PART 1

20 Years of MIDI

David Williams & Peter Webster
Illinois State and Northwestern University
dave.williams@ilstu.edu and pwebster@northwestern.edu

CMS/ATMI 2003
Miami Florida

DBW

Overview

Session 1

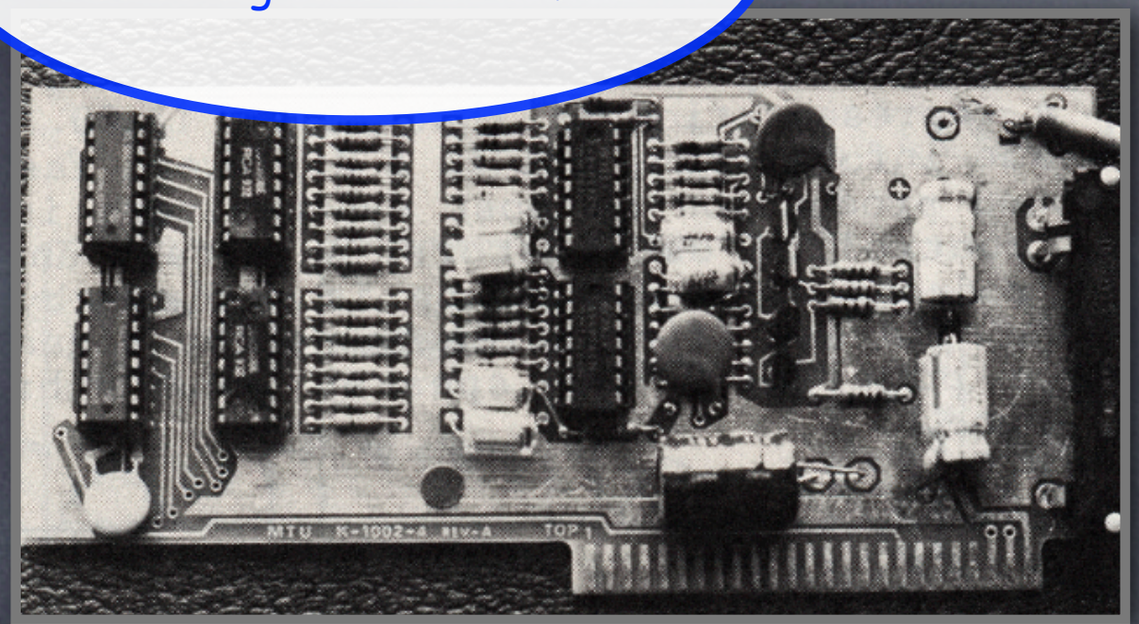
- HAPPY BIRTHDAY MIDI
- Historical timeline for audio and MIDI
- 3 things MIDI does well
- Most memorable MIDI event?

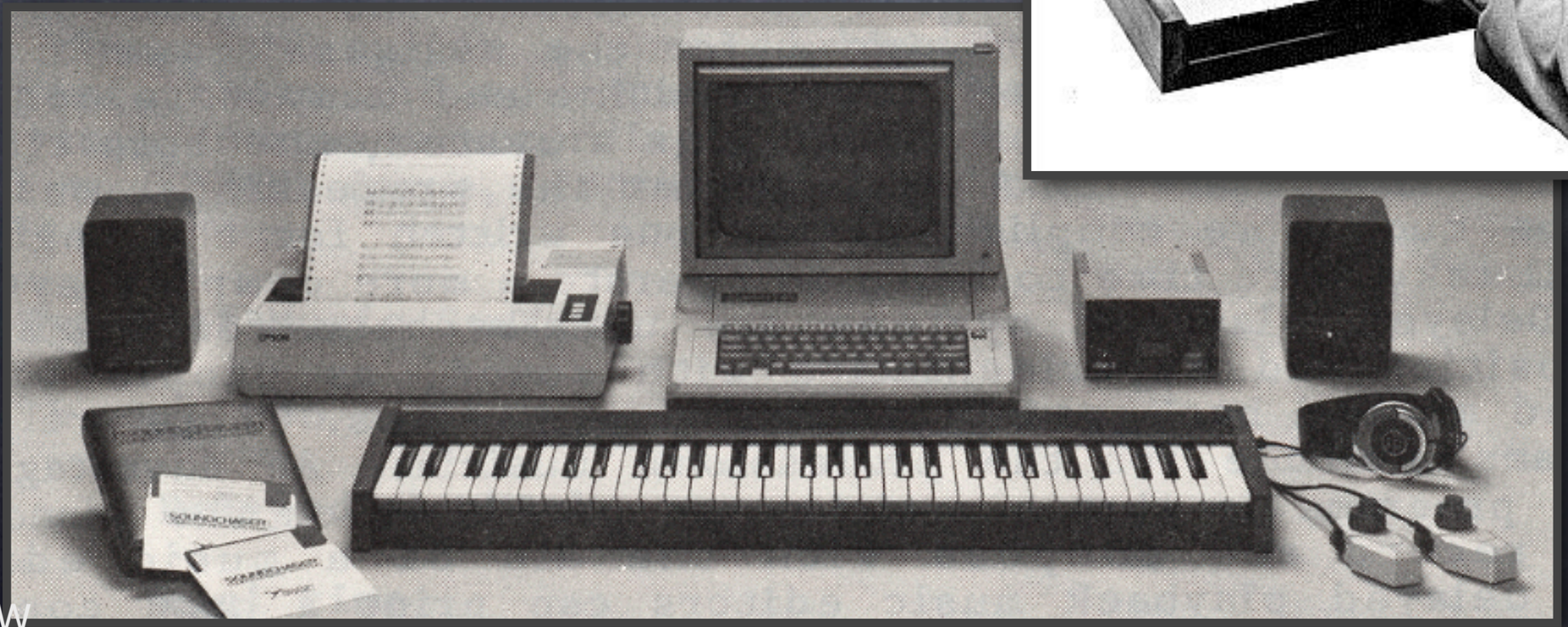
Session 2

- Software components of music synthesis
- Mainstream MIDI applications
- Transition in music studio hardware
- Remaining shortcomings of MIDI
- What is the next stage for MIDI?

Before MIDI

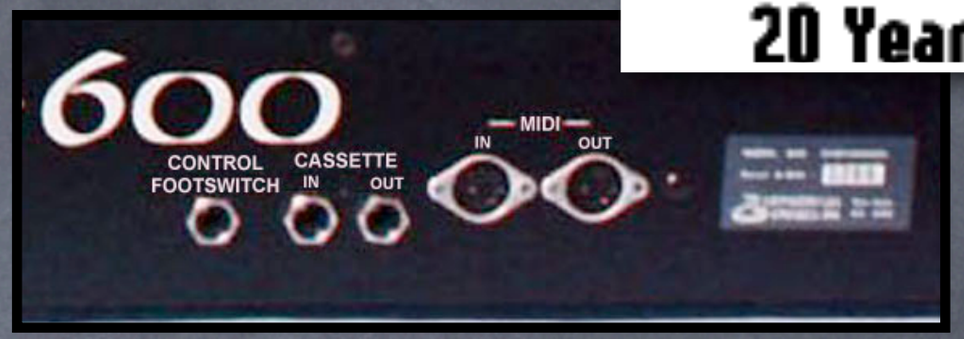
MMI DAC board 8-bit/22kHz
4-voice digital audio in 1978





DBW

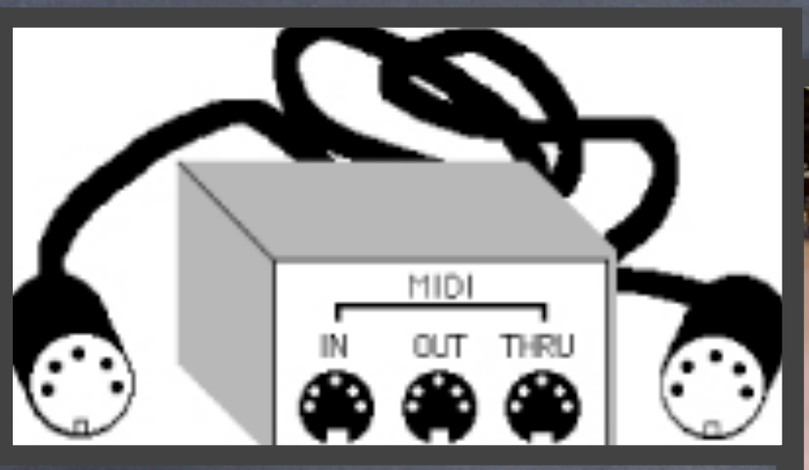
MIDI's Birth (1983)

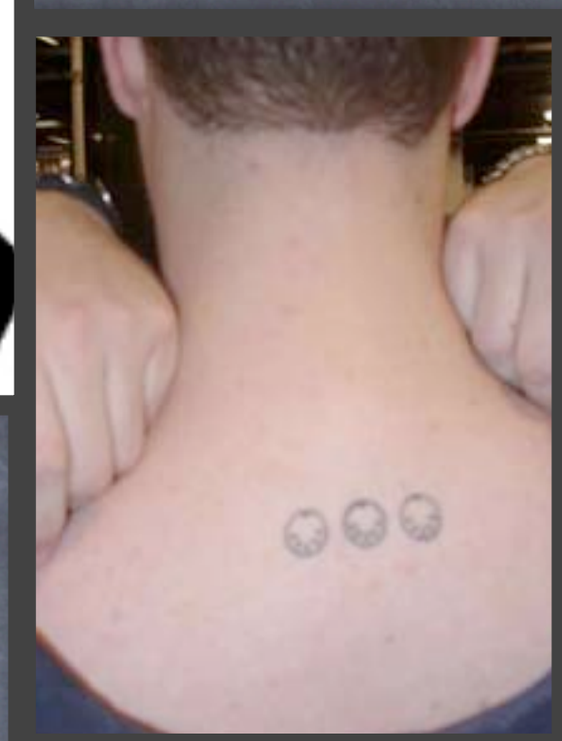


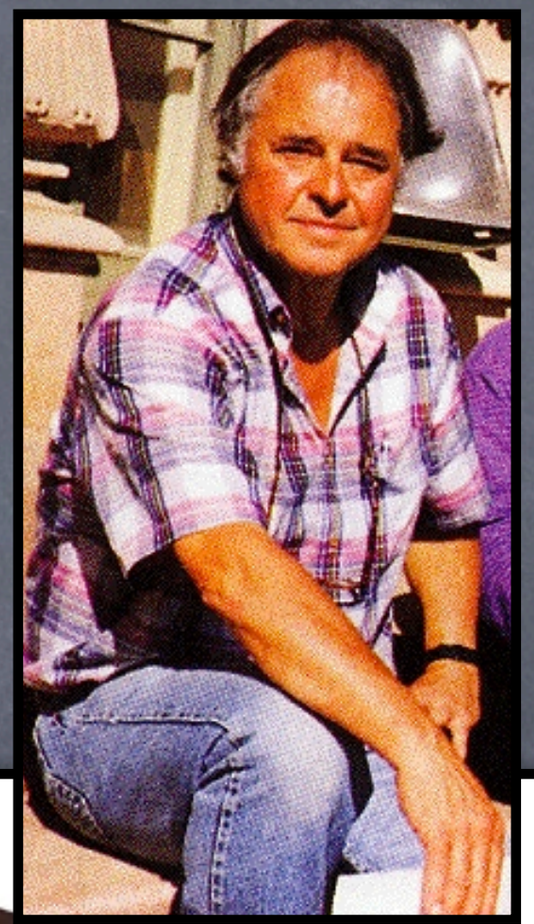
MIDI 20 Years

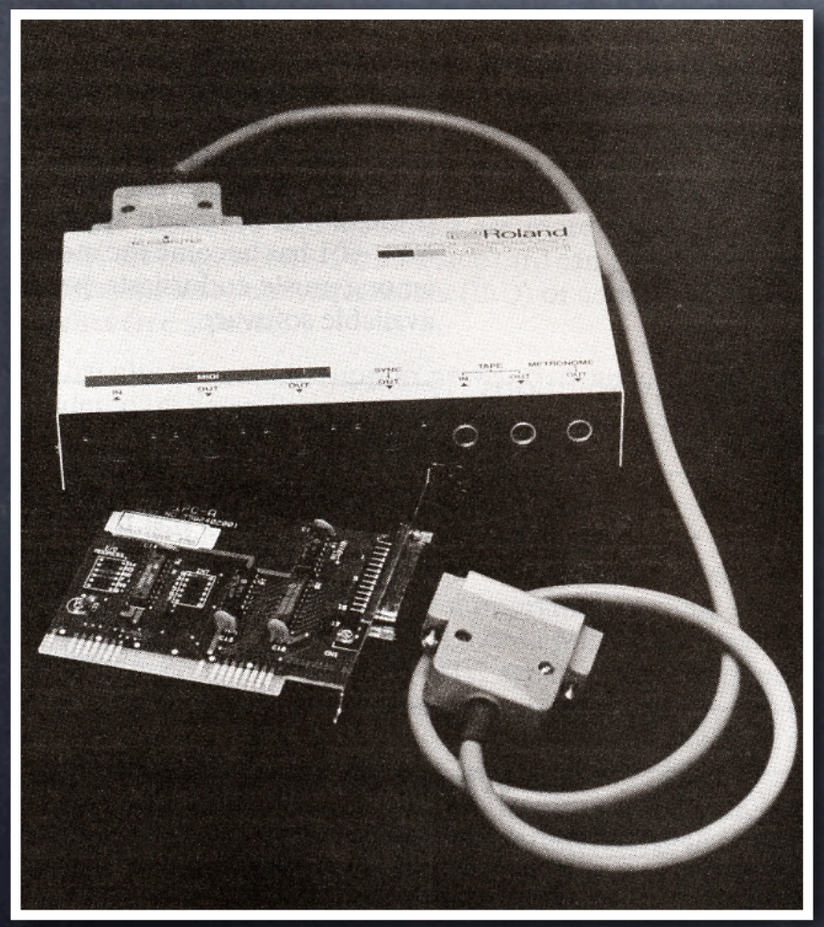
CD Audio introduced in 1982

DBW



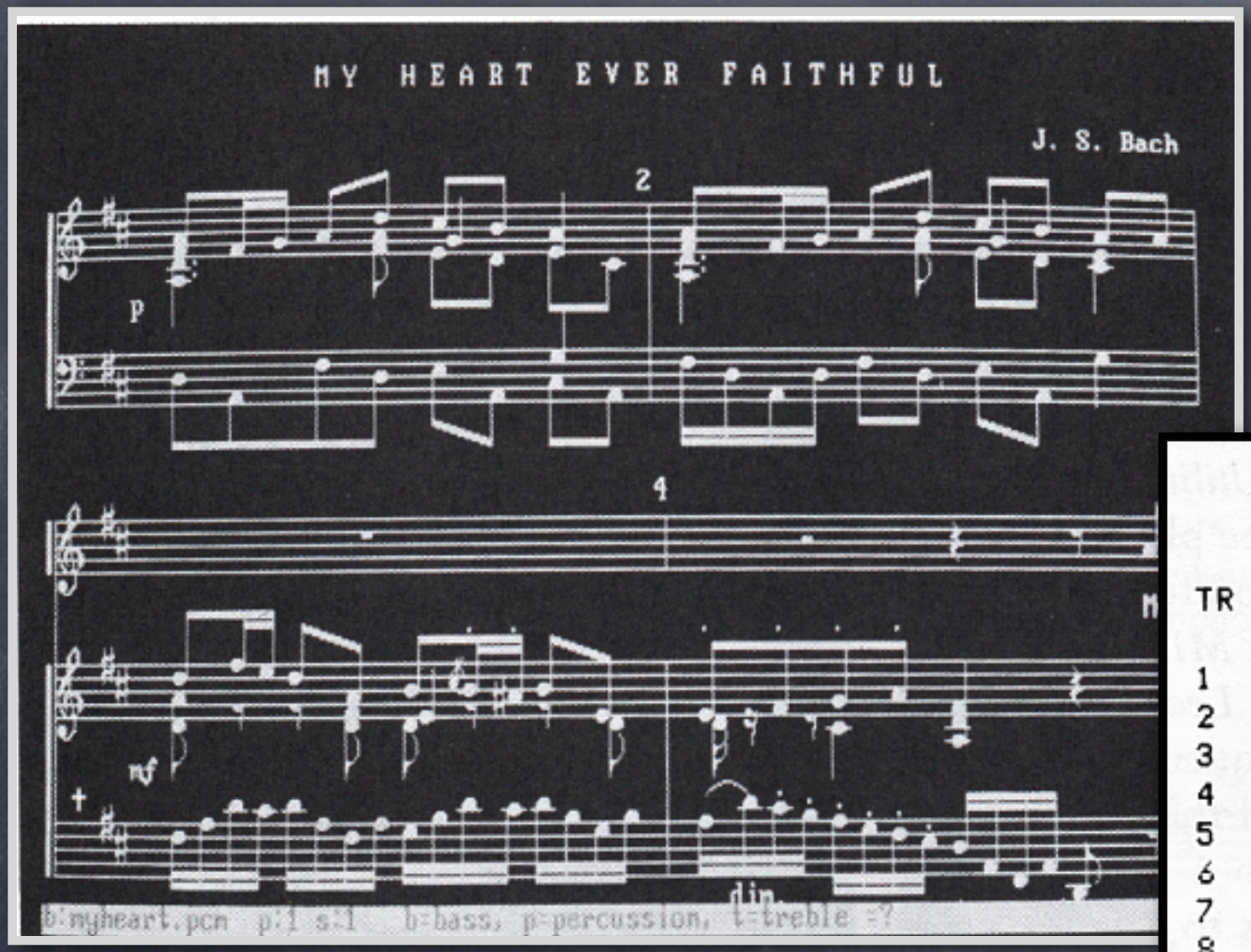






DBW

1984 Early Software



Personal Composer (PC)

CD-ROMs available in 1984

MasterTracks (Apple II)

```
(1) (2) (3) (4) (5) (6) (7) (8) (9) (0)
4   6   12  18  24  36  48  72  96  1
CT# CTV PRE AFT PWL *** ACC ART TMP FLA
0   0   0   0   +0      10  TIE 123
MEM=35162   VEL=127 010 1.00  D   V   A
```

```
MIDI/8 PLUS
COPYRIGHT 1985 PASSPORT DESIGNS

TR   FUNC   CH   PRE     INSTRUMENT

1    PLA    01   002     FLUTES
2    PLA    01   002     DOUBLE REEDS
3    >REC   01   004     CLARINET
4    PLA    01   002
5    PLA    01   002     S    BARBER
6    PLA    01   002     T      OF
7    PLA    01   002     R    SEVILLE
8    OFF    01   002     INGS>

TEMPO=120  TRNS=+00  BEATS=4  THRU=01

FORMAT SECTION

LAST <-          -> NEXT
ESC
NEXT TRACK

PRESS SPACE TO EXIT
```

```
--- 24  30  75
--- 12  45  75
--- 12  60  75
--- 12  75  75
--- 12  90  75
--- 12  105 75
--- 12  120 75
--- 24  127 75
--- 24  127 25
--- 24  127 25
--- 24  127 25
--- 48  127 ]]
--- 48  127 ]]
--- 48  127 ]]
--- 48  127 ]]
--- 48
```

PRW

1985 More Software

Performer

Vision

PRW

1987 SMF & MTC

Atari MOD trackers distribute music over BBSs

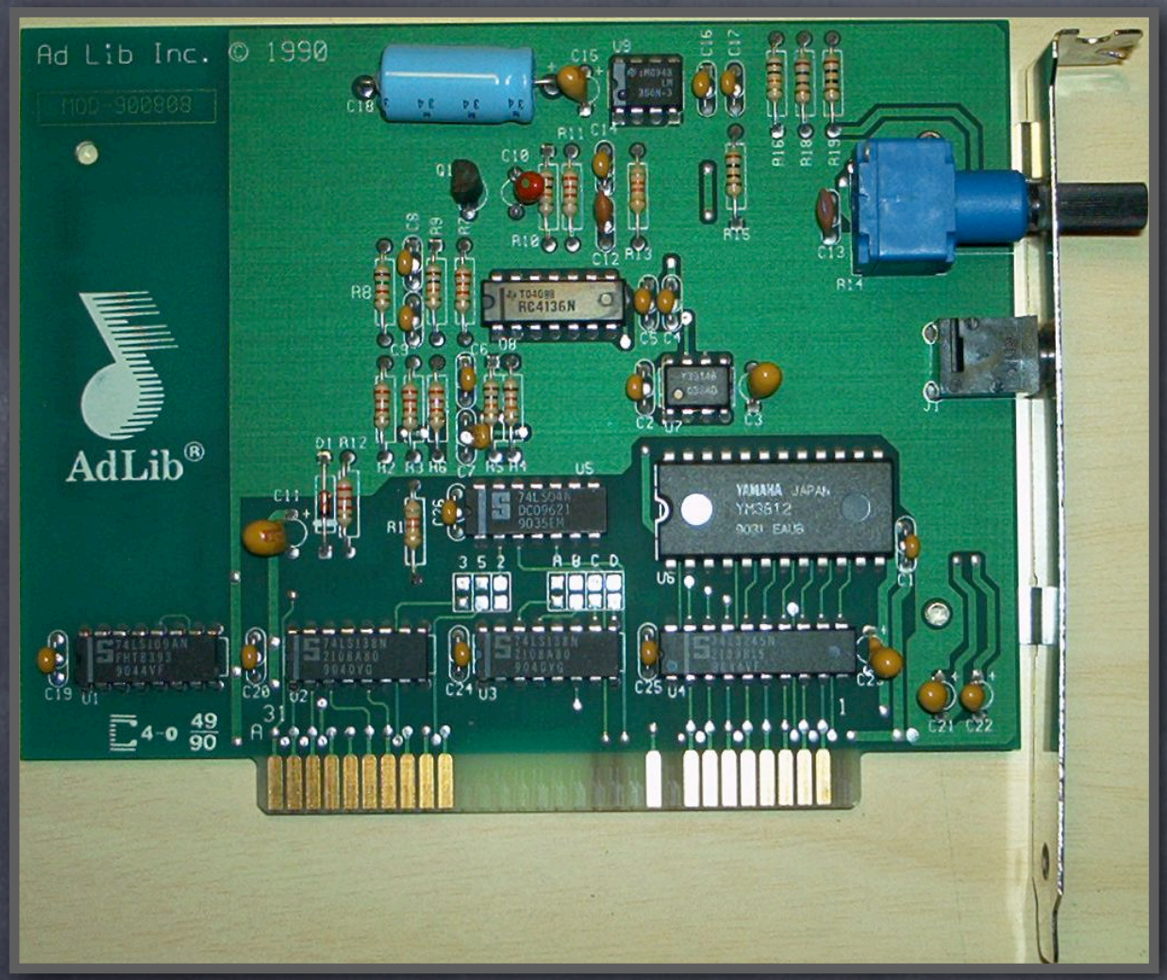
Chris Meyer

Dave Oppenheim

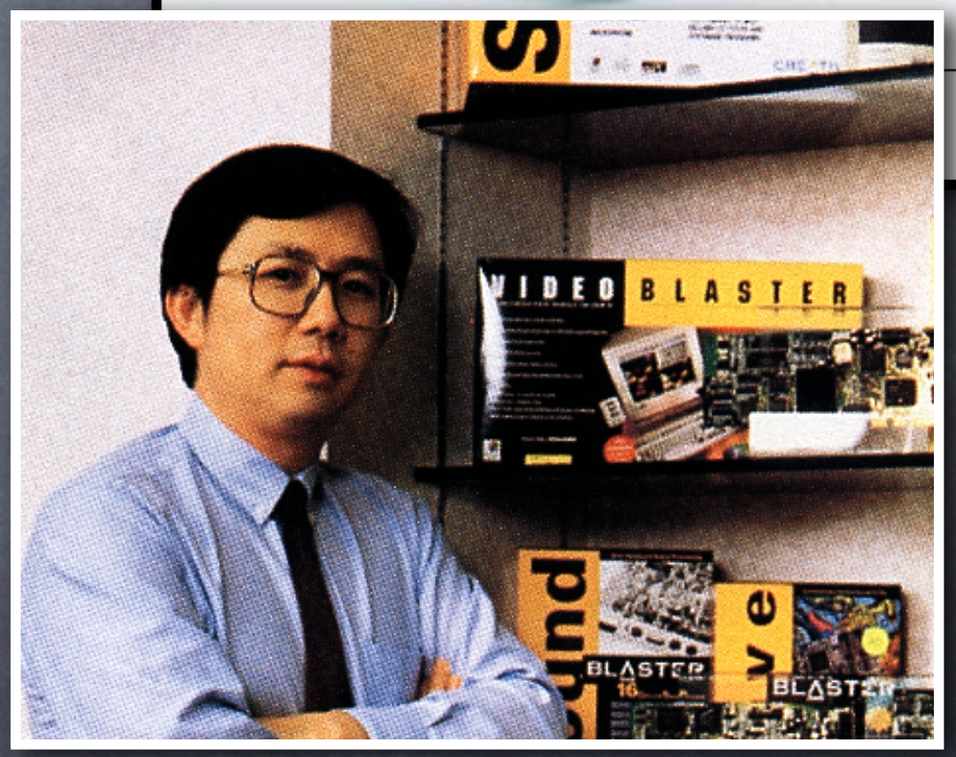
- Standard MIDI Files (SMF)
- MIDI Time Code (MTC)
- MIDI Sample Dump

PRW

1987 MIDI Sound for Gamers



AdLib card from
Martin Prevel

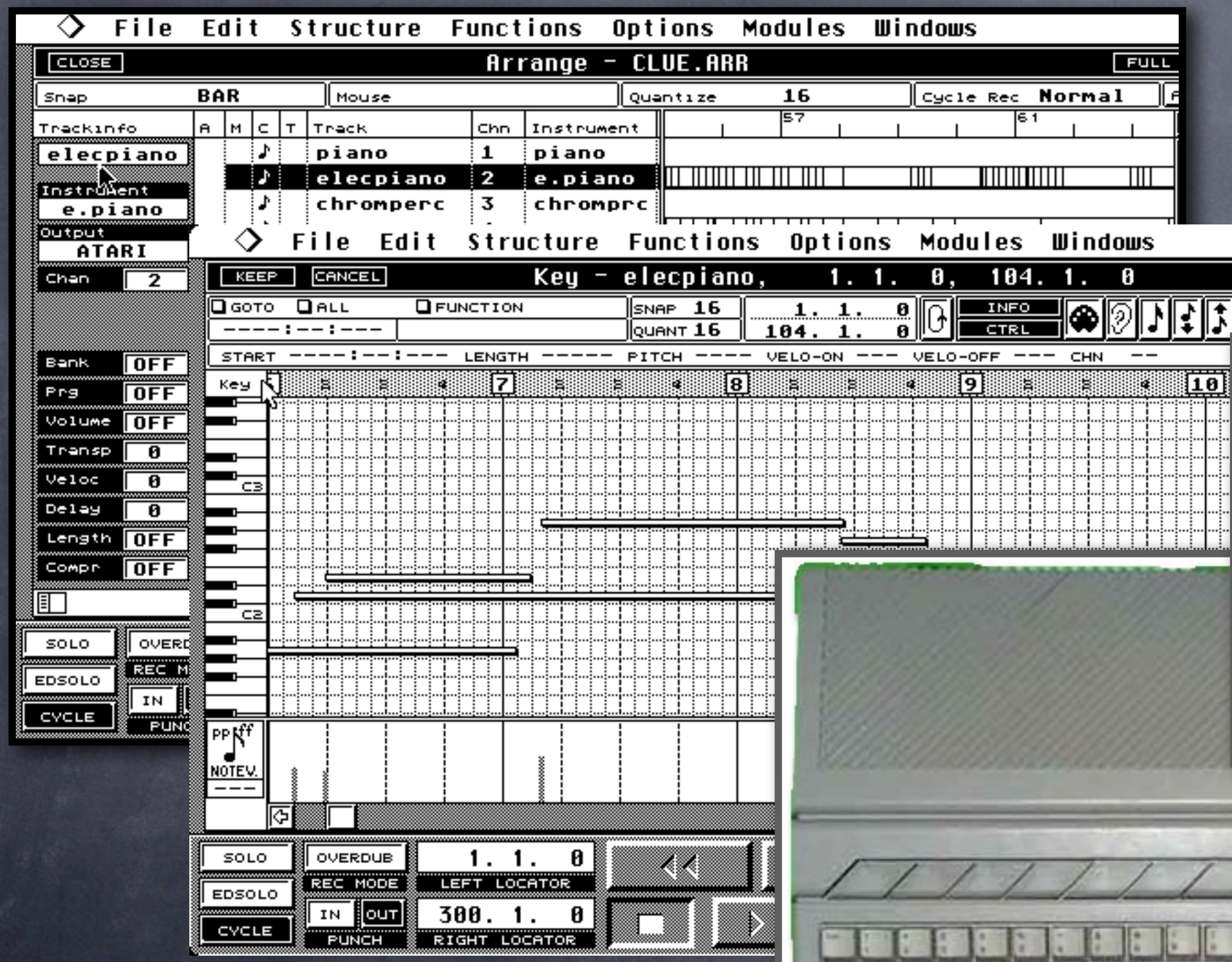


Sim Wong Hoo produces
SoundBlaster from Creative Labs

PRW

1988 MIDI Built-in

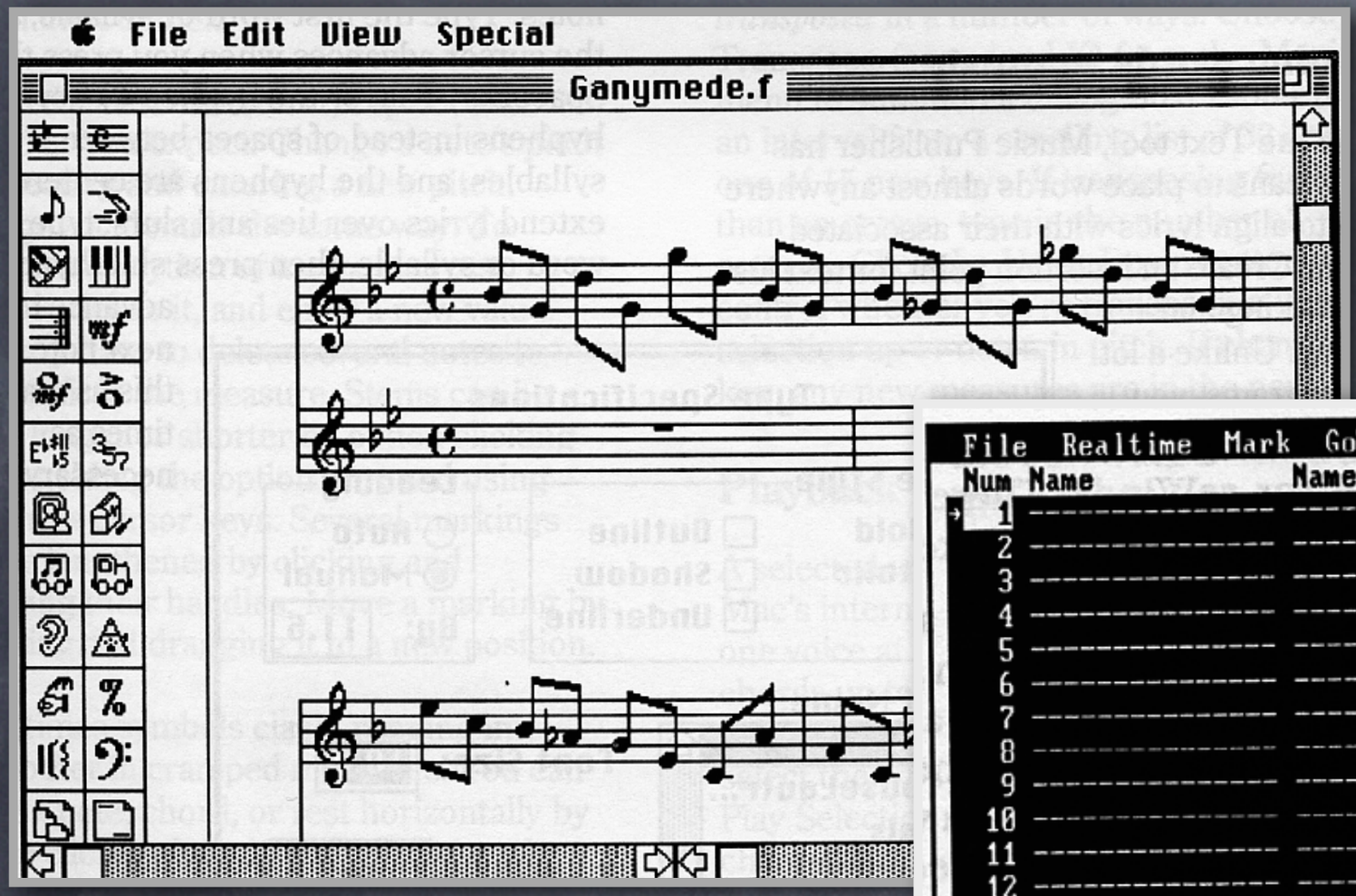
Band-in-a-Box



Atari (successor to Commodore) first computer w/MIDI

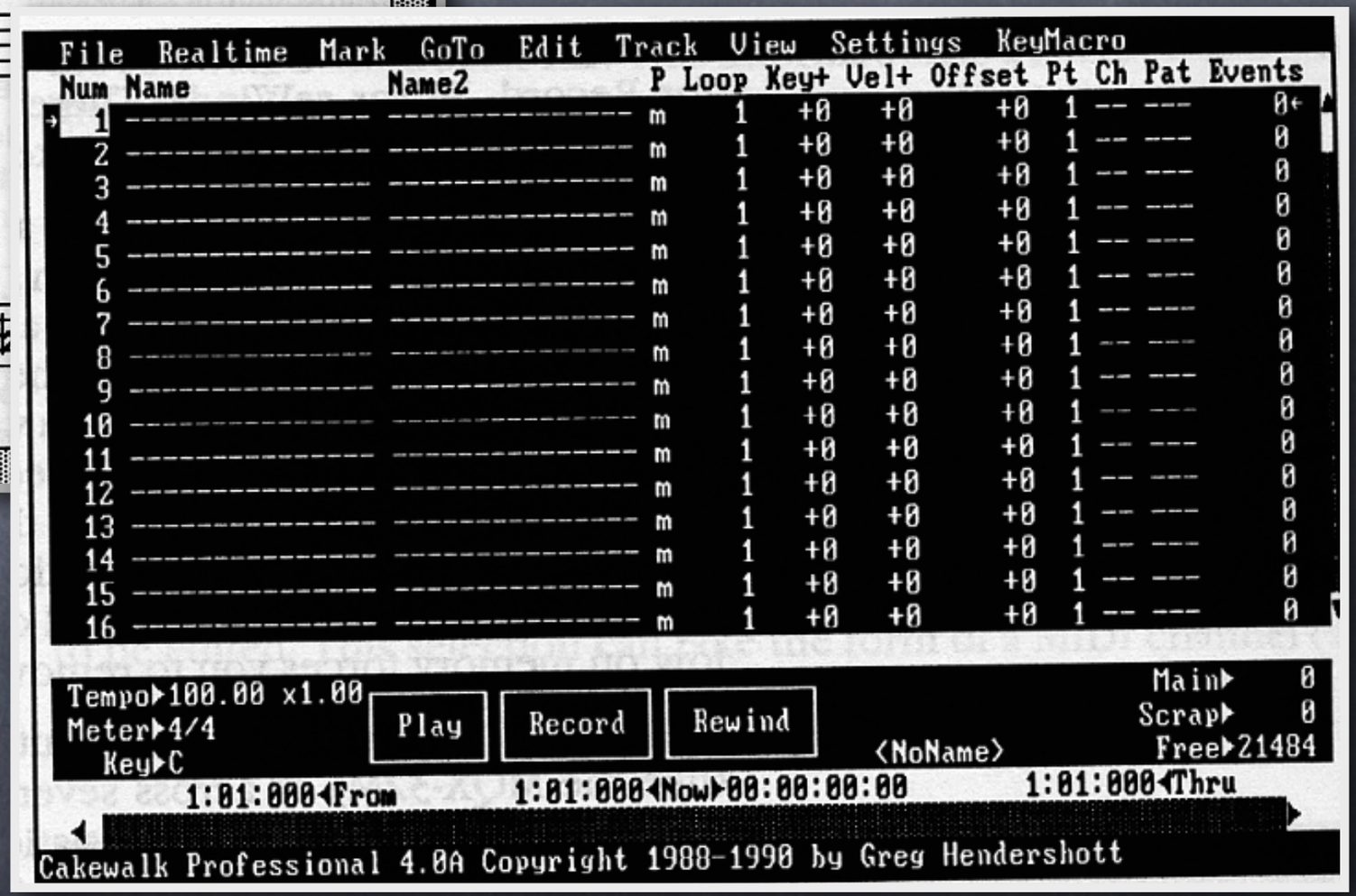
PRW

1988 Finale and Cakewalk



Finale Mac (Windows to come in 1990)

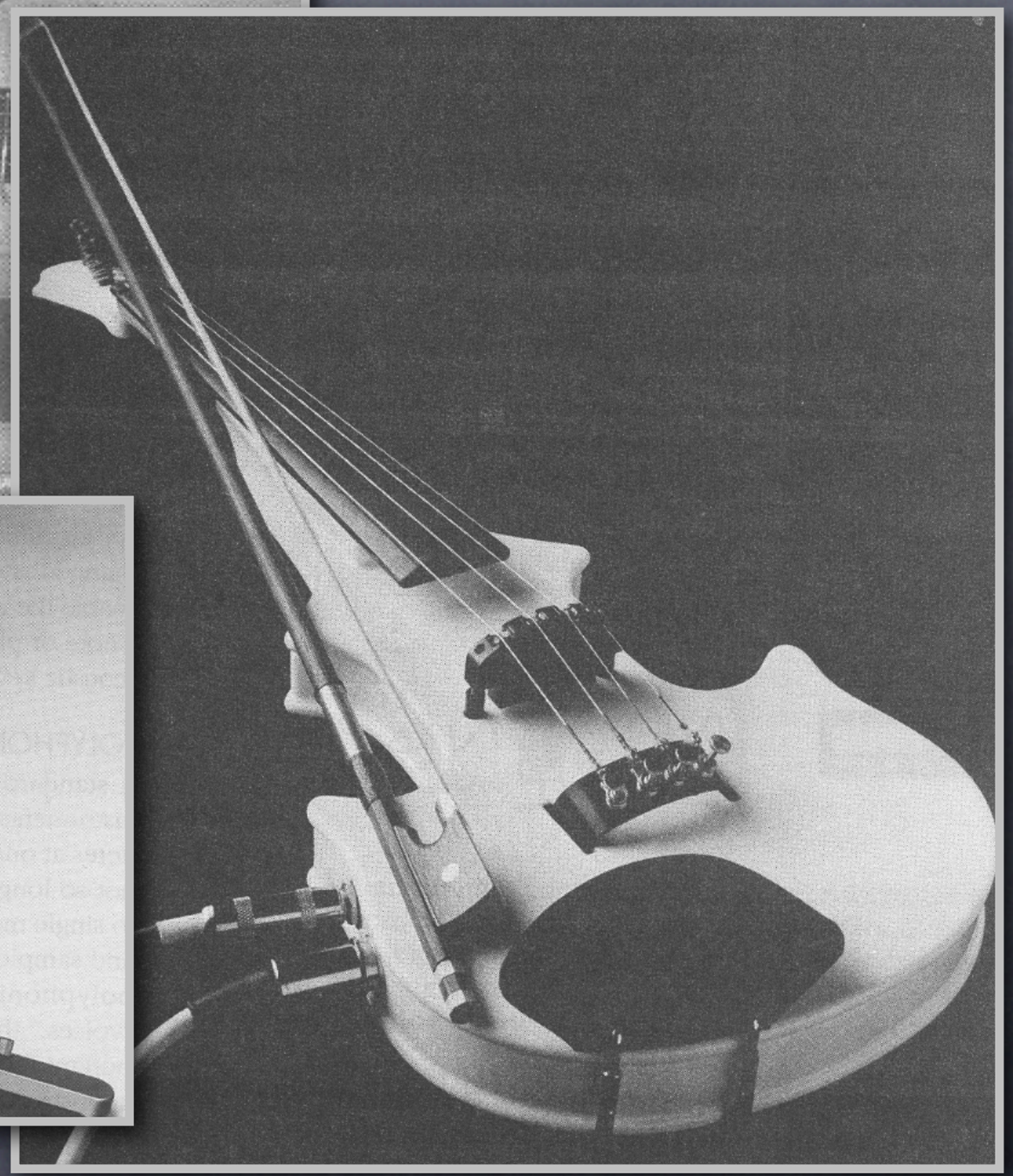
DigiDesign DSP card for the Mac and R. Winter's Beethoven CD-ROM



Cakewalk for the PC

PRW

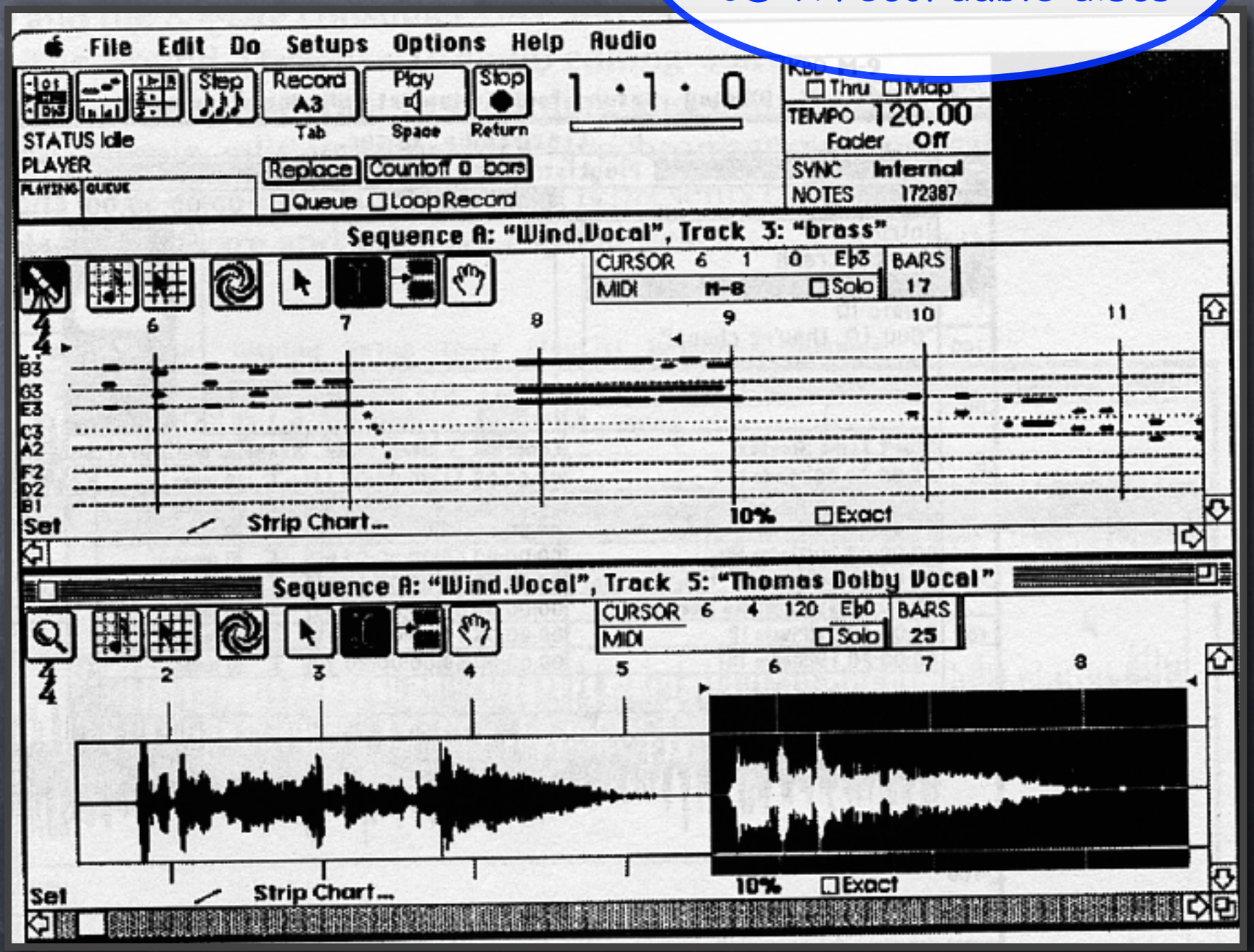
More controllers emerge...



1990- Audio joins MIDI

- General MIDI spec released
- QuickTime 1.0
- Cubase for Atari, PC, and Mac
- Studio Vision early integration of MIDI and audio sequencing

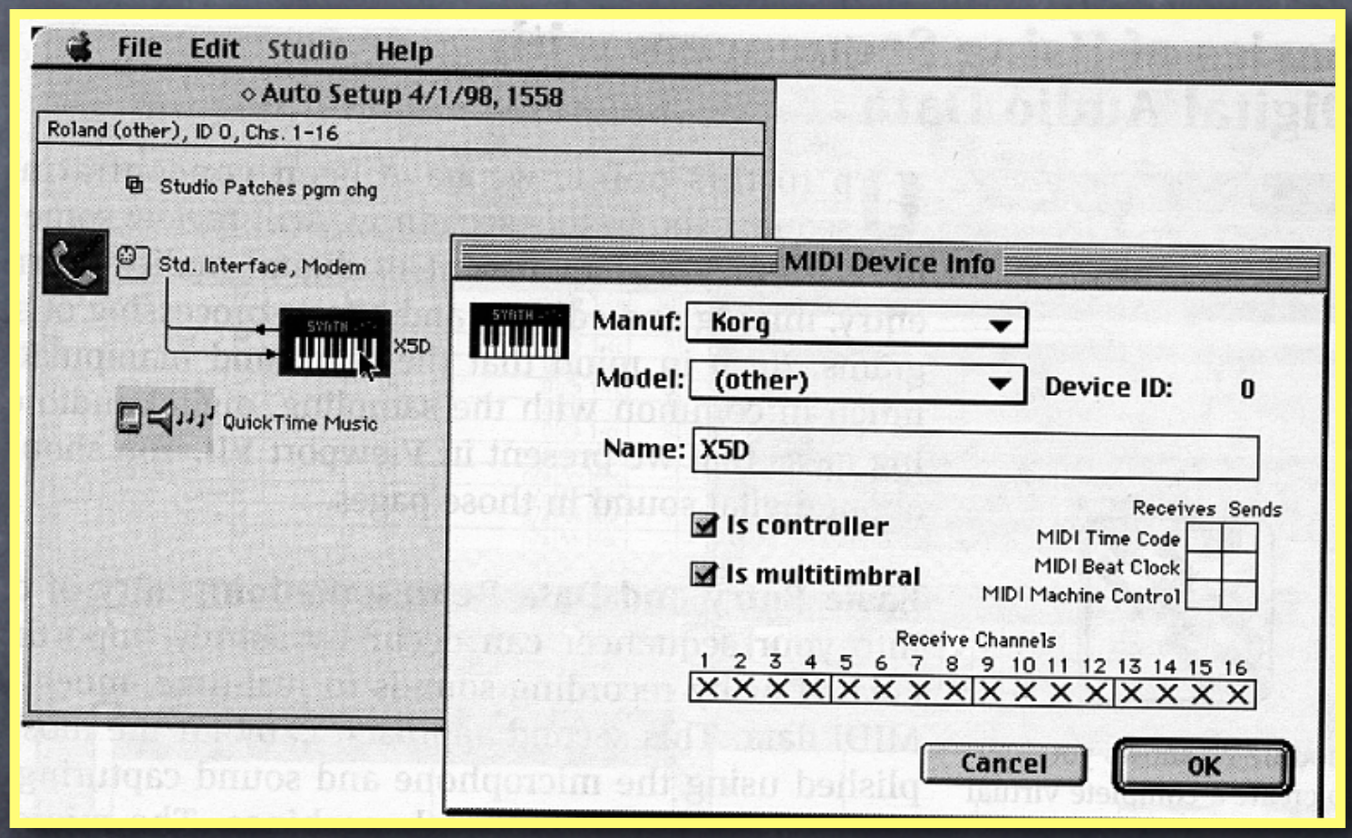
QuickTime 1.0 and CD-R recordable discs



1992 OpCode MIDI System

Doug Wyatt starts work on Opcode MIDI System, which becomes Open MIDI System (1993), which becomes CoreMIDI (2002)

MP3 audio (MPEG-1/Level 3)



DBW

1993- More virtual sounds

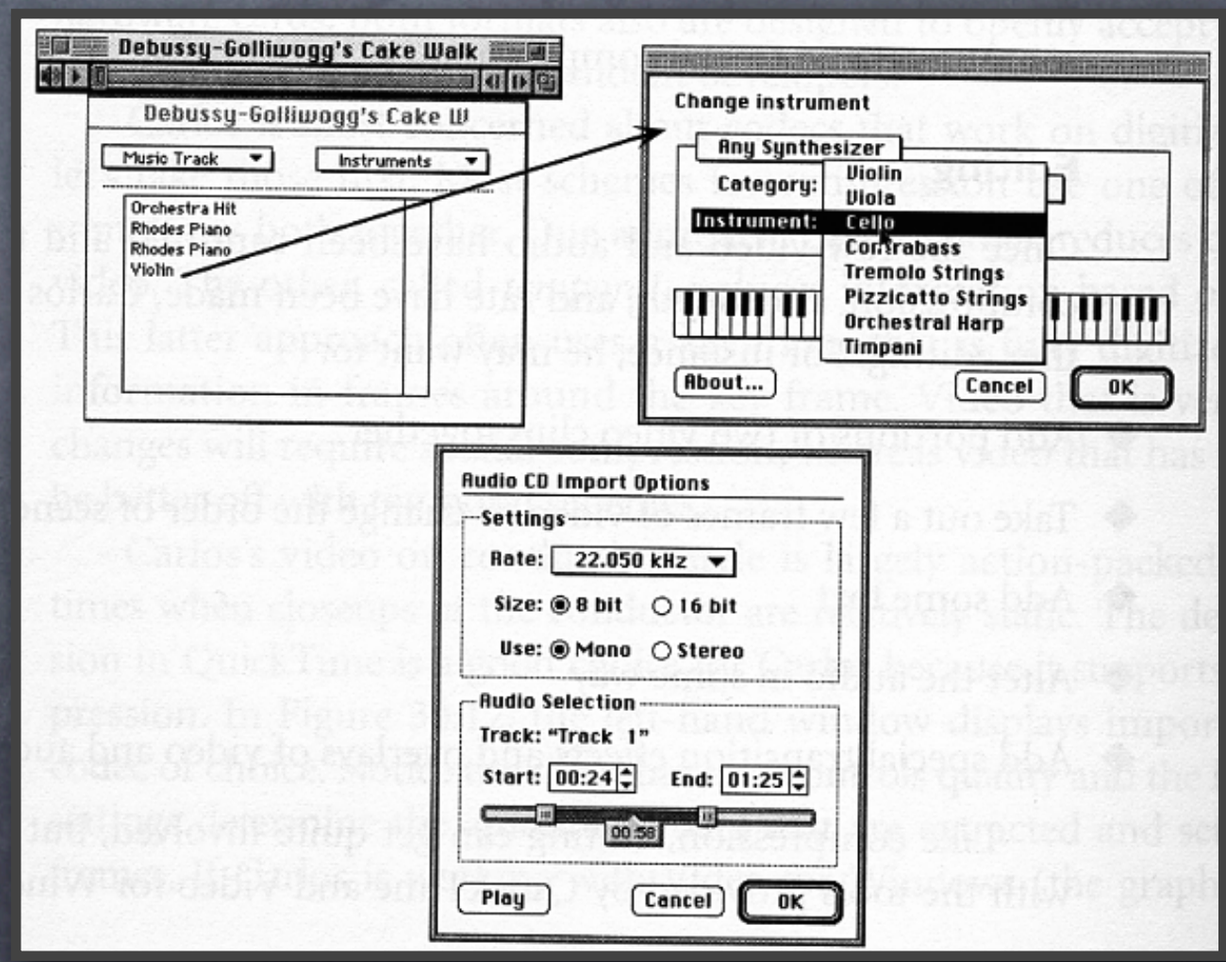
Creative Lab SoundFonts

Beatnik, LiquidAudio…

Roland Virtual Canvas

Mosaic Web Browser (NCSA)

QuickTime w/MIDI and Roland sounds



DBW

1998- USB MIDI

MMA's GM2 & GM Lite & DLS spec

RealAudio (1995), DVDs (1996), and AAC MPEG-4 audio (1997)

DBW

2000+ DAW Sequencers

Riff Funk Audio and MIDI Demo.bun - SONAR

File Edit Process View Insert Transport Go Track Tools Options Window Help

1:04:095 00:00:05:00

Riff Funk Audio and MIDI Demo.bun* - Track

1 MIDI Piano Ril — Vol 127 Pan 14% L Vel+ 0 — In None Out 1-US-428 Port 1 — Ch 1: Triton Le Program — Bnk 15488-Triton GM

2 Guitar — Vol 0.0 Pan 13% R Trim 0.0 dB

3 Bass — Vol 0.0 Pan C Trim 0.0 dB

4 Drums — Vol 0.0 Pan C Trim 0.0 dB

Lone Funk Piano

Guitar

Bass

Drums

Riff Funk Audio and MIDI De...

Trk	HMSF	MBT	Ch	Kind
1	00:00:04:18	1:04:004	1	Note
1	00:00:04:18	1:04:006	1	Note
1	00:00:04:22	1:04:034	1	Note
1	00:00:04:26	1:04:063	1	Note
1	00:00:04:29	1:04:091	1	Note
1	00:00:05:03	2:01:000	1	Note
1	00:00:05:03	2:01:001	1	Note
1	00:00:05:03	2:01:002	1	Note
1	00:00:05:11	2:01:062	1	Note
1	00:00:05:15	2:01:091	1	Note
1	00:00:05:15	2:01:093	1	Note
1	00:00:05:19	2:02:001	1	Note

For Help, press F1

TASCAM US-428 Control Panel

US-428 Control Panel | Tuner | System

Control Surface
Protocol
US-428 Native
Master fader sends MIDI only
Master fader affects application

Input Monitor
Mute
Pan

B C D

Close Cancel

Shawn Fanning creates Napster and P2P music sharing (1999)

2002- Control surfaces

DBW

2003 *All-in-one Boxes*

-MIDI
-AD/DC (multichannel)
-Control surfaces
-Keyboard
-USB, USB 2, Firewire

400 and 800

PRW

MIDI Demo

PRW

3 Things MIDI Does Well

- Controlling instruments and devices
- Capturing gestures from performance
- Triggering sound production

PRW

3 Things MIDI Does Well

	1983	Then	Now
Control	keyboard-to-keyboard, keyboard-to-computers	sync, MTC, SMPTE, more channels (32+)	virtual patching, trigger soft events
Gesture	keyboard and drum gestures	string, guitar, wind, pitch-to-MIDI, etc	any gesture can be captured
Sound	unique devices (no GM), FM synth dominant	GM, soundfonts, external digital sounds	GM2, DLS, computer-centric digital audio

PRW

From Williams & Webster *Experiencing Music Technology* (3rd Ed, in press)

MIDI Sound Quality

- 1983: No quality control (lots of FM synth)
- 1991: General MIDI
- 1993: SoundFonts
- 1994: QuickTime w/MIDI (Roland sounds)
- 1997: MIDI DLS standard and Roland Virtual Canvas and patent on soft synth issued
- 1999: General MIDI 2 with soft synth emerging
- 2003: World of soft synths (who needs GM?)

Most memorable MIDI event?

www.arts.ilstu.edu/emtbook/atmi2003