



TF 2103

Transistorized
Wide Range
Oscillator

INSTRUCTION MANUAL

MARCONI INSTRUMENTS LIMITED



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TRANSISTORIZED WIDE RANGE OSCILLATOR TF 2103

1. Introduction

The output frequency of this compact sinewave/squarewave portable oscillator is continuously variable within the band 10 Hz to 1 MHz. The design employs semi-conductors mounted on printed circuit boards.

A bank of five range-selecting push-buttons and a clearly calibrated dial are used to set the output frequency: the effective scale length for the band exceeds 3 ft. Output signal amplitude is continuously variable (in four switched ranges) from 0 to 2.5V RMS.

The instrument is powered by two internal 9V batteries. A push-button operated indicator lamp facilitates occasional checking of the supply.

If mains operation is preferred, the batteries may be replaced by a Mains Power Unit type TM 9808 which is available as an optional extra.

The TF 2103 employs a transistor Wien-bridge variable frequency oscillator as the signal source; this is followed by an inverter/amplifier when sinewave output is selected, or by a Schmitt trigger circuit when squarewave output is selected. The signals of selected waveform and frequency are applied to a complementary emitter follower output stage and then pass via an attenuator to the output terminals. Amplitude stabilization is provided by thermistor-controlled negative feedback.

2. Specification

Frequency: 10 Hz to 1 MHz. Continuously variable in 5 ranges:-

10 Hz - 100 Hz	:	100 Hz - 1 kHz	:
1 kHz - 10 kHz	:	10 kHz - 100 kHz	:
100 kHz - 1 MHz	:		:

Calibration accuracy: $\pm 3\%$.

Waveform: Sinewave or squarewave

Squarewave rise-time: Not greater than 100 nS. Typically 30 nS. (Between 10% and 90% amplitude points)

Output amplitude: 0 to 2.5V RMS. Continuously variable in 4 ranges:-

0 - 2.5 mV : 0 - 25 mV : 0 - 0.25 V : 0 - 2.5 V.

Output impedance: 600 Ω on 2.5 mV, 25 mV and 0.25 V ranges.

Not greater than 600 Ω on 2.5 V range: typically 100 Ω at maximum output.

Note. The attenuator is frequency compensated to feed a high impedance load. If excessive capacity is connected across the output a fall off in high frequency response will result.

Sinewave distortion: Typically 0.5% for frequencies 50 Hz to 10 kHz.
Less than 2% for frequencies to 100 kHz.

Short-Term Stability: Frequency change typically $\pm 0.05\%$ for frequencies (Approx. 2 hour period) to 100 kHz.

Frequency change typically $\pm 0.2\%$ for frequencies 100 kHz to 1 MHz.

Frequency/Supply Variation: For 10% variation in battery voltage; each range:-

Less than $\pm 0.1\%$ change in frequency at scale setting '1'.

Typically $\pm 1\%$ change in frequency at scale setting '10'.

Frequency/Temperature Variation: Typically less than $\pm 0.05\%$ per $^{\circ}\text{C}$ at 20°C :

Power Supply: Two series-connected 9 V batteries: Vidor type VT9 or Ever Ready type PP9 or equivalent, (Mains Power Unit optional extra). Minimum supply voltage: 12 V DC.
Consumption: 0.4 W (25 mA: 16 V).

Temperature range: 0° to $+45^{\circ}$ Centigrade.

Size : $8\frac{3}{8}$ " x 5" x $4\frac{3}{4}$ " (21.1 cm x 12.7 cm x 12 cm).

Weight : 2.7 lbs. (1.1 kg) without batteries.
4.6 lbs. (1.9 kg) including batteries.

3. Operating Instructions

3.1. Insertion of Batteries or Mains Power Unit type TM 9808:

(Note: The instrument is normally supplied complete with internal batteries).

To gain access to the battery compartment first set the front-panel-mounted Output switch to 'OFF'; remove the screw at each side of the unit and lift off the instrument lid. The battery compartment is situated in the right hand rear corner.

(a) Insertion of Batteries:



