



# FM-100C/FM-250C/FX-50

## 50, 100 & 250 Watt Exciter/Transmitter

The FX-50, FM-100C, and FM-250C from Broadcast Electronics can bring existing FM transmitters up to digital quality standards and have the lowest distortion of any available exciter. As the acknowledged standard for FM audio performance, these exciters' breakthrough technology remains unsurpassed by more costly and complex digital exciters. With the superb specifications available in these products, these exciters are totally transparent to your broadcast signal.



Model FM-100C shown here

### Features

- The FM-100C can serve as a reliable 125 watt stand-alone FM transmitter; the FM-250C can serve as a reliable 250 watt stand-alone FM transmitter, and the FX-50 can serve as a reliable 50 watt stand-alone FM transmitter.
- Computer-optimized phase locked loop greatly improves low frequency response.
- Contains a 250 watt MOSFET as the output device.
- Optional N+1 board allows selection of up to 10 different frequencies in local or remote locations.
- Frequency range of 87-109 MHz digitally programmable in 10 kHz increments.
- Performance specifications feature a dynamic range that rivals CD players with harmonic and intermodulation distortion values so low they are virtually unmeasurable.
- With a signal to noise ratio that is typically 93dB, the FM-50 can handle all of the nuances and power of digital audio.

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# FM-100C/FM-250C/FX-50

## 50, 100 & 250 Watt Exciter/Transmitter

### FM-100C Performance Specifications

#### GENERAL

**Power Output:** 10 to 125 W continuously variable (BNC connector) open and short circuit protected.

**Frequency Range:** 87MHz to 109MHz digitally programmable in 10kHz increments.

**RF Output Impedance:** 50 ohms.

**Frequency Stability:** 300Hz, +32°F to +122°F (0°C to +50°C).

**Modulation Type:** Direct FM at the carrier frequency.

**Modulation Capability:** 350kHz.

**Modulation Indication:** Peak reading, color coded, LED display with baseband overmodulation indicator.

**Asynchronous AM S/N Ratio:** 70dB minimum below equivalent reference carrier with 100% amplitude modulation at 400Hz and 75µS de-emphasis (no FM modulation present).

**Synchronous AM S/N Ratio:** 55dB minimum below equivalent 50W reference carrier with 100% AM modulation at 1kHz, no de-emphasis (FM modulation ±75kHz and 1kHz).

**AC Input Power:** 97 to 133 VAC or 194 to 266 VAC, 50/60 Hz, 400 W maximum.

**Ambient Temperature Range:** +32°F to +122°F (0°C to +50°C).

**Dimensions:** 20.375"D x 7"H x 19"W (51.75 x 13.33 x 48.26 cm)

**Net Weight:** 42 lbs. (19 kg), packed 50 lbs. (22.7 kg).

#### WIDEBAND COMPOSITE OPERATION

**Composite Inputs:** 3 total, (1) unbalanced, (1) balanced, plus (1) front panel test provision (BNC connectors).

**Composite Input Impedance:** Unbalanced: 10 k ohm, nominal, resistive. Balanced: 10 k ohm or 50 ohm, programmable, jumper selected.

**Composite Input Level:** 3.5V p-p nominal, for ±75 kHz deviation.

**Composite FM S/N Ratio:** 90dB below ±75 kHz deviation at 400Hz, measured in a 20Hz to 200kHz bandwidth with 75µ de-emphasis, 94dB with DIN "A" weighting.

**Composite Harmonic Distortion:** 0.005% or less.

**Composite Intermodulation Distortion:** 0.005% or less.

**Composite CCIF IMD:** 0.005% or less. (Twin tone, 15kHz/14kHz, 1:1 pair).

**Composite Transient IMD:** 0.01% or less (square wave/sine wave).

**Composite Amplitude Response:** ±0.1dB, 30Hz to 53kHz.

**Composite Phase Response:** ±0.25 degree from linear phase, 30Hz to 53kHz.

**Composite Group Delay Variation:** ±5 nanoseconds, 30Hz to 100kHz.

#### MONAURAL OPERATION

**Audio Input Impedance:** 600 ohms balanced, resistive, adaptable to other impedances, 60dB common mode suppression.

**Audio Input Level:** +10dBm nominal for ±75kHz deviation @ 400Hz, adaptable to other levels.

**Audio Frequency Response:** ±0.5dB, 30Hz to 15kHz; selectable flat, 25, 50 or 75µS pre-emphasis.

**Total Harmonic Distortion + Noise (THD + N):** 0.01%.

**Intermodulation Distortion:** 0.01% or less, 60Hz to 7kHz, 4:1 ratio.

**CCIF Intermodulation Distortion:** 0.01% or less (Twin tone, 15kHz/14kHz, 1:1 pairs).

**Transient Intermodulation Distortion:** 0.01% or less (square wave/sine wave).

**FM S/N Ratio:** 85dB below ±75kHz deviation @ 400Hz. Measured within a 20Hz to 200kHz bandwidth with 75µS de-emphasis.

### FM-250C Performance Specifications

#### GENERAL

**Power Output:** 25 to 250 W continuously variable (BNC connector open and short circuit protected).

**RF Output Impedance:** 50 ohms.

**Frequency Range:** 87MHz to 109MHz digitally programmable in 10kHz increments.

**Frequency Stability:** ±300Hz, +32°F to 122°F (0°C to +50°C).

**Modulation Type:** Direct FM at the carrier frequency.

**Modulation Capability:** ±350kHz.

**Modulation Indication:** Peak reading, color coded, LED display with baseband overmodulation indicator.

**Asynchronous AM S/N Ratio:** 70dB minimum below equivalent reference carrier with 100% amplitude modulation at 400Hz and 75µS de-emphasis (no FM modulation present).

**Synchronous AM S/N Ratio:** 55dB minimum below equivalent 50 W reference carrier with 100% AM modulation at 1kHz, no de-emphasis (FM modulation ±75kHz and 1kHz).

**AC Input Power:** 97 to 133 VAC or 194 to 266 VAC, 50/60Hz, 650 W maximum.

**Ambient Temperature Range:** ±32°F to 122°F (0°C to +50°C).

**Altitude:** 15,000 feet (4,572 m) AMSL.

**Dimensions:** 20.375"D x 7"H x 19.00"W (51.75 x 13.33 x 48.26 cm).

**Net Weight:** 53 lbs (24 kg); packed 63 lbs (27 kg).

#### WIDEBAND COMPOSITE OPERATION

**Composite Inputs:** 3 total, (1) unbalanced, (1) balanced plus (1) front panel test provision (BNC connectors).

**Composite Input Impedance:** Unbalanced: 10 k ohm, nominal, resistive. Balanced: 10 k ohm or 50 ohm, programmable, jumper selected.

**Composite Input Level:** 3.5V p-p nominal, for ±75kHz deviation.

**Composite FM S/N Ratio:** 85dB below ±75kHz deviation at 400Hz, measured in a 20Hz to 200kHz bandwidth with 75µS de-emphasis.

**Composite Harmonic Distortion:** 0.003% or less.

**Composite Intermodulation Distortion:** 0.01% or less.

**Composite CCIF IMD:** 0.01% or less. (Twin tone, 15kHz/14kHz, 1:1 pair).

**Composite Transient IMD:** 0.01% or less (square wave/sine wave).

**Composite Amplitude Response:** ±0.1dB, 30Hz to 53kHz.

**Composite Phase Response:** ±0.25 degree from linear phase, 30Hz to 53kHz.

**Composite Group Delay Variation:** ±5 nanoseconds, 30Hz to 100kHz.



# FM-100C/FM-250C/FX-50

## 50, 100 & 250 Watt Exciter/Transmitter

### FM-250C Performance Specifications continued

#### MONAURAL OPERATION

**Audio Input Impedance:** 600 ohms balanced, resistive, adaptable to other impedances, 60dB common mode suppression.

**Audio Input Level:** +10dBm nominal for  $\pm 75$ kHz deviation @ 400Hz, adaptable to other levels.

**Audio Frequency Response:**  $\pm 0.5$ dB, 30Hz to 15kHz; selectable flat, 25, 50 or 75 $\mu$ S de-emphasis.

#### Total Harmonic Distortion Plus Noise

**(THD+N):** 0.01% or less at  $\pm 75$ kHz deviation and 50W RF power output, 400 Hz, using 75 $\mu$ S de-emphasis.

**Total Harmonic Distortion + Noise (THD+N):** 0.01%.

**Intermodulation Distortion:** 0.005% or less (0.01% typical) 60Hz to 7kHz, 4:1 ratio.

**CCIF Intermodulation Distortion:** 0.01% or less (all products greater than 86dB below 100% modulation. Twin tone, 15kHz/15kHz 1:1 pairs.).

**Transient Intermodulation Distortion:** 0.01% or less (square wave/sine wave).

**FM S/N Ratio:** 85dB below  $\pm 75$ kHz deviation @ 400Hz. Measured within a 20Hz to 200kHz bandwidth with 75 $\mu$ S de-emphasis.

### FX-50 Performance Specifications

#### GENERAL

**Power Output:** 3 to 50 W continuously variable (BNC connector) open and short circuit protected.

**RF Output Impedance:** 50 ohms.

**Frequency Range:** 87MHz to 109MHz digitally programmable in 10kHz increments.

**Frequency Stability:**  $\pm 300$ Hz,  $+32^\circ$ F to  $+122^\circ$ F ( $0^\circ$ C to  $+50^\circ$ C).

**Modulation Type:** Direct FM at the carrier frequency.

**Modulation Capability:**  $\pm 350$ kHz.

**Modulation Indication:** Peak reading.

Color coded, LED display with baseband overmodulation indicator.

**Asynchronous AM S/N Ratio:** 80dB minimum below equivalent reference carrier with 100% amplitude modulation at 400Hz and 75 $\mu$ S de-emphasis (no FM modulation present).

**Synchronous AM S/N Ratio:** 60dB minimum below equivalent 50W reference carrier with 100% AM modulation at 1kHz, no de-emphasis (FM modulation  $\pm 75$ kHz and 1kHz).

**AC Input Power:** 97 to 133 VAC or 194 to 266 VAC, 50/60Hz, 230 W maximum.

**Ambient Temperature Range:**  $\pm 32^\circ$ F to  $+122^\circ$ F ( $0^\circ$ C to  $+50^\circ$ C).

**Altitude:** 15,000 feet (4,572 m) AMSL.

**Dimensions:** 17.70"W x 5.25"Hx19.00"D (44.96 x 13.33 x 48.26 cm).

**Net Weight:** 38 lbs (17.1 kg), packed 46 lbs (20.7 kg).

#### WIDEBAND COMPOSITE OPERATION

**Composite Inputs:** 3 total, (1) unbalanced, (1) balanced, plus (1) front panel test provision (BNC connectors).

**Composite Input Impedance:**

Unbalanced: 10 k ohm, nominal, resistive.

Balanced: 10 k ohm or 50 ohm, programmable, jumper selected.

**Composite Input Level:** 3.5V p-p nominal, for  $\pm 75$  kHz deviation.

**Composite FM S/N Ratio:** 90dB (94dB typical) below  $\pm 75$ kHz deviation at 400Hz, measured in a 20Hz to 200kHz bandwidth with 75 $\mu$ S de-emphasis, 94dB (96dB typical) with DIN "A" weighting.

**Composite Harmonic Distortion:** 0.003% or less.

**Composite Intermodulation Distortion:** 0.005% or less (0.003% typical).

**Composite CCIF IMD:** 0.005% or less (all products greater than 86dB below 100% modulation. Twin tone, 15kHz/14kHz, 1:1 pair).

**Composite Transient IMD:** 0.01% or less (square wave/sine wave).

**Composite Amplitude Response:**  $\pm 0.025$ dB, 30Hz to 53kHz.

**Composite Phase Response:**  $\pm 0.1$  degree from linear phase, 30Hz to 53kHz.

**Composite Group Delay Variation:**  $\pm 5$  nanoseconds, 30Hz to 100kHz.

#### MONAURAL OPERATION

**Audio Input Impedance:** 600 ohms balanced, resistive, adaptable to other impedances, 60dB common mode suppression.

**Audio Input Level:** +10dBm nominal for  $\pm 75$ kHz deviation @ 400Hz, adaptable to other levels.

**Audio Common Mode Rejection Ratio:** Greater than 60dB.

**Audio Frequency Response:**  $\pm 0.5$ dB, 30Hz to 15kHz; selectable flat, 25, 50 or 75 $\mu$ S de-emphasis.

**Total Harmonic Distortion Plus Noise (THD+N):** 0.005% or less (0.003% typical) at  $\pm 75$ kHz deviation and 50W RF output, 400Hz using 75 $\mu$ S de-emphasis.

**Total Harmonic Distortion + Noise (THD+N):** 0.005% (0.003% typical).

**Intermodulation Distortion:** 0.005% or less (0.003% typical) 60Hz to 7kHz, 4:1 ratio.

**CCIF Intermodulation Distortion:** 0.005% or less (all products greater than 86dB below 100% modulation. Twin tone, 15kHz/15kHz, 1:1 pairs).

**Transient Intermodulation Distortion:** 0.01% or less (square wave/sine wave).

**FM S/N Ratio:** 90dB below  $\pm 75$ kHz deviation @ 400Hz (93dB typical). Measured within a 20Hz to 200kHz bandwidth with 75 $\mu$ S de-emphasis. 94dB (96dB typical) with DIN "A" weighting.