



## HF Antenna Tuning Unit R&S® FK 855C3

For matching HF transceivers to antennas used in stationary and shipboard applications

- ◆ Tuning range 1.5 MHz to 30 MHz
- ◆ Fully automatic tuning
- ◆ 400 W CW and PEP at 100 % duty cycle
- ◆ 1000 W CW and PEP with restrictions
- ◆ Tuning of rod, whip and broadband antennas used in naval applications
- ◆ Low probability of intercept (LPI)
- ◆ Extremely short setting time
- ◆ Silent tuning over the entire frequency range from 1.5 MHz to 30 MHz
- ◆ Maintenance-free
- ◆ MTBF 12 000 h
- ◆ Continuous monitoring of operational status
- ◆ Rugged design



**ROHDE & SCHWARZ**



*The 400 W Antenna Tuning Unit R&S® FK 855C3 for shipboard applications of the Radio Equipment Family R&S® XK 2000*

## Brief description

The R&S® FK 855C3 matches rod and whip antennas, as they are used in naval applications, to the RF output of the Transceivers R&S® XK 2500 and R&S® XK 2900.

It can handle power up to 400 W CW and PEP at a 100% duty cycle and up to 1000 W with restrictions. The R&S® FK 855C3 operates in the frequency range from 1.5 MHz to 30 MHz, where it performs an antenna impedance transformation into 50  $\Omega$  in both the receive and transmit modes. Additionally, it provides preselection in the receive mode.

The R&S® FK 855C3 has an extremely fast setting time for silent channels (switching time <5 ms and life >10<sup>9</sup> switching operations).

Owing to the silent tuning feature of the Transceivers R&S® XK 2500 and R&S® XK 2900, low probability of intercept (LPI) is enhanced.

## Tuning functionality

### Silent tuning over the entire frequency range from 1.5 MHz to 30 MHz

Before the ATU can be used, it must be connected to an antenna to "learn" its characteristic. Learning takes place in a user-defined frequency range in the HF band (1.5 MHz to 30 MHz).

The ATU "learns" the antenna characteristic by receiving tuning data for a maximum of 1500 predefined frequencies. Once the tuning data for these frequencies is known and stored, the typical ATU setting time is less than 5 ms.

The advantage for the user is low probability of intercept (LPI), since ATU frequency setting is performed very quickly and without any emission of RF power.

## Repeated tuning

A change in environmental conditions may slightly alter the actual antenna tuning data as compared to the stored data.

The quality of antenna matching is therefore checked during operation by means of an integrated VSWR measuring device. If the required VSWR (<1.5:1) is not attained, the ATU can be retuned in less than typ. 100 ms.

## Design

The rugged design of the R&S® FK 855C3 allows it to be operated continuously 24 hours a day.

## BITE

The ATU is included in the continuous monitoring of the entire system so that deviations from the normal operating status are displayed on the control unit.

## ECM and overvoltage protection

All circuit boards are equipped with ECM filters. For protection against overvoltage as produced by lightning strokes to the antenna, the R&S® FK 855C3 output is provided with lightning protection.

## Specifications

Frequency range	transmit: 1.5 MHz to 30 MHz receive: 10 kHz to 30 MHz
RF input power	max. 400 W PEP and CW (rod and whip antennas >5 m) <b>10 m rod antenna</b> <1.8 MHz: max. 400 W PEP and CW 1.8 MHz to 2.5 MHz: max. 500 W PEP and CW 2.5 MHz to 30 MHz: max. 1000 W PEP and CW <b>12 m rod antenna</b> 1.5 MHz to 2.2 MHz: max. 700 W PEP and CW 2.2 MHz to 30 MHz: max. 1000 W PEP and CW
Duty cycle	100% for 400 W input power on all antennas 100% for 1 kW input power (10 m and 12 m rod antennas only and $f > 3.5$ MHz) 2:1 RX/TX for 1 kW input power (10 m and 12 m rod antennas only and $f \leq 3.5$ MHz), max. 10 min TX
Input impedance	50 $\Omega$ , VSWR <1.5:1, typ. 1.3:1
Antennas	rod antennas: 7 m to 12 m, broadband antennas: nominal impedance 50 $\Omega$ , VSWR <3:1, wire antennas: 15 m to 30 m
Silent tuning	1500 predefined frequencies for learning antenna characteristic
Tuning time	
First tuning	typ. <0.5 s, max. 3 s
Repeated tuning	typ. <0.1 s
Silent tuning	<5 ms
Antenna connection	unbalanced isolated M5 connection for antennas, 50 $\Omega$ adapter with coaxial N type connector on request, e.g. for broadband antennas
Power supply	19 V to 31 V, approx. 1.2 A
RF tuning power	40 W $\pm$ 1 dB, VSWR <2
Connectors	
RF connector	N female
Control and power supply	round, 26-contact
Antenna connector	M5
Earthing screw	M8
Maximum distance	
Between antenna base and ATU	$\leq$ 30 cm
Between transceiver and ATU	$\leq$ 50 m
<b>Environmental data</b>	
Temperature range	
Operating temperature range	-40 °C to +55 °C in line with MIL-STD-810E, meth. 501.3 and 502.1, cat. A2 and C2
Storage temperature range	-40 °C to +85 °C in line with MIL-STD-810E, meth. 501.3 and 502.1, cat. A2 and C2
Humidity (operational)	30 °C/55 °C, 95% rel. humidity, duration of 10 days; in line with MIL-STD-810E, meth. 507.3, proc. III
Random vibration (without shockmount)	10 Hz to 55 Hz, 0.3 mm double amplitude, VG 95332, sheet 24, degree of severity A2 4 Hz to 50 Hz, 0.01 g <sup>2</sup> /Hz, 2 h per axis; in line with MIL-STD-810E, meth. 514.4, proc. I, cat. 9
Random vibration (with shockmount)	4 Hz to 12.5 Hz, 1.6 mm double amplitude, 12.5 Hz to 63 Hz, max. 1 g (BV044, test characteristic 9) 4 Hz to 50 Hz, 0.02 g <sup>2</sup> /Hz, 2 h per axis; in line with MIL-STD-810E, meth. 514.4, proc. I, cat. 9
Shock resistance (without shockmount)	30 g, 11 ms
Shock resistance (with shockmount)	50 g, 11 ms
Class of protection	IP 56 in line with EN 60529 (VDE0470)
Electromagnetic compatibility	in line with MIL-STD-461E (CS114, RE101, RE102, RS101, RS103)
MTTR	30 min
MTBF	12 000 h in line with MIL-HDBK-217E
Dimensions without shockmounts (W × H × D)	378 mm × 292 mm × 493 mm
Depth including antenna insulator	554 mm
Weight	33 kg
Color	RAL 7001, navy grey

## Ordering information

Designation	Type	Order No.
HF Antenna Tuning Unit	R&S®FK 855C3	0724.8908.07
<b>Recommended extra</b>		
Shockmount, navy grey	R&S®KS 855C3	0729.4900.04
<b>Cables and connectors</b>		
ATU Control Cable (between R&S®XK 2500/2900 and R&S®FK 855C3)	R&S®GK 2903M	6117.9757.xx <sup>1)</sup>
Mating Connector Set	R&S®ZF 4105	6120.5407.02
<b>Documentation</b>		
User manual R&S®FK 855C3		0743.8774.12
Repair manual R&S®FK 855C3		0743.8797.62

<sup>1)</sup> Order number depending on cable length.

- 10 10 m length
- 20 20 m length
- 30 30 m length
- 40 40 m length
- 50 50 m length



More information at  
[www.rohde-schwarz.com](http://www.rohde-schwarz.com)  
 (search term: FK855C3)



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