

RDS(EON), TRI, FM Stereo, AM SSG

100 kHz to 140 MHz



3217 RDS STANDARD SIGNAL GENERATOR

GENERAL

The 3217 is a synthesized RDS Standard Signal Generator covering 100 kHz to 140 MHz with CW, FM, and AM modulated outputs. It boasts an internal FM stereo generator, as well as FM multiplex RDS (Radio Data System) and TRI (Traffic Radio Information) signal generators.

The model 3217 can be used for the receiving test of U.S. RBDS (Radio Broadcast Data System) receiver.

FEATURES

- The standard signal generator includes an RDS signal generator and a stereo signal generator, making it ideal for use in RDS receiver production line applications.
 - RDS patterns accommodate the EON (Enhanced Other Network) function.
 - TRI signal generation provided as standard. Signals conforming to two USA/EBU systems can be generated.
 - Up to 512 groups of RDS signal data can be stored internally, and up to 16 patterns of a maximum data length of 255 groups for each pattern can also be stored internally.
 - Output level can be set in the range -20 to 126 dB μ (0 dB $\mu=1$ μ V, 50 Ω , open circuit) in 0.1 dB steps.
 - The frequency, output level, and modulation factor can be input using numeric keys, or rotary encoder and digit select keys.
 - Up to 100 sets of frequency, output level, and modulation factor can be stored as presets in internal memory.
- All front-panel switches except the power switch can be remotely controlled.
 - The GPIB interface (conforming to IEEE 488.2) is provided as standard, enabling direct use of the 3217 in GPIB-based automated measurement systems.
 - RDS Data Editing Software (Option) is provided. FS 3015 Version 2 (Application software for Windows 2000/XP)
 - The creation and changing of RDS message is easy with most Windows application software.
 - RDS automatic messaging generation provides easy introduction of the test systems to the manufacturing / testing facility.
 - The adoption of the USB \rightarrow GPIB converter (indispensable option with additional payment) is available for immediate use on Windows2000/XP operating system (PC with the USB terminal is necessary.) regardless of the make of the desktop or notebook. (No GPIB driver Installation required.)
 - Remote setting to 3217 from FS 3015 is available.

SPECIFICATIONS

3217

Frequency

Range:	100 kHz to 140 MHz
Accuracy:	$\pm 5 \times 10^{-5}$ (≥ 500 kHz) $\pm(5 \times 10^{-5} + 1 \text{ digit})$ (< 500 kHz)

Output

Range:	-20 to 126 dB μ (0 dB μ =1 μ V, into open circuit)
Impedance:	50 Ω

FM

Frequency Deviation:	0 to 99.9 kHz (≥ 1 MHz) 0 to 1/10 of carrier frequency (< 1 MHz)
Display:	3-digit
Resolution:	0.1 kHz
Modulation Accuracy:	\pm (preset value x 0.1+1) kHz
Distortion:	≤ 0.05 % (10.7 MHz ± 1 MHz, 76 to 108 MHz) ≤ 0.1 % (other frequencies) (1 kHz, 75 kHz deviation, demodulated band: 50 Hz to 15 kHz, 50 μ s de-emphasis)
Residual FM:	73 dB or greater S/N for 75 kHz deviation (≤ 110 MHz), (demodulated band: 50 Hz to 15 kHz, 50 μ s de-emphasis) OFF, 25, 50, 75 μ s
Pre-emphasis:	

a. Stereo Signal

Separation:	≥ 55 dB (1 kHz, 75 kHz deviation, 76 to 108 MHz)
--------------------	---

Mode:

Composite Output Level:	1 Vrms max., into open circuit
Impedance:	75 Ω

b. Pilot Signal

Frequency:	19 kHz ± 1 Hz
Frequency Deviation:	0 to 10.0 kHz
Display:	3-digit
Resolution:	0.1 kHz
Modulation Accuracy:	\pm (preset value x 0.1 + 0.5) kHz
Output Level:	1 Vrms, into open circuit
Impedance:	600 Ω

AM

Modulation Factor:	0 to 80.0 % (500 to 1799 kHz) 0 to 60.0 % (other frequencies)
Distortion	0.5 % max. (150 kHz to 2 MHz) 1.5 % max. (other frequencies) (1 kHz, 30 % modulation, demodulated bandwidth: 50 Hz to 15 kHz)

Internal Modulation frequency

Frequency:	Select one of following seven frequencies: 30 Hz, 100 Hz, 400 Hz, 1 kHz, 6.3 kHz, 10 kHz, 15 kHz
Accuracy:	± 3 %

External Modulation

Input Impedance:	10 k Ω
Reference Input Voltage:	1.0 V rms
Frequency Range:	FM: 20 Hz to 100 kHz AM: 20 Hz to 10 kHz
Frequency Response:	Within ± 1 dB (1 kHz reference)
Pre-emphasis:	OFF, 25, 50, 75 μ s (FM only)

FM Multiplex

A. RDS (Radio Data System)

a. Subcarrier

Frequency:	57 kHz ± 3 Hz
Phase:	0 ° or 90 ° (with respect to the 3rd harmonic of pilot signal)

Frequency Deviation:	0 to 7.5 kHz
Resolution:	0.1 kHz
Modulation Accuracy:	\pm (preset value x 0.1+0.5) kHz
Display:	2-digit

b. RDS Message:

EON, PI, PIN, PS, PTY, RT, TA, TP, AF, CT, DI, MS, etc.

c. Internal Reference Data

Number of Patterns:	16 (0 to F)
Maximum Number of Groups:	512
Maximum Pattern Length:	255 groups
Data Input:	TTL level (on rear panel)
Clock Output:	(1/1.1875 k) bit/s TTL level (on rear panel)

d. User-defined Internal Data

Number of Patterns:	16 (U0 to UF)
Maximum Number of Groups:	512
Maximum Pattern Length:	255 groups

B. TRI (Traffic Radio Information)

a. EBU System

SK (Transmitter Identification Code)

Frequency:	57 kHz ± 3 Hz
Phase:	0 ° (with respect to the 3rd harmonic of the pilot signal)

Frequency Deviation:	0 to 7.5 kHz
Resolution:	0.1 kHz
Modulation Accuracy:	\pm (preset value x 0.1 + 0.5) kHz
Display:	2-digit

DK (Announcement Identification Code)

Modulation Signal:	DK (125 Hz)
Modulation Factor:	0 to 40 %
Resolution:	1 %
Modulation Accuracy:	\pm (preset value x 0.1 + 1) %
Display:	2-digit

BK (Area Identification Code)

Modulation Signal:	A to F (23.75 to 53.98 Hz)
Modulation Factor:	0 to 80 %
Resolution:	1 %
Modulation Accuracy:	\pm (preset value x 0.1 + 1) %
Display:	2-digit

b. USA System

57kHz Pilot

Frequency:	57 kHz ± 3 Hz
Phase:	0 ° (with respect to the 3rd harmonic of the pilot signal)

Frequency Deviation:	0 to 7.5 kHz
Resolution:	0.1 kHz
Modulation Accuracy:	\pm (preset value x 0.1 + 0.5) kHz
Display:	2-digit

ME (Message Signal)

Modulation Signal:	ME1 (142.5 Hz), ME2 (154.9 Hz)
Modulation Factor:	0 to 80 %
Resolution:	1 %
Modulation Accuracy:	\pm (preset value x 0.1 + 1) %
Display:	2-digit

ZO (Zone Signal)

Modulation Signal:	1 to 10 (23.75 to 122.84 Hz)
Modulation Factor:	0 to 80 %
Resolution:	1 %
Modulation Accuracy:	\pm (preset value x 0.1 + 1) %
Display:	2-digit

Remote Control

All controls on the front panel can be remote-controlled except the power switch and local key.

GPIB

Provided as standard (conforming to ANSI/IEEE Std 488.2-1987).

Environmental Conditions

Operating:	Temperature: 0 to 40 °C Humidity: ≤ 85 % RH (without condensation)
Spec-Guaranteed:	Temperature: 10 to 35 °C Humidity: ≤ 85 % RH (without condensation)
Operating Environment:	Indoor use
Operating Altitude:	Up to 2,000m
Overvoltage Category:	II
Pollution degree:	2

Power Requirements

100, 120, 220, 240 VAC ± 10 %
(250 V max.), 50/60 Hz, 55 VA

Dimensions and Weight

426 (W) x 99 (H) x 400 (D) mm,
11 kg

Accessories

BNC-BNC cable (3D-2V, 1 m)	1
Power cord	1
Instruction manual	1