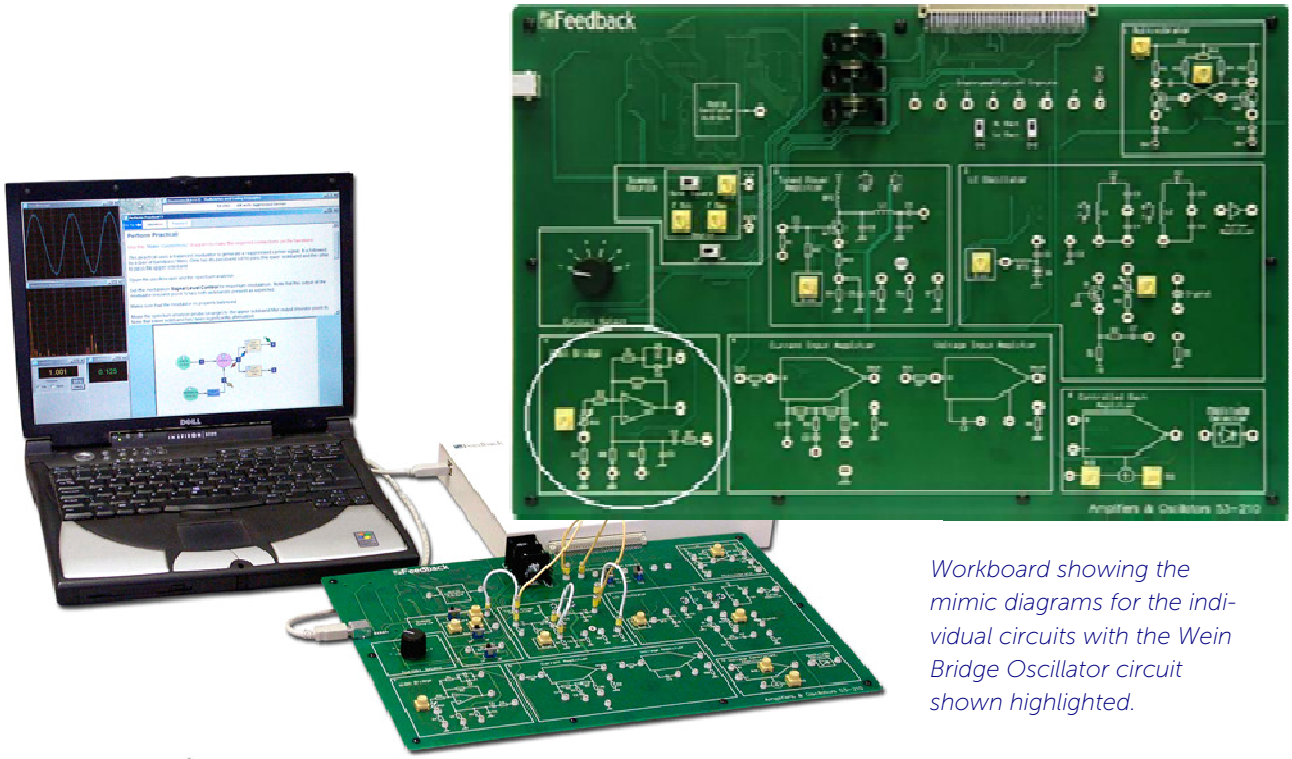
Amplifiers and Oscillators 53-210



Workboard showing the mimic diagrams for the individual circuits with the Wein Bridge Oscillator circuit shown highlighted.

espial

Description

This modern training system provides a learning platform that involves the interaction between hardware, software, PC and the student. It has been specifically developed to convey the theory of a wide variety of subjects in a way that enhances the learning experience through visual presentation and interaction with the subject matter.

The Amplifier and Oscillators workboard (53-210) is one of set of three that are related to the subject of Telecommunications. Two other workboards covering Tuned Circuits and Filters (53-220) and Modulation and Coding (53-230) are available, the complete set forming a comprehensive telecommunications course.

The Amplifiers and Oscillators workboard contains a variety of circuits that are studied individually and collectively by inter- connecting the various circuits together. These circuits consist of a Signal Source, Tuned Power Amplifier, LC Oscillator, Multivibrator, Wein Bridge Oscillator, Current and Voltage Amplifiers, Controlled Gain Amplifier, Amplitude Detector and Buffer Amplifier. The workboard is connected to a PC via a USB Real-time Access Terminal (92-203 RAT). The RAT also provides all the necessary power supplies for the workboard to operate. The Espial Software Package (93-420) is supplied extra and required for use with the 53-210 and comprises full student instruction for performing the many assignments and practical Activities together with relevant background and theoretical information combined with editing tools.
The software also provides the instrumentation required for the monitoring and measurement of the workboard signals. Additional software is also available for adding multimedia materials, ESPIAL Course Manager (93-410).

Features

- Suitable for both technician and undergraduate teaching
- Complete trainer, requires only a PC
- Computer based assignments
- Covers an introduction to Amplifiers and Oscillators
- Integrated hardware and software environment
- On-screen background, theory and practical instructions
- Software provides embedded Instrumentation (includes Automatic Bode & Nyquist plot)
- No costly additional instrumentation required
- Stand-alone workstation

Curriculum Coverage

The curriculum supplied with the 53-210 workboard is an integral part of the product installation supplied on CD. The assignments available are displayed on the screen for selection by the student, consisting of a choice of eleven main headings with up to four practical assignments under each heading.

Familiarisation
Equipment connection and operation
Using ESPIAL Software

Voltage Amplifier
Amplifier gain and phase characteristic
Amplifier input resistance
Amplifier output resistance

Current Input Amplifier
Amplitude and phase response
Amplifier input resistance
Amplifier output resistance

Controlled Gain Amplifier
Gain controlled amplifier
Automatic gain control

LC Oscillator (Part 1)
The tuned amplifier
Using the GPA (Gain Phase Analyser)
Requirements for oscillation
Oscillator stability

LC Oscillator (Part 2)
Loading and buffering
Varicap diode tuning

Crystal Oscillator
Fundamental frequency operation
Overtone operation

Wein Bridge Oscillator
Oscillation point analysis
Amplitude Stability

Power Amplifier (Part 1)
Tuned power amplifier
Amplifier input resistance
Effect of different load resistances

Power Amplifier (Part 2)
Variation of gain with bias voltage
Variation of efficiency with bias voltage

Multivibrator
The basic Multivibrator
Multivibrator additional components
(Mark/space ratio control)

Specification

The software instruments provided are:

- 2-channel oscilloscope
- Spectrum analyser
- Phase scope with phasor (vector) display
- Gain Phase Analyser (GPA) Frequency meter
- Voltmeter

Dimensions & Weight

Dimensions: 410 mm x 270 mm x 60 mm
Weight: 1 kg

Tender Specification

[1] A self-contained, telecommunications trainer.
[2] To be used for teaching the principles of Amplifiers and Oscillators through the use of a work board.
[3] The workboard to operate with a Real Time Access Terminal (RAT) enabling connection to a PC via a USB.
[4] To be supplied with interactive software which includes teaching curricula and PC-based instrumentation.
[5] The PC-based instruments to be allowed to be opened all at the same time in a Windows environment.
[6] PC-based instruments to include all of the following: Oscilloscope, Spectrum Analyser, Frequency Meter, Voltmeter, Phase Meter and Gain Phase Meter.
[7] Curriculum to cover Amplifiers and Oscillators.
[8] Eleven assignments to be provided with up to four sub-practicals.
[9] Standalone workstation with the option to add course manager package.
[10] Workboard to have dimensions approx. 410 mm x 270 mm x 60 mm and weight approx. 1 kg.
[11] To be supplied with an experimental manual.
[12] To be supplied by a company offering a 2 year parts and labour warranty.

Ordering Information

Amplifiers and Oscillators Workboard	53-210
USB Rapid Access Terminal (RAT) - essential	92-203
ESPIAL Software Package - essential	93-420
ESPIAL Course Manager - optional	93-410

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