

ENERGY SAVING BY SWITCHING FROM FM TO DAB+ NEW DEVELOPMENTS FOR INCREASED EFFICIENCY AND RESILIENCE

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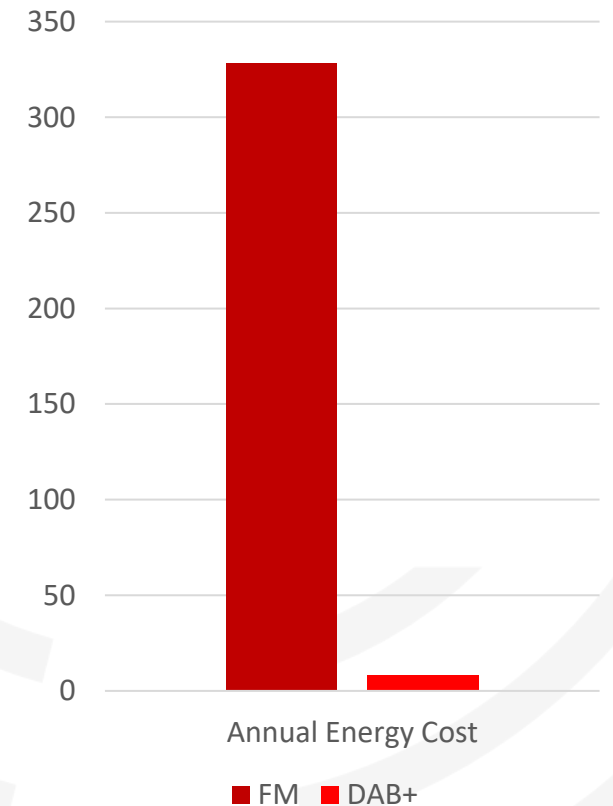
COMPARISON: FM VERSUS DAB+

Cost efficiency example: 18 radio programs; same coverage

Transmission Type	FM	DAB+
Power	10 kW	2.5 kW
AC-to-RF Efficiency	72%**	40%**
Energy consumption per Tx	13.9 kW	6.25 kW
# of Tx	18	1
Total energy consumption	250 kW	6.25 kW
Annual energy cost*	\$328,500 USD	\$8,000 USD

*Assumes \$0.15 USD per kWh

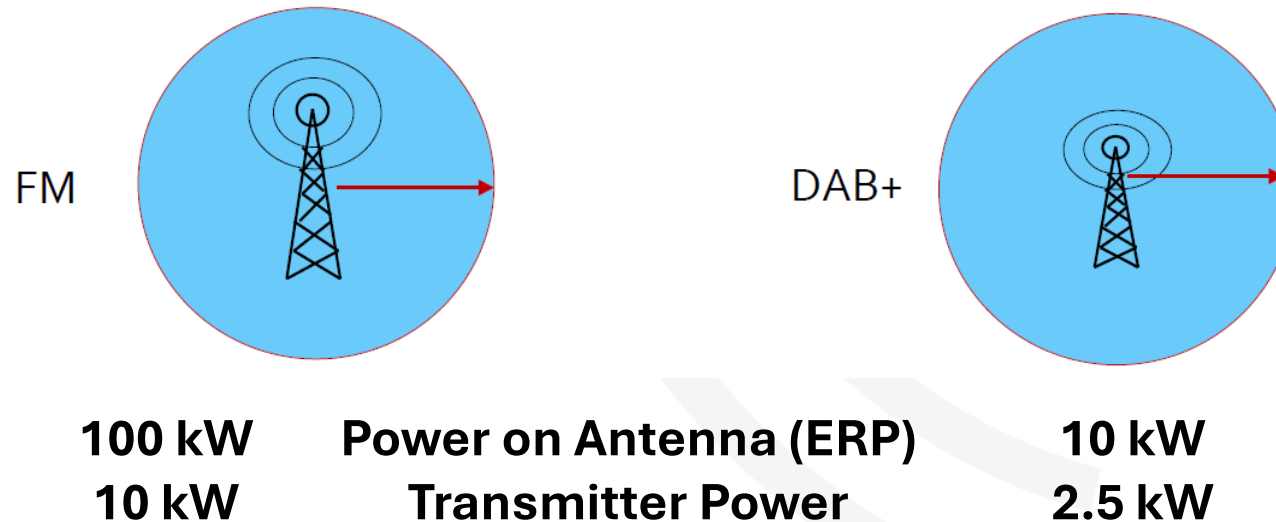
** Typical values for transmitters manufactured recently.
Today higher efficiencies are achievable.



COMPARISON: FM VERSUS DAB+

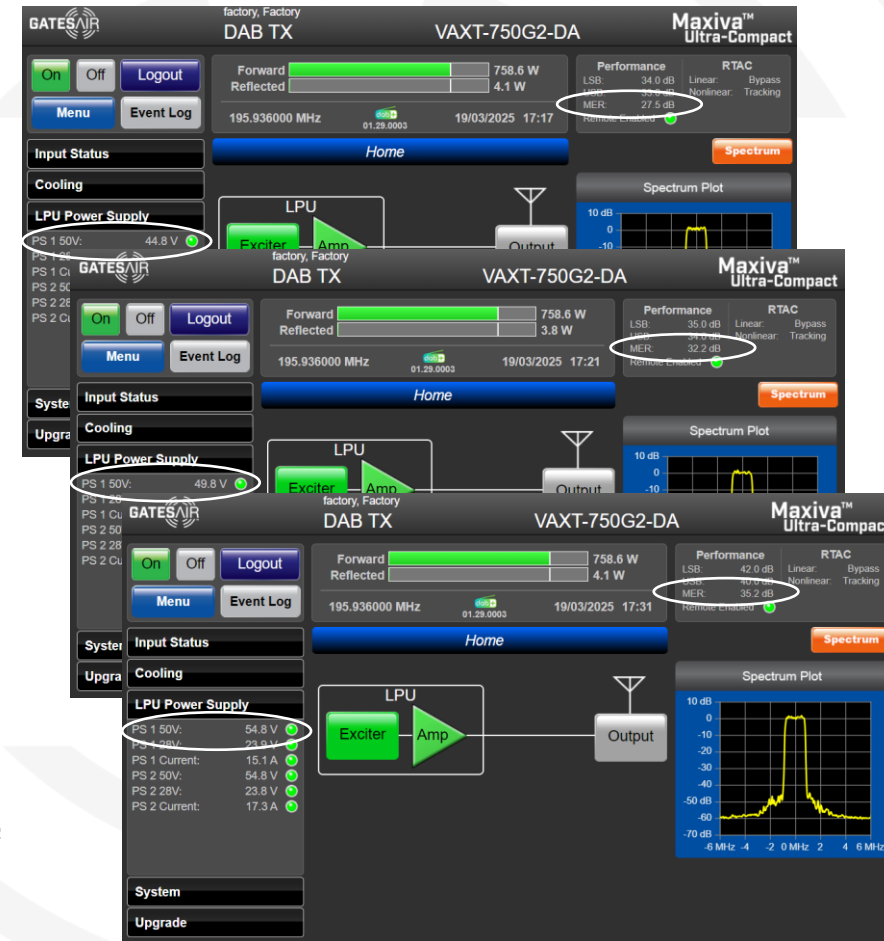
Transmission power example: Same programs; same coverage

- 10 times less RF power in DAB+ for same coverage as FM
- Due to higher losses in Band III (Filter, RF line) the effective transmitter power of DAB+ is $\frac{1}{4}$ to FM (conservative)



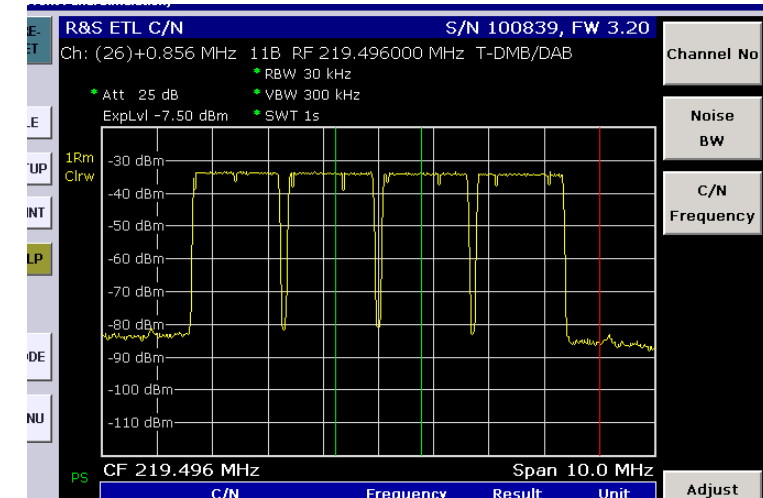
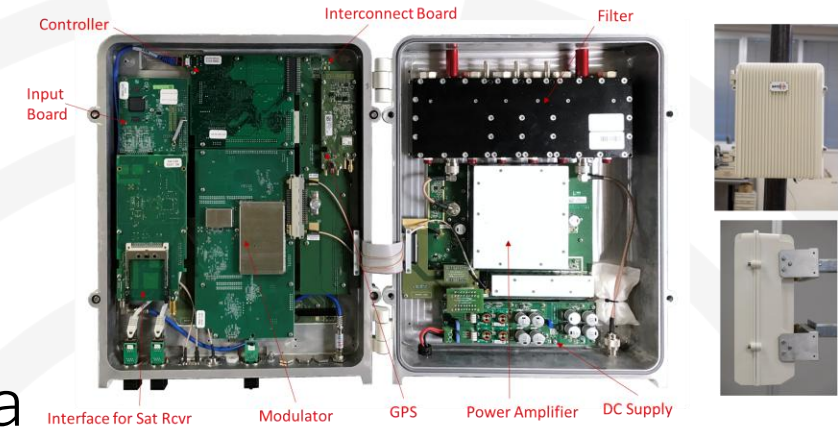
METHODS OF INCREASING TRANSMITTER EFFICIENCY IN 2024/2025

- Use of new transistor type increases efficiency for low- & medium power transmitters between 5% and 10% depending on power level
- MER & Efficiency have an indirect correlation
- “Low” MER (27-28dB) vs. “typical” MER (32-33dB typical for DAB Transmitters)
 - MER modified by changing PSU output voltage
 - Increase of about 2-3% in average efficiency
 - Increase of 2-4% in maximum efficiency – above 50%



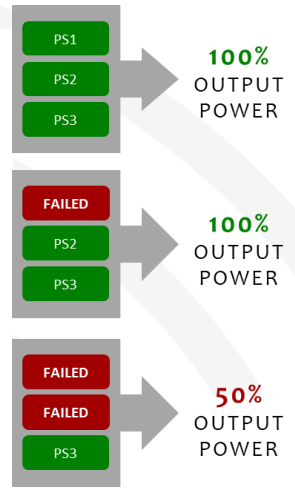
METHODS OF INCREASING TRANSMITTER EFFICIENCY

- Usage of outdoor transmitter close to antenna
 - PMTX with up to 50W post-filter for DAB+ & DVB-T/T2
 - Transmitter/transposer/on-channel repeater
 - Reduced losses on RF cable between TX & Antenna
- Using 1 transmitter for multiple MUX – MultiD
 - Up to 4 MUX in one device
 - Max. total output power of 1.9kW
 - No need for external RF combiner or adjacent channels operation.
- Integration of external equipment into transmitter
 - GPS receiver
 - SAT or RF receiver
 - For FM TX: Audio processor, IP input , dynamic RDS coder



DAB+ TRANSMITTER RESILIANCE

- Redundancy concept:
 - Single drive (a.k.a. 1+0)
 - Dual drive
 - 1+1 redundancy (with/without switchover unit)
- PSU redundancy (“2-out-of-3”)
- Redundant inputs with seamless switching between networks
- Redundant AC/LC cooling



GATESAIR'S DAB+ & DVB-T/2 INNOVATIONS

- **Maxiva™ UAXT/VAXT Ultra-Compact:** up to 750W, high efficiency, SFN-ready
- **Maxiva™ UAX-OP/VAX-OP:** up to 13.6kW, high efficiency, SFN-ready
- **Maxiva™ MultiD:** Up to 4 DAB+ channels in 1RU, low-cost & efficient
- **Maxiva™ PMTX-1:** Outdoor, self-contained, pole-mounted unit
- **Maxiva™ XTE:** Software-defined exciter; upgradeable and GNSS-ready for SFN
- **Maxiva™ UAXTE/VAXTE:** up to 19.2kW, high efficiency, SFN-ready



CONCLUSION: GATESAIR'S COMMITMENT TO DAB+ & DVB-T/T2

- Industry-leading DAB/DAB+ & DVB-T/T2 solutions across all power levels
- Optimized for efficiency, scalability, and cost-effectiveness
- Proven deployments worldwide



Maxiva™ PMTX-1-V



THANK YOU

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