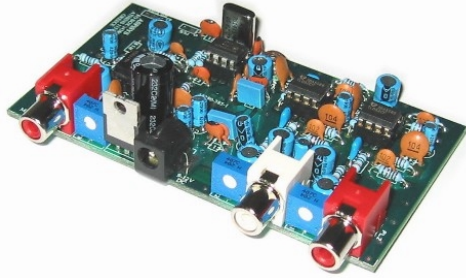


FMPX-1 FM Stereo (Multiplex) Generator



ASPiSYS FMPX-1 FM Stereo Generator

This is a high-quality MPX encoder Board, with a crystal based 19KHz reference. It provides a stereo encoded signal that can modulate any FM Broadcast transmitter. You can now upgrade your radio station to Stereo with this LOW COST but HIGH QUALITY stereo encoder that provides a "crystal-clear" stereo sound!!! Its audio frequency response and stereo separation can both easily exceed the quality of many *FM* encoders that have a price 10 times higher! With its an on-board 15KHz "Brick-wall" LPF at each input, it provides an excellent stereo sound. And it's easy to install it. Phono (RCA) connectors for audio input and MPX output, all adjustable from front panel trimmers make connecting and using really simple.

Specifications:

- ❑ Channel Separation: >44db (Typical 42db)
- ❑ Input impedance: 10K Ω Unbalanced
- ❑ Input Frequency response: 20Hz -15KHz
- ❑ Input level: 0.25V up to 2.5V p.p. (adjustable)
- ❑ Pilot Level: 10%
- ❑ Pilot Frequency: 19KHz +/- 2Hz
- ❑ Output impedance: 10K Ω Unbalanced
- ❑ Output level: 350mV - 2.5V p.p (adjustable)
- ❑ Encoding system: MPX
- ❑ THD: 0,05% max @ 1KHz
- ❑ Power supply: 9 - 12V DC @ 40mA

FMPX-1

FM STEREO ENCODER

Usage Instructions

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Description

FMPX-1 accepts unbalanced analog audio L & R signals of 0.775V level and converts them to a signal suitable for the modulation of FM radio transmitters. By use of the MPX (multiplex) technique DSBSC the modulated output signal carries the separation information for the audio channels of a stereo signal, thus converting any FM transmitter to STEREO. Its use is extremely simple and does not require the use of specialized equipment, spectrum analyzers, etc. The only adjustment required by the user is the input level for each channel separately, and that ONLY when the transmitter to be used does NOT conform to international specifications regarding the AF input level. **FMPX-1** has been pre-adjusted at the lab for immediate connection to professional FM transmitters, according to the CCIR/CEPT specifications. It's fully compatible with the **FM05TXNV FM 1W PLL** by **ASPiSYS**. Its output has a phono jack (RCA type) *adjusted at 0 dBu* for $\Delta f=150\text{KHz}$, while the possibility of internal cable connection is provided (if necessary). Simply connect any unbalanced $\geq 10\text{K}\Omega$ (typically $10\text{K}\Omega$) AF sources (left channel to the white RCA and the right channel to the red RCA jack). Next to each RCA input there is a level adjustment trimmer. Make it so your transmitter, when modulated by $1\text{KHz} / 0\text{dBu}$ signal, has a deviation of $\pm 75\text{KHz}$ ($\Delta f_{\text{max}}=150\text{KHz}$) and you are ready to start broadcasting in STEREO!

There is only one adjustment on the device, that for the input level of each channel separately, which you must perform only if your transmitter is NOT properly tuned according to international specifications! **NOTE: FMPX-1 is delivered with its output adjusted using precision lab instruments so that it complies with the internationally required specifications for systems of FM radio stereo broadcasting! If you need additional information or technical support regarding this matter, please ask!**

On one side there are:

1. A phono (RCA) jack at the left-hand-side of the PCB
2. A 2.5mm jack near the middle of the PCB for connecting DC 9-15V (center +)!
3. A phono (RCA) jack for each input channel (white for LEFT, and red for RIGHT) at the right-hand-side of the PCB.

On the other side there are:

1. A connection for internal transfer of the MPX stereo signal when that is required (e.g., placing the stereo generator inside the transmitter enclosure.)
2. Two contacts for adding a mono/stereo switch. When shorted, it operates as mono.

Warranty: This device is covered under a one-year warranty.
ATTENTION: The warranty is void if the device is tampered with by an unauthorized person, except for proper usage as described in this document!

Adjustments

The only adjustment you can do to the device is through the two trimmers at the inputs for the audio signal level that will modulate your transmitter. Although FMPX-1 includes a circuit that will protect your transmitter from random overmodulation (excessive levels of the AF input signal), it is considered necessary BEFORE input of the acoustic signal to the stereo generator to have proper processing via AF signal compressors/expanders. Such systems help in the better utilization of the dynamic area of the modulation having as a result a clear and loud stereo modulation! **NOTE: You must disengage any possible pre-emphasis circuit at your transmitter's input to connect FMPX1! The generator has a built-in pre-emphasis for each channel independently!**

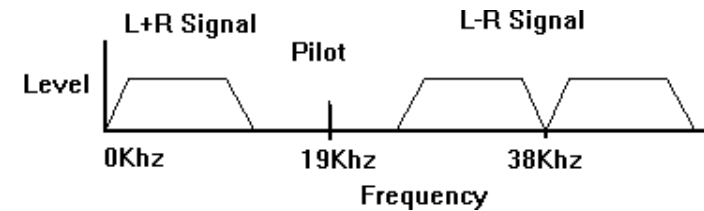
The stereo modulated signal of an FM radio transmitter has a triple function:

- The transfer of a monophonic signal, which is the result of adding the two channels (Left and Right) so that mono receivers can "listen" correctly!

- The simultaneous transfer of a processed signal for the stereo information (separation) of the two channels of audio signal. This is achieved with the subtraction of mono (basically same AF information) from both channels, and the transfer through a secondary modulation channel (at 38KHz) so that with the use of an "inverse" circuit at the receiver, to add this difference back to the AF channel from which it came, reproducing the original stereo signal that was used to modulate the transmitter!
- The production of a signal of stable frequency (called 'pilot') for the activation of the above mentioned "inverse" circuit at the receiver so that it operates in demodulating this signal only when that pilot signal (19KHz) is received.

For the modulation of the transmitter the same bandwidth of $\pm 75\text{KHz}$ (150KHz) is used for either mono or stereo broadcasting.

The graph below shows the frequency spectrum of a stereo modulator!



A recommended FM PLL for FMPX-1 is FM05TXNV capable of 1W output @ 50 Ω sufficient to drive RF amplifiers of greater power.

ASPiSYS Ltd designs and produces FM – AM radio transmitters and analog television VHF –UHF based on international specifications and quality control at a fully equipped lab, up to 18GHz!

You may find more information about our products through our Internet web site:

www.aspisys.com

Thank you for your preference in our products.

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