



# 705

## FM Stereo Generator (with FMX™ as a plug-in option)



Inovonics' 705 is a full-featured, stand-alone Stereo Generator incorporating all necessary lowpass filtering and transmission pre-emphasis functions. The subcarrier and pilot signals are generated by digital circuitry to assure optimum performance and drift-free operation.

FMX™, the coverage-extension system developed jointly by CBS and the NAB, is available as a plug-in option which, itself, makes extensive use of digital techniques. Whether or not the FMX™ option is used, the 705 Generator remains fully compatible with existing FM broadcasting standards and practices, whether reception is in the FMX™, conventional stereo or monaural mode.

### FEATURES:

**Digital synthesis** of pilot(s) and subcarrier(s) gives maximum stereo separation and stable operation with no trimming adjustments or other routine maintenance.

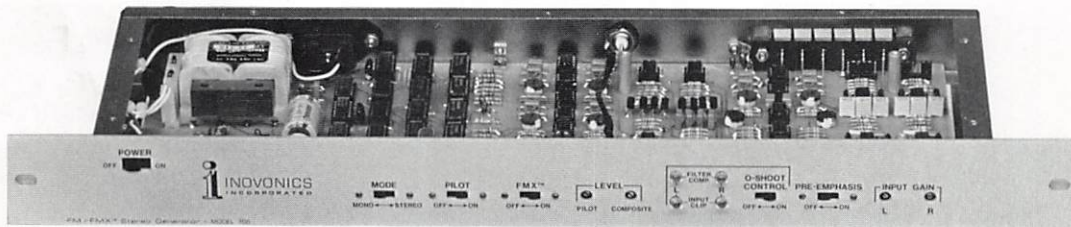
**Internal phase-compensated** lowpass input filtering provides complete pilot and SCA protection. A 25Hz highpass function reduces exciter PLL perturbations.

**Built-in peak overmodulation protection** and proprietary filter overshoot control circuits assure full modulation without need for additional composite processing.

**Adjustable composite equalization** can correct for STL or other system non-linearities.

**The 705 can interface** with a variety of Inovonics or other audio processing systems.

**Easy setup and maintenance.** All components are readily available; no encapsulated or single-source parts are used.



Single Board Construction

**Frequency Response:**  $\pm 0.5\text{dB}$ , 25Hz - 16kHz; -20dB or better at 10Hz, -60dB or better at 19kHz.

**Stereo Separation:** Better than 55dB, 25Hz - 5kHz; better than 45dB, 5kHz - 16kHz.

**Distortion:**  $< 0.15\%$  THD in baseband and subcarrier at 95% modulation.

**Noise** (below 100% modulation, pilot OFF): -75dB or better in baseband and subcarrier; 38kHz residual and "digital" noise above 54kHz, -60dB or better.

**Pilot:** 19kHz  $\pm 1\text{Hz}$ ;  $< 2\%$  THD (dist. products better than 55dB below 100% mod.); injection level adjustable between 6% and 12% relative to 100% modulation.

**Inputs** (LEFT and RIGHT): Active-balanced, bridging; accept line input levels between -10 and +15dBmV for 100% modulation.

**Input Filtering:** 7-pole, phase-corrected, active-elliptic, "FDNR" lowpass with defeatable overshoot control circuitry. Third-order Chebyshev highpass section.

**Pre-Emphasis:** Selectable for 75- or 50-microsecond or flat transmission characteristics.

**Output:** Single-ended; selectable 75-ohm or "zero" (voltage source) impedance. Level adjustable between -5 and +12dBmV (0.5 - 3V r.m.s., or 1.2 - 8V p-p).

**Overmodulation Protection:** Integral part of input filter overshoot control circuitry, defeatable with same.

**Digital Synthesis Sampling Rate:** 608kHz (16X subcarrier.)

**FMX™ Option:** Auxiliary plug-in circuit board with all parameters preset. Easily user-installed (or exchanged with possible updated versions).

**Power Requirements:** 105 - 130 or 205 - 255 VAC, 50/60Hz; 8W.

**Size:** 1 1/4" x 19" x 7" (1U).

**Shipping Weight:** 8 lbs.

## ABOUT FMX™

"FMX" is the tradename for a patented, improved system of FM stereo broadcasting, fully compatible with the customary standards and practices used throughout the world. This means that not only can FMX™ transmissions be received by existing mono and stereo receivers with no performance compromise, but the new generation of FMX™-equipped receivers can provide the broadcaster with a substantial increase in stereocasting coverage; up to 400% has been claimed by the inventors.

FMX™ employs a second, "quadrature" subcarrier at the same 38kHz as the regular L-R signal, but with a 90-degree phase offset. The additional subcarrier is modulated by "compressed" L-R information, and "expanded" in the FMX™ receiver for a much improved signal-to-noise figure.

Because the new transmission format squeezes yet another subcarrier into the already-"interleaved" composite stereo signal, Stereo Generator design becomes more critical to avoid potential overmodulation and other undesirable effects.

Inovonics chose first to develop a very high-performance conventional FM Stereo Generator, but with the necessary circuitry to support a user-installed plug-in option card. The obvious advantage of this approach over that of a dedicated-FMX™ generator is that the choice to use FMX™ is left open, with no penalty for a "yes/no" or "maybe later" decision. In addition, should the inventors make changes or improvements in the system, the plug-in card can be exchanged with an updated version in a matter of minutes.

FMX™ was developed jointly by Emil Torick, V.P. of Audio Technology for CBS, Inc. and senior staff member of the former CBS Technology Center (CBS Labs), and by Thomas Keller, senior V.P. of the Science and Technology Dept. of the Nat'l. Assn. of Broadcasters. The system is described in detail in U.S. Patent No. 4,485,483.



Rear View

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