



## **FM BROADCAST EXCITER**

### **QUANTUM M Series**

*QEI QUANTUM M Series advanced technology FM Exciters for outstanding audio performance.*

The **QUANTUM M Series** continues the tradition of superior performance and reliability set by its legendary predecessor the Model 695. QEI took this field-proven exciter design and has refined the system to deliver uncompromised performance, at an affordable price.

The **QUANTUM M Series** is an all solid-state, broadband designed to exceed the FCC requirements for use in the FM broadcast band.

The **QUANTUM M Series** exciter is a frequency-synthesized design, incorporating a dual speed phase locked loop, and may be programmed to operate on any 100 kHz increment in the FM band (10 kHz steps optional). Direct FM "On Carrier" operation insures spurious free transmission and extremely low distortion, crosstalk, noise, and no stereo degradation. The frequency-modulated oscillator (FMO) of the **QUANTUM M Series** has superior linearity and does not require any "pre-distortion" networks. *Sound for sound the **QUANTUM "M" Series** will match other FM exciters costing twice as much or more.* The FMO is sealed in steel and foam to shield it from stray magnetic fields and eliminate microphonics.

The Power Amplifier (PA) of the **QUANTUM M Series** is unconditionally stable and will withstand any magnitude or phase of VSWR indefinitely, without damage. The **QUANTUM M Series** power output can be varied from 2-Watts to greater the 20-Watts without oscillation or "break up". A 50-Watt version is also available. The **QUANTUM M Series** is designed with components that are operated conservatively and well within their ratings.

The **QUANTUM M Series** exciters are housed in a space saving 5-1/4-inch rack mounted chassis and are completely self-contained.. The **QUANTUM M Series** can also be used as a replacement exciter for an older FM transmitter.

Complete metering of critical parameters is available at the push of a button. All operational indicators are LED's to eliminate all routine lamp replacement. RF and audio connections are made by way of back panel connectors. A BNC for composite audio, barrier strip for monaural audio and a Type N female for the RF output connector. Reliability and simplicity of design and operation make the **QUANTUM M Series** FM exciter an outstanding choice for every FM station.



**QUANTUM 50M FM Exciter**

#### *A short list of features:*

- Ultra Low Distortion, Crosstalk and Noise
- Modulation Monitoring
- Broadband Design
- Compact Rack Mount Package
- Dual Speed Phase Locked Loop Design
- Frequency Synthesized
- Unconditionally Stable Amplifier, "VSWR Proof"
- Compact 5-1/4-inch rack mounted package

# QEI QUANTUM M Series FM Exciter

## Technical Specifications

### GENERAL

#### Power Output:

Model 20M: ..... 5 to 20 Watts

Model 50M: ..... 5 to 50 Watts

**Frequency Range:** ..... 87.5 to 108 MHz (other frequencies optional)

**RF Load Impedance:** ..... 50 ohms

**Output Connector:** ..... Type "N" Female

**VSWR:** ..... Operation into any phase or magnitude at reduced output power

**RF Harmonic/Spurious:** ..... Suppression meets or exceeds all FCC /DOC / CCIR specifications

**Frequency Stability:** .....  $\pm 200$  Hz from 0° to 50° C.

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

**Modulation Sensitivity vs. Temperature:** 0.01% per degree Centigrade

#### Pre-Emphasis:

Standard: ..... 75 $\mu$ sec (FCC)

Optional: ..... 50 $\mu$ sec (CCIR)

**Asynchronous AM S/N Ratio (AM Noise):** ... -60 dBc (no FM modulation present)

**Synchronous AM S/N Ratio (Incidental AM):** -55 dBc with 100 % FM Modulation

### ELECTRICAL/MECHANICAL

**AC Power:** ..... 105-125/210-250 VAC, 50/60Hz.

#### Power Consumption:

Model 20M: ..... 50 Watts

Model 50M: ..... 120 Watts

#### Ambient Temperature Range:

Operating: ..... -15° C to +50° C

Startup: ..... 0° C to +50° C

**Maximum Humidity:** ..... 95% non-condensing

**Size:** ..... 5.25"H (13.35cm) x 19"W (48.25cm) x 18"D (45.7cm) Add 2.5" for Type N connector clearance

### MONAURAL PERFORMANCE

**Input Impedance:** ..... 600 ohms balanced

**CMRR:** ..... >60 dB

**Input Level:** +10 dBm for 75 kHz deviation at 100 Hz

**Frequency Response:** .....  $\pm 0.5$  dB, 30 Hz to 15 kHz

**THD+N:** ..... 0.025% at 400 Hz

**FM S/N Ratio:** ..... Greater than 75 dB below 75 kHz deviation at 400 Hz, measured in a 50 Hz to 15 kHz bandwidth with 75  $\mu$ sec de-emphasis

### WIDEBAND COMPOSITE PERFORMANCE

**Inputs:** (1) unbalanced on rear panel, BNC connector

**Input Impedance:** ..... 10K ohms

**Input Level:** ..... 3.5 V<sub>P-P</sub> for 75 kHz deviation

**FM S/N Ratio:** ..... Greater than 75 dB below 75 kHz deviation at 400 Hz, measured in a 50 Hz to 15 kHz bandwidth with 75  $\mu$ sec de-emphasis

**THD+N:** ..... 0.025% at 400 Hz

**Amplitude Response:** .....  $\pm 0.01$  dB, 30 Hz to 75 kHz

**Composite Slew Rate:** ..... 9 v/ $\mu$ sec, symmetrical

**Phase Response:**  $\pm 0.1$  degrees from linear phase, 30 Hz to 75 kHz

### STEREO PERFORMANCE\*

**Modulation Type:** ..... True numeric digital stereo generation, digitally generated pilot; no alignment required.

**Frequency Response:** .....  $\pm 0.1$  dB, 30 Hz to 15 kHz

**THD+N:** ..... 0.025% at 400 Hz

**FM S/N Ratio:** ..... Greater than 75 dB below 75 kHz deviation at 400 Hz, measured in a 50 Hz to 15 kHz bandwidth with 75  $\mu$ sec de-emphasis

**Stereo Separation:** ..... >60 dB

**Dynamic Stereo Separation:** ..... >60 dB

**Crosstalk (linear):** ..... >60 dB

**Crosstalk (non-linear):** ..... >60 dB

### SCA PERFORMANCE

**Subcarrier Inputs:** ..... (3) total, unbalanced, BNC connectors

**Subcarrier Input Impedance:** ..... 10K ohms

**Subcarrier Input Level:** ..... 1.0 V<sub>rms</sub>, nominal for 10% injection

**Subcarrier Amplitude Response:**  $\pm 0.2$  dB, 40 kHz to 100 kHz

\*Model QUANTUM M Series performance is specified using 710A digital stereo generator at rated exciter power output into a 50-ohm resistive load.

Since measurement techniques vary, care should be observed in comparing specifications of different manufacturers.

QEI maintains an ongoing program of research and development to insure the finest product performance and quality.

All specifications are subject to change without notice.

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