

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

**CE**  
Upon request

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.

#### ● 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 $\mu$ ( $0$  dB $\mu=1$   $\mu$ V,  $50$   $\Omega$ , 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.
  1. FS 3015 (Application software for Windows 95/NT4.0)
    - 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 RS-232C $\rightarrow$ GPIB converter (necessary option) system is available for immediate use on most Windows (PC) application software, regardless of the make of the desktop or notebook. (Installation of the GPIB driver software is not necessary).
    - Remote setting to 3217 from FS 3015 is available.
  2. FS 3005 (Application software DOS version BASIC)
    - Software, which can edit detailed data, is also applicable to PC 9800 series.
    - Requires GPIB interface at personal computer side.

## ● SPECIFICATIONS

3217

### Frequency

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

### Output

**Range:** -20 to 126 dB $\mu$  (0 dB $\mu$ =1  $\mu$ V, into open circuit)  
**Impedance:** 50  $\Omega$

### FM

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

#### a. Stereo Signal

**Separation:**  $\geq 55$  dB (1 kHz, 75 kHz deviation, 76 to 108 MHz)  
**Mode:** MAIN, SUB, L, R  
**Composite Output Level:** 1 Vrms max., into open circuit  
**Impedance:** 75  $\Omega$

#### b. Pilot Signal

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

### 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:**  $\pm 3$  %

### External Modulation

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

### FM Multiplex

#### A. RDS (Radio Data System)

##### a. Subcarrier

**Frequency:** 57 kHz  $\pm$  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  $\times$  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  $\pm$  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  $\times$  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  $\times$  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  $\times$  0.1 + 1) %  
**Display:** 2-digit

#### b. USA System

##### 57kHz Pilot

**Frequency:** 57 kHz  $\pm$  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  $\times$  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  $\times$  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  $\times$  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:  $\leq 85$  % RH (without condensation)

Temperature: 10 to 35 °C

Humidity:  $\leq 85$  % RH (without condensation)

Indoor use

up to 2,000m

#### Operating Environment:

#### Operating Altitude:

#### Overvoltage Category:

#### Pollution degree:

2

100, 120, 220, 240 VAC  $\pm 10$  %

(250 V max.), 50/60 Hz, 55 VA

426 (W)  $\times$  99 (H)  $\times$  400 (D) mm,

11 kg

BNC-BNC cable (3D-2V, 1 m) ..... 1

Power cord ..... 1

Instruction manual ..... 1