Remote Control Processor GP2000

The wild card in shortwave communication

Remote Control Processor GP2000 is the latest member in the XK2000 family of shortwave transceivers. This is a highly versatile unit for use in complex split-site applications, as a favourably priced upgrade of the HF850 transceiver family, as well as for adaptation of transceivers, transmitters and receivers of another make to the Rohde & Schwarz XK2000 standard.

Split site

High transmitting power or the use of several transmitting antennas in shortwave communications (1.5 to 30 MHz) frequently requires that transmitters and receivers be located at separate sites. Ideally, transmitters and receivers are spaced several kilometers from each other. In most cases it is sufficient to install only the transmitters at a separate site, leaving the receivers at the central station – the converse arrangement is comparatively rare. The more seldom split-site application with remote receivers has been implemented without any problems. But what has not been solved satisfactorily is a configuration with the transmitting site or both the transmitting and receiving sites away from the central station. This is now possible with Remote Control Processor GP2000 (FIG 1). The processor allows remote control of transmitters and receivers from any location (FIG 2) whilst fully retaining the functions of HF Transceivers XK2000 [1; 2].

At the receiving end, VLF-HF Receiver EK895 [3] or Receiver/Exciter GX2900 [2] is generally used, and at the transmitting end shortwave transceivers of the XK2000 and HF850 families. Besides Rohde & Schwarz equipment, non-R&S transceivers, transmitters and receivers can be integrated for the first time. Communication networks based on Rohde & Schwarz equipment can now be extended by existing shortwave stations from other manufacturers.

HF850 upgrade

Remote Control Processor GP2000 is the ideal solution for upgrading the older HF850 shortwave transceiver family [4] to match the current and future XK2000 standard. Fitted with XK2000 options as required in each case, GP2000 is connected to HF850 transceivers and controls them. This allows realization of the latest procedures, protocols and applications with such HF850 transceivers. The following XK2000 features are available for an upgrade:
- automatic link establishment (ALE) in line with FED-STD 1045/46/49 and the Rohde & Schwarz ALIS procedure [5],
- fast data transmission with HF Modem GM2100 offering waveforms to MIL-STD-188-110 A, STANAG 4285 and a Rohde & Schwarz-specific waveform [6],
- HF voice link to telephone network with automatic phone patch [1],
- improvement of voice quality in shortwave communications with voice processing unit [1].

ARINC and non-R&S equipment

Processor GP2000 can be fitted optionally with a special ARINC interface (Aeronautical Radio, Incorporated) for controlling aeronautical HF transceivers equipped with interfaces to ARINC-429. Both Rohde & Schwarz Transceivers XK516 and suitable transceivers of another make can be controlled. If there are deviations from ARINC standard or the customer wishes control facilities beyond those of the standard, the software must be modified in line with customer’s requirements.

FIG 1 Remote Control Processor GP2000 makes it possible: shortwave communication with remote Tx and Rx components Photo 43 075
Customized software modification is required also if GP2000, using XK2000 functionality, is to control transceivers, transmitters or receivers of another make instead of Rohde & Schwarz equipment. The extent of modification depends on the particular application.

### Operation

The following operating modes can be realized with GP2000 providing there are no constraints imposed by the remote link or remote equipment:

- Morse
- teletype
- speech
- data
- telephone
- independent sideband
- link 11
- automatic mode.

Rohde & Schwarz offers a range of computer-based software products, eg Message-Handling Software PostMan [7], for setting up nationwide or worldwide communication networks with integrated shortwave. The software packages – designed for use with XK2000 transceivers – provide full functionality also with Remote Control Processor GP2000, which allows the so far unparalleled features of the software products to be utilized to the full also with HF850 transceivers and even with transceivers of another make.

In split-site applications, interface signals often have to be taken to external equipment across large distances by remote transmission. This is most frequently implemented by cable links (up to 1 km), modems and lines (up to 100 km) or microwave links (up to 50 km). Transmission links must of course meet common standards with respect to signal delay and fail-safe characteristics.

Featuring excellent characteristics, Remote Control Processor GP2000 rounds off the range of products and applications offered by the XK2000 transceiver family. The facility of adapting non-R&S equipment to the XK2000 standard puts GP2000 in a key position, opening up a wide field of applications for the future-oriented software products from Rohde & Schwarz.

**Thomas Kneidel**

### REFERENCES


---

**Condensed data of Remote Control Processor GP2000**

- **Frequency range**
  - Transmission: 1.5 to 30 MHz
  - Reception: 10 kHz to 30 MHz

- **Classes of emission**
  - A1A (CW), J3E (SSB), H3E (AME), (depending on equipment connected) J7B (A7I, radio data), F18 (FSK/AFSK), B8E (SSB), F3E (FM)

- **Interfaces**
  - RS-232-C, RS-485/RS-422 (bus-compatible)
  - Tx/Rx control V.10, asynchronous, 300 to 38 400 baud to ARINC-429 (command and answer)

**Reader service card 157/04**