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Contents of this CDROM

This CDROM contains installation files for APWIN version 1.52, Adobe Acrobat PDF files for all manuals, Addendum information, and several audio tracks containing test signals. Here is the organization of the disc.

Folder or Directory	Contents
APWIN	Installation files for APWIN version 1.52. Run SETUP.EXE to install this software
Adobe	Installation files for the Adobe Acrobat Reader that is necessary to view or print any on the manuals included on this disc in Adobe Acrobat PDF format. If you do not already have the Adobe Acrobat Reader installed on your system, run SETUP.EXE in this directory to install version 3.01.
Manuals	Adobe Acrobat PDF files of all user manuals. Using the supplied Adobe Acrobat Reader, any of the manuals may be viewed and/or printed. The Reader allows convenient navigation to specific chapters and pages. Also included in this folder are PDF files of various other forms and tables. See the more detailed list below for a complete list of all included files.

List of included Adobe Acrobat PDF files (Manuals and documents)

Folder	Manual, form, or document
APP-NOTE	Copies of all AppNotes, associated test and procedure files
APWBasic	APWIN BASIC User's Guide and Programming Reference (3 volumes)
AUDIOTST	Copies of selected AUDIO.TST issues
Brochures	Brochures for cable kits, switchers, product specifications and an assortment of product brochures
GetStrS1	Installation and Getting Started for System One
GetStrS2	Installation and Getting Started for System Two
Misc	New features in APWIN, table listing the 71 audio test signals on this CD, Register form for your copy of APWIN, detailed specifications for System Two hardware and a bug report form to submit observed samples to Technical Support
Portable	Portable One Access and Portable One Dual Domain
TECHNOTE	Copies of all TechNotes, associated test and procedure files
TutorS1	APWIN Simplified Tutorial, Multitone, and Procedures for System One
TutorS2	APWIN Simplified Tutorial, Multitone, and Procedures for System Two
UsrManS1	APWIN User's Manual for System One
UsrManS2	APWIN User's Manual for System Two

AP P/N 8211.0052

APWIN Version 1.52

(Maintenance release November 1998)

Note that version 1.52 uses all of the same documentation and manuals as version 1.50 with the addition of two Addendum manuals. These manuals are: **APWIN version 1.52 User Manual Addendum and APWIN Basic version 1.52 Programmer's Reference Manual Addendum**

These manuals are supplied in hard copy form with the CDROM containing the software and as Adobe Acrobat pdf files on the same CDROM.

Changes in version 1.52 from version 1.50: See the APWIN version 1.52 User's Manual Addendum for a more complete description of all of these items.

Not compatible with Windows 3.11

APWIN version 1.52 will operate on Windows 95, Windows 98, and Windows NT 4.0. It will not run under Windows 3.1 or 3.11 as did version 1.50.

Windows Common Control

Early versions of Windows 95 do not support certain Windows Common Control features that are required for APWIN version 1.52. If you are using an older version of Windows 95, it is possible that the installation of some other application may have already updated your computer to the newer Common Control Library (comctl32.dll). If your computer does not have the required version of this Windows support program, the installation of APWIN 1.52 will detect this and give you the choice of installing the newer version or aborting the installation.

Correct APWIN Basic Syntax

Recent changes in Visual Basic have tightened the requirements for correct syntax. This evolution of the Basic language has been tracked by APWIN Basic. This tighter syntax control could mean that APWIN Basic procedures written previously that ran with earlier versions of APWIN might not run with this version 1.52 without minor syntax revisions.

New Utilities Configuration dialog

A new UTIL Configuration dialog now has five tabs to access the several areas that may be customized to individual preferences.

- * The GENERAL tab is similar to the top portion of the previous dialog.
- * The HARDWARE tab selects the choice of hardware (System One vs System Two)
- * The CONFIGURE FILTERS tab allows the user to specify plug-in analog filters
- * The LOG tab includes the items formerly on the lower half of the previous dialog
- * The GRAPH tab is new and allows user preferences of several graph color attributes to be set and characteristics of the graph export feature to be set.

New user-settable behavior of numeric field data entry

User data entry in all editable numeric fields may be set to behave as in version 1.50 or to do an automatic Enter whenever the cursor leaves the field, such as from a mouse click elsewhere in APWIN. This behavior is found in spreadsheets and should make the user interface feel more consistent. Improvements in Graph Legend and Data Editor operation. A number of improvements have been made in the Data Editor and Graph Legend to make it much easier to identify which data group corresponds to which trace within a sweep when there are multiple traces resulting from nested sweeps, Append sweep and/or new Data from a File Append command.

Tabular Printout from Data Editor

The File Print menu command has been modified to permit a tabular printout of the contents of the Data Editor (including any comments typed into the Comments Editor below the Graph Legend) as an alternative to a graph printout.

New External Single-Point Sweep Function

Single-point sweeps may now be made with either a Setting parameter at Source 1 (such as Generator Frequency) or a Reading parameter (such as Analyzer Level or Analyzer Frequency). These features may be used to extract a single reading, or permit a procedure to continue, only when a measured parameter reaches a particular value. For example, a test tape or disc or distant-origination signal may include a stepped or swept frequency track following a track with a 1 kHz reference signal. The external single-point feature could also be used to capture the frequency value when the measured amplitude reaches -3.0 dB relative to a mid-band value, thus automatically finding the -3.0 dB point of a filter.

Copy to Clipboard Changes

Previous versions of APWIN could copy the graph (if the graph has the Windows focus) to the Windows clipboard only as a bitmap image. This bitmap, as an exact pixel-for-pixel copy of the graph on screen, has a black background. With version 1.52, it is now also possible to copy a white-background metafile to the clipboard and then paste it into another application. A metafile is a vector rendition of the graph. It will print at the resolution of the output device, unrelated to the graph size, shape, and resolution on screen at the time of capture.

Graph Trace Color Changes

Controls on the new Utilities Configuration Graph tab provide some improved functions on how colors are assigned to traces on the graph. Six colors (plus gray) are available for graph trace colors. There is a defined sequence of these six trace colors: cyan, green, yellow, red, magenta, and blue. This is the order in which the colors appear in the drop-down list in the Color column of the Graph Legend.

Page Setup Dialog Modified

The File Page Setup dialog has been modified to a new structure with three tabs: Display, Layout, and Trace. The functions of the various controls have not changed, only their location.

New User Interface for MAKEWAVE

System One and System Two DSP-equipped models can generate multitone signals at both their analog and digital outputs. A multitone signal consists of a number of sinewaves, all generated simultaneously. These signals and the appropriate DSP analyzer program (FASTTEST with System Two and System One, plus FASTTRIG and CODEC with System One) can test audio devices and systems with a number of benefits. Primary advantages include minimized testing duration, comprehensive testing (response, distortion, noise, phase, separation), and more realistic signals than the single sinewave normally used. A number of multitone signal files (.AGM and .AGS file types) are furnished with APWIN for use in multitone testing. These furnished waveform files are located in the C:\APWIN\WAVEFORM folder.

Changes Affecting System Two Only

Jitter Calibration Changed to PEAK

To conform with the latest revision of the AES3 recommendation on digital audio interface, the jitter measurement calibration of System Two has been changed to peak, rather than p-p.

BITTEST for System Two

Digital Data Analyzer (BITTEST) The Digital Data Analyzer program (BITTEST), long a capability of system One Dual Domain, has now been added to System Two. In conjunction with certain specific signals created by the digital generator, this program measures the returned digital audio signals for bit errors.

Signal Compatibility for BITTEST

Signal generation must be coordinated with BITTEST analysis. BITTEST can analyze five different digital-domain waveforms: Random, Constant, Walking-1, Walking-0, and Sine. When testing real-time devices and using System Two's digital generator, the same waveform must be selected on both the Digital Generator panel and the BITTEST analyzer. When analyzing a previously-recorded or distantly-generated signal, the Waveform field on the BITTEST analyzer panel must correspond to the waveform being analyzed.

New dBGA, B, W Units for DSP Audio ANLR

Three amplitude measurement units dBG A, dBG B, and W have been added to the Level and Function Reading Meter of DSP Audio Analyzer when set for analog input.

EQ SINE Available on SINE A/D Generator

The second Wfm field on the Analog Generator panel, when Sine (D/A) has been selected in the first Wfm field, now includes the selection EQ Sine. This selection produces a DSP-generated D/A converted sinewave from the Analog Generator output terminals.

INTERVU Can Measure Jitter on Squarewave

In addition to measuring jitter on an AES/EBU or SPDIF/EIAJ serial digital input signal, INTERVU can now also measure jitter on any 28 kHz to 13 MHz squarewave connected to the BNC digital input connector. This new feature permits measurement of jitter directly on the clock signal of A/D and D/A converters.

Audio Precision APWIN CD-ROM Audio Test Signals

All waveforms are at the standard CD Audio 44.1 kHz sample rate.

Track	Description	Level	Duration	Dither	FILE NAME
1	Data track: APWIN software, Manuals in PDF format, Newsletters, and TECHNOTES. Readable on a computer CDROM drive only				
Reference					
2	997 Hz single tone level reference	0 dBFS	30 seconds	Triangular	
Noise					
3	Quiet Track, "Infinity zero"	Zero	30 seconds	None	
4	Quiet Track	Zero	30 seconds	Triangular	
5	Quiet Track	Zero	30 seconds	Shaped	
Frequency Sweep					
6	20 – 20 kHz High Resolution 120 frequencies	0 dBFS	1 sec each tone	Triangular	
7	20 – 20 kHz High Resolution 31 frequencies	0 dBFS	1 sec each tone	Triangular	
8	20 – 20 kHz High Resolution 120 frequencies optimized for Fast RMS	0 dBFS	.5 sec each tone	Triangular	
9	20 – 20 kHz High Resolution 31 frequencies optimized for Fast RMS	0 dBFS	.5 sec each tone	Triangular	
10	20 – 20 kHz High Resolution 120 frequencies	0 dBFS	120 seconds, 1 sec each tone	Shaped	
11	20 – 20 kHz High Resolution 31 frequencies	0 dBFS	31 seconds, 1 sec each tone	Shaped	
12	20 – 20 kHz High Resolution 120 frequencies optimized for Fast RMS	0 dBFS	.5 seconds	Shaped	
13	20 – 20 kHz High Resolution 31 frequencies optimized for Fast RMS	0 dBFS	.5 seconds	Shaped	
14	Stepped sweep with 11 frequencies at ISO octave spacing	0 dBFS	1 sec each tone	Triangular	
15	Stepped sweep with 21 frequencies at ISO half-octave spacing	0 dBFS	1 sec each tone	Triangular	
16	Stepped sweep with 31 frequencies at ISO third-octave spacing	0 dBFS	1 sec each tone	Triangular	
17	Stepped sweep with 11 frequencies at ISO octave spacing	0 dBFS	3 sec each tone	Triangular	
18	Stepped sweep with 21 frequencies at ISO half-octave spacing	0 dBFS	3 sec each tone	Triangular	
19	Stepped sweep with 31 frequencies at ISO third-octave spacing	0 dBFS	3 sec each tone	Triangular	
20	20 – 20 kHz High Resolution 120 frequencies	-20 dBFS	1 sec each tone	Triangular	
21	20 – 20 kHz High Resolution 31 frequencies	-20 dBFS	1 sec each tone	Triangular	
22	20 – 20 kHz High Resolution 120 frequencies optimized for Fast RMS	-20 dBFS	.5 sec each tone	Triangular	
23	20 – 20 kHz High Resolution 31 frequencies optimized for Fast RMS	-20 dBFS	.5 sec each tone	Triangular	
24	20 – 20 kHz High Resolution 120 frequencies	-20 dBFS	1 sec each tone	Shaped	
25	20 – 20 kHz High Resolution 31 frequencies	-20 dBFS	1 sec each tone	Shaped	
26	20 – 20 kHz High Resolution 120 frequencies optimized for Fast RMS	-20 dBFS	.5 sec each tone	Shaped	
27	20 – 20 kHz High Resolution 31 frequencies optimized for Fast RMS	-20 dBFS	.5 sec each tone	Shaped	
28	Stepped sweep with 11 frequencies at ISO octave spacing	-20 dBFS	1 sec each tone	Triangular	
29	Stepped sweep with 21 frequencies at ISO half-octave spacing	-20 dBFS	1 sec each tone	Triangular	
30	Stepped sweep with 31 frequencies at ISO third-octave spacing	-20 dBFS	1 sec each tone	Triangular	
31	Stepped sweep with 11 frequencies at ISO octave spacing	-20 dBFS	3 sec each tone	Triangular	
32	Stepped sweep with 21 frequencies at ISO half-octave spacing	-20 dBFS	3 sec each tone	Triangular	
33	Stepped sweep with 31 frequencies at ISO third-octave spacing	-20 dBFS	3 sec each tone	Triangular	

Track	Description	Level	Duration	Dither	FILE NAME
Amplitude Sweep					
34	400 Hz 0 dBFS to -110 dBFS	NA	5 sec each tone	Triangular	
35	Left: Amplitude Linearity 400 Hz 0 dBFS to -110 dBFS Right: Frequency sweep 1000 to 890, 10 Hz steps synced with amplitude changes	NA	5 sec each tone	Triangular	
36	Right: Amplitude Linearity 400 Hz 0 dBFS to -110 dBFS Left: Frequency sweep 1000 to 890, 10 Hz steps synced with amplitude changes	NA	5 sec each tone	Triangular	
37	400 Hz single tone level reference	0 dBFS	30 seconds	Triangular	
38	400 Hz single tone level reference	-3 dBFS	30 seconds	Triangular	
39	400 Hz single tone level reference	-6 dBFS	30 seconds	Triangular	
40	400 Hz single tone level reference	-10 dBFS	30 seconds	Triangular	
41	400 Hz single tone level reference	-20 dBFS	30 seconds	Triangular	
42	400 Hz single tone level reference	-30 dBFS	30 seconds	Triangular	
43	400 Hz single tone level reference	-40 dBFS	30 seconds	Triangular	
44	400 Hz single tone level reference	-50 dBFS	30 seconds	Triangular	
45	400 Hz single tone level reference	-60 dBFS	30 seconds	Triangular	
46	400 Hz single tone level reference	-70 dBFS	30 seconds	Triangular	
47	400 Hz single tone level reference	-80 dBFS	30 seconds	Triangular	
48	400 Hz single tone level reference	-90 dBFS	30 seconds	Triangular	
49	400 Hz single tone level reference	-100 dBFS	30 seconds	Triangular	
50	400 Hz single tone level reference	-110 dBFS	30 seconds	Triangular	
Acoustic					
51	MLS Sequence Pink #1	0 dBFS	15 seconds	None	
52	MLS Sequence Pink #2	0 dBFS	15 seconds	None	
53	MLS Sequence Pink #3	0 dBFS	15 seconds	None	
54	MLS Sequence Pink #4	0 dBFS	15 seconds	None	
Miscellaneous					
55	1 kHz Squarewave	0 dBFS	15 seconds	None	
56	Polarity	0 dBFS	15 seconds	None	
57	J-Test	NA	15 seconds	None	
58	Walking Ones 10 Samples / Step	NA	15 seconds	None	
59	Walking Zeros 10 Samples / Step	NA	15 seconds	None	
60	Monotonicity 10 Samples / Step	NA	15 seconds	None	
Calibration					
61	THD -40dB 1kHz and 2kHz at -40 dB	0 dBFS	15 seconds	None	
62	THD -60dB 1kHz and 2kHz at -60 dB	0 dBFS	15 seconds	None	
63	THD -80dB 1kHz and 2kHz at -80 dB	0 dBFS	15 seconds	None	

Track	Description	Level	Duration	Dither	FILE NAME
Twin Tone (Intermodulation Distortion Test Signals)					
64	63 Hz & 7 kHz 4:1 Amplitude Ratio (SMPTE IMD Test Signal)	-1 dBFS	30 seconds	Triangular	SMPTE-44.AGM
65	19 kHz & 20 kHz Twin Tone (CCIF IMD Test Signal)	-1 dBFS	30 seconds	Triangular	1920TT44.AGM
66	14 kHz & 15 kHz Twin Tone (CCIF IMD Test Signal)	-1 dBFS	30 seconds	Triangular	1415TT44.AGM
Multitone					
67	Multitone with 31 frequencies at ISO 1/3 octave spacing + 20kHz	-1 dBFS	10 seconds	Triangular	ISO3144.AGM
68	Multitone with 11 frequencies at ISO 1 octave spacing + 20kHz	-1 dBFS	10 seconds	Triangular	ISO-1-44.AGM
69	Multitone with 21 frequencies at ISO half-octave spacing + 20kHz	-1 dBFS	10 seconds	Triangular	ISO-2-44.AGM
70	Multitone with 31 frequencies at ISO third-octave spacing + 20kHz	-1 dBFS	10 seconds	Triangular	ISO-3-44.AGM
71	Multitone with 31 frequencies at ISO 1/3 octave spacing, 3 frequencies near 200 Hz, 2 kHz, 20 kHz have been shifted up one bin to the next possible frequency in right channel for crosstalk measurements	-1 dBFS	10 seconds	Triangular	ISOXTALK.AGS
Codec					
72	Sinewaves in every other critical band from 40 Hz to 20 kHz excluding 1 kHz to 4 kHz	-1 dBFS	10 seconds	Triangular	ALTCRT44.AGM

Installing the software

The CDROM starts with an opening screen illustrated at the right. If your CDROM is set to AUTORUN, this screen will be automatically displayed within a minute or two after inserting the disc. If AUTORUN is not enabled, browse the CDROM and start the SETUP.EXE program you will find in the root folder.



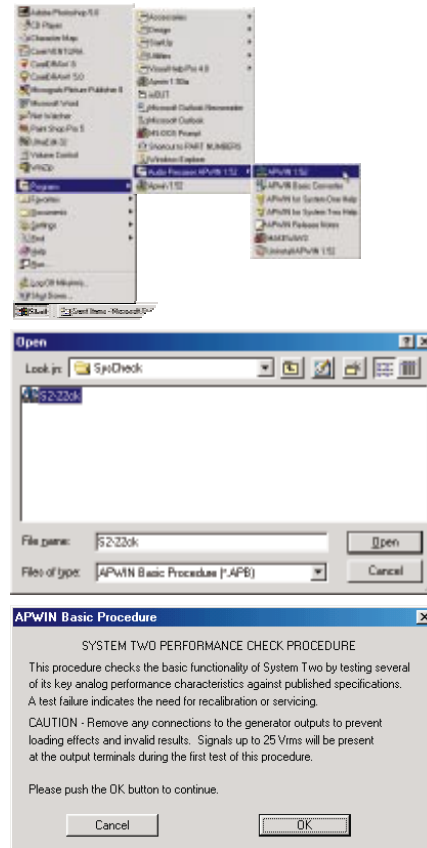
From this point, you can browse the CDROM, install APWIN, view or print any of the manuals, or view last minute information. The installation program for APWIN is self explanatory and will guide you through the installation process. The APWIN installation program will automatically detect what operating system you are using (Windows 95 or Windows NT) and install the appropriate driver. It will give you a choice of what files to install and where to install them. The default installation will install all files and take approximately 37 MB of hard disk space.



After a successful installation, you will find a new Start Menu Folder such as shown at the right. Select the APWIN 1.52 icon to start APWIN.

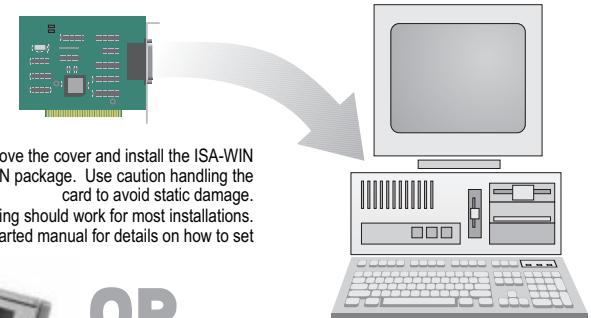
For a quick tour of the software, open one of the sample tests or procedures supplied. Select File Open, Test or Procedure, and navigate to the S1 or S2 sub-directory (for System One and System Two). There are several sample tests you can browse for an introduction to some of the capabilities of System One and SystemTwo inside APWIN.

An interesting procedure to start with is the System Performance procedure S1-22CK.APB (S2-22CK.APB) which runs a complete performance evaluation of the analog hardware of the System including comparison to specification limits and failure reporting. It will also illustrate automatic test loading and show several sweeps on graphs. To find this procedure, look in S1 (or S2) under APWIN. Then navigate to PROCEDUR and then SYSCHECK subdirectory and find a file called S1-22CK.APB (or S2-22CK.APB). Load this self check procedure and select RUN under the Procedure menu. This will test the hardware and illustrate an automatic sequence of tests, graphing, and comparison to limits.

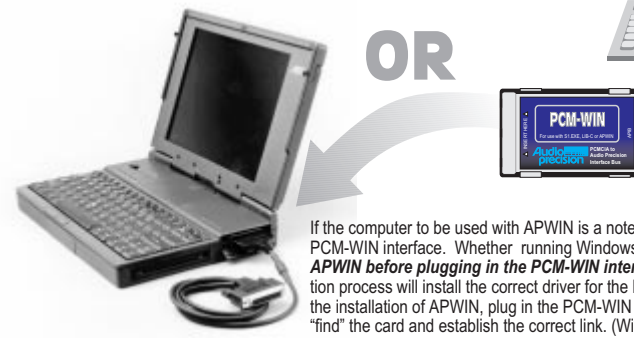


Installing the hardware

APWIN requires an interface card to communicate with System One or System Two. Every purchased copy of APWIN includes either an ISA-WIN interface card for desktop PC installation or a PCM-WIN PCMCIA interface card for notebook computers. (Note that APWIN will not run with earlier Audio Precision APiB interface cards such as PCI-1, PCI-2 or PCI-3.)



With the computer turned off, remove the cover and install the ISA-WIN interface card that came with this APWIN package. Use caution handling the card to avoid static damage. The factory default address jumper setting should work for most installations. If not, see the Installation and Getting Started manual for details on how to set



If the computer to be used with APWIN is a notebook with a PCMCIA slot, use the PCM-WIN interface. Whether running Windows 95 or Windows NT, **install APWIN before plugging in the PCM-WIN interface card**. The APWIN installation process will install the correct driver for the PCM-WIN card. After completing the installation of APWIN, plug in the PCM-WIN card and Windows 95 should "find" the card and establish the correct link. (Windows NT requires a power cycle to "find" the card)

Not compatible with Windows 3.11

APWIN version 1.52 will operate on Windows 95, Windows 98, and Windows NT 4.0. It will not run under Windows 3.1 or 3.11 as did version 1.50.