# F M 0 5 T X   F M   P L L   K I T [Rev. 3]

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Dear Customer,

Before you use for the first time, please read the following for information on using your FM PLL. **Wrong connections may damage your FM PLL**. If you are uncertain how to wire this kit, please contact us (support@aspisys.com) <u>before</u> making any wishful attempts to see if it will work.

The following shows the display / keyboard panel of the FM PLL unit.
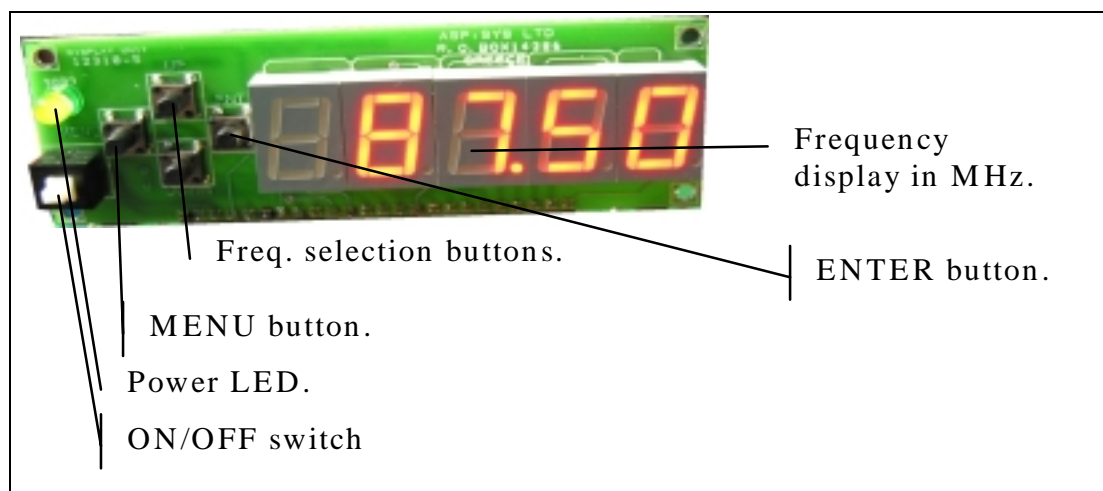
Before powering up your unit, you must connect an FM-tuned antenna, or a 50-Ohm dummy load, to the RF output.

The unit has two audio inputs. One is balanced with pre-emphasis for the MONO signal, and the other is unbalanced for stereo generator output (MPX signal). For a suitable stereo encoder, please visit <u>http://www.aspisys.com/mpx.htm</u>

MONO input is PL2, the one nearer to the RF output pins at the rear of the unit. The balanced input has three connections (+, -, and GND/Shield). The pin closer to the RF output pins is + signal. The middle one is GND. The remaining one is the - signal. You can adjust the deviation-modulation level via VR2 located next to the LM358 (U1). You can see the part numbers on the page with the topographic layout of the PCB. Turning VR2 clockwise, the modulation level decreases. (Adjust VR2 according to your audio input level so that it does not over-modulate).

Unbalanced input (MPX input – PL1): The center pin is the + signal. The two outer pins are GND. You can adjust the deviation level of the MPX input via VR1 located near PL1. Note: VR1 and VR2 are factory adjusted for 100% modulation according to the CCIR standard.

To operate the unit you must connect power. You can connect <u>DC from 18V-24V</u> (observe PCB markings for correct polarity) to the power supply connector.

Press the On/Off switch located on the lower left-hand-side of the display panel. You should see the LED above the switch light up, as well as the current frequency after the PLL has locked. Until the PLL locks to the pre-set frequency, the message *UnLoc* will display. This may last several seconds.

Select the transmission frequency by pressing the UP/DOWN push-buttons while in the frequency selection menu. Once you change the original frequency, the message «Hold» will start flashing. This is to remind you to press the ENTER push-button to accept the new value. Keep the UP/DOWN button pressed until the desired frequency is displayed.

To enter the newly selected frequency, you must press the ENTER button. Until that button is pressed, the unit will keep transmitting in the previous frequency. When ENTER is pressed, the currently displayed frequency will be accepted and the PLL will almost immediately start transmitting at this frequency. The message *UnLoc* will display while the PLL is trying to lock to the new frequency. *[Note: While the message «UnLoc» is shown, the PLL hasn't locked yet, and the RF output is disabled. If this happens any time other than when setting a new frequency, it may mean either a hardware failure, or a significant over-modulation of the input (i.e. $\Delta f > 350$ KHz).]*

After you press any button the display will show either the frequency or a message. The frequency will go out (blank display) after several seconds to minimize power consumption and also eliminate any noise coming from the display driver. At that time, the only indication the unit is on will be the LED next to the ON/OFF power switch. If the display is blanked, but a frequency change is pending, the «Hold» message will flash to remind to press the ENTER key. If you change your mind, you can either go to a new frequency, and then press ENTER, or press the MENU button to cancel the frequency change and return the display to the original frequency.

You can save the currently transmitting frequency (and power level, default is LPFM compliant) by going to the menu EEPRo and pressing the ENTER button. The message «EEPro» will display momentarily indicating the frequency was successfully saved to the unit's internal Flash or EEPROM. The unit will then remember the power-on frequency even if power is lost. You cannot save the power-up frequency while the message «Hold» is flashing.

You can adjust the output power level as percentage from 20% to 100% (in 5 step increments) by going to the Po ??? menu (where ??? is the current level display). The number displayed is indicative of the approximate power level. It is not to be taken as a precise measurement. So, at Po 50, the unit should output about 500 – 600 mW, roughly 50% of its total power.

The menu rF On/rFOff toggles the output on/off. Press the ENTER button to toggle.

The menu L-On/L-Off toggles the Blanking of the LEDs. L-On means the blanking is active. Press the ENTER button to toggle.

All push buttons will auto-repeat if held pressed. This is useful mostly for the frequency selection.

Thank you for purchasing the FM PLL by ASPiSYS Ltd.

> ## *IMPORTANT NOTE*
>
> *This device is a Low Power FM (LPFM) radio band modulator for the transmission of audio signals. Use of this device may be illegal in your area. Please check with your local authorities if you are unsure. Under no circumstances should it be used in violation of any local laws/regulations.*
>
> *The responsibility for legal/proper usage rests solely on you!*

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