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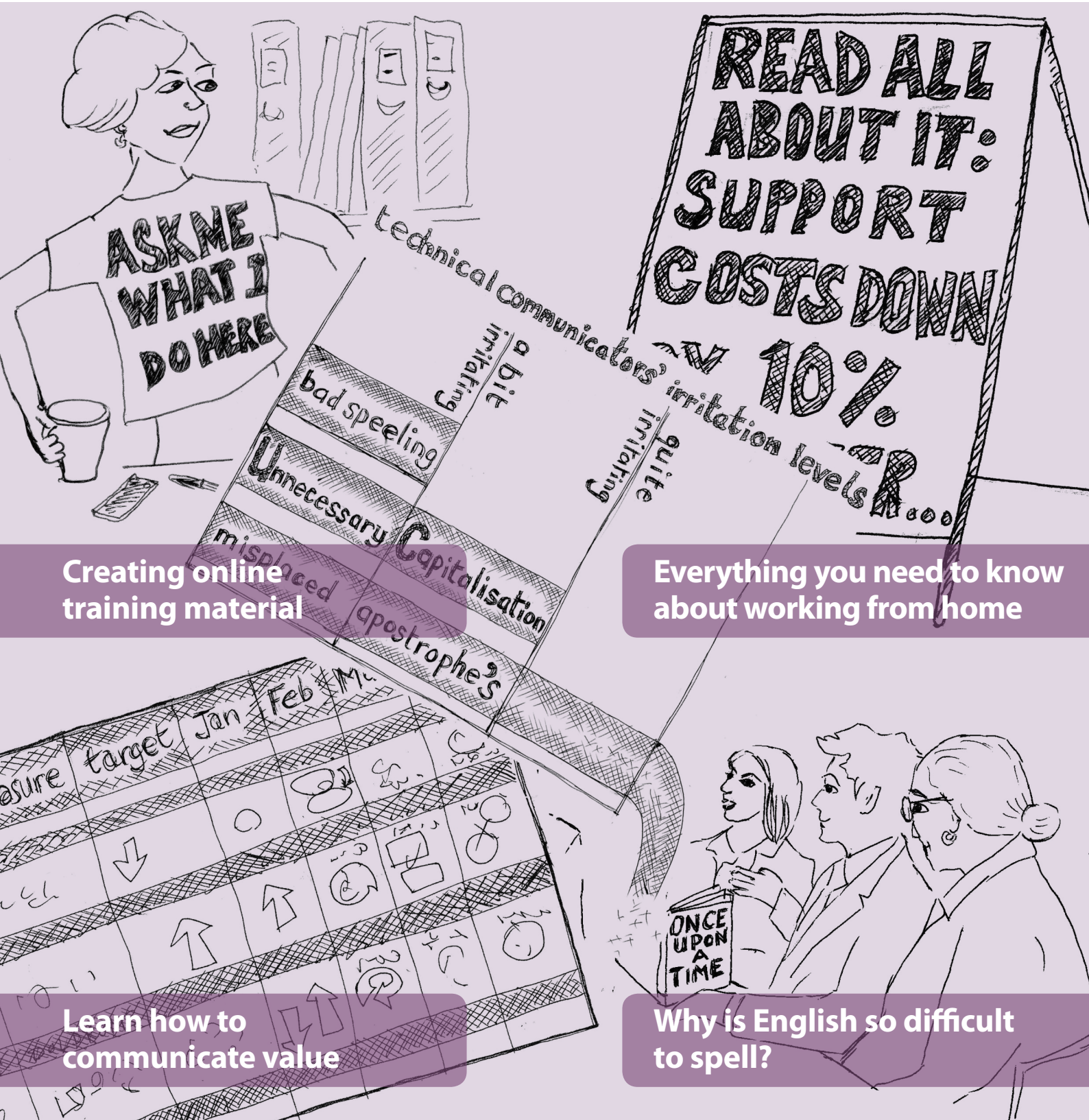
The Institute of Scientific and Technical Communicators
Autumn 2013



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How things were

Were all old documentation styles wrong? Richard Truscott compares an old BT instruction manual with modern practice.

In this article, I am going to look at a 1961 one-page manual used by Post Office[i] Telecommunications Technicians to do a small maintenance task in a telephone exchange. I will examine the document in detail and compare what is the same in modern documentation and what has changed.

In 1961 in the UK, the Strowger[1] telephone exchange was ubiquitous. The year 1912 saw the installation of the first Strowger exchange at Epsom, Surrey, the last being taken out of service at Crawford, South Lanarkshire, in Scotland in 1995[2].

This type of exchange worked by making connections between customers by passing a moving contact (called a wiper) over fixed contacts (called the bank). Initially, there were many different technologies available for doing this, but finally the Post Office settled on the American-invented Strowger system.

Contamination by dust in the air and corrosion of the bank's copper surface caused the build-up of an insulating layer. Likewise, the wipers were spring-loaded and needed periodic adjustment to make a good electrical contact with the bank. Failure of the wiper to bank contact gave rise to failed or poor-quality calls.

A stepper magnet made the wiper move vertically in equal steps then rotated it by equal steps into the bank of fixed contacts (blue arrows in Figure 1). The vertical and rotary motion gave rise to the name 'two-motion' selector[3]. The bank-to-wiper contact stayed in place for the duration of the call. With the ending of the call, the stepper magnet returned the contacts to their home position, ready for use on another call. The bank had a number of layers, depending on its use.

Figure 1 shows a typical two-motion selector. Telephone exchanges consisted of many racks of such selectors as shown in Figure 2.

Key document features

A reproduction of the *Engineering Instruction* (EI) is shown in Figure 3. The original paper size was demi-quarto (8½ by 11 inch; 216 mm by 279 mm, the same as US letter size), the text is 10 point.

The numbers and *comments* below tie in with call-outs in Figure 3.

1. Called EIs for short, these instructions covered all aspects of the business. They later became *Telecom Instructions* (TIs).
2. EIs had a three-layer naming system. TIs had a similar naming system.
3. This is the full title, followed by a sub-title.
4. The last three digits of the Maintenance Routine Instruction (MRI) number are the same as the last three digits of the naming system.
5. The star indicates a change to the EI. On making a change, individual pages of multiple-page documents resulted in the issue of single pages. *This meant that the first page was also reprinted as the note changed.*

i Later to become British Telecommunications and then BT.

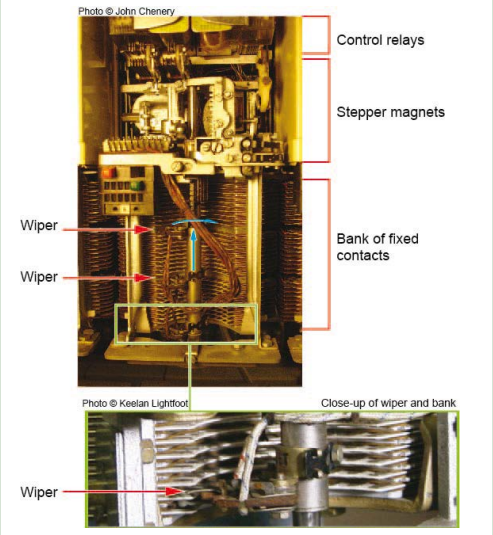


Figure 1. Typical two-motion selector[4]

Figure 2. Racks of two-motion selectors, Strowger Telephone Exchange
© Martin Addison Wiki Creative Commons[5]

6. This section described what the document was about. *More likely these days to be an Introduction, or 'what this instruction is about'. No reason is given about why you should be doing this work or about how often (it's a routine) it should be done.*
7. This section is important because **not** carrying out this part of the instructions results in disconnecting existing calls or failure of new calls. *A modern document would make this part stand out more by using a Note or a Caution box.*
8. The EIs contained 'references out' to other documents. This made them hard to use. In some cases, the Technician might not have all the instructions in their set.
9. There were three types of versions of this type of equipment. *The first part of the instruction refers to the least numerous type of equipment. The exception is to lubricate the bank.*
10. Post-cleaning checks. *This contains a 'reference out' to another document.*
11. The naming of tools and materials seems odd in this paragraph. *However, it follows the naming in a tools and parts catalogue in use at the time.*
12. References. To complete this task you need these two instructions as well.
13. There is copyright and issue information at foot of page. *It is not possible to give a total page count because future issues could add or reduce the number of pages.*

What is different?

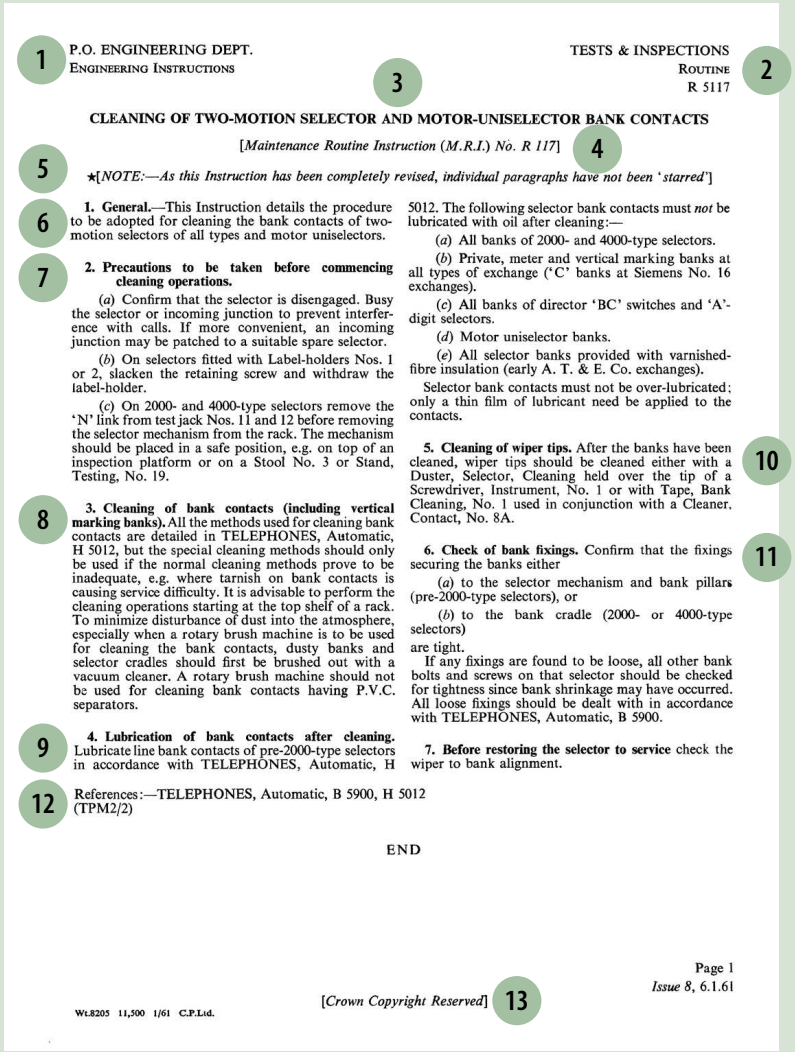
These are the differences I noticed:

1. The first thing is the language style. It is not in the now ubiquitous first-person style.
2. Secondly, there are the 'references out' to other documents. This seems strange now but was necessary in 1961. The EI system sought to address this problem by re-arranging the documentation in a different hierarchy to avoid the problem. With single sourcing this would not present a problem.
3. Numbered paragraphs look odd to modern eyes particularly as they appear to be a sequence when in fact they are not.
4. It is rare these days' to replace individual pages of documents.
5. The use of two-column printing is interesting and rarely seen these days for technical documentation. It was chosen for easy reading. Narrow columns are faster to read and comprehension is better: this is why newspapers still print in columns.

Editor: Communicator still uses a two-column format, so it's still popular in print journals as well.

What remains the same

There is plenty of good practice in this 52-year-old document:



P.O. ENGINEERING DEPT.
ENGINEERING INSTRUCTIONS

TESTS & INSPECTIONS
ROUTINE
R 5117

CLEANING OF TWO-MOTION SELECTOR AND MOTOR-UNISELECTOR BANK CONTACTS

[*Maintenance Routine Instruction (M.R.I.) No. R 117*]

★[*NOTE:—As this Instruction has been completely revised, individual paragraphs have not been 'starred'*]

1. General.—This Instruction details the procedure to be adopted for cleaning the bank contacts of two-motion selectors of all types and motor uniselectors.

2. Precautions to be taken before commencing cleaning operations.

(*a*) Confirm that the selector is disengaged. Busy the selector or incoming junction to prevent interference with calls. If more convenient, an incoming junction may be patched to a suitable spare selector.

(*b*) On selectors fitted with Label-holders Nos. 1 or 2, slacken the retaining screw and withdraw the label-holder.

(*c*) On 2000- and 4000-type selectors remove the 'N' link from test jack Nos. 11 and 12 before removing the selector mechanism from the rack. The mechanism should be placed in a safe position, e.g. on top of an inspection platform or on a Stool No. 3 or Stand, Testing, No. 19.

3. Cleaning of bank contacts (including vertical marking banks). All the methods used for cleaning bank contacts are detailed in TELEPHONES, Automatic, H 5012, but the special cleaning methods should only be used if the normal cleaning methods prove to be inadequate, e.g. where tarnish on bank contacts is causing service difficulty. It is advisable to perform the cleaning operations starting at the top shelf of a rack. To minimize disturbance of dust into the atmosphere, especially when a rotary brush machine is to be used for cleaning the bank contacts, dusty banks and selector cradles should first be brushed out with a vacuum cleaner. A rotary brush machine should not be used for cleaning bank contacts having P.V.C. separators.

4. Lubrication of bank contacts after cleaning. Lubricate line bank contacts of pre-2000-type selectors in accordance with TELEPHONES, Automatic, H 5012. The following selector bank contacts must *not* be lubricated with oil after cleaning:—

(*a*) All banks of 2000- and 4000-type selectors.

(*b*) Private, meter and vertical marking banks at all types of exchange ('C' banks at Siemens No. 16 exchanges).

(*c*) All banks of director 'BC' switches and 'A'-digit selectors.

(*d*) Motor uniselector banks.

(*e*) All selector banks provided with varnished-fibre insulation (early A. T. & E. Co. exchanges).

Selector bank contacts must not be over-lubricated; only a thin film of lubricant need be applied to the contacts.

5. Cleaning of wiper tips. After the banks have been cleaned, wiper tips should be cleaned either with a Duster, Selector, Cleaning held over the tip of a Screwdriver, Instrument, No. 1 or with Tape, Bank Cleaning, No. 1 used in conjunction with a Cleaner, Contact, No. 8A.

6. Check of bank fixings. Confirm that the fixings securing the banks either

(*a*) to the selector mechanism and bank pillars (pre-2000-type selectors), or

(*b*) to the bank cradle (2000- or 4000-type selectors)

are tight.

If any fixings are found to be loose, all other bank bolts and screws on that selector should be checked for tightness since bank shrinkage may have occurred. All loose fixings should be dealt with in accordance with TELEPHONES, Automatic, B 5900.

7. Before restoring the selector to service check the wiper to bank alignment.

References:—TELEPHONES, Automatic, B 5900, H 5012 (TPM2/2)

END

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Issue 8, 6.1.61

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Figure 3. The Engineering Instruction A one-page manual from 1961. Courtesy of BT Heritage

1. The writing style of the EI is clear and uses plain English.
2. There is structure to the presentation of the information.
3. It shows copyright information.
4. An issue number and date are present for traceability.
5. The document is one of a whole structured hierarchy of documents.

How were EIs produced?[ii]

There were no technical authors, the engineers in the Post Office headquarters wrote the EIs. There were technical editors for each section of the EIs.

The engineer wrote the text on paper and sent it to a typing pool. When the typed text was approved by the engineer, it was sent to the editor.

ii Engineering Instructions and Allied Publications www.britishtelephones.com/eiexplan.htm

After editing and retyping, the editor sent the text to the printer to make 'galley proofs'[6]. Printed by hand from the set-up type the galley proof was a long strip of paper containing just the body text for the column. The engineer received the galley proof for checking.

If photographs or drawings appeared in the document, the author had to commission these. There was no colour printing. The photographs were low resolution. The printer decided where to place the figures, and the page and column breaks.

The printer made any changes suggested by the engineer and editor and produced the final type set version of the EI, complete with any figures. The engineer and editor received a hand-printed (pulled) copy for final check.

Before printing, the editor decided how to distribute the EI to the workgroups. The printers ran off a batch of the EIs for distribution and for stock.

The distribution system worked by dividing the work force into workgroups, each workgroup (duty) performing similar tasks. For example, a duty might be 'maintain exchanges' or 'install outside cables' and so on. In this way, each duty had its own set of documents applicable to their type of work.

Did they get it right?

I think they did. Remarkably, you would find many of the EI's features in a modern technical instruction. However, what has changed dramatically is the method of production. With the advent of desktop publishing the printer's work is redundant. The technical communicator is writer, printer and publisher combined. It is interesting that the management system 'pushed' new and updated instructions to the engineering field staff, rather than expecting them to 'pull' new or revised documents. Even in the Internet age, there are few examples of 'pushing' new or changed documents to users. In addition, the engineers wrote the instructions as part of their job: only editors and administrators worked solely on documentation.

Did the system have failings? Yes; in two main areas:

- It was notoriously difficult to get the engineers to write the EIs in the first place. To get the task done it required management commitment (much as it does today).
- The field engineers were not keeping their documents up to date. Even with new documents pushed to them, they often failed to file them in their ring binders.

Thanks go to...
John Chenery and Keelan Lightfoot of the Telecommunications Heritage Group[iii] (THG) for the use of their photographs, particular thanks to John for taking the photograph specifically for me. C

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Acronymns

EI	Engineering instructions
TI	Telecom instructions
MRI	Maintenance routine instructions

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iii Telecommunications Heritage Group www.thg.org.uk