UHF Transmitter Family R&S SV 7000

# Low-power transmitters for terrestrial digital TV

**Terrestrial digital transmitter networks are currently being set up worldwide, initially with transmitters of the high-power or medium-power class. But there is also a need for low-power transmitters, for example to cover small urban areas and valleys or for closing coverage gaps. The UHF Transmitter Family R&S SV 7000 is a compact and economical solution in such cases.**

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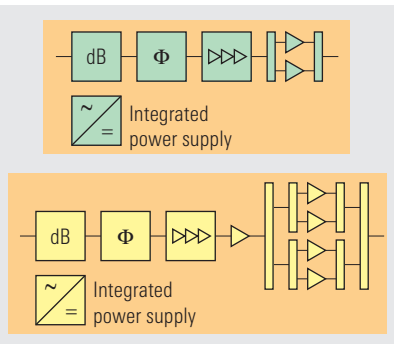
**FIG 1**
**Air-cooled, low-power TV Transmitter R&S SV 7000 for DVB-T, configured for 2 x 210 W and with NetLink option**

**FIG 2**
**Schematic of UHF Power Amplifier R&S VH 610 A2 (top) and R&S VH 620 A2**




## Compact and modular system

The low-power Transmitters R&S SV 7000 are mainly used to cover small urban areas and valleys and to close gaps in coverage. The innovative Exciter R&S SV 700 [1] for the transmitters of the NV 7000 (1 kW to 50 kW) and NV 7001 (200 W to 800 W) families is also used in these low-power transmitters [2; 3]. This ensures a uniform operating concept for transmitters of all power classes. Transmitters can be implemented in line with the DVB-T standard ETS 300 744 and the American ATSC standard. Especially compact and space-saving solutions are obtained when several transmitters are integrated in a single rack.

The R&S SV 7000 transmitter family is a building block system. Two racks of different size and four transmitter kits with output powers between 55 W and 210 W for DVB-T and 70 W to 230 W for ATSC are available, maximally two amplifiers per transmitter being com-

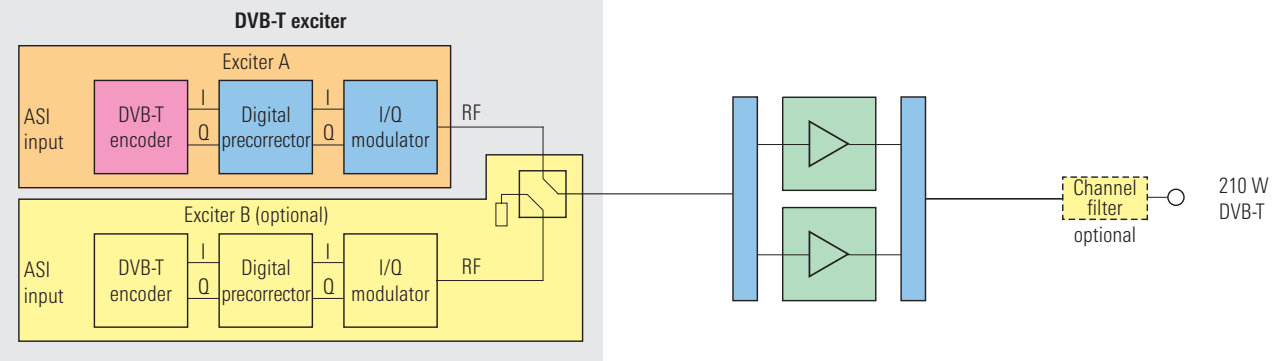



**FIG 3 Schematic of Transmitter R&S SV 7000**

bined to boost power (FIG 3). Different configurations are possible: as a single transmitter, transmitter with exciter standby, transmitter with passive transmitter standby or as a system in (n+1) standby configuration with up to six operative transmitters and one standby. In the case of exciter standby, the central control unit (CCU) is driven by an additional power supply. A bypass circuit is also provided for the CCU so that the latter can be replaced without interrupting operation in the event of failure.

The large variety of systems and the possibility of housing several transmitters in a single rack mean maximum flexibility. Two single transmitters with a total DVB-T output power of 210 W (FIG 1) can be accommodated in a rack of 21 height units, up to four single transmitters in a rack of 42 height units. Subsequent integration of amplifiers or transmitters into an existing rack takes little effort particularly because the modules of a specific transmitter (amplifier, coupler, absorber, cables) come as ready and complete kits. The power combiners and absorber resistors (dummy loads) required for combining the amplifiers as well as the rack controller are accommodated in the back of the rack for easy access.

## Power amplifiers

Two different power amplifiers are available. The UHF Amplifier R&S VH 610 A2 produces power of 55 W for DVB-T or 70 W for ATSC, the R&S VH 620 A2 120 W for DVB-T or 130 W for ATSC (FIG 2). Both are broadband to operate in the 470 MHz to 862 MHz band and are accommodated in 19-inch rackmounts of only three height units. From the outside, the only difference is the depth. The concept is very similar to that of high-power and medium-power amplifiers. The power supply and the whole cooling system are integrated in the amplifier. The output stage transistors in advanced LDMOS technology as well as the preamplifier module are the same and the interfaces are almost identical to those of the higher power amplifiers. This means considerable advantages in terms of spare parts logistics and service, and the same test equipment can be used. A built-in protection facility guards the amplifier against reflection and overheating. Faults are indicated on the front panel and signalled to the exciter. The output power is circuit-controlled and can be set from the exciter by a DC voltage. A monitored fan with high airflow in conjunction with an optimized heat sink ensures low junction temperature and thus long life of the power transistors.

## Remote control

For remote control, an RS-232-C interface is integrated as standard in the exciter for connecting a modem, a parallel interface can be optionally integrated, and the NetLink [4] option is available as an efficient, future-oriented medium. There is sufficient space in the racks for the 19-inch NetLink plug-in of only one height unit (FIG 1).

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**More information at www.rohde-schwarz.com (search term: SV 7000)**

REFERENCES
[1] Exciter R&S SV 700 – Digital TV standard ATSC for Transmitter Family R&S Nx 700 x. News from Rohde & Schwarz (2001) No. 172, pp 40–41
[2] Liquid-cooled TV transmitters for terrestrial digital TV. News from Rohde & Schwarz (1999) No. 165, pp 11–13
[3] Medium-power transmitter for terrestrial digital and analog TV. News from Rohde & Schwarz (2001) No. 171, pp 39–41
[4] Remote control and monitoring of transmitters on the Internet. News from Rohde & Schwarz (2001) No. 170, pp 27–29

# R&S®SV7000 UHF Low Power DVB-T/ATSC Transmitter

Output classes 60W - 230W available in various rack and reserve configurations

With the transmitter family R&S® SV7000, Rohde & Schwarz is presenting a new transmitter generation for UHF DVB-T low power applications. This family is designed as an expansion to the high and medium power series (NV7000 / NV7001), making use of the same digital exciter R&S® SV700 which guarantees first class performances. Due to the smaller, self-contained amplifier modules and a complete new mechanical arrangement, the design has been optimised to the requirements for low power transmitters.

A 3U self-contained LDMOS amplifier with integrated power supply is available as 60W (VH610) or 120W (VH620) version. Each individual unit of the transmitter is cooled independently by its own fan(s). Exciter(s) and power amplifier(s) can be accommodated in various configurations into a small 19” 21U rack or a 42U rack.
Based on this modular concept, multi-transmitter racks (i.e. several transmitters are accommodated into one rack) can be offered in order to save space. This flexibility is enhanced by multiple possibilities of reserve concepts: dual drive, passive exciter/power amplifier, active reserve or n+1.

Features

- self-contained LDMOS amplifier with integrated power supply, available as 60W (VH610) or 120W (VH620) version
- design optimised for low power transmitters
- modular concept, multitransmitter racks available
- each individual unit of the transmitter is cooled independently by its own fan(s)

| **Type Specifications** | **SV7050** | **SV7100** | **SV7102** | **SV7200** |
|---|---|---|---|---|
| No. of amplifiers VH610A2 | 1 | | 2 | |
| No. of amplifiers VH620A2 | | 1 | | 2 |
| Output power (w/o bandpass-filter) | | | | |
| DVB-T | 60W | 120W | 110W | 220W |
| ATSC | 70W | 130W | 125W | 230W |
| Number of rack units (U) for single transmitter / for double transmitter system | 11 / 14 | 11 / 14 | 14 / 20 | 14 / 20 |
| Connectors RF output: | N | N | 7/16 | 7/16 |
| Configuration: | | | | |
| Single transmitter | x | x | x | x |
| Dual Drive | | | x | x |
| Passive Exciter / Power Amplifier | x | x | | x |
| | | x | | x |
| Active Amplifier Reserve | x | x | x | x |
| N+1 | x | x | x | x |
| Multi-transmitter rack system | | | | |