## APPENDICES
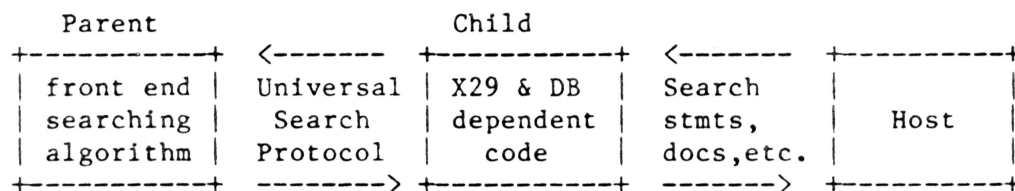
A1   Macaskill, M.J.   Splitting Cirt into two processes

A2   Robertson, S.E.   On sample sizes for non-matched-pair IR experiments

A3   Sample logs

A4   Publicity for free searches

A5   Thompson, C.L.   The Cirt manual

A6   Random allocator cards

A7   The questionnaires

A8   Tables of results

**Splitting cirt** into two processes


M. J. Macaskill



The original idea in project B [1,2 ] was to split **cirt** into two processes as follows:

```
     Parent                    Child
+-----------+ <-------  +-----------+ <-------  +----------+
| front end | Universal | X29 & DB  | Search    |          |
| searching | Search    | dependent | stmts,    |   Host   |
| algorithm | Protocol  |   code    | docs,etc. |          |
+-----------+ ------->  +-----------+ ------->  +----------+
```


The idea was that this work should be done during the data gathering stage of project A [1]. It was not possible however to add any more features to **cirt** without running out of core space. So we were forced to do something in the way of splitting **cirt** as part project A in order to make **cirt** viable as an experimental tool. The split is not as sophisticated as that outlined in [2], in that it does not attempt to handle more than one host. Nevertheless, it uses the same fundamental method as that outlined in [2]:

Parent calls **pipe** twice to set up a two way communication channel. It then calls **fork** and if **fork** returns zero, it spawns the child process using **execl** and then passes the file descriptors (one read and one write) as arguments.

The flow of control in the child is follows:

1. Get next command from parent.

2. Hold dialogue with host.

3. Send reply to parent.

4. Go to 1.

The main program for the parent process is in cirt.c, the main program for the child process is in subpro.c. The parent and child processes both access general functions held in the program library, /lib/libgs.a. The files are distributed between the two processes as follows:

```
Parent:-
main + functions: cirt.c
functions: print.c search.c /lib/libgs.a

Child:-
main + functions: subpro.c
functions: x29.c lex.yy.c /lib/libgs.a
```

The contents of files cirt.c, print.c, search.c, x29.c and lex.yy.c are described in [3].


The parent sends commands to the child via the UNIX* pipe, and the child then either sends a message to the network or reads from the network via yylex. In talkthro mode, where cirt allows the searcher to talk directly to the Host (Data-Star), the parent reads from the pipe while the child directly controls terminal I/O and network I/O.

As an example, consider the case of a single term search. The parent will send

&lt;send-msg-command&gt;:&lt;search term&gt;:

to the child. When the child receives this request, it sends a '1' back to the parent acknowledging this. The child then sends the search term to the host. To get the search result, the parent then sends

&lt;call-yylex-command&gt;:

to the child. The child then calls yylex to read the result from the network. If the search was valid, then the parent will be sent

1:&lt;yylex-return-value&gt;:&lt;doc set no.&gt;:&lt;search result&gt;:

If there was a yylex error, then the parent will be sent:

1:&lt;yylex-return-value&gt;:&lt;possible other information&gt;:

There are three possibilities for the other information depending on the yylex return value:

| yylex return value | other information returned |
|---|---|
| zero | call status 1-up; 0-down |
| 5 | Data-Star error code |
| other value | nothing |

If the yylex return value is zero (a network event of some sort) then the appropriate action is taken and the command is aborted. If the return value is 5, then an error message is displayed and result taken as zero. If a program error has occurred, then the parent is sent a '0'

---

*UNIX is a Trademark of Bell Laboratories.

indicating a serious bug - the parent will then kill the child and exit itself.

1. Robertson,S.E. (1984) Project Proposal.
   City front-end project
2. Robertson,S.E. and Bovey,J. (1983) A front-end for IR
   experiments.  BLRDD Report Number 5807.
3. Macaskill,M.J. (1986) An Overview of Cirt (doc in dept).

On sample sizes for non-matched-pair IR experiments

S.E. Robertson

Department of Information Science
The City University
Northampton Square
London EC1V OHB, U.K.

The use in IR experiments of formal statistical methods such as significance tests has been relatively unusual. This gap has to do in part with the difficulty of establishing the validity of particular tests or even of defining a suitable framework for such tests (IR experimental data is notoriously difficult to pin down in any neat statistical model). Some of the difficulties are discussed elsewhere.[1]

One consequence is that the use of experimental design ideas from statistics, even to the extent of attempts to determine required sample size, has been almost non-existent. A notable exception was in a proposal to the British Library in 1979 by Jamieson and Oddy.[2] Here an argument was given to suggest a particular minimum sample size for an operational comparison of two systems, using independent samples of requests on the two systems.

The object of this paper is to place the Jamieson/Oddy argument in the context of a more general discussion of experimental design for IR, drawn in part from Robertson,[1] and to review and extend the argument. Ideas are also borrowed from Sparck Jones and Bates,[3] and Gilbert and

Sparck Jones,[4] who address particularly the matched-pair experimental design (rather than independent samples).


## 1    STATISTICS IN IR TESTS


### 1.1    Experimental design:  system comparison

An experiment is normally undertaken to answer, or to provide evidence which will help to answer, a research question or questions.  Formal methods of experimental design are used to establish experimental techniques and procedures which have the best chance of answering these questions.  Such formal methods appeal to logical or statistical arguments.

The research questions in an IR experiment will frequently have to do with comparing two or more variant systems, or with diagnostic approaches to less-than-perfect performance on the part of one system.  In this paper, I concentrate on the former (comparison) type of question.  A comparison will normally involve the measurement (observation) of some variables on a number of instances of use of the systems, and the comparison of averages or distributions of observations on the different systems.  The variables may be traditional performance measures such as recall or precision, cost factors such as time taken, user satisfaction, or any other variable of interest.

An IR experiment will normally involve a system or systems (that is, computer programs, human procedures, methods, rules etc., documents and requests).[1]  Both the set of documents used and the set of requests put to the systems must be regarded as some sort of sample of all possible documents/requests.  Although it is seldom the case that the sample can be assumed to be a genuine random sample, nevertheless any inference from the results of the experiment must be based on the assumption that the documents and requests used in the test do represent those that may come to the system later.

For documents, this may not be so much of a problem: there is not usually any shortage of documents to chooose from. For requests, on the other hand, it is a major problem: requests (in the sense of Anomalous States of Knowledge or ASKs, perceived and acted upon) exist only for a short time, and must be caught then. Any observation that depends on the state of knowledge of the requester, such as relevance judgements or indications of satisfaction or otherwise, must also be trapped at the same time.

Requests are extremely variable in their characteristics; any comparison between two systems must seek to eliminate such variations from the comparison. That is, one must try to ensure that any inferred difference between the two systems is actually a systematic difference and not some accidental effect of the requests used.

For these reasons, the most usual way of using requests in an IR experiment, from Cranfield on, has been based on a "matched-pair" design. That is, the same set of requests has been put to both or all the systems being compared. This should clearly prevent some of the grosser inter-request differences from affecting the comparison, although it will not eliminate interaction effects (a particular system being better for particular types of request). (This kind of argument is taken further in the Latin-square experimental designs of Keen.)[5]

The matched-pair design is based on the assumption that the same request can be put to the two or more systems, and equivalent measurements or observations can then be made. In a way this assumption dates from an earlier era of information retrieval: the time of black-box batch computer retrieval systems. However, as befits the on-line age, we now see IR processes as essentially iterative and interactive, and the "request" or "need" or ASK as something fluid and difficult to get hold of. In particular the user, having once made a search on a particular problem at a particular time, and having responded to the results of that search, no longer has the same ASK as before, and the search cannot therefore be repeated on another system.

This problem was confronted by Jamieson and Oddy,[2] and they therefore proposed, for a comparison of two highly interactive systems, to obtain two independent samples of requests. The matched-pair design has become so much the norm that few other IR researchers have taken up the independent-sample method; nevertheless, as we get to grips with the problems of interaction, it seems likely that more use will have to be made of this method. It was adopted by the author for an experiment currently under way.[6]

## 1.2    Tests of significance

An obvious application of statistical ideas to IR experiments is to apply significance tests to the results. In the case of a comparative evaluation of two or more systems, such a test would normally address the question of whether any observed difference between the systems was real, or alternatively could be attributed to chance effects due to the samples involved.

Some such tests have been used in IR experiments, though by no means universally. The earliest such tests were based on treating the document collection as a sample, ignoring the fact that the request set should also be seen in that light. Since (as we have seen) document collections are usually much larger than request sets, such tests would attribute significance where it was not always justified.

The problem with dealing with <u>both</u> samples simultaneously has seldom been tackled in IR, and looks pretty intractable.[1] Given the point about relative sizes, it therefore seems more profitable to concentrate on request sets. Some tests based on requests have been tried; they come into two categories:

(a) Tests based on the matched-pair design of the experiment, whereby observations on all or both systems on each query are compared, and the test applied to this comparative information (one datum

for each request);

(b) Tests based on examining the distribution of observations over all queries for each system, and comparing the distributions for the different systems.

The former includes for example the sign test and Wilcoxon's signed ranks test,[5] and is clearly only applicable in the case of a matched-pair design.

One problem which needs to be addressed when deciding on a statistical significance test, is what (if any) assumptions can be made about the shapes of the distributions. Many tests depend on strong assumptions about these shapes. Unfortunately, IR data is notoriously difficult to pin down in this respect: if one looks, for example, at recall or precision values, one finds the whole range (0-100%) covered, with points of concentration at those values which happen to be low-denominator frations (half, two-thirds etc.). Of course the actual distribution will depend on which particular variable is being measured as well as the circumstances of measurement; but the situation does not look good for such strong assumptions. We are therefore led towards non-parametric tests.[7]

Given this point, and given also that we are looking at the independent sample rather than the matched-pair design, the choice of test is fairly limited. Jamieson and Oddy[2] suggest the Mann-Whitney U test, a suggestion which is followed in the present paper.

The matched-pair design, and its consequences for choice of significance test and sample size calculation, were analysed extensively in the context of the 'Ideal' test collection (Sparck Jones and Bates;[3] Gilbert and Sparck Jones[4]). Several of the ideas discussed there re-appear below.

## 1.3 Experimental design: sample size

A common application of experimental design ideas outside IR is in the
determination of the sample size that might be required in order to
answer a particular research question. Sample sizes are difficult to
determine in advance, chiefly because the calculation involves guessing
what the results will look like. In some kinds of experimental endeavour,
it may be reasonable to suppose that such guesses can be made.
Generally this is not the case in IR experiments.

The basis for the determination of sample size is as follows:

(a) Guess the shapes of the distributions of the variables involved;

(b) Guess the magnitude of the difference whose existence is to be
established, or the precision of the estimate required;

(c) Choose a test of significance and a required level of
significance;

(d) Calculate, given the above, the minimum sample size which can be
expected to give the right result.

Thus, for example, suppose we have a theory that rose bushes reared on
XGRO should produce 10% more flowers than those grown on ordinary
fertilisers. We conduct an experiment with some bushes given XGRO and
some not, with a view to establishing (if our theory is correct) at least
that there is a significant difference between the experimental and
control groups. For (a), we need to know or guess something about the
usual distribution of numbers of flowers per bush; for (b) our theory has
given us the figure of 10%; we choose a test and a significance level
for (c), and the calculation can then, in principle, be made.

Some of the difficulties of applying these ideas to IR will already be
apparent: the distribution shape has been identified as a problem, and
theories in IR are rarely so explicit as to predict a particular

quantitative improvement. For (b), we may design an experiment which will detect a difference between two systems if it exceeds a certain amount; in other words, we specify a minimum difference we would like to be able to detect. That will be the approach taken here.

For (a), the situation may not be quite so bad as appears at first. Although we have rejected any significance test which is based on assumptions about distribution shapes, it may nevertheless be appropriate to use particular shapes in a sample-size calculation. This would at least give us some first approximation to an appropriate sample size, and a number of calculations based on different shapes would indicate to what extent the calculation was dependent on the distribution. In other words, over-simplified assumptions about distributions are not a suitable basis for a choice of significance test, but may be suitable for a sample-size calculation.

The next section develops various sample-size calculations for the independent-samples design of IR experiment, based on different distributional assumptions.

## 2 SAMPLE SIZES FOR INDEPENDENT SAMPLES

### 2.1 Variables and distributions

As indicated above, a comparison between two or more systems may involve measurement or observation of a number of variables. For example, these may include traditional performance measures such as recall and precision, unnormalised performance data such as number of relevant documents retrieved, cost of searching or of various aspects of the searching process (such as on-line costs), other cost-related factors such as time taken (human or machine), and more subjective factors such as user satisfaction.

Most of these variables have a range of values which is restricted in some logical fashion, which will affect the choice of distribution. Thus recall and precision are restricted to the range 0-100%; cost factors are normally constrained to be positive. In both cases, the fact that observed distributions tend to push the limits of the range means the exclusion of the statistician's favourite distribution, the Normal. A calculation based on the Normal distribution is included below, but is considered to be the least realistic assumption for most IR data.

## 2.2    The Mann-Whitney U test and the sample size calculation

We assume, then, that two systems are being compared, and that the distributions of observations of the variable in question over the set of requests, for one system, is known. We assume further that the two distributions A, B (for the two systems) are of the same shape, and differ only in location. The density functions we consider will take the form $f_\mu(x)$ and $f_{\mu+\delta}(x)$, where $\mu$ is the mean for the lower of the two distributions, A, and $\mu+\delta$ the mean for the higher, B.

The U test involves ranking the observations of the two systems together, and counting the number of instances in which an observation from B precedes (is less than) an observation from A. For continuous distributions, the expected value of this count will be

$$U_E = N^2 \int_{-\infty}^{\infty} f_{\mu+\delta}(x) \int_{x}^{\infty} f_\mu(y) \, dy \, dx \qquad (1)$$

where N is the sample size (in these calculations, both samples are assumed to be the same size N). For a discrete distribution, where the density function f is replaced by a probability p, this would read

$$U_E = N^2 \sum_{x=-\infty}^{\infty} p_{\mu+\delta}(x) \sum_{y=x+1}^{\infty} p_\mu(y)$$

However, in most of the cases discussed here, the distributions are

assumed continuous. The limits of $\pm\infty$ are chosen to represent "all possible values" upwards or downwards respectively; as we have seen, the values may in fact be restricted.

For N>20, under the null hypothesis (no difference between the samples), U is approximately Normally distributed; in fact

$$z = \frac{U - \frac{1}{2}N^2}{\sqrt{\dfrac{N^2(2N+1)}{12}}}$$

is approximately Normally distributed with mean zero and standard deviation one. Probability tables for the Normal distribution can then be consulted for significance levels for z. In most examples below, N is in the hundreds, and a further approximation is taken, namely $(2N+1) \approx 2N$, hence

$$z = \sqrt{6N}\left(U/N^2 - \tfrac{1}{2}\right)$$

In the examples we will be looking for significance at the 5% level, i.e. for sample sizes which will give an expected value $z_E$ below -1.96 (having chosen A as the lower of the two distributions, $z_E$ will be negative). This value is based on a two-tailed test, i.e. assuming no prior implication as to which system is better. From (1), $U_E/N^2$ is independent of N. Hence

$$N = \frac{1}{6}\left(\frac{z_E}{(U_E/N^2 - \tfrac{1}{2})}\right)^2$$

and the requirement for significance becomes

$$N > \frac{c}{(2U_E/N^2 - 1)^2} \qquad \text{where} \quad c = 2.56 \qquad (2)$$

It should be noted that the requirement that the _expected_ value of z should be below -1.96 allows a substantial chance (50% in the extreme

case) that the value actually observed is nevertheless above this limit and therefore not significant. In statistical terms, the test would be described as having 50% power. A more stringent requirement would be that the test should have 95% power, i.e. that there should be no more tha a five per cent chance of the experiment yielding a non-significant result (this is the position taken in the "ideal" test collection studies).[3,4]

A sample size calculation for a 95% power test in the present case would require an analysis of the distribution of the Mann-Whitney U statistic under assumptions other than the null hypothesis, which has not been attempted in this paper. (The 50% power calculation requires only the mean of this distribution, which is relatively easy to establish.) In relation to the results presented below, it should be stressed that a 95% power test would require considerably larger sample sizes.

Two further tests are used in the sample-size calculations below: a t test for Normal distributions and a chi-squared test for binary data.

## 2.3   Jamieson and Oddy's rectangles

Jamieson and Oddy considered the measure precision in their attempt to calculate sample size. As precision is restricted to a limited range, they assumed for the purpose of the calculation that the distributions were rectangular (i.e. uniform over the range r). Then the distributions will appear as in Figure 1. The absolute position of the pair of distributions is not important; we will assume for the calculation that A starts at 0. Then $f_{\mu}(x)$ is 1/r for 0<x<r, and 0 elsewhere; $f_{\mu+\delta}(x)$ is 1/r for $\delta$<x<r+$\delta$, and 0 elsewhere.

[insert figure 1 about here]

Formula (1) gives

$$U_{\epsilon} = \frac{N^2}{r^2} \int_{\delta}^{r} \int_{x}^{r} dy \, dx$$

$$= \frac{1}{2} N^2 \left( 1 - 2\frac{\delta}{r} + \left(\frac{\delta}{r}\right)^2 \right)$$

(the end-point of the range of integration for the first integral is taken as r because in the range (r, r+$\delta$) the second integral is zero). Then (2) gives

$$N > \frac{c}{\left( 2\frac{\delta}{r} - \left(\frac{\delta}{r}\right)^2 \right)^2}$$

From this formula, we can calculate a table of minimum values for N given different $\delta$/r (Table 1).

| $\delta$/r | Minimum N |
|------------|-----------|
| 2.5% | 1050 |
| 5% | 269 |
| 10% | 71 |
| 20% | 20 |

Table 1. Minimum N values for two rectangle distributions (U test)

It is instructive to reconsider some aspects of the original Jamieson and Oddy version of this argument. Firstly, the sample sizes they present are less than those in Table 1. The reason for this is that they chose a one-tailed test of significance rather than a two-tailed test. They took the theory to predict that one of the systems would necessarily work better than the other; the only question was, was it significantly better? This shows a touching faith in IR theory, and actually a misconception of the theory under test (which theory was due to the present author!). At any rate, it is not the normal situation in IR experiments.

Secondly, the discussion by Jamieson and Oddy suggests that the difference $\delta$ between the distributions is normalised by the mean $\mu$ of the lower distribution. That is, they discuss a factor $\delta/\mu$, instead of what they actually calculate, namely $\delta/r$. Since they are considering precision, r is likely to be 1 (or 100%); $\mu$ might easily be 1/2 (50%). Thus their specification of the minimum difference they would like to be able to detect is actually expressed in units which are perhaps twice as big as they intended. The sample size required to detect, say, $\delta/\mu=5\%$ would be larger still than that required to detect $\delta/r=5\%$ as in Table 1.

Thirdly, the form of distribution assumed contradicts the assumption that precision values are likely to cover the whole 0-100% range since the end-points of the two distributions do not coincide. It would be worth attempting a formulation that satisfied this assumption.

## 2.4   Trapezium distribution

In pursuit of a simple model for a variable like precision, a trapezium-shaped distribution on the range (0,1) suggests itself. A pair of trapezium distributions are represented in Figure 2. $f_\mu(x)$ is given by the straight line through the three points (0,1-3a), (1/2,1), and (1,1+3a) for some a such that $-1/3<a<1/3$. Then f (x) = 1-3a+6ax and $\mu = \frac{1}{2}(1+a)$. $f_{\mu+\delta}(x)$ is given by the same formula with b replacing a; $\mu+\delta = \frac{1}{2}(1+b)$, and $\delta = \frac{1}{2}(b-a)$.

[insert figure 2 about here]

From (1),

$$ U_\epsilon = N^2 \int_0^1 (1-3b + 6bx) \int_x^1 (1-3a + 6ay)\, dy\, dx $$

$$ = \frac{1}{2} N^2 (1 + a - b) $$

$$ = \frac{1}{2} N^2 (1 - 2\delta) $$

and from (2)

$$N > \frac{C}{(2\,\delta)^2}$$

Table 2 gives minimum N for different values of $\delta$ from this formula.  These $\delta$ values are not normalised, but the range is necessarily 1, so they can be taken as equivalent to the $\delta/r$ values in Table 1.

It may be seen that the figures are in fact very close to those derived from the two rectangle model.

---------------------------------

| $\delta$ | Minimum N |
|---|---|
| 2.5% | 1024 |
| 5% | 256 |
| 10% | 64 |
| 20% | 16 |

Table 2.  Minimum N values for two trapezium distributions (U test)

---------------------------------

## 2.5  Normal distributions

Turning now to the case of an unrestricted variable, an obvious model to try is a pair of Normal distributions of the same variance.  Figure 3 shows two Normal distributions $N(\mu,\sigma)$ and $N(\mu+\delta,\sigma)$.

[insert figure 3 about here]

From (1) and the Normal distribution function, we have

Robertson

$$U_E = \frac{N^2}{2\pi\sigma^2} \int_{-\infty}^{\infty} exp\left(\frac{-(x-\mu-\delta)^2}{2\sigma^2}\right) \int_{x}^{\infty} exp\left(\frac{-(y-\mu)^2}{2\sigma^2}\right) dy\, dx$$

Solution of this equation is not simple. However a solution to an equation of which this is a special case is given in Robertson.[8] From that, we can infer that

$$U_E = \frac{N^2}{\sqrt{2\pi}} \int_{\delta/\sqrt{2}\sigma}^{\infty} exp\left(\frac{-t^2}{2}\right) dt$$

and from (2)

$$N > \frac{C}{\left(\frac{1}{\sqrt{2\pi}} \int_{-\delta/\sqrt{2}\sigma}^{\delta/\sqrt{2}\sigma} exp\left(\frac{-t^2}{2}\right) dt\right)^2}$$

The integral is simply a probability from $N(0,1)$ and can be looked up in suitable tables. Table 3 gives the minimum sample sizes for different values of $\delta/\sigma$. It should be noted that normalising $\delta$ by the standard deviation $\sigma$ is not equivalent to the methods adopted in the two previous examples; there is strictly no such equivalent. Therefore, making comparisons between Table 3 and the two previous tables is not really valid. A rule-of-thumb comparison can be devised by saying that 95% of the observations in a Normal distribution lie within ±2 standard deviations, so the range might perhaps be taken as $4\sigma$. On this basis, 5% $\delta/r$ in Table 1 would be equivalent to 20% $\delta/\sigma$. By this argument it would appear to be a little easier to distinguish Normal distributions than rectangle or trapezium.

| $\delta/\sigma$ | Minimum N |
|------|-----|
| 10% | 822 |
| 20% | 206 |
| 40% | 53 |
| 80% | 14 |

Table 3.  Minimum N values for two
Normal distributions (U test)

## 2.6   Exponential distributions

As discussed above, the Normal distribution is not likely to represent
many IR variables very closely.  Those that are not constrained to a
finite interval (like precision) tend to be constrained by a lower limit
(e.g. zero, like any cost-related factor).  Furthermore, their
distributions tend to be very highly skew.  A candidate distribution
having these properties is the (negative) exponential.  A pair of
exponential distributions is shown in Figure 4.  The exponential is
described by a single parameter $\mu$ which is both mean and standard
deviation.

[insert figure 4 about here]

From (1) and the exponential distribution function,

$$U_E = N^2 \int_0^\infty \frac{1}{\mu+\delta} \, exp \, \frac{-x}{\mu+\delta} \int_x^\infty \frac{1}{\mu} \, exp \, \frac{-y}{\mu} \, dy \, dx$$

$$= \frac{N^2}{2 + \delta/\mu}$$

From (2),

$$N > c \left( \frac{2 + \delta/\mu}{\delta/\mu} \right)^2$$

whence we may calculate Table 4. The normalisation $\delta/\mu$ is comparable with the normalisation $\delta/\sigma$ for the Normal case. On the basis of the rather arbitrary comparison discussed in the previous section, exponential distributions are somewhat more difficult to distinguish than any of the other cases analysed so far.

---------------------------------

| $\delta/\mu$ | Minimum N |
|---|---|
| 10% | 1129 |
| 20% | 310 |
| 40% | 92 |
| 80% | 31 |

Table 4. Minimum N values for two exponential distributions (U test)

---------------------------------

## 2.7  Normal distribution with t-test

It is worth considering alternative tests as well as alternative distributions, to see whether the choice of test is likely to be critical. In particular, we should ask whether there is much to be gained by using a parametric test. One obvious candidate is the t-test for a difference between two means.

The expected value of the t statistic for the case of two Normal distributions (as in 2.5) is

$$t_E = \frac{\delta}{\sigma\sqrt{\frac{2}{N}}}$$

(for two samples both of size N).  For large N, t is approximately Normally distributed with mean 0 and variance 1 under the null hypothesis. Therefore, for a 95% significance level with 50% power, we need $t_E > 1.96$.  This yields

$$N > \frac{7.68}{\left(\frac{\delta}{\sigma}\right)^2}$$

from which we calculate the minimum sample size required (Table 5).  (The formula requires a slight correction when N is not large, which has been taken into account in the last two values in the table.)

--------------------------------------

| $\delta/\sigma$ | Minimum N |
|---|---|
| 10% | 768 |
| 20% | 192 |
| 40% | 51 |
| 80% | 14 |

Table 5.  Minimum N values for two
Normal distributions (t-test)

--------------------------------------

These results are a little but not very much better than those already obtained for Normal distributions:  it seems that we do not gain much by allowing the strong parametric assumptions of the t-test.

## 2.8   Binary distributions with chi-squared test

All the distributions discussed so far have been continuous.  Many variables involved in retrieval tests are (either essentially or because

of a particular operational definition) discrete rather than continuous.
An extreme version of a discrete distribution is a binary distribution
(i.e. the variable has only two values). Comparing two such distributions
suggests a chi-squared test. (Although the Mann-Whitney is capable of
dealing with ties in the ranking, as is bound to occur with a discrete
variable, the number of ties in the extreme case of a binary variable
renders that test unsuitable.)

A binary distribution may be represented by a probability for one of
the values, which would also be the mean if the value chosen is
arbitrarily associated with unity, the other being zero. In other words
the mean is $\mu = P(1)$, and $1-\mu = P(0)$.

We assume two distributions, A with mean $\mu - \delta/2$ and B with mean $\mu + \delta/2$.
The results of the experiment will be represent by a 2x2 table:

|   | A | B |  |
|---|---|---|---|
| 1 | $S_A$ | $S_B$ | $S_A + S_B$ |
| 0 | $N - S_A$ | $N - S_B$ | $2N - S_A - S_B$ |
|   | N | N | 2N |

The expected value of $S_A$ (the number of "successes" with A) is $N(\mu - \delta/2)$,
of $S_B$ is $N(\mu + \delta/2)$.

If we perform a chi-squared test on this data, the expected value under
the null hypothesis for cell A1 will be $(S_A + S_B)/2$, with similar
values for the other cells. We may therefore calculate an "expected"
value for the chi-squared statistic. (The quotation marks are used
because this is not a true expected value, as $\chi^2$ is a non-linear function
of the cell values. Therefore the sample sizes reported here are
approximate only.) The calculation gives

$$\chi^2_E = \frac{\frac{1}{2} N \delta^2}{\mu(1-\mu)}$$

This formula depends on $\mu$, but we can calculate a worst case: if $\mu = 1/2$,

$$\chi^2_E = 2N\delta^2$$

otherwise it is larger. The 5% significance level of $\chi^2$ with one degree of freedom is 3.84; hence we need, in the worst case,

$$N \geqslant \frac{1.92}{\delta^2}$$

This gives the values in Table 6. As in Table 2, the $\delta$ values are not normalised, but the range is necessarily 1.

---

| $\delta$ | Minimum N |
|---|---|
| 2.5% | 3072 |
| 5% | 768 |
| 10% | 192 |
| 20% | 48 |

Table 6. Minimum N values for two binary distributions ($\chi^2$ test)

---

It may be seen that it is very much more difficult to demonstrate a significant difference for this kind of variable.


3    DISCUSSION

It should be remembered that the sample sizes given in the tables apply to each of the systems being compared -- i.e. a comparison of two systems would require a total of twice the number of requests given in the tables.

The present study has been limited in a number of ways. First, it has dealt with a small number of somewhat artificial distributions. Real-life distributions tend to be much messier, and in this respect the results are indicative only.

Second, it has considered mainly continuous distributions. Discrete distributions are likely to be more problematic (i.e. to require larger samples) with Mann-Whitney, because of the possibility of ties in the ranking; this point is confirmed by the analysis of section 2.8, where a discrete distribution was used, albeit with a different test.

Third, it provides only for tests of 50% power (i.e. for the given difference, a sample of the given size would have a 50% chance only of producing a significant result). Requiring higher power would involve larger samples again.

Thus, in general, the figures given here may be seen to underestimate the sample sizes required.

## 4    CONCLUSIONS

The major conlusion to be drawn from the present analysis must be the extreme difficulty of conducting adequate non-matched-pair tests in IR. On the one hand, differences in IR performance between alternative systems have often been small; on the other hand, few IR researchers have found it feasible to obtain and work with query set sizes greater than a hundred or so. Between these two facts and the numbers arrived at above, there seems little opportunity for establishing statistically significant differences in properly conducted operational experiments.

On a somewhat more positive note, this analysis seems to indicate the need for more experiments based on some compromise between reality and laboratory controls. While it is clearly desirable to go beyond the highly artificial laboratory experiments that have been common since

Cranfield, attempting total realism is likely to introduce insuperable
methodological problems. The difficulty lies, of course in the selection
of appropriate compromises for particular research aims.


## REFERENCES


1. ROBERTSON, S.E.  The methodology of information retrieval experiment.
In:  SPARCK JONES, K., ed.  Information Retrieval Experiment.
London: Butterworths, 1981, pp 9-31.

2. JAMIESON, S.H. and ODDY, R.N.  Implementation and evaluation of
interactive retrieval through an intelligent terminal.  Project
proposal to the British Library Research and Development Department,
1979.

3. SPARCK JONES, K. and BATES, G.  Report on a design study for the
'ideal' test collection.  Computer Laboratory, University of
Cambridge, 1977 (BLR&D Report No.     ).

4. GILBERT, H. and SPARCK JONES, K.  Statistical bases of relevance
assessment for the 'ideal' test collection.  Computer Laboratory,
University of Cambridge, 1979 (BLR&D Report No. 5481).

5. KEEN, E.M. and DIGGER, J.A.  Report of an information science
index languages test.  Aberystwyth: College of Librarianship Wales,
1972.

6. ROBERTSON, S.E., THOMPSON, C.L., MACASKILL, M.J. and BOVEY, J.D.
Weighting ranking and relevance feedback in a front-end system.
Journal of Information Science, 12, 1986, 71-75.

7. SIEGEL, S.  Nonparametric statistics for the behavioural sciences.
New York: McGraw-Hill, 1956.

8. ROBERTSON, S.E.  The parametric description of retrieval tests. Part II: overall measures. <u>Journal of Documentation, 25,</u> 1969, 93-107.

The following is a log of a Weighted search, in the abbreviated
form used for analysis (an unabbreviated log is given in the
Cirt manual, Appendix A5). More specifically, this is the log
of the Cirt/searcher dialogue; the corresponding Cirt/Data-Star
dialogue is given below (A3-4 on). The searcher's contibutions
are underlined; brief explanations are given on the right.


```
Enter id for offline prints-  275 w
Enter query identifier- 275
Enter y or Y for boolean search; n,N or RETURN for weighted search-
-> aof food-formulated-ut composition
-> oq                                            [2 terms added offline]
 rels t rels
 1. 0  0  food-formulated-ut
 2. 0  0  composition
-> li
No host name given - dstar assumed               [Automatic login]
call established
USERID :
DATA BASE NAME_:  meyy

Login successful
Any limits ?
-> add all
 food-formulated-ut not found                    [1 of the 2 not found]
 3.F30911 W4.7
-> add food-formulated
 4.F1340 W7.8
-> add "food-formulated with ut                  [3 more attempts, 1
 food-formulated with ut not found                sucessful]
-> add "food-formulated with ut"
 food-formulated with ut not found
-> s

Searching..Searched                              [weighted search]

Search tree

82  0  12.5  food-formulated composition         [best set has 82 docs]
-> 1

  set: 82
iplq?1                                           [display 1st title]
1?? q                                            [quit displaying]
-> add elemental                                 [add new term]
 8.F1527 W7.7
```

```
-> s

Searching..Searched

Search tree

12   0   20.2   food-formulated composition elemental
164  0   15.5   food-formulated elemental
-> 1                                              [best set now has 12
                                                   docs, second best
   set: 12                                         has 164]
iplq?1
document 1  already seen
1?? rl                                            [1st & 2nd titles
2?? rl                                             marked as relevant.
3?? fl                                             Abstract displayed
3?? rp                                             for 3rd, then marked
   set: 164                                        rel; remainder of
iplq?q                                             set printed]
   rels: 3
7.8  9.8  3  food-formulated                      [weights recalculated
4.7  6.6  3  composition                           using relevance info]
7.7  9.6  3  elemental
-> add "fatty adj acid"
12.F11757 W3.7
-> s

Searching..Searched

Search tree

3    0   23.1   food-formulated elemental fatty adj acid
6    0   20.1   food-formulated composition fatty adj acid
2    0   20.0   composition elemental fatty adj acid
161  0   19.4   food-formulated elemental
-> 1

   set: 3
iplq?1
1?? rl
2?? rl
3?? rl

   set: 6
iplq?1
1?? 1
2?? 1
3?? q
   rels: 6
9.8  10.4  6  food-formulated
6.6   4.7  3  composition
9.6  10.3  6  elemental
3.7   5.7  3  fatty adj acid
```

```
-> 1

  set: 3

iplq?i

  set: 161
iplq?q
-> add amino-acids
21.F33138 W2.0
-> s

Searching..Searched

Search tree

18  0  22.7  food-formulated elemental amino-acids
-> 1
  set: 18
iplq?1
1?? rl
2?? 1
3?? 1
4?? rp
Search exhausted                                [no more sets in
  rels: 8                                         search tree]
10.4  10.7  8  food-formulated
4.7  4.2  3  composition
10.3  10.5  8  elemental
5.7  5.2  3  fatty adj acid
2.0  3.7  2  amino-acids
-> q
No. of documents in off-line print set is 33
*CONNECT TIME MEYY: 0:12:37 HH:MM:SS 0.210 DEC HRS. SESSION 1842*
*SIGN-OFF 17.28.17 16.03.87Clearing the call
Hours 0, Minutes 13, Seconds 16, Rx 278, Tx 60
                                                [all docs marked
                                                 relevant, plus all
                                                 sets requested,
                                                 printed offline]
```

*Cirt - Data Star log*

```
### Service Packet - Set parameters - Received ###
(7,25) (3,2) (4,0)
D A T A - S T A R , PLEASE ENTER YOUR USERID :

ENTER YOUR A-M-I-S PASSWORD
OOOOOOOO
XXXXXXXX
********

- SUNDAY 22. MARCH 1987: DUE TO MAINTENANCE, D-S WILL NOT BE AVAILABLE
  FROM 0700 TO 1700 HOURS SWISS TIME (0600-1600GMT).
- HSELINE, THE DATABASE OF THE UK HEALTH AND SAFETY EXECTUVIE TO BE
  LAUNCHED SOON. SEE BROADCAST MESSAGE.
- THE EUROPEAN DIRECTORY OF AGROCHEMICAL PRODUCTS DATABANK TO BE
  LAUNECHED SOON. SEE BROADCAST MESSAGE.
ENTER YES IF BROADCAST MSG IS DESIRED_:

ENTER DATA BASE NAME_: meyy

*SIGN-ON   17.15.28                    16.03.87
D-S/MEDL/MEDLINE 1983 - APRIL 1987          SESSION   1841


D-S - SEARCH MODE - ENTER QUERY
    1_:  docz

    RESULT   3378409

    2_:  food-formulated-ut

                 FOOD-FORMULATED-UT KEYWORD NOT IN DICTIONARY
    RESULT        0

    3_:  composition

    RESULT    30911

    4_:  food-formulated

    RESULT     1340

    5_:  food-formulated with ut

    RESULT        0

    6_:  food-formulated with ut

    RESULT        0

    7_:  4 and 3

    RESULT       82

    8_:  ..print 7 /AN,TI/doc=1
```

```
        1
TI Effect  of  enteral  formula  infusion rate, osmolality, and chemical
   composition  upon  clinical  tolerance and carbohydrate absorption in
   normal subjects.

                END OF DOCUMENT

_:..s


D-S - SEARCH MODE - ENTER QUERY
   8_:  elemental

   RESULT    1527

   9_:  7 and 8

   RESULT        12

   10_:  4 not 3 and 8

   RESULT        164

   11_:  ..print 9 /AN,TI/doc=1


        1
TI Effect  of  enteral  formula  infusion rate, osmolality, and chemical
   composition  upon  clinical  tolerance and carbohydrate absorption in
   normal subjects.

                END OF DOCUMENT

_:..print 9 /AN,TI/doc=2


        2
TI Influence  of  the  intake and composition of elemental diets on bile
   acid metabolism and hepatic lipids in the rat.

                END OF DOCUMENT

_:..print 9 /AN,TI/doc=3


        3
TI Energy   needs   and   nutritional   rehabilitation   in  undernourished
   adolescents and young adult patients with cystic fibrosis.

                END OF DOCUMENT

_:..print 9 /AN,TI/doc=4


        4
TI (Immediate  postoperative  enteral  feeding  with  an  elemental  diet
   (Survimed)  using a new application form of the so-called fine needle
   catheter jejunostomy. A prospective study).

                END OF DOCUMENT

_:..print 9 /AB/doc=4
```

4

END OF DOCUMENT

_:..s

D-S - SEARCH MODE - ENTER QUERY
   11_:  (86308376).AN. or (85057528).AN. or (84107858).AN.

   RESULT         3

   12_:  fatty adj acid

   RESULT     11757

   13_:  11 and 12

   RESULT         0

   14_:  7 not 8 and 12

   RESULT         6

   15_:  10 and 12

   RESULT         3

   16_:  3 not 4

   RESULT     30829

   17_:  16 and 8

   RESULT       236

   18_:  17 and 12

   RESULT         2

   19_:  ..print 15 /AN,TI/doc=1

      1
TI Essential fatty acid deficiency after prolonged treatment with
   elemental diet (letter).

            END OF DOCUMENT

_:..print 15 /AN,TI/doc=2

      2
TI Essential fatty acid deficiency after prolonged treatment with
   elemental diet (letter).

            END OF DOCUMENT

_:..print 15 /AN,TI/doc=3

      3
TI Alterations in gastrointestinal contents induced by elemental diets.

D-S - SEARCH MODE - ENTER QUERY
    19_ :  ..print 14 /AN,TI/doc=1


        1

TI Modulation of human erythrocyte shape and fatty acids by diet.

                END OF DOCUMENT

_:..print 14 /AN,TI/doc=2

        2

TI Changes in essential fatty acids in plasma lipid fractions of
   traumatized patients.

                END OF DOCUMENT

_:..print 14 /AN,TI/doc=3

        3

TI Essential fatty acid status in premature newborns fed by nasoduodenal
   technique.

                END OF DOCUMENT

_:..s


D-S - SEARCH MODE - ENTER QUERY
    19_ :  (86308376).AN. or (85057528).AN. or (84107858).AN.
or (81073924).AN. or (81051304).AN. or (80031286).AN.

    RESULT        6

    20_ :  ..s


D-S - SEARCH MODE - ENTER QUERY
    20_ :  10 not 12

    RESULT       161

    21_ :  ..s


D-S - SEARCH MODE - ENTER QUERY
    21_ :  amino-acids

    RESULT    33138

    22_ :  19 and 21

    RESULT        0

    23_ :  20 and 21

    RESULT       18

24_ :  18 and 21

RESULT          0

25_ :  ..print 23 /AN,TI/doc=1

       1
TI Nutritional support: how much for how much?

END OF DOCUMENT

_:..print 23 /AN,TI/doc=2

       2
TI Alteration of methotrexate toxicity in rats by manipulation of dietary components.

END OF DOCUMENT

_:..print 23 /AN,TI/doc=3

       3
TI Efficacy of two elemental diets: a pair feeding study.

END OF DOCUMENT

_:..print 23/AN,TI/doc=4

       4
TI (Experimental study on intestinal absorption of elemental diet).

END OF DOCUMENT
_:..s


D-S - SEARCH MODE - ENTER QUERY
   25_ :  (86308376).AN. or (85057528).AN. or
(84107858).AN. or (81073924).AN.
or (81051304).AN. or (80031286).AN.
or(87081546).AN. or (85163376).AN.

   RESULT          8

   26_ :  25 or 9 or 23

   RESULT          33

   27_ :  ..po 26/ALL/ALL/M. Wilson 275w;275

..PRINTOFF 26/ALL/DOC=ALL/ID=M. WILSON 275W;
I4632 TOTAL DOCUMENTS FOR OFFLINE PRINT: 33
I4607 PRINTOFF SAVED AS QUERY Q0469

D-S - SEARCH MODE - ENTER QUERY
   27_ :  ..po 26/ALL/ALL/M. Wilson
275w;275;evaluation copy

..PRINTOFF 26/ALL/DOC=ALL/ID=M. WILSON 275W;
I4632 TOTAL DOCUMENTS FOR OFFLINE PRINT: 33

APPENDIX A3-9


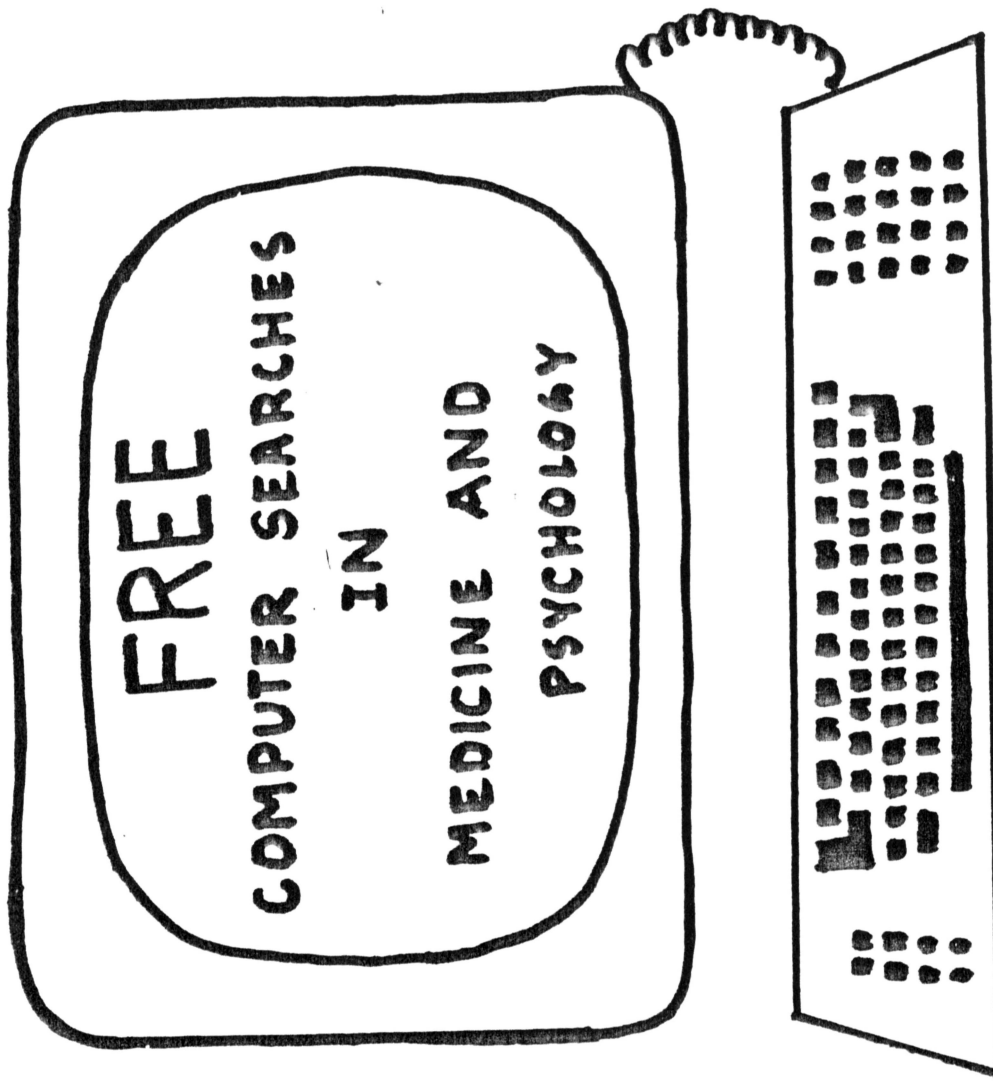I4607 PRINTOFF SAVED AS QUERY Q0470

D-S - SEARCH MODE - ENTER QUERY
    27_:  ..o

*CONNECT TIME MEYY:   0:12:37 HH:MM:SS   0.210 DEC HRS.   SESSION  1842*
*SIGN-OFF  17.28.17                    16.03.87
### Service Packet - Inv. to Clear - Received ###

FREE

COMPUTER SEARCHES

IN

MEDICINE AND

PSYCHOLOGY

FOR MORE DETAILS
PLEASE TAKE A LEAFLET

# FREE
# COMPUTER SEARCHES

Do you need a reference for:

>      an essay
>      a supplement to required reading
>      further information on a specific subject
>      research?

Don't go searching the shelves. . .. come and have a FREE computer search at City University Department of Information Science.

Online bibliographic searches can produce just the references to journal articles, reviews or books that you require in only a matter of minutes.

Generally you pay for this convenience and charges range around £20.00 BUT now you can have one done FREE. The City University Department of Information Science is conducting an experiment involving online database searches and welcomes your particular enquiry.

All you have to do is:

1.  Make sure it is a subject enquiry related to Medicine or Psychology so it can be searched for on the U.S. National Library of Medicine database MEDLINE. Examples of subject enquiries might be –
    - The effects of cigarette smoking on the lungs
    - Arthritis and drug therapy
    - Schizophrenia and diet etc. etc. etc.

2.  Come to City University Department of Information Science and be there while the search is taking place.

3.  Answer a brief questionnaire and evaluate the success of your particular search.

If you are interested would you please contact:

>      Catherine Thompson
>      Department of Information Science
>      The City University
>      Northampton Square
>      London
>      EC1V OHB
>      phone: 253 4399 ext. 3901

Don't be shy come along and have a try...

<u>CIRT USERS MANUAL</u>

Catherine Thompson

January, 1986

APPENDIX A5-2


Preface


This manual is divided into three sections

      1.  Search guide

      2.  Alphabetical listing of commands

      3.  Sample searches


     Note: terms citation, reference, and document all refer to the same thing ie the document surrogate offered by the host Data-Star.

## REFERENCE CARD

| | |
|---|---|
| ->DELelet,del | deletes terms before or after the search |
| ->LIST,list | lists the terms presently active on the search |
| ->Look,l | displays titles of documents |
| ->NewWeights,nw | recalculates the weights based on relevance feedback information |
| ->Out,o | log-off Data-Star |
| ->RESET,reset | start a new search or changes databases |
| ->Quit,q | log-off Cirt |
| ->Search,s | sends search terms to Data-Star |
| ??rl | indicates the present document as relevant and displays the title of the next document |
| ??rq | indicates the present document is relevant then quits the whole set and returns to command mode -> |
| ??r | indicates the present document is relevant and asks what you would like to do with the entire set ie ignore, print, look, or quit |
| ??f | would like to see further fields |

              1.Abstract  2.Descriptors  3.Year
              4.Language  5.Source       6.Author & Source

| | |
|---|---|
| ??l | look at the title of the next document |
| ??i | ignores the whole set and skips to the next set |
| ??p | print the whole set off-line in full format. |
| ??q | returns to command mode -> |
| ??CR | asks what you would like to do to the entire set ie ignore, print look or quit |

# TABLE OF CONTENTS TO SEARCH GUIDE

SEARCH GUIDE

CIRT

SEARCH GUIDE

## 1. Introduction

Cirt is a prototype front-end system which permits weighting ranking and relevance feedback on a traditional Boolean retrieval system - Data-Star. The system Cirt is strictly dependent on the host Data-Star but within that host it is able to access the following databases MEZZ MEDL PSYC INSP INZZ. Cirt permits two forms of searching. One is to use weighting ranking and relevance feedback facilities of Cirt, and the other is to use Cirt transparently, providing access to the traditional Boolean retrieval offered by the host. For the experiment both types of searches will be done on Cirt in order to keep a log of the transactions for later comparison and provide a consistent basis for comparison. Although Cirt will provide the mechanism for exploring and developing weighted ranked and relevance feedback retrieval it is not the finished front-end, but essentially a tool for this experiment. Therefore it is somewhat cumbersome and like all prototypes lacking the refinements which will result from further development.

## 2. Weighting Ranking and Relevance Feedback

This form of retrieval offers three processes to enhance retrieval effectiveness: weighting, ranking, and relevance feedback. As terms in the enquiry are put to the chosen database the terms are weighted according to the frequency of occurrence of that term within the database, the most infrequently used (and perhaps most specific) terms having the highest weight. Searches are then done with combinations of terms, giving sets of documents ranked by matching value (sum of weights). References within each retrieved set can then be examined. The title is automatically displayed; if more information is required in order to judge relevance, there is also option to see other fields such as Abstract Source etc. Having seen these references, judgements are made as to the citation's relevance or lack of it by tagging the reference with an "r" to indicate relevance, and blank or no response to indicate not relevant. After viewing and tagging any number of references in this fashion it is possible to calculate new weights based not on the frequency of occurrence information mentioned previously but on the relevance information supplied by the tagged references. Using these new weights and perhaps additional terms it is possible to re-search thereby achieving more effective results.

## 3. Modes

Not unlike Data-Star Cirt has two modes

3.1 COMMAND MODE which has the prompt ->. This mode expects any one of the commands mentioned in the alphabetical listing of commands preceded by the -> prompt.

All commands are in the form

> -> command argument1 argument2 ...

valid arguments are dependent on the command. For instance:

> -> add  term1 term2...

Commands and arguments can be in upper or lower case. Any command or argument in the list below can be abbreviated by leaving out only of the letters given in lower case eg if a command is specified as LogIn it can be abbreviated as "li" or "logi" or "lin" or entered in full as "login" but it cannot be abbreviated to "l" or "log". Spaces separate the command and arguments, but there should be no space within the command itself.


3.2 DISPLAY MODE which has the prompt ??. This mode expects any one of the responses mentioned in the alphabetical listing of commands preceeded by the ?? prompt.

This mode essentially asks two questions - one related to relevance the other related to displaying documents, therefore it can accept either a single or double response.

? When addressing the question of relevance you must positively indicate relevance by typing "r". All documents tagged with an "r" will automatically be printed offline. Non-relevance is indicated by a blank or no response.

? The next question queries what you would like to do with the following document or the whole set.

Responses to the  ?? prompt can take three forms.

1. Further information required

> f       permits the display of additional fields, after which you are returned to the  ?? prompt. There are six possible options with corresponding numbers:
>
> > 1.Abstract  2.Descriptors  3.Year
> > 4.Language  5.Source       6.Author  &  Source
>
> f6      It is possible to skip this menu and indicate directly the additional field you require. This can be done by adding the corresponding number of the desired field after typing "f" ie "f1" would display the abstract, "f6" would display author and source etc.

2. Indicating relevance and automatically printing offline.

rl - indicates the present document is relevant
     displays the title of the next document

rq - indicates the present document is relevant,
     and quits the set to return to command mode->

r - indicates the present document is relevant and
    asks whether you would like to ignore or print the
    entire set, look or quit to command mode ->.

3. Non-relevant documents

l      displays the title of the next document

q      returns to command mode ->

CR     asks what you would like to do with the entire set
       ie ignore, print look or quit to command mode ->

4. Searching

4.1 LOGGING ON

### 4.1.1 Logging on to Cirt

Call up the LSI 11/23 (which you will be instructed to do
according to your particular circumstances).  Once you are
connected to the 11/23, log-in using the ID, which you have
been given, and your password, which you should assign
yourself.  This should put you directly into Cirt.  If you
have been successful you will get the header:

```
+-------------------------------------+
|                                     |
|   W E L C O M E   T O   C I R T     |
|                                     |
+-------------------------------------+
```

Using dstar:
    When you get the Cirt prompt -> type li (login) dstar and press RETURN.
    When you get the next Cirt prompt, you can start using any of the Cirt
    commands (add, search, etc.). To end a dstar session use the Cirt command
    o(ut).

Quitting Cirt:
    Use the Cirt command q(uit). When you quit Cirt, you will be left in
    Unix (the Unix prompt is $). Logoff by typing ^z (control-z).

Looking at documents:
    Use the Cirt command l(ook). To look at further fields, use the f
    command. Type f and then press RETURN (if you wish to be prompted
    for a field number), or f followed by one of the following numbers
    for the associated field(s).
        1. Abstract    2. Descriptors    3. Year
        4. Language    5. Source         6. Author & Source

The first input you will be asked to type is

**"Enter id for offline prints"**

This is identical to the ID required on the printoff statement of Data-star, all the appropriate punctuation will apply (ie ";" to produce a new line etc). This statement generally refers to the person to whom the off-line prints are to be sent.

You will then be asked for the query identifier.

**"Enter query identifier"**

This is the number printed on the card which randomly allocated either a Cirt or Boolean search. The same number should be put on all questionnaires and forms relating to this particular enquiry.

Lastly you will be requested to indicate which type of search you will be doing eg Cirt or Boolean.

**"Enter y or Y for Boolean search; n,N or RETURN for weighted search"**

When these three questions have been answered you will be in command mode with the -> prompt.

### 4.1.2 Logging on to Data-Star

After you have received the command mode prompt -> you simply type

-> li dstar

A successful log-in will be indicated. If you do encounter any problems the error messages are self explanatory and generaly involve retyping the log-on command ie "li dstar".

The search processes will divide at this stage

### 4.1.3 Boolean Searches

If you have successfully logged on to Data-Star you will receive the message

You Are Connected to the Host

Simply enter RETURN and you will receive the standard Data-Star search mode prompt.

1_:

### 4.1.4 Cirt Searches

If you have successfully logged on to Data-Star you receive the message

Any Limits?

4

## 4.2 BUILDING A QUERY

### 4.2.1 Limits

These limits apply to MEDLINE SEARCHES ONLY; if you are searching on an other database you need only reply N or No and the program will skip this section and prompt with the Cirt command mode prompt ->. Now you can start to build your query (see next section).

If you are going to search Medline and require limits for Year, Language, Human, Animal, Female, Male or any other limits, you need only reply Y or Yes to this request for limits.

There are four types of responses to the limit requests.

Specify  - this response requires a statement of the type of limit you want. It applies to YR, LG or "other limits".

Y or Yes - a positive limit; for instance everything written pertaining to females

N or No  - a negative limit; do not want anything written on animals

CR - skips to the next limit, this limit does not apply

Limits and their appropriate responses are:

YR  - Specify any two digit year ie 84, or Carriage Return
(This will include all documents from the specified year to the most current. It is not possible to specify only one isolated year unless it is the most recent year).

LG - Specify or Carriage Return
(All Medline language abbreviations apply. If you are making a list put a comma, space between each abbreviation. In addition it is possible to exclude a language by specifying "not" before the language ie "not fr" or "not gr")

human - Yes No or Carriage Return

animal - Yes No or Carriage Return

female - Yes No or Carriage Return

male - Yes No or Carriage Return

other limits - Specify or Carriage Return
(This includes any applicable Medline check tag or negative Boolean statement, such as adolescence, or not electron)

## 4.2.2 Adding and Deleting terms

Adding: The command to add terms to the database is "add" followed by the term in any of the following forms.

    1. Single natural language terms

```
->add term1
->add term2 ...
```

    OR
      A string of terms separated by a space

```
->add term1 term2 term3...
```

    2. Data-Star search terms

      Truncated - psycholog$6
              If right-truncation is used and more than 100 terms match, Cirt will simply pass on the Data-Star error message.
      Adjacency - "long adj term"
       Boolean - "labor or labour"
   Paragraph
   qualification - television$1.ti.de.

    3. Mesh search term facilities

      Explosion - lung#
      Mesh heading - lung-diseases

N. B. QUOTATION MARKS - If the search term contains blanks then it must be enclosed in quotes. There is no harm in enclosing a term in quotes so, if in doubt use quotes.

After using the command "add" Cirt will respond with

    Search set number, term, frequency and weight

Deleting: Terms can be deleted in one of two ways

    1. Before the search is executed:

```
->del term1 term2...
```

    OR

```
->List   (to get the following display)
```

```
-) list
Query terms
  No. frequency  weight   rels   text
S  4.         5 12.6586    0     rubbish
S  2.        68 10.0485    0     thalidomide-ae
S  8.      1075  7.2879    0     asia
S  9.      1539  6.9291    0     america
S  5.      3439  6.1251    0     europe
S 10.      5152  5.7209    0     africa
S  7.      8130  5.2647    0     us
S  3.     10375  5.0209    0     uk
S  6.     19193  4.4057    0     australia
```

one situation in which it may be necessary to type "search" again would be if you require more than a minimum of 15 documents for display. The searching algorithm has an internal parameter known as search size, which is the target number of documents to be found, ie the target length of the ranked list of documents. By default, search size has been set at 15. Since documents are found in sets, the actual number found is likely to be more than 15, it can be less than 15 (if all single term searchs yield less than 15 between them). Futhermore there may be additional documents which are retrievable by the search statement, but Cirt is unaware of them because the program stopped when it reached the minimum of 15 documents. If you do a search and then display or print some documents, you may reach the end of the documents known to Cirt, at this point you will receive the prompt "Search exhausted". If you type "search" again, Cirt will carry on and try to find a further 15 documents beyond those you have already seen.

## 4.4 LOOKING AT DOCUMENTS

After searching it is possible to look at the document one set at a time using the command

-> l or look

Cirt will respond with the number of documents in the set, the weight of all the documents within that set and the individual terms and their weights. In addition you will be asked if you wish to "ignore, print, look or quit" (all responses can be abbreviated to the first letter ie i,p,l or q).

l or look - This "look" refers only to the current document not to the whole set. If you choose this option the title will automatically be displayed, and you will receive a ?? cirt display mode prompt. If you wish to see additional fields in this citation type "f" which will display the six options available. They are:
1.Abstract 2.Descriptors 3.Year
4.Language 5.Source 6.Author & Source
It is possible to skip this display and indicate directly the additional field you require. This can be done by adding the corresponding number of the desired field after typing "f" ie "f1" would display the abstract, "f6" would display author and source etc. (for additional details on display mode see page ).

i or ignore This will ignore the whole set and skip to the next set.

p or print Print will print the whole of the set off-line in full format.

q or quit This command will return you to command mode with the -> prompt.

then type

->del 9

OR

->del 9 6...

2. Deleting after the search is done in the same form as above but as the term has been searched it will still appear in the listing but with a zero weighting. For example

```
-) list                                        -) delete 4 8 9 10
Query terms                                    -) list
    No. frequency  weight  rels  text          Query terms
S  4.         5  12.6586   0    rubbish            No. frequency  weight  rels  text
S  2.        68  10.0485   0    thalidomide-ae  S  4.         5   0.0000   0    rubbish
S  6.      1075   7.2879   0    asia            S  2.        68  10.0485   0    thalidomide-ae
S  9.      1539   6.9291   0    america         S  8.      1075   0.0000   0    asia
S  5.      3439   6.1251   0    europe          S  9.      1539   0.0000   0    america
S 10.      5152   5.7209   0    africa          S  5.      3439   6.1251   0    europe
S  7.      8130   5.2647   0    us              S 10.      5152   0.0000   0    africa
S  3.     10375   5.0209   0    uk              S  7.      8130   5.2647   0    us
S  6.     19193   4.4057   0    australia       S  3.     10375   5.0209   0    uk
Search tree                                     S  6.     19193   4.4057   0    australia
No.    seen      weight   terms                 Search tree
3       0        31.33    asia america europe africa us    No.    seen      weight   terms
1       0        31.09    asia america europe africa uk    1       0        16.17    thalidomide-ae europe
17      0        30.47    asia america europe africa australia
```

## 4.3 EXECUTING A SEARCH

Once you have constructed an enquiry using the terms you deem necessary, the command to search these terms is:

search or s

This command will automatically send sets of Boolean statements to Data-Star which are prescribed by the search algorithm (Robertson and Bovey, 1983). While the search is automatically being executed the terminal displays the message

Searching . . . . . .

full stops are added after the word "searching" to show the user the search is in progress. Once the search is complete you will be prompted with

Searching . . . . . . . Searched

The length of time required for each search varies considerably and is dependent on host usage, response time, and the number of terms used for the enquiry. The search time increases exponentially in relation to the number of terms used – the more terms the longer it takes.

The search procedure is designed in such a way that it never needs to resend any search statement. Hence if you type "search" after just completing a search the program will simply list the results of the search again. Nevertheless

**N.B.** - Once a document has been seen or a document set has been ignored, or printed, it CANNOT BE SEEN AGAIN unless you RESET and start the search over. In other words the only way to go back is to start over. This is due to the nature of the search algorithm.

## 4.5  RELEVANCE FEEDBACK

### 4.5.1 Relevance

Having seen the title(or any other fields) it is possible to tag the citation as relevant or not. You will receive the ?? prompt which is essentially asking two questions: firstly, is the document relevant? and secondly, what would you like to do with the next document or the whole set?

If you wish to indicate relevance you will need to reply with anyone of the following responses:

rl - indicates the present document is relevant displays the title of the next document

rq - indicates the present document is relevant, and quits the set to return to command mode->

r - indicates the present document is relevant and asks whether you wish to ignore or print the entire set, look at the next document or quit to command mode ->

### 4.5.2 New Weights

After looking at and tagging any number of references as relevant it is then possible to recalculate the weights based on the relevance information provided. This will be done automatically when you leave display mode. Nevertheless in command mode you can ask for a list of new weights at any stage. The command "newweights" or "nw" will provide the following display  -) nw

There are 3 known relevant documents

| old wt. | new wt. | rels. | |
|---------|---------|-------|---|
| 6.30 | 8.24 | 3 | cigarettes2 |
| 5.10 | 7.04 | 3 | smoking |

If you then add new terms or execute another search the new weights will be based on the relevance information you have provided.

### 4.5.3 Reset

When the search on the one database is exhausted and you wish to change to another database, start over with a new search or revise a previous sesearch the RESET command will provide any of these facilities. Upon entering "reset" you will first be asked

### Enter database name

if you wish to change enter the appropriate 4 letter abbreviation  MEZZ, PSYC, INSP, INZZ or simply carriage return which will default to MEDL. You will then receive the Cirt command mode prompt and you can start building your new query.

## 4.6 LOGGING OFF

It is sometimes necessary to log-off as many as three separate "layers".

> display mode
> Data-Star
> Cirt

It is always necessary to log-off at least two separate "layers".

> Data-Star
> Cirt

Display mode: Valid answers are r,l,f,q,rl,rq or return. The only responses which will return you to command mode are: q or rq or r followed by q

Command mode -> type "o" and you will receive the Data-Star log-off message which will finish with a Cirt command mode prompt ie

```
-> o
*CONNECT TIME INSF:    0:00:53 HH:MM:SS   0.015 DEC HRS.   SESSION  1106*
*SIGN-OFF  18.15.29                27.01.86Clearing the call
Hours 0, Minutes 6, Seconds 21, Rx 186, Tx 79
Cost of call ( ) 0.00
```

At the -> prompt type

> ->q

which will take you out of Cirt. It will also log you off the City University.

## 4.7 ADDITIONAL FEATURES

### 4.7.1 Commands

ACcounting        This permits you to examine the number of City PSS units used and allocated limit. This command is most appropriately used BEFORE YOU LOG-ON TO DATA-STAR, OR AFTER YOU LOG-OFF.

SET SearchSize=n  This command permits you to increase the number of documents Cirt "gathers" for display. After the search has been executed the program seeks a minimum number of 15-documents for display. For instance if you searched four terms Cirt progresses through the sets until it has "gathered for display" a minimum of 15 documents

```
Search tree
No.    seen      weight    terms
3      0         31.33     asia america europe africa us
1      0         31.08     asia america europe africa uk
17     0         30.47     asia america europe africa australia
```

there are now 21 documents ready for display that
is 6 more than the minimum of 15.

Another example could look like this:

```
No.    seen      weight    terms
1      0         16.36     health uk funding
62     0         15.27     care health funding
```

there are now 63 documents ready for display that
is 48 more than the minimum of 15 required by
Cirt.

If you require more than 15 documents for display
it is possible to adjust Cirt with the command

        -> set ss=n

n is any number of documents over the default of
15 set by Cirt.

For example:
Set Searchsize=50 will look for a minimum of 50
documents for display. Therefore the results of
a search may look somthing like this:

```
No.    seen      weight    terms
2      0         26.43     embolism stroke thrombosis infarction myocardial
1      0         25.87     embolism angina thrombosis infarction acute
4      0         24.93     embolism angina infarction myocardial acute
1      0         24.48     embolism stroke infarction myocardial acute
12     0         24.27     embolism thrombosis infarction myocardial acute
6      0         24.20     angina stroke infarction myocardial acute
22     0         23.99     angina thrombosis infarction myocardial acute
3      0         23.54     stroke thrombosis infarction myocardial acute
```

There are now 51 documents gathered for display
1 more than your required 50.

## 4.7.2 Abandoning a Search

When the message

              Searching........

is being displayed if for any reason you need to abandon a
search simply press CONTROL C. This will break the search
and send the following message

        Search interrupted
        Call talk to clear any remaining input or continue
        ->

You respond with the command "talk" which puts you into Data-

Star search mode ie

$$1\_:$$

Here you respond CONTROL P which will put you back into Cirt command mode.

In summary - to abandon a search your responses are:

control c
->t
control p

**Once you have abandoned a search it is impossible to pick up where you left off.** If you wish to re-do the same search or start a new and totally different search the only method for doing this is to use the command RESET. This command offers several facilities: at the end of a search or after you have abandoned a search RESET allows you to re-enter the previous search, execute a completely new subject search, or to change databases. Those databases offered by Cirt are MEDL, MEZZ, PSYC, INSP AND INZZ.

## 5. Printing off-line

### 5.1 PRINTING OFF-LINE USING WEIGHTED RETRIEVAL

In display mode:

??p   will print the whole set of documents offline in
      full format

??r   marks a document as relevant and automatically
      prints it offline

Cirt will automatically print two sets of full format offline prints, one for the user to keep and one for the evaluation. If the offline print set is

a)  Less than 50 there will be two identical print-off sets

b)  Greater than 50 there will be one complete set and
    another a selection of 50 documents only the first and
    last 25 of the whole set.

### 5.2  PRINTING OFF-LINE USING BOOLEAN RETRIEVAL

A minimum of two print off statements must be made

1) For the user to keep.  It will consist of a complete set
   in whatever form you feel appropriate to the user.

2)  For the evaluation.

   a.  Less than 50 documents to the print-off set* will
       require a complete set

   b.  Greater than 50 documents to the print-off set*
       will require **two statements**

       1. the first 25 of the set

       2. the last 25 of the set

       for example if there are 65 documents in the
       print-off set

       ..po 6/all/docs=1-25/id=abcd

       ..po 6/all/docs=40-65/id=abcd

   All three print statements can be entered on separate
lines or if you are courageous all three can be entered in
one line stacking the commands eg

..po6/all/doc=1=25/id=abcd/..po6/all/doc=40-65/id=abcd/..po6/bibl/doc=all

   *  If there is more than one set to be printed off-line it
is advisable to "OR" all the statements together into one
set.

# INDEX TO SEARCH GUIDE

APPENDIX A5-22

ALPHABETICAL LISTING OF COMMANDS

## Alphabetical Listing of Commands

The nature of commands and responses.

Not unlike Data-Star Cirt has two modes

**COMMAND MODE** which has the prompt ->.   This mode expects any one
of the commands mentioned in the alphabetical listing of
commands, preceeded by the -> prompt.

All commands are in the form

-> command argument1 argument2 ...

valid arguments are dependent on the command. For instance:

-> add  term1 term2...

Commands and arguments can be in upper or lower case.  Any
command or agrument in the list below can be abbreviated by
leaving out ony of the letters given in lower case eg if a
command is specified as LogIn it can be abbreviated as "li" or
"logi" or "lin" or entered in full as "login" but it cannot be
abbreviated to "l" or "log".  Spaces separate the command and
arguments, but there should be no space within the command itself.

**DISPLAY MODE** which has the prompt ??.   This mode expects any one
of the responses mentioned in the alphabetical listing of
commands preceeded by the ?? prompt.

This mode essentially asks two questions - one related to
relevance the other related to desplaying documents, therefore it
can accept either a single or double response.

?When addressing the question of relevance you must
positively indicate relevance by typing "r".  All documents
tagged with a "r" will automatically be printed offline. Non-
relevance is indicated by a blank or no response.

?The next question queries what you would like to do with the
following document or the whole set.

**************************************
COMMAND MODE

-> ACcounting    A special command in Cirt which is not part of
the search program therefore it must be used
either before you log on to Data-Star or after
you log-off. (See sample searches). The purpose
of the command is to examine the number of City
PSS units used and the allocated limit.  It is
particularly useful toward the end of the month
(units are allocated monthly) to ensure there are
sufficient units.

-> ADD    The command to add terms to the database.    Terms
          can take any of the following forms:

                    1. Single natural language terms

                              ->add term1
                              ->add term2 ...

                         OR

                    A string of terms separated by a space

                              ->add term1 term2 term3...

                    2. Data-Star search terms

                    Truncated - psycholog$6
                         If right-truncation is used and more
                         than  100  terms  match,  Cirt  will
                         simply  pass on the Data-Star  error
                         message.
                    Adjacency - "long adj term"
                    Boolean  - "labor or labour"
                    Specific field - television$1.ti.de.

                    3.  Mesh search term facilities

                    Explosion - lung#
                    Mesh heading - lung-diseases

          N. B. QUOTATION MARKS - If  the  search  term
          contains  blanks  then  it must  be  enclosed  in
          quotes.  There is no harm in enclosing a term  in
          quotes so if in doubt use quotes.

          After  using the command "add" Cirt will  respond
          with

          Search set number, term, frequency and weight

-> BReak  In  transparent mode ie when searching  Data-Star
          directly,  if you have requested a number  of
          documents to be displayed at the terminal and  no
          longer  require  all  those  documents  to  be
          transmitted  to  the  terminal  BREAK  supresses
          further  output.  It must be used in  conjunction
          with CONTROL P and TALK.   In other words to stop
          a Data-Star print command type

                              control p
                              br
                              t


          This should stop the printing of documents at the
          terminal.  You should be in Data-Star print  mode
          type ..s to get out of Data-Star print mode.)

-> ADD          The command to add terms to the database.  Terms can take any of the following forms:

      1. Single natural language terms

              ->add term1
              ->add term2 ...

         OR

      A string of terms separated by a space

              ->add term1 term2 term3...

      2. Data-Star search terms

        Truncated - psycholog$6
            If right-truncation is used and more than 100 terms match, Cirt will simply pass on the Data-Star error message.
        Adjacency - "long adj term"
        Boolean  - "labor or labour"
        Specific field - television$1.ti.de.

      3. Mesh search term facilities

        Explosion - lung (hash)
        Mesh heading - lung-diseases

N. B. <u>QUOTATION MARKS</u> - If the search term contains blanks then it must be enclosed in quotes. There is no harm in enclosing a term in quotes so if in doubt use quotes.

After using the command "add" Cirt will respond with

Search set number, term, frequency and weight

-> BReak      In transparent mode ie when searching Data-Star directly, if you have requested a number of documents to be displayed at the terminal and no longer require all those documents to be transmitted to the terminal BREAK supresses further output. It must be used in conjunction with CONTROL P and TALK. In other words to stop a Data-Star print command type

              control p
              br
              t

This should stop the printing of documents at the terminal. You should be in Data-Star print mode type ..s to get out of Data-Star print mode.)

->Clr       A backup command which clears the call to Data-Star. If ->q or ..o for some reason do not clear the call, type "cl" and this should clear the call.

-> DELete      Terms can be deleted in one of two ways

      1.  Before the search is executed:

          del term1 term2...

          OR

          list (to get the following display)

```
-) list
Query terms
  No. frequency  weight  rels   text
   3.        32 10.5024    0     snobol
  11.        38 10.3306    0     bliss
   7.       157  8.9119    0     compass
  10.       518  7.7182    0     prolog
   9.       650  7.4912    0     algol
   2.       736  7.3669    0     cobol
   8.      1100  6.9651    0     macro
   5.      2723  6.0587    0     pascal
   4.      3482  5.8128    0     fortran
   6.    101923  2.4362    0     c
No search
-) del 9 6
term 9 deleted
term 6 deleted
```

      then type:

          del 9

          OR

          del 9 6...

      2.  Deleting after the search is done in the same form as above but as the term has been searched it will still appear in the listing but with a zero weighting. For example

```
-) list
Query terms
  No. frequency  weight  rels   text
S  4.         5 12.6586    0     rubbish
S  2.        68 10.0485    0     thalidomide-ae
S  8.      1075  7.2879    0     asia
S  9.      1539  6.9291    0     america
S  5.      3439  6.1251    0     europe
S 10.      5152  5.7209    0     africa
S  7.      8130  5.2647    0     us
S  3.     10375  5.0209    0     uk
S  6.     19193  4.4057    0     australia
Search tree
No.  seen    weight   terms
3     0      31.33    asia america europe africa us
1     0      31.05    asia america europe africa uk
17    0      30.47    asia america europe africa australia
```

```
-) delete 4 8 9 10
-) list
Query terms
  No. frequency  weight  rels   text
S  4.         5  0.0000    0     rubbish
S  2.        68 10.0485    0     thalidomide-ae
S  8.      1075  0.0000    0     asia
S  9.      1539  0.0000    0     america
S  5.      3439  6.1251    0     europe
S 10.      5152  0.0000    0     africa
S  7.      8130  5.2647    0     us
S  3.     10375  5.0209    0     uk
S  6.     19193  4.4057    0     australia
Search tree
No.   seen    weight   terms
1      0      16.17    thalidomide-ae europe
```

-> NewWeights   permits a recalculation of the weights based on relevance feedback information obtained from tagging documents after the first search. This command applies only after the first search. The following information is displayed.

```
-> nw
There are 3 known relevant documents
old wt.    new wt.    rels.
6.30       8.24       3       cigarettes2
5.10       7.04       3       smoking
4.20       4.69       2       long adj term
4.19       6.12       3       lungf
```

->Out           The log-off command to log-off Data-Star

->RESET         If you wish to do the same search or start an new and totally different search the only method for doing this is to use the command RESET. This command offers several facilities: at the end of a search or after you have abandoned a search RESET allows you to re-enter the previous search, execute a completely new subject search, or to change databases. Those databases offered by Cirt are MEDL, MEZZ, PSYC, INSP AND INZZ.

->Quit          The log-off command to log out of Cirt

->Search        This command automatically sends sets of boolean statements to Data-Star which are prescribed by the search algorithm (Robertson and Bovey, 1983). While the search is automatically being executed the terminal prompts the user with

                        Searching . . . . . .

full stops are added after the word "searching" to show the user the search is in progress. Once the search is complete you will be prompted with

                Searching . . . . . . . Searched

The length of time required for each search varies considerably and is dependent on host usage, response time, and the number of terms used for the enquiry. The search time increases exponentially in relation to the number of terms used - the more terms the longer it takes.

The search procedure is designed in such a way that it never needs to resend any search statement. Hence if you type "search" after just completing a search the program will simply list the results of the search again. Alternatively if you execute a few commands (such as adding terms) then "search" again the new search will bring it all up to date.

If after looking at, printing or ignoring some documents you get the message "search exhausted"

->LIST               Lists the terms presently active on this search. Presents the following display

```
-) list
Query terms
   No. frequency weight    rels   text
S  4.          5 12.6586    0     rubbish
S  2.         68 10.0485    0     thalidonide-ae
S  8.       1075  7.2879    0     asia
S  9.       1539  6.9291    0     america
S  5.       3439  6.1251    0     europe
S 10.       5152  5.7209    0     africa
```

->LogIn          The command used to log-in to Data-Star. This command is always used in conjunction with the host name. The standard abbreviation for this command is

li dstar

->Look           After searching it is possible to look at the documents one set at a time using the command

-> l or look

Cirt will respond with the number of documents in the set, the weight of all the documents within that set and the individual terms and their weights. In addition you will be asked if you wish to "ignore, print, look or quit" (all responses can be abbreviated to the first letter ie i,p,l or q).

l or look - This "look" refers only to the current document not to the whole set. If you choose this option the title will automatically be displayed, and you will receive a ?? Cirt display mode prompt. If you wish to see additional fields in this citation type "f" which will display the six options available. They are:

1.Abstract  2.Descriptors  3.Year
4.Language  5.Source      6.Author & Source

It is possible to skip this display and indicate directly the additional field you require. This can be done by adding the corresponding number of the desired field after typing "f" ie "f1" would display the abstract, "f6" would display author and source etc.

ignore        This will ignore the whole set and skip to the next set.

print         Print will print the whole of the set off-line in full format.

quit          This command will return you to command mode ->

then typing "search" or s" again will cause Cirt
to attempt to gather some more documents to look
at (See search guide page   for further details).


->SET SearchSize=n  This command permits you to increase the
number of documents Cirt gathers for display.
After the search has been executed the program
seeks a minimum number of 15 documents for
display. For instance if you searched four terms
Cirt progress through the sets until it has
a minimum of 15 documents

For example:

```
Search tree
No.    seen    weight    terms
3      0       31.33     asia america europe africa us
1      0       31.08     asia america europe africa uk
17     0       30.47     asia america europe africa australia
```

there are now 21 documents ready for display, that
is 6 more than the minimum of 15.


Another example could look like this:

```
No.    seen    weight    terms
1      0       16.36     health uk funding
62     0       15.27     care health funding
```

there are now 63 documents ready for display,
that is 48 more than the minimum of 15.

If you require more than 15 documents for
display it is possible to adjust Cirt with the
command

     -> SET SS=n
n is any number of documents over the
default of 15 set by Cirt.

For example:
SET SS=50 will look for a minimum of 50 documents
for display. Therefore the results of a search
may look something like this:

```
No.    seen    weight    terms
2      0       26.43     embolism stroke thrombosis infarction myocardial
1      0       25.87     embolism angina thrombosis infarction acute
4      0       24.93     embolism angina infarction myocardial acute
1      0       24.48     embolism stroke infarction myocardial acute
12     0       24.27     embolism thrombosis infarction myocardial acute

6      0       24.20     angina stroke infarction myocardial acute
22     0       23.99     angina thrombosis infarction myocardial acute
3      0       23.54     stroke thrombosis infarction myocardial acute
```

There are now 51 documents gathered for display
1 more than your required 50.


However, this procedure is not normally

necessary. If you look at, print or ignore all the gathered documents, executing search again will cause Cirt to gather the next 15 documents anyway.

->Talk        Permits the user to talk directly to Data-Star. In order to make certain you are in Data-Star search mode it is best to type ..s which will respond with the usual Data-Star search mode prompt ie 6_:   To return to Cirt simply press CONTROL P which will prompt with Cirt command mode ->

## DISPLAY MODE

??rl -      indicates the present document is relevant displays the title of the next document

??rq -      indicates the present document is relevant, and quits the set to return to command mode->

??r -      indicates the present document is relevant and asks what you would like to do with the entire set ie ignore, print or quit.

??f -      permits the display of additional fields. There are six possible options with corresponding numbers:

       1.Abstract   2.Descriptors   3.Year
       4.Language   5.Source        6.Author & Source

It is possible to skip this display and indicate directly the additional field you require. This can be done by adding the corresponding number of the desired field after typing "f" ie "f1" would display the abstract, "f6" would display author and source etc.

??l -      displays the title of the next document

??i -      ignores the whole set and skips to the next set

??p -      prints the whole set off-line in full format.

??q -      returns to command mode ->

??CR -      asks what you would like to do with the entire set ie ignore, print or quit

**********************************

CONTROL C -       Not a Cirt command.  Used for abandoning a search
while in progress.  If for any reason you need to
abandon  a search at the message Searching.......
simply press CONTROL C.This will break the search
and send the following message

Search interrupted
Call talk to clear any remaining input or continue
->

You  respond with the command "talk"  which  puts
you into Data-Star search mode ie

1_:

Here  you  respond CONTROL P which will  put  you
back into Cirt command mode ->.

In  summary - to abandon a search your  responses
are:

control c
t
control p

Then use RESET to "reinitialize" the search tree.

CONTROL P -       Not a Cirt command. Used after the command "talk" to
return you to Cirt

limits -       Applicable to Medline searches only.   If you are
searching an other database you need only reply N
or No and the program will skip this section  and
prompt with the Cirt command mode prompt ->.  Now
you  can  start to build your enquiry (see  next
section).

If  you  are going to search Medline and  require
limits for Year, Language, Human, Animal, Female,
Male or any other limits,  you need only reply  Y
or Yes to this request for limits.

There  are  four types of responses to  the
limit requests.

Specify  - this  response requires a statement  of
the  type  of  limit you  want.   It
applies to  YR, LG or "other limits".

Y or Yes - a   positive  limit;  for  instance
everything written pertaining to females

N or No  - a negative limit;  do not want anything
written on animals

CR - skips to the next limit, this limit does
not apply

APPENDIX A5-32

Limits and their appropriate responses are:

YR - Specify any two digit year ie 84, or
     Carriage Return
     (This will include all documents from the
     specified year to the most current.   It is
     not possible to specify only one isolated
     year unless it is the most recent year).

LG - Specify or Carriage Return
     (All Medline language abbreviations apply.
     If you are making a list put a comma, space
     between each abbreviation.   In addition it
     is possible to exclude a language by
     specifying "not" before the language ie
     "not fr" or "not gr")

human - Yes No or Carriage Return

animal - Yes No or Carriage Return

female - Yes No or Carriage Return

male - Yes No or Carriage Return

other limits - Specify or Carriage Return
     (This includes any applicable Medline check
     tag or negative boolean statement, such as
     adolescence, or not electron)

SAMPLE SEARCHES

Jan 27 15:59 1986   500 Page 1


Enter id for offline prints- cathy
Enter query identifier- 500
Enter y or Y for boolean search; n, N or RETURN for weighted search-
-> li dstar
call established
D A T A - S T A R , PLEASE ENTER YOUR USERID :raluab

ENTER YOUR A-M-I-S PASSWORD
OOOOOOOOXXXXXXXX********   |
- TELEPAC NUA 464110115 IS OVERLOADED, PLEASE USE 484110115. THANK YOU!
- TWO NEW PREDICASTS DATABASES (PTNP/PTMA) ONLINE NOW. SEE BROADCAST.
- FAIRBASE, THE DIRECTORY ON TRADE FAIRS. ONLINE NOW. SEE BROADCAST.
- MESH AND TREE 1986: SEE BROADCAST.
ENTER YES IF BROADCAST MSG IS DESIRED_:
ENTER DATA BASE NAME_:   medl

Login successful
Any limits ?n
-> add cigarette$2 smoking 'long adj term' lungf
  2. 'cigarette$2' added, freq=2897, weight= 6.2966
  3. 'smoking' added, freq=9615, weight= 5.0969
  4. 'long adj term' added, freq=23636, weight= 4.1975
  5. 'lungf' added, freq=23756, weight= 4.1924
-> s


Searching......Searched


Search tree
No.    seen      weight    terms
13      0        19.78     cigarette$2 smoking long adj term lungf
89      0        15.59     cigarette$2 smoking long adj term
-> add smoking.ti.
  9. 'smoking.ti.' added, freq=2627, weight= 6.3944
-> s


Searching........Searched


Search tree
No.    seen      weight    terms
1       0        26.18     cigarette$2 smoking long adj term lungf smoking.ti.
35      0        21.99     cigarette$2 smoking long adj term smoking.ti.
-> 1
1 documents with weight 26.18
cigarette$2(6.3) smoking(5.1) long adj term(4.2) lungf(4.2) smoking.ti.(6.4)
-----------------------------------------------------------------
ignore, print, look or quit? 1
TI Morphologic  and  morphometric effects of prolonged cigarette smoking
   on the small airways.
?? f6
AU Cosio-M-G, Hale-K-A, Niewoehner-D-E.
SO Am-Rev-Respir-Dis 1980 Aug, VOL: 122 (2), P: 265-21, ISSN: 0003-0805.
?? f1
AB We studied lungs from 25 smokers and 14 lifelong nonsmokers, all over
   40  yr  of  age,  to  examine the relationship of long-term cigarette
   smoking  to  histopathologic  changes  in  the  small airways. Despite

considerable overlap between the 2 groups, smokers had a significantly higher score (p < 0.01) for small airway disease. The specific morphologic features separating smokers from nonsmokers were increases in goblet cell metaplasia (p < 0.001), smooth muscle hypertrophy (p < 0.05), inflammation in the walls of bronchioles (p < 0.01), and respiratory bronchiolitis (p < 0.001). The average bronchiolar diameter was not significantly different in smokers compared with nonsmokers; however, smokers had an excess of airways less than 400 microns in diameter (p < 0.03). Among smokers, the severity of small airway disease correlated with the percentage of airways that are less than 400 microns in diameter (rs = 0.63) and with the extent of centrilobular emphysema (r = 0.53). Smokers also had an increase in the proportion of bronchial gland mass (p < 0.05), but this pathologic feature was not related to the severity of either small airway disease or centrilobular emphysema. We concluded that prolonged cigarette smoking is associated with progressive pathologic changes in the small airways that may be an important cause of airflow obstruction and that may predispose to the development of centrilobular emphysema. Author.
??
35 documents with weight 21.99
cigarette$2(6.3) smoking(5.1) long adj term(4.2) smoking.ti.(6.4)
------------------------------------------------------------
ignore, print, look or quit? q
-> reset
Enter data base name
->
Any limits ?n
-> add cisplatin-ae heartf
  2. 'cisplatin-ae' added, freq=637, weight= 7.8112
  3. 'heartf' added, freq=42904, weight= 3.6013
-> s


Searching....Searched

Search tree
No.    seen    weight    terms
2      0       11.41     cisplatin-ae heartf
635    0       7.81      cisplatin-ae
-> 1
2 documents with weight 11.41
cisplatin-ae(7.8) heartf(3.6)
------------------------------------------------------------
ignore, print, look or quit? 1
TI Combined    intravenous    and    intra-arterial    cyclophosphamide, doxorubicin, and cisplatin (CISCA) in the management of select patients with invasive urothelial tumors.
?? rl
TI High-dose    cis-platinum    in combination with adriamycin in the treatment of ovarian carcinoma.
?? r
635 documents with weight 7.81
cisplatin-ae(7.8)
------------------------------------------------------ _ .
ignore, print, look or quit? q
-> add female

7. 'female' added, freq=529019, weight= 1.0892
-) nw
There are 2 known relevant documents
old wt.     new wt.     rels.
7.81        9.42        2       cisplatin-ae
3.60        5.18        2       heartf
1.09        2.29        2       female
-) s


Searching.....Searched


Search tree
No.     seen        weight      terms
363     0           11.71       cisplatin-ae female
-) reset
Enter data base name
-)
Any limits ?n
-) add cigarette$2 smoking 'long adj term' lungf
  2. 'cigarette$2' added, freq=2897, weight= 6.2966
  3. 'smoking' added, freq=9615, weight= 5.0969
  4. 'long adj term' added, freq=23636, weight= 4.1975
  5. 'lungf' added, freq=23756, weight= 4.1924
-) s


Searching......Searched


Search tree
No.     seen        weight      terms
13      0           19.78       cigarette$2 smoking long adj term lungf
89      0           15.59       cigarette$2 smoking long adj term
-) 1
13 documents with weight 19.78
cigarette$2(6.3) smoking(5.1) long adj term(4.2) lungf(4.2)
----------------------------------------------------------
ignore, print, look or quit? 1
TI Clearance of polonium-210-enriched cigarette smoke from the rat
   trachea and lung.
?? rl
TI Factors affecting the 'alveolar deposition' of 5 microns inhaled
   particles in healthy subjects.
?? rl
TI The pulmonary alveolar macrophage.
??
10 docs remaining in this set:
ignore, print, look or quit? p
89 documents with weight 15.59
cigarette$2(6.3) smoking(5.1) long adj term(4.2)
----------------------------------------------------------
ignore, print, look or quit?
Search exhausted
-) s


Searching........Searched

Search tree

```
No.    seen      weight   terms
205     0        15.59    cigarette$2 smoking lungf
-) 1
205 documents with weight 15.59
cigarette$2(6.3) smoking(5.1) lungf(4.2)
---------------------------------------------------------
ignore, print, look or quit? 1
TI Endobronchial  foreign  body (cigarette filter tip) with inflammatory
    pseudotumor of the lung. A 'true' xanthogranuloma.
?? r1
TI Nicotine and cigarette smoking: an alternative hypothesis.
??
203 docs remaining in this set:
ignore, print, look or quit? q
-) nw
There are 3 known relevant documents
old wt.   new wt.    rels.
6.30      8.24       3       cigarette$2
5.10      7.04       3       smoking
4.20      4.69       2       long adj term
4.19      6.12       3       lungf
-) add asbestos
 13. 'asbestos' added, freq=1480, weight= 6.9682
-) s


Searching.........Searched

Search tree
No.    seen      weight   terms
17      0        28.37    cigarette$2 smoking lungf asbestos
-) reset
Enter data base name
-)
Any limits ?n
-) add cigarette$2 smoking 'long adj term' lung-diseasesf
  2. 'cigarette$2' added, freq=2897, weight= 6.2966
  3. 'smoking' added, freq=9615, weight= 5.0969
  4. 'long adj term' added, freq=23636, weight= 4.1975
  5. 'lung-diseasesf' added, freq=48551, weight= 3.4776
-) s


Searching.....Searched

Search tree
No.    seen      weight   terms
19      0        19.07    cigarette$2 smoking long adj term lung-diseasesf
-) o
*CONNECT TIME MEDL:   0:08:29 HH:MM:SS   0.141 DEC HRS.   SESSION   1102*
*SIGN-OFF  16.58.18                      27.01.86Clearing the call
Hours 0, Minutes 9, Seconds 51, Rx 274, Tx 71
Cost of call ( ) 0.00
-) q
```

```
Enter id for offline prints- mjm
Enter query identifier- q123
Enter y or Y for boolean search; n, N or RETURN for weighted search-
-> ac
call established
You have used 10146 units (max: 75000 units)
-> li dstar
call established
D A T A - S T A R , PLEASE ENTER YOUR USERID :raluab

ENTER YOUR A-M-I-S PASSWORD
OOOOOOOOXXXXXXXX********
- TELEPAC NUA 464110115 IS OVERLOADED, PLEASE USE 484110115. THANK YOU!
- SATURDAY 25. JAN: DUE HARDWARE INSTALLATIONS, D-S WILL NOT BE
  AVAILABLE FROM 0630 TO 1900 HOURS SWISS TIME.
- TWO NEW PREDICASTS DATABASES TO BE LAUNCHED ON JANUARY 20, 1986.
  CONSULT BROADCAST.
- FAIRBASE, THE DIRECTORY ON TRADE FAIRS, EXHIBITIONS, CONFERENCES
  ONLINE FROM JANUARY 27, 1986. SEE BROADCAST.
- DATAPRO PC-SOFTWARE DATABASE ONLINE NOW. SEE BROADCAST.
- MUNZINGER-LAENDERARCHIV ONLINE NOW. SEE BROADCAST.
- MESH AND TREE 1986: SEE BROADCAST.
ENTER YES IF BROADCAST MSG IS DESIRED_:
 RESTART IS POSSIBLE FOR DATABASE 'MEDL'
              REPLY 'Y' IF DESIRED  -  IF NOT, PRESS CARRIAGE RETURN_:
ENTER DATA BASE NAME_:  medl

Login successful
Any limits ?y
YR? 80
LG? FR, EN
 human?
animal?
female?
  male?
other limits?
-> add drug-ae
drug-ae not found
-> add drug$1 'long adj term adj effects'
  5. 'drug$1' added, freq=63477, weight= 2.9623
  6. 'long adj term adj effects' added, freq=871, weight= 7.2511
-> s

Searching...Searched

Search tree
No.    seen      weight    terms
113     0        10.21     long adj term adj effects drug$1
-> 1
113 documents with weight 10.21
long adj term adj effects(7.3) drug$1(3.0)
------------------------------------------------------------
ignore, print, look or quit? 1
Ti Enalapril in essential hypertension.
??
```

32

```
112 docs remaining in this set:
ignore, print, look or quit? q
-> 1
112 documents with weight 10.21
long adj term adj effects(7.3) drug$1(3.0)
```
_____
```
112 docs remaining in this set:
ignore, print, look or quit? 1
TI The long-term effects of cranial irradiation on the central nervous
   system.
?? 1
TI Long-term effects of neuroleptic drugs on the neuroendocrine system.
?? q
-> add 'nervous system'
   8. 'nervous system' added, freq=73375, weight= 2.8174
-> delete 8
term 8 deleted
-> add 'nervous adj system'
   9. 'nervous adj system' added, freq=10259, weight= 4.7848
-> s

Searching.......Searched

Search tree
No.    seen      weight    terms
7      0         15.00     long adj term adj effects drug$1 nervous adj syste
13     0         12.04     long adj term adj effects nervous adj system
-> 1
7 documents with weight 15.00
long adj term adj effects(7.3) drug$1(3.0) nervous adj system(4.8)
```
_____
```
ignore, print, look or quit? 1
document 1 already seen
TI Long-term behavioral effects of phenobarbital in suckling rats.
?? 1
TI Nadolol: evidence for sympathetic nerve inhibition by a beta blocker
   in essential hypertension.
?? r
4 docs remaining in this set:
ignore, print, look or quit? 1
TI Haemodynamic consequences of intrinsic sympathomimetic activity in
   relation to changes in plasma renin activity and noradrenaline during
   beta-blocker therapy for hypertension.
?? rl
TI Time course of regression of left ventricular hypertrophy in treated
   hypertensive patients.
?? q
-> add beta-blocker$1
beta-blocker$1 not found
-> add beta-blocker
beta-blocker not found
-> 1
2 documents with weight 15.00
long adj term adj effects(7.3) drug$1(3.0) nervous adj system(4.8)
```
_____
```
2 docs remaining in this set:
```

ignore, print, look or quit? 1
TI Neurotoxicity of industrial chemicals and contaminants: aspects of
   biochemical mechanisms and effects.
?? 1
TI Pharmacologic considerations in the therapy of neonatal apnea.
?? 1
13 documents with weight 12.04
long adj term adj effects(7.3) nervous adj system(4.8)
------------------------------------------------------------
ignore, print, look or quit? 1
TI Transient enhancement of sympathetic nervous system activity by long-
   term restriction of sodium intake.
?? 1
TI Autonomic neuroeffector mechanisms in smooth muscle.
??
11 docs remaining in this set:
ignore, print, look or quit? 1
TI Long term effects of exposure to viral infections in utero.
?? f1
AE An analysis was conducted of the major findings of a long term follow
   up study of 3076 subjects who were exposed to viral infections in
   utero and who at the time of analysis were up to 40 years of age.
   Mortality and morbidity were compared with those in a control
   population matched for sex and date and area of birth. An excess of
   cancers (16 cases against seven) appeared to be clustered among those
   exposed to herpes viruses (varicella or cytomegalovirus). There was
   evidence of an increased risk of diabetes among those exposed to
   mumps during the first trimester (four cases among 128 subjects
   against none in 148 controls). The most surprising finding was a
   decrease of diseases of the skin and subcutaneous tissue and of the
   nervous system among subjects exposed to antenatal varicella zoster
   infection. The mechanism for the association may include production
   of fetal anti-idiotype antibodies in response to transplacentally
   acquired maternal autoantibodies. Author.
?? q
-) reset
Enter data base name
-)
Any limits ?n
-) add sclerosis
  2. 'sclerosis' added, freq=5281, weight= 5.6961
-) add lateral
  3. 'lateral' added, freq=13615, weight= 4.7491
-) s

Searching... Searched

Search tree
No.     seen     weight    terms
461      0       10.45     sclerosis lateral
-) add amytrophic
amytrophic not found
-) add neuromuscular
  6. 'neuromuscular' added, freq=3265, weight= 6.1770
-) s

```
Searching....Searched

Search tree
No.    seen      weight    terms
28      0        16.62     sclerosis lateral neuromuscular
-> add niven
niven not found
-> l
28 documents with weight 16.62
sclerosis(5.7) lateral(4.7) neuromuscular(6.2)
--------------------------------------------------------
ignore, print, look or quit? 1
TI (Results  of  muscular  x-ray  computed  tomography  in  145 cases of
    neuromuscular disease).
?? f2
DE Adolescence;
   Adult;
   Amyotrophic Lateral Sclerosis/radiography;
   Comparative Study;
   Diagnosis, Differential;
   English Abstract;
   Human;
   Hypertrophy/radiography;
   Muscles/*radiography;
   Muscular Atrophy/radiography;
   Muscular Dystrophy/familial & genetic, radiography;
   Myositis/radiography;
   Myotonia Atrophica/radiography;
   Neuromuscular Diseases/classification, *radiography;
   Peripheral Nerve Diseases/radiography;
   Tomography, X-Ray Computed/* .
?? q
-> add amyotrophic
  9. 'amyotrophic' added, freq=444, weight= 8.1722
-> s


Searching.....Searched

Search tree
No.    seen      weight    terms
28      0        24.79     sclerosis lateral neuromuscular amyotrophic
-> l
28 documents with weight 24.79
sclerosis(5.7) lateral(4.7) neuromuscular(6.2) amyotrophic(8.2)
--------------------------------------------------------
ignore, print, look or quit? 1
document 1 already seen
TI (Computed  tomography  of  the  skeletal  muscles  in  neuromuscular
    diseases).
?? r1
TI Analog  specificity  of the thyrotropin-releasing hormone receptor in
    the central nervous system: possible clinical implications.
?? rq
-> l
25 documents with weight 24.79
sclerosis(5.7) lateral(4.7) neuromuscular(6.2) amyotrophic(8.2)
```

---

```
25 docs remaining in this set:
ignore, print, look or quit? p
Search exhausted
-> reset
Enter data base name
->
Any limits ?n
-> t
..d type po

I1027 THE FOLLOWING PRINTOFF QUERIES FOUND:
  Q0029   Q0030
                  ****     END OF DISPLAY    ****

D-S - SEARCH MODE - ENTER QUERY
    2_:   ..purge q0029 q0030

I1064 PRINTOFF QUERY Q0029 PURGED
I1064 PRINTOFF QUERY Q0030 PURGED

D-S - SEARCH MODE - ENTER QUERY
    2_:
-> o
*CONNECT TIME MEDL:   0:33:26 HH:MM:SS   0.557 DEC HRS.   SESSION   1084*
*SIGN-OFF  13.59.30                   20.01.86Clearing the call
Hours 0, Minutes 34, Seconds 3, Rx 334, Tx 67
Cost of call ( ) 0.00
-> ac
call established
Killed with signal 3
stop child reading from network
get child to clear call
```

# NEW COMMANDS IN CIRT

Six new commands have been added to Cirt. They provide several capabilities. Firstly to enable you to add terms offline before you logon thereby saving on line time. Secondly to save searches and execute them subsequently on other databases, either at the same session or at a later date. Lastly to overcome the problems involved in limiting by year in MEZZ (this has been overloading the system), the new commands will let you save searches and then execute them on the smaller databases ie

ME74   1966 - 1974
ME82   1975 - 1982
MEDL   1983 -

**N. B. All commands are listed here in upper case, this is purely for emphasis, Cirt will accept either upper or lower case.**

ADDING TERMS OFFLINE

The command for this is Add Off Line **AOF**

The most appropriate time to use this command is just after you have been asked which type of search you hope to do ie Cirt or Boolean (see Cirt Users Manual 4.1.1 page 4). Having added the terms you then logon to Data Star. You will get the usual Data Star response and be requested to designate any limits.

When the command mode prompt -> appears it is advisable to check to see that your terms are there, with the command **OQ** (Old Query)

SENDING THE TERMS DOWNLINE TO DATA STAR

If the terms are satisfactory send them down the line to Data Star with the command **ADD ALL**. If only a few of the terms are appropriate it is possible to select only those terms to be sent to Data Star by typing in **ADD** and the corresponding number eg **ADD 1 3 4** etc. You then proceed with the search in the usual way typing **S** to search or adding additional terms.

The whole process should look something like this:

```
Enter id for offline prints- mjm
Enter query identifier- mick
Enter y or Y for boolean search; n,N or RETURN for weighted search-
-> aof heart stroke valve thrombosis embolism infarction
-> oq
      rels      t rels
  1.  0         0        heart
  2.  0         0        stroke
  3.  0         0        valve
  4.  0         0        thrombosis
  5.  0         0        embolism
  6.  0         0        infarction
-> li detal
call established
D A T A - S T A R , PLEASE ENTER YOUR USERID  raludb
ENTER YOUR A-M-I-S PASSWORD
OGIIOOOOOXXXXXXXX*********
- MONDAY 12. MAY 1986: DUE TECHNICAL MAINTENANCE, D-S WILL NOT BE
  AVAILABLE FROM 0630 TO 0900 HOURS SWISS TIME.
ENTER YES IF BROADCAST MSG IS DESIRED_:
ENTER DATA BASE NAME_:  medl

Login successful
Any limits ?n
-> add 1 2 6
  2. 'heart' added, freq=30076, weight= 3.3298
  3. 'stroke' added, freq=3851, weight= 5.4158
  4. 'infarction' added, freq=6817, weight= 4.8413
-> s
```

```
Searching....Searched

Search tree
No.   seen      weight    terms
133.   0        13.59     stroke infarction heart
-> 1

133 documents with weight 13.59
stroke(5.4) infarction(4.8) heart(3.3)
--------------------------------------------------------
ignore, print, look or quit? 1
TI A  prognostic comparison of asymptomatic left ventricular hypertrophy
     and unrecognized myocardial infarction; the Framingham Study.
?? r
132 docs remaining in this set:
ignore, print, look or quit?
Search exhausted
There are 1 known relevant documents
old wt.   new wt.   rels.
5.42      6.51      1       stroke
4.84      5.94      1       infarction
3.33      4.43      1       heart
```

## CHANGING DATABASES

AFTER A **RESET, OQ** will give you a list of your query terms as
they were before the reset.  Again you can **ADD ALL** or **ADD 1 2
4...** to repeat the search on the new database.

## SAVING SEARCH TERMS FOR LATER SESSIONS

If you wish to log off completely and come back to the query at a
later date this is possible with the combination of SAVE AND
RESTORE commands, in this manner.

Immediately after you logoff Data Star(->O)or change database
using **RESET**  save the query with ->**SAVE** (filename of up to 10
letters). eg **SAVE MIKE** then logoff Cirt (->**Q**).

```
-> reset
No. of documents in off-line print set is 1
Enter data base name
-> demmed
*CONNECT TIME MEDL:    0:04:57 HH:MM:SS   0.083 DEC HRS.   SESSION 1408*
Any limits ?n
-> save mjm
-> oq
     rels      t rels
1.   1         1        stroke
2.   1         1        infarction
3.   1         1        heart
-> q
*CONNECT TIME DEMM:    0:00:45 HH:MM:SS   0.013 DEC HRS.   SESSION 1409*
*SIGN-OFF  10.53.14                       09.05.86Clearing the call
Hours 0, Minutes 6, Seconds 4, Rx 61, Tx 18
```

## SEARCHING AT A LATER DATE

At the new session before you logon to Data Star (ie after you
have been asked what type of search you want  - Boolean or
weighted) in type **RESTORE** and file name, this will bring back
your previously saved file and restore it ready for use.  To be
on the safe side you can get a listing of the terms saved by
typing **OQ**. Then logon to Data Star and specify limits, send the
terms to Data Star with the command -> **ADD ALL** and lastly search
->s

```
Enter id for offline prints- mjm
Enter query identifier- mick
Enter y or Y for boolean search; n,N or RETURN for weighted search-
-> restore mjm
-> oq
     rels      t rels
  1   1          1        stroke
  2   1          1        infarction
  3   1          1        heart
-> ll dstar
call established
D A T A - S T A R , PLEASE ENTER YOUR USERID :raluab

ENTER YOUR A-M-I-S PASSWORD
OOOOOOOOXXYYYXXX********
- MONDAY 12. MAY 1986: DUE TECHNICAL MAINTENANCE, D-S WILL NOT BE
  AVAILABLE FROM 0630 TO 0900 HOURS SWISS TIME.
ENTER YES IF BROADCAST MSG IS DESIRED_:
ENTER DATA BASE NAME_:  medl

Login successful
Any limits ?n
-> reset
Enter data base name
-> mezz
*CONNECT TIME MEDL:    0:00:14 HH:MM:SS    0.004 DEC HRS.   SESSION  1413*
Any limits ?y
YR?
LG? en
 human?
animal?
female?
 male?
other limits?
-> add all
  2. 'stroke' added, freq=9877, weight= 6.9051
  3. 'infarction' added, freq=18195, weight= 6.2917
  4. 'heart' added, freq=87785, weight= 4.6965
-> s

Searching....Searched

Search tree
No.   seen      weight    terms
251    0        17.89     stroke infarction heart
-> q
*CONNECT TIME MEZZ:    0:08:18 HH:MM:SS   0.138 DEC HRS.   SESSION  1414*
*SIGN-OFF  12.44.34                       09.05.86Clearing the call
Hours 0, Minutes 8, Seconds 56, Rx 36, Tx 13
```

## LISTING PURGING EXISTING FILES

The command **UNSAVE** provides two functions:

1. When entered with a file name of one or your saved files it will erase the file.

2. Typed in on its own it will provide a list of all the file names currently being used.

SUMMARY

| | |
|---|---|
| aof | Adding terms offline, permits you to type in terms before logging on. |
| oq | Displays the terms and relevance information currently held in the "old query terms table". |
| add all | Sends the saved query down line to Data Star then listing the usual term frequency and weighting information usually expected from the "add" command. |
| save (file name) | Specifies a file into which the present query will be saved. |
| unsave | 1. With a file name erases the specified file. 2. Without a file name provides a list of current files holding saved queries. |
| restore | 1. Brings back a previously saved query for use during the current session. 2. Without a file name provides a list of current files holding saved queries. |

## OUTLINE OF PROCEEDURES

1. When the user comes requesting a search, briefly check that:

   a. it is a subject search

   b. you will be present

   c. the database you want is available on Cirt.

2. Explain briefly about the experiment, give them the introductory letter and have them sign it.

3. Draw the random card

   a. write their name clearly on the card

   b. staple the numbered card to the signed introductory letter

4. Write the query number on the top right corner of the purple presearch questionnaire. Ask the user to fill in the form, perhaps while you are both discussing the search.

5. Do the search - see Cirt manual for details of executing a search and printing offline. If for any reason you do not go online reuse the random card, alternatively if you go online and the search fails for any reason, consider this a failed search and do not reuse the random card.

6. Write the same query number on the blue and green questionnaires. Give the blue one to the user. Fill in the green one yourself.

7. When the off-line prints come enclose the pink form, and make sure the query number is on the copy of the prints to be evaluated.

8. Cross fingers and hope they return the offline prints.

9. Keep this mass of paper together so I can come and collect it.

Many Thanks,

(121)

(front)

(Name inserted here)

(back)

WEIGHTED

(85)

(front)

(Name inserted here)

(back)

BOOLEAN

# THE CITY UNIVERSITY

Northampton Square   London EC1V 0HB
telephone: 01-253 4399   telex: 263896

**Department of Information Science**
**Head**: Professor R. T. Bottle

The City Front End Project is a two year research grant funded by British Library Research and Development Department, headed by Dr. S. E. Robertson of the Department of Information Science at City University. The purpose of the project is to conduct an experiment in an operational environment comparing weighted retrieval with traditional Boolean retrieval. The weighted retrieval data will be provided by a front end system "Cirt" which was created under another BLR&D grant by Robertson and Bovey (1983). The Boolean retrieval data will be supplied from conventional searching using Data-Star.

The project will consist of collecting a large number of searches randomly designated to either "Cirt's" weighted retrieval or traditional Boolean retrieval. The searches will be evaluated and the results compared to see whether there is a significant difference between the two systems.

Your participation in the project will involve completing a questionnaire in three parts

1.    The first part will be given before the search indicating your expectations of the search.

2.  The second part will be given just after finishing the online search. This will provide us with background information and most importantly your assessment of certain aspects of the search.

3.    The last part will involve evaluating a copy of the offline prints.

This research is registered under the Data Protection Act. All the information will be STRICTLY CONFIDENTIAL and used for no other purpose than the experiment. The data will be held on a computer only for the duration of the experiment and will be used for statistical processing. No individuals will be identified in the final report.

If you are willing to participate would you please sign the bottom of this form.

Many thanks for your cooperation.

Signed_____          Date

Query no_____

QUESTIONNAIRE

**CONFIDENTIAL**

Instructions: Please answer each question. We encourage comments on the back, but do please number your comments so we can match them to the question.

1. NAME

   DEPARTMENTAL ADDRESS

   DAYTIME TELEPHONE

   STATUS: **Consultant**____ **Doctor**____ **Lecturer**____

**Post Graduate**____ **Researcher**____**Other please specify**_____

2. How do you intend to use this information? eg teaching, research, patient care etc

_____

3. Indicate your general assessment of the NATURE or your SUBJECT ENQUIRY

   **Precise or Accurate**____ **General**____ **Vague or Waffley**____

4. What type of search do you require?

   ____**BROAD** – ie all the references on a subject including peripheral material.

   ____**NARROW** – ie only very specific references

5. Have you had online searches done for you before?

   **Yes**____ **No**____

   If **YES** about how many?____

6. Have you done an online search on your own without an intermediary?

   **Yes**____ **No**____

   If **YES** about how many?____

Query no_____

QUESTIONNAIRE

**CONFIDENTIAL**

Instructions:  Please answer each question from 1 – 6 and EITHER 7 OR 8.  We encourage comments on the back, but do please number your comments so we can match them to the question.

1.  Indicate your SATISFACTION with the search on the basis of the scale below.
    **Excellent____  Good____  Satisfactory____  Poor____  Bad____**

2.  Please provide a general assessment of the SEARCH.
    **Easy____  Average____  Difficult____**

3.  Generally speaking were the RESULTS of the search.
    **Excellent____ Good____  Satisfactory____  Poor____  Bad____**

4.  Please assess the SEARCHER'S CONTRIBUTION to the search.
    **Essential____  Helpful____  Satisfactory____  Poor____  Bad____**

5.  How close was the online search to your original or intended enquiry?
    **Exact____  Fairly close____  Considerably altered____**

6.  Did you GET the number of REFERENCES EXPECTED?

**Less than expected_____  About as expected_____
More than expected____**

**************************************

"CIRT" SEARCHES ONLY

7.  Did you mark any seen references as relevant?
    **Yes____  No____**

    If **YES** did it appear to make the search more effective?
    **Yes____  No____**

BOOLEAN SEARCHES ONLY

8.  Did you view any references while online?
    **Yes___  No____**

    If **YES** did you modify the search on the basis of the references you saw online?
    **Yes___  No____**

Query no_____

**CONFIDENTIAL**

Instructions: Please answer all the questions.

1. NAME

2. Indicate your OVERALL SATISFACTION with the search.

   **Excellent____ Good____ Satisfactory____ Poor____ Bad____**

3. Please provide a general assessment of the SEARCH PROCESS.

   **Easy____ Average____ Difficult____**

4. Generally speaking were the RESULTS of the search

   **Excellent____ Good____ Satisfactory____ Poor____ Bad____**

5. What was the total NUMBER of TERMS in your PRESEARCH strategy ie after the interview but before going online.

   _____

6. Approximately how long did it take to PREPARE the SEARCH (starting when you met the user ending when you went online).

   _____

7. What was your REASON FOR FINISHING the search?

   ____Found what was required
   ____Technical difficulties
   ____The search strategy failed
   ____Others please specify

APPENDIX A8-1

Tables of results

The results reported in the following tables relate to the 190
searches eventually obtained (96 Boolean and 94 Weighted).
(The totals in individual tables may vary slightly because of
occasional missing values.)  The tables are numbered to
correspond to the sub-sections of section 4 in which they are
discussed.

There are two kinds of table.  For those that refer to nominal
variables, the results are presented as numbers of searches in
each category.  At the bottom of the table is the value of the
chi-square statistic and a significance value (i.e. $p$ value).
For the quantitative variables, the results are first summarised
as an overall mean and standard deviation.  Then the Mann-Whitney
U test is used:  the individual observations are ranked,
ignoring sign, and the mean ranks for Boolean and Weighted are
calculated.  The statistic given is the $z$ statistic, being the
transformation of the $U$ statistic into a form that is (under
the null hypothesis) approximately normal with mean 0 and
variance 1.  A $p$ value is also given.

The significance criterion used in the text is 5%:  i.e. a $p$
value of less than 0.05 is regarded as significant.

All these results were derived using the SPSS package.

|              | Boolean | Weighted |
|--------------|---------|----------|
| Excellent    | 31      | 20       |
| Good         | 45      | 47       |
| Satisfactory | 14      | 19       |
| Poor         | 6       | 5        |
| Bad          | 0       | 2        |
| Chi- Square  | 5.21821 |          |
| Significance | 0.2656  |          |

4.2.1  User's Satisfaction with the Search

========================================================================

|           | Boolean | Weighted |
|-----------|---------|----------|
| Easy      | 49      | 49       |
| Average   | 33      | 31       |
| Difficult | 14      | 13       |
| Chi-Square | 0.05193 |         |
| Significance | 0.9744 |        |

4.2.2  User' Assessment of the Search

========================================================================

|              | Boolean | Weighted |
|--------------|---------|----------|
| Excellent    | 20      | 17       |
| Good         | 50      | 48       |
| Satisfactory | 19      | 20       |
| Poor         | 5       | 6        |
| Bad          | 2       | 1        |
| Chi-Square   | 0.64913 |          |
| Significance | 0.9575  |          |

4.2.3  User's Assessment of Results

|              | Boolean | Weighted |
|--------------|---------|----------|
| Essential    | 75      | 65       |
| Helpful      | 21      | 25       |
| Satisfactory | 0       | 3        |
| Chi-Square   | 4.01550 |          |
| Significance | 0.1343  |          |

4.2.4  Searcher's Contribution

===========================================================================

|              | Boolean | Weighted |
|--------------|---------|----------|
| Exact        | 41      | 36       |
| Close        | 48      | 55       |
| Difficult    | 7       | 2        |
| Chi-Square   | 3.53145 |          |
| Significance | 0.1711  |          |

4.2.5  Match of Search to Enquiry

===========================================================================

|              | Boolean | Weighted |
|--------------|---------|----------|
| Less         | 21      | 25       |
| Expected     | 49      | 41       |
| More         | 26      | 27       |
| Chi-Square   | 1.03045 |          |
| Significance | 0.5974  |          |

4.2.6  Expected References

|              | Boolean | Weighted |
|--------------|---------|----------|
| Excellent    | 12      | 13       |
| Good         | 51      | 52       |
| Satisfactory | 28      | 16       |
| Poor         | 4       | 10       |
| Bad          | 0       | 3        |
| Chi- Square  | 8.88882 |          |
| Significance | 0.0639  |          |

4.3.1  Intermediary's Satisfaction with the Search

=================================================================================

|              | Boolean | Weighted |
|--------------|---------|----------|
| Easy         | 20      | 31       |
| Average      | 56      | 46       |
| Difficult    | 20      | 17       |
| Chi-Square   | 3.57553 |          |
| Significance | 0.1673  |          |

4.3.2  Intermediary's Assessment of the Search

=================================================================================

|              | Boolean | Weighted |
|--------------|---------|----------|
| Excellent    | 13      | 11       |
| Good         | 51      | 57       |
| Satisfactory | 25      | 20       |
| Poor         | 6       | 5        |
| Bad          | 1       | 1        |
| Chi-Square   | 0.64913 |          |
| Significance | 0.9575  |          |

4.3.3  Intermediary's Assessment of Results

APPENDIX A8-5

|                      | Boolean | Weighted |
|----------------------|---------|----------|
| Found Req Results    | 83      | 85       |
| Tech Difficulties    | 0       | 1        |
| Strategy Failed      | 2       | 1        |
| Others               | 4       | 2        |
| Found & Tech Diffs   | 7       | 5        |
| Chi- Square          | 2.233635 |         |
| Significance         | 0.6742  |          |

4.3.4 Reason for Finishing

| Mean | 69.994 | |
|---|---|---|
| Std. Deviation | 57.827 | |
| | Boolean | Weighted |
| Mean Rank | 66.57 | 113.17 |
| Cases | 89 | 90 |
| Z | -6.0160 | |
| Significance | 0.0000 | |

4.4.1 Packet Switching Packets Sent

:=================================================================

| Mean | 22.206 | |
|---|---|---|
| Std. Deviation | 16.931 | |
| | Boolean | Weighted |
| Mean Rank | 85.03 | 94.92 |
| Cases | 89 | 90 |
| Z | -1.2766 | |
| Significance | 0.2017 | |

4.4.2 Online Time (minutes)

:=================================================================

| Mean | 28.103 | |
|---|---|---|
| Std. Deviation | 25.349 | |
| | Boolean | Weighted |
| Mean Rank | 100.66 | 84.34 |
| Cases | 92 | 92 |
| Z | -2.0796 | |
| Significance | 0.0376 | |

4.4.3 Online Citations

| Mean | 68.099 | |
|------|---------|---|
| Std. Deviation | 67.747 | |
| | Boolean | Weighted |
| Mean Rank | 98.80 | 83.11 |
| Cases | 91 | 90 |
| Z | -2.0148 | |
| Significance | 0.0439 | |

4.4.4  Offline Citations

===========================================================================

| Mean | 7.940 | |
|------|---------|---|
| Std. Deviation | 4.813 | |
| | Boolean | Weighted |
| Mean Rank | 108.83 | 76.17 |
| Cases | 92 | 92 |
| Z | -4.1729 | |
| Significance | 0.0000 | |

4.4.5 (a)  Terms Used in the Search

===========================================================================

| Mean | -0.011 | |
|------|---------|---|
| Std. Deviation | 3.842 | |
| | Boolean | Weighted |
| Mean Rank | 103.59 | 82.29 |
| Cases | 93 | 92 |
| Z | -2.7621 | |
| Significance | 0.0057 | |

4.4.5 (b) Terms Added and Amended

| Mean | 15.912 | |
|---|---|---|
| Std. Deviation | 12.166 | |
| | Boolean | Weighted |
| Mean Rank | 97.88 | 85.26 |
| Cases | 90 | 92 |
| Z | -1.6179 | |
| Significance | 0.1057 | |

4.5.2 (a) Total Relevant1 Retrieved

==============================================================================

| Mean | 24.253 | |
|---|---|---|
| Std. Deviation | 15.268 | |
| | Boolean | Weighted |
| Mean Rank | 97.18 | 85.94 |
| Cases | 90 | 92 |
| Z | -1.4400 | |
| Significance | 0.1499 | |

4.5.2 (b) Total Relevant2 Retrieved

==============================================================================

| Mean | 0.477 | |
|---|---|---|
| Std. Deviation | 0.275 | |
| | Boolean | Weighted |
| Mean Rank | 87.92 | 95.01 |
| Cases | 90 | 92 |
| Z | -0.9080 | |
| Significance | 0.3639 | |

4.5.3 (a)  Precision1

| Mean | 0.708 | |
|---|---|---|
| Std. Deviation | 0.267 | |
| | Boolean | Weighted |
| Mean Rank | 86.67 | 96.22 |
| Cases | 90 | 92 |
| Z | -1.2266 | |
| Significance | 0.2200 | |

4.5.3 (b) Precision2