 46 connectors.



Using Model 9868 to Adapt RCA-Bus Distribution Amps to Cat 5

When it is desired to interconnect RCA-bus distribution amplifiers such as Model 9851 with a 9860 Cat 5 bus system, use Model 9868. It converts the 9860 Series Cat 5 bus to RCA outputs that can be directly connected to the bus input of any of these models. Figure 4 shows how 9868s may be used to drive 9851s directly or through RCA patch cords.

Figure 4. Note: power supplies are not shown.



NOTE: The cable length compensation controls on the 9868 and 9869s are adjusted to the distance from the 9861. However, the 9868 becomes the “source” for the 9851 amplifier. Therefore, the cable length compensation on the 9851 is adjusted to the distance from the 9868, not the distance from the head end source.

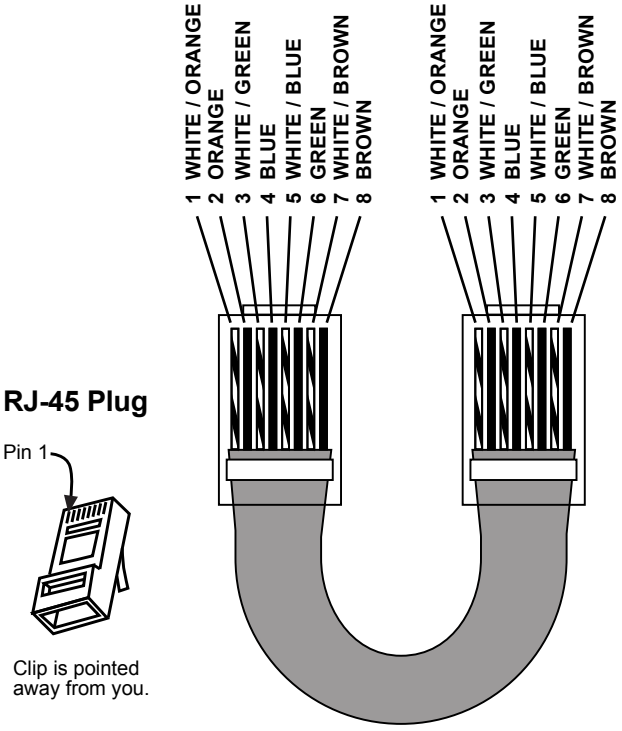
A 9861/9868 pair can be used in any instance where it is desirable to send audio or video signals long distances over Cat 5 cable. Adjust the 9868 cable length compensation to the number of feet of Cat 5 cable between it and the 9861.

Installation

Pull good quality Category 5 UTP cable between the amplifier locations determined in Step 2 under “How to Design a 9860 Signal Distribution Network”. Pull two cables for analog and digital audio and component video, or three cables if composite video and/or a second pair of analog audio signals are needed as well. Good quality cable is important. Mark both ends of the cables in each set A, B and C, or use three different jacket colors of UTP cable for A, B and C.

Install an RJ-45 plug on each end, using EIA-568B pairing (pins 1-2, 3-6, 4-5, 7-8). Check each cable with a network cable tester – CONTINUITY TESTING IS NOT ADEQUATE – the color code must match the wiring diagram in Figure 5 exactly.

Install a 9861 at the source and a 9869 amplifier at each location and secure to any surface. Plug in a wall-mount power supply (PN 571-013, included) for each unit and connect it to its power jack. Starting with the head end, plug the A, B and C Cat 5 cables into their respective bus jacks. Observe that the cable check lamps on each Bus In jack that have a cable plugged in are illuminated. These lamps indicate that the A, B and C cables are in order, but they do not indicate that individual cables are wired correctly (use cable tester). With only A and B cables plugged in, the A and B lamps will light but the C lamp will remain dark.



When all units have been connected, check that the Auto-terminate lamp on the last unit in each Cat 5 Bus run is illuminated and that the Auto-terminate lamps on all intermediate units on a Bus string are NOT illuminated. If either of these conditions are not met, faulty Cat 5 wiring in that bus is probably the cause.

Adjust the Cable Length Compensation control on each unit according to the distance of that unit from the 9861 feeding the bus. See Figure 4 for examples of distance calculations. Add up the lengths of bus cable between the unit you are adjusting and the 9861 output feeding that unit. Set the dial to the hundreds digit of the number of feet of Cat 5 cable. For example, if the total Unbuffered Bus cable from a 9869 to the 9861 is 100, set its control to “1” and if the total is 250, set the control to 2. If it is 390, set it to 3 and so on.

Connect the audio/video source(s) to the 9861 inputs and connect television displays and home theater receivers to the 9869 outputs. Test and adjust the displays and/or audio gear.

In Case of Difficulty

Most problems are caused by open or crossed Cat 5 cable conductors or crossed A-B-C cables. Check the former using a network cable tester and the latter by observing the cable check lamps on the left edge of each 9869.

You can use a spare 9861 with three short Cat 5 patch cords and an input such as a video generator to inject test signals into a 9869 amplifier that appears to be malfunctioning. Unplug the cables from the 9869 Unbuffered Bus In jacks, plug in the 9861 test rig in their place, and monitor the 9869 output. If good, look for bad cable wiring or a bad amplifier upstream.

If you have trouble with your system that you cannot resolve, please call Audio Authority Technical Support at 800-322-8346.

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