

## The Graphic Information Research Unit: Background and Recent Research

Linda Reynolds

### About the Graphic Information Research Unit

The Graphic Information Research Unit was established by Herbert Spencer at the Royal College of Art in 1966, under the name of 'Readability of Print Research Unit'. It was initially supported by a two-year grant from the International Publishing Corporation, to investigate problems of legibility in information publishing. The study was mainly concerned with the evaluation of research to date, and with the compilation of a comprehensive bibliography. The results were published by Professor Spencer in 1969, under the title 'The visible word: problems of legibility'<sup>1</sup>.

This first project was followed in 1969 by a commission from the Post Office to investigate various aspects of the legibility of telephone directories, including the implications of the addition of post codes and the effects of using tinted papers.

In 1971 the Unit commenced work on the first of a series of projects for the British Library Research and Development Department (BLR&DD), formerly the Office for Scientific and Technical Information. This three-year project comprised five experimental studies. The first of these was concerned with the relative legibility of alternative letter shapes<sup>2</sup>, with a view to the design of a single alphabet utilising a mixture of the most legible upper and lower case character forms. Such an alphabet, it was felt, could be of use in situations where, for technical reasons, only one set of 26 letters is available.

There then followed three experiments relating to the design of bibliographical materials such as reading lists and library catalogues. The effectiveness of selected typographic variations was first of all studied out of context using non-typographers as test subjects<sup>3</sup>. Typographic variations and spatial coding devices were then used to create ten different styles of presentation for type-written bibliographies<sup>4</sup>, and eighteen different styles for typeset bibliographies<sup>5</sup>. The relative effectiveness of these different styles was objectively assessed in both cases by asking subjects to perform a realistic task on bibliographies presented in the different styles and by measuring the amount of work that they were able to do within a given time period. The last experiment was concerned with the effects of poor quality reproduction on the legibility of different typefaces<sup>6</sup>. Texts set in Baskerville, Rockwell, Times New Roman and Univers (Figure 1) were subjected to image degradation in the form of various degrees of thinning-down or thickening-up of the type image, and to the introduction of background 'noise' in the form of a random dot pattern. Legibility was measured by means of a scanning task.

This work was followed by further investigations on the effects of various kinds of visual 'noise' on legibility. Four different background patterns, including a continuous tone, two regular dot screens and a random dot screen, were studied at dif-



Figure 1  
Image degradation

ferent densities on both continuous text and numerical information<sup>7</sup>. A scanning task was used as a measure of legibility for both kinds of material. A second experiment in this series was concerned with the effects of loss of contrast in the form of 'greying' of the background and/or image<sup>8</sup>. The third and final experiment was an investigation of the effects of 'show-through'<sup>9</sup>. Four papers of different opacities were printed single-sided, backed-up, and with the lines on successive pages either aligned or unaligned. The effects of the resulting show-through were again measured by means of a scanning task on continuous text.

At this point, the Unit's interests began to extend to other media besides print. In 1976 a literature survey on factors affecting the acceptability of microforms was published<sup>10</sup>. The emphasis was on visual factors relating to the design of the microforms and of the reading equipment. In 1977 a second survey report was published, this time dealing with the problems of directional signing, guiding, and labelling in libraries and museums<sup>11</sup>. The purpose of the survey was to investigate existing practices in libraries and museums, to review relevant research literature in a number of disciplines, and to suggest where further research was most needed. This study is described in more detail below. Both of these surveys were funded by the British Library.

A third survey report, commissioned by the Post Office, was completed in 1978. This was concerned with the legibility and readability of Prestel displays. Prestel is a system whereby alphanumeric information stored on a central computer can be accessed via the telephone network and displayed on domestic colour television receivers. The report attempted to draw together relevant research from a number of disciplines and to recommend where further research of specific relevance to Prestel was most badly needed<sup>12</sup>.

Recent work for the British Library has been mainly concerned with the design of Computer Output Microfilm library catalogues<sup>13,14</sup>, and the two projects carried out to date are summarised below. The Unit was also requested by the British Library to prepare a set of publicity leaflets describing the various projects carried out over the years. These have now been sent out to an initial mailing list of 1,000 organizations, with the aim of disseminating the results of the Unit's work more widely.

The work of the Unit has therefore diversified considerably over the years, and this has been reflected in the change of name from 'Readability of Print Research Unit' to 'Graphic Information Research Unit'. In addition to the legibility of conventionally printed materials, the Unit is now becoming increasingly concerned with the effects of new technology on the legibility of scientific and technical information, whether it be in print, microform, or displayed on a VDU. It is also concerned with information graphics in a broader sense, as exemplified by the library guiding work.

# Directional signing, guiding and labelling in libraries and museums

## Introduction

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In this study we were concerned with identifying some of the outstanding problems in providing effective graphics in libraries and museums, rather than with providing solutions by carrying out our own experimental work. The investigation included the examination of existing signing, guiding, and labelling systems in 27 libraries, 18 museums, and a total of 14 transport termini, hospitals, shops, and offices. In-depth interviews with those responsible for designing and implementing the systems were carried out in most of the libraries and museums visited. Architects, designers, and psychologists from a number of other organisations were also consulted. The literature survey covered items relating to librarianship, museum studies, psychology, ergonomics, architecture, and graphic design. Some of the conclusions drawn from the study are summarised below.

## The present state-of-the-art

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### Libraries

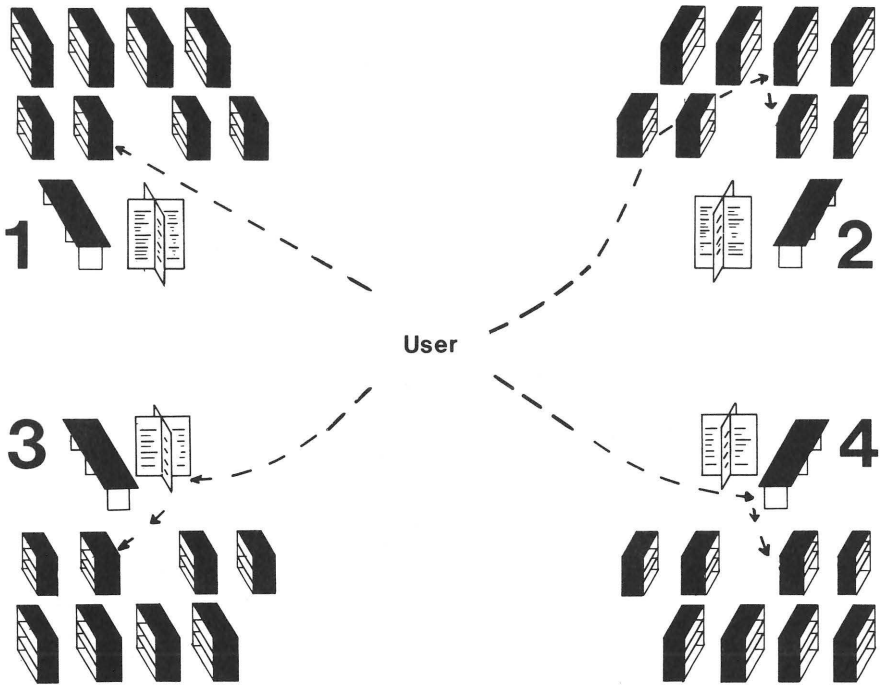
The standard of graphics in most of the libraries visited was poor, in terms of both visual appearance and content. Rarely was there any attempt to coordinate signs, guiding, labels, stationery, and printed information, and in many cases there was little similarity between items within these categories. Signs and guiding had often been applied haphazardly as and when the need for them was felt, rather than being planned as a complete system. This often gave rise to omissions and duplications of information. Inappropriate positioning of signs and failure to achieve a reasonable density of signs—neither too

few nor too many—were other common faults. The overall effect was often one of untidiness and disorganisation, though this may not have been true of the running of the libraries themselves.

There were three main reasons for this state of affairs. First, very few libraries could afford to employ a graphic designer. Of the remainder, many had no staff member with any design skills, and it was unusual for any one person to be given overall responsibility for library graphics. The result was often a total lack of coordination. Second, many libraries felt that the provision of adequate guiding was an expensive luxury. They had not considered the positive effect that a visually coordinated system of graphics might have on staff morale and on the library's image in the minds of the users, nor had they considered the potential increase in the efficiency of both staff and users. As a result, an allowance for signing, guiding, and labelling had not been included in the library budget. Third, many libraries wanting to make improvements did not have ready access to advice or facilities which would help them in preparing their own graphics or in commissioning them from outside.

### Museums

In general the standard of graphics observed in museums was much higher than that in libraries. Museums tended to be far more aware of the need to present information attractively, legibly, logically, and in easily assimilable amounts. Most of the larger museums had at least one designer if not a design department, and the cost of designing and producing signs and



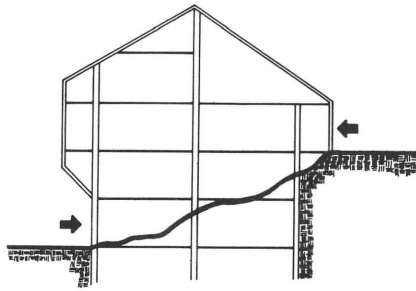
labels was included in the budget. Many of the smaller provincial museums did not have trained design staff however, and their problems were similar in many ways to those of the libraries.

### Directional signing

#### Factors influencing signing requirements

The study showed that the requirements for an effective signing system are dependent on a number of factors such as the background and motives of users, the policy of the library or museum with regard to signing, the physical characteristics of the building, and the way in which the various departments are distributed throughout the building. Some users will have very specific interests which will lead them to a particular department, whereas others may wish to browse at random; some libraries and museums will expect users to rely heavily on signing, whereas others

will prefer them to ask a member of staff for directions; some buildings are relatively simple in their design and therefore require a minimum of signing, whereas others are extremely complex and need to be very well signposted; libraries and museums in newer buildings are likely to have a more logical arrangement of materials and services which will facilitate signing, whereas in older buildings the departments are likely to have expanded haphazardly and will be difficult to signpost satisfactorily.



### Density and siting of signs

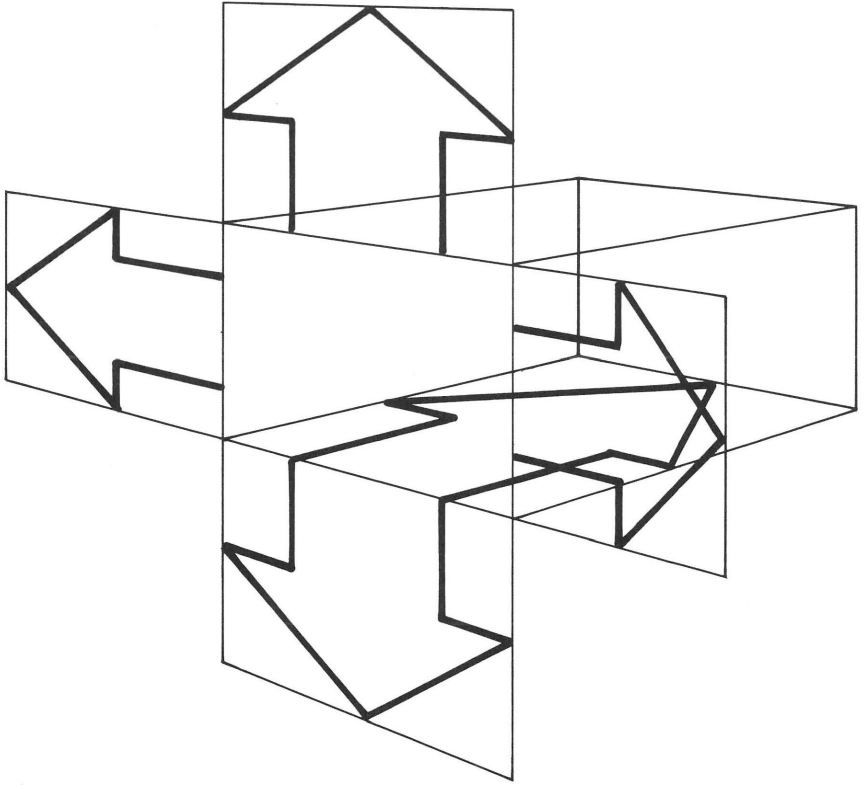
It is important that directional signing should be thought out and applied as a coordinated system. It was clear from a number of the libraries and museums visited that the addition of 'helpful' signs as and when the need for them is felt can result in utter confusion. The system must be designed to explain the overall size and shape of the building and the spatial relationships between the various functional areas within it; it must then direct visitors to specific destinations. Adequate signing between destinations and to exits is also important. Care must be taken to avoid over-signing, however, as the more signs there are and the more information they carry, the less likely they are to be read. The positioning of signs is also significant. Research has shown that information should be given just before each 'decision point' on a route. The information should relate only to the next decision point however; instructions for later decision points will often be ignored or forgotten.

### Information content

The amount of information given on each sign should be kept to a minimum. This can sometimes be done by grouping destinations under general headings initially, and then using progressively more specific terms as the final destinations are approached. Ideally the names of destinations should describe their functions and abbreviations should be avoided.

The naming or numbering of floors needs to be carefully thought out, particularly on sloping sites where ground level on one side may be basement or first floor on the other.

Floor plans are an important part of any directional signing system, but many people apparently have difficulty in understanding them. Confusion is often caused by inappropriately oriented plans; ideally they should be redrawn if necessary so that their orientation always matches reality.



The use of arrows on signs should be carefully thought through. Arrows indicating right or left are generally unambiguous, as are arrows pointing up or down to indicate straight on. Diagonal arrows can be very confusing however, especially in situations where both vertical and horizontal movement are possible.

Symbols can often be used to present simple messages concisely and clearly, and they are particularly useful in situations where users are likely to be of several different nationalities. Standard symbols should be used wherever these exist.

## Design

In designing a signing system it is important to choose materials which are appropriate for the application. In the case of libraries and museums, factors to be considered include visual appearance, flexibility, cost, and resistance to wear and tear and vandalism.

Lettering on signs should be in upper and lower case as this will facilitate the recognition of familiar word shapes. A simple sans serif face will generally be the most legible. Character size should be determined in relation to the greatest distance from which the signs must be read and acted upon. The size should be consistent throughout the series of signs, and not varied simply to accommodate messages of different lengths. Different sizes may be used to distinguish between information which differs in kind or importance however.

As a general rule, each line of information should begin at the left hand margin unless an indent is required. Centering is unhelpful, particularly in the case of lists of destinations. Layout should be consistent between signs, and on no account should character spacing or line spacing be varied according to the length of the message.

In choosing colour combinations for sign backgrounds and lettering, it is important to achieve a high level of contrast between the colours in terms of their intensity as well as in terms of their hue. Experiments on printed materials have shown that some of the best combinations for legibility are black and yellow, and white with blue, green or red. One of the worst possible combinations is black and red. Colour can be used very effectively in directional signing as a way of coding information, but no more than about 6 or 8 different colours should be used. Ideally, colour coding should be used redundantly, as a way of reinforcing information which is also given in some other way. Mistakes in discriminating between colours, particularly by persons with defective colour vision, make total reliance on colour codes impractical.

## Placement of signs

Signs may be fixed to a vertical surface such as a wall, in which case they should be facing the oncoming user. Alternatively, they may be suspended from the ceiling if it will support them—this often gives optimal visibility. If walls or ceilings are unsuitable, free-standing signs may be used. These can be used as an obstacle to attract attention, but they are easily obscured. Certain kinds of signs, such as route markings, may be placed on the floor, but again they are easily obscured.

Directional signs should be displayed at a constant height to avoid confusion with other kinds of information. Ideally they should not be outside an angle of 10 degrees above or below eye level.

## Library guiding

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### Guiding requirements

As with directional signing, the level of library guiding required will depend on the characteristics of the users and on the policy of the library. Some libraries prefer users to rely on guiding as far as they can, whereas others deliberately force them to ask staff for help by providing very little guiding.

It is important that library guiding should also be thought of as a system, and the design of a successful system will require a careful analysis of all library procedures which affect users. The simpler and more logical the arrangement of the materials and services within the library and the procedures associated with their use, the simpler the guiding system will be. Once the procedures have been analysed, they can then be set out logically and should be presented visually in a way which makes the logic clear to the user.

### Information content

Library guiding systems comprise a number of different kinds of displayed information such as notices, instructions, indexes, keys, labelling of catalogues, labelling of storage units and labelling of stock. Wording on all of these should be as concise and clear as possible. On notices and instructions in particular, it is important to consider whether narrative prose is necessarily the best way of presenting the information, and whether some other form such as a list, flow chart or diagram of some kind might be more effective.

### Design

The choice of materials for these items will depend in many cases on their degree of permanence. Ideally their appearance should be coordinated in terms of materials, colours, letter forms etc., and there is no reason why even the most temporary items should not be neat and legible. The general principles of design outlined in relation to directional signing will also apply here.

# a. identify

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## b. describe

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### c. detail

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#### Design

Again, the general principles outlined in relation to signs also apply here. The type style should blend with the nature of the exhibits, but it should not be so gimmicky that it attracts attention to itself rather than to its message. Type size should be carefully chosen in relation to the likely maximum reading distance, and should be used logically and consistently.

#### Museum labelling

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##### Information content

One of the greatest problems in museum labelling is that of providing sufficient information for the specialist without frightening away the layman. This problem can sometimes be solved by providing several 'levels' of text on a descriptive label, so that visitors can read as much or as little as they wish.

In some instances it will be appropriate to label each object individually, but where there are large numbers of small objects, or in situations where labels would be intrusive, it is often necessary to use a key of some kind. This makes more work for the user because he has to relate the objects to the key before he can find out what they are. In some cases the objects will be numbered and it is only necessary to look up the appropriate number on the key; in other cases the user may be required to match the object with a diagram according to its position, read off a number on the diagram, and then refer to a numbered list of captions. Studies on user's reactions to these kinds of key would be valuable.

Very little research has been done on optimum line lengths and line spacing for type sizes of 14 points upwards, so this will be largely a matter of judgement. The question of whether the right hand margin of labels should be justified or unjustified is partly one of taste, but for relatively short line lengths, justification is likely to result in very irregular word spacing and in an excessive number of broken words at the ends of lines.

##### Positioning of labels

The optimum height for vertical descriptive panels would seem to be between about 3 ft and 6 ft. Ideally, object labels should be at right angles to the the visitor's normal line of sight. This will often mean that they should be at an angle of about 45 degrees rather than horizontal or vertical. They should be displayed in approximately the same plane as the objects to which they relate, to save constant refocussing of the eyes.

## Introduction

Following the Unit's survey of visual factors affecting the acceptability of micro-forms<sup>11</sup>, it was felt that further research would have its greatest impact if directed towards Computer Output Microfilm as opposed to source document microfilm. The Unit therefore set out to investigate several basic questions relating to the layout of information on COM by means of an experimental study<sup>13</sup>, and to carry out a survey of the various styles of presentation currently used in COM library catalogues<sup>14</sup>.

## The layout of information on COM

### Column spacing and horizontal coding in tables and indexes

The first of the two experiments in this study was concerned with the effects of column spacing on subjects' ability to read across between columns of information quickly and accurately. Excessively wide column spacings are by no means unusual in COM materials and are sometimes unavoidable; the experiment therefore included an investigation of various horizontal coding devices which might help in reading across.

Two different kinds of two-column index were used as test material, one an alphabetical index of names and the other a numerical index. These are illustrated in Figures 2 and 3. Each index consisted of 640 entries, presented in cine mode on roll film (i.e., with the frames arranged vertically on the film in a scroll-like manner).

Column spacings of 5, 20 and 30 blank character spaces were used. In the case of the alphabetical index, the blank character spaces were counted from the end of the longest name, so that the spacing was in effect greater on this index than on the numerical index. The following six 'horizontal' codings were used:

1. Lines set solid
2. Lines double spaced
3. Lines set solid with a line space after every fifth entry
4. Lines set solid with a rule after every fifth entry
5. Lines set solid with a line space and a rule after every fifth entry
6. Lines set solid with leader dots between columns

The three column spacings were combined with the six horizontal codings to give a total of 18 different layouts.

One group of 18 subjects was presented with all 18 layouts for the alphabetical index, and another group of 18 worked on the numerical index. An 18 x 18 latin square design was used to determine the order in which each subject saw his 18 layouts. For each layout, subjects were given a list of 30 entries from the first column of the index and were asked to find the entries on the film and write down the corresponding three-character codes, working against time.

The results showed a significant decrease in scores between column spacings of 5 and 30 characters on both kinds of index. There were relatively few errors however.

Blackie, Robert	171
Blackie, Les	177
Blance, Ellen	155
Blasner, M	155
Block, Matthew H	155
Bloomfield, Vasserie	156
Bloomquist, Roger	168
Bodensteil, Wilcox	170
Bogans, G	174
Bogata, Dick	148
Bolton, Gary R	108
Bonelli, Gordon	97
Boudler, Roger	80
Bowers, Jack	93
Boyce, Ma	99
Boyle, Keith	22
Brackett, Leigh	23
Bradbury, Farel	21
Bradbury, R J	12
Bradford, Will	20
Bradley, Howard	29
Bradley, Ian	28
Brady, Terence	135
Brand, Christanna	79
Brandt, Richard	63
Bratler, Morton A	78
Braun, Henry	28
Brindley, Louis Peter	66
Britz, Esthwa	58
Brockman, Pat	81
Brown, Gordon	18
Brown, James R	99
Brown, Brian	45
Brown, James R	99
Brown, Felicity	106
Brychta, Alex	85
Buchanan, Ronald Hull	107
Bullock, Jim	119
Burchell, Mary	15
Burgess, Eric	113
Burkitt, Judith	132
Burroughs, William	131
Burby, Richard James	17
Busch, Eberhard	106
Burton, George Daniel	19
Button, Kenneth John	182
Caboury, Betty	143
Caffrey, Kate	27
Caine, Jeffrey	27
Cammerly, Clare	100
Carew, Jan	144
Carlisle, Stanton	88
Carme, Stuart	130
Carr, James Lloyd	15
Carter, James Roy	107
Carter, Robert Alastair	108
Cartland, Barbara	76
Castelli, Marsha	74
Cather, Willa	167
Catherall, Arthur	22
Catto, Mar	78
Caw, Peter	13
Cellin, Louis Ferdinand	105
Chambers, Aidan	105
Chametz, Walter John	84

Figure 2  
Extract from the names index

770530	122
7705310	101
7705311	15
7705314	104
7705315	19
7705316	17
7705318	113
770531	189
770532	105
7705327	102
770533	122
7705334	109
7705335	11
7705341	119
7705345	125
7705346	153
7705349	156
7705360	121
7705364	114
7705365	118
7705366	108
7705367	167
7705368	150
7705369	156
7705370	150
7705371	161
7705375	107
7705378	105
7705380	161
7705381	108
7705385	101
7705385	106
7705389	11
7705392	100
7705396	101
7705399	111
7705401	184
7705402	101
7705403	109
7705404	178
7705406	133
7705407	100
7705408	107
7705410	100
7705411	111
7705417	111
7705420	109
7705421	148
7705422	180
7705423	180
7705425	108
7705427	108
7705430	101
7705437	11
7705438	129
7705439	159
7705444	114
7705445	108
7705447	108
7705449	162
7705450	102
7705451	125
7705454	128

Figure 3  
Extract from the numbers index



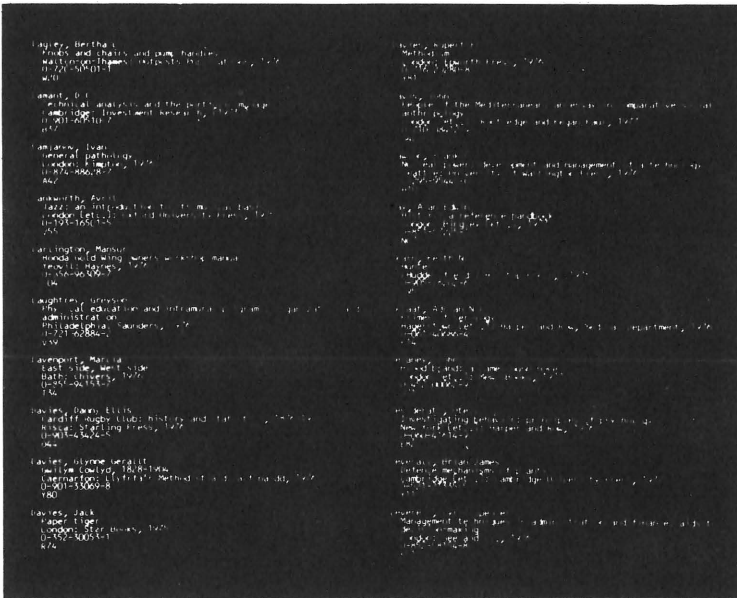


Figure 7  
The double column format

The results of the experiments are shown in Table 1. It may be seen that, overall, the double column format was superior to the single column, and the cine mode better than the comic mode. There was, however, a strong interaction between format and film mode, the combination of single column format and comic mode resulting in significantly lower scores than any of the other three conditions. In the second part of the experiment, where the task of searching for the correct entry was minimised, the double column format showed a significant advantage. This suggests that where the task involves searching for a particular entry and for a specific element within the entry, the advantage of the double column format for within-entry searching is counter-balanced by the advantage of the single column format for between-entry searching. The optimum format therefore depends on the task.

Table 1

Mean scores for questions in random order*			
	single column	double column	$\bar{X}$
cine mode	45.71	44.04	44.87
comic mode	30.79	42.92	36.85
$\bar{X}$	38.25	43.48	

Mean scores for questions in alphabetical order\*\*

	single column	double column
cine mode	39.70	45.00

\* number of questions correctly answered in 8 minutes

\*\* number of questions correctly answered in 4 minutes

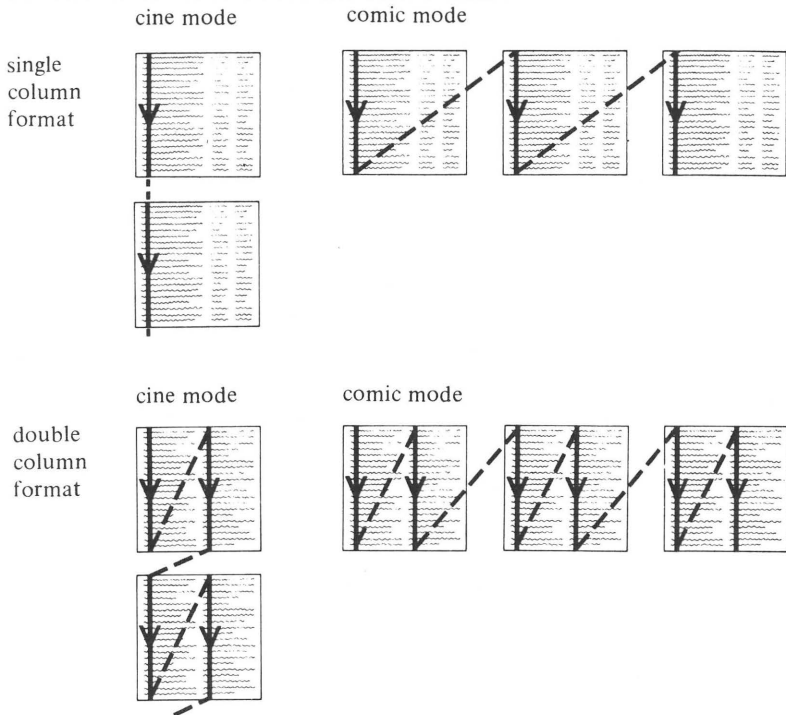


Figure 8  
Scanning strategies in relation to layout  
and frame progression

The single column format is likely to be better for between-entry searching because in effect it presents a continuous sequence of authors' names in a constant position on the film, the names are close together with no intervening data and are therefore easily compared, and there is less film to wind through because this format accommodates more entries per frame. The double column format is likely to be better for within-entry searching because the problem of reading across between columns of information is eliminated and the various elements of the entry are physically closer together and therefore more easily scanned.

The cine mode of frame progression is preferable for single column formats because it creates a continuous sequence of entries; the comic mode breaks the sequence unnecessarily (Figure 8). The comic mode with the single column format has the disadvantage of requiring accurate centering each time the film is moved, whereas with the double column format it is only necessary to center the film to the nearest half frame in order to be able to use the information. In some ways the comic presentation is more logical for double column formats, since the sequence of entries is already broken within the frame.

## Visual presentation of information in COM library catalogues: a survey

### Introduction

This survey was originally designed to provide information needed by the Bath University Programme of Catalogue Research.

The results of the survey were felt to be of sufficient interest to the library community in general to be published as a report which might be referred to by those designing a COM catalogue for the first time or re-designing an existing one<sup>14</sup>. Examples of catalogues from some 60 U.K. libraries of various kinds were examined in the course of the study.

### The importance of presentation

The examples examined in the survey showed that in many cases the importance of good presentation had not been fully realised or sufficiently considered. The presentation of the information will not only affect the ease and speed with which users are able to find what they want in a catalogue; it is also likely to affect their psychological approach. Microforms in general undoubtedly have disadvantages as a reading medium, and many people are already prejudiced against them to some degree. It is therefore all the more important that the presentation of the information itself should be optimal, within the limitations of the medium. But while the importance of good presentation cannot be over-emphasized, it is more difficult to achieve on microforms than in print. Given that most library materials are recorded in utility fonts, there is very little scope for typographic 'coding' of the information. This means that spatial 'coding' must be heavily relied upon, and layout becomes crucial. Even here, however, there are limitations imposed by COM recording equipment and computer software.

### Historical aspects of layout

The study revealed that the layouts used for COM catalogues have been strongly influenced by trends in computer hardware and software.

The earliest COM catalogues were derived from pre-existing computer systems, especially in public libraries. The original output was often on paper or cards, and the layout was largely dictated by systems considerations. The input was in upper case only, and the output likewise. Both input and output were slow, and the large storage capacity required for text handling was expensive and cumbersome to access. There was therefore a need to keep the length of the entries to a minimum. The lack of sophisticated text handling packages meant that there was also a need to keep the file structure and layout as simple as possible. The result of all these constraints was the single-column format, with the information strung out across the width of the frame in a series of fixed fields. Figure 9 is a typical example of this style of presentation.

In recent years, however, the development of more sophisticated hardware and software has meant that large quantities of data can be stored and easily accessed, and much more sophisticated layouts are possible. This has resulted in a trend towards longer entries, and because these could not be satisfactorily accommodated in the single column format, there has been an accompanying trend towards double column formats. In some cases a treble column format has been found to be more suitable for shorter entries, as illustrated in Figure 10.

AUTHOR / TITLE	CLASSIFICATION	YEAR	LOCATION	ACC. NO.
TRICK/CHEN/(IEEE) CIRCUIT & SYSTEMS THEORY 6TH 1968	621.301	1968	CONFERENCE	6806195 2
TRICKER/ ACCOUNTANT IN MANAGEMENT	657	1967		6721009 7614895
TRICKER/ CONTRIBUTION OF SCIENCE TO EDUCATION	5:371.3	1967		6761087
TRICKER/ EARLY ELECTRODYNAMICS	538.1(091)	1965		6738956
TRICKER/ MANAGEMENT INFORMATION & CONTROL SYSTEMS	658	1967		7611682
TRICKER/ MANAGEMENT INFORMATION SYSTEMS	016:658	1969	QUICK REF	6805674
TRICKER/(MUFFIELD FOUND) ADV SCI-BIOL SCI.PROJECTS	574:371.3	1970		7400864
TRICKER/TRICKER/ SCIENCE OF MOVEMENT	591.17	1966		6757451
TRICKETT/ HONEST MUSE	821	1967		6801148
TRICKEY/ QUANTUM STATISTICS & THE MANY-BODY PROBLEM	536.48	1975	CONFERENCE	7605686
TRICKEY/ TEACHING & LEARNING IN CHEMISTRY 5TH 72	64:371.3	1972	CONFERENCE	7205874
TRICOM/ DIFFERENTIAL EQUATIONS	517.91	1967		6750166 6750933
TRIDENT 1 & - APP-REPORT OF ACCIDENT INQUIRY/(DTI)	656.708	1973	GOV PUB	7207013 1
TRIER/(LANG) WALTER TRIER	837	1971	3-HR LOAN	7008561 1
TRIER/(WIESE/DORCK) FESTSCHRIFT	327	1964		6743000 1
TRIGALD/ KORT BESKRIFNING ELB- & LUFT-MACHIN1734(LOS)	5(091)	1966	MICROFORM	18 13322
TRIGGS/ MECHANICS	531.01	1966		7005108 7004923
TRIFFIN/ BALANCE OF PAYMENTS & FOREIGN INVESTMENT US	332.6		PAMPHLET	7002115
TRIFFIN/ EUROPE & THE MONEY HURDLE	332.4(4)	1957		6753538
TRIFFIN/ EVOLUTION OF INTERNATIONAL MONETARY SYSTEM	332.43	1964	PAMPHLET	6800264 7003240 PAMPHLET 7403240
TRIFFIN/ FATE OF THE POUND CIM ATLANTIC PAPERS 1969,23	332.42			18 13326
TRIFFIN/ GOLD & THE DOLLAR CRISIS	381.81	1961		6750885
TRIFFIN/ MONOPOLISTIC COMPETITION & GENERAL EQUIL THY	307.83	1940		6728326
TRIFFIN/ OUR INTERNATIONAL MONEY SYSTEM	332.43	1968		6805778
TRIFFIN/ WORLD MONEY PALE	332.4(4)	1966		6754741 6909116
TRIFONOV/ A.V.LIMACHARSKII I SOVETSKAIA LITERATURA	882.95	1974	CYRILLIC	7508851
TRIFONOV/KUDRIASHEV/ RUSSKAIA SOVETSKAIA LITERATURA	882	1956	CYRILLIC	6740614
TRIFONOV/SHURA-BURA/ SISTEMA AVTONOMIZATS PROGRAMIROV	518.5	1961	CYRILLIC	7000952
TRIGG/ CRUCIAL EXPERIMENTS IN MODERN PHYSICS	63	1971		7011687
TRIGG/ PAIN & EMOTION	159.901	1970		6907737
TRIGG/ QUANTUM MECHANICS	530.143	1964		6729257
TRIGLES/ CHEMICAL ASPECTS OF THE AUTONOMIC NERVOUS SYS	577.1:591.18	1965		6747560
TRIGGLE/ CHOLINERGIC LIGAND INTERACTIONS 1970	577.15	1971	CONFERENCE	7010117
TRILLAT/(CSRC) IONIC COMBOMBARDMENT BELLEVUE 1962	539.19	1964	CONFERENCE	7006252
TRILLING/ BEYOND CULTURE	820	1960		6743346
TRILLING/ LIBERAL IMAGINATION	8:3	1970		7205624
TRILLING/ SINCERITY & AUTHENTICITY	008	1972		7200552
TRILLING/(ARNOLD) PORTABLE MATTHEW ARNOLD	820	1960		6743346
TRILLING/BLOOM/ VICTORIAN PROSE & POETRY	820	1967		7605932
TRILLING/MACHMAN/ RAREFIED GAS DYNAMICS:INT SYM 68 V1	533.5	1969	CONFERENCE	7509401
TRILLING/MACHMAN/ RAREFIED GAS DYNAMICS:INT SYM 68 V2	533.5	1969	CONFERENCE	7509402
TRIMMINGHAM/ HISTORY OF ISLAM IN WEST AFRICA	297(66)	1962		7503368
TRIMMINGHAM/ ISLAM IN EAST AFRICA	297(66)	1964		6803459
TRIMMINGHAM/ ISLAM IN WEST AFRICA	297(66)	1959		7502723
TRINIDAD & TOBAGO REPUBLIC ACT 1976	576.31	1976	GOV PUB	7618271
TRINKAUS/ CELLS INTO ORGANISMS	669.04	1934		7000173 6713513
TRINKS/ INDUSTRIAL FURNACES 2E V2	669.04	1942		6712841
TRINKS/ INDUSTRIAL FURNACES 3E V1	669.04	1953		6734982
TRINKS/ INDUSTRIAL FURNACES 4E V1	669.04	1951		6712307

Figure 9  
Single column format with single line entries

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ACTON. HAROLD MORE MEMOIRS OF AN AESTHETE. METHUEN. 1970. G 0416129005	828.912			
ACTON. SIR HAROLD HANKY MITFORD: A MEMOIR. HAMILTON. 1975. B2 D E F G H J L P2 V X Y 0241892846	823.912			
ACTON. HAROLD TUSCAN VILLAS: WITH PHOTOGRAPHS BY ALEXANDER ZIEGLER. THAMES AND HUDSON. 1972. ILL. ON LIVING PAPERS. G 050024085X	914.55			
ACTON. HARRY BURROWS PANT'S MORAL PHILOSOPHY. MACMILLAN. 1970. 0333104498	170.924			
ACTON. JOHN EMERICH EDWARD DALBERG ESSAYS ON FREEDOM. FORD. SELECTED BY GERTRAUDE HINNELFARB. THAMES & HUDSON. 1956. Z 85613129	320			
ACTON. JOHN EMERICH EDWARD DALBERG- ACTON ESSAYS ON CHURCH AND STATE: EDITED BY DOUGLAS WOODROFF. HOLLIS & CARTER. 1952. Z 85:08152	332			
ACTON. THOMAS ALAN GYPSY POLITICS AND SOCIAL CHANGE: THE DEVELOPMENT OF ETHNIC IDENTITY AND PRESSURE POLITICS AMONG BRITISH GYPSIES FROM VICTORIAN REFORMISM TO ROMANY NATIONALISM. EBV THOMAS ACTON. ROUTLEDGE AND KEGAN PAUL. 1974. Y 0710078352	301.45191+97041			
ACHORTH. BERNARD BIRD AND BUTTERFLY MYSTERIES: REALITIES OF MIGRATION. EYRE & SPOTTISWOODE. 1955. Z 85515252	598.25			
AD HOC INQUIRIES IN LOCAL GOVERNMENT: A SOURCE-RIPA PROJECT STEERED BY A COMMITTEE CHAIRED BY SIR ALAN MARRE. SOLUCE. 1978. Z 0905566025	352.16			
ADAIR. CORNELIA MY DIARY: AUGUST 30TH TO NOVEMBER 5TH. 1874. ILLUSTRATED BY MALCOLM THURGOOD. NEW ED. TENGIS U.P. 1965. Z 86611770	978.020924			
ADAIR. IAN CONJURING AS A CRAFT. DAVID & CHARLES. 1970. D F G J N P V Y 0715247977	793.8			
ADAIR. IAN PAPERCRAFT: LINE DRAWINGS BY THE AUTHOR AND SUZANNE STEPHENSON. PHOTOGRAPHS BY A. C. LITTLEJOHN. DAVID AND CHARLES. 1975. B E2 N 0715266386	745.54			
ADAIR. IAN PARTY PLANNING AND ENTERTAINMENT. LINE DRAWINGS BY THE AUTHOR. PHOTOGRAPHS BY A. C. LITTLEJOHN AND THE AUTHOR. DAVID AND CHARLES. 1971. B2 F G2 H J K2 M P X2 Y 0715352687	793.2			
ADAIR. JOHN. B 1934 A LIFE OF JOHN HAMPDEN, THE PATRIOT (1594-1643). MACDONALD AND JANE'S. 1976. SPINE TITLE: JOHN HAMPDEN, THE PATRIOT. F 0354040146	942.0620924			
ADAIR. JOHN. B 1934 ROUNDHEAD GENERAL: A MILITARY BIOGRAPHY OF SIR WILLIAM WALLER. MACDONALD & CO. 1969. K 0356026418	941.620924			
ADAIR. AGNES BUSINESS MEETING: A SCOTS COMEDY FOR SIX WOMEN. BROWN, SON & FERGUSON. N. D. Q X000000159	822.041			
ADAIR. ANTOINE GRANDEUR AND ILLUSION: FRENCH LITERATURE AND SOCIETY, 1600-1715. TRANSLATED FROM THE FRENCH MS. 3 BY HERBERT TINT, HEIDENFELD AND NICOLSON. 1972. D 0297763520	840.9004			
ADAIR. FRANK THE CLANS, SEPTS AND REGIMENTS OF THE SCOTTISH HIGHLANDS: REVISED BY SIR THOMAS INNES OF LEARNIE. 7TH ED. JOHNSTON & BACON. 1966. JOHNSTON ED. (860-20766) 1960. Z 86711775	929.209411			
ADAIR. FRANK THE CLANS, SEPTS, AND REGIMENTS OF THE SCOTTISH HIGHLANDS. 8TH ED. JOHNSTON & BACON. 1970. Z 0717945006	929.209411			
ADAIR. IAN GEORGE ELIOT. ROUTLEDGE & K. PAUL. 1969. Pbk. 9/-. SEN 7100 6735 6. Z 0710067364	823.8			
ADAIR. JAMES BRYCE THE LANGUAGE LABORATORY. PITHAN. 1963. Z 86401704	407.8			

Figure 10  
A three column format

954.029035SP SPEAR PERCIVAL	DELHI [ETC.] LONDON OXFORD UMI	OXFORD HISTORY OF MODERN INDIA, 1740-1947 BY PERCI 1 P1			0195605675
954.03BRI BRISTOW ROBERT	(355.332BRI) LONDON JOHNSON 1974	MEMORIES OF THE BRITISH RAJ A SOLDIER IN INDIA [BY 3 C1 P2			0853071322
954.03WIL SMITH BILLTHEON	LONDON DUCKWORTH 1976	TWO MONSOONS [BY] THEON WILKINSON WITH DRAWINGS BY 1 C1			0715610155
954.03WIL WILKINSON THEON	LONDON DUCKWORTH 1976	TWO MONSOONS [BY] THEON WILKINSON WITH DRAWINGS BY 1 C1			0715610155
954.035AUT	LONDON J. MURRAY 1975	AUTOBIOGRAPHY OF A PRINCESS ALSO BEING THE ADVENTU 1 C1			0719532892
954.035MOO MOON PENDEREL	CHATTO AND WINDUS 1961	DIVIDE AND QUIT 1 C1			B6122333
954.035MOO MOORE ROBIN JAMES	(320.954035H) OXFORD CLARENDON PRESS 1974	CRISIS OF INDIAN UNITY, 1917-1940 BY R.J. MOORE 1 C1			0198215606
954.035WIL BROWNE HERBERT	[915.4WIL] LONDON COOPER 1974	DEKHO! THE INDIA THAT WAS BY ELIZABETH CRAWFORD WI 3 C1 M2			085052167X
954.035WIL WILKIN ELIZABETH CRAWFORD	[915.4WIL] LONDON COOPER 1974	DEKHO! THE INDIA THAT WAS BY ELIZABETH CRAWFORD WI 3 C1 M2			085052167X
954.0350922A	LONDON DEUTSCH BRITISH BROADCA	PLAIN TALES FROM THE RAJ IMAGES OF BRITISH INDIA I 3 C3			0233967109 0563129042 V
954.04GAN GANDHI INDIRA	920GAN LONDON [ETC.] HODDER AND STOU	INDIA THE SPEECHES AND REMINISCENCES OF INDIRA GAN 1 C1			0340193875

Figure 11  
A single column format with overlapping  
columns

133.1	TABORI, PAUL	BEYOND THE SENSES: A REPORT ON PSYCHICAL RESEARCH AND OCCULT PHENOMENA IN THE SIXTIES, BY PAUL TABORI AND PHYLLIS RAPHAEL. (FRONTIERS OF THE UNKNOWN) SOUVENIR, 1971. S 028 562 0118	ABCDGKHM
133.1	TACKABERRY, ANDREW	FAMOUS GHOSTS, PHANTOMS, AND POLTERGEISTS FOR THE MILLIONS. NEW YORK: BELL, 1966. C 120 012 2089	A
133.1	TACKABERRY, ANDREW	FAMOUS GHOSTS, PHANTOMS, AND POLTERGEISTS FOR THE MILLIONS. LOS ANGELES: SHERBOURNE P., 1966. C 140 001 865X	A
133.1	TAILLEPIED, MOEL (FATHER)	TREATISE OF GHOSTS: BEING THE PSYCHOLOGIE, OR TREATISE UPON APPARITIONS AND DISSEMBODIED SOULS, PHANTOM FIGURES, STRANGE PRODIGES, AND OF OTHER MIRACLES... TR. BY MONTAGUE SLIMMERS. FORTUNE, [N.D.] C 120 012 2267	A
133.1	TYRELL, G. H. M.	APPARITIONS. REV. ED. COLLIER, 1963. C 120 013 8171	B
133.1	UNDERWOOD, PETER	HOST OF HAUNTINGS: A SHUDDERSOME BOOK OF GHOSTS AND GHOSTLY ADVENTURES. FREWIN, 1973. S 085 632 0277	ACDFGHKLM
133.12	HARRIES, JOHN	GHOST HUNTER'S ROAD BOOK. MULLER, 1968. S 058 410 1066	ACDFHLM
133.122	BRADDOCK, JOSEPH	HAUNTED HOUSES, CHIVERS, 1972. S 085 594 658X	I
133.122	LAFFOREST, ROGER DE	CES MAISONS QUI TUENT, - NOUVELLE EDITION REVUE ET AUGMENTEE. PARIS : LAFFONT, 1972 C 200 017 5732	A
133.12941	BYRD, ELIZABETH	STRANGE AND SEEING TIME. HALE, 1971. S 070 912 0818	AFHILN

Figure 12  
The trend toward blocked entries

## The single column format

From the user's point of view, the single column format can create real difficulties in relating the different elements of each entry. There are often wide gaps between columns which can give rise to errors in reading off information such as ISBN numbers, accession numbers, and locations.

In some catalogues, an attempt has been made to accommodate more information by allowing two or three lines for each entry, with the information in each line arranged in fixed fields, thus creating a series of overlapping columns. This is illustrated in Figure 11. In this case it is much less easy for the user to scan down the information in any given column. A more successful method of fitting in more information is to create turnover lines double column format (Figure 7). This layout is likely to waste space however. The single column format is therefore best suited for short entries which can be accommodated within a single line. Some single column formats show a strong trend towards the blocked entries typical of double column formats, as illustrated in Figure 12. This often wastes space however.

## The double column layout

The answer to the problem of accommodating more information within each entry without causing visual confusion or wasting large amounts of space is the double column format (Figure 3G). This eliminates the problem of reading across between columns of information and therefore makes the task of finding any given element within an entry much easier. It does, however, have the disadvantage of breaking sequence of entries within each frame as well as between frames, and is therefore likely to make the process of finding any given entry somewhat slower. There is little doubt, however, that for entries of moderate length the double

column format is the best all-purpose solution.

There are numerous variations between catalogues in the detailed layout of entries in double column formats. Too many libraries have tried to exactly mimic the layout of catalogue cards, and have positioned items such as the classmark or ISBN number at the top or bottom right of the entry. On a card this would cause no confusion, but on film it is often unclear which entry such information belongs to. It is wiser, therefore, to begin all elements at the left hand side of the entry. The entry heading, or the element under which it is filed, should always stand clear from the rest of the entry by two or three characters; this means that the first line of the entry should begin at the left hand margin and all subsequent lines should be indented by two or three characters. This will greatly facilitate the location of a particular entry in an alphabetical or numerical sequence because it will be relatively easy to compare the first few characters of each heading.

The various information elements within each entry may either run on or begin a new line. In the latter case, there will be a considerable wastage of space with entries which give only a minimum of detail in each data field. In this case, the three column format is likely to save space.

## Present and future work

The Unit is currently working on the preparation of a manual for use by librarians who are faced with the problem of designing and implementing a library guiding system. It might be argued that rather than attempting to turn professional librarians into amateur graphic designers, one should persuade them to employ a professional designer. Unfortunately, however, many smaller libraries simply cannot afford to do this, and there is therefore a need to provide them with information which will help them to produce the best result they can with the resources they have available to them. The manual will cover the following topics: the planning of the guiding system in terms of the content, number and positioning of signs; basic design principles; materials and methods currently available; sample design schemes at two levels of cost, one for production in-house and the other assuming that some of the items will be commissioned from outside; advice on how to specify requirements and liaise with designers and manufacturers.

In the future, the Unit's work is likely to include further studies on the layout of COM catalogues in relation to ease of use and economy of space. With some libraries in Great Britain now experimenting with on-line catalogues, there is also a need for a study of suitable entry layouts for VDU's. There is also considerable scope for further work on the use of colour in displays such as Prestel.

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