

# Typesetting before 1985 (*before DTP*)

## **Conrad Taylor : March 2013**

Recording available from <http://www.conradiator.com/av/>  
*Draft script: the recording deviates slightly from this*

This is the fourth in my series of autobiographical monologues, and in this episode I am talking about how I got involved with text composition and typesetting, in the decade before desktop publishing arrived — that is, from 1975 to 1985.

I have been interested in letterforms for a long, long time; an interest sparked in my last year of primary school, when Mr Duffy taught our class how to do italic handwriting. That got me interested in calligraphy generally.

In my second recorded episode, I talked about using spirit and stencil duplicators. The text for these was either handwritten, or produced on a manual typewriter.

When I went to Glasgow University, I rapidly equipped myself with an Adler Gabriele semi-portable typewriter/ The design of its typeface, as well as its ability to cut a duplicator stencil, were my two main purchasing criteria.

My third recorded episode took me into the mid-to-late seventies, when I learned how to produce camera-ready artwork, for printing on an offset lithographic press.

This printing technology, with its photographic means of making a printing plate, was highly liberating.

Any technology that could produce sharp-edged, high-contrast lettering was now eligible as a means of typesetting. And you could mix methods, just by pasting the different outputs onto your artwork.

So, for example — for *Movement*, the Student Christian Movement magazine, we commissioned typesetting for the body copy, and made headlines with Letraset rub-down type.

In this episode, as I said, my focus is on my experience of typesetting before 1985.

But if these recordings are going to be about my life, *and* my times, I should rewind, and give you some historical background —

about how getting type ready for printing  
had been evolving in the second half of the 20th century.

Now I guess a lot of people already know  
that in the 15th century,  
Johannes Gutenberg and sundry other experimenters  
devised a way of printing pages  
from an assembled collection of individual metal types,  
each type character being a kind of small stamp  
at the upper end of a pillar or rectangular section.

In the printshop, compositors would laboriously  
pick these individual types from the storage cases,  
the lower case for the minuscule,  
the upper case for the majuscule Capitals,  
assemble them into filled-out lines of text,  
and stack the lines next to each other  
to make up a column of type.

These serried ranks of little lead soldiers  
would then get boxed in with spacing material,  
and locked into an iron frame, called a chase.

The chase got transferred to the bed of a press.  
Then the raised faces of the type matter were coated with ink,  
and paper was pressed hard onto the type matter  
to transfer the inked impression onto the page.

This was letterpress printing,  
and for four centuries it hardly changed at all.

I do have some experience  
of letterpress type composition and printing,  
but only in a dabbling, hobbyist kind of way.

Around 1981, someone gave me a small hobbyist's  
letterpress printing machine, of the Adana brand,  
and with it, a collection of metal types, spacing material,  
a composing stick, and other supplies.

I used it to print business cards, and other small items,  
not only from the metal type I acquired with the press,  
but also from wooden blocks that I engraved myself,  
zinc line blocks that I had made from artwork — and lino cuts.

Shortly afterwards, 1981 I think it was,  
I enrolled for a year at Goldsmiths College in South London,  
in their Department of Graphic Communication,  
as what they called an Ad Hoc Student.

Basically this meant that I did a lot of what the post-grads did,  
but I would not be examined  
and I would not get a degree out of it.

Now, at the time I was also responsible  
for two young children, Adrian and Katrina.  
I was living with their Mum, Patricia.  
She had a full-time Community Health Worker job.

This meant that I had to organise my times at college  
around childcare duties and school hours.

As a consequence,  
I gravitated towards the letterpress room at Goldsmiths,  
not only to indulge my growing passion for typography,  
but also because it was very easy  
to break off midway through a typesetting project,  
park the type matter in one of those  
three-sided metal storage trays,  
which we called 'galleys',  
jump on the bicycle, and pedal off furiously  
in the direction of Charlton and the school gate.

The following year, as it happens,  
Goldsmiths invited me back —  
but this time they paid me  
as a part-time tutor and technician  
in the letterpress area.

My duties involved looking after 17 post-grads  
and trying to keep upwards of  
half a million little metal types  
properly organised in the type cases,  
which, given that students don't like to  
tidy up after themselves,  
was quite a challenge.

But to be perfectly honest,  
these forays into letterpress technology  
didn't have anything to do with my  
other practical, freelance work  
of designing and artworking magazines and newsletters,  
Annual Reports for voluntary organisations,  
books and booklets, leaflets and the like.

Most of the type I used in those projects  
was produced on various types of machine.

So, now for a bit of background  
about typesetting machines...

The first typesetting machines were invented  
at the end of the 19th century —  
great big clanking things!  
with molten lead in their veins,  
which cast metal type on demand.

The Monotype machine dominated in the book trade,  
until the fifties or sixties;  
the Linotype machine, which as its name suggests  
cast a whole line of type, as a single slug of type metal,  
hung on in the newspaper trade until the mid-1980s.

This was known as 'hot metal' typesetting.

Professional publishers didn't do their own typesetting:  
they commissioned it from printing companies.

But smaller publishing units in business,  
or government offices, or academia,  
or in voluntary organisations,  
turned to what (by contrast with Hot Metal)  
got called 'cold composition'.

Basically, to be honest, this was posh typewriter technology.

My first experience of this was in the mid 70s,  
working for Luzviminda Francisco at the  
Europe Third World Research Centre.  
I typeset the body text for our publications  
using an IBM Executive Model D typewriter  
with a one-time-use carbon film ribbon.

The Executive Model D was a proportional spacing typewriter.  
That means, a lower-case letter L or an I  
or a full stop or a comma,  
took up much less space widthways  
than, let's say, a capital M.

Compared to an ordinary electric typewriter,  
the result looked more like the real proportional type  
you would find in a magazine or newspaper.  
The letters just fitted together better,  
and the result was more attractive, and I'd say, more legible.

When I moved to Oxford and started to work for  
the development campaign Third World First,  
I got some new publishing toys to play with.

Our main way of preparing text for our magazines  
was with an even more famous IBM electric typewriter,  
the Selectric.

IBM Selectric typewriters carried the entire type-able alphabet  
on a spherical element often called a 'golfball'.  
In less than a second you could change  
from one golfball element to another one,  
completely changing the style of type, even in mid-line.

I think at Third World First we had a collection  
of six or seven fonts on these golfball elements,  
and I think they also came in two sizes,  
ten characters to the inch, and twelve characters to the inch.

However, the Selectric typewriter had limitations.  
Compared to the Executive Model D,  
it was in one respect a backwards step,  
because the fonts were all monospaced,  
not proportional like in proper typesetting.

However, there was a fancier and much more expensive  
version on the same essential Selectric golfball concept,  
which a lot of small printing companies used  
for more professional-looking typesetting.

This was the IBM Selectric Composer,  
and one of these cost about as much as a car!

At first glance the Composer looked like a Selectric typewriter,  
but had a few extra buttons and knobs down the side.  
It also used golfball type elements,  
but these fonts were proportionally spaced  
and came in a range of text sizes and styles,  
from about 8 point to 12 point I think,  
based on well established font designs  
such as Bembo, Garamond, Times, Baskerville or Helvetica.

Some of these Composers had an internal electronic memory  
or could store a typesetting job on a magnetic card.

Having typed a column of type first time round,  
making your decisions about where lines should break,  
you could flip a switch  
and have the machine print it out again —  
but this time, with the wordspaces adjusted  
to make a so-called 'justified' column  
with flush straight column edges, both left and right.

I did get to play with one of these Composers later.

Also, after I married Sang-usa Suttitanakul  
we acquired an Olympia Supertype,  
a very impressive machine;  
I think that was in 1984.

The Supertype was a bilingual,  
Thai and English electronic typewriter  
with a selection of interchangeable  
daisywheel type elements for each language,  
and they were proportionally spaced too.  
Clever stuff!

But when I worked at Third World First  
my means of setting type were strictly limited  
to the ordinary Selectric golfball typewriter —  
and Letraset for the headlines, of course.

Little did I suspect at that time  
that computer technology was already on the march  
and taking over the professional end of typesetting;  
indeed, I knew next to nothing about computers then.  
But that changed when I met Nicola Bourdillon.

Nicola was one of the great loves of my life.  
We were together in 1978 and the first half of 1979.  
She wasn't much older than me,  
but she seemed to have lived a lot more.  
She'd been to China in the years of Mao Zedong,  
travelled in India and on the Trans-Siberian Railway.  
She was a well-read feminist and was sexually adventurous,  
and had a keen intellect.

When I first met Nicola,  
I worked for Third World First and she worked for Oxfam.  
By the time we were lovers, she had taken a job  
with a peculiar Oxford institution of the time  
called 'Daily Information'.

Daily Information was a one-sheet news-poster  
distributed all over Oxford each day  
and supported by display and classified advertising.

The company also rented out electric typewriters to students  
and undertook thesis word processing  
— even mathematical and journal typesetting.  
Nicola learned to be a maths typesetter,  
which was done using some kind of computer system.

I wish I could ask Nicola  
just what sort of computer system they used for this;  
but it's too late, because she died in the 1990s  
of an unstoppable tumour of the brain.

In 1979 I went off for a five-month trip to Thailand and Malaysia;  
and by the time I came back,  
she had taken up with somebody else.  
I lost contact with her for several years after that;  
but I must say she had changed my life,  
and had made me aware of a link between  
computers, the organisation of text,  
and typesetting.

In the 1980s, Nicola joined Research Machines,  
the Oxford-based manufacturer of computers for British schools.  
The other day, I searched the Internet to see  
if I could find any evidence of Nicola's existence.

The only thing with her name on it was  
the Programmers' Guide to the Z-380 microcomputer,  
which she edited.

This memory of mine, then, is Nicola's partial obituary.

But now I must move my story onwards —  
towards my own encounter in the 1980s  
with computerised photo-typesetting.

Yet another technical aside is called for...!

In the 1960s, several companies were at work  
devising how to imprint the shapes of letters  
onto photographic paper and film.

In these photo-typesetting systems,  
the font was carried as a series of tiny negative images  
on a filmstrip or disc, which was made to spin rapidly.

When the desired letter came round,  
a flashgun fired and the image of the letter  
travelled through a set of focusing lenses  
to be printed onto the paper,  
which was later developed in a chemical processor.

This complicated photographic printing head  
was moved mechanically  
across the roll of photographic paper,  
exposing one letter at a time,  
until the end of the column was reached.

Really, it was like a photographic version  
of a daisy-wheel printer.

I came across phototypesetting machines  
towards the end of 1980,  
when I was living in South London with Patricia.

My former employers, Third World First  
asked me to design a newsletter.  
At about the same time,  
the Campaign Against Depo-Provera  
wanted me to design and produce a book for them.

I don't remember where the recommendation came from,  
but I was fortunate at this time to be introduced  
to a very proficient phototypesetting compositor  
by the name of Shanta Thawani  
in Bounds Green in North London.

Shanta did typesetting for a number of publishing houses,  
using AM VariType machinery.  
The VariTyper fonts were carried on glass disks  
and I don't think you could have more than two or three  
installed in the machine at any one time;  
as a designer, you had to take account of that.

The machine was — well, kind-of L-shaped:  
the larger part was the actual photosetter,  
and sticking out at ninety degrees at one end  
was the operator's workstation:

basically, it was like an old-fashioned word-processor with a text display on a green screen and absolutely no preview of what the job would look like when printed out.

Shanta took the typescript I supplied, and input the text into the VariTyper, at the same time inserting the control codes which selected the font, changed the type size, set the letterspace and linespace and indicated where lines should break, for in those days there was no automatic linebreaking algorithm.

As the job was being typeset the first time round, it was also being stored on an eight-inch floppy disk.

After the so-called galley output had been proofread and any mistakes marked for correction (not that Shanta made all that many mistakes) the floppy disk could be re-inserted into the machine. The job would be called back onto the screen to be corrected electronically before being printed out again.

Shanta was such a fast and productive operator that she had not one VariTyper in her living room, but two...

Because, you see, when one of the machines was directed to print out a formatted text, this would take quite some time. So, she just swapped over to the other machine and started a new job.

Her efficiency and earning capacity was such that Shanta's husband, who had been a GP, gave up his practice to act as her office manager.

However, despite her efficiency, Shanta was enormously generous to me with the time that she took to explain the best way to mark up instructions on typescript copy and also how to mark proofs for correction.

Another very useful source of instruction for me was the book 'Phototypesetting: a design manual' written by James Craig, for Watson-Guptill publishers which became my typographer's Bible and *vade mecum*.

Shanta lived and worked in Bounds Green but after I started at Goldsmiths College I discovered another typesetting shop down the road in Loampit Vale in Lewisham; it was called Jubal Multiwrite and was run by Father Francis, I forget his second name, an eccentric Anglican priest.



I used Jubal for a few jobs, and then in 1983  
I took space in a room on their first floor  
and set up my own little graphic design studio.

Jubal had a Selectric Composer, which I played with;  
but their main machine was a Quadritek phototypesetter.  
A bit more advanced than the VariTyper.

It also used fonts that were physical negatives,  
in fact each font was sandwiched into a perspex quadrant,  
hence the Quadritek name,  
so you could have four fonts loaded at once.

For example, you might have  
Baskerville, Baskerville Italic and Baskerville Bold  
for the body type,  
and Franklin Gothic Bold for the headlines.

By adjusting the lenses within the light path,  
the machine could make type from tiny four point  
up to — hmm, I think — 72 point.

I can't remember if it used 8 inch floppies  
or the new five and a quarter inch floppies;  
I do remember that it was multi-user,  
and Jubal's machine had two input terminals sharing  
the central CPU unit and output device.

I remember one time I organised a visit to Jubal  
by the postgrad design students from Goldsmiths.

I felt I had a duty to rescue them from the delusion  
that modern typesetting was done with lead type,  
which I think they might have believed  
from what they were exposed to at Goldsmiths!

Now a word about typesetting mathematics.

Back then, you certainly didn't just rush into  
commissioning a phototypesetting job,  
not if you had any sense.

You did your copyfitting calculations first.

Remember, these systems weren't WYSIWYG  
— What You See Is What You Get —  
the green screen just showed  
the characters that had been entered  
and also the formatting codes.

Now, just suppose you'd requested the type to be set  
at 12 point size, with a 14 point linefeed,  
and when you got the printout back  
you found that it was too big to fit  
the page space you had available.

You might retrospectively have to change  
the typesetting spec...

maybe to 11 point type  
or else — edit the text down, cut words out.

Either way, you would quite legitimately be charged  
for operator and machine time and materials cost.

The smart thing to do was to mathematically model  
the process in advance, before going  
anywhere near the typesetters.

The first step, as John Craig's book taught me,  
was to estimate the total of  
all the letters and spaces in each  
paragraph of the typescript.

Not one by one — there was a smart way to do that  
by marking a vertical line for the average line length,  
which might be, let's say, 70 monospaced characters,  
then multiply by the number of lines in the paragraph.

You then had to know how many characters  
would be generated, on average, for each line of  
the typeset material.

Quadritek, indeed all of the typesetter manufacturers,  
gave their customers a fat three-ring binder of type samples  
which also contained copyfitting data.

Thus for example I might read that when set at ten points,  
a particular font would, on average, generate 2.23  
characters per pica, that is, per sixth of an inch...  
So a column of type set at eighteen picas wide  
would contain, on average, just over 40  
characters, spaces and punctuation marks.

In short, the job involved a lot of repetitive maths...  
but the prize for doing an accurate copyfit  
was that you got the job typeset faster, and cheaper —  
and if you were also good at proof-correction,  
the job would be ready for paste-up  
with only the second print-out.

And boy, was I good at it!

I once figured that, my copyfitting estimates  
were out by less than two percent.

And this, by the way,  
is where the microcomputer entered my life.

I had started reading Personal Computer World  
for my own general education  
and it was obvious to me that the copyfitting process  
involved plugging some variables into an equation  
then applying the same equation to a batch of data  
derived from measurements of the text paragraphs.  
Why not automate it?

I bought a little Casio PB-100 pocket computer:  
a primitive thing with one kilobyte of RAM  
and a 12-character LCD text display  
but I taught myself some programming in BASIC  
and it was good enough for automating my  
copyfitting calculations.

And there was something else I noticed.

Father Francis who ran Jubal  
wanted a third terminal for inputting typesetting jobs  
but to buy one from Quadritek would have been very expensive.

Instead, he bought a cheap Sharp microcomputer,  
and software which made it behave like a Quadritek front end;  
it could even write a floppy disk so that the Quadritek  
would be fooled into thinking it was one of its own.  
So I began to see that a typesetting job  
could start electronically on one system,  
and then be moved to another one for output.

All of this experience stood me in good stead,  
when Sang-usa and I were invited in the autumn of 1984  
to join the workers' co-operative  
publishing the magazine Inside Asia  
edited by Larry Jagan and Tony Kahane.

I took responsibility for all aspects of  
typographic design, typescript mark-up and copyfitting,  
and the two editors and I did the proofreading as a relay team.

Typesetting was provided by a company in Kilburn,  
run by former Malaysian student Dunstan Chan.  
They ran Compugraphic Modular Composition System kit.

The MCS was a representative of the next generation  
of typesetting machines: a CRT setter.

That meant, there was no longer a physical font  
as a photographic negative.  
Instead, images of type characters  
were generated by software on the face  
of a cathode ray tube.

This in turn meant that all the fonts  
for which the typesetting company  
had purchased the license and software  
were available and online at all times.

Also, freed from many mechanical constraints,  
output was damned fast!

From one year after we started Inside Asia,  
we did have one computer in the offices in Pentonville Road —  
that was Larry Jagan's Amstrad PCW word-processor.  
At just under four hundred quid, the PCW was a bargain,

and introduced millions of people to the benefits  
of word-processing.

However, there was no way that the text files  
that Larry could generate on his PCW  
could be transferred electronically to Duncan's typesetting system;  
so all of Larry's Amstrad texts got printed out,  
marked up by me, and sent — on paper — by motorbike to Kilburn  
to be keyed in again.

With all the possibilities for error that brings in.

Ridiculous? I guess so,  
but that's how things generally were back then.

*Phototypesetting,  
generating long rolls of bromide paper;  
followed by scalpels and adhesive  
to make camera-ready artwork.*

But then one day in Autumn 1985,  
Sang-usa and I went to a reprographics exhibition,  
where we met a little beige Apple computer  
which was about to change our lives.  
But that — well, that's another story.