

OSCILLATOR OS2/31

Introduction

The OS2/31 is a 23-kHz oscillator designed for monitoring purposes at transmitting stations. It has provision whereby the output can be interrupted in accordance with a pre-arranged pattern. The unit requires a 12- or 24-volt d.c. power supply and provides two balanced outputs.

The oscillator is built on a printed wiring card which is mounted in a CH1/12A chassis. Connections are made to a 15-way plug at the rear of the chassis. Index peg positions are 17 and 43.

General Specification

Output Frequency	23 kHz \pm 1.5 kHz.
Maximum Level of the Output Signals	+7 dB, with respect to standard zero level, across pins 7 and 8 when terminated with a high impedance. -24 dB across pins 11 and 12 when terminated with 600 ohms.
Power Supply	12 or 24 volts d.c.
Current Consumption	18 mA at 24 volts.

Circuit Description

Fig. 1 is a circuit diagram of the OS2/31. TR1, TR2 and TR3 comprises a conventional Wien bridge circuit^{1,2}. Control of frequency and of signal amplitude is provided by preset resistors RV1 and RV2 respectively. The output of the oscillator section is applied to the base of TR4, a phase inverter. Balanced outputs are available from pins 7 and 8, and 11 and 12 on the output connector. The emitter resistor, R14, of TR4 is normally returned to earth via pin 10 of the output plug. For test purposes a push-button switch, PB1, is mounted on the front of the unit. Operating PB1 connects pin 10 to earth and allows TR4 to conduct. Pins 7 and 8 are bridged by a balanced mixer arrangement comprising resistors R15, R16 and RV3, and diodes D1 and D2. An external tone can be injected between pin 14 and earth so that it and the 23-kHz output produce a beat note which is available for aural monitoring by headphones plugged into a jack socket on the front of the unit. Preset control RV1 is to enable the mixer to be accurately balanced.

Test Procedure

Apparatus Required

Model 8 Avometer
Oscilloscope
High-impedance valve voltmeter (ATM/1)
Audio-frequency oscillator (TS/10)
Frequency counter
24-volt d.c. power supplier

Method

1. Link pins 10 and 13 and connect the 24-volt supply between pins 9 (negative) and 3 (positive).
2. Measure the current consumption; this should be about 18 mA.
3. Set RV2 for maximum output and measure the a.c. voltage across pins 7 and 8. This should be +7 dB with respect to standard zero level.
4. Check the waveform between pins 7 and 8 and between each pin and earth; there should be no distortion or limiting.
5. Adjust RV1 from the minimum position to the maximum position. The output-signal frequency should vary from 24.5 kHz to 21.5 kHz. The values of C4 and C5 are chosen so that the output-frequency range is centred approximately on 23 kHz.
6. Adjust RV1 to give an output of 23 kHz.
7. Adjust RV3 for minimum output between pin 14 and earth. Measure the level of the residual signal; this should be at least -40 dB.
9. Feed a 20-kHz sine-wave signal into the unit between pin 14 and earthed pin.
10. Measure the output voltage between pin 6 and earth; this should be approximately -16 dB when measured with a high-impedance voltmeter.
11. Check that a 3-kHz beat note can be heard at the jack socket on the front panel.
12. Connect a 600-ohm termination across pins 11 and 12 and adjust RV2 so that the measured output is at the required level.

Bibliography

1. Mullard Reference Manual of Transistor Circuits.
2. See Appendix to PTS/12.

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See overleaf for Fig. 1

from TP10097.3.1A3
parts list TP 10097.1.2A4

Fig. 1 Circuit Diagram of the OS2/31

