A Field Guide to the Teletypesetter

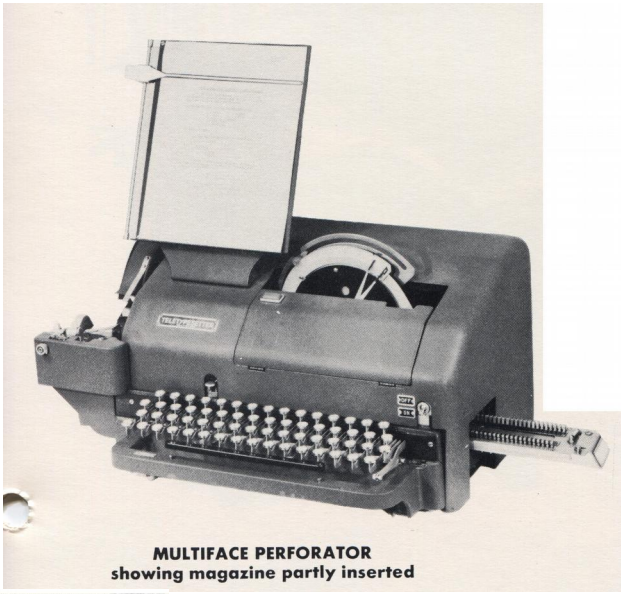
David M. MacMillan

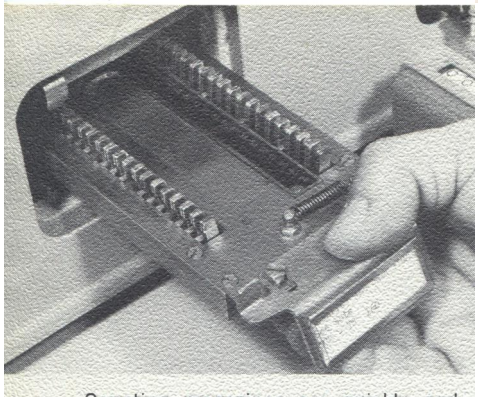
Many of the various pieces of equipment which made up the Teletypesetter (TTS) system are not distinctive in external appearance. They're also unfamiliar to most letterpress printers and teletypewriter enthusiasts. This is a quick visual guide to the system.

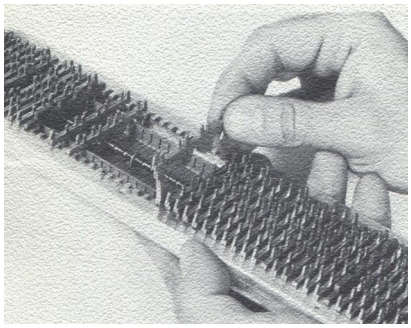
1. The “Perforator” (Keyboard)

This is the basic unit in the system. It always contains a keyboard with an integral paper tape punch. It may be associated with a Table, a Tape Winder, and/or a Line Counter. The Perforator was introduced in the late 1920s and came in two variations: “Standard” and “Multiface.” Note that the Multiface Perforator (only) has a removable “Counting Magazine” on its right side. These Counting Magazines are full of tiny “Counting Code Blades” which adapt the machine to the set widths of the typeface to be used. They are frequently lost. Caution: the outer case of a Perforator is, by design, not firmly attached to its frame/base. Try not to lift the unit by its outer case.

STANDARD PERFORATOR


MULTIFACE PERFORATOR
showing magazine partly inserted



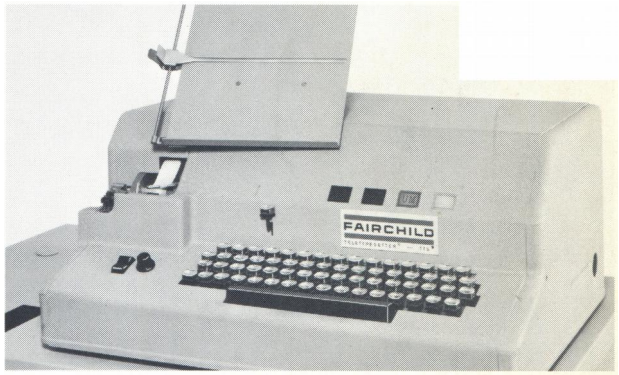


After Fairchild acquired the Teletypesetter Corporation in the late 1950s, they redesigned the Perforator into several “Light Touch” models. These also came in “Standard” and “Multiface” versions (the latter, still, with removable Counting Magazines).

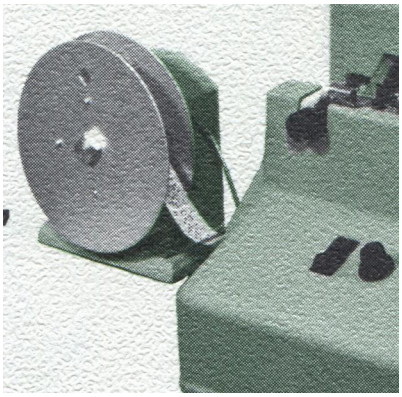
MULTIFACE PERFORATOR—Designed primarily for use with

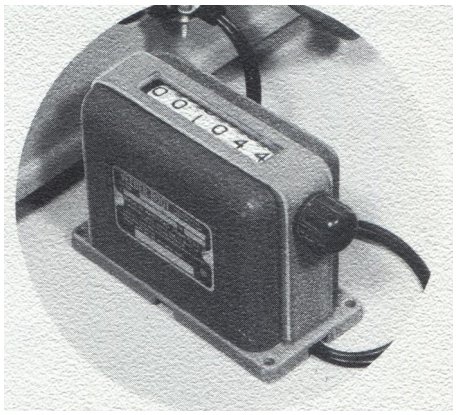
Fairchild also introduced two other models, a “Universal” Perforator (for use with mixer linecasters) and a “Non-Counting” Perforator (with no line justification capabilities, for use in keyboarding input into computer tape-justification machines such as the Compugraphics/Linotype Justape).

UNIVERSAL PERFORATOR—Permits mixing of type faces



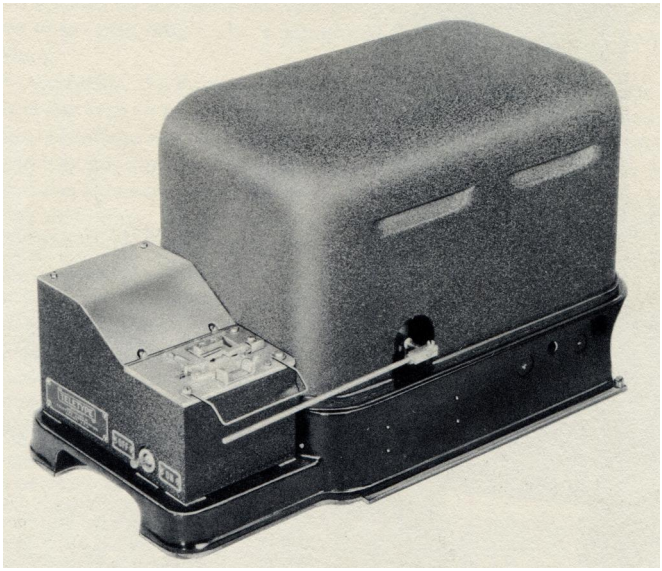
All Perforators might come on a custom Table. Fairchild units might have an external Line Counter. The tape punched by all Perforators might be received by a Tape Winder (sometimes made by TTS/Fairchild, sometimes made by the telegraph equipment maker Bunnell). Even in the Atomic Age, the Tape Winder remained a wind-up spring-driven unit.





2. The “Transmitter-Distributor”

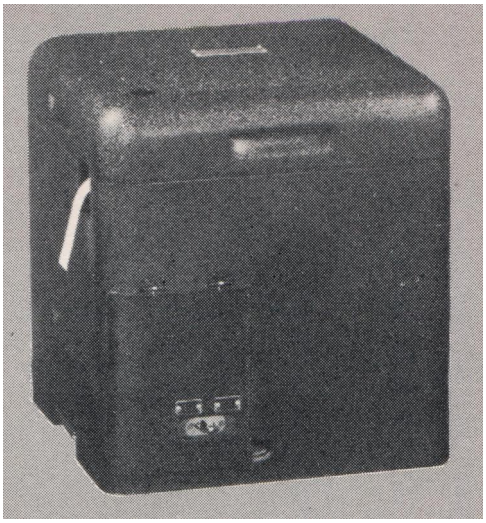
The Perforator just punched a tape. After it was punched, this tape could either be mounted directly on a Linotype/Intertype (see “The Operating Unit,” below) or it could be transmitted electrically to a remote location over a telegraph circuit. This telegraphic transmission was done using a unit called a “Transmitter-Distributor” (TD). (Aside: In the 20th century, telegraph circuits were multiplexed on to telephone lines. The codes used were 5 and 6 level start-stop codes, not Morse code.)

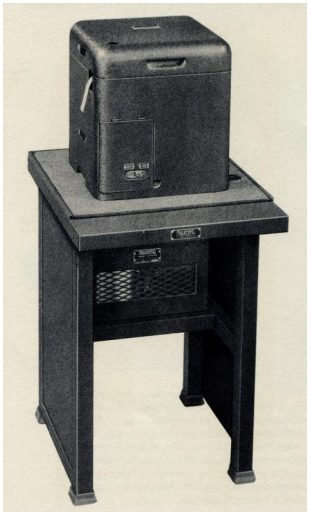


Note that the large rectangular cover on a Transmitter-Distributor is a casting and that it <u>is not attached</u> to the TD (it just rests on it). It can fall off or become separated from the unit.

3. The “Reperforator”

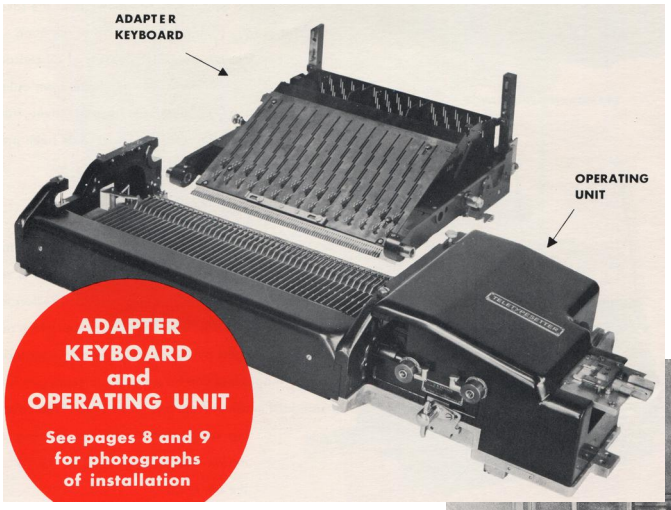
At the receiving end of the telegraphic signal, either (or both) of two things could happen: the transmitted text could be printed out on a Teletype Model 20 Page Printer (discussed later) or it could be punched to a new tape using a unit called a “Reperforator.” The Reperforator was sometimes supplied with a special Stand. On the outside, the Reperforator is just a nondescript metal box. Plain as it is, it is still a necessary part of the system.

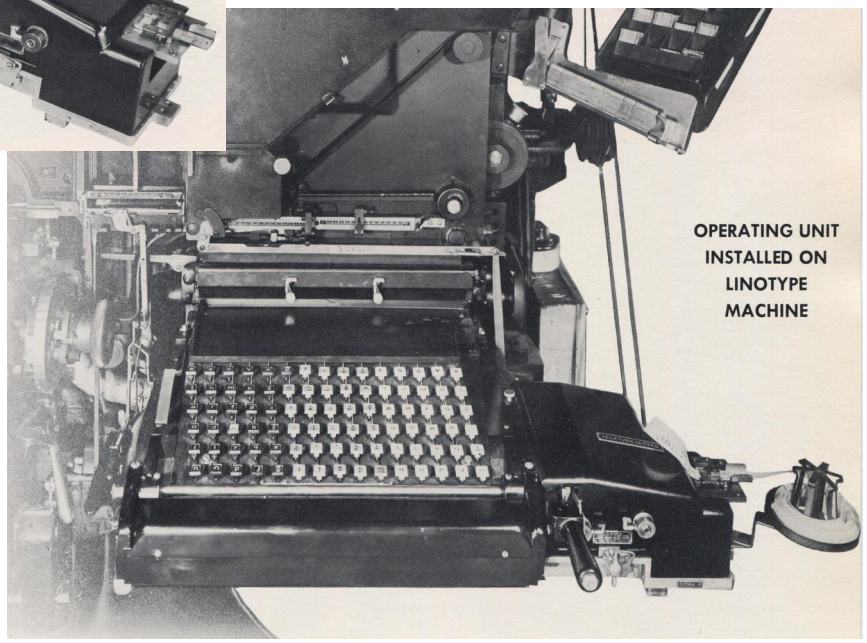




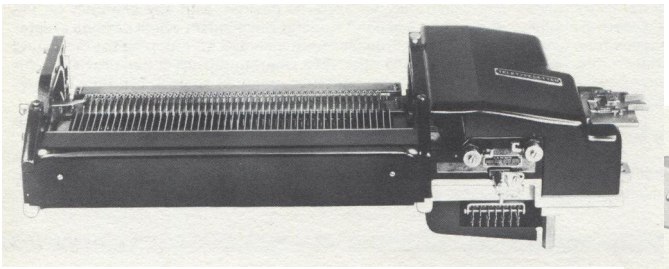
4. The “Operating Unit”

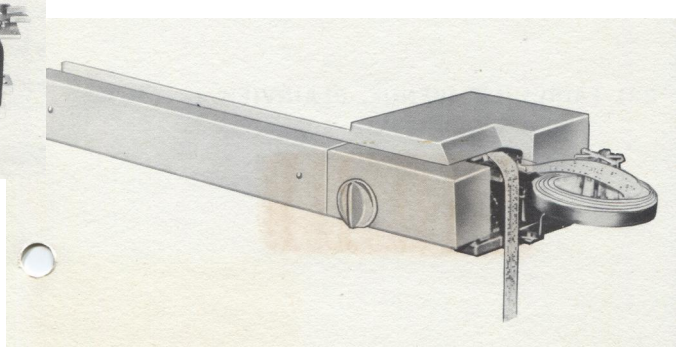
A TTS-equipped linecaster was driven by paper tape (not directly by telegraphic signal). A TTS linecaster was fitted with a unit under the keyboard which had a paper tape reader and which actuated the standard linecaster keyboard mechanism. This unit was called the “Operating Unit” (sometimes “TOU” for Teletypesetter Operating Unit). Most TTS-equipped linecasters retained their keyboards and could also be operated manually. A few later ones (some Linotype Elektrons; I'm not sure about the Intertype Monarchs) were not fitted with keyboards and were TTS-only.





There was some variation in the appearance of Operating Units.





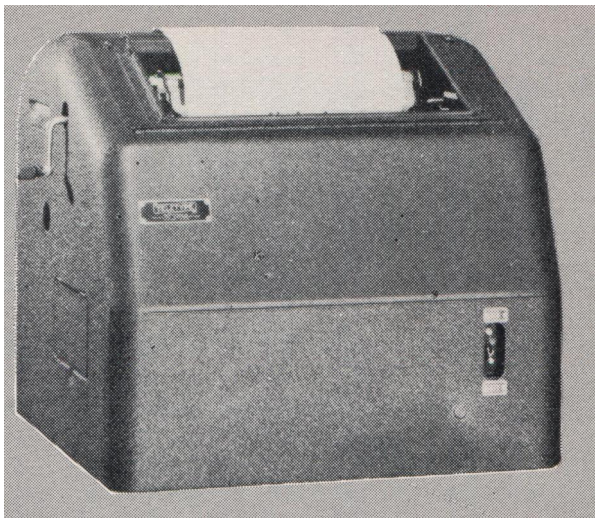
5. The Model 20 Page Printer

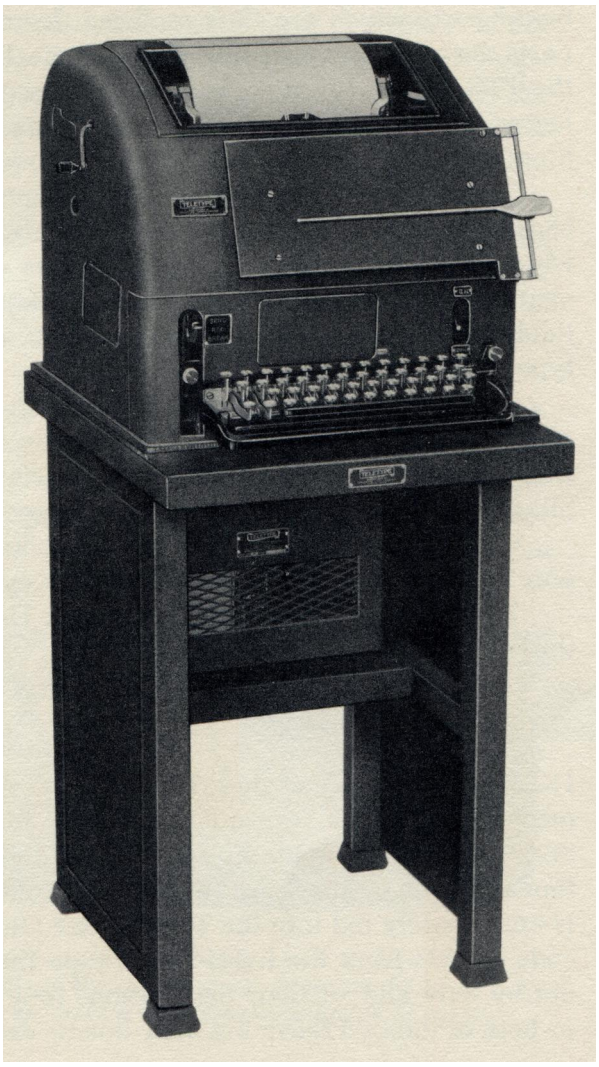
At the receiving end of the TTS signal, the transmitted text could also be printed directly on a Model 20 Page Printer. (Note: TTY/TTS model numbers have nothing to do with Linotype model numbers.)

This unit was manufactured by the Teletype Corporation. It may be branded “Teletype” or “TTY”; it is not necessarily branded as a TTS/Teletypesetter. (The branding of Fairchild-era units is not yet clear to me). The Model 20 Page Printer is externally indistinguishable from the Teletype Model 15. I *think* that both could be supplied with or without a keyboard (the keyboardless unit shown below left is from Fairchild literature, the unit with keyboard shown below right is from Mergenthaler Linotype literature).

Aside: The TTY Model 15 was a “five-level” (five-punch tape) unit which could only do uppercase and therefore was not suitable for TTS operation. The TTY/TTS Model 20 was a “six level”/TTS tape machine which could do upper and lower case.

Like the Reperforator, the Page Printer could be supplied with or without a Stand.





6. Minimal Equipment Setup

In order to run a Teletypesetter-equipped composing linecaster in local operation, the minimal equipment required is:

- A Perforator (keyboard)
- A Tape Winder
- TTS 7/8 inch paper tape, preferably oiled
- A Linotype or Intertype equipped with the appropriate TTS Operating Unit

Additionally, your linecaster should probably be equipped with some kind of “mat detection” system (to be discussed later) to stop the machine safely in the even of jammed matrices.

In order to accomplish complete one-way remote Teletypesetter operation, you need the following additional equipment in between the Perforator and the TOU:

- A Transmitter-Distributor
- An appropriate telegraph line
- A Reperforator

Any realistic installation would also include:

- A Teletype Model 20 Page Printer

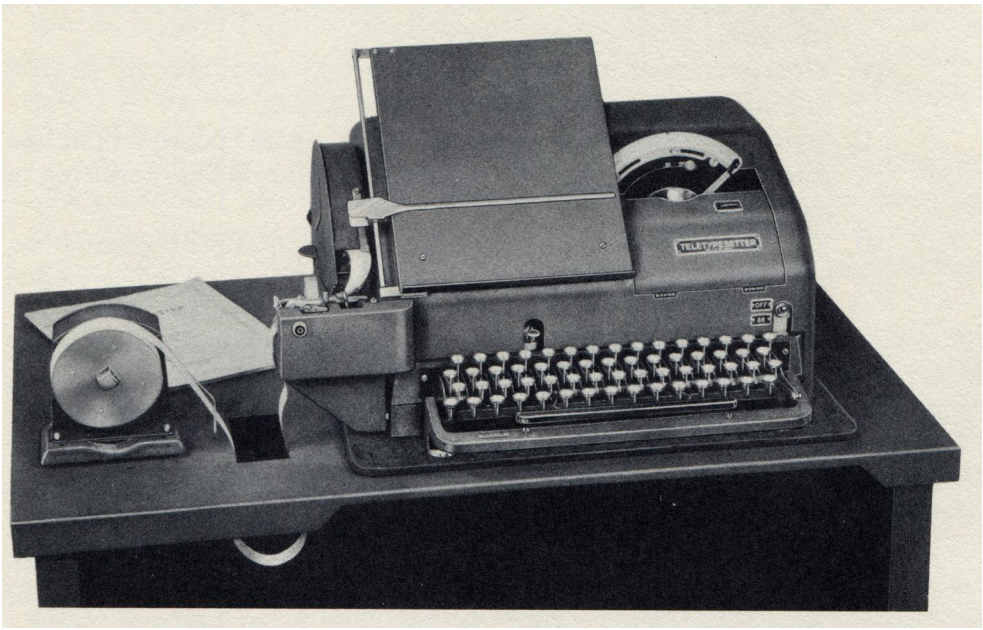
Note: The machines shown in the previous pages are those necessary for a basic TTS setup. From here on out we're in to equipment which is less critical, more specialized, or in some other way more unusual.

Appendix 1. Auxiliary and Third-Party Equipment

1a. Tables, Stands, and Power Supplies

As noted earlier, these various units were sometimes furnished on special tables or stands. These tables were of standard Teletype Corporation construction, and are therefore substantial (meaning heavy). Tables or stands may, additionally, include Teletype Corporation power supplies.

Also as noted earlier, Perforators might be equipped with Tape Winders (sometimes by Bunnell) and (for Fairchild units, at least) Line Counters. Here's an image of a Perforator with a Tape Winder as installed on a Table:



Aside for TTY enthusiasts: The TTS model 20 Page Printer is a variant of the TTY Model 15. A TTY 15 plus a Table and a 5-level TTY Transmitter-Distributor made up the TTY Model 19 set. I am unaware of any corresponding designation for the TTS Perforator.

1b.Third-Party Keyboards

Several companies produced TTS-compatible keyboards (primarily in the Fairchild TTS era). Here's the Star Parts Autoperf.

Here's a later machine: an AKI Autocomp PCI-80 keyboard/perforator (a bit dusty in this photograph).

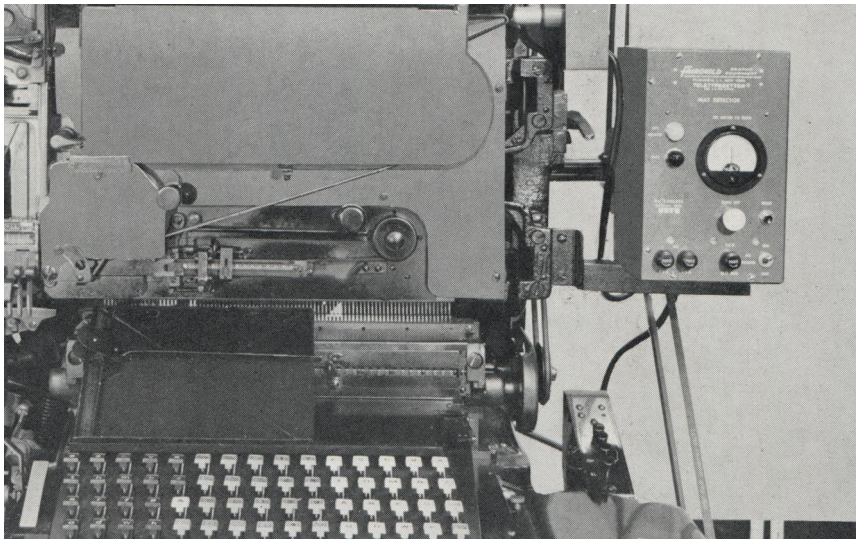
A great deal of phototypesetting keyboard and tape-related equipment was also TTS-compatible.

1c. Matrix Detection Systems

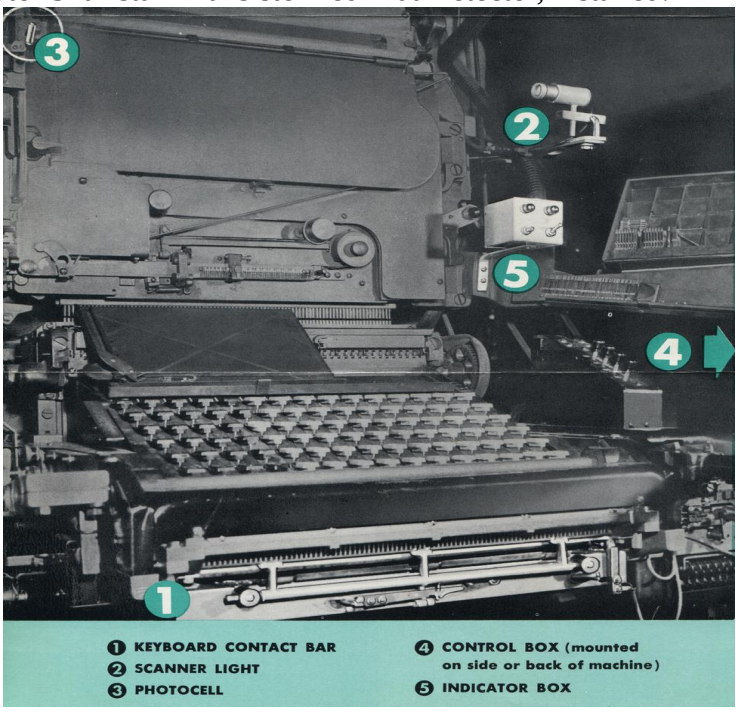
Linecasters in automatic operation ran an increased risk of damage (and lost time) when mats jammed. Where in a manually operated machine this would be noticed by the operator and immediately cleared, in automatic operation the machine itself had to detect this situation and stop.

Mat detection systems were made by both Fairchild and by the Shaffstall company. Linotype also made their own equipment for this purpose (e.g., the “Electromatic Safety Device”), and installed it on both TTS-equiped and non-TTS Linotypes (my Model 29 has some of this equipment). There was also TTS-specific equipment for the Linotype Comet. I'm not sure what Intertype provided in this regard.

Here's a picture of the Fairchild mat detection system, installed:



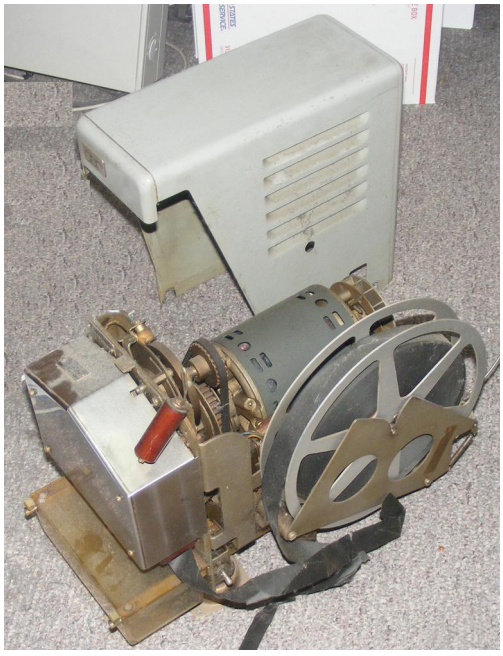
Mat detection hardware is difficult to illustrate because as installed it is distributed throughout the linecaster. Here's the later Shaffstall Transistorized Mat Detector, installed:



1d. Other Paper Tape Punches

There were any number of third-part paper tape punches that were either designed for or configurable to 6-level TTS operation. Here's one example – a Litton "Roytron" punch intended to be connected to a computer:

The Teletype Corp. (which was "third-party" to TTS after Fairchild) also made their BRPE model high-speed punch. These could be configured for 5, 6, 7 (ASCII) and 8 level operation. Here's a BRPE:

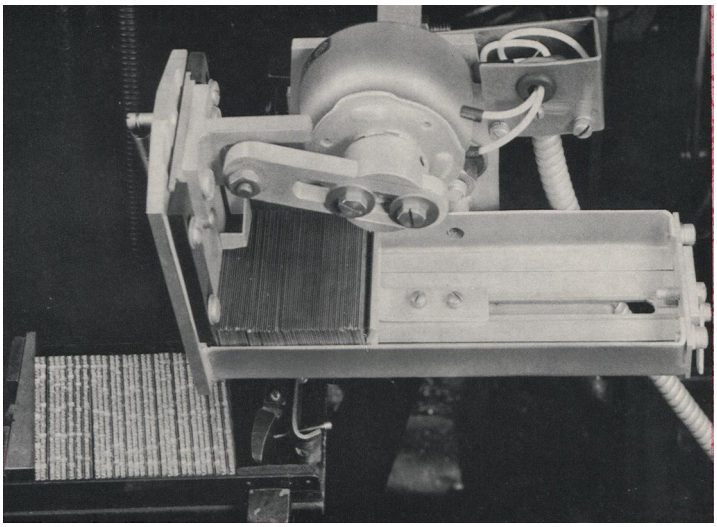


Note that in standard TTY engineering style, the case is not actually attached to the base of the machine.

The reader/punch equipment which came with the Mergenthaler M/101 CorRecTerm CRT typesetting system was also 6-level and TTS compatible.

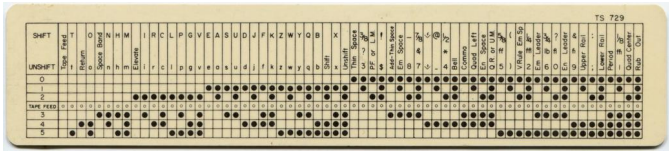
1e. Fairchild Rule-Dropper

Fairchild also built a “Rule Dropper” which would, under tape control, add pre-cast rules from a tray into the linecaster's galley.



1f. Bits and Pieces

Some Teletype tape maintenance devices work with 6-level TTS tape as well. And no pocket is complete without a pocket ruler with TTS code chart. The photographs below are not mutually to scale.



1g. TTS Parts and Tools

For the most part, Teletypesetter parts come in nondescript little envelopes. Sometimes they may carry the "Teletype" (rather than "Teletypesetter") name. Keyboard and Operating Unit parts are often long, thin, and punched. TTY/TTS engineering has a feel to it which is entirely different from Mergenthaler Linotype engineering.

Teletypesetter tools tend to be small and interesting. The spring scales will bear the names of third-party manufacturers.

1h. ITU Brewer Keyboard

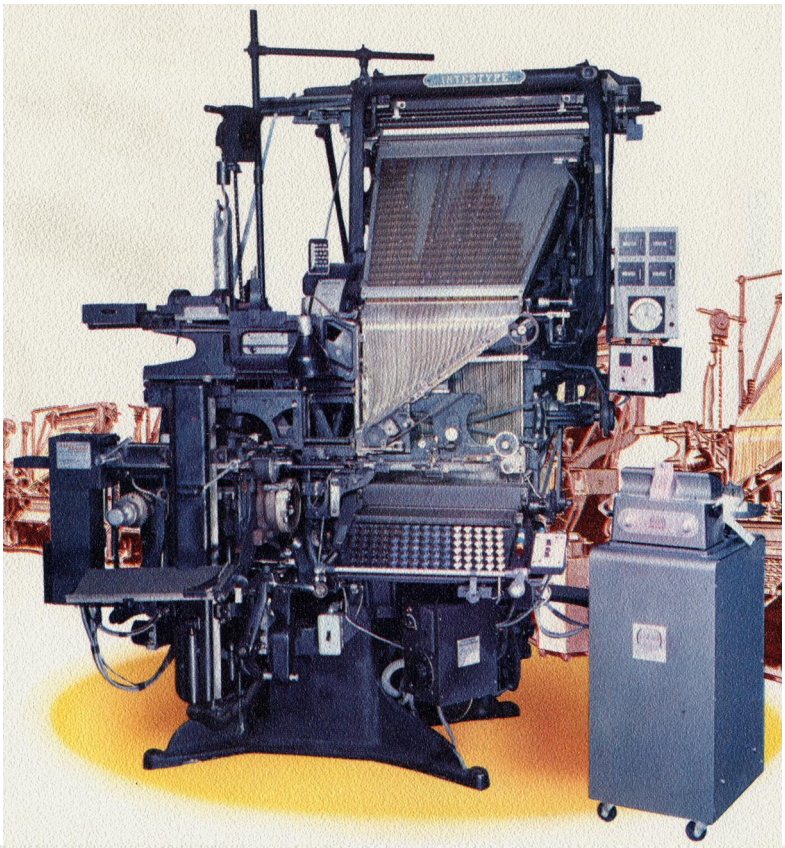
The TTS was developed by the Gannett newspaper syndicate not only to speed transmission of the news but also to allow unionized Linotype operators to be replaced by non-union underpaid female labor. Putting aside the (many) social and legal issues, the technological aspect of this was that the Linotype operator knew the etaoin keyboard but the secretary knew only the qwerty keyboard. The TTS always had a qwerty keyboard.

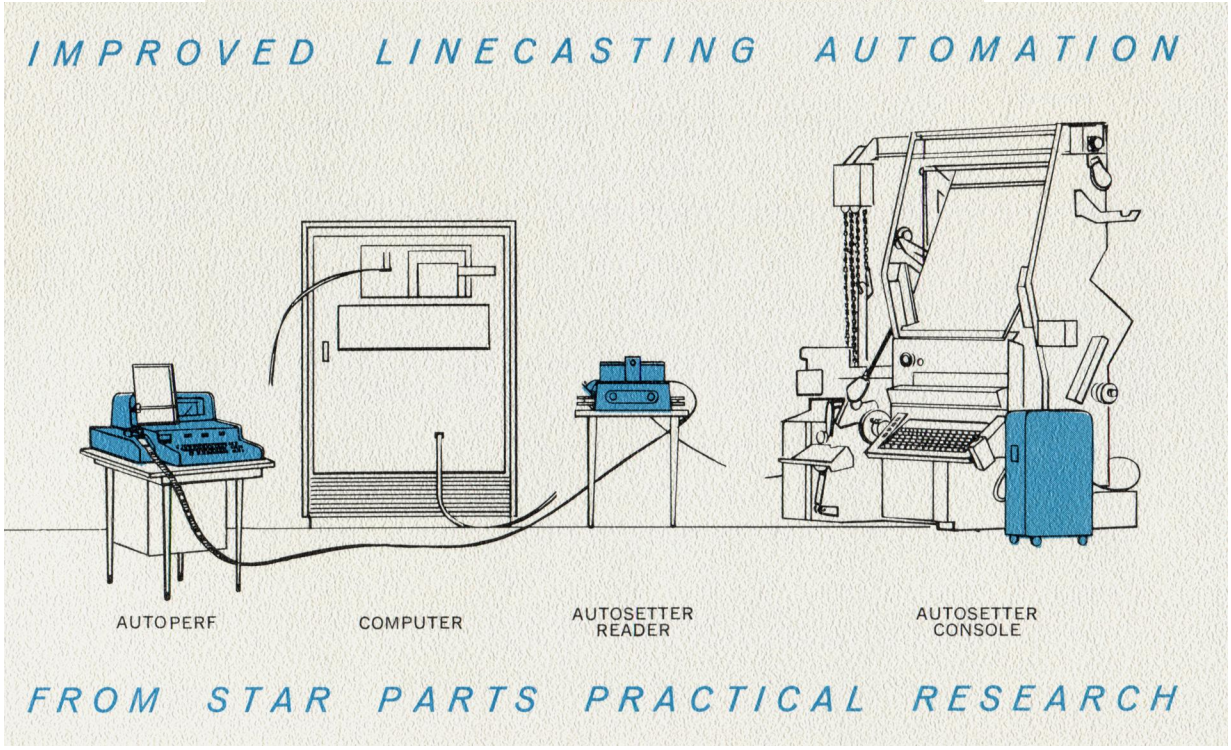
On the one hand (not TTS-related) this led to at least two systems which placed a qwerty keyboard on top of an etaoin keyboard (the Kellog and Hal Stern's ELK). This allowed qwerty-only labor without the expense or complication of going to the TTS.

There was also one attempt to go the other direction. The International Typographical Union's Brewer keyboard was an etaoin keyboard attached to an otherwise unmodified qwerty TTS Perforator. This would allow Linotype/Intertype operators to retain their jobs in a TTS shop. It was not a commercial success. I do not know if any survive.

Appendix 2. Compatible Complete Systems (Star Parts)

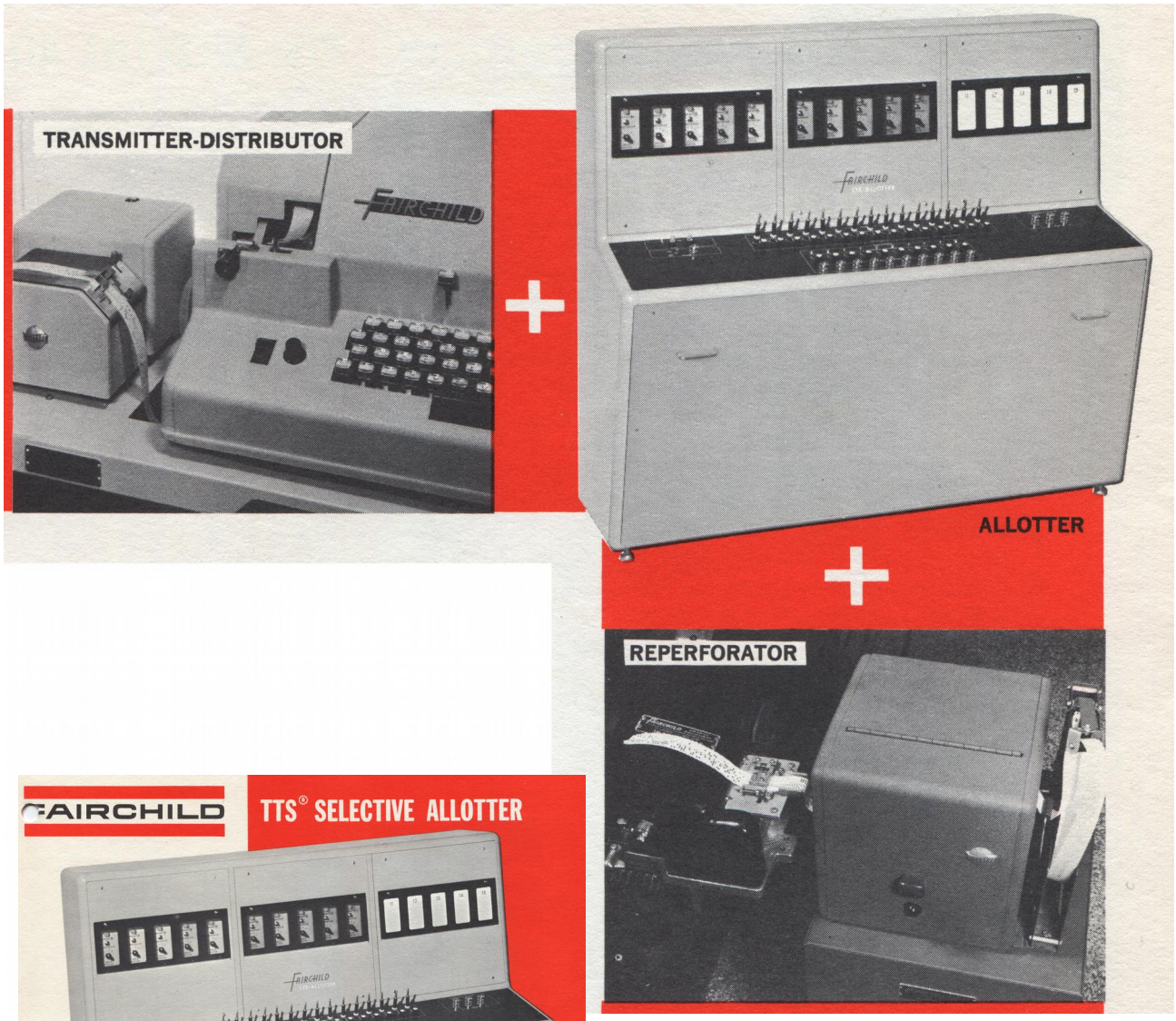
Star Parts, the largest third-party Linotype/Intertype parts supplier, developed various items of TTS compatible equipment over the years. By the end, they had developed a complete system and moved into computer typesetting. Here are two view of the more elaborate "Star Autosetter" system.





Appendix 3. The Fairchild “Selective Allotter”

This was a machine which made sense only in very large operations. I would be surprised if even a single one survives today. It was basically a large electric (probably not electronic) switching unit which took as its input both TTS wire service signals and local TTS Transmitter-Distributors and switched these input streams (“allotted” them) between TTS Reperforators installed alongside linecasters. This allowed the linecasters to run continuously regardless of the rate of, or interruptions in, individual inputs.

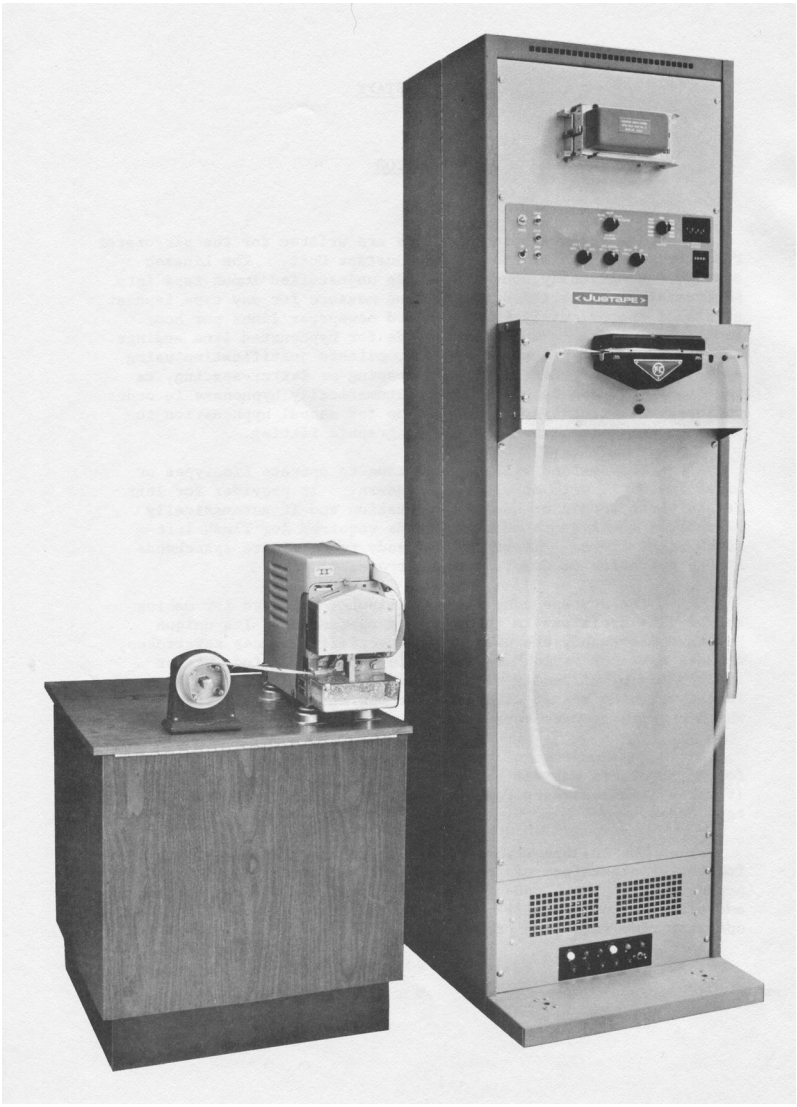


Appendix 4. Computerized Hot Metal Type

Although the Teletypesetter began as a self-contained system for transmitting text for automatic setting, it evolved into a de facto standard for information processing which from the 1950s onward allowed the creation of early computerized typesetting systems. They may appear primitive to us in the 21st century, but they set real type – which is more than you can say for any digital type system today other than Bill Welliver's Monotype Composition Caster computer interface.

Here's one example that was sold more widely than others: The Compugraphic Justape, rebranded as the Mergenthaler Linasec Justape. It took as its input a TTS tape punched without any line justification information (produced by low-paid typists unskilled in typesetting). It computed the line justification and punched the justified TTS tape for use in a linecaster or phototypesetter.

Here's the machine – a standalone special-purpose computer – connected to a TTY BRPE punch and a Bunnell-style Tape Winder (which could have been built in the 19th century).



Appendix 5. Why?

It's old equipment that has been completely discarded by industry. (Even the few remaining automatically operated Linotypes today run instead on 1980s vintage special-purpose interfaces, not TTS equipment.) Most of the hundreds of TTS installations were scrapped without a thought. Why save what remains? There are several reasons.

First, of course, it's a part of the history of printing, and especially the newspaper industry. This is a sufficient reason, but to be honest it's not why I'm saving this equipment.

Second, the equipment itself is fascinating. Search youtube for “AP Model 20 teletype”, a video by Bill Buzbee. If this does not entrance you, then you do not have machinery in your heart.

This *is* a part of one of the reasons that I'm interested in this machinery. Not only is it beautiful, but it forms a link between the era of paper tape computation and printing type. I started out as a programmer in the late paper-tape era, and have discovered letterpress printing type in my retirement, so this equipment speaks to me.

But there is another reason – one not recognized by most users of “digital type” today, but no less important for its obscurity. By the 1960s and 1970s Teletypesetter and 6-level tape technology had begun to create an entire small industry of computerized typesetting equipment capable of working with both hot metal and photographic type production in ways which respected all of the traditional aspects of type (body size, etc.) This *could* have been the birth of modern digital type, and if that had happened it would have given us digital type today which was in fact an exact analog of traditional metal type and its capabilities.

It was not to be. Teletypesetter-based digital typesetting technology was destroyed almost overnight in the early 1980s by the adoption of Postcript by the Macintosh. Postscript, the computerized lettering encoding with which we produce nearly all print today, was created in complete ignorance of real type and does not encode basic aspects of real type. It is in principle not possible in Postscript and its derivatives (which represent all of digital “type” today) to perform even the most basic operations equivalent to setting real type (because these digital formats do not encode the concept of type body size). As I am both a second-generation computer programmer (who knows we could have done better) and a typefounder (who knows what type really was), I am deeply troubled and discouraged by this failing.

The computer today allows us to do very sophisticated computer-assisted *lettering*. But lettering, as fine a thing as it is, is not type. TTS-driven equipment set real type, in metal and photographically. Had we continued on this path we would be setting real digital type today. The Teletypesetter isn't just a relic of the newspaper age. It represents a higher-quality path in type technology *which we did not take*. We should look at Teletypesetter equipment and contemplate how much *less* sophisticated we are today than they were when they made this old junk.

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