

Test Platform for Mobile Phone Production R&S TS 7180

Ready for mass production, incoming goods inspection and service

Compact design with a minimum of components is characteristic of modern mobile phones. Although this simplifies the scope of production tests, precise, fast and comprehensive RF measurements are still necessary. Moreover, with the launch of 3G there will also be mobile phones that support several mobile radio standards in one unit. This calls for a production test system such as the new R&S TS 7180 which meets all these requirements with a high degree of both economic viability and flexibility.

43 856/6



FIG 1 R&S TS 7180 test system with R&S TS 7110 fixture.

Economical and flexible

As with the Cellular Phone Production Test Platform R&S TS 7100 [1], the new R&S TS 7180 (FIG 1) is also designed for PCB tests, RF adjustment and final tests. Both test systems equally support the current mobile radio standards GSM/GPRS, TDMA (IS-136), AMPS, CDMA (IS-95), CDMA2000 and soon WCDMA and the *Bluetooth*[™] radio standard* as well. Both systems provide almost the same basic functionality. The

new test system uses as process controller a favourably priced industrial PC, whereas the R&S TS 7100 incorporates the PCI/CompactPCI Test System Versatile Platform TSVP. The comprehensive generic test software library (GTSL) from Rohde & Schwarz runs on both systems.

Owing to its economic viability and flexibility, the new test system is of interest to start-up companies in the mobile phone market as well as to contractual manufacturers, since they can test their

* *Bluetooth* is a registered trademark of Bluetooth SIG, Inc., USA and is licensed to Rohde & Schwarz.

products at relatively low investment costs. This is also an important factor for use in service centers and for incoming goods inspection at network operators. Handover tests from WCDMA to GSM or from CDMA2000 to IS-95 require only an R&S TS 7180 test system. Future mobile phones are likely to support several 3G technologies such as WCDMA and CDMA2000 in a single unit. The R&S TS 7180 has been designed to meet these requirements, too.

Used in combination with the new Shielded Fixture R&S TS 7110, all wire-line RF tests, tests via antenna as well as voltage supply and acoustic tests can be performed by means of one and the same fixture. The mobile phones to be tested need be fitted with neither a battery nor a SIM card.

The R&S TS 7180 consists of the following standard components (FIG 2):

- ◆ Universal Radio Communication Tester R&S CMU 200
- ◆ Commercial PC with Windows® 2000

- ◆ GTSL running on TestStand test executive from National Instruments
- ◆ Dual-Channel Analyzer / Power Supply R&S NGM 02 or Keithley 2306

Future-proof Universal Radio Communication Tester R&S CMU 200

The Universal Radio Communication Tester R&S CMU 200 [2] performs all acoustic and RF tests (with and without signalling). Its modular design and expandability to cover future standards is a major asset since the R&S CMU 200 can be expanded to a multiprotocol tester by means of additional hardware or software options at any time. This currently applies to the GSM, GPRS, EDGE, CDMA (IS-95), AMPS, TDMA (IS-136), CDMA2000 and WCDMA standards. Its compact size of only four height units, low power loss, in-depth selftest capability and high reproducibility of results are crucial, particularly for use in production.

Intelligent fixture kit

The R&S TS 7110 is a flexible fixture kit that can be remote-controlled via a universal serial bus (USB) and modularly expanded from a simple shielded housing through to a complete final test fixture with built-in antenna, loudspeaker, microphone and pneumatics (FIG 2). The mobile phone is on a removable disk that can easily be replaced by another UUT. The pneumatic support considerably facilitates the handling of the shielding cover. The test fixture interface includes all required switchover facilities and amplifiers for testing the audio loops in the mobile phone. An RS-232-C level converter sets up the connection to the UUT. Additional spare relays allow expansions, e.g. test points for voltage measurements. Simple system expansions can thus be economically implemented in the fixture.

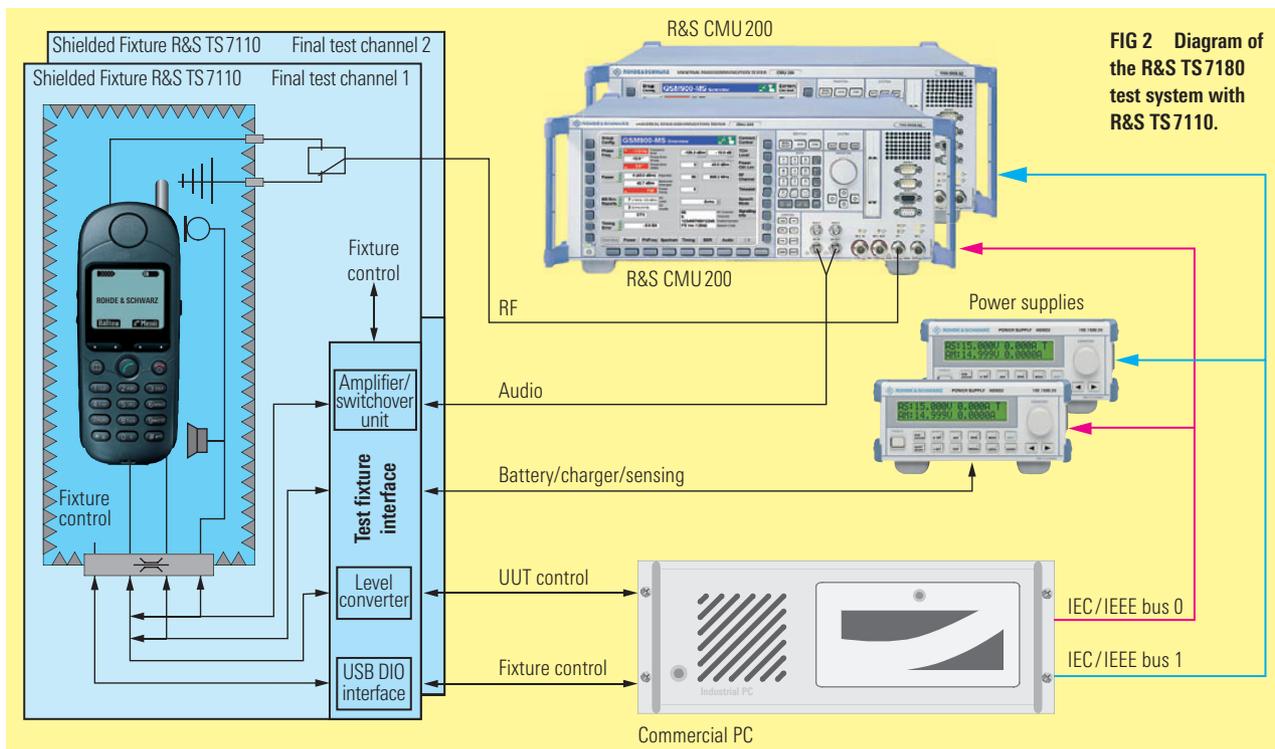


FIG 2 Diagram of the R&S TS 7180 test system with R&S TS 7110.

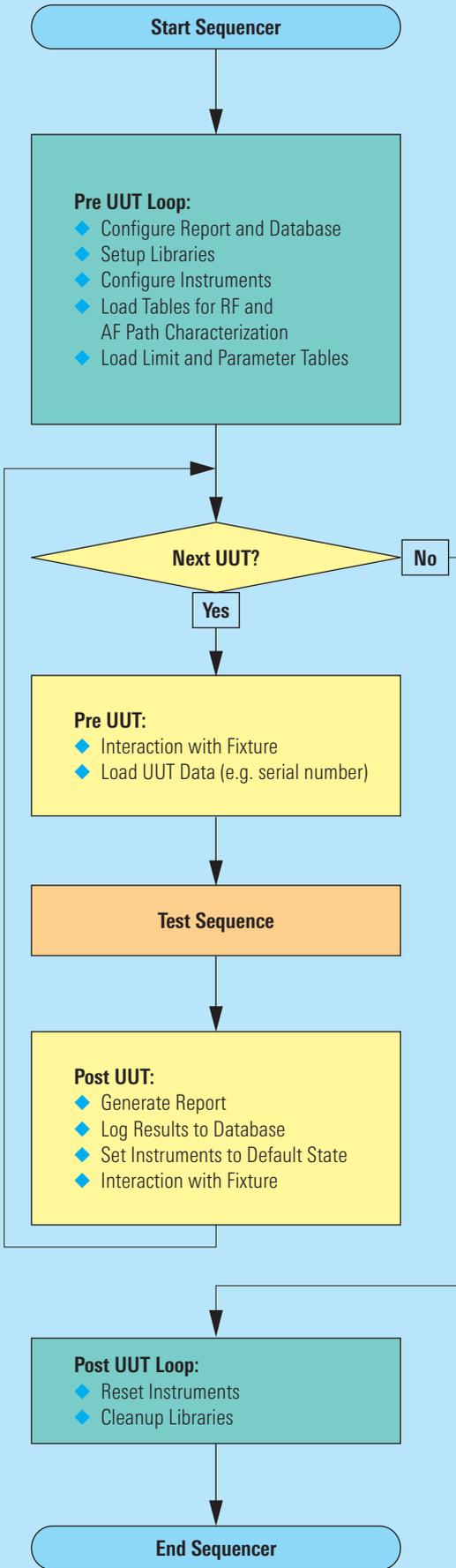


FIG 3 TestStand process model.

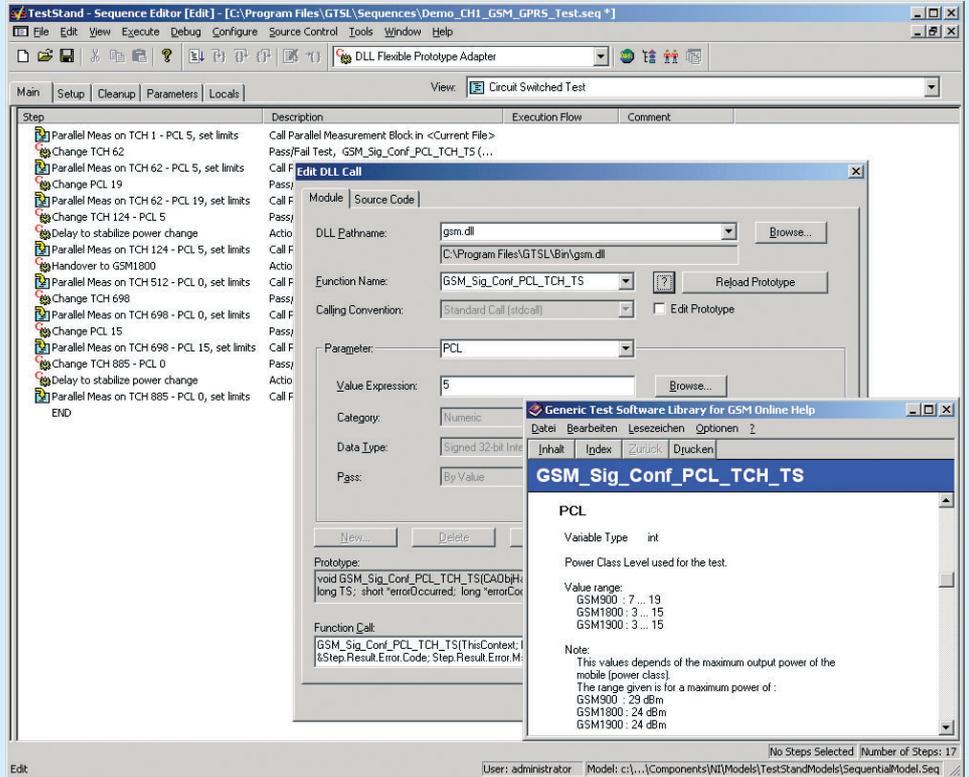
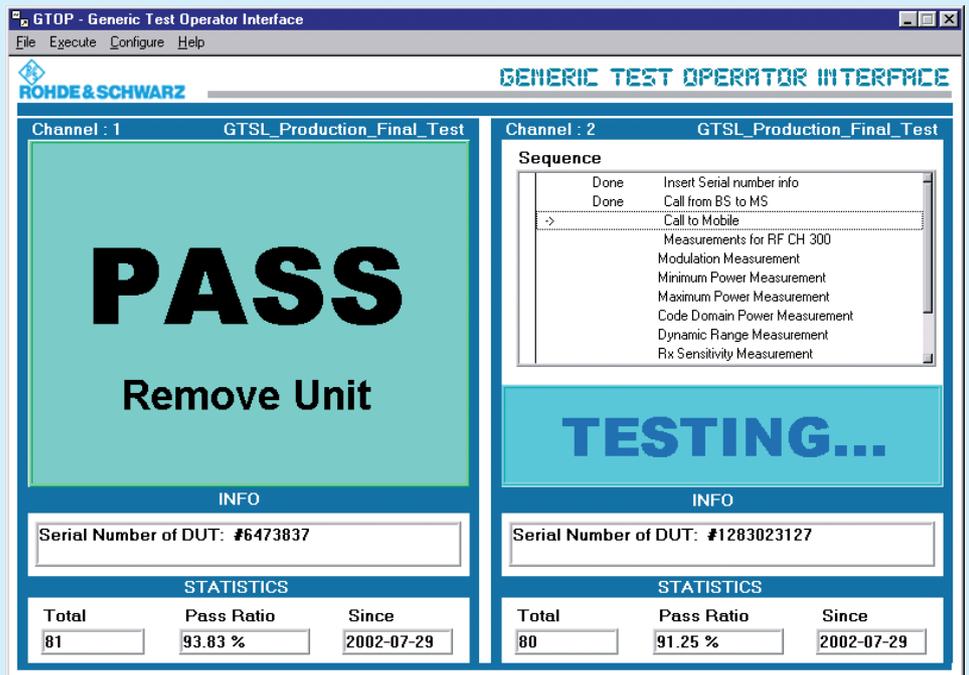


FIG 4 TestStand sequence editor.

FIG 5 Generic test operator interface.



► Production-tailored

By means of the TestStand sequence editor, the individual setting and measurement functions of the GTSL are combined to form a complete test run so that a fully automatic test sequence can be implemented (FIG 4), including audio measurements as well as fixture and UUT control. No programming knowledge is required. Dual-channel operation is also possible, i.e. two UUTs with the same test sequence are tested simultaneously, independently of each other. A process model from TestStand, specially tailored to meet production requirements, considerably facilitates the additional integration of one-time instrument settings after the system has been started (FIG 3). Fixture control, serial number determination as well as report generation and database connection after each test sequence are similarly integrated.

Worldwide support

Rohde & Schwarz regional integration centers provide customer support worldwide. Experienced engineers help users with their individual system configuration, finding the optimum test strategy and integrating the system into the existing infrastructure. The portfolio also includes service and maintenance after installation and the training of the operating, service and maintenance personnel. Upon request, customized maintenance contracts are possible, taking into account user-specific requirements.

The new test system from Rohde & Schwarz with its support offers an all-in-one solution for mobile phone testing, enabling short start-up time, high production throughput, minimum test costs and comprehensive test coverage.

Manfred Gruber; Georg Steinhilber

More information and data sheet at
www.rohde-schwarz.com
(search term: TS 7180)



REFERENCES

- [1] Cellular Phone Production Test Platform R&S TS 7100: Compact, flexible and ready to go for mass production. News from Rohde & Schwarz (2000) No. 169, pp 4–7
- [2] See article on page 21 in this issue.

Main features of the R&S TS 7180 test system

- ◆ Low costs and therefore ideal for both mass production and service.
- ◆ Includes the R&S CMU 200 which combines all established mobile-radio standards in one unit.
- ◆ Considerable simplification of R&S CMU 200 programming by virtue of GTSL.
- ◆ GTSL software runs on desktop PCs as well as on R&S TS 7180 or R&S TS 7100.
- ◆ GTSL will be continuously expanded by new standards also in future. It currently supports GSM/GPRS, TDMA (IS-136), AMPS, CDMA (IS-95), CDMA2000, Bluetooth and soon WCDMA.
- ◆ Multiprotocol tests with UUT and test system.
- ◆ Library concept allows integration into any production test software.
- ◆ Libraries are user-expandable.
- ◆ Simultaneous asynchronous testing of two UUTs.
- ◆ Automatic consideration of the RF and AF path frequency response.
- ◆ Powerful development environment for the generation of test sequences (TestStand from National Instruments).
- ◆ Database interfaces and report generation.
- ◆ Executable sequences for final tests and system characterization.
- ◆ Easy-to-operate GTOP operator interface for fully automatic test sequences in production (FIG 5).
- ◆ Fixture concept which includes antenna tests and acoustic tests.
- ◆ Worldwide support with the help of our system support centers in Asia, Europe and the USA.