

*Learning about the Histories of
Computerizing Publishing and
Desktop Publishing, 2017–2019*

See: history.computer.org/annals/dtp

TUG Annual Conference, August 2019

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The written version of this will have proper citations
that are not included here.

This is my third publishing, printing, and typesetting history presentation for TUG

- **TUG 2010: Printing & Publishing in Boston: An Historical Sketch**
`walden-family.com/bbf/bbf-printing.pdf`
- **TUG 2016: An Informal Look into the History of Digital Typography**
`tug.org/tug2016/walden-digital.pdf`
- **TUG 2019: Learning (2017-19) about the History of Desktop Publishing — draft at**
`walden-family.com/texland/x-tug2019.pdf`

Desktop publishing pioneers meeting, May 22-23, 2017, Computer History Museum (CHM)

Nine meeting sessions covering the technology that made DTP possible and the development of the DTP business.

Pioneers in attendance: Liz Crews (was Liz Bond, Xerox PARC and Adobe), Larry Tesler (PARC and Apple), Butler Lampson (PARC), Paul Brainerd (Aldus), John Warnock (PARC, Adobe), Lee Lorenzen (Ventura), Charles Geschke (PARC, Adobe), Charles Simonyi (PARC, Microsoft), Bob Sproull (PARC), Don Knuth (Stanford, TeX), Jonathan Seybold (ROCAPPI, Seybold Publications & Seminars), Chuck Bigelow (Bigelow & Holmes type design studio), Richard Ying (Atex), John Scull (Apple).



Organized by Burt Grad

- **GE**
- **IBM**
- **BGAI**
- **ADAPSO**
- **Co-founder CHM
Software History SIG**
 - **14 pioneer meetings**
 - **8 *Annals* special issues
plus various additional
articles**
 - **130 oral histories**



[history.computer.org/
annals/dtp](http://history.computer.org/annals/dtp)

Resulting published papers =>

The Computer History Museum has posted on its website the transcripts of the nine sessions of the two-day-meeting.

The Museum also has or soon will have interviews or oral histories of Charles Bigelow, Paul Brainerd, Charles Greschke and John Warnock, Steve Kirsch, Donald Knuth, Butler Lampson, Lee Lorenzen, John Schull Jonathan Seybold, Robert Sproull, Gary Starkweather, Larry Tesler, and Charles Thacker.

IEEE Annals of the History of Computing DTP special issues

Issue 1 ([Annals vol. 40, no. 3, July-September 2018](#))

[Desktop Publishing: Laying the Foundation](#) —

Burton Grad and David Hemmendinger

Rocappi: Computerizing the Publishing Industry — Jonathan W. Seybold

How Atex Helped an Industry Change the World — Douglas Drane

More about Atex — Jonathan Seybold

The Xerox Alto Publishing Platform — Robert F. Sproull

How Modeless Editing Came To Be — Lawrence G. Tesler

The Origins of PostScript — John E. Warnock

[TeX: A Branch of Desktop Publishing, Part 1](#) —

Barbara Beeton, Karl Berry, and David Walden

[Interview with Charles Bigelow](#) — David Walden

Issue 2 ([Annals vol. 41, no. 3, July-September 2019](#))

[Desktop Publishing: Building the Industry](#) —

Burton Grad and David Hemmendinger

Seybold Publications and Seminars — Jonathan Seybold

Founding and Growing Adobe Systems Inc. — John Warnock and
Charles Geschke

Paul Brainerd, Aldus Corporation and the Desktop Publishing Revolution
— Suzanne Crocker

Desktop Publishing: The Killer App That Saved the Macintosh —
John Scull and Hansen Hsu

Interview with Tim Gill (Quark) — Jay Nelson

Frame Technology and FrameMaker — David J. Murray

The Ventura Story — Lee Lorenzen

[TeX: A Branch of Desktop Publishing, Part 2](#) — Barbara Beeton, Karl
Berry, and David Walden

(published in *Annals* vol. 41, no. 2, April-June 2019)

Oral History of Liz Bond Crews — Paul McJones

(to be published in the *Annals* in early 2020)

[Font Wars parts 1 and 2](#) — Charles Bigelow

(to be published in the *Annals* in early 2020)

In particular, I learned about...

- **Computerizing newspaper, periodical, and book publishing**
 - John Seybold and ROCAPPI
 - Michael Barnett's PAGE-1
 - Bringing “all digital” to newspapers, e.g., Atex
- **Jonathan Seybold and the Seybold Reports and Seminars**
- **Development of the desktop publishing technology and market: Xerox PARC, Adobe, Aldus, Apple, Frame, Interleaf, Quark, Ventura**
- **“Font wars” of 1989 to 1995 and prior technology**

Evolution to digital in newspapers, etc.

- **Papers tapes and/or wire services for hot metal type casting machines with fax-like systems for images (keyboards?)**
- **Phototypesetters driven by keyboards (first dedicated electronics and then general purpose computers) with optical output of articles**
- **Whole pages from computer keyboards (text plus layout commands)**
- **Fully computerized publishing offices**
- **Lots of backward compatibility**

*Phototypesetting to digital for industry**

- 1961–1964, Michael Barnett's experiments at MIT ***
- 1962, John Duncan began research on computer typesetting at the University of Newcastle-upon-Tyne
- RCA 301 and IBM 1620 based hyphenation and justification at newspapers
- 1963–1970, John Seybold's Rocappi company ***
- 1964–5, IBM 1401 and 1130 and DEC PDP-8 based typesetting systems
- 1964, Saltzer's RUNOFF at MIT – **interactive text formatting**
- 1966–1967, PAGE—1 computer composition system, produced in the Graphics Systems Division of RCA ***
- 1967 on, other similar systems
- 1971, Seybold Reports started by John and Jonathan Seybold ***
- 1973–1981, Atex offers full office newspaper/periodical/etc. system ***

*Derived from history.computer.org/annals/dtp/rocappi-typesetting.pdf
by Jonathan Seybold

Michael Barnett

MIT experiments

70 PREPARING TYPRINT

International Union List of
COMMUNIST CHINESE SERIALS

Scientific, technical and medical
with selected social science titles

Compiled by
Bernadette P. N. Shih
and
Richard L. Snyder
Massachusetts Institute of Technology Libraries

with mechanization and photocomposition methods developed by
Prof. M. P. Barnett and Dr. D. A. Luce
Cooperative Computing Laboratory
Massachusetts Institute of Technology

Cambridge, Massachusetts
August, 1963

Example 3.28. Sample of TYPRINT output: title page of Union List. (PC6 project 4. See Section 1.9.)

[indn77d121s24st1,,36cnxs1]

EXCERPT FROM ALICE IN WONDERLAND

[nl1s18]

December 6, 1961

[sp4st2,10,36st3,11,36st4,12,36st5,13,36st6,14,36st8,16,36st9,17,36st10,18,361s14d11xs2r1]

[sc19sc19]Fury said to

[xs3]a mouse, That

[nlxs6]he met

[xs7]in the

[xs8]house,

[xs9][sc19]Let us

[xs7]both go

[xs61s12]to law:

[xs5d19]I[d11] will

[xs3]prosecute

[xs2d19]you.

[nlxs3d11] Come, I'll

[nlxs4]take no

[nlxs5]denial:

[nlxs7]We must

[nlxs81s11]have a

[nlxs9]trial[sc47]

[nlxs10] For

[xs7]really

[xs6]this

[nl] morning

[nlxs81s10] I've

[xs6]nothing

[xs5]to do.'

[xs4]Said the

[xs2]mouse to

[xs1] the cur,

[nlxs3][sc19]Such a

[nlxs41s9]trial,

[xs3]dear sir,

[xs2] With no

[xs2]jury or

[xs11s8]judge,

[nlxs2]would be

"Fury said to
a mouse, That
he met
in the
house,
'Let us
both go
to law:
I will
prosecute
you.
Come, I'll
take no
denial:
We must
have a
trial;
For
really
this
morning
I've
nothing
to do.'
Said the
mouse to
the cur,
'Such a
trial,
dear sir.'
With no
jury or
judge.
would be
wasting
our breath.
'I'll be
judge.
I'll be
jury.'
Said
cunning
old Fury:
'I'll try
the whole
cause.

John Seybold and Rocappi

- **Research on Computer Applications in the Printing and Publishing Industries, 1963-1970**
- **Typesetting for publishers (and consulting and evangelizing)**
- **Phototypesetter independent using RCA 301 computer and Rocappi software**



- **Jonathan joined in 1965**
- **New programming was generalized**
- **Sold to Lehigh Press in 1967**

Rocappi innovated

- **Markup** tinyurl.com/rocappi
 - typesetter independent markup, *Bi*
 - abstract, \$hb = second level heading / device code
- **Pattern based hyphenation — Colin Barber**
- **Hyphenation correction**
- **Tracking, kerning, ligatures**
- **Character width changing for justification — Harris Intertype Fototronic CRT, e.g., Bible**
- **Pagination — “text facts”, “vertical justification”**

Rocappi, Barnett, etc., were aiming higher than, for instance,

RUNOFF

- Jerry Saltzer, 1964
- CTSS on MIT's IBM 709 and 7090 in MAD language
- Influential, e.g., RUNOFFs for other computers, Script for CP/CMS; roff to nroff to troff to ditroff to groff

.ap	.append A
.ll	.line length n
.in	.indent n
.ss	.single space
.ds	.double space
.bp	.begin page
.ad	.adjust
.fi	.fill
.nf	.nofill
.nj	.nojust
.pa	.page (n)
.sp	.space (n)
.he	.header xxxx
.br	.break
.ce	.center
.li	.literal

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Project MAC

TO: CTSS users.

FROM: J. H. Saltzer

SUBJECT: TYPSET and RUNOFF, Memorandum editor and type-out commands.

DATE: November 6, 1964

The command TYPSET is used to create and edit 12-bit BCD line-marked files. This command permits editing and revising by context, rather than by line number. The command RUNOFF will print out a 12-bit BCD line-marked file in manuscript format. RUNOFF contains several special features not available with the DITTO command, including type-justification.

These two commands provide an alternative to the MEMO, MODIFY, and DITTO commands, and are intended to provide experience with a different approach to editing symbolic files.

This memorandum was prepared with the aid of these two commands.

Michael Barnett 's PAGE-1

- RCA Spectra 70 computer; RCA VideoComp 70|820
Electronic Photocomposer
- Variables
 - 13 typographic, e.g., *tb, mx, tf*
 - 3 read only: *cx, cy, cc*
 - 5 global types: *pn, fn, pi, 201 gvi, 9 ivi*
- 6 arithmetic operators, e.g., *[ad,variable,p1,p2]*
- 6 conditionals, e.g., *[gr,p1,p2[[code]text]]*
- Names:
 - synonyms *t1...z9* for current document/job
 - formats *a1...s9* across documents/jobs
- Dozens more two letter codes

[sy,x1[[gt,cx,gv1[[gv1,cx]];nl]]]

[sy,x2[[x1;df,gv1,rb,gv1;qo,gv1,gv1,2;us]]]

...

...

...

[gv1,0;su;lb,gv1]

Some text[x1]

Some more text[x1]

And this[x2]

...

...

sy synonym

x1 and x2 are variable names

gt greater than

cx current horizontal setting

position

gv1 column indicator

nl newline

df difference

rb right boundary

qo quotient

us unsuppress

su suppress

lb left boundary

Code for two-column pages with footnotes and spaces for stripping in graphics

```
B3 ≡ [gv143,gv123;gv149,gv123;gv168,gv88;gv169,gv88;
gv195,0;gv196,0;gv197,0;gv198,0;gv200,0;iv1,98;
gv1,0;gv3,3;ad,pn,pn,1;fn,1;
sb,6;lb,0;tb,0;rb,gv58;bb,gv88;pd,gv88;
ne,gv123,0[[bb,gv87;pd,gv87]];ib;
sb,2;lb,0;rb,gv58;bb,gv88;ps,gv15;bl,ps;tf,gv45;Y4;n1;
sb,3;lb,0;rb,gv59;bl,gv29;ju;wb[[Y3]];cb;
ab[[jv;sb,4;bb,gv99;eq,gv182,0[[ib;sb,5;cb]];gv182,0;
iv1,99;gv1,1;gv3,5;ab[[jv;pg;sb,1;bb,gv168;ad,pn,pn,1;
pd,gv88;ne,gv123,0[[pd,gv186;by,2,0]];ib;sb,2;lb,0;rb,gv58;
Y2;n1;sb,3;lb,0;rb,gv59;ju;cb;by,1,gv143;by,4,gv149;
gv98,gv168;gv99,gv169;gv144,gv143;gv150,gv149;
gv195,gv197;gv196,gv198;gv168,gv88;gv169,gv88;
gv143,gv123;gv149,gv123;gv197,0;gv198,0;
gv200,0;iv1,98;gv1,0;gv3,3]]];wb[[Y1]]

B4 ≡ [ad,gv144,cy,gv110;gv150,gv144;n1;by,1,gv144;by,4,gv150;
df,gv98,gv88,gv144;ne,gv123,0[[df,gv98,gv87,gv144]];
gv99,gv98;sb,1;lb,0;rb,gv59;bb,gv98;ps,gv11;bl,gv26;tf,gv41;ju]

B6 ≡ [gv192,cy;bb,gv88;gv182,1;eq,gv1,0[[sb,5]]]

B7 ≡ [eq,gv1,0[[jd;sb,4;bb,gv99;eq,gv182,0[[ib;sb,5;cb]];
gv182,0;iv1,99;gv1,2;gv3,5]];
eq,gv1,1[[jd;pg;sb,1;bb,gv168;ad,pn,pn,1;ib;
sb,2;lb,0;rb,gv58;Y2;n1;sb,3;lb,0;rb,gv59;
ju;cb;by,1,gv143;by,4,gv149;gv98,gv168;
gv99,gv169;gv144,gv143;gv150,gv149;gv195,gv197;
gv196,gv198;gv168,gv88;gv169,gv88;gv143,gv123;
gv149,gv123;gv197,0;gv198,0;gv200,0;iv1,98;gv3,3]];
df,gv1,gv1,1]
```

[sy,Y1[[B7]];sy,Y2[[**]];sy,Y3[[B6]];sy,Y4[[††]]

** Desired running head. †† Desired drop folio.

```
B8 ≡ [eq,gv200,1[[eq,gv198,0[[eq,gv197,1[[[ge,gv169,gv6[[[ge,gv6,gv92[[[gv198,1]];
lt,gv6,gv92[[ne,gv149,gv123[[[gv198,1]];eq,gv149,gv123[[ad,gv149,gv149,gv6]]]];
df,gv169,gv169,gv6]]]];
eq,gv197,0[[lt,gv168,gv6[[[ge,gv169,gv6[[[ge,gv6,gv92[[[gv198,1]];lt,gv6,gv92[[ne,gv149,gv123[[[gv198,1]];
eq,gv149,gv123[[ad,gv149,gv149,gv6]]]];
df,gv169,gv169,gv6]]]];
ge,gv168,gv6[[[ge,gv6,gv92[[[gv197,1]];
lt,gv6,gv92[[ne,gv143,gv123[[[gv197,1]];eq,gv143,gv123[[ad,gv143,gv143,gv6]]]];
df,gv168,gv168,gv6]]]]]];
eq,gv200,0[[eq,gv196,1[[[ge,gv6,gv92[[[gv197,1]];lt,gv6,gv92[[ad,gv143,gv143,gv6]];df,gv168,gv168,gv6;gv200,1]];
eq,gv196,0[[eq,cy,0[[[gv90,0;ne,cx,0[[[gv90,ps]]]];
ne,cy,0[[[eq,cx,0[[[df,gv90,cy,bl;ad,gv90,gv90,ps]];ne,cx,0[[ad,gv90,cy,ps]]]];df,gv90,bb,gv90;
eq,gv1,0[[[eq,gv195,1[[[ge,gv6,gv92[[[gv196,1]];
lt,gv6,gv92[[ne,gv150,gv123[[[gv196,1]];eq,gv150,gv123[[ad,gv150,gv150,gv6;by,4,gv150]]]];
df,gv99,gv99,gv6]];
eq,gv195,0[[[ge,gv90,gv6[[[ge,gv6,gv92[[[gv195,1]];
lt,gv6,gv92[[ne,gv144,gv123[[[gv195,1]];
eq,gv144,gv123[[ad,gv144,gv144,gv6;by,1,gv144]]]];
df,bb,bb,gv6;gv98,bb]];
lt,gv90,gv6[[[ge,gv6,gv92[[[gv196,1]];lt,gv6,gv92[[ad,gv150,gv150,gv6;by,4,gv150]];
df,gv99,gv99,gv6]]]];
eq,gv1,1[[[ge,gv90,gv6[[[ge,gv6,gv92[[[gv196,1]];lt,gv6,gv92[[ne,gv150,gv123[[[gv196,1]];
eq,gv150,gv123[[ad,gv150,gv150,gv6;by,4,gv150]]]];
df,bb,bb,gv6;gv99,bb]]];
```

lt,gv90,gv6[[[ge,gv6,gv92[[[gv197,1]];lt,gv6,gv92[[ad,gv143,gv143,gv6]]]]];

THIS SET OF FORMAT STATEMENTS will generate two-column pages with footnotes and allocate white space for subsequent “strip in” of graphics. The format statements B3 and B4 are used together to provide for a full, two-column chapter opening followed by two columns of text to complete the chapter opening page. The format statements B7 and B6 are the text block and footnote block bottom boundary procedures respectively and they must be equated with the synonym names Y1 and Y3 in the job specification.

White space is cited by assigning to gv6 a value equal to the depth of white space desired (in points) and then calling B8; the amount of white space requested should equal an integral number of text lines.

The footnote format statements appear and their use is described on page B11.

The two-column style generator (for use with these format statements) provides for user selection of two basic typographic formats. See discussion on page B11.

Seybold Reports

- **John and Jonathan**
- **World moving too fast for another book**
- *The Seybold Report, 1971-2*
- **Seybold Publications, mid 1972 on**
- **Also two-day seminars & consulting**
- *Seybold Report[s] by early 1980s ...on Publishing Systems, ...on Office Systems, ...on Professional Computing, and later ...on Desktop Publishing Systems*



Seybold Seminars

- Reaction to coming desktop computing
- Annually, then biannually
- Trade show added in 1986
- Sold Publications and Seminars to Ziff
- “Computerization of print publishing and democratization of publishing”

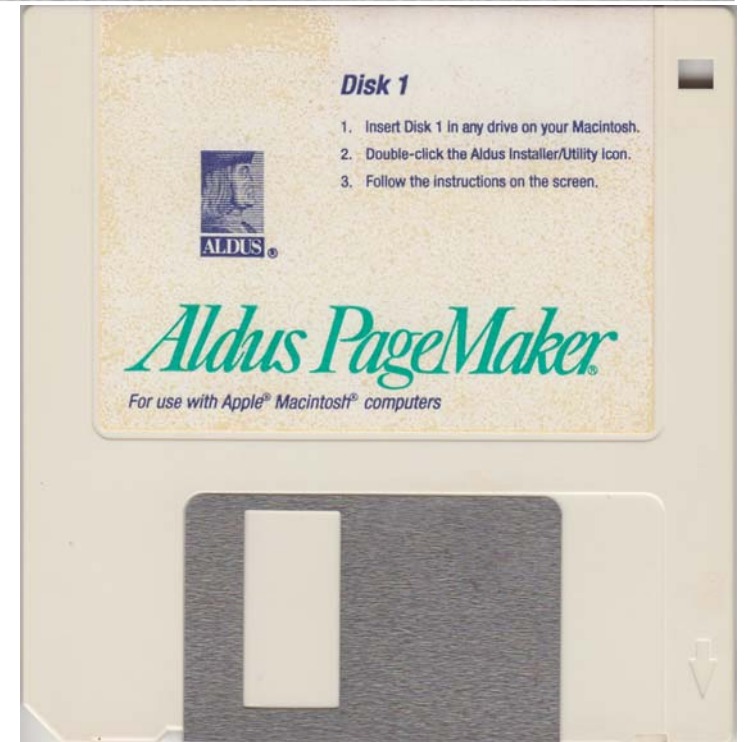




- **Douglas Drane, Charles and Richard Ying, 1973**
- **Jonathan Seybold met Doug & Charlie; John Seybold introduced them to *US News and World Report***
- **Dumb terminals, low end PDP-11s, custom designed hardware: memory-management, video-buffering, LAN-between-PDP-11s**
- **Software: Atex-developed multiuser/multitasking OS, publishing application software**
- **Custom configuration for each customer; many follow-on offerings; some developed with customers**
- **Grew to 1500 employees; dominated the market**
- **With increasing competition, sold to Kodak in 1981**

Desktop publishing

- 1970s, Xerox PARC, etc.
- 1970-80s, Seybold Reports and Seminars [described already]
- 1980-90s, development and consolidation of the desktop publishing market



Xerox PARC

- **The Alto networked (via Ethernet) workstation with a raster display which therefore could provide a graphical user interface**
- **Laser xerographic printers that could print high resolution bit maps for output pages**
- **Printer servers on the local area network (the Electronic Array Raster Scanner, EARS)**
- **“Press files” that could intermingle text and graphics**
- **The Fred program to create (on the Alto) outline fonts for printing and display using cubic splines**
- **The Draw program to create figures made up of text, lines, and curves, again using cubic splines**
- **The Press program to print Press files**
- **The Bravo and Gypsy WYSIWYG editors**
- **Interpress page description language (the predecessor of PostScript)**

	Adobe Inc.	Aldus Corporation	Apple Computer	Frame Technology	Interleaf	Quark Incorporated	Ventura Software
1981					Founded	Founded	
1982	Founded						
1983	Prototype PostScript laser printer						
1984	PostScript (Level 1) Deal to use ITC fonts in PostScript	Founded	Apple Mac with graphical user interface Deal between Apple and Adobe for PostScript [and raster output device?]				
1985	Licensing PostScript to other computer and printer manufacturers	PageMaker for Apple Mac for "desktop publishing"	Laserwriter with built-in PostScript using Adobe Type 1 and 3 font technology Marketing DTP to small businesses in information collaboration with Aldus and Adobe [check year?]		Interleaf Technical Publishing Software (TPS) for Sun, etc., workstations		Founded Innovative way to layout multi-story document.
1986	Other type libraries support PostScript Adobe pushes PostScript into graphics applications			Founded	Interleaf is market leader		Ventura Publisher for IBM PC (DOS)
1987					Later runs on more workstations, Mac, and Windows	QuarkXPress 1.0 for Mac high end publishing	
1988	Encapsulated PostScript graphics format (year approximate)	Lots of work on acquisitions and other products					

	Adobe Inc.	Aldus Corporation	Apple Computer	Frame Technology	Interleaf	Quark Incorporated	Ventura Software
1989						Offers to buy Adobe	The tiny staff was getting tired.
1990		Serious competition from QuarkXPress and others			Sold to Broadvision	Serious competition for PageMaker (year ?)	Acquired by Xerox
1991	PostScript Level 2						
1992				Has been made to run on Unix, Mac, and Windows PCs		Windows version with QuarkXPress 3.1	
1993	Acrobat and Portable Document Format (PDF)					QuarkXPress 3.3 (year ?)	Acquired by Coral
1994	Adobe PageMaker	Acquired by Adobe					
1995				Acquired by Adobe			
1996						QuarkXPress 4.0	
1997							
1998						Dominates Adobe PageMaker	
1999	InDesign 1.0						
2000	later InDesign dominates QuarkXPress					Founder Tim Gill leaves	

- **The DTP market developed and consolidated in a period of approximately a dozen years**

Observations

- **Early interactive and newspaper/periodical composition systems tended to be done in the east; the more graphically oriented desktop publishing systems tended to be done in the west; eventually it all came together**
- **Everywhere there was an evolution in putting the technologies into operational use – by the sellers and buyers; this allowed many niches**
- **There was an enormous amount of formal and informal collaboration**

Thank you

Questions and comments to
dave@walden-family.com

My publication plan

- **Presented at TUG 2019 some of the things I learned since 2016**
- **Will integrate new information more generally into my 2016 paper to become a 2019 small monograph**
- **Will submit a conference proceedings paper that covers what I presented at TUG 2019**