

Preface for Instructors on using the TeachScope II

If it happens dynamically in time, somewhere a physicist is using an oscilloscope to monitor it. That might be a bit of an exaggeration, but it's a pretty good description of how tabletop physics is actually done in the laboratory. We at TeachSpin and HuckansLabs are convinced that facility in using an oscilloscope is one of the very best skills for upper-level physics students to acquire, so we have developed the TeachScope II as a tool for students to use in gaining facility with an instrument so vital as a 'scope.

TeachScope II comes with a Manual, easily found on the Web, at a URL that's found on a sticker on the back panel of each TeachScope II device. But it does *not* come with a fixed curriculum, since we know that it will be used in a host of different contexts. There are many ways to introduce the oscilloscope to students, and we hope that students encounter, in their laboratory progression, their first 'scope experience in a genuine physics-experiment context. But as with any skill, some actual practice is required for facility in using a tool as powerful as a modern digital oscilloscope. We offer the TeachScope II hoping its 'buried treasure' of waveforms will be, and will be used as, an incentive for students to see how much a 'scope can show them.

The Manual for TeachScope II includes in Ch. 0 some motivational reading for students, and in Ch. 1 the basic information on how to use a TeachScope II with a 'scope. We have put into Ch. 2 some suggestions to students on what to look for in a 'scope image, knowing as we do that seeing is not always the same as observing.

For instructors who'd like students to cycle around to a *frequency-domain* view of waveforms, using the FFT capabilities of modern digital 'scopes, we have included in the TeachScope II some waveforms that will reward such a view, and in the Manual a Ch. 3 discussion of how to use a modern 'scope to see the frequency content of waveforms. There is some counter-intuitive advice here, and even faculty users might be able to profit from it.

The Manual also includes Ch. 4, motivating and rewarding the use of a 'scope probe as an intermediary between the TeachScope II as a generator and a 'scope as a detector.

The Manual does *not* include, anywhere, an 'answer sheet' telling anyone the contents of the 16 waveforms that a TeachScope II can generate. We are willing to provide, on request by faculty users, a printed version of such an answer sheet; but we decline to provide that sheet in digital form, hoping to keep its results out of general circulation.