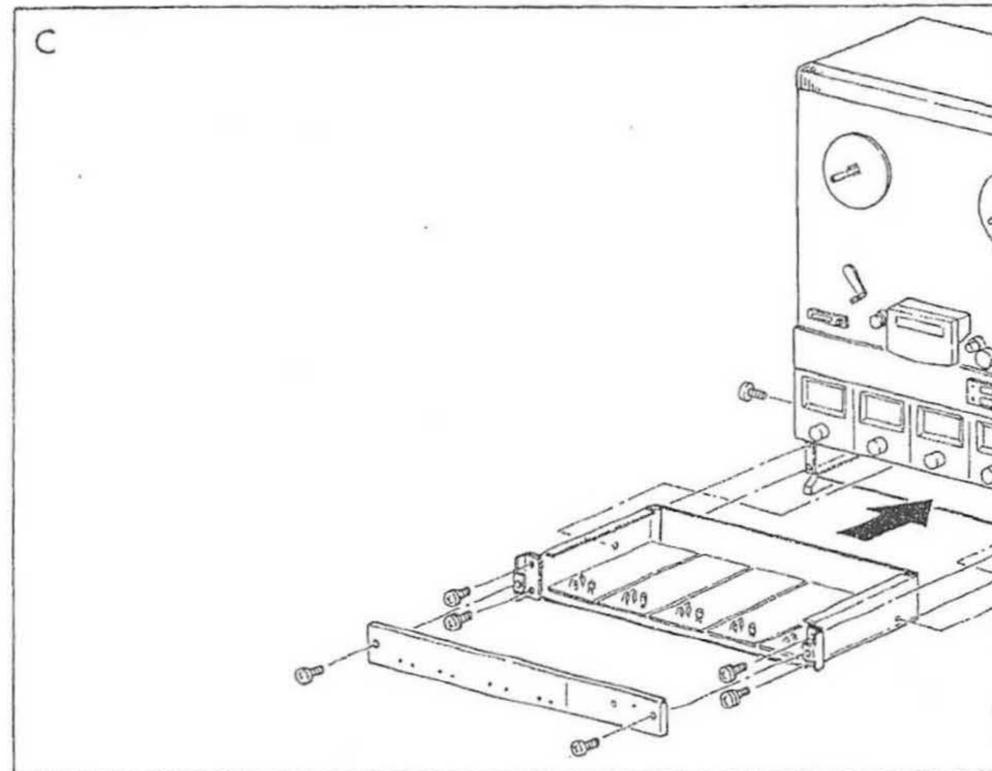
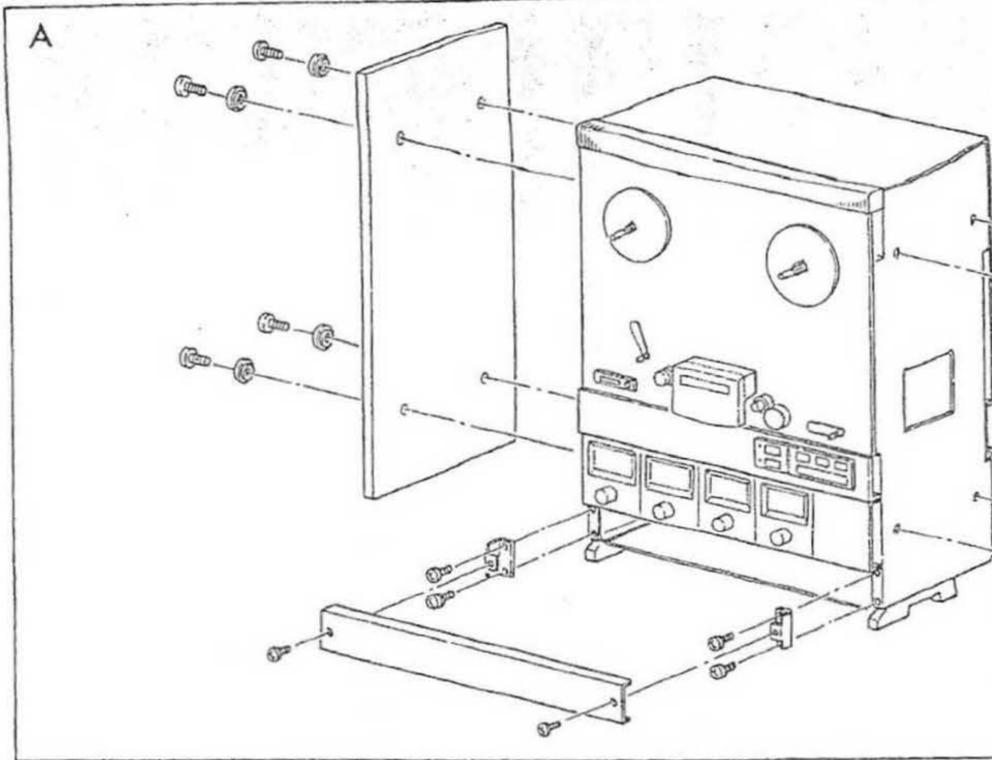


# INSTALLATION AND OPERATION WITH THE DX-4 WORKS-THEORY



## How to plug in:

1. Remove lower front panel (2 screws) and 2 lower front panel mounting brackets (2 screws on each side).
2. Remove rear panel located just below rear connection panel (4 screws).
3. Remove 2 screws in lower rear panel and slide panel out toward rear of the deck.
4. Remove lower inside rear panel (4 countersunk screws).
5. Slide the DX-4 into the deck from the front and replace the 2 screws that were removed in step 1.
6. Remove the two wooden side panels (4 screws on each) and install 2 screws on each side of the DX-4 through the access holes.
7. Replace the two wooden side panels. Save the removed panels and hardware for possible future use.
8. Connect the LINE OUT jacks of the 40-4 to the DECODE IN jacks of the DX-4.
9. Connect the LINE IN jacks of the 40-4 to the ENCODE OUT jacks of the DX-4.
10. Use the INPUT and OUTPUT jacks of the DX-4 to provide the connection between your mixer and the 40-4. (Connect mixer's line outs to DX-4 INPUT,

DX-4 is a wide-band compression-expansion system that provides a net noise reduction (broadband, not just of a little more than 30 dB. In addition, the reduction during recording permits a net gain in tape volume of about 10 dB.

A compression factor of 2:1 is used before recording; 1:2 expansion on playback. These compression and expansion factors are linear in decibels and allow the system to produce tape recordings with over a 100 dB dynamic range — an important feature, especially when doing live recording.

DX-4 employs RMS level sensors to eliminate compressor-expander tracking errors due to phase shifts in tape recorder, and provide excellent transient tracking abilities.

To achieve a large reduction in audible tape hiss, without fear of overload or high frequency self-erasure on the tape, frequency pre-emphasis and de-emphasis are added to the signal and RMS level sensors.

If you're an electronic engineer, all of the above gobs may tell you the whole story of what's going on in the DBX, if you're not, to make things a little easier to understand we'll ask you to use your imagination.

Imagine four little recording engineers in the box with four hands on a volume control each. They are incredibly smart but very stupid, so you must give them a set of rules. Tell them to raise signals that are below "0 VU," and lower signals that are higher than "0 VU."

As the signal is, the more they raise it, and the more they lower levels above "0 VU" get lowered more and more as they go up in level past "0." This is the 2:1 compression.

Also tell them to call ".316 volt" "0 VU." Here they do nothing, no change except frequency pre-emphasis or de-emphasis. Since you know they are going to keep the high frequencies under control, you can raise the "top end" a bit and not overload the tape. Just to keep it simple for them, the boost in highs is fixed. They put it in all the time, no matter what level changes they are making. Now we play tape back, and say OK, do everything backwards.

Levels above ".316 volt" "0 VU" are raised and levels below ".316 volt" are lowered, and while you're at it, take off the extra top end as well. Follow the same in reverse. As long as you don't confuse them by moving the "0 VU" point, they work just great, but — don't put in more than ".316 volt" as zero VU, and don't move the tape playback zero anything other than ".316 volt" either. As we said they're very dumb and will follow instructions very precisely. Differing levels will produce decoding errors.

The reason these errors may not be objectionable is that the tape could have played or sung or whatever with a little more or less dynamics. A small change won't be noticeable as a mistake, but it is not perfect. The tolerance here is not electronic, it's human. To get exactly what you put in it is necessary to get an exact "0 VU," ".316 volt" in and out.

The system is level sensitive although it is realistic to think of it as "artistically" forgiving.

REASONING: Program material must be in uncompressed form for mixing and sound-on-sound recording. You must decode the program material which has been encoded by the DX-4 in order to mix it with any other material — compressed or uncompressed. Of course, mixed material must be compressed again for recording. If this precaution is not followed, you'll get cross-modulation of the separate signals or tracks.

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