



MF/HF SYNTHESIZED EXCITER Model MMX-4

Product Bulletin 1B02219

400KHz to 30MHz Range

Integrated Solid State

Broadband RF Output

Digital Remote Control



Compact, Modular and Transportable

The Model MMX-4 synthesized exciter is the high frequency counterpart of the LFE series of exciters designed for lower frequencies. Used extensively in communications systems that process high-capacity, multi-channel voice, teletype and data, the MMX-4 features rapid digital selection of extremely stable MF and HF frequencies. Normally provided for 2-29.9999MHz operation, the MMX-4 is optionally available for coverage to 400KHz without modifying its technical parameters. Selection of the required operating mode and frequency is by momentary pushbuttons. No additional tuning or peaking is required once selection is completed; the exciter is ready for immediate service. The exciter operates in the CW, AM, AME, SSB, ISB, FSK and FAX modes. Its output is broadbanded and delivers a conservatively-rated 250 milliwatts PEP/average.

The MMX-4 provides the main RF drive for all of the HF synthesized transmitters designed by TMC. Its small size, rugged modular design, and ease of operation make it especially well-suited for transportable applications. The MMX-4 was specifically designed to be digitally remote controlled using the TCR-4 or, when combined into an integrated system of equipment, the TCS-11 microprocessor-based control terminal. An RS-232 port is provided for communications with the exciter from an associated computer and an optional port can be provided for control data to any associated linear amplifier.

The low-cost, reliable operation that TMC exciters are known to provide is a characteristic of the MMX-4. It meets the stringent requirements of critical, point-to-point and tactical circuits in military, government and commercial communications. TMC incorporated advanced, integrated circuit designs in the exciter to provide ultra-stable operation under all environmental conditions. Totally solid state components are used to assure dependable performance over the long life of this equipment. The modular construction of the unit with plug-in circuit cards, facilitates maintenance and provides complete access by the technician from the front panel. Innovative circuits are included to improve linearity, limit distortion and enable an associated transmitter to deliver a constant RF output level in all modes and under all conditions of operation. A multi-function meter is built in to monitor the performance of critical circuits in the exciter, affording BITE capability in automated stations.

The MMX-4 exciter is constructed of aluminum alloy with all external hardware stainless steel for durability. Removeable top and bottom covers allow access to internal circuits and provide additional shielding to prevent unwanted coupling of RF energy. The equipment is cooled by convection since the solid state components used throughout the unit generate relatively little heat. RF and audio/keying connections are made at the rear panel with additional provisions for input at the front.

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TECHNICAL SPECIFICATIONS

GENERAL

Frequency Range	2 - 29.99990MHz
Optional:	400KHz - 29.99990MHz
Frequency Entry	Front pushbutton, digital display
Frequency Stability	1 part in 10^8 /day/ 15°C change
Frequency Selection	Direct synthesis in 100Hz steps
Phase Jitter	$<5^{\circ}$ in two successive 10ms periods
Operating Modes	CW(A1), AM(A3), AME(A3H) USB/LSB(A3A,A3J), 2ISB(A3B) Optional: FSK(F1), FAX(F4), 4ISB(A9B)
Output Impedance	50 ohms unbalanced, BNC-type
Power Output	250 milliwatts PEP and Average CW

RF PARAMETERS

Sideband Rejection	500Hz tone $>60\text{dB}$ below PEP
Spurious Signals	Nominal 60dB below PEP
Distortion (Intermod)	$>40\text{dB}$ below either tone of a two-tone test at rated PEP
Residual Noise/Hum	Minimum 70dB below PEP
Carrier Suppression	$-6/-20/-30/-55\text{dB}$ (full)/others
Harmonic Suppression	Dependent on linear amplifier and output filters provided

POWER SUPPLY

Primary Power	115/230VAC, 50/60Hz 50 watts, Single-phase
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CONSTRUCTION

Totally solid state, modular design with RF isolation.

SPECIAL FEATURES

Remote Control Option	Full-feature remote control of mode, frequency, and carrier level with installation monitoring capability.
Metering	Continuous front-panel display of exciter performance to the module level; BITE optional.
ALDC	Automatic load and drive control to improve linearity, limit distortion and provide relatively constant output during input level peaks or load changes.

AUDIO and KEYING PARAMETERS

Sideband Response	250-3040Hz, $\pm 1.5\text{dB}$ maximum
Optional filters:	250-6080Hz, others on request
Audio Input	Twin 600-ohm, rear panel, $+10\text{dBm}$ Microphone preamplifier, front panel
Keying Inputs	CW: Key jack, front panel, 200 baud FSK: Rear panel, 200 baud $\pm 42.5/85/170/425\text{Hz}$ shifts 20ma/60ma/50V/100V, dry contact

ENVIRONMENTAL

Operating	0°C to $+55^{\circ}\text{C}$, 90% R.H.
Storage	-30°C to $+75^{\circ}\text{C}$; 90% R.H.
Cooling	Convection
Size and Weight	5.25H x 19W x 20D inches, 30 lbs. 13.3H x 48.3W x 50.8D cm, 13.7Kg.

ORDERING INFORMATION AND ACCESSORIES

MMX-4	Synthesized HF Exciter		
MMX-4/M	Synthesized MF/HF Exciter (Extended range to 400KHz)		
LPF-1K	Low Pass RF Filter	Product Bulletin 1B02211	
TCR-4	Transmitter Remote Control	Product Bulletin 1B04108	
TCS-11	Transmitter Control Terminal	Product Bulletin 1B04109	
TFP-1K	Switched Harmonic RF Filter	Product Bulletin 1B02220	
2B02219	Spare Parts - Initial (90-day)	2C02219	Spare Parts - Operating (1-year)
2D02219	Spare Parts - Maintenance (2-year)	2E02219	Spare Parts - Depot (5-year)
2F02219	Spare Parts - Replacement Modules	3A02219	Technical Manual (Complete set)

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