



#### DESCRIPTION

Heralding a new era in sound reproduction, the 4-channel concept can place you in a concert hall or drop you in the middle of a musical group. By opening up the entire listening room to musical sources, an entirely new dimension of creativity in music has been launched.

There are two basic approaches to four channel reproduction: discrete and matrix. These terms refer to the nature of the equipment being used, rather than having any musical connotation. In a discrete system, there is a totally independent transmission "space" for each channel of information. In the case of magnetic tape, the width of tape is divided into the desired number of tracks. Similarly, a stereo record groove contains two essentially independent transmission channels, the two groove walls.

In an effort to reduce the cost and complexity of 4-channel systems, the matrix technique has been developed. When there are more channels of information than there are discrete transmission channels, the information channels are mixed together in certain predetermined ways and applied to the transmission channels available. A complementary device, called a decoder, provides reconstruction of the 4-channel information during playback.

Matrix development at Electro-Voice has culminated in the design of a Universal Decoder. This patented\* process has been reduced to an integrated circuit, and this integrated circuit is the heart of the EVX-44. All matrix encoded material will be decoded by the EVX-44 in the proper quadrant. In addition, the subjective effect

of ordinary stereo program material can be much improved through the use of the decoding circuitry. The decoding process takes place without affecting frequency response, distortion, signal-to-noise ratio, or other factors relating to audio quality.

A unique Separation Enhancement circuit in the EVX-44 provides an additional measure of realism. When a front center soloist is present in the recording, back separation is decreased and front-to-back isolation is increased to firmly localize the soloist in the front speakers. The separation enhancement circuitry operates automatically and can be manually switched off or on as well.

The EVX-44 is more than a decoder—its flexibility makes it a 4-channel control center. In addition to tape output jacks, the EVX-44 has provision for connecting both 2-channel and 4-channel tape machines. Any input can be operated in discrete mode or can be decoded. A Master Volume control adjusts the level of all four channels simultaneously on all inputs and all functions.

#### SPECIFICATIONS

|                                    |                                                                   |
|------------------------------------|-------------------------------------------------------------------|
| Gain (control maximum):            | Unity                                                             |
| Maximum Input Signal:              | 4V RMS                                                            |
| Frequency Response:                | 20 – 20,000 Hz; $\pm 1$ dB                                        |
| Noise Level (at 20 kHz bandwidth), |                                                                   |
| Max. Volume:                       | 80 $\mu$ V                                                        |
| Min. Volume:                       | 10 $\mu$ V                                                        |
| Total Harmonic Distortion,         |                                                                   |
| (at .25V input):                   | Less than .1%                                                     |
| Intermodulation Distortion,        |                                                                   |
| (at .25V input):                   | Less than .2%                                                     |
| Input Impedance,                   |                                                                   |
| Discrete:                          | 50k ohms                                                          |
| Decode:                            | 390k ohms                                                         |
| Output Impedance:                  | Less than 14,000 ohms                                             |
| Controls:                          | Master Volume/Power On/Off,<br>Function Switch and Input Selector |
| Dimensions:                        | 2 $\frac{3}{4}$ " h., 8" w., 7" d. overall                        |
| Power Requirements:                | 110-120V, 50-60 Hz, 5 watts                                       |

## SYSTEM REQUIREMENTS

For four independent sound channels to exist, there must be four separate power amplifiers (two stereo amplifiers) and four speakers. Happily, there is a simple way to use the preamp and input selector sections of most stereo amplifiers and receivers to feed the decoder, while the power amplifier sections of that amplifier or receiver are used to power the left front and right front speakers of the 4-channel system. Most stereo electronics today include a tape monitor (also called tape-source) switch, which interrupts the normal signal path through the amplifier and introduces a new signal from outside the unit, independent of the input selector switch. How this is done is detailed in Figure 2. For the moment, however, if you have a separate control on your unit which permits selection of tape input without disturbing the normal input selector, you can easily connect the EVX-44 decoder.

The EVX-44 decoder can be inserted in your system anywhere ahead of the power amplifier. For example, if you have separate preamp and power amplifier components, the decoder can be inserted between them. However, some flexibility in system operation is lost using this method of connection, so the tape monitor connection is recommended.

While the choice of equipment for a 4-channel system is a concern to many, the criteria for good performance are less severe than for two-channel stereo. As is the case with 2-channel stereo, best performance results when all four amplifier channels are the same and all four speakers are the same. However, the results are still totally satisfactory if the back amplifier is of lower power and the back speakers have narrower frequency range, because the back channels are helped out substantially by the front channels, especially at low frequencies. For best results, however, the two front speakers should be closely matched, as should the back pair.

With the decoder Master Volume control set at maximum, the decoder output can be no higher than the input voltage from the tape jacks of the front amplifier. For this reason, the input sensitivity of the back amplifier must be high enough that the decoder output will drive it satisfactorily.

## SYSTEM WIRING

You may be using complete receivers (amplifier with tuner), integrated amplifiers, preamps and power amps, integrated compact systems, consoles, or combinations of the above for your 4-channel electronics. To keep the instructions as simple as possible, the electronic unit used to drive the front pair of speakers will be called the Front Amplifier, and the electronic unit used to drive the back speakers will be called the Back Amplifier.

First, a few hints for a successful hookup.

1. The unit to which program sources (phono, tuner, etc.) are connected should be considered the Front Amplifier. For this reason, a more complete unit (stereo receiver versus stereo amplifier) should be considered the Front unit. If two similar units are to be used (two amplifiers or two receivers), the better unit in terms of power output, distortion, or whatever should be considered the Front unit.

2. If the two pairs of speakers are not identical, the better pair should be considered the Front Speakers.
3. If the two amplifiers are to be stacked on top of each other, the Front Amplifier should be on top for least confusing operation.
4. Follow the hookup directions slowly and carefully. With so many cables, it is easy to become confused. Observe the left and right channel connections scrupulously. In fact, it may be less confusing to go through the hookup steps for the left channel only, and then repeat the operation for the right channel. This way there is less chance of interchanging channels.
5. Once you have decided which units are to be Front and Back Amplifiers, make certain in your mind which is which, or even make a note on masking tape and stick it on the rear of the unit for reference while wiring.

## CONNECTIONS

1. Using convenient length shielded audio cables, connect the Front Amplifier's tape out jacks to the decoder Input jacks.
2. Connect the decoder's Front Output jacks to the Tape In jacks on the Front Amplifier. At this point you should have cables going to and from the Front Amplifier, connected to the decoder's Input and Front Output jacks.
3. Connect the decoder's Back Output jacks to the Back Amplifier input. If the Back Amplifier has Tape In jacks, use those. If not, use the auxiliary or other high-level inputs.
4. Connect the four speakers to the appropriate amplifier output terminals. Just as the fenders of a car are identified from the driver's seat, the speaker locations are named while facing the "front" of the 4-channel system. Thus, the left back speaker is connected to the left speaker terminals of the back amplifier. Be sure to connect all speakers "in phase," as outlined in your electronics and speaker instructions.
5. Connect the AC line cord to a convenient outlet. If a switched AC outlet is available on one of your amplifiers, power will be applied when the amplifier is turned on, and the decoder's Master Volume control can be left turned up all the time. In fact, if switched AC outlets are available on both the Front and Back Amplifiers, plugging the Back Amplifier into the Front Amplifier, and the decoder into the Back Amplifier, will permit the entire set of electronics to be turned on with the Front Amplifier power switch.

## TAPE CONNECTIONS

### TWO-CHANNEL TAPE

The Tape Out and 2-channel Tape In jacks on the decoder duplicate the tape jacks of the Front Amplifier which were used to connect the decoder. The Tape Out jacks permit recording of any 2-channel program source selected by the selector switch of the Front Amplifier.

### FOUR-CHANNEL TAPE

Separate tape inputs for 4-channel tape are provided on the EVX-44. Observe the front-back and left-right

markings of the jacks when connecting a 4-channel tape player.

If the 4-channel machine is a recorder, the front channel line inputs may be connected to the Tape Out jacks on the decoder, thus permitting a 2-channel recording of other program sources coming from the Front Amplifier.

If a pair of 2-channel tape machines are to be used in the system, one of them may be connected to the front jacks of the 4-channel tape input. Either machine may then be selected for playback at the decoder.

## CONTROL FUNCTIONS

### MASTER VOLUME

The large knob turns on the AC power, and controls the volume of all four channels simultaneously. With the Master Volume control turned all the way up (fully clockwise), the output level is the same as the input level (unity gain). The decoder may be turned on with the power switch on the Master Volume control, or the power may be controlled by plugging the decoder into a switched outlet on another piece of equipment, as outlined earlier.

### FUNCTION SELECTOR

This control determines the mode of operation of the decoder circuitry. A number of functions are provided:

**Discrete.** Provides straight-through operation from input to output. Whatever program source is selected by the input selector will be routed to the appropriate output jacks. A 2-channel program source will be directed to the front output jacks. Signals from the 4-channel tape input jacks will be connected directly to the four output jacks.

**Decode.** In the remaining three positions of the function switch, the Electro-Voice universal integrated circuit decoder is in operation. A 2-channel source, or the front channels of a 4-channel source in the case of the Tape 4 input, will be decoded and directed to the four output jacks.

**Separation Enhancement.** To augment the operation of the universal decoder and offer some personal control of playback effect, a unique Separation Enhancement circuit is included in the EVX-44. In the *auto* position, the Separation Enhancement circuitry senses the presence of a front center soloist and increases the front-to-back separation to isolate the soloist in the front speakers without reducing the level of back instruments.

With the switch in the *on* position, the separation enhancement circuitry is activated at all times, substantially increasing the center isolation as described above.

Use of the Separation Enhancement switch positions is entirely optional. Use of either of these positions should be decided simply on the basis of the subjective effects provided. These positions may be found to be of benefit for the

playing of stereo records recorded under "live" conditions, for example.

## INPUT SELECTOR

Chooses the desired input to the decoder and the rest of the system. In the Source position, whatever program material is coming from the Tape Out jacks on the front amplifier will continue through to the balance of the system. When Tape 2 is selected, a tape machine connected to the 2-channel Tape In jacks will play. Tape 4 selects the 4-channel tape inputs.

## OPERATION

Once the decoder is properly connected, putting the amplifier's Tape Monitor switches in the Tape position (or the Aux position on the Back amplifier, if that was used) connects the output of the decoder into all four amplifier channels. Start with the amplifier volume controls turned all the way down, the decoder Master Volume control turned all the way up, the decoder input switch in the proper position and the function switch in one of the Decode positions. Turning up the amplifier volume controls will provide the desired sound level in the room and also permit adjustment of front-to-back balance. If the volume controls are initially set for the loudest sound level you want in the room, then the Master Volume control on the decoder will reduce the sound from all four speakers equally as it is turned down. After this initial adjustment, the back amplifier volume control can be considered the front-to-rear balance control, adjusting the rear sound level up and down slightly to move the balance point forward or backward in the room, and to adjust for best subjective effect. Feel free to experiment.

The left-right balance controls of both amplifiers work normally, although there will be less need to adjust the left-right balance in either front or rear.

To return to normal, straight-through 2-channel operation of the Front speakers, turn the decoder function switch to Discrete.

## WARRANTY

Electro-Voice high fidelity electronics are guaranteed for three years from date of original purchase against malfunction due to defects in workmanship and materials. If such malfunction occurs, unit will be repaired or replaced (at our option) if delivered to the proper Electro-Voice service facility. There will be no charge for parts or return freight during the entire length of the warranty period; no charge for labor will be made during the first year of the warranty period. Warranty does not cover finishes or malfunction due to abuse or operation at other than specified conditions. Repair by other than Electro-Voice or its authorized service agencies will void this guarantee.

**Factory repair department for this product is located at: Electro-Voice, Inc./Rankin Rd., Newport, Tenn. 37821.**

## CUSTOMER SERVICE

The Electro-Voice EVX-44 is packed to provide maximum protection—well in excess of the shipping requirements of the Interstate Commerce Commission. If shipping damage does occur, contact the carrier immediately, requesting inspection and instructions, or contact the dealer from whom the unit was purchased.

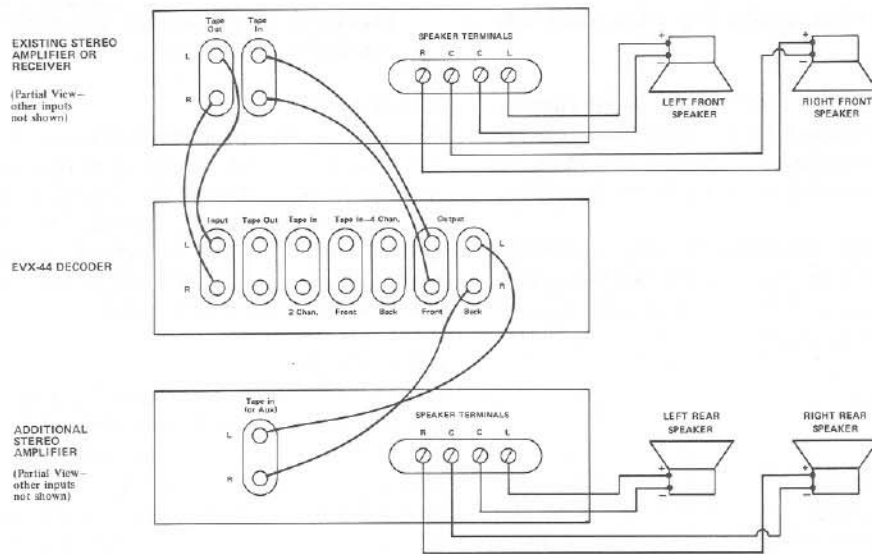
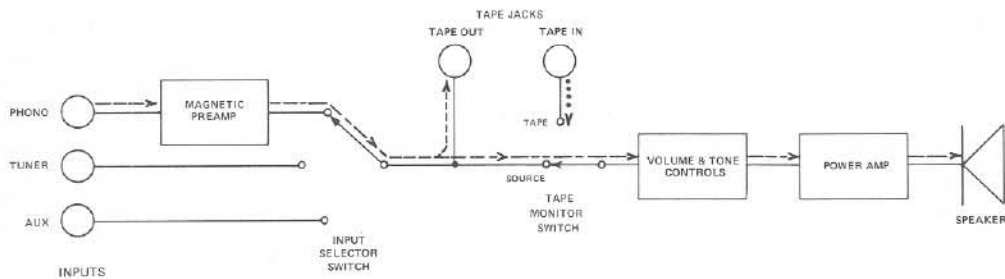
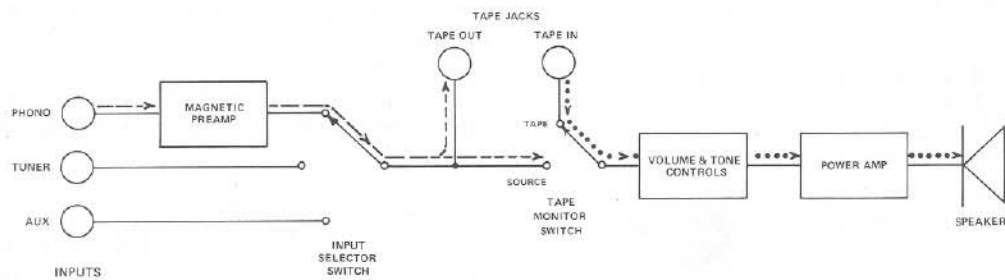


FIGURE 1 – Connecting EVX-44 Decoder



- a. With the Tape Monitor switch in the Source position, the source selected by the Input Selector switch plays through the speaker. The source signal also appears at the Tape Out jack.



- b. With the Tape Monitor switch in the Tape position, the Tape In signal plays through the speaker. The signal at the Tape Out jack is still the source signal.

FIGURE 2 – Block Diagrams of Typical Amplifier, Showing Tape Monitor Switch Operation

