



FM BROADCAST TRANSMITTING SYSTEMS

QUANTUM "E" Series 150, 300, 600 Watts

QEI QUANTUM "E" Series advanced technology FM broadcast transmission systems for superior on-air performance. The **QUANTUM "E"** establishes a new level in FM performance with the advantage of the highest power emergency back-up available in an exciter style package. QEI took the field-proven design of the model 695 exciter and incorporated a high power FET amplifier to deliver un-compromised performance as a transmitter, exciter, booster or translator**.

The **QUANTUM "E"** is an all solid state, broadband, frequency synthesized, "on carrier" direct FM, phase locked, transmission system, designed to exceed the FCC requirements for use in the FM broadcast band.

The **QUANTUM "E"** may be programmed to operate on any 100 kHz increment (10 kHz optional) in the FM band. 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 "E"** has superior linearity and does not require any "pre-distortion" networks to achieve high performance specifications. *Sound for sound the **QUANTUM "E"** will match other FM exciter/transmitters costing twice as much or more.* The FMO is sealed in a specially designed high Mu enclosure to shield it from stray magnetic fields and is acoustically dampened to eliminate microphonics.

The Power Amplifier (PA) of the **QUANTUM "E"** is unconditionally stable and will withstand any magnitude or phase of VSWR indefinitely without damage by automatically reducing power. The conservatively designed **QUANTUM "E"**'s power amplifier can be varied from a few Watts to full output without any oscillation or "break up".

The **QUANTUM 150E, 300E & 600E** are housed in a rack space saving 5-1/4" package. The **QUANTUM "E"** series when used as an exciter or replacement for the exciter and driver will fit into

virtually all transmitters in use and is the perfect upgrade for older systems.



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 and barrier strip for monaural

audio are provided on each system. The **QUANTUM "E"** series between 150 Watts and 600 Watts utilizes a type "N" female output connector. Reliability and simplicity of design and operation make the **QUANTUM "E"** FM broadcast transmission system an outstanding choice for every FM station.

A short list of features:

- w Ultra Low Distortion, Crosstalk and Noise
- w Highest Power Emergency Back-up
- w Frequency Synthesized
- w Phase Locked
- w "On Carrier" Direct FM
- w Solid State FET Amplifier
- w Stability +/- 200 Hz (0° C to 50° C)
- w Compact Rack Mount Package

QEI FM transmitters, designed and manufactured with pride in the U.S.A.

QEI QUANTUM Series 150 Watt – 600 Watt FM Transmitters

Technical Specifications

GENERAL

Power Output:

QUANTUM 150E 50 to 150 Watts
 QUANTUM 300E 100 to 300 Watts
 QUANTUM 600E 100 to 600 Watts

Frequency Range: 87.5 to 108 MHz

RF Load Impedance: 50 ohms

Output Connector:

QUANTUM 150E through 600E Type "N"
 Female

VSWR: 1.6:1 max. at full power
 (automatic power control for operation at
 reduced power into any phase or magnitude)

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

Exciter:

QUANTUM 150E through 600E Integral

Frequency Stability: +/- 200 Hz from 0° to 50°C

Modulation Capability: Greater than
 +/- 350 kHz

Modulation Sensitivity vs. Temperature:
 0.01 % per degree Centigrade

Pre-Emphasis:

Standard 75usec (FCC)
 Optional 50usec (CCIR)

Asynchronous AM S/N Ratio (AM Noise): -55
 dBc (no FM Modulation present)

Synchronous AM S/N Ratio (Incidental AM): -
 50 dBc with 100 % FM modulation

ELECTRICAL/MECHANICAL

AC Power requirement:

150E Through 600E 120/240 VAC
 50/60Hz single phase. (DC input options
 available)

Ambient Temperature Range:

Operating -15°C to +50°C
 Startup 0°C to +50°C

Maximum Altitude: 10,000 feet AMSL

Maximum Humidity: 95% non-condensing

Size: (Transmitter)

150E Through 600E Amplifier 5.25"H
 (13.35cm) x 19"W (48.25cm) x 19"D
 (48.25cm) note: add 2-1/2" for connector
 clearance. (Rack Mount)

Size: (Power Supply)

150E Through 600E 13.75"H (34.375m) x
 9.5"W (23.75cm) x 12.00"D (30.00cm)

MONAURAL PERFORMANCE

Input Impedance: 600 ohm balanced, 60 dB
 common mode suppression

Input Level: +10 dBm nominal for +/-75 kHz
 deviation at 400 Hz

CMMR > 60dB

Frequency Response: +/-0.5 dB, 30 Hz to
 15 kHz

THD+ N: 0.02 % or less at 400 Hz

FM S/N Ratio: -80 dB below +/-75 kHz
 deviation at 400 Hz, measured in a 50 Hz to 15
 kHz bandwidth with 75 usec de-emphasis

WIDEBAND COMPOSITE PERFORMANCE*

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

Input Impedance: .. 10K ohm , nominal, resistive

Input Level: 3.5 V_{P-P} nominal, for +/-75 kHz
 deviation

FM S/N Ratio: 80 dB below +/- 75 kHz
 deviation at 400 Hz, measured in a 50 Hz to 15
 kHz bandwidth with 75 usec de-emphasis

THD + N: 0.02 % or less at 400 Hz

Amplitude Response: +/-0.01 dB, 30 Hz to 75
 kHz

Phase Response: +/-0.1 degrees from linear
 phase, 30 Hz to 75 kHz

Composite Slew Rate: 9 V/microsecond
 (symmetrical)

STEREO PERFORMANCE*

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

Frequency Response: +/-0.1 dB, 20 Hz to
 15 kHz

THD + N: 0.02 % or less at 400 Hz

FM S/N Ratio: -80 dB below +/- 75 kHz
 deviation at 400 Hz, measured in a 50 Hz to 15
 kHz bandwidth with 75 usec de-emphasis

Stereo Separation: > 60dB

Dynamic Stereo Separation: > 60dB

Crosstalk:

(Linear) > 60 dB
 (Non-Linear) > 60dB

SCA PERFORMANCE

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

Subcarrier Input Impedance: 10K ohm,
 nominal, resistive

Subcarrier Input Level: 1.0 V_{rms} nominal for 10 %
 injection

Subcarrier Amplitude Response: +/-0.2 dB, 40
 kHz to 100 kHz

* Quantum-Series performance is specified using
 listed exciter, 710A digital stereo generator at
 rated transmitter power into a 50 ohm resistive
 load. Specifications are subject to change
 without notice. Since measurement techniques
 vary, care should be observed in comparing
 specifications of different manufacturers.

** Translator option available



Typical configuration for model 50E through 600E

