Audio precision®

APWIN for
System Two Cascade
and Cascade *Plus*

Frequency
Response

Analog

also supports
System One and System Two

Contents of this CD-ROM

This CD-ROM contains installation files for the Cascade *Plus* control software, APWIN; Adobe Acrobat PDF files for all manuals, Addendum information, and audio tracks containing test signals. Most items can be accessed via links from the installation opening screen (via **Autorun** or **Setup.exe** in the root of the CD-ROM). Here is the organization of the folders on the disc:

Folder	Contents
Adobe	Installation files for Adobe Acrobat Reader, which is necessary to view or print any of the manuals in Adobe Acrobat PDF format included on this disc. If you do not already have Adobe Acrobat Reader installed on your system, run **ar405eng.exe** in this folder to install version 4.
Apwin	Installation files for the APWIN control software. Run **Setup.exe** located in the Apwin folder to install this software.
Documentation	Adobe Acrobat PDF files of all user manuals, installation manuals, and related documents. Open the file **Documentation.pdf** for a list with links to the primary manuals. The manuals may be viewed and/or printed using Adobe Acrobat Reader.
Drivers	APIB interface drivers for various interface cards and operating systems.
	Audio Test Signals This CD-ROM also contains 59 test signals as "Red Book" CD audio tracks. See the last section of this booket for a description of the audio tracks and a listing of APWIN test files recommended for use with each track.

Installing the software

The installation CD-ROM starts with the opening screen shown at the right. If your CD-ROM is set to Autorun, this screen will be automatically displayed shortly after inserting the disc. If Autorun is not enabled, browse the CD-ROM and start the Setup.exe program located in the root.

From this point, you can browse the CD-ROM, install the control software, view and print any of the manuals, or view last-minute information. The installation program is self-explanatory and will guide you through the installation process. The program will automatically detect what operating system you are using (Windows 95/98, Windows 2000 or Windows NT) and install the appropriate drivers. It will give you a choice of what files to install and where to install them.

The default installation will install all files, using approximately 56 MB of hard disk space.

All User Manuals and a number of other documents are included on this CD-ROM as Adobe Acrobat PDF files. The PDF page allows convenient selection of any of the primary manuals. Simply click a document title on the PDF page to open that document in Acrobat Reader, where you can view or print the document.

Acrobat Reader is included on the CD-ROM; if it is not already on your computer, it will automatically be installed when you first try to open any PDF document. Navigation tools are included in Acrobat to help you quickly move about the document.

After a successful installation, you will find a new Start Menu Folder like the one shown at the right. Click the **APWIN** icon to start.

For a quick tour of the software, open one of the sample tests or sample procedures supplied. From the **File** menu, choose **Open > Test** or **Open > Procedure**, and navigate to the S1 folder (for System One), the S2 folder (for System Two) or the S2Cascade folder (for System Two Cascade and Cascade *Plus*). There are several sample files you can run as an introduction to the capabilities of your system.
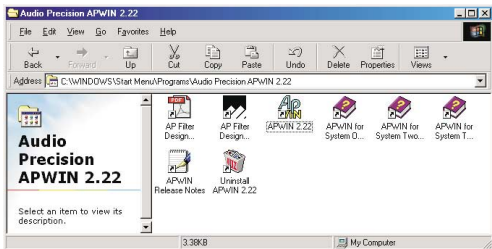
Installing the hardware

Current versions of APWIN will operate under Microsoft Windows 95/98, Windows 2000 and Windows NT 4.0 operating systems. APWIN requires an APIB computer interface card for use with Audio Precision instruments such as System Two Cascade or Cascade *Plus*. APIB interface cards are available in ISA-WIN or PCI-WIN models for desktop PC installation, or as a PCM-WIN (PCMCIA) card for notebook computers. Not all combinations of Audio Precision instruments, APIB cards, operating systems and APWIN versions are compatible. Go to http://audioprecision.com/techsupport/compatibility.htm for a compatibility chart.

PCI or ISA
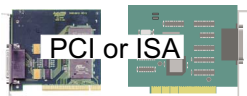
To install an ISA-WIN or PCI-WIN APIB card, turn the computer off, remove the cover and mount the interface card. Use caution handling the card to avoid static damage. The jumper settings on the ISA card should work for most installations. If not, see the *Getting Started with Cascade Plus* manual for details on how to set these. The PCI card has no jumpers, but it is important to install the control software *before* installing the PCI interface so that Windows 98/2000 can find the card.
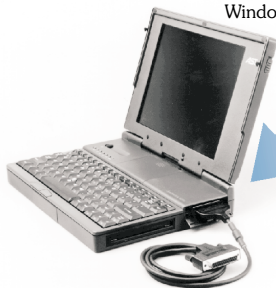
OR

If the computer to be used is a notebook with a PCMCIA slot, use the PCM-WIN interface. Install the control software before plugging in the PCM-WIN interface card. The installation process will install the correct driver for the PCM-WIN card. After completing the installation, plug in the PCM-WIN card and Windows 95/98 should find the card and establish the correct link. Windows NT will find the card on restart.
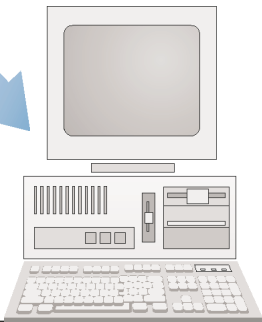
Audio Precision CD-ROM Audio Test Signals

Track 1 is data, not audio. Tracks 2 through 60 are "Red Book" CD audio, with all waveforms recorded at the standard 44.1 kHz sample rate.

All Tracks have triangular dither unless otherwise indicated.

Track	Description	Duration	Test File (note -see below)
1	Data Track: APWIN software, manuals and other Audio Precision publications in PDF format. This track can only be read on a CD-ROM drive and will be muted to OFF on a CD audio player.		

REFERENCE — in \A-a\ unless indicated

2	997 Hz 0 dBFS single tone	30 s	— 0 dBr reference — (1)

NOISE

3	Quiet track, no data, no dither, "infinity zero" AES17 "Idle channel noise"	30 s	A-A NOISE (2)
4	Quiet track, no data, triangular dither	30 s	A-A NOISE (2)
5	Quiet track, no data, shaped triangular dither	30 s	A-A NOISE (2)

FREQUENCY SWEEP 0 dBFS

6	120 Tones 20–20k Hz High resolution	1 s each	X-A FREQ RESP
7	31 Tones 20–20k Hz	1 s each	X-A FREQ RESP
8	120 Tones 20–20k Hz High resolution	0.5 s each	X-A FREQ RESP
9	31 Tones 20–20k Hz	0.5 s each	X-A FREQ RESP
10	11 Tones at ISO one octave spacing	1 s each	X-A FREQ RESP (3)
11	21 Tones at ISO one-half octave spacing	1 s each	X-A FREQ RESP (3)
12	31 Tones at ISO one-third octave spacing	1 s each	X-A FREQ RESP (3)
13	11 Tones at ISO one octave spacing	3 s each	X-A THD+N V.S. FREQ (3,4)
14	21 Tones at ISO one-half octave spacing	3 s each	X-A THD+N V.S. FREQ (3,4)
15	31 Tones at ISO one-third octave spacing	3 s each	X-A THD+N V.S. FREQ (3,4)

FREQUENCY SWEEP –20 dBFS

16	120 Tones 20–20k Hz High resolution	1 s each	X-A FREQ RESP
17	31 Tones 20–20k Hz	1 s each	X-A FREQ RESP
18	120 Tones 20–20k Hz	0.5 s each	X-A FREQ RESP
19	31 Tones 20–20k Hz	0.5 s each	X-A FREQ RESP
20	11 Tones at ISO one octave spacing	1 s each	X-A FREQ RESP (3)
21	21 Tones at ISO one-half octave spacing	1 s each	X-A FREQ RESP (3)
22	31 Tones at ISO one-half octave spacing	1 s each	X-A FREQ RESP (3)
23	11 Tones at ISO one octave spacing	3 s each	X-A THD+N V.S. FREQ (3,4)
24	21 Tones at ISO one-half octave spacing	3 s each	X-A THD+N V.S. FREQ (3,4)
25	31 Tones at ISO one-half octave spacing	3 s each	X-A THD+N V.S. FREQ (3,4)

Track	Description	Duration	Test File
	AMPLITUDE SWEEP		
26	0 dBFS to –110 dBFS at 400 Hz	5 s each	\D-A\X-A D-A LINEARITY (4)
27	Frequency Controlled Amplitude sweep. Left channel 0 to –110 dBFS @ 300 Hz, Right channel 1000 to 890 Hz in 10 Hz steps	5 s each 60 s total	X-A FreqCtrl L CH AMPL LINEARITY
28	Frequency Controlled Amplitude sweep. Right channel 0 to –110 dBFS @ 300 Hz, Left channel 1000 to 890 Hz in 10 Hz step	5 s each 60 s total	X-A FreqCtrl R CH AMPL LINEARITY
29	0 dBFS 400 Hz tone	30 s	X-A THD+N V.S. AMPL (4)
30	–3 dBFS 400 Hz tone	30 s	X-A THD+N V.S. AMPL (4)
31	–6 dBFS 400 Hz tone	30 s	X-A THD+N V.S. AMPL (4)
32	–10 dBFS 400 Hz tone	30 s	X-A THD+N V.S. AMPL (4)
33	–20 dBFS 400 Hz tone	30 s	X-A THD+N V.S. AMPL (4)
34	–30 dBFS 400 Hz tone	30 s	X-A THD+N V.S. AMPL (4)
35	–40 dBFS 400 Hz tone	30 s	X-A THD+N V.S. AMPL (4)
36	–50 dBFS 400 Hz tone	30 s	X-A THD+N V.S. AMPL (4)
37	–60 dBFS 400 Hz tone AES17 "Noise in the presence of signal"	30 s	\D-A\X-A DYN RANGE (2)
38	–70 dBFS 400 Hz tone	30 s	X-A THD+N V.S. AMPL (4)
39	–80 dBFS 400 Hz tone	30 s	X-A THD+N V.S. AMPL (4)
40	–90 dBFS 400 Hz tone	30 s	X-A THD+N V.S. AMPL (4)
41	–100 dBFS 400 Hz tone	30 s	X-A THD+N V.S. AMPL (4)
42	–110 dBFS 400 Hz tone	30 s	X-A THD+N V.S. AMPL (4)
	SPECIAL MEASUREMENT—all have no dither		
43	1 kHz squarewave 0 dBFS	15 s	A-A VIEW WAVEFORM
44	Polarity: 1kHz pos, 2 kHz neg 0 dBFS	15 s	A-A VIEW WAVEFORM
45	J-Test - data-induced jitter	15 s	\DioAnalyzer\DIO INTERF EYE-PATTERN
46	Walking One: 10 samples/step	15 s	\D-D\X-D BIT ERROR WALKING 1
47	Walking zero: 10 samples step	15 s	\D-D\X-D BIT ERROR WALKING 1 (5)
48	Monotonicity: 10 samples/step	15 s	\D-A\X-A MONOTONICITY
49	Distortion Cal: 1kHz, 0 dBFS & 2kHz @ -40dB	15 s	X-A THD+N V.S. FREQ (6)
50	Distortion Cal: 1kHz, 0 dBFS & 2kHz @ -60dB	15 s	X-A THD+N V.S. FREQ (6)
51	Distortion Cal: 1kHz, 0 dBFS & 2kHz @ -80dB	15 s	X-A THD+N V.S. FREQ (6)

Track	Description	Duration	Test File

ARBITRARY WAVEFORM SIGNALS \Apwin\Waveform\44k\

Track	Description	Duration	Test File
52	SMPTE IMD: 63Hz & 7kHz, 4:1 ratio 44kSMPTE7k&60.agm	30 s	A-A SMPTE V.S. AMPL (4)
53	Twin-Tone IMD: 19k & 20k Hz 44kCCIF19k&20k.agm	30 s	A-A CCIF V.S. AMPL (4)
54	Twin-Tone IMD: 14k & 15k Hz 44kCCIF14k&15k.agm	30 s	A-A CCIF V.S. AMPL (4)
55	31 tones: 16 to 20k Hz 44kMulTon31.agm	10 s	X-A MULTI SPECTRUM (2,7)
56	11 tones: 1 octave ISO spacing 44kMulTonIso1perOct.agm	10 s	X-A MULTI SPECTRUM (2,7)
57	21 tones: ½ octave ISO spacing 44kMulTonIso2perOct.agm	10 s	X-A MULTI SPECTRUM (2,7)
58	31 tones: 1/3 octave ISO spacing 44kMulTonIso3perOct.agm	10 s	X-A MULTI SPECTRUM (2,7)
59	31 monaural tones plus 6 Xtalk tones 44kMulTon30+6.ags	10 s	X-A MULTI SPECTRUM (2,7)
60	CODEC test: 26 tones in alternate critical bands, excluding 1k to 4k Hz 44kMulTon26no1k-4k.agm	10 s	X-A MULTI SPECTRUM (2,7)

NOTES

General:
All tests with a signal source not generated by the AP System are called External tests. There are three different qualification modes for starting an external sweep. The mode must be selected each time APWIN is started. Select **Procedure > Open > \Apwin\XStart-OnRules.apb** and **Procedure > Run** to select the mode desired. Generally, the second mode ("Beyond the Start setting") is the most reliable.

Track-Specific Notes:

1. Set Analyzer dBr reference while playing the 0 dBFS tone by pressing the **F4** key.

2. Valid noise tests depend on having the dBr value set to 0 while playing a 0 dBFS tone.

3. ISO tone sequences start at 16 Hz. Set the Sweep panel **Source 1 Start** field to 16 Hz to capture the first tone.

4. Analyzer meters will display distortion. On the Sweep panel select **Single Point** to read distortion at a single level.
Check the **Stereo** box to take Stereo (2 channel) data.

5. Select **Walking 0** in the Digital Analyzer Waveform field.

6. Check the Sweep panel **Single Point** check box. Set Sweep panel **Source 1 Start** field to 1kHz. See the test result in the Data Editor.

7. Enter the Waveform file name in the AGen panel Waveform field. Select **Spectrum**, **Response**, **Distortion**, **Noise**, etc. modes in the Digital Analyzer panel Measurement field. Appropriate sweep tables, if you choose to use them, are available in the same folder as the Waveform files.

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