FLEXIVA™ DX DESTINY

50 kW Digital MW Transmitter

GATESAIR® Connecting What's Next

GatesAir efficiently leverages wireless spectrum to maximize performance for multichannel TV and radio services, offering the industry's broadest portfolio to help broadcasters wirelessly deliver and monetize content. With nearly 100 years in broadcasting, GatesAir's exclusive focus on the over-the-air market helps broadcasters optimize services today and prepare for future revenue-generating business opportunities. All research, development and innovation is driven from the company's facilities in Mason, Ohio and supported by the long-standing manufacturing center in Quincy, Illinois.

GatesAir's turnkey solutions are built on three pillars: Create, Transport and Transmit. The company is best known for powering over-the-air analog and digital radio/TV stations and networks worldwide with the industry's most operationally efficient transmitters. Groundbreaking innovations in low, medium and high-power transmitter reduce footprint, energy use and more to establish the industry's lowest total cost of ownership. Support for all digital standards and convergence with mobile networks ensure futureproof systems.

GatesAir's unrivaled legacy in over-the-air radio reaches new heights with the Flexiva™ transmitter family. The Flexiva range symbolizes decades of broadcast innovation and engineering experience, offering the industry's most complete and reliable solutions to suit all over-the-air power and coverage requirements in FM, AM, and digital radio. Truly groundbreaking strides in operational efficiency make high-quality broadcasting and low total cost of ownership a reality in equal measure.

Award Winning Service

From experienced installation and field service engineers to responsive factory experts, GatesAir provides the strongest service team in the broadcast transmission industry. Couple that team with reliable products, responsible service parts inventories and a demonstrated commitment to the industry, and you have a service offering that's perfectly matched to your equipment and your operations.

Global Service Locations

Contact Information

+1 (800) 622 0022

Americas
Americas@gatesair.com

Asia Pacific
APAC@gatesair.com

Europe, Middle East, and Africa
EMEA@gatesair.com

Carribean and Latin America
CALA@gatesair.com

For more information, please visit gatesair.com

AM RADIO'S DIGITAL DESTINY

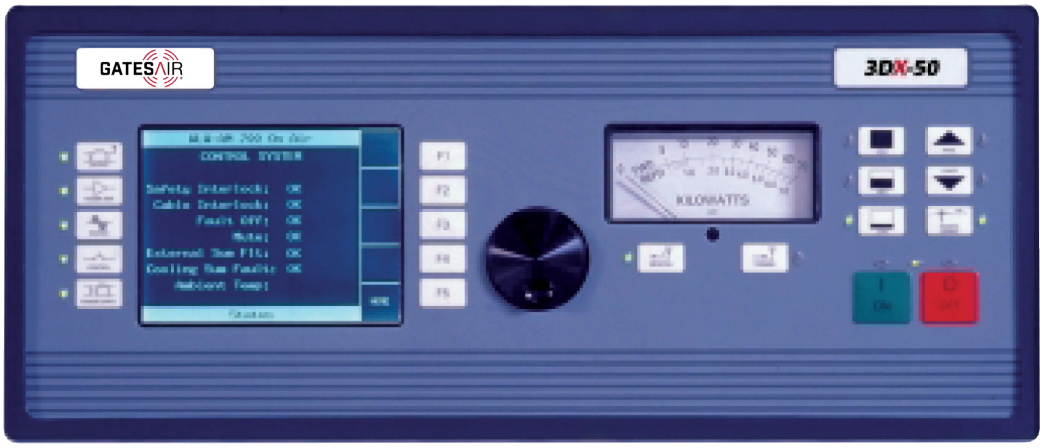
Unmatched Performance, Efficiency and Reliability

DX Destiny - The Next Level DX Transmitter - the world's best linearity, efficiency and reliability–and now auto-servicing!

GatesAir DX Destiny transmitters are the most innovative medium wave transmitters in the world. The 3DX50 takes you to the next level of the famed DX Series transmitters, which introduced digital amplitude modulation. Not only does the 3DX-50 have all the great attributes of DX like super high efficiency, outstanding audio performance and rock solid reliability, it pushes the DX envelope with a new design from the ground up.

DX Destiny features 3D technology, Direct Digital Drive, which provides a whole host of new features and benefits for DX. Some of the benefits of Direct Digital Drive are the world's best efficiency and a multitude of ways to keep you on the air at maximum power and performance should any difficulty occur. In addition, comprehensive diagnostics let you know exactly how your transmitter is performing at all times.

If you operate Medium Wave transmitters, your future destiny should be DX Destiny!



3DX-50 Control Panel

User Interface

The DX Destiny is designed for easy use through the IntelliStat™, the ultimate in control and diagnostic user interfaces. This combination of large, internationally-identified control buttons, a status panel with selectable metering, and 1/4 VGA display provides all important control and status parameters needed to know exactly how the transmitter is performing.

The 3DX-50 is easy to operate.

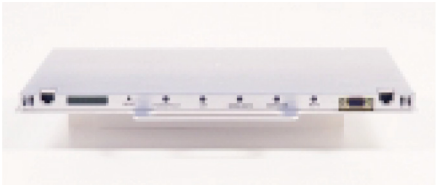
Digital Exciter

Based on a 3D approach, the DX Destiny exciter uses direct digital synthesis to accurately produce the RF signal. The exciter combines the digital modulation and the RF drive signals for the first time. The transmitter also accepts analog or digital AES3 inputs. A frequency synthesizer is provided with the capability of accepting an external GPS 10 MHz lock ensuring the highest possible frequency stability.

Safety

DX Destiny transmitters are IEC 215- compliant. The 3DX-50 also contains an internal AC mains disconnect switch that ensures all three phase power is turned off prior to power supply cabinet access. An earthing stick is also provided in the output cabinet to short the RF output conductor.

3DX-50 Transmitter



Serial Modulation Encoder Module

Serial Modulation Encoder

The 50 kW DX Destiny uses four plug-in serial modulation encoders. Each encoder provides the direct drive to 16 RF power amplifier modules, which are turned ON or OFF to produce the modulated RF signal. All serial modulation encoders are the exact same module and, with the auto-servicing feature, the transmitter can still operate with less than four active encoders.

RF Power Amplifiers

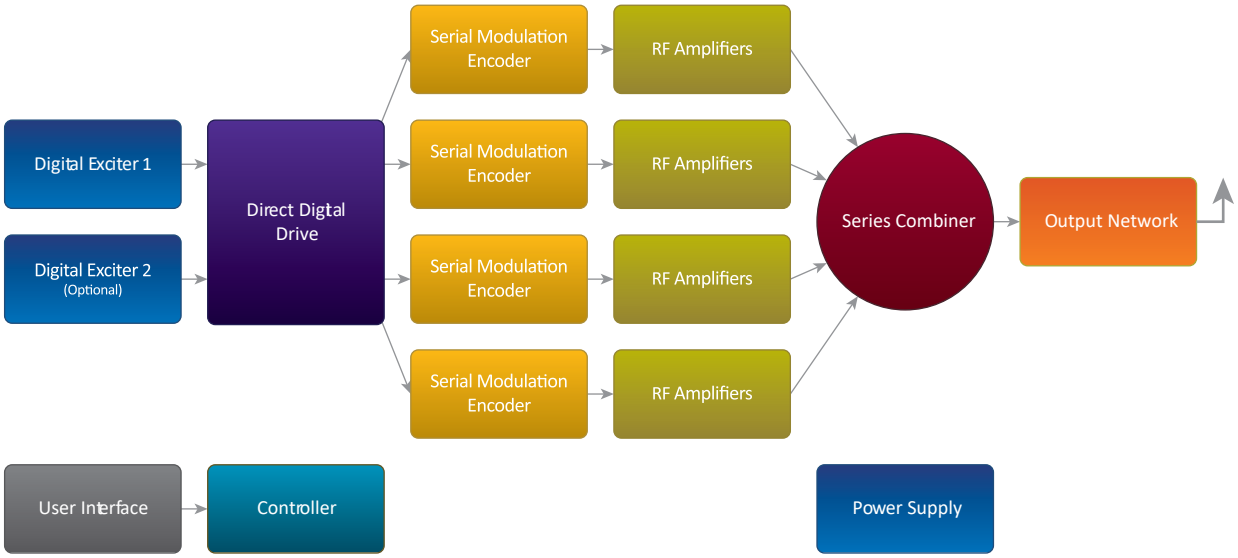
The 50 kW DX Destiny uses 62 main and six binary solid-state RF power amplifiers. These modules protect themselves from over-temperature, loss of RF drive, loss of power and shorted RF output conditions, and are hot-pluggable for on-air servicing. These modules are of simple construction with easy access to the individual MOSFET transistors.

Binary RF Amplifier

RF Power Amplifier

RF modules may be removed while on the air

3DX-50 Block Diagram



Output Network (left),
RF Combiner (right)

RF Combiner

Output from RF power amplifiers is summed in a simple, field-proven combiner. The combiner assembly is readily accessible from the rear of the transmitter and redesigned for easier servicing. This allows individual RF motherboards to be easily removed.

Main DC Power Supply

A true 12-pulse SCR-controlled power supply maintains a high power factor and generates low AC line harmonic distortion. Voltage ramp-up protects the transmitter when it is turned on and eliminates separate step-start/run contactors and resistors. The power supply tolerates AC line fluctuations of +/-5% (full performance) and +10/-15% (operational).

Output Network

The 50 ohm fixed output network with internal variability ensures the transmitter is properly matched into the antenna and that all output meter readings are correct. The internal bandpass f ilter provides VSWR protection in addition to improving turnaround loss. The transmitter uses a minimum of frequencydetermined components for ease of frequency changes in the field. A VSWR detector, carbon arc gap, arc detector and static drain choke are all provided for protection against lightning, static electricity, and other transients.

The Next Level DX Design

Improved modulation accuracy and performance, now with auto-servicing

Make these 3DX Benefits Yours:

Direct Digital Drive-- GatesAir (3D) technology drives greater signal accuracy, better efficiency and IBOC-readiness

GatesAir's 3D technology improves signal linearity and provides typical overall efficiency of 87%. Each power amplifier module is driven directly by a low-level signal, eliminating the RF driver section. This enhancement conserves energy, saves money and reduces complexity. The 3D modulation method improves modulation linearity and bandwidth which is especially important for the coming transition to Digital Audio Broadcasting.

Auto-Serviceability offers more freedom

GatesAir's innovative technology makes the DX Destiny virtually auto-servicing. Patent-pending Digital Serial Adaptive Modulation (DSAM) continuously monitors each serial modulation encoder and RF power amplifier module and makes automatic module reassignments should any difficulty occur. Several modules can be out of service without affecting transmitter output power, signal accuracy, or normal modulation capability (+125%). DSAM keeps the transmitter running at peak performance until you are ready to perform maintenance.

Intelligent User Interface

The DX Destiny is designed for easy operation through IntelliStat™, the diagnostic user interface. This combination of large, internationally-identified control buttons, a status panel with selectable metering, and 1/4 VGA display provides all important control and status parameters to show exactly how the transmitter is performing.

DX Destiny takes hot-pluggability to its next level–hot serviceability

Hot serviceability is a key feature of the DX Destiny. An RF power amplifier or binary amplifier can be removed for service without taking the transmitter off the air. A module access and diagnostics card is provided with the transmitter for troubleshooting or safe removal of the module. Simply insert the card into the connector below the module to obtain module status information or use the disable switch for module removal.

DX Destiny takes transmitter redundancy to its next level

In addition to the main RF power amplifier modules, the DX Destiny has the capability for two spare modules. Four serial modulation encoders plug into the PA section, in a similar fashion as the RF power amplifier modules. The transmitter is also available with optional dual digital exciters, dual low voltage power supplies, dual binary amplifiers, and dual binary amplifier power supplies--all with automatic switchover. The fully configured system provides unprecedented redundancy and true hot serviceability.

World-proven Digital Amplitude Modulation technology delivers unequaled peace of mind

DX Destiny transmitters build on the benefits of GatesAir-patented Digital Amplitude Modulation and unprecedented DX transmitter reliability. This innovative modulation technology was introduced in 1987 and is operating in more than 1,000 DX transmitters worldwide.

WORLD "FIRSTS " IN DIGITAL BROADCAST TRANSMITTERS

1987
GatesAir introduces Digital Amplitude Modulation technology used in DX Series Medium Wave broadcast transmitters.

1991
GatesAir demonstrates prototype digital FM exciter.

1993
GatesAir introduces DIGIT, world's first digital FM exciter.

1994
GatesAir DX successfully demonstrates IBOC amplification at the NAB Radio Show.

1996
GatesAir introduces first 1 megawatt digital AM transmitter.

1997
GatesAir premieres the CD Link, a 950 MHz digital STL, at NAB in Las Vegas.

2000
GatesAir introduces DX Destiny with Direct Digital Drive at NAB in Las Vegas.

Specifications

Specifications and designs are subject to change without notice

General	
Type of Modulation	GatesAir patented Direct Digital Drive Amplitude Modulation.
Transmitter Type	Medium Wave, 100% solid-state.
Power Output Range	10-55 kW. Transmitter capable of combined operation. Three adjustable power levels are provided.
Frequency Range	531 kHz to 1610 kHz. Supplied, tuned, and tested on one frequency as specified.
AC Mains Input	380, 430, 485 VAC, 50 or 60 Hz with ±18V taps.
Power Supply Variation	±5% voltage, ±5% frequency for full performance. +10/-15% voltage transmitter operational.
Transient Protection	Meets ANSI/IEEE C62.41-1980 requirements; includes high energy MOVs.
Power Factor	0.97 typical.
Frequency Stability	2 PPM over frequency range, 0 to 50˚ C. Higher stability available with external reference.
Audio Input	-10 to +10 dBm, adjustable transformerless input; 600 and 20k terminators provided. AES3 digital input, 110 ohm, -20dBfs adjustable.
RF Output	3-1/8" EIA flange, bullet provided.
RF Load	50 ohms, fixed, unbalanced, resistive.
VSWR	1.2:1 or better for full rated power. Typical 1.3:1.
Cabinet & Harmonic/ Spurious Radiation	Meets or exceeds FCC, IC, and other world standards.
Overall AC Efficiency	86% or better at 50 kW. 87% typical.
Audio Performance	
Audio Frequency Response	+0.2/-0.8 dB at 95% modulation, 20 Hz to 10 kHz. Reference 1 kHz.
Total Harmonic Distortion	0.7% or less at 95% modulation, 20 Hz to 10 kHz, 10 kW — 55 kW; 0.3% typical.
Intermodulation Distortion	1:1 0.8% or less, Typical 0.4%, 4:1 1.5% or less Typical 1.3% (60/7000 Hz; SMPTE at 95% modulation.)
Transient Intermodulation Distortion	0.5% or less at 95% modulation, 2.96/8.0 kHz, 4:1. Typically 0.3%.
Squarewave Overshoot	0.5% or less 400 Hz, 80% modulation. Measured peak to peak. Typically less than 0.3%.
Squarewave Tilt	0.5% or less at 40 Hz, 80% modulation.
Carrier Shift	Less than 1% at 95% modulation at 1 kHz. Typically less than 0.5%.
Hum and Noise	-65 dB or better below 100% modulation (unweighted). Typically -70 dB.
IQM	-36 dB at 1 kHz, 95% modulation; -40 dB typical.
Positive Peak Capability	+145% or greater at 55 kW, audio program modulation, at nominal AC mains voltage.
Duty Cycle	Continuous 100% modulated sine wave.
Service Conditions	
Power Consumption	57.5 kW or less typical at 50 kW, 0% modulation; 86 kW or less typical at 50 kW, 100% tone modulation.
Ambient Temperature	0˚ C to 50˚ C; derate 2˚ C per 1,000 feet (305 meters) of altitude.
Temperature Rise	Approximately 6˚ C (Inlet/Outlet Air) at 4000 CFM.
Humidity Range	0 to 95% non-condensing.
Altitude	Up to 13,000 feet (3962 meters).
Size	198 cm H x 260 cm W x 105 cm D (78" H x 102" W x 42" D) without fan/filter assembly. 198 cm H x 260 cm W x 137 cm D (78" H x 102" W x 54" D) with fan/filter assembly.
Weight	1644 KG (3625 lbs.)

NOTES:

1. All measurements made into test load at rated power.

2. Noise may degrade if AC lines are unbalanced.

3. Audio performance measurements made with standard audio input, no special filters required to obtain these specifications.

Connecting What's Next

5300 Kings Island Drive, Suite 101
Mason, OH USA 45040
Tel: +1 800 622 0022
GatesAir.com

Americas
Americas@gatesair.com

Europe, Middle East, and Africa
EMEA@gatesair.com

Asia Pacific
APAC@gatesair.com

Carribean and Latin America
CALA@gatesair.com

For more information, please visit gatesair.com

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