University of Michigan Proposal Writer's Guide

By Don Thackrey

Foreword

This Guide is intended for faculty and staff members with little or no experience in writing proposals for sponsored activities.

I. Introduction

Writing a proposal for a sponsored activity such as a research project or a curriculum development program is a problem of persuasion. It is well to assume that your reader is a busy, impatient, skeptical person who has no reason to give your proposal special consideration and who is faced with many more requests than he can grant, or even read thoroughly. Such a reader wants to find out quickly and easily the answers to these questions.

- What do you want to do, how much will it cost, and how much time will it take?
- How does the proposed project relate to the sponsor's interests?
- What difference will the project make to: your university, your students, your discipline, the state, the nation, the world, or whatever the appropriate categories are?
- What has already been done in the area of your project?
- How do you plan to do it?
- How will the results be evaluated?
- Why should you, rather than someone else, do this project?

These questions will be answered in different ways and receive different emphases depending on the nature of the proposed project and on the agency to which the proposal is being submitted. Most agencies provide detailed instructions or guidelines concerning the preparation of proposals (and, in some cases, forms on which proposals are to be typed); obviously, such guidelines should be studied carefully before you begin writing the draft.

Two Preliminary Steps.

You will benefit by consulting two persons at an early stage in the planning of the proposal:

- your department chair (or dean) and
- the Division of Research Development and Administration (DRDA) project representative who maintains liaison with the sponsoring agency you have in mind.
The department chair, whom you will eventually be asking to approve the proposal and thereby endorse your plans for staff and facility commitments, should be informed of your intentions and especially of any aspect of the proposed project that might conceivably affect departmental administration or your departmental duties. Early discussion of potential problems will smooth the way for the proposal later. Several schools and colleges have assistant or associate deans with special responsibilities for sponsored programs. These persons can provide valuable help and advice both in substantive and administrative matters.

DRDA project representatives are a general source of help for the whole process of planning and writing the proposal. They can give you the latest agency guidelines, know the deadlines, can explain funding peculiarities that might affect your preparation of the proposal, can sometimes put you in touch with others at the University in similar work or capable of helping you in some way, can judge whether any additional University officials need to be informed at an early stage about your proposal, can help you work out a detailed budget appropriate to the work you wish to undertake, and in general can raise the pertinent questions that must be resolved before the proposal will be approved for submission by the University. These questions may concern, for example, human subjects review, the use of animals, potential conflicts of interest, off-campus work, subcontracting, space rental, staff additions, consultants, equipment purchase, biological hazards, proprietary material, cost sharing, and many other matters.

II. The Parts of a Proposal

Proposals for sponsored activities follow generally a similar format, although there are variations depending upon whether the proposer is seeking support for a research grant, a training grant, or a conference or curriculum development project. The following outline and explanation concern chiefly the components of a research proposal. This section concludes with a discussion of certain variations in format required if one is seeking support for other kinds of academic programs.

A. Research Proposals

Typical parts of a research proposal are:

- Title (or Cover) Page
- Abstract
- Table of Contents
- Introduction (including Statement of Problem, Purpose of Research, and Significance of Research)
- Background (including Literature Survey)
- Description of Proposed Research (including Method or Approach)
- Description of Relevant Institutional Resources
- List of References
- Personnel
- Budget

The Title (or Cover) Page

Most sponsoring agencies specify the format for the title page, and some provide special forms to summarize basic administrative and fiscal data for the project. Generally, the principal investigator, his or her department head, and an official representing the University sign the title page. In addition, the title page usually includes
the University's reference number for the proposal, the name of the agency to which the proposal is being submitted, the title of the proposal, the proposed starting date and budget period, the total funds requested, the name and address of the University unit submitting the proposal, and the date submitted. Some agencies want the title page to specify whether the proposal is for a new or continuing project. And some ask to which other agencies the proposal is being submitted.

A good title is usually a compromise between conciseness and explicitness. Although titles should be comprehensive enough to indicate the nature of the proposed work, they should also be brief. One good way to cut the length of titles is to avoid words that add nothing to a reader's understanding, such as "Studies on...," "Investigations...," or "Research on Some Problems in...".

The Abstract.

Every proposal, even very brief ones, should have an abstract. Some readers read only the abstract, and most readers rely on it initially to give them a quick overview of the proposal and later to refresh their memory of its main points. Agencies often use the abstract alone in their compilations of research projects funded or in disseminating information about successful projects.

Though it appears first, the abstract should be written last, as a concise summary (approximately 200 words) of the proposal. It should appear on a page by itself numbered with a small Roman numeral if the proposal has a table of contents and with an Arabic number if it does not.

To present the essential meaning of the proposal, the abstract should summarize or at least suggest the answers to all the questions mentioned in the Introduction above, except the one about cost (which is excluded on the grounds that the abstract is subject to a wider public distribution than the rest of the proposal). Certainly the major objectives of the project and the procedures to be followed in meeting these objectives should be mentioned.

The abstract speaks for the proposal when it is separated from it, provides the reader with his first impression of the request, and, by acting as a summary, frequently provides him also with his last. Thus it is the most important single element in the proposal.

The Table of Contents.

Very brief proposals with few sections ordinarily do not need a table of contents; the guiding consideration in this is the reader's convenience. Long and detailed proposals may require, in addition to a table of contents, a list of illustrations (or figures) and a list of tables. If all of these are included, they should follow the order mentioned, and each should be numbered with lower-case Roman numerals. If they are brief, more than one can be put on a single page.

The table of contents should list all major parts and divisions (including the abstract, even though it precedes the table of contents). Subdivisions usually need not be listed. Again, the convenience of the reader should be the guiding consideration.

The Introduction.

The introduction of a proposal should begin with a capsule statement of what is being proposed and then should proceed to introduce the subject to a stranger. You should not assume that your reader is familiar with
your subject. Administrators and program officers in sponsoring agencies want to get a general idea of the
proposed work before passing the proposal to reviewers who can judge its technical merit. Thus the
introduction should be comprehensible to an informed layman. It should give enough background to enable
him to place your particular research problem in a context of common knowledge and should show how its
solution will advance the field or be important for some other work. Be careful not to overstate, but do not
neglect to state very specifically what the importance of your research is.

In introducing the research problem, it is sometimes helpful to say what it is not, especially, if it could easily
be confused with related work. You may also need to explain the underlying assumption of your research or
the hypotheses you will be using.

If the detailed exposition of the proposed research will be long or complex, the introduction may well end by
specifying the order and arrangement of the sections. Such a preview helps a reviewer begin his reading with
an orderly impression of the proposal and the assurance that he can get from it what he needs to know.

The general tone of the introduction should reflect a sober self-confidence. A touch of enthusiasm is not out
of place, but extravagant promises are anathema to most reviewers.

The Background Section.

This section may not be necessary if the proposal is relatively simple and if the introduction can present the
relevant background in a few sentences. If previous or related work must be discussed in some detail,
however, or if the literature of the subject must be reviewed, a background or literature review section is
desirable.

A background discussion of your own previous work usually can be less detailed than the customary
"progress report." Here you should not attempt to account for time and money spent on previous grants but
rather point your discussion to the proposed new (or continuing) research. Sufficient details should be given
in this discussion (1) to make clear what the research problem is and exactly what has been accomplished; (2)
to give evidence of your own competence in the field; and (3) to show why the previous work needs to be
continued. Some sponsors want to know also who has funded the previous work.

Literature reviews should be selective and critical. Reviewers do not want to read through a voluminous
working bibliography; they want to know the especially pertinent works and your evaluation of them. A list
of works with no clear evidence that you have studied them and have opinions about them contributes almost
nothing to the proposal.

Discussions of work done by others should therefore lead the reader to a clear impression of how you will be
building upon what has already been done and how your work differs from theirs. It is important to establish
what is original in your approach, what circumstances have changed since related work was done, or what is
unique about the time and place of the proposed research.

The Description of Proposed Research.

The comprehensive explanation of the proposed research is addressed not to laymen but to other specialists in
your field. This section, which may need several subsections, is, of course, the heart of the proposal and is the
primary concern of the technical reviewers. Research design is a large subject and cannot be covered here,
but a few reminders concerning frequently mishandled aspects of proposals may be helpful.
• Be realistic in designing the program of work. Overly optimistic notions of what the project can accomplish in one, two, or three years or of its effects on the world will only detract from the proposal's chances of being approved. Probably the comment most frequently made by reviewers is that the research plans should be scaled down to a more specific and more manageable project that will permit the approach to be evaluated and that, if successful, will form a sound basis for further work. In other words, your proposal should distinguish clearly between long-range research goals and the short-range objectives for which funding is being sought. Often it is best to begin this section with a short series of explicit statements listing each objective, in quantitative terms if possible.

• If your first year must be spent developing an analytical method or laying groundwork, spell that out as Phase 1. Then at the end of the year you will be able to report that you have accomplished something and are ready to undertake Phase 2.

• Be explicit about any assumptions or hypotheses the research method rests upon.

• Be clear about the focus of the research. In defining the limits of the project, especially in exploratory or experimental work, it is helpful to pose the specific question or questions the project is intended to answer.

• Be as detailed as possible about the schedule of the proposed work. When will the first step be completed? When can subsequent steps be started? What must be done before what else, and what can be done at the same time? For complex projects a calendar detailing the projected sequence and interrelationship of events often gives the sponsor assurance that the investigator is capable of careful step-by-step planning.

• Be specific about the means of evaluating the data or the conclusions. Try to imagine the questions or objections of a hostile critic and show that the research plan anticipates them.

• Be certain that the connection between the research objectives and the research method is evident. If a reviewer fails to see this connection, he will probably not give your proposal any further consideration. It is better here to risk stating the obvious than to risk the charge that you have not thought carefully enough about what your particular methods or approach can be expected to demonstrate.

The Description of Relevant Institutional Resources.

The nature of this section depends on your project, of course, but in general this section details the resources available to the proposed project and, if possible, shows why the sponsor should wish to choose this University and this investigator for this particular research. Some relevant points may be the institution's demonstrated competence in the pertinent research area, its abundance of experts in related areas that may indirectly benefit the project, its supportive services that will directly benefit the project, and its unique or unusual research facilities or instruments available to the project.

The List of References.

This list is desirable only if the proposal contains six or more references. Otherwise, the references can be inserted in the text within parentheses, like this (A. N. Author, "An Article," A Professional Journal, XX [1987], pp. 45-50). (Note that brackets, not parentheses, are used within parentheses.)

If a list of references is to be included, it is placed at the end of the text proper and before the sections on
personnel and budget. The items should be numbered and should be in the order in which they are first referred to in the text. In contrast to an alphabetical bibliography, authors' names in a list of references should not be reversed.

In the text, references to the list can be made in various ways; a simple way is to use a raised number at the appropriate place, like this.1 Such numbers should be placed outside any contiguous marks of punctuation.

The style of the bibliographical item itself depends on the disciplinary field. The main consideration is consistency; whatever style is chosen should be followed scrupulously throughout.

The Personnel Section.

This section usually consists of two parts: an explanation of the proposed personnel arrangements and the biographical data sheets for each of the main contributors to the project. The explanation should specify how many persons at what percentage of time and in what academic categories will be participating in the project. If the program is complex and involves people from other departments or colleges, the organization of the staff and the lines of responsibility should be made clear.

Any student participation, paid or unpaid, should be mentioned, and the nature of the proposed contribution detailed. If any persons must be hired for the project, say so, and explain why, unless the need for persons not already available within the University is self-evident.

The biographical data sheets should follow immediately after the explanatory text of the "personnel" section, unless the agency guidelines specify a different format. For extremely large program proposals with eight or more participants, the data sheets may be given separately in an appendix. All biographical data sheets within the proposal should be in a common format. A convenient, easily read format is illustrated in the sample following this item. These sheets should be confined to relevant information. Data on marital status, children, hobbies, civic activities, etc., should not be included unless the sponsor's instructions call for them. The list of publications can be selected either for their pertinence to the proposed work or for their intrinsic worth. All books written and a selection of recent or important journal articles written may well be listed, but there is no need to fill several pages with a bibliography. The list can be labeled "Selected Publications," "Recent Publications," or "Pertinent Publications," whichever best fits the facts.

Biographical Data for Principal Investigator

Robeson, George W.
Associate Professor of Mechanical Engineering

Education:
B.S. (Mech. Engr.), Princeton University, 1980
Ph.D. (Mech. Engr.), University of Michigan, 1985

Teaching Experience:
Lecturer, Mechanical Engineering, University of Michigan, 1983-1985
Assistant Professor, Mechanical Engineering, University of Michigan, 1985-1990
Associate Professor, Mechanical Engineering, University of Michigan, 1990-present

Other Relevant Experience:
U.S. Navy Engineering Officer, 1973-1979
Engineering Sales, Northrup, Inc., Detroit, 1979-1980

Professional Membership:
ASME (Current Chair, Systems Commission); ASTM; I. Mech. Engr. (Fellow)

Honors and Awards:
Sigma Xi (Past President); Phi Beta Kappa; ASME Distinguished Service Award
(1989); Listed in American Men of Science and Who's Who in American Education

Selected Publications:
"Measurements in Systems Engineering," Proceedings of the Fourth International Symposium on
Systems Engineering, Denver Research Institute, 1989, pp. 41-64.
And thirteen other publications in mechanics, heat transfer, and cavitation.

The Budget Section.

The budget should be worked out with the appropriate DRDA project representative. Sponsors customarily
specify how budgets should be presented and what costs are allowable. The overview given here is for
preliminary guidance only.

The budget section may require not only the tabular budget (a simple format is illustrated in the sample given
here) but also a budget summary and explanation or "budget justification" if the budget is complicated or if
all its details are not made completely clear by the text of the proposal. The need for consultants, for example,
or the unavailability within the University of an item of equipment proposed for purchase may need to be
explained. Foreign travel should be specifically detailed and justified, not combined with domestic travel, and
the need to travel to professional meetings should be tied specifically to the proposed project, if possible.

Typical divisions of the tabular budget are personnel, equipment, supplies, travel, and indirect costs. Other
categories, of course, can be added as needed. The budget should make clear how the totals for each category
of expenses are reached. Salary information, for example, often needs to be specified in detail: principal
investigator (1/2 time for 3 months at $24,000 [9-month appointment]) = $4,000. If salary totals involve two
different rates (because of an anticipated increase in salary during the budget period), this should be made
clear.

The category of personnel includes not only the base salary or wage for each person to be employed by the
project but also (listed separately) the percentage added for staff benefits. The current figure used for
approximately the average cost of staff benefits is 30% of the total salaries and wages. Project representatives
should be consulted on the calculation of staff benefits, because the rate may vary significantly owing to the
kinds of personnel involved and the selected benefit option. A table is available from DRDA.

Graduate Student Research Assistants who are to be employed on research projects for more than 1/2 time,
may have part of their tuition costs covered by their unit. The remaining tuition costs must be included as a
line item in the budget to the sponsor.

Any costs absorbed by the University should be shown as cost sharing. A more detailed description of this procedure may be found on the UM research web under budget preparation/cost sharing.

Indirect costs are shown as a separate category, usually as the last item before the grand total. Indirect costs are figured as a fixed percentage of the total direct costs (modified by various exceptions). Exceptions include equipment, graduate research assistant tuition, the amount of subcontracts over $10,000, and the separate indirect cost centers: Computing Center Services, Unit for Laboratory Animal Medicine, and the Michigan Memorial Phoenix Laboratory. Because these fixed indirect cost percentages change each year, after negotiation with the federal government, proposal writers should consult a DRDA project representative before calculating this part of their budget. The indirect cost rate table is available on the research web.

Cost sharing, which is required by many sponsors, can be shown as a separate column labeled U-M, as illustrated in the sample budget. Frequently a portion of the salary of the principal investigator, paid from University funds, with its related staff benefits and indirect costs, can be used to satisfy cost-sharing requirements.

To call attention to the variety of expenses that might arise in the conduct of a research project, a checklist of possible budget items is included here. This checklist suggests many of the expenses that might be appropriate to your budget, but consultation with project representatives is still very important. They can help ensure (1) that the budget has not omitted appropriate elements of cost, such as page charges for publication in professional journals, or service charges for the use of certain University facilities (for example, surveys conducted by the Institute for Social Research), and so on; (2) that any estimates for construction, alterations, or equipment installation have been properly obtained and recorded; (3) that costs are not duplicated between the direct and indirect cost categories; (4) that the budget complies with any cost-sharing requirements of the sponsor; (5) that provisions are made for the escalation of costs as may be appropriate; and (6) that costs in all categories are realistically estimated.

### Twelve-Month Budget

<table>
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<tr>
<th>Personnel</th>
<th>U-M</th>
<th>Total</th>
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<tbody>
<tr>
<td>Principal Investigator, 25%, Academic Year</td>
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<tr>
<td>Project Associate, 10%</td>
<td>0</td>
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<tr>
<td>Research Assistant, 50%</td>
<td>9,000</td>
<td>0</td>
</tr>
<tr>
<td>Clerk-Typist, 50%</td>
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<td>Subtotal</td>
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<td>Staff Benefits (30% of S&amp;W)</td>
<td>$9,300</td>
<td>$900</td>
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<td>Subtotal</td>
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<td>$3,900</td>
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<tr>
<td>Consultants</td>
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<tr>
<td>John Smith, $200/day, 2 days</td>
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<td>0</td>
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<tr>
<td>Equipment</td>
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<td></td>
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<td>Methometer</td>
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Materials and Supplies

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<td>Glassware</td>
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<td>Chemicals</td>
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<td>$200</td>
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<td><strong>Subtotal</strong></td>
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<td><strong>$400</strong></td>
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Travel

Principal Investigator consultation with sponsor, Ann Arbor to Washington, D.C., and return.
1 person, 2 days

<table>
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<td>Per Diem @ $100/day</td>
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<td>200</td>
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<tr>
<td>Local Transportation</td>
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<tr>
<td><strong>Subtotal</strong></td>
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**Total Direct Costs**

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Indirect Costs

(51.5% of modified total direct costs)

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**Grand Total**

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<tr>
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<td><strong>$71,576</strong></td>
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Checklist for Proposal Budget Items

**A. Salaries and Wages**
- Academic personnel
- Research assistants
- Stipends (training grants only)
- Consultants
- Interviews
- Computer programmer
- Tabulators
- Secretaries
- Clerk-typists
- Editorial assistants
- Technicians
- Subjects
- Hourly personnel
- Staff benefits
- Salary increases in proposals that extend into a new year
- Vacation accrual and/or use

**B. Equipment**
- Fixed equipment
- Movable equipment
- Office equipment
C. Materials and Supplies

- Office supplies
- Communications
- Test materials
- Questionnaire forms
- Duplication materials
- Animals
- Animal care
- Laboratory supplies
- Glassware
- Chemicals
- Electronic supplies
- Report materials and supplies

D. Travel

- Administrative
- Field work
- Professional meetings
- Travel for consultation
- Consultants' travel
- Subsistence
- Automobile rental
- Aircraft rental
- Ship rental

E. Services

- Computer use
- Duplication services (reports, etc.)
- Publication costs
- Photographic services
- Service contracts
- ISR services (surveys)

F. Other

- Space rental
- Alterations and renovations
- Purchase of periodicals and books
- Patient reimbursement
- Tuition and fees (training grants)
- Hospitalization
- Page charges
• Subcontracts

G. Indirect Costs

The Appendices. Some writers are prone to append peripheral documents of various kinds to their proposals on the theory that the bulk will buttress their case. Reviewers almost never read such appendices, and may resent the padding. The best rule of thumb is: When in doubt, leave it out.

Appendices to proposals are occasionally used for letters of endorsement or promises of participation, biographical data sheets (when there are too many — say, eight or more—to be conveniently placed in the "personnel" section), and reprints of relevant articles.

If two or more appendices are included in a proposal, they should be designated Appendix A, Appendix B, etc.

B. Proposals for Academic Programs

It may be that your need is not for a research grant, but for outside sponsorship of an academic program involving a new curriculum, a conference, a summer seminar, or a training activity. If so, once again your best guide in proposal preparation is to consult any guidelines that the sponsoring agency provides. In the event that none is available, however, the following outline may be followed.

The Introduction, including a clear statement of need, and the Background section, describing the local situation and developmental activities to date, should begin the request. These should be followed by a section entitled Planning. This section details the activities that will occur after the grant is received and before the institution of the new courses, training activities, or seminar. A Program Description should come next. This section lists the courses or instructional sessions to be offered, the interrelationship of parts, and the program leading to certification or a degree. It discusses the students or participants to be selected and served by the program, as well as plans for faculty retreats, negotiation with cooperating institutions, released time to write instructional materials, and so on.

Before concluding with the Institutional Resources, Personnel, and Budget sections, special attention should be given to a section entitled Institutional Commitment. Here the agreements made by various departments and cooperating institutions are clarified, and the willingness of the home institution to carry on the program once it has proven itself is certified. This section is crucial to the success of curriculum development programs because, in contrast to research programs, they have a profound impact on the host institution. Funding agencies need to be reassured that their funds will not be wasted by an institution that has only responded to a funding opportunity without reflecting soberly upon the long-range commitments implied.

III. Inquiries to Private Foundations

Proposals to foundations have a better chance of succeeding if they are preceded by an informal contact. This contact is usually a brief (not more than two pages) letter outlining the proposed project, suggesting why the foundation should be interested in it, and requesting an appointment to discuss it in further detail. Such a letter permits an investigator to make inquiries to several foundations at once and gives an interested
foundation the chance to offer suggestions before receiving the formal proposal.

This letter of inquiry is crucially important, and in preparing it investigators should avail themselves of the advice and help of the Division of Research Development and Administration. The project representative responsible for liaison with foundations is Julie Feldkamp (763-4522). She has information about most foundations and can advise about which foundations are most likely to support a particular project, as well as about timing, approach, budgetary matters, whom to contact, and so on. Sometimes she can also refer investigators to others within the University who have had experience with certain foundations, and she can help ensure that the proper University offices are kept informed about proposed approaches to foundations. (Projects involving $250,000 or more should be brought to the attention of the Vice-President for Development to help coordination of activities.) Assistance in writing or editing letters is available from DRDA. These two DRDA offices will help investigators prepare effective inquiries.

Most foundations have specific areas of interest for which they award funds. It is essential that the grant seeker identify those foundations whose interests match the proposed project. Seldom will a foundation fund a project outside of its stated field of interest. DRDA has resources to help investigators identify the appropriate foundations.

The initial letter of inquiry should demonstrate that the investigator is acquainted with the work and purposes of the particular foundation being approached and should point out a clear connection between these and the proposed project. A letter so generally phrased that it could be a form letter is almost certain to be disregarded. An effective letter will discuss the significance or uniqueness of the project: Who will benefit? Who cares about the results? What difference will it make if the project is not funded? It will give enough indication of step-by-step planning to show that the project has been thought through and that pitfalls have been anticipated. It will demonstrate the writer's grasp of the subject and his credentials to undertake the project. It will emphasize at the same time that this is a preliminary inquiry, not a formal proposal, and that the investigator will send further details if the foundation wishes, or, better yet, will visit the foundation to discuss the project in depth. (Travel funds for this purpose are usually available through DRDA.) It is unnecessary in the preliminary inquiry to include a detailed budget, although an overall cost estimate should be mentioned.

A good letter, then, might begin something like the following: "Because of the interest the __________ Foundation has shown in __________, I am writing to solicit its support for a project that will __________." This should be followed by a sentence describing the program, the institution, and another one or two concerning the need for and uniqueness of the project.

The body of the letter should consist of three or four paragraphs giving the context or background of the project, its scope and methodology, the time required for its completion, the institutional commitments, and any special capabilities that will ensure the project's success. A separate paragraph might be given to some of the major categories of the proposed budget, including a rounded total direct cost estimate, and mention of any matching fund or cost-sharing arrangements, either in dollars or in-kind contributions.

The last paragraph could be patterned along these lines: "If the __________ Foundation is interested in learning more about this program, I will be happy to travel to __________ to discuss it in detail, or to submit a full proposal outlining my plans. My phone number in __________ is (___) _______ at work, and (___) _______ at home. I look forward to hearing from you soon."

In directories and other general sources of information, foundations often indicate their areas of interests in such broad terms (e.g., higher education or social welfare) that the investigator cannot tell with any
IV. Dealing with Short Deadlines

Having the time and leisure to follow the foregoing outline methodically is something of an ideal. It is far more common to discover that a proposal deadline is only a week and a half away, your co-workers are out of town, and you're left with their classes to teach, a whole proposal to write, and a hint of the flu. If you find yourself in this situation, several niceties of orderly procedure can be slighted, but the following steps emerge of paramount importance.

First, start (don't finish) with the sponsor's guidelines. Mark them as you study, noting such things as deadline (for mailing or arrival?), number of copies, where to mail, and so on. Look for such requirements as the collection of institutional data which, were it left to last, could not be gathered. The guidelines will also probably specify certain topics or questions that must be addressed. If you can reasonably say anything at all on these topics, you should use the sponsor's exact phrases as your headings. You may even wish to borrow some of the language of the guidelines if it fits naturally into the framework of your proposal. If the sponsor is looking for "transdisciplinary" approaches to the problem, you would do well to use that term rather than say, interdisciplinary or interdepartmental to describe the same activities.

Second, after you have studied the guidelines, if there are sections that are either too vague or too specific for comfort or convenience, check with the project representative to see if she has a clarification. If she does not, she may call the appropriate program officer at the agency for you or give you the number of the person to call. In either event, two ends will be served: the project representative will be alerted to your intentions to submit, and the information you will receive will help focus further the task of preparing a rush proposal.

Third, break the proposal up into small and simple subsections--especially if more than one person will be writing. Give each subsection headings and subheadings (referring again to the guidelines), and write slavishly to this outline. Using subheadings liberally will not only help you organize your material but will also guide reviewers through your perhaps not altogether flawlessly organized narrative. For facilitating last-minute corrections in the typed copy, start new sections and major subsections on new pages, and don't number pages, except lightly in pencil, until the last step.

Fourth, compare your budget and your text to insure that for every cost figure a corresponding activity is mentioned and justified in the text.

Fifth, pay special attention to the abstract. Having rushed through the narrative, you will find that careful construction of the abstract will serve both as a summary of what you intend to do and as a check on whether you have omitted any essential topics.

V. Why Proposals are Rejected
Assuming that funds are available, that geographical distribution is not a criterion, and that political considerations are not present, the success of a proposal will depend both on the quality of the project itself and the quality of its presentation in the proposal. Different reviewers, of course, will weigh merits and defects differently, but the following list of short-comings of 605 proposals rejected by the National Institutes of Health is worth pondering. The list is derived from an article by Dr. Ernest M. Allen (Chief of the Division of Research Grants, National Institutes of Health) that appeared in Science, Vol. 132 (November 25, 1960), pp. 1532-34. (The percentages given total more than 100 because more than one item may have been cited for a particular proposal.)

A. Problem (58 percent)

- The problem is not of sufficient importance or is unlikely to produce any new or useful information. (33.1)
- The proposed research is based on a hypothesis that rests on insufficient evidence, is doubtful, or is unsound. (8.9)
- The problem is more complex than the investigator appears to realize. (8.1)
- The problem has only local significance, or is one of production or control, or otherwise fails to fall sufficiently clearly within the general field of health-related research. (4.8)
- The problem is scientifically premature and warrants, at most, only a pilot study. (3.1)
- The research as proposed is overly involved, with too many elements under simultaneous investigation. (3.0)
- The description of the nature of the research and of its significance leaves the proposal nebulous and diffuse and without a clear research aim. (2.6)

B. Approach (73 percent)

- The proposed tests, or methods, or scientific procedures are unsuited to the stated objective. (34.7)
- The description of the approach is too nebulous, diffuse, and lacking in clarity to permit adequate evaluation. (28.8)
- The overall design of the study has not been carefully thought out. (14.7)
- The statistical aspects of the approach have not been given sufficient consideration. (8.1)
- The approach lacks scientific imagination. (7.4)
- Controls are either inadequately conceived or inadequately described. (6.8)
- The material the investigator proposes to use is unsuited to the objective of the study or is difficult to obtain. (3.8)
- The number of observations is unsuitable. (2.5)
- The equipment contemplated is outmoded or otherwise unsuitable. (1.0)

C. Investigator (55 percent)

- The investigator does not have adequate experience or training for this research. (32.6)
- The investigator appears to be unfamiliar with recent pertinent literature or methods. (13.7)
- The investigator's previously published work in this field does not inspire confidence. (12.6)
- The investigator proposes to rely too heavily on insufficiently experienced associates. (5.0)
- The investigator is spreading himself too thin; he will be more productive if he concentrates on fewer projects. (3.8)
D. Other (16 percent)

The requirements for equipment or personnel are unrealistic. (10.1)
It appears that other responsibilities would prevent devotion of sufficient time and attention to this research. (3.0)
The institutional setting is unfavorable. (2.3)
Research grants to the investigator, now in force, are adequate in scope and amount to cover the proposed research. (1.5)