

PART 1

20 Years of MIDI

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Miami Florida

Overview

Session 1

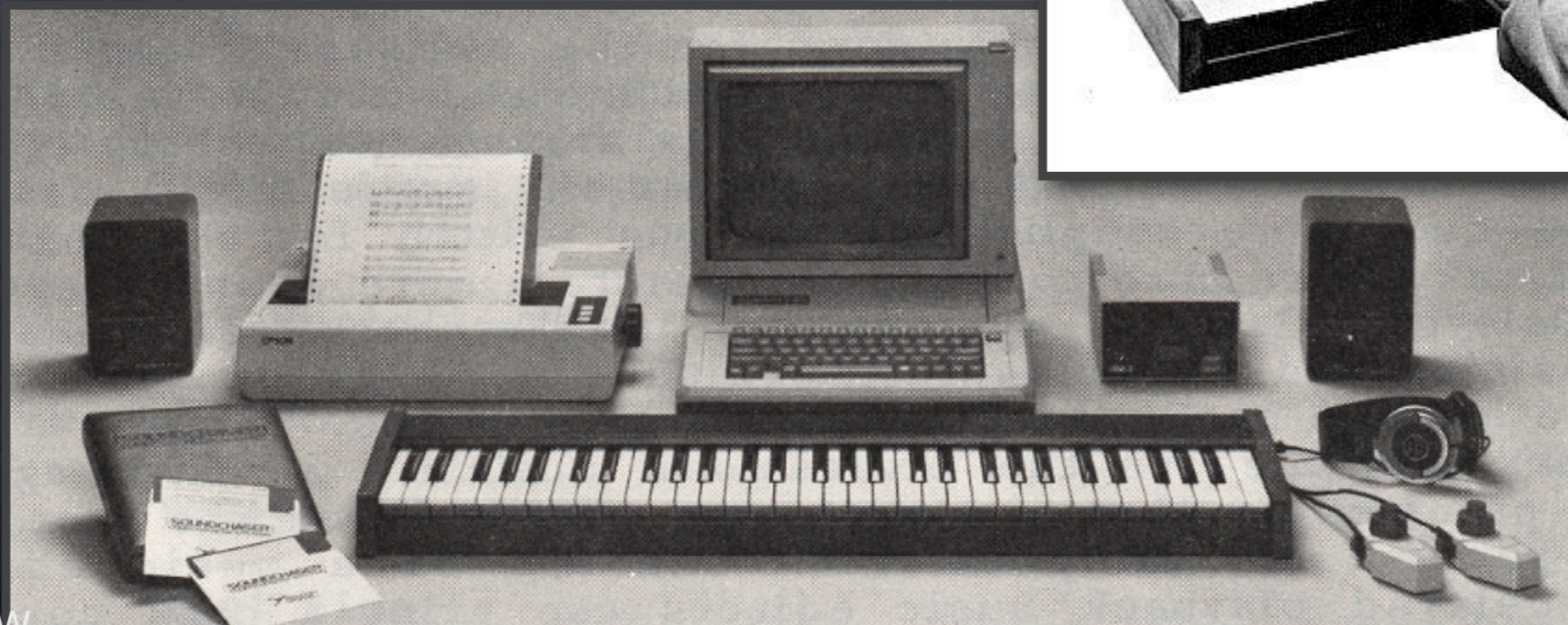
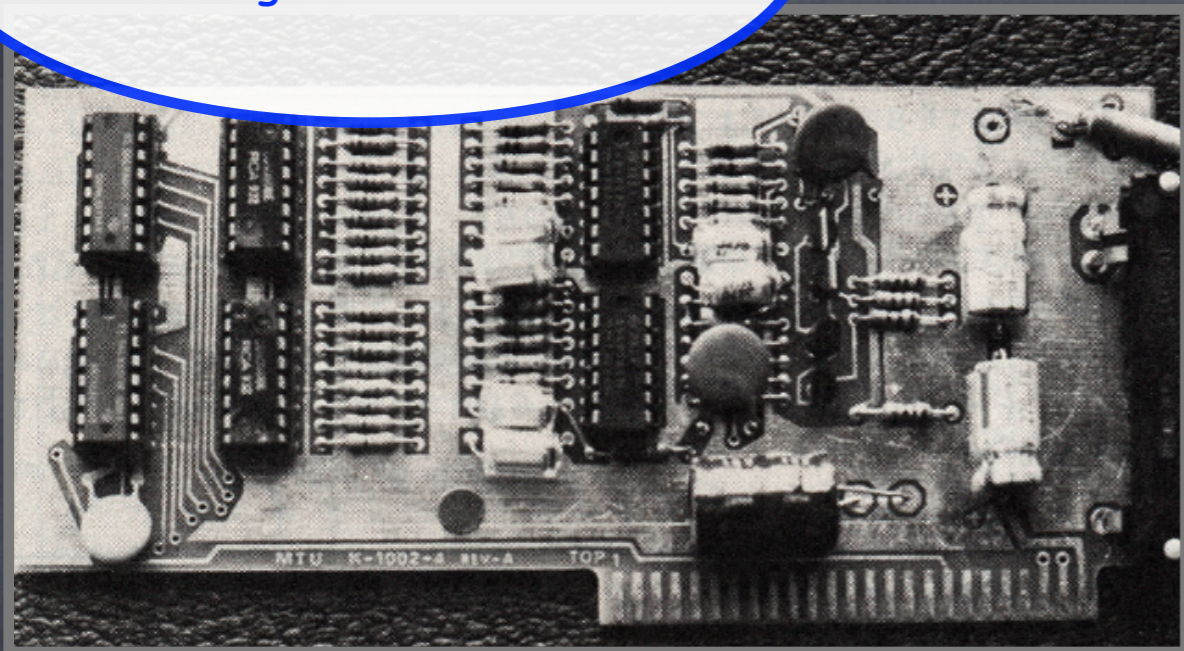
- HAPPY BIRTHDAY MIDI
- Historical timeline for audio and MIDI
- 3 things MIDI does well
- Most memorable MIDI event?

Session 2

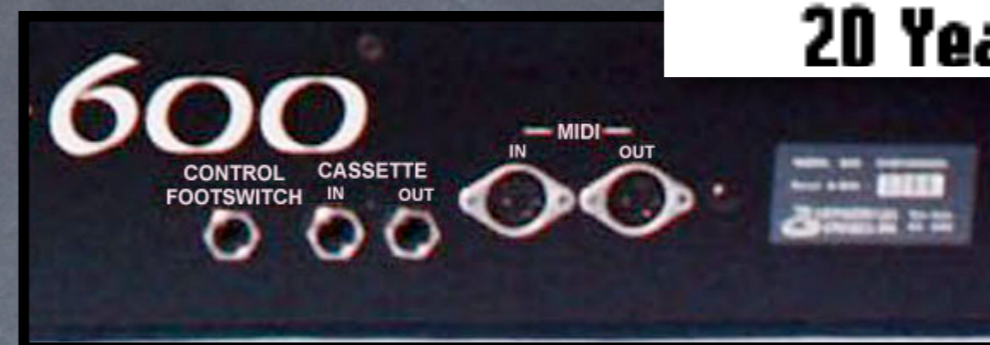
- Software components of music synthesis
- Mainstream MIDI applications
- Transition in music studio hardware
- Remaining shortcomings of MIDI
- What is the next stage for MIDI?

Before MIDI

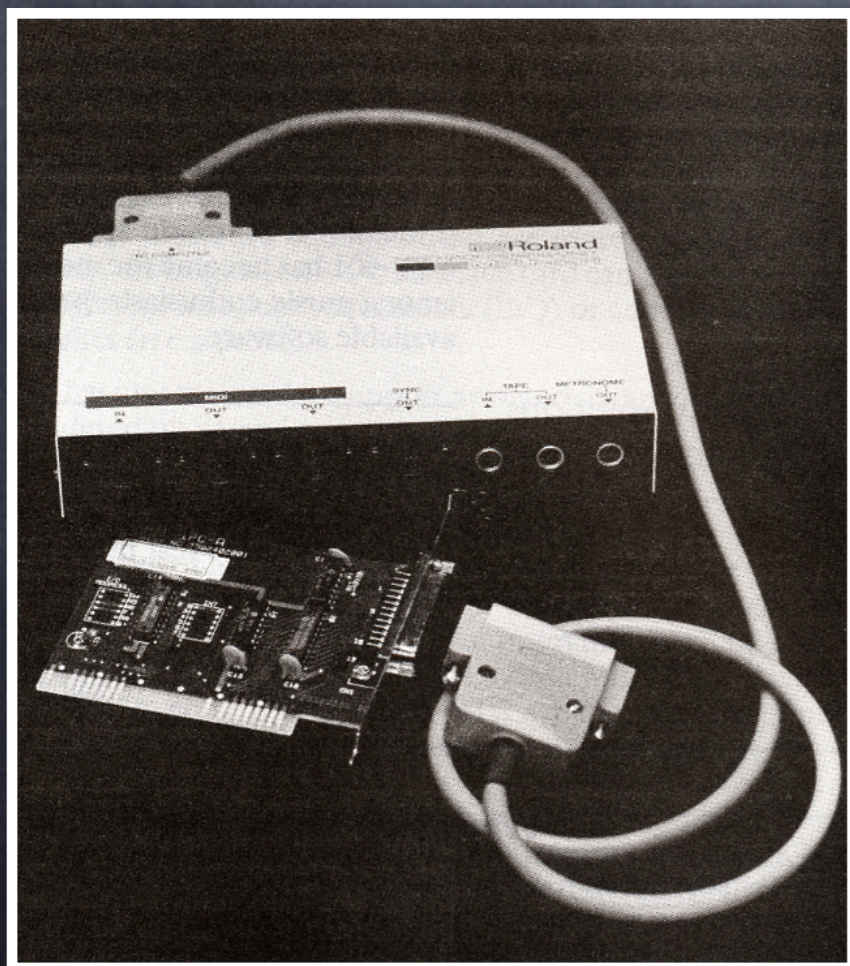
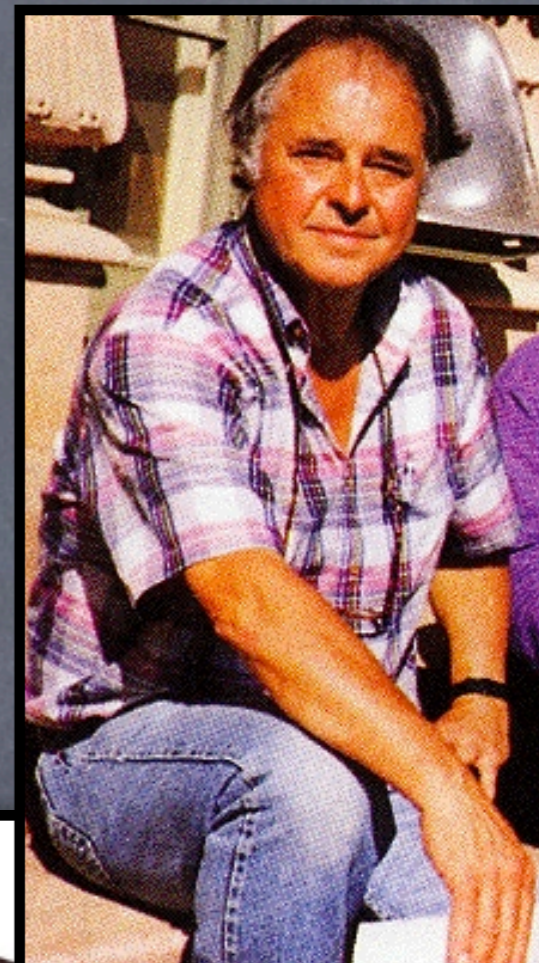
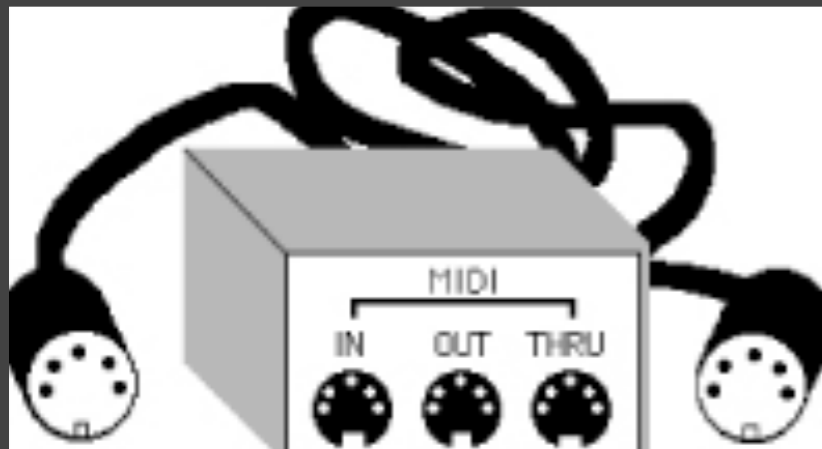
MMI DAC board 8-bit/22kHz
4-voice digital audio in 1978



MIDI's Birth (1983)



CD Audio introduced
in 1982



1985 More Software

Performer

File Edit Region Basics Change Windows

Artificial Intelligence

2 BARS

REWIND STOP PLAY PAUSE RECORD

Playing Seq-1

Seq-1

Edit Start: 1|1|000 End: 130|1|001

MOVE	LOOP	REC	PLAY/CH.	TRACK NAME	COMMENTS
				Conductor	
			M1	Bass Riff	
			M3	Buzz Bass	
			M5	Stacatto	
			M6	Organ Solo	
			M7	Chords	

Seq-1

MEASURE	FRAME	LOCK	
21 1 000	0:00:01:12		Start
70 1 000	0:01:38:17		Solo
118 1 000	0:02:47:14		Big Finish
130 1 000	0:03:06:20		End

Metronome

168

Man. Auto.

168.0 bpm

Memory

445K free

File Edit Do Setups Options Help

24 · 7 · 42

00:01:18:29

1000HX-1

♩ = 160.00

Internal

86503

PLAYERS

Replace Countoff 0 bars

Queue Loop Record

Visionary

New Sequence New Gen Seq

	F17	100		F18	106		F19	32		F20	106		F21	102		F22	100		F23	100		F24	122		F25	82		F26	108		F27	127		
A • MellowMan	N • Intro																																	
B • Interactive	O • Verse 1																																	
C • Royalty	P • Verse 2																																	
D • Scarey	Q • Verse 3																																	
E • FranticVln	R • Chorus																																	
F • Mellow	S • Coda																																	
G • Xanthe	T • (empty)																																	
H • XantheVibeLoop	U • Generatia																																	
I • CountdownOvertu	V • (empty)																																	
J • INIT	W • Mix Version 1																																	
K • (empty)	X • Mix version 2																																	
L • Quant of C	Y • (empty)																																	
M • (untitled)	Z • Final MIX																																	

Seq U: Generatia

SYNC Speed OFFSET 00:00:00:00.00

RHYTHM 2 - 3

Constant

DURATION 1 - 2

Constant

Meter 4/4

Tempo 160.00

Seq Length 6

Start 1.0

Rec Loop Order Instrument

(untitled) Random Rhythm

(untitled) Random K250-1

Seq H: XantheVibeLoop

SYNC Speed OFFSET 00:00:00:00.00

Meter 10/4

Tempo 96.00

Seq Len ∞

Start 1.0

RecMuteSolo Loop Length Instrument

4 • Mellow Str. Hi : 12 : K250-B-15

5 • Mello Str Lo : 12 : K250-B-10

6 • Pizz Triplets : 12 : Proteus/2-

7 • Harp : 12 : Wavestation

8 • Trumpet 625 : 12 : 1000HX-1

9 • French Horn : 12 : 1000SX-6

10 • Barimba : 12 : K250-B-4

11 • Bell Tree : 12 : Proteus/2-

TRACK 9 PLAY Atks Durs SHIFT 0

QUANTIZE

Track H8: "Trumpet 625"

▶	8 · 7 · 320	00:00:47:27.40							
◀	8 · 7 · 320	00:00:47:27.40							
	13 · 1 · 0	00:01:15:00.00	62 Events						
•	1 · 1 · 0	00:00:00:00.00	Program 25						
•	1 · 1 · 0	00:00:00:00.00	Pitch Bend: 0						
•	1 · 1 · 2	00:00:00:00.06	C#2	0 · 240	88↓	65↑			
•	1 · 1 · 240	00:00:00:09.30	G#2	0 · 120	94↓	64↑			
•	1 · 1 · 360	00:00:00:14.05	E3	0 · 120	90↓	63↑			
•	1 · 2 · 0	00:00:00:18.60	E♭3	0 · 240	102↓	62↑			
•	1 · 2 · 240	00:00:00:28.10	B3	0 · 240	99↓	62↑			
•	1 · 3 · 0	00:00:01:07.40	F#4	0 · 240	81↓	62↑			
•	1 · 4 · 240	00:00:02:05.50	C#2	0 · 240	88↓	65↑			

Vision

1987 SMF & MTC

Atari MOD trackers
distribute music over
BBSs



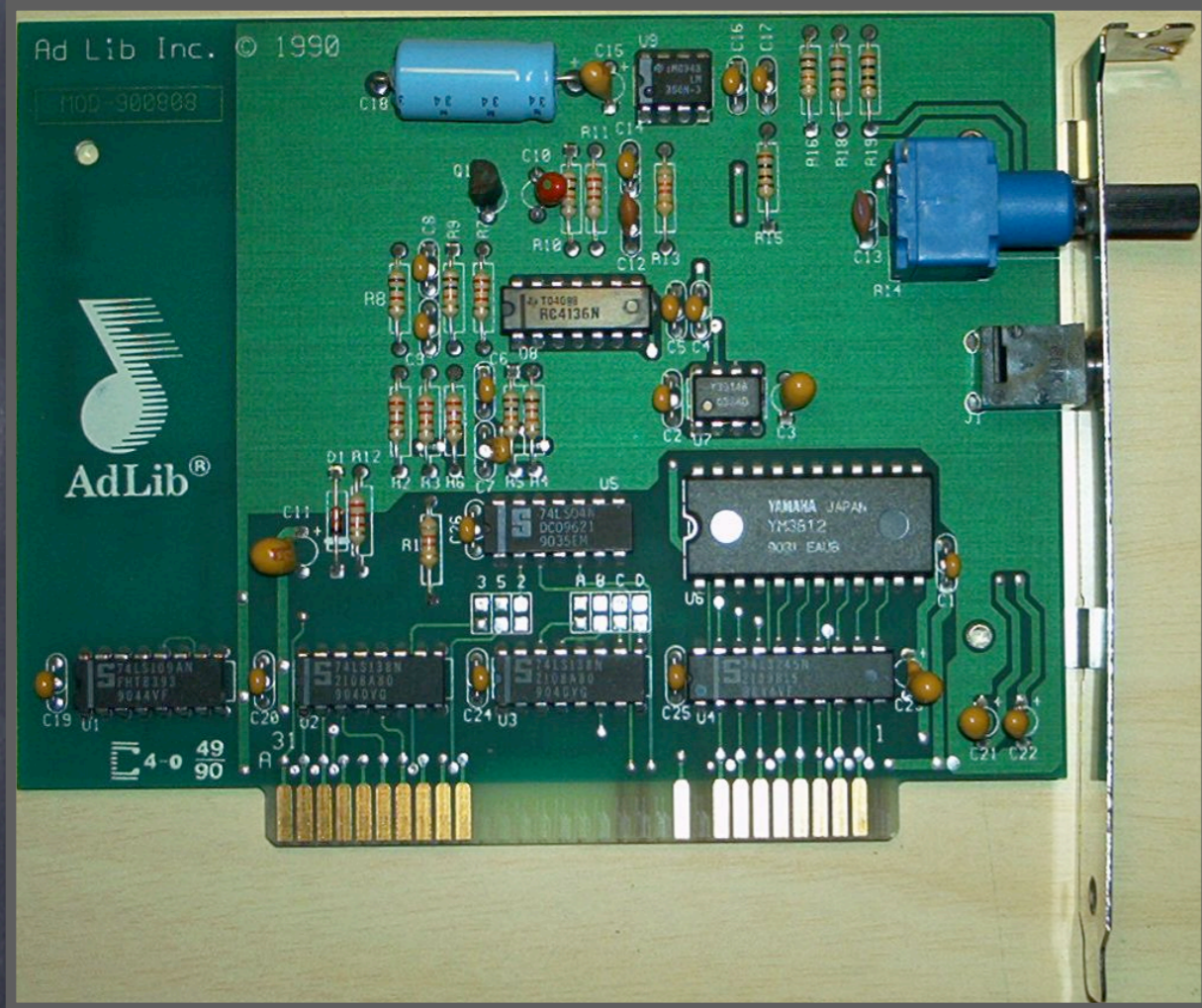
Dave
Oppenheim



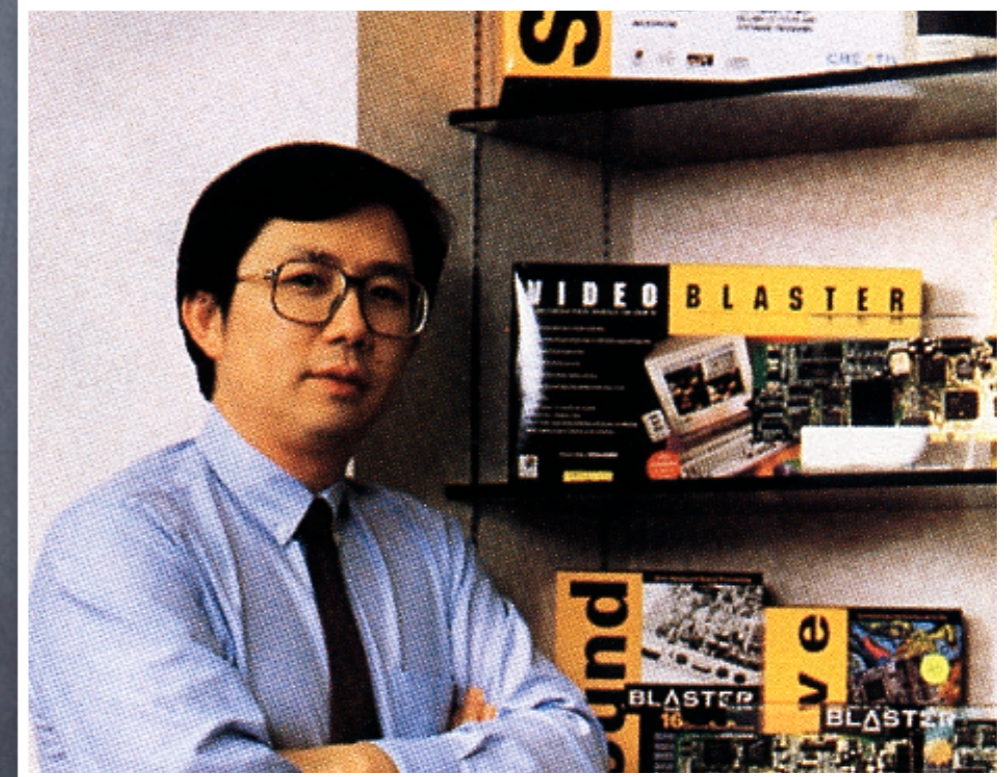
Chris Meyer

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

1987 MIDI Sound for Gamers



AdLib card from
Martin Prevel



MIDI OUT
MIDI IN

Sim Wong Hoo produces
SoundBlaster from Creative Labs

1988 MIDI Built-in



Band-in-a-Box

The screenshot displays the Atari music software interface. At the top, a menu bar includes File, Edit, Structure, Functions, Options, Modules, and Windows. Below this, a window titled 'Arrange - CLUE.ARR' shows track information:

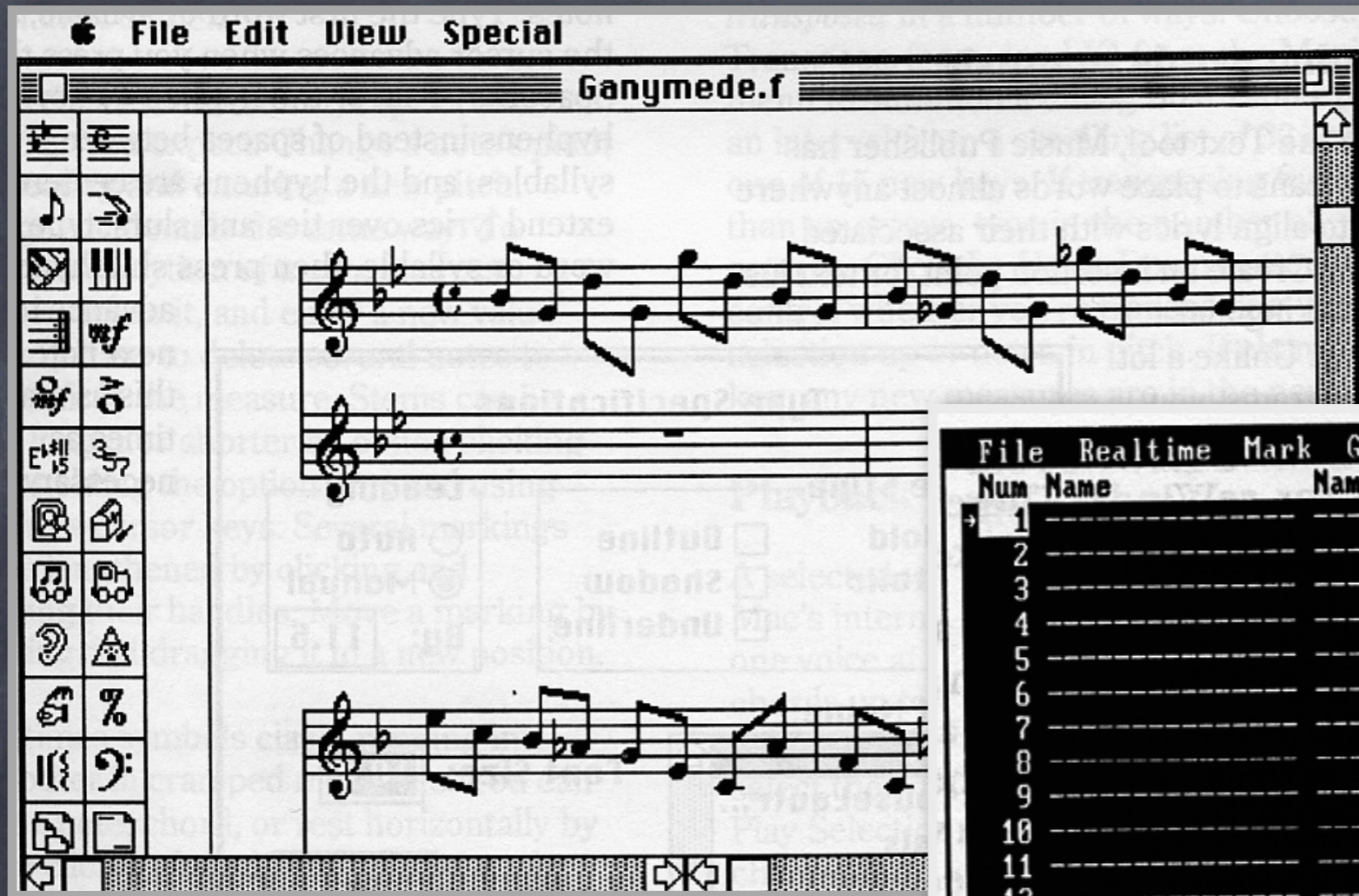
Trackinfo	A	M	C	T	Track	Chn	Instrument
elec piano					piano	1	piano
elec piano					elec piano	2	e. piano
elec piano					chromperc	3	chromprc

Below the track list, a piano roll is visible, showing notes for keys 7, 8, 9, and 10. The interface includes various controls such as 'Snap', 'Quantize', 'Cycle Rec', and 'Output'.



Atari (successor to Commodore) first computer w/MIDI

1988 Finale and Cakewalk



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

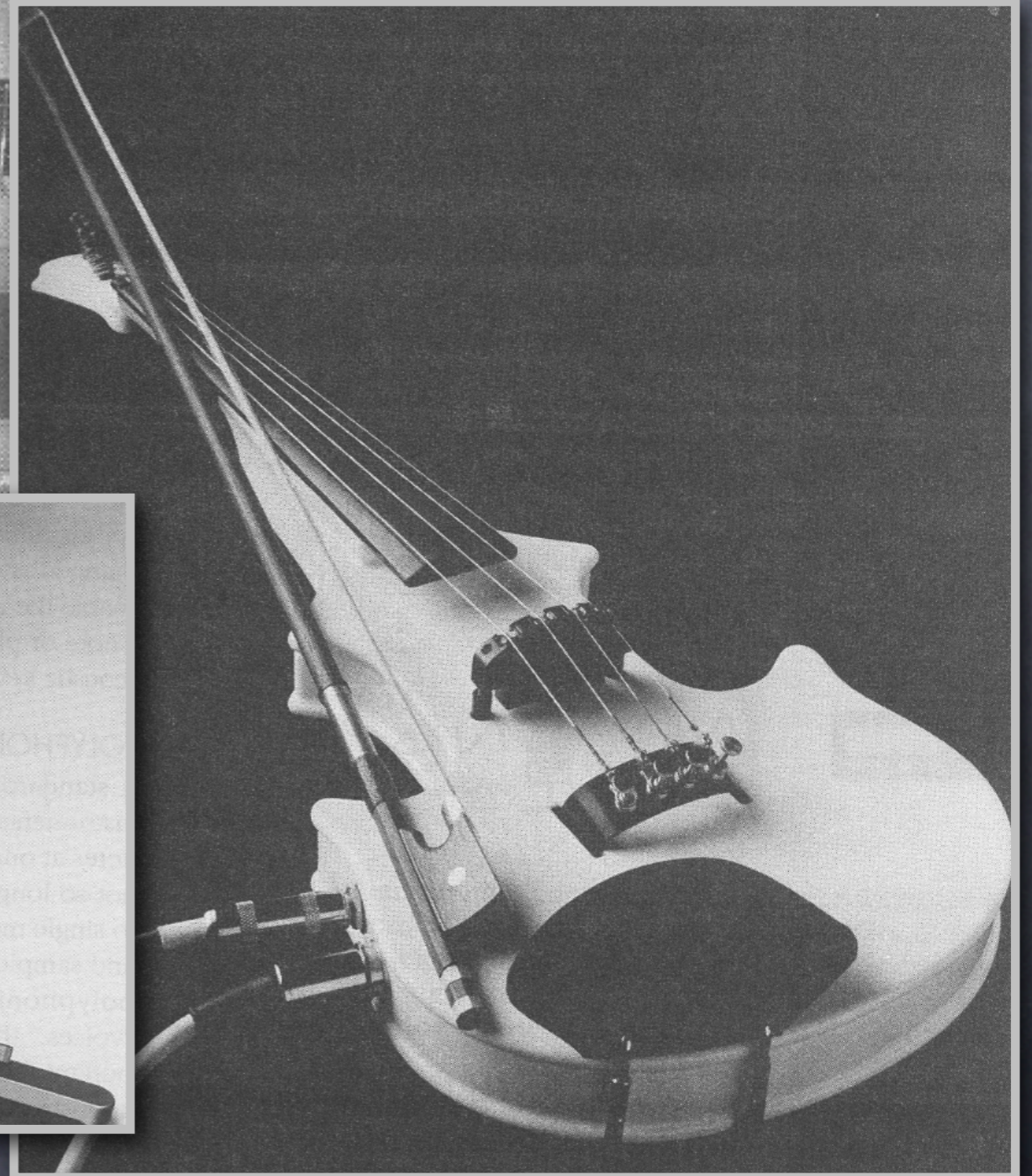
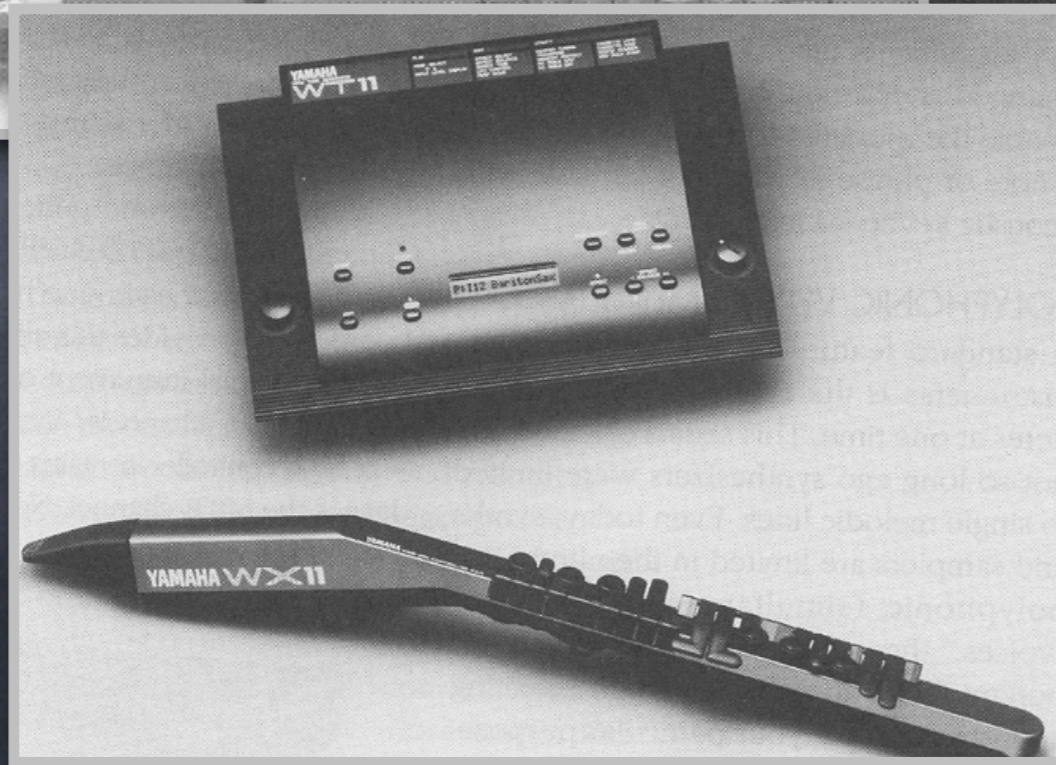
Finale Mac (Windows to come in 1990)

The image shows a screenshot of the Cakewalk Professional 4.0A software interface. The window title is "Cakewalk Professional 4.0A". The interface features a menu bar with "File", "Realtime", "Mark", "GoTo", "Edit", "Track", "View", "Settings", and "KeyMacro". Below the menu bar is a track list table with columns: "Num", "Name", "Name2", "P", "Loop", "Key+", "Uel+", "Offset", "Pt", "Ch", "Pat", and "Events". The table contains 16 rows of data. Below the table are playback controls including "Tempo", "Meter", "Key", "Play", "Record", "Rewind", and a progress bar. The progress bar shows "1:01:000<From", "1:01:000<Now>00:00:00", and "1:01:000<Thru". At the bottom, the text reads "Cakewalk Professional 4.0A Copyright 1988-1990 by Greg Hendershott".

Num	Name	Name2	P	Loop	Key+	Uel+	Offset	Pt	Ch	Pat	Events
1			m	1	+0	+0	+0	1	--	---	0+
2			m	1	+0	+0	+0	1	--	---	0
3			m	1	+0	+0	+0	1	--	---	0
4			m	1	+0	+0	+0	1	--	---	0
5			m	1	+0	+0	+0	1	--	---	0
6			m	1	+0	+0	+0	1	--	---	0
7			m	1	+0	+0	+0	1	--	---	0
8			m	1	+0	+0	+0	1	--	---	0
9			m	1	+0	+0	+0	1	--	---	0
10			m	1	+0	+0	+0	1	--	---	0
11			m	1	+0	+0	+0	1	--	---	0
12			m	1	+0	+0	+0	1	--	---	0
13			m	1	+0	+0	+0	1	--	---	0
14			m	1	+0	+0	+0	1	--	---	0
15			m	1	+0	+0	+0	1	--	---	0
16			m	1	+0	+0	+0	1	--	---	0

Cakewalk for the PC

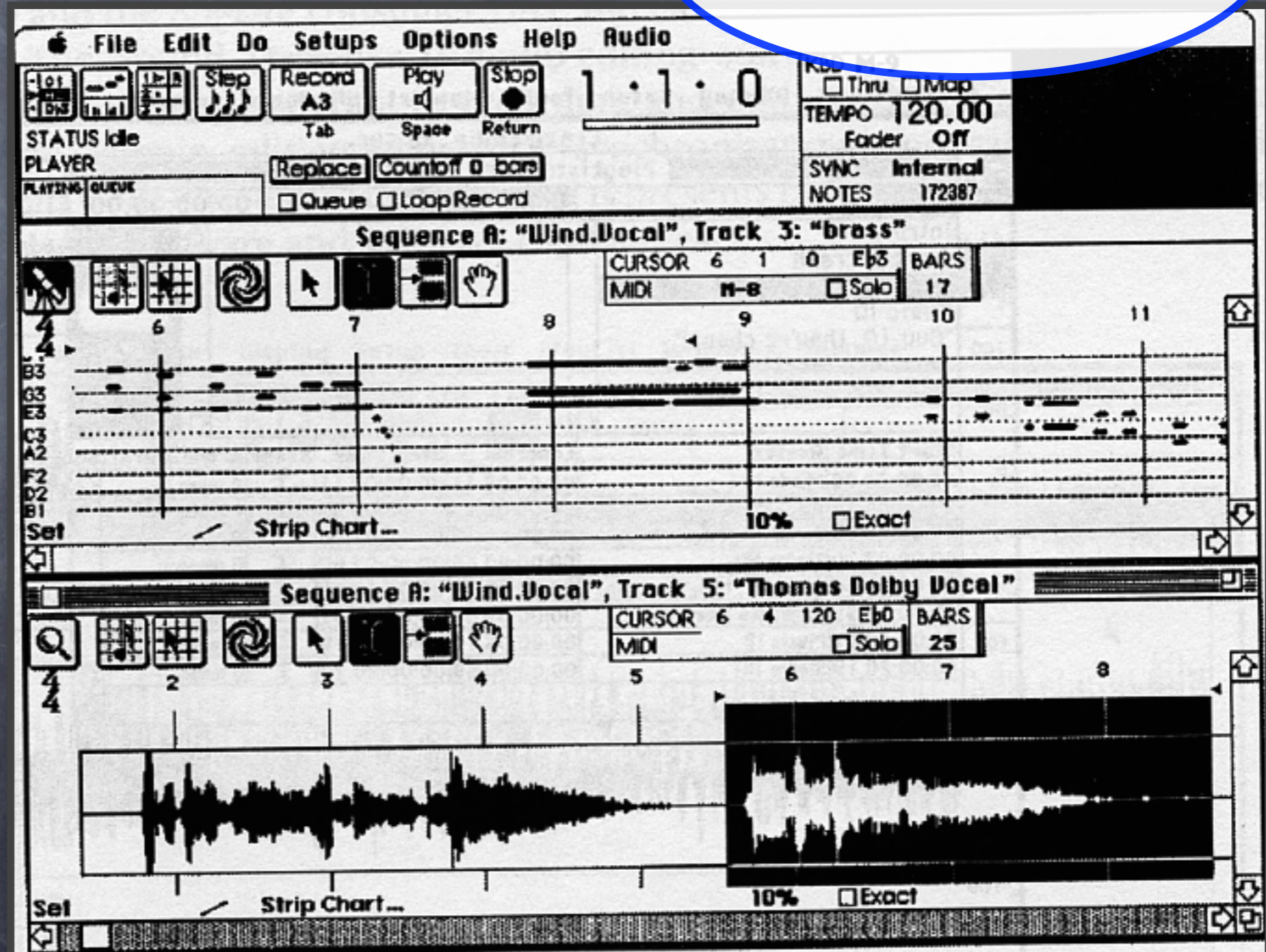
More controllers emerge...



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

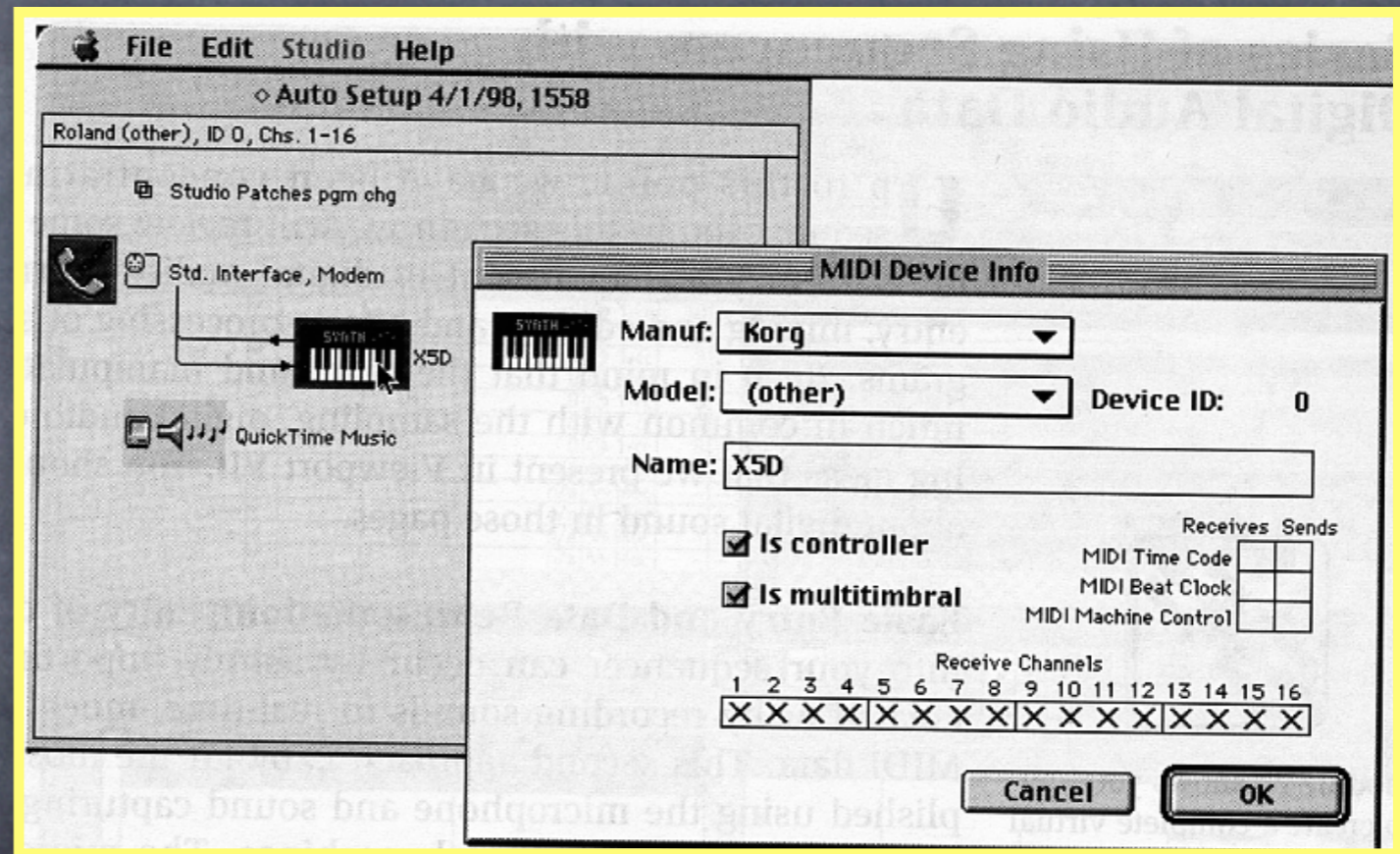


1992 OpCode MIDI System



MP3 audio
(MPEG-1/Level 3)

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



1993- More virtual sounds

Creative Lab SoundFonts



The ultimate audio midi-file plug-in!
Go get it first, come back and hear the difference!
Saturday in the Park - Chicago

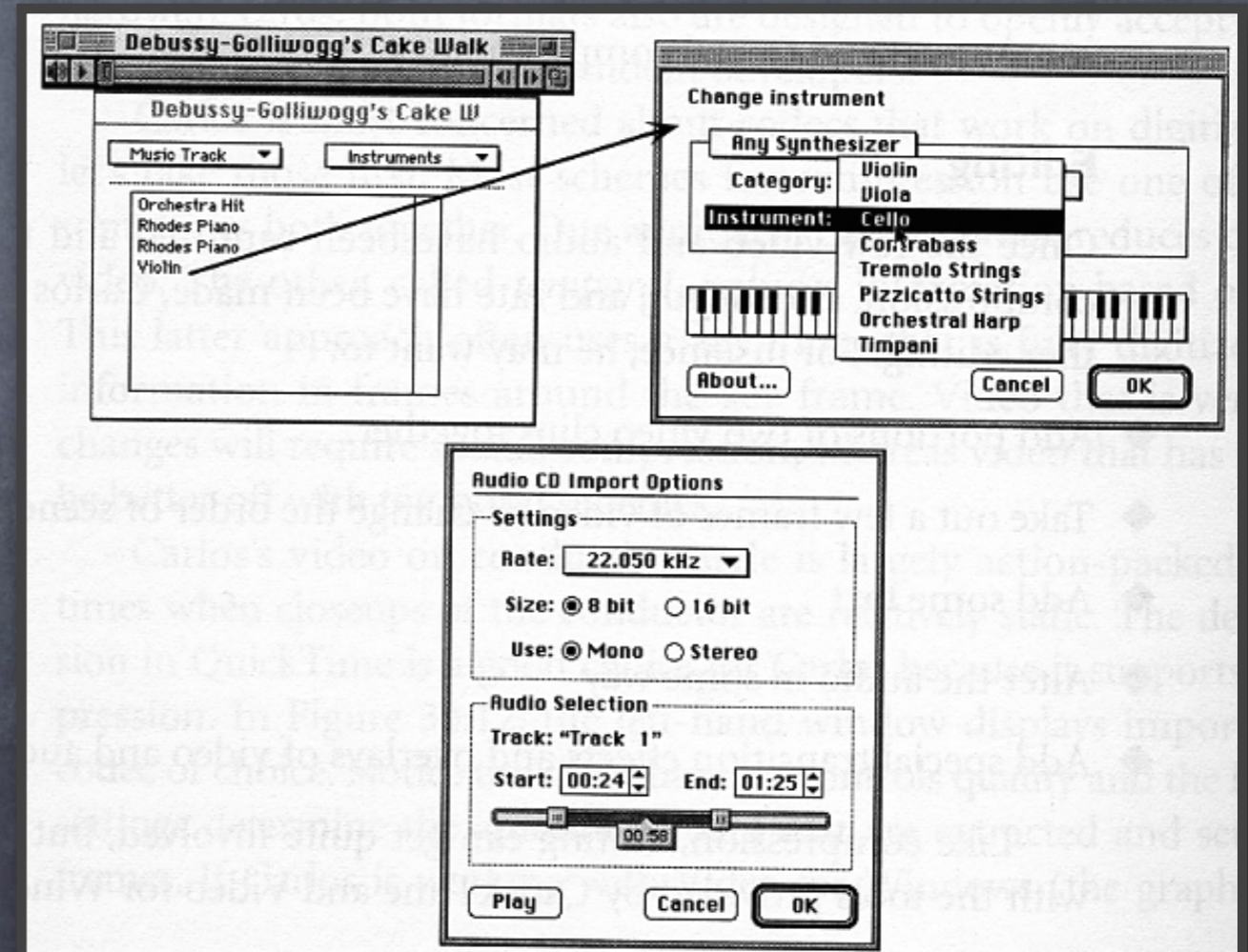
Beatnik, LiquidAudio...

Roland Virtual Canvas

QuickTime w/MIDI and Roland sounds



PART	PREV	INSTRUMENT	FADER
1		Gt. Harmonics	70
2		Gt. Harmonics	105
3		Fingered Bs.	96
4		Detuned Or. 2	81
5		Piano 1	127
6		Piano 1	127
7		Piano 1	127
8		Piano 1	127
9		Piano 1	127
10		STANDARD1	67
11		Piano 1	127
12		Piano 1	127
13		Piano 1	127
14		Piano 1	127
15		Piano 1	127
16		Piano 1	127



Change instrument

Any Synthesizer

Category: Violin, Viola

Instrument: Cello

Contrabass, Tremolo Strings, Pizzicato Strings, Orchestral Harp, Timpani

Audio CD Import Options

Settings

Rate: 22.050 kHz

Size: 8 bit, 16 bit

Use: Mono, Stereo

Audio Selection

Track: "Track 1"

Start: 00:24, End: 01:25

Play, Cancel, OK

Mosaic Web Browser (NCSA)

1998- USB MIDI



MMA's GM2 & GM
Lite & DLS spec



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

2000+ DAW Sequencers

The screenshot shows the SONAR DAW interface with a project titled "Riff Funk Audio and MIDI Demo.bun". The tracks include MIDI Piano, Guitar, Bass, and Drums. A TASCAM US-428 Control Panel window is open, showing settings for the control surface protocol (US-428 Native) and input monitor options. A table of MIDI events is visible at the bottom of the screenshot.

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



Shawn Fanning creates Napster and P2P music sharing (1999)

2002- Control surfaces

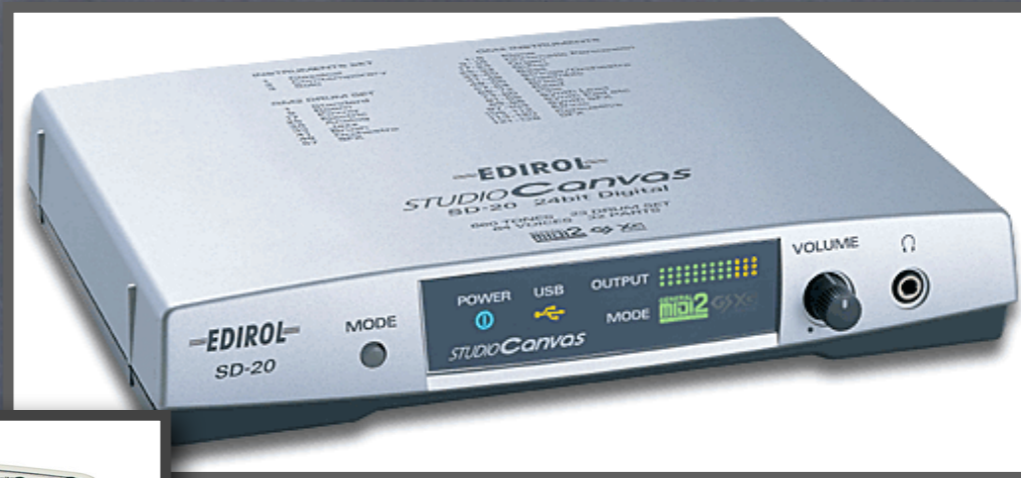


2003 All-in-one Boxes

- MIDI
- AD/DC (multichannel)
- Control surfaces
- Keyboard
- USB, USB 2, Firewire
400 and 800



MIDI Demo



3 Things MIDI Does Well

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

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

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