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A MEDIA MIX TEST OF PAID RADIO ADVERTISING FOR ARMED SERVICES R--ETC(U)

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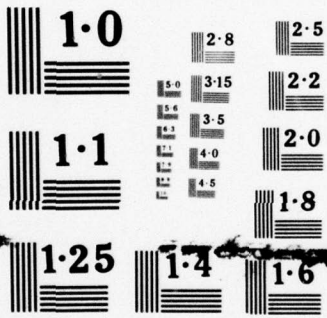
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NATIONAL BUREAU OF STANDARDS
MICROCOPY RESOLUTION TEST CHART

LEVEL #1

(2) NW

AD A 057262

A056 9/13

(6) A MEDIA MIX TEST
OF PAID RADIO ADVERTISING
FOR ARMED SERVICES RECRUITMENT,
VOLUME I

(9) Research
Repts.

PREPARED FOR:
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(MANPOWER & RESERVE AFFAIRS)

DEPARTMENT OF DEFENSE
THE PENTAGON
WASHINGTON, D.C.

(12) 88p.

AD No. _____
DDC FILE COPY

CONTRACT NUMBER:

(13) M00027-73-A-0013

DDC
RECEIVED
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A

PREPARED BY:

RUSS HALEY & ASSOCIATES, INC.
405 LEXINGTON AVENUE
NEW YORK, NEW YORK 10017

DISTRIBUTION STATEMENT A
Approved for public release
Distribution Unlimited

(11) MAY 1976

410 780

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Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER No number available	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) A MEDIA MIX TEST OF PAID RADIO ADVERTISING FOR ARMED SERVICE RECRUITMENT, Volumes One-Four		5. TYPE OF REPORT & PERIOD COVERED Research Report
		6. PERFORMING ORG. REPORT NUMBER number not available
7. AUTHOR(s) Research Staff and Dr. Raymond E. Schucker		8. CONTRACT OR GRANT NUMBER(s) M00027 73 A 0013 ✓
9. PERFORMING ORGANIZATION NAME AND ADDRESS Russ Haley & Associates Inc. 405 Lexington Avenue New York, NY 10017		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS no number available
11. CONTROLLING OFFICE NAME AND ADDRESS OASD(M, RA&L)MPP Accession & Retention Programs, Rm 2B269 Pentagon, Washington, D.C. 20301		12. REPORT DATE Vol 1&2-May 76 Vol 3-Jul 76, Vol 4-Mar 77
		13. NUMBER OF PAGES 225
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) Same as 11		15. SECURITY CLASS. (of this report) Unclassified
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) approved for public release; unlimited distribution		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report) approved for public release; unlimited distribution		
18. SUPPLEMENTARY NOTES None		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Paid Radio Advertising Perceptions of military services Recruiting Advertising Advertising Inquiries Media Mix test Advertising impact Effect of Advertising		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This was a test of the effectiveness of paid radio recruiting advertising. The four active military services (Army, Navy, Air Force, Marine Corps) participated. Criterion variables measured were contracts for accession, inquiries by mail, telephone and in person, pre-disposition toward joining a service, awareness and knowledge of specific programs and benefits offered by individual services and awareness of armed forces advertising.		

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TABLE OF CONTENTS

VOLUME I

	<u>Page</u>
I. BACKGROUND AND OBJECTIVES	1
II. METHOD	6
III. CONCLUSIONS	8
A. Overall Results	8
B. Commentary	17
C. Postscript	18
IV. THE STUDY IN DETAIL	19
A. Philosophy and Overall Design	19
B. Sources of Information Employed	27
C. Analysis of the Results	36
D. Statistical Analyses	72

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STUDY OVERVIEW

I. Background And Objectives

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The Department of Defense has not employed paid broadcast advertising in support of military recruiting since 1971. In the meantime the military services have developed their advertising media plans without access to either radio or television advertising except on a public service basis.

In 1975 the Office of The Secretary of Defense (OSD) began an analysis of the relative effectiveness of paid broadcast advertising in support of the All Volunteer Force. The first step was a study¹⁾ of the cost efficiency of including paid broadcast in service advertising media schedules. In this instance efficiency was evaluated in terms of physical exposure to the target audience. The technique employed was an analysis of audience ratings to determine the relative costs of various media in accumulating reach and frequency of exposure among the target audience. Results suggested that employment of paid broadcast (radio and/or television) offers advantages in either of two directions:

- . Achievement of greater reach and frequency²⁾ for a given budget level

1) OSD Media Study, April 25, 1975, conducted by Vitt Media International

2) Reach is defined as the percent of the target audience to whom at least one message is delivered. Frequency is the average number of messages delivered per recipient.

- Achievement of similar reach and frequency for lower budget levels.

However, Physical exposure is only the first step in effective advertising. Ultimate effectiveness depends also upon the ability of the medium to convey comprehensible, memorable information to the prospect which may affect his attitudes or behavior in a desired direction.

Consequently a decision was made in the Spring of 1975 to carry the investigation further by testing the capability of paid radio advertising to convey service advertising messages and to accomplish advertising objectives. All four services agreed to participate simultaneously in the test.

Since media efforts now exclude paid radio, the central question was how radio would perform when gross impressions against young men between the ages of 17 and 24 are equalized for a schedule containing a mix of radio and other media versus a schedule containing other media alone.

The term "gross impressions," used in this context, refers

to the sum total of exposures to the full list of media used during a specified period of time.

It is recognized that the objectives of the test are in a sense, relatively modest. For example, it would have been possible to test several levels of radio simultaneously to attempt to determine the optimum mix of radio and other media. However, given the generally negative experience of past media tests in other areas, it was reasoned that it would be unwise to be more ambitious in the first experiment for the armed services. It was hoped that one solid clean experience would lay the groundwork for future work with controlled experiments. Accordingly the test reported upon here attempts simply to see whether the addition of radio to the media schedule would have any effects and, if so, what kinds of effects they would be.

There are, of course, a large number of ways in which the effectiveness of advertising can be measured. The most important one is the desired end result -- accessions. However, enlistment impact is probably also the most difficult criterion to influence. One reason for this is the role played by the recruiter. It seems likely that advertising

does not usually cause accessions directly. Rather it may influence attitudes or result in an inquiry of a recruiter. Whether an accession results depends importantly on how the recruiter does his or her job.

Advertising, when it is successful, operates in a variety of ways. One potential effect, often obtained in the early stages of a campaign, is a change in the level of awareness of the service being advertised and/or of its advertising. A second possible effect is a change in the amount and nature of the information being communicated. Thirdly, if the information communicated favorably interacts with the value systems and pre-disposition of the person exposed to the advertising, that person's attitudes toward joining a service may change in a positive direction. And, finally, the exposed person may take some specific action toward enlistment. This may take the form of an inquiry by mail, by telephone, or in person. There are no clearcut rules as to which of these criteria are apt to be affected by a given campaign, nor in what sequence they are likely to be affected if they are affected. The safest procedure is to measure them all. That is what was done. The key criteria measured were:

- . Contracts for accession
- . Inquiries by mail, telephone and in person (at both national and local levels)
- . Pre-disposition toward joining a service
- . Awareness and knowledge of specific programs and benefits offered by individual services
- . Awareness of armed forces advertising

The foregoing list of criteria is arranged in the order of their presumed importance. In other words, the most important effect that could possibly occur would be a direct increase in contracts for accession. Next would be people taking actions that might be precursors to joining a service. Then come favorable attitudes, knowledge, and awareness of advertising -- in that order. Interestingly, the more important the criterion, the more difficult it traditionally has been to measure it and attribute it to advertising alone. The easiest measure to change is advertising awareness and the hardest contracts for accession.

II. Method

The research design employed was a standard before and after design with test and control markets. A series of variables, taken to be related to advertising effectiveness, was measured before the test was begun, at intervals during the test, and again after it had been completed. Changes in test markets were contrasted with changes in control markets. Test markets employed some radio in their media schedules; control markets did not.

In all, eight triads of matched markets were monitored during the test. Within each triad two markets served as test markets for one or more services with the third market serving as a control. Services used radio either by themselves or in combination with two other services. A full schemata of the design is shown in Chart 1 on the following page.

A number of sources were utilized in assembling an extensive data bank for the markets involved in the test. Primary sources were a large scale telephone survey of men 17 - 24 and an audit of recruiting stations. A full description of the information obtained and its sources can be found in Section IV, The Study in Detail. A complete listing of variables appears in appendix B, The Data-Base (Vol. II).

CHART 1RESEARCH DESIGNSINGLE ADVERTISER MARKET TRIADS

	<u>Air Force</u>	<u>Army</u>	<u>Marine Corps</u>	<u>Navy</u>
Test 1	Bowling Green	Columbus, Ohio	Augusta	Lansing
Test 2	Boise	Atlanta	Dothan	Knoxville
Control	Casper	Omaha	Charleston, S.C.	Binghamton

THREE-SERVICE SIMULTANEOUS ADVERTISER MARKET TRIADS

	<u>AF/A/MC</u>	<u>A/MC/N</u>	<u>MC/N/AF</u>	<u>N/AF/A</u>
Test 1	Denver	Louisville	Valdosta	Altoona
Test 2	Kansas City	Seattle	Baton Rouge	Spokane
Control	Albany	Portland	Shreveport	Yakima

1.1. Conclusions And Implications

A. Overall Findings

There are two levels at which the results of an experiment may be analyzed and interpreted.

Statistically Significant Findings

The first is by the standard of statistical significance, that is, by determining through a rigorous statistical procedure whether the observed results on certain criterion variables could have occurred by chance more than one time in twenty theoretical repetitions of the experiment.

Twenty one criterion measures selected as reflecting various aspects of the effectiveness of advertising were considered for this type of analysis. However, many of them were highly intercorrelated, thus interfering with statistical tests requiring independent units.

To circumvent this problem a factor analysis was per-

formed on the 21 variables in order to aid in identifying specific measures which were relatively independent, logically distinct and representative of the basic content all 21 effects measured. (See Factor Analysis Comments, Pages 72-74.)

For such criteria were identified:

- . Accessions
- . Local inquiries (from the station audit)
- . Attitudes toward the service (as reflected by a specially weighted rating scale)
- . Awareness of radio advertising

An analysis of Variance and Covariance¹ was performed to test the statistical significance of test versus control differences on these four variables.

1. The Analysis of Variance technique consider both the size of observed differences between groups of test and control markets and also the size of difference between individual test markets and between individual control markets. If variations among test markets and among control markets are large relative to variations between the groups of test and control markets significance is weakened. See page 75 for details.

The four may be confidently assumed to stand as surrogates for all the 21 criterion variables for which data was available.

Changes in the level of awareness of radio advertising were found to be significant. None of the other three variables showed significant effects.

We may conclude with confidence that the use of radio for Armed Forces Recruiting advertising is effective in achieving a recallable impression among the target audience.

In respect to all other levels of effectiveness our conclusions must be far more tentative and qualified. Nevertheless certain indications in the data on behavioral and attitudinal shifts should not be ignored.

Patterns And Indications

It was recognized in advance of the test that attitudinal and behavioral changes in prospects would be

difficult to affect with variations in the media mix. This is not a test of advertising for such as toothpaste or cake mix where attitudes and behavioral patterns are not deeply ingrained and thus, to some extent, are malleable. Rather, we are dealing with well-known national institutions and with career choices toward which most people have strong feelings and hold well developed stereotypes.

Thus it seems appropriate to search for indications of small shifts in the patterns of response as well as for major statistically significant results. Two facts suggest that some small positive effects did occur in respect to prospect behavior and "objective" attitude toward the services, enlistment in general, but not in respect to "subjective" attitude as measured by personal likelihood to enlist.

First when all 21 criterion variables are considered there is a regularity of response from service to service and from variable to variable particularly in the area of local inquiries. Accessions themselves are somewhat higher in radio markets for the Army, Air Force and Marines, but not for the Navy. (See Chart 3 page 16.) This analysis suggests that the

patterns of response are not random but rather reflect the effects of some fundamental underlying factors common to the various services.

The second fact worth noting with respect to patterns of response is the parallelism between patterns of response for the first and second halves of the test. The addition of second half results did very little to change the patterns established during the first half. Moreover, the changes that did occur were in the direction of even greater service-to-service consistency. Changes toward consistency far outnumbered those away from consistency (See Page 81). Had the test been continued for a longer period of time, it is reasonable to assume that still fewer inconsistencies in response patterns from service to service would have remained. This means, of course, that given a longer test, the probability of attaining statistical significance would also be likely to be improved. Consequently, we may cautiously infer that, had the test continued it would eventually have shown statistically significant radio effects on accession station inquiries and perhaps "objective" attitudes (as well

as the previously noted significant effects on awareness of radio advertising).

Furthermore, even in these test markets during the test period magazines received by far the largest proportion of advertising weight -- at least two-thirds. At the same time the proportion of dollars spent on radio ranged from a high of 31% to a low of 17%.

Let us now consider the patterns shown by the criterion measures listed in Chart 3. Several types of measures are incorporated. They have been grouped into sets on the basis of logical similarity.

Accessions are DOD contracts for accessions. National inquiries are compiled by fulfillment houses. The local inquiries are based on the audits of recruiting stations. Recalled actions were gathered from the consumer survey, as were the attitudinal measures. The latter are largely attitude scale ratings. The measures labeled "Probability (linear)" and "Probability (log)" come from the same scale but utilize differing scoring systems for the various points on the scale.

CHART 2

PROPORTION OF ADVERTISING DOLLARS
SPENT IN THE VARIOUS MEDIA
(OVER THE TEST PERIOD¹ IN THE TEST MARKETS)

	<u>AIR FORCE</u>	<u>ARMY</u>	<u>MARINE CORPS</u>	<u>NAVY</u>
(Number of test markets)	(8)	(8)	(8)	(8)
Percentage of respective service <u>advertising dollars by medium</u>				
	%	%	%	%
Radio	17.7	20.2	30.9	31.0
Magazine	76.5	75.2	64.1	66.1
Outdoor	5.8	3.7	3.1	2.9
Sunday Supplement	-	.9	1.9	-

1. September 7 to December 28, 1975

The "idea of enlistment" is also a scaled rating and comes from the consumer survey as do the two awareness measures.

An overview of the directional changes that occurred during the test can be had by scanning Chart 3. Pluses indicate net movement that is favorable to the radio schedule without regard for statistical significance and minuses net movement that favors the non-broadcast schedule. As a generalization, it is evident that the direction of net accessions movement, changes in inquiries, the awareness of service advertising and the attractiveness of the "objective" idea of joining a service, all favor the radio markets. On the other hand, changes in subjective attitudes about personal likelihood of enlisting tend to favor the non-broadcast markets. Recalled actions are mixed.

In sum, the overall results must be considered favorable to the use of radio. The net change in awareness of radio advertising is statistically significant. Most other net changes, including the changes in the key accessions measure, point tentatively in the direction of superior performance in radio markets. Finally, under the most conservative interpretation of the test results, there is little risk associated with the addition of radio to service media mixes and a clear possibility of longer term gains as advertising effects have time to cumulate.

CHART 3

<u>Criterion Variables</u>	<u>DOD</u>	<u>AIR FORCE</u>	<u>ARMY</u>	<u>MARINE CORPS</u>	<u>NAVY</u>
*Accessions	+	+	+	+	-
National Inquiries -					
Total	+	+	+	-	+
Phone	+	-	+	-	+
Mail	+	+	+	-	+
Local Inquiry Audits -					
*Total	+	+	+	+	+
Phone	+	+	+	+	+
Walk-in	+	+	+	+	+
First male app.	+	+	+	+	+
Recalled Actions -					
Read direct mail	+	+	+	+	-
Responded to mailing	-	-	-	+	-
Called toll free no.	-	-	+	-	+
Sent in coupon	-	-	-	+	-
Mail + toll free + coupon	-	-	-	+	-
Attitudes -					
In Plans for Next Few Years	-	-	-	-	-
Some possibility of joining	-	-	-	-	-
Very/fairly likely to join	-	-	-	-	-
Probability (linear)	-	-	-	-	-
*Probability (log)	-	-	-	-	-
Idea Of Enlistment	+	+	+	+	+
Awareness Of Advertising	+	+	+	+	+
*Awareness Of Radio Advertising	+	+	+	+	+

+ = favors radio markets
 - = favors non-broadcast markets

*Variables tested for significance

B. Commentary

Despite huge expenditures on advertising research in the past, most professional advertising researchers would be willing to admit that the process by which advertising affects behavior in any given circumstance is far from clear. Many people believe that attitude change largely follows behavioral change. Results of this test suggest that for service advertising this is a very real possibility. The awareness and behavioral measures appear to be moving in directions favorable to the use of radio. Although the attitudinal measures are the farthest of any from reaching significant levels, they are consistently pointing in the opposite direction. Accordingly some comments on how an opposite movement might occur may be in order. As suggested above the first possibility is that there is a lag effect and that attitudes will eventually move in the same direction as the other measures.

A second hypothesis that might explain the differences in the performance of the attitudinal and behavioral measures is polarization. In other words, it is possible that the heightened levels of effort triggered positive actions on the part of people who were favorably predisposed toward the services but that radio messages, perhaps partially because of their frequency, actually reinforced negative attitudes among people who were not favorably predisposed.

Note that "objective" attitudes toward the general idea of a young man joining the armed forces tended to improve in radio markets. Only the more deeply held "subjective" attitudes about one's own personal likelihood of enlistment tended to be negatively effected.

A final hypothesis is simply that broadcast and non-broadcast media operate differently -- that radio is a more effective catalyst in triggering actions but that non-broadcast is more effective in communicating information and in developing favorable attitudes.

One last comment is in order. While the parallelism from service to service is encouraging in respect to the probable effectiveness of radio it may also suggest that the services are competing with each other for the same prospects, or at least the people in the individual service markets behave similarly with respect to the observed advertising effects.

C. Postscript

One more statistical analysis is planned in conjunction with this research. An audit was made of public service activities and results will be analysed as soon as they have been compiled. Also, as is apparent, an enormous databank has been assembled and supplementary analyses beyond those summarized here are possible in the future.

IV. THE STUDY IN DETAIL

A. Philosophy and Overall Design

In designing the test, the principles of experimental design, developed originally for tightly controlled agricultural experiments, were employed. These allow the researcher to sort out the effects of the variable of interest (in this case our two types of media schedules) from the effects of the many other variables that inevitably intrude on a test of this sort and are apt to mask the effects of the key variable. In real world experiments, some compromises tracing to budgetary and time limitations are inevitably required. This section spells out the nature of those compromises.

1. The Unit of Analysis

Markets were chosen as appropriate test units because they were the smallest geographical unit within which media, in particular radio, could be manipulated efficiently. After discussions with service advertising media planners, it was decided that markets would be defined as SMSA's (Standard Metropolitan Statistical Areas) because much of

the data required for matching and for evaluative purposes was collected using that particular form of market definition.

2. Combinations of Services to be Represented

Further discussions with service advertising managers indicated that there would be relatively few instances where all four services would be advertised in the same markets simultaneously. At the same time pairs and trios of services did seem likely and it was hypothesized that there might well be interaction effects between the combinations of services doing the advertising in a particular market.

Accordingly, a compromise design was selected, one that allowed measurement of two of the many conditions that might result should the services be permitted to employ paid radio advertising -- the condition when a service is advertising alone and the condition where it is advertising with two other services. It was hoped that reasonable interpolations might be made for the missing conditions should significant effects be found.

3. The Experimental Design

One of the principal tradeoffs in selecting test and control markets is between projectability and the precision of market matching. Markets can be dispersed geographically, which aids projectability, or they can be concentrated in clusters, which aids matching. Complicating the situation was the necessity of representing each of the four services alone and in combination with the other services.

The design selected represented a compromise between projectability and reliability with greater emphasis on the latter characteristic. It required eight triads of matched markets (See Chart 1, Pg.7). Within each triad, two markets were to serve as test markets for one of the test conditions and one as a control. Test markets were so named because some form of paid radio was used in them. Control markets maintained a non-radio schedule. The use of a single control market in each triad was a concession to cost. Also, there was particular concern about having a large sample of enough markets for the test condition. Occasionally, in the course of a test like this, markets have to be dropped for one reason or another (e. g., natural disasters). An extra market serves to protect against this contingency.

Aside from the economic advantage, it was felt that it might be possible, if necessary, to make some of the control markets do double duty against test conditions in triads outside of their own.

4. Market Matching

The history of media testing is not very encouraging to people who hope to conduct such tests. Typically the effects of extraneous variables overwhelm the effects of the test variables and results are virtually impossible to read. To hold this risk to the lowest possible levels, great care was taken in matching test and control markets before the beginning of the test.

To begin with, a list of 175 possible SMSA's was compiled. The largest 155 were markets for which Arbitron ratings were available. Arbitron ratings are a standard radio source. Ratings for larger markets are compiled from consumer diaries. A set of 20 smaller markets was also included to provide some representation for that particular size bracket.

The list was then "purified" by excluding markets considered too large for testing purposes, markets with some special media problems and markets with large military or naval bases.

For the surviving 138 markets a regression¹⁾ was run to identify variables associated with quality accessions (high school graduates in mental categories I, II and III divided by QMA). The independent variables used in the regression were largely obtained from a databank²⁾ of demographic and economic information previously compiled from Department of Commerce records by Russ Haley & Associates, Inc. for use in market testing problems. To this information were added several series available from data compiled by the General Research Corporation, namely unemployment rates, wage rates, number of recruiting stations, qualified military available, and accessions. The multiple regression program used was an expanded version of BMD 02R from the Biomedical Program Library of the University of California at Los Angeles. The resultant equation is shown in Chart 4 on the following page.

-
- 1) It is recognized that the inclusion of QMA on both sides of the equation is questionable practice in some situations. However, in this instance, interest centered around identifying variables that helped to explain residual variations.
 - 2) Over 100 demographic and economic series had been factor analyzed and after the elimination of redundancy reduced to a set of thirty-two "market variables." These are listed in Appendix B of Volume II.

CHART 4REGRESSION MATCHING PROCESS

Multiple R = .5532

Regression Equation

Accessions/QMA = -.00001 + .5772 (Recruiters/QMA)

-.7814 (QMA) - .2031 (% Working Women)

-.1857 (% Owner-Occupied Housing) + .1498 (% Black)

Next the 138 markets were clustered into groups of markets with similar profiles using the Singleton-Kautz algorithm of the Stanford Research Institute and the variables shown in Chart 3. Then, random starting points within clusters were chosen and triads of matched markets were developed around each starting point using a correlation matrix of markets. Finally, markets within triads were randomly assigned to the test and control conditions.

However, even the best pre-test matching procedure is subject to some risk. By bad luck the random aspects of the selection process can cause unbalanced test and control groups. Moreover, markets that appeared to be matched on one basis before the test began may, once further data become available, appear out of balance. Thus, to guard against random mismatches, an extensive post-analysis was made of the base period differences between test and control markets.

An examination of 148 variables, 30 of which were designated as criterion measures and the remainder as covariates, showed that very few of the criterion measures were mismatched (fewer than would be expected by chance). That is,

test and control means were essentially the same. Results were similar for the covariates. Moreover, none of the latter group bore a very strong relationship to any of the criterion measures.

5. Matching During the Test Period

Sometimes in the course of a test, markets which were initially well matched become mismatched. Trends can develop in individual markets that distort the results of the test. The performance of co-variates provides a check on the extent to which this is a risk.

The Data Base section (covariates) of the appendix (Vol.II) shows the close parallelism between the situations in the test markets and in the control markets. Test markets are slightly larger than control markets in the aggregate. However, the profiles across variables within markets are virtually identical, giving added confidence to the validity of test results.

A somewhat different matching problem is the problem of matching the quality of advertising copy. It is sometimes maintained in cross-media tests that the tests are not tests of the media at all. Rather, it is claimed, they are tests of copy. If the print executions are inspired and the radio

commercials are ordinary, then print will win the test. Conversely, if the radio commercials are superior, then radio will win.

Two factors suggest that copy is not a major problem in interpreting the results of this test. The first is the general parallelism of results by service. Because each service uses a different advertising agency, the likelihood of superior executions for the same medium in every service is reduced. Another reassuring fact is the similarity of the nature of advertising recall for test and control markets. In every service the nature of the playback suggests that matching on copy is also acceptable.

B. Sources of Information Employed in the Investigation

Five major sources of information were employed in the course of the investigation.

- . A telephone survey of consumers
Three waves of 1,800 interviews each of men 17 - 24 and employing a probability sample of the twenty-four markets.
- . An audit of recruiting stations
All stations in the twenty-four markets were visited and a follow-up telephone audit was made of the largest stations.
- . Service fulfillment house data on inquires and DOD accessions data (supplied on a market and quality basis by General Research Corporation).

- . A databank based on Department of Commerce records
- . Service advertising agencies

Highlights of the procedures used in gathering information from each of these sources are covered in the following paragraphs.

1. The Consumer Survey

The role of the consumer survey was to provide information on the criterion measures relating to actions taken (e. g., inquiries recalled) pre-disposition toward the services, knowledge of their programs, and awareness of armed forces advertising. In addition, data on a host of covariates were gathered.

The term "covariates" has been used previously but not fully defined. The general research design employed calls for monitoring each market before the beginning of the actual test in order to establish a normal or "base" level for that market. During the test period, the changes of each market from its base are then monitored and the changes in the test markets are compared with those of the control markets. In a perfect test, that is all that would be required. However, in the real world, many variables beyond those that are known to be vary-

ing can affect the criterion measures. Fortunately, if it is possible to measure them, it is also possible to make statistical adjustments for their effects where their effects are significant. These variables are called co-variates, because they co-vary with the measures of direct interest (the criterion measures).

To maximize the chance of a meaningful analysis, measurements were made of a large number of co-variates that were thought might have an influence on the criteria.

Questioning covered a variety of areas, including:

- . The probability of choosing various career alternatives, including enlistment in each armed service
- . Attitudes toward each service and toward the military in general
- . Awareness and knowledge of recruitment programs and the communications objectives of individual services

- . Awareness and recall of advertising copy
- . Recall of contacts made with or inquiries made of services or recruiting personnel
- . Media habits
- . Past family associations with the armed services
- . School grades and types of educational programs enrolled in
- . Demographic data such as age, education, occupation, and marital status, income and residential status

The survey itself was a three-wave before/after telephone survey conducted in test and control markets among a probability sample of men 17 to 24 years of age with less than three years of college and no prior military involvement. The first, or base, wave was conducted just before the start of test advertising (between August 21 and September 7). A second wave was conducted at the midpoint of the test period (between October 11 and October 25) and a third at its close (between December 6 and December 19).

2. The Audit of Recruiting Stations

The primary purpose of the audit of recruiting stations was to gather data on the volume of local inquiries received by mail, by telephone, or in person. However, it was felt that these also might be affected by covariates and that the nature of the recruiting stations might in turn have an effect upon the rate of accessions and other performance criteria. Accordingly, once again information was obtained on a large number of potential covariates. These included:

- . Number of stations
- . Total size of staff
- . Number of production recruiters
- . Number present in the office at the time of an audit of the recruiting station
- . Average grade of production recruiters
- . Number of hours stations are open

- . The extent to which stations are in central cities
- . Whether they are in retail areas or residential areas
- . Whether they are in non-white areas
- . Whether they are in locations such as storefronts, shopping centers or malls
- . Whether they are at street level
- . The visibility of the station
- . Whether other services have stations in the immediate area
- . The number of telephone lines and instruments
- . Convenience of parking facilities
- . Foot traffic past offices during sample periods

The data listed above were obtained as follows. Each of the

recruiting stations in the 24 test and control markets was visited and information was gathered on the characteristics of the station, its location, its personnel, and its methods of operation. In addition, a special telephone audit was made of a representative sample of high traffic stations. These account for more than 70% of all inquiries. Recruiters were asked to keep track of unsolicited inquiries by mail or in person during a random time sample of the hours during which the stations are open. About thirty seven-hour days, or about two hundred hours in total, were audited in each market. A typical station was audited about forty hours during the base period and about eighty hours during the test period.

3. Service Fulfillment House Data on
Inquiries and DOD Accessions Data

Inquiries are received at national centers as well as by individual recruiting stations. Inquiries received at these centers but originating in test or control markets were tabulated as part of the input data and represent one of the criterion measures.

DOD data on contracts for accession were compiled for all test and control markets for the base and test periods. These contracts were limited to diploma (actual and expected) high school graduates in mental categories I, II and III.

4. The Databank

The data bank mentioned earlier in conjunction with the marketing matching process also has potential value in providing covariate data. It contains variables such as:

- . Unemployment rates
- . Wage rates
- . QMA (Qualified Military Availables)
- . Population
- . Percent of the population that is black
- . Percent owner occupied dwelling units
- . Demographic characteristics of the market

It comes from several sources, primarily from a databank of economic and demographic information compiled largely from Department of Commerce records.

5. Service Advertising Agencies

Each service advertising agency provided detailed information on media delivery in each of the twenty-four markets. These, of course, are likely to be important covariates. They include measures such as:

- . "Reach" obtained in each market (the proportion of people in the target group exposed to one or more messages)
- . "Frequency" obtained in each market (the average number of exposures per exposed person in the target audience)
- . Gross impressions obtained (the total number of exposures)
- . Separate data for Sunday Supplements, Outdoor and Magazines

(See Media Plans, Appendix A, Vol. II)

C. Analysis of the Results

To reduce the data base to a manageable size, the survey data for individual respondents was aggregated to the level of markets. In doing so, some consideration was given to the possibility of using medians rather than arithmetic means as measures of central tendency. However, most distributions were unimodal in character so means were decided upon.

Another consideration concerned the most appropriate base period. The study had been designed around an August base period. However, both accessions and fulfillment house data on inquiries were available for longer historical periods. Thus, it would be possible to have longer bases for those two criteria. However, all of the criteria relating to local inquiries, attitudes and awareness were available only for the August base. The choice, therefore, was whether to have bases of inconsistent length in order to use as much base period information as possible, or whether to use the August base uniformly. It was decided that a consistent time frame was the more desirable alternative because it allowed clear comparisons between the performances of all the criteria.

Still another possibility was to drop the base period entirely and use a matched group design, simply comparing performance in test markets during the test with that of the control markets. However, this possibility was discarded when it became apparent that such a choice would add substantially to the variance. Accordingly, the analysis is focussed on the change that occurred between the base period (August 1975) and the 13 weeks during which radio was injected into the media mix of the test markets (September to December 1975).

1. Performance of the Criterion Measures

This section discusses in some detail the differences in the behavior of selected performance criteria in markets using radio (test markets) and in those using a non-broadcast schedule (control markets). It should be noted at the outset that despite the apparent size of certain other net changes in means, intra test market and intra control market variance was also large, thus reducing the significance of the net changes. The only statistically significant results obtained were those concerning the awareness of radio advertising. (See the Treatment effects row in the table on Page 73.) Moreover, none of the service by treatment interactions is significant (same table), suggesting that the patterns of response were basically similar from service to service.

Nevertheless, for reasons outlined earlier, it is sometimes instructive to review the kinds of changes that occurred during the test without reference to statistical significance. These can provide additional insights into the nature of the underlying processes at work. The primary purpose of this section is to provide such a summary.

a. Accessions

Accessions were larger during the test period than during the base period in both the test and control markets (see Page 39). However, in general, the test markets showed larger increases than control markets. Thus, three of the

four services showed net increases in accessions in radio markets during the test. The exception was the Navy whose test market and control market performance is virtually identical.

Net gains in radio markets were largest for the Army.

DOD ACCESSION INFORMATION¹
(Test vs. Control Markets)

	<u>Base Period Level</u> ²		<u>Change From Base To Test Period</u>		
	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Change - Control Change</u>
			<u>+</u> %	<u>+</u> %	
Total DOD ³	<u>.082</u>	<u>.078</u>	<u>+.070</u>	<u>+.063</u>	<u>+.007</u>
Air Force	.091	.078	+.065	+.063	+.002
Army	.130	.130	+.106	+.082	+.024
Marines	.039	.047	+.031	+.029	+.002
Navy	.068	.056	+.077	+.077	-

Base = August 1 to September 6, 1975

Test = 9/7/75 to 12/28/75

1. Accessions = High School Graduates, Mental Categories I, II, and III divided by QMA. (Source: General Research Corp.)
2. Table Entries = Average accessions per market per month
3. DOD = 4 service average

b. Inquiries

Information on inquiries was gathered from two sources. National level inquiries were compiled for test and control markets by the service fulfillment houses. At the same time local stations were audited for each of the four services.

In general, the two sources show similar results. Radio markets tend to show larger rates of gain than the control markets. This holds for three of the four services for the fulfillment house statistics. The exception this time is the Marines, where control markets showed larger gains in inquiries than radio markets (Page 41).

Fulfillment house data can be subdivided into mail inquiries and phone inquiries. Mail inquiries show the same pattern as total inquiries. Three of the four services showed stronger performance in test markets. For phone inquiries, the services are split. The Army and Navy show superior performance in test markets, the Air Force and Marines in control markets.

Local station inquiries cover slightly different information, namely walk-in inquiries, inquiries per hour audited and first male applicant contacts.* All of the series measured point in the direction of larger gains for the radio markets. This holds true for all four services (Pages 42-45).

*Excludes previous contacts and inquiries of friends and relatives.

NATIONAL INQUIRY INFORMATION¹
(TEST VS. CONTROL MARKETS)

	<u>Base Period Level³</u>		<u>Change From Base To Test Period</u>		
	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Change - Control Change</u>
<u>DOD²</u>	<u>25.8</u>	<u>20.6</u>	<u>+ 29.9</u>	<u>+ 29.1</u>	<u>+ .8</u>
Telephone	2.7	1.6	+ 1.5	+ 1.3	+ .2
Mail	23.1	19.0	+ 28.4	+ 27.8	+ .6
<u>Air Force</u>	<u>12.1</u>	<u>5.8</u>	<u>+ 5.5</u>	<u>+ 5.2</u>	<u>+ .3</u>
Telephone	5.4	.8	+ .9	+ 1.4	- .5
Mail	6.7	5.0	+ 4.6	+ 3.8	+ .8
<u>Army</u>	<u>9.6</u>	<u>6.8</u>	<u>+ 29.7</u>	<u>+ 18.4</u>	<u>+ 11.3</u>
Telephone	.9	1.0	+ .9	-	+ .9
Mail	8.7	5.8	+ 28.8	+ 18.4	+ 10.4
<u>Marine Corps</u>	<u>23.4</u>	<u>22.8</u>	<u>+ 31.1</u>	<u>+ 44.3</u>	<u>- 13.2</u>
Telephone	.6	.5	+ 1.2	+ 1.6	- .4
Mail	22.8	22.3	+ 29.9	+ 42.7	- 12.8
<u>Navy</u>	<u>58.2</u>	<u>47.0</u>	<u>+ 53.2</u>	<u>+ 48.6</u>	<u>+ 4.6</u>
Telephone	4.1	4.0	+ 3.1	+ 2.2	+ .9
Mail	54.1	43.0	+ 50.1	+ 46.4	+ 3.7

Base = August 1 to September 6, 1975

Test = September 7, 1975 to December 28, 1975

1 - Source: Fulfillment Houses

2 - DOD = 4 Service Average

3 - Table Entries = Average Number of Inquiries Per Market Per Month

ARMED FORCES - AIR FORCE
TOTAL STATION INQUIRIES*
 (Test vs. Control Markets)

	<u>Base Period Level</u> ¹		<u>Change From Base To Test Period</u>		
	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Change - Control Change</u>
<u>INQUIRIES/MARKET</u>	<u>7.95</u>	<u>5.52</u>	<u>+0.99</u>	<u>-0.16</u>	<u>+1.15</u>
Telephone	3.80	2.63	+0.74	+0.04	+ .70
Walk-in	4.15	2.88	+0.25	-0.20	+ .45
First Contact	3.18	1.93	+1.15	+0.36	+ .79

*Source: Recruiting Station Audit Forms (Male Applicants)

1 - Inquiries = Average Number of Inquiries Per Market

Base = August, 1975

Test = 9/7/75 to 12/28/75

ARMED FORCES - ARMY

TOTAL STATION INQUIRIES*
(Test vs. Control Markets)

	<u>Base Period Level¹</u>		<u>Change From Base To Test Period</u>		
	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Change - Control Change</u>
<u>INQUIRIES/ MARKET</u>	<u>12.82</u>	<u>13.67</u>	<u>+4.05</u>	<u>-0.90</u>	<u>+4.95</u>
Telephone	7.53	8.06	+2.53	-0.65	+3.18
Walk-in	5.30	5.61	+1.52	-0.24	+1.76
First Contact	5.59	5.96	+2.76	+0.10	+2.66

*Source: Recruiting Station Audit Forms (Male Applicants)

1 - Inquiries = Average Number of Inquiries Per Market

Base = August, 1975

Test = 9/7/75 to 12/28/75

ARMED FORCES - MARINES

TOTAL STATION INQUIRIES*
(Test vs. Control Markets)

	<u>Base Period Level</u> ¹		<u>Change From Base To Test Period</u>		
	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Change - Control Change</u>
<u>INQUIRIES/ MARKET</u>	<u>2.09</u>	<u>2.33</u>	<u>+2.01</u>	<u>-0.77</u>	<u>+2.78</u>
Telephone	.74	1.27	+0.86	-0.30	+1.16
Walk-in	1.35	1.06	+1.16	-0.46	+1.62
First Contact	1.34	1.49	+1.02	-0.46	+1.48

*Source: Recruiting Station Audit Forms (Male Applicants)

1 - Inquiries = Average Number of Inquiries Per Market

Base = August, 1975

Test = 9/7/75 to 12/28/75

ARMED FORCES - NAVY

TOTAL STATION INQUIRIES*
(Test vs. Control Markets)

	<u>Base Period Level</u> ¹		<u>Change From Base To Test Period</u>		
	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Change - Control Change</u>
<u>INQUIRIES/ MARKET</u>	<u>9.01</u>	<u>10.69</u>	<u>-1.05</u>	<u>-3.59</u>	<u>+2.54</u>
Telephone	3.70	5.47	+0.26	-2.25	+2.51
Walk-in	5.31	5.22	-1.31	-1.34	+ .03
First Contact	4.12	5.30	-0.07	-2.37	+2.30

*Source: Recruiting Station Audit Forms (Male Applicants)

1 - Inquiries = Average Number of Inquiries Per Market

Base = August, 1975

Test = 9/7/75 to 12/28/75

c. Recalled Actions (Response to Communications Efforts)

The term "recalled actions" refers to activities such as reading direct mail, responding to mailings, calling a toll free number, or sending in a coupon -- any response to the communications efforts of the services. These statistics were generally at low levels and their performance during the test was somewhat erratic (Pages 47-50).

- The criterion of reading direct mail favors radio markets for three of the four services. However, for the Navy control markets were slightly better than radio markets.

- The criteria of responding to mailings and sending in coupons show superior performance for radio markets only for the Marines. For the other three services, net changes showed control markets ahead.

- The criterion of calling toll free numbers shows, first of all, that few people make use of this medium of response. For those who did, two services, the Army and the Navy, show larger net changes in radio markets. The other two services show larger net changes in control markets.

Memory loss may also account for some of the lack of reliability for the measures in this section.

ARMED FORCES - AIR FORCE

RESPONSE TO COMMUNICATIONS EFFORTS*

(Test vs. Control Markets)

	<u>Base Period Level</u> ¹		<u>Change From Base To Test Period</u>		
	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Change - Control Change</u>
<u>Percentage...</u>					
Read direct mail	9.2	5.9	+0.5	-0.8	+1.3
Respond to direct mail	1.1	.2	-0.5	+0.2	-0.7
Call 800 number	.5	.0	-0.3	+0.6	-0.9
Return ad coupon	.9	.3	+0.4	+0.4	<u>+0.0</u>

*Source: Survey Questionnaire (time period is "last 3 months")

1 - Response to Communications Efforts = Average Percent Responding Per Market

Base = August, 1975

Test = 9/7/75 to 12/28/75

ARMED FORCES - ARMY

RESPONSE TO COMMUNICATIONS EFFORTS*
 (Test vs. Control Markets)

	<u>Base Period Level¹</u>		<u>Change From Base To Test Period</u>		
	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Change - Control Change</u>
<u>Percentage...</u>					
Read direct mail	14.4	16.6	-1.1	-1.5	+0.4
Respond to direct mail	1.6	.8	-0.8	+0.0	-0.8
Call 800 number	.1	.0	+0.1	+0.0	+0.1
Return ad coupon	1.1	1.5	-0.3	-0.2	-0.1

*Source: Survey Questionnaire (time period is "last 3 months")

¹ - Response to Communications Efforts = Average Percent Responding Per Market

Base = August, 1975

Test = 9/7/75 to 12/28/75

ARMED FORCES - MARINES

RESPONSE TO COMMUNICATIONS EFFORTS*

(Test vs. Control Markets)

	<u>Base Period Level</u> ¹		<u>Change From Base To Test Period</u>		
	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Change - Control Change</u>
<u>Percentage...</u>					
Read direct mail	8.4	7.0	+1.8	+0.7	+1.1
Respond to direct mail	1.2	1.0	-0.1	-0.4	+0.3
Call 800 number	.0	.0	+0.2	+0.3	-0.1
Return ad coupon	.7	1.2	+0.0	-0.8	+0.8

*Source: Survey Questionnaire (time period is "last 3 months")

1 - Response to Communications Efforts = Average Percent Responding Per Market

Base = August, 1975

Test = 9/7/75 to 12/28/75

ARMED FORCES - NAVY

RESPONSE TO COMMUNICATIONS EFFORTS*

(Test vs. Control Markets)

	<u>Base Period Level</u> ¹		<u>Change From Base To Test Period</u>		
	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Change - Control Change</u>
<u>Percentage...</u>					
Read direct mail	12.6	10.2	-0.9	+0.2	-1.1
Respond to direct mail	1.5	.7	+0.5	+0.8	-0.3
Call 800 number	.4	.0	+0.1	+0.0	+0.1
Return ad coupon	1.7	.5	-1.0	+1.9	-2.9

*Source: Survey Questionnaire (time period is "last 3 months")

1 - Response to Communications Efforts = Average Percent Responding Per Market

Base = August, 1975

Test = 9/7/75 to 12/28/75

d. Likelihood of Joining

A number of attitudinal measures were built into the consumer survey in an attempt to measure the pre-disposition of men in the 17-24 age group to join a service. These included:

- Unaided mentions of a service in the respondent's "plans for the next few years."
- A forced choice between "some possibility" and "no possibility" of spending time in their late teens or early twenties serving in any of the Armed Forces.
- A rating scale of the likelihood of spending some time serving (very likely, fairly likely, not very likely).
- A four point rating scale for each specific service on how likely the respondent was to enter that service. Because it has been shown that the way in which a scale is scored can sometimes affect its sensitivity and its powers of discrimination, this scale was scored in two ways - linearly (3, 2, 1, 0) and as a log or power function (9, 4, 1, 0).

Results of the radio test showed these scales to be relatively highly intercorrelated. Moreover, they all indicated slightly higher net changes for the control markets. Each of the services showed similar results (Pages 53-56).

ARMED FORCES - AIR FORCE

LIKELIHOOD OF JOINING*
(Test vs. Control Markets)

	<u>Base Period Level</u>		<u>Change From Base To Test Period</u>		
	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Change - Control Change</u>
<u>Percentage...</u>					
Unaided mention of service in "plans for next few years"	1.4	.5	- .5	+ .5	-1.0
"Some possibility" will serve in armed forces	30.9	27.8	-7.2	-5.9	-1.3
"Very or fairly" likely will serve in armed forces	24.9	22.2	-5.9	-5.0	- .9
<u>Probability of serving¹</u>					
Linear scale probability of serving (3, 2, 1, 0)	.69	.62	-.16	-.14	-.02
Log scale probability of serving (9, 4, 1, 0)	1.65	1.52	-.42	-.38	-.04

*Source: Survey Questionnaire

1 - Probability of Serving = Mean Scale Values Per Market

- Base = August, 1975

Test = 9/7/75 to 12/28/75

ARMED FORCES - ARMY

LIKELIHOOD OF JOINING*
(Test vs. Control Markets)

	<u>Base Period Level</u>		<u>Change From Base To Test Period</u>		
	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Change - Control Change</u>
<u>Percentage...</u>					
Unaided mention of service in "plans for next few years"	.3	.0	+ .4	+ .6	- .2
"Some possibility" will serve in armed forces	19.7	11.3	-1.1	+3.2	-4.3
"Very or fairly" likely will serve in armed forces	16.6	8.3	-4.1	+2.0	-6.1
<u>Probability of serving¹</u>					
Linear scale probability of serving (3, 2, 1, 0)	.44	.24	-.09	+.06	-.15
Log scale probability of serving (9, 4, 1, 0)	1.02	.51	-.25	+.14	-.39

*Source: Survey Questionnaire

1 - Probability of Serving = Mean Scale Values Per Market

Base = August, 1975

Test = 9/7/75 to 12/28/75

ARMED FORCES - MARINES

LIKELIHOOD OF JOINING*
(Test vs. Control Markets)

	<u>Base Period Level</u>		<u>Change From Base To Test Period</u>		
	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Change - Control Change</u>
<u>Percentage...</u>					
Unaided mention of service in "plans for next few years"	.4	.7	- .2	- .2	-
"Some possibility" will serve in armed forces	16.5	12.5	- .6	- .5	- .1
"Very or fairly" likely will serve in armed forces	12.8	9.6	-1.6	- .1	-1.5
<u>Probability of serving¹</u>					
Linear scale probability of serving (3, 2, 1, 0)	.36	.28	-.03	-.01	-.02
Log scale probability of serving (9, 4, 1, 0)	.84	.65	-.08	-.03	-.05

*Source: Survey Questionnaire

1 - Probability of Serving = Mean Scale Values Per Market

Base = August, 1975

Test = 9/7/75 to 12/28/75

ARMED FORCES - NAVYLIKELIHOOD OF JOINING*
(Test vs. Control Markets)

	<u>Base Period Level</u>		<u>Change From Base To Test Period</u>		
	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Change - Control Change</u>
<u>Percentage...</u>					
Unaided mention of service in "plans for next few years"	.4	.6	+ .1	+ .4	- .3
"Some possibility" will serve in armed forces	27.3	22.5	-5.8	-3.4	-2.4
"Very or fairly" likely will serve in armed forces	22.8	17.2	-5.1	-2.5	-2.6
<u>Probability of serving¹</u>					
Linear scale probability of serving (3, 2, 1, 0)	.58	.47	-.11	-.07	-.04
Log scale probability of serving (9, 4, 1, 0)	1.32	1.04	-.22	-.13	-.09

*Source: Survey Questionnaire

1 - Probability of Serving = Mean Scale Values Per Market

Base = August, 1975

Test = 9/7/75 to 12/28/75

e. Rating of Enlistment Idea

Respondents were also asked to rate, on an Excellent to Poor scale, the idea of enlisting in each specific service "for the average young man of your age." It is correlated with the measures of the preceding section. It is reported separately, however, because it seems to be performing somewhat differently.

For every service without exception, the radio markets outperform the control markets, though not at a statistically significant level. While the real reasons for the difference in the behavior of this measure are not certain, it can be hypothesized that the radio communications efforts of the services have begun to have a positive effect on the "objective" attitude toward the general idea of joining a service but have not yet been personalized to the extent that the respondent sees himself as a good candidate for joining (Pages 58-61).

ARMED FORCES - AIR FORCE

RATING OF ENLISTMENT IDEA*
(Test vs. Control Markets)

	<u>Base Period Level</u>		<u>Change From Base To Test Period</u>		
	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Change - Control Change</u>
Average "Enlistment Idea Rating"	2.58	2.65	+0.04	-.07	+0.11

*Source: Survey Questionnaire (Average rating on a four-point scale -- "Excellent" (4); "Good" (3); "Fair" (2); "Poor" (1) -- for the average young man of your age).

Base = August, 1975

Test = 9/7/75 to 12/28/75

ARMED FORCES - ARMY

RATING OF ENLISTMENT IDEA*
 (Test vs. Control Markets)

	<u>Base Period Level</u>		<u>Change From Base To Test Period</u>		
	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Change - Control Change</u>
Average "Enlistment Idea Rating"	2.08	2.11	+ .15	+ .02	+ .13

*Source: Survey Questionnaire (Average rating on a four-point scale -- "Excellent" (4); "Good" (3); "Fair" (2); "Poor" (1) -- for the average young man of your age).

Base = August, 1975

Test = 9/7/75 to 12/28/75

ARMED FORCES - MARINES

RATING OF ENLISTMENT IDEA*

(Test vs. Control Markets)

	<u>Base Period Level</u>		<u>Change From Base To Test Period</u>		
	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Change - Control Change</u>
Average "Enlistment Idea Rating"	2.18	2.12	+.01	-.03	+.04

*Source: Survey Questionnaire (Average rating on a four-point scale -- "Excellent" (4); "Good" (3); "Fair" (2); "Poor" (1) -- for the average young man of your age).

Base = August, 1975

Test = 9/7/75 to 12/28/75

ARMED FORCES - NAVY

RATING OF ENLISTMENT IDEA*
 (Test vs. Control Markets)

	<u>Base Period Level</u>		<u>Change From Base To Test Period</u>		
	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Change - Control Change</u>
Average "Enlistment Idea Rating"	2.46	2.48	+ .07	- .03	+ .10

*Source: Survey Questionnaire (Average rating on a four-point scale -- "Excellent" (4); "Good" (3); "Fair" (2); "Poor" (1) -- for the average young man of your age).

Base = August, 1975

Test = 9/7/75 to 12/28/75

f. Advertising Awareness

The awareness statistics reflect favorably on the use of radio. Both awareness of service advertising and recall of radio advertising are higher in radio markets than in control markets. Once again, this situation holds true for each of the four services.

Tables on levels of change follow (Pages 63-66).

ARMED FORCES - AIR FORCE

ADVERTISING AWARENESS*
(Test vs. Control Markets)

	<u>Base Period Level</u> ¹⁾		<u>Change From Base To Test Period</u>		
	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Change - Control Change</u>
<u>Percentage...</u>					
Seeing or hearing service advertising	42.2	40.9	+3.4	- .2	+3.6
Recalling radio advertising	6.2	8.8	+6.6	+1.8	+4.8

*Source: Survey Questionnaire

1) Table Entry = Average percent per market

Base = August, 1975

Test = 9/7/75 to 12/28/75

ARMED FORCES - ARMY

ADVERTISING AWARENESS*
(Test vs. Control Markets)

	<u>Base Period Level¹⁾</u>		<u>Change From Base To Test Period</u>		
	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Change - Control Change</u>
<u>Percentage...</u>					
Seeing or hearing service advertising	47.1	49.6	+6.9	-1.5	+8.4
Recalling radio advertising	7.5	5.8	+17.1	+5.9	+11.2

*Source: Survey Questionnaire

1) Table Entry = Average percent per market

Base = August, 1975

Test = 9/7/75 to 12/28/75

ARMED FORCES - MARINES

ADVERTISING AWARENESS*

(Test vs. Control Markets)

	<u>Base Period Level</u> ¹⁾		<u>Change From Base To Test Period</u>		
	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Change - Control Change</u>
<u>Percentage...</u>					
Seeing or hearing service advertising	47.5	47.3	+1.7	-1.5	+3.2
Recalling radio advertising	7.0	9.9	+12.1	-2.8	+14.9

*Source: Survey Questionnaire

1) Table Entry = Average percent per market

ARMED FORCES - NAVY

ADVERTISING AWARENESS*
(Test vs. Control Markets)

	<u>Base Period Level¹⁾</u>		<u>Change From Base To Test Period</u>		
	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Markets</u>	<u>Control Markets</u>	<u>Test Change - Control Change</u>
<u>Percentage...</u>					
Seeing or hearing service advertising	46.8	48.4	-1.2	-3.3	+2.1
Recalling radio advertising	7.4	11.0	+5.3	-3.9	+9.2

*Source: Survey Questionnaire

1) Table Entry = Average percent per market

Base = August, 1975

Test = 9/7/75 to 12/28/75

g. Advertising Source Recall

In the consumer survey, respondents were asked, for each service, not only whether or not they had seen or heard any advertising in the past month but, if so, in what medium they had seen or heard it.

While net advertising source recall advanced in general, there is some evidence of confusion as to the precise media source. For the Army, the Marines, and the Navy, the net changes in mentions of radio are generally large relative to net increases in other media. For the Navy and the Marines, the net increases in radio are larger than those of any other medium. For the Army they are very large (+10.8 percentage points) and second to television changes. For the Air Force, the radio net changes are third behind the net changes for billboards and magazines.

Perhaps the most likely reason for these results is that people are notoriously poor at remembering the sources of the messages they received. It is common for people to remember having been exposed to advertising but not to be able to remember the exact source of their exposure.

RECALL OF ADVERTISING FOR THE AIR FORCE

<u>Recalled Media Source</u>	<u>Base Period¹⁾</u>		<u>Test Period</u>		<u>Test Change - Control Change</u>
	<u>Test</u>	<u>Control</u>	<u>Test</u>	<u>Control</u>	
	<u>Markets</u>	<u>Markets</u>	<u>Markets</u>	<u>Markets</u>	
	<u>%</u>	<u>%</u>	<u>%</u>	<u>%</u>	
Television	23.1	24.3	25.0	19.4	+6.8
Radio	6.2	8.8	12.8	10.6	+4.8
Billboards	26.4	30.6	28.2	29.4	+3.0
Newspapers	6.4	9.2	8.3	9.6	+1.5
Magazines	21.6	25.4	26.4	24.3	+5.9
Mailings to respondent's home	12.4	12.3	11.1	10.1	+ .9

1) Percentages = fractions of total test markets survey sample and total control markets survey sample recalling advertising source

Base = August, 1975

Test = 9/7/75 to 12/28/75

RECALL OF ADVERTISING FOR THE ARMY

<u>Recalled Media Source</u>	<u>Base Period¹⁾</u>		<u>Test Period</u>		<u>Test Change - Control Change</u>
	<u>Test</u>	<u>Control</u>	<u>Test</u>	<u>Control</u>	
	<u>Markets</u>	<u>Markets</u>	<u>Markets</u>	<u>Markets</u>	
	<u>%</u>	<u>%</u>	<u>%</u>	<u>%</u>	
Television	20.8	27.2	28.1	22.3	+12.2
Radio	7.5	5.8	24.2	11.7	+10.8
Billboards	31.7	32.0	32.2	33.0	- .5
Newspapers	13.8	14.3	11.4	12.3	- .4
Magazines	29.6	32.1	31.9	28.7	+ 5.7
Mailings to respondent's					
home	17.7	21.6	17.1	17.1	+ 3.9

1) Percentages = fractions of total test markets survey sample and total control markets survey sample recalling advertising source

Base = August, 1975

Test = 9/7/75 to 12/28/75

RECALL OF ADVERTISING FOR THE MARINE CORPS

<u>Recalled Media Source</u>	<u>Base Period¹⁾</u>		<u>Test Period</u>		<u>Test Change - Control Change</u>
	<u>Test</u>	<u>Control</u>	<u>Test</u>	<u>Control</u>	
	<u>Markets</u>	<u>Markets</u>	<u>Markets</u>	<u>Markets</u>	
	<u>%</u>	<u>%</u>	<u>%</u>	<u>%</u>	
Television	25.5	22.8	25.0	23.5	- 1.2
Radio	7.0	9.9	19.0	7.0	+14.9
Billboards	32.0	34.9	32.8	31.3	+ 4.4
Newspapers	6.4	12.1	8.4	8.3	+ 5.8
Magazines	21.4	29.8	27.6	24.3	+11.7
Mailings to respondent's home	15.1	15.9	13.3	15.0	- .9

1) Percentages = fractions of total test markets survey sample and total control markets survey sample recalling advertising source

Base = August, 1975

Test = 9/7/75 to 12/28/75

RECALL OF ADVERTISING FOR THE NAVY

<u>Recalled Media Source</u>	<u>Base Period¹⁾</u>		<u>Test Period</u>		<u>Test Change - Control Change</u>
	<u>Test</u>	<u>Control</u>	<u>Test</u>	<u>Control</u>	
	<u>Markets</u>	<u>Markets</u>	<u>Markets</u>	<u>Markets</u>	
	<u>%</u>	<u>%</u>	<u>%</u>	<u>%</u>	
Television	21.4	24.6	23.5	21.2	+5.5
Radio	7.4	11.0	12.7	7.2	+9.1
Billboards	29.8	37.6	31.2	36.4	+2.6
Newspapers	5.5	7.0	9.0	8.8	+1.7
Magazines	24.5	30.7	28.1	27.3	+7.0
Mailings to respondent's home	13.2	18.4	13.7	15.2	+3.7

1) Percentages = fractions of total test markets survey sample and total control markets survey sample recalling advertising source

Base = August, 1975

Test = 9/7/75 to 12/28/75

D. Statistical Analyses

While it is virtually impossible to fully analyze a data bank of the size gathered in the course of this study (because the analytical possibilities are almost limitless), especially in the time that has elapsed since the completion of the test, nevertheless a good many statistical analyses were carried out in the course of the research. The purpose of this section is to provide a succinct summary of what was done and of the results of these analyses.

The overall rationale behind these analyses was as follows:

Step 1. Factor Analysis

Twenty-one criteria is too large a set to be manageable. Factor analysis can be used as an aid in selecting a smaller number of criterion measures which are, taken together, representative of the larger set and each of which is relatively independent of the others. To permit comparisons across services these should be the same for every service.

Step 2. Co-Variate Selection

Once the key criteria have been determined in Step 1 the co-variates most likely to affect the analysis need to be identified. Again, this must be a comparatively small number because of

limitations on the number of degrees of freedom. Correlation between each of the key criteria and the co-variates can be helpful in the selection process.

Step 3. Covariance Analysis

The effects of potentially distorting variables need to be taken into consideration. Parallel analyses across services and across key criterion measures are desirable to permit comparisons to be made.

1. Factor Analysis of Criterion Measures

Twenty-one potential criterion measures were obtained in the course of the study. However, many of them represented different ways of measuring the same underlying variable. To eliminate redundancy and, at the same time, reduce the number of subsequent analyses to more manageable dimensions, a factor analysis was run for each service separately, using the SPSS program. Similar but overlapping factor structures were found. Consequently, it was decided that marker variables rather than factor scores would be used in subsequent analyses. The factor structures were compared from this point of view.

Based on the results of the comparisons, plus an examination of the correlation matrix produced as an intermediate part of the output, it was decided that the criterion measures could safely be reduced to four which are relatively independent of each other and adequately represented all twenty-one originally selected criteria.

- Accessions (as represented by DOD accessions data)
- Inquiries (as represented by the audit of total local inquiries)
- Attitudes (as represented by the log probability scale)
- Awareness of radio advertising (as represented by the survey responses)

2. Selection of Co-Variates

Because the number of available co-variates was far too large for the number of degrees of freedom available from the experimental design it became necessary to screen them down to a more reasonable size. Accordingly, changes in each of the 4 key factor criteria were correlated with each of the co-variates using the SPSS Pearsonian correlation routine of the University of Pittsburg. This analysis

was done four times, once for each service. Five covariates were then chosen on the grounds that they were most strongly related to the criterion measures, that the relationships found appeared to hold for all or almost all of the services, and that they appeared to have high levels of generality across criteria and to be logically disparate. These were:

- Number of stations/QMA
- Percent with high school military training
- Percent unemployed, looking, past two years
- Percent with father, relative, or friend in the service
- Percent listening regularly to any radio type

Changes in two of the four criteria (inquiries and attitudes) were found not to be significantly correlated with any of the candidates for co-variate status.

3. Analysis of Variance and Co-Variance

This section reviews the tests of statistical significance that were conducted to evaluate radio performance and to adjust for the effects of the selected covariates. The overall analysis of variance compared results for each service under three experimental treatments -- for the non-broadcast situations, for the situation in which the service was the only radio advertiser and for the situation where the service used radio advertising along with two other services.

The first conclusion from this analysis was that the effects of the selected covariates generally were not significant, the exception being high school military training ($F = 5.83$) which inexplicably appears to have a slight negative effect on awareness. Because the adjustment effect was minimal, data shown in every section other than this one are unadjusted for covariate effects.

F tables for each of the four criteria follow:

ANALYSIS OF VARIANCE¹ AND CO-VARIANCE

	DF	Summary of F Ratios			
		Accessions	Inquired	Attitudes	Awareness
<u>Total</u>	<u>48</u>				
<u>Total Reduction</u>	<u>17</u>	3.34	3.88	.60	9.31
Grand Mean	1	1.25	25.73	.97	46.18
Experimental Treatment (Test Vs. Control)	2	1.47	.62	.73	14.65*
Service	3	2.94*	.68	.75	3.86*
Service By Treatment Interactions	6	.67	.84	.43	1.61
<u>Co-Variates</u>					
No. of Recruiting Sta.	1	.73	.17	.09	3.83
High School Military Training	1	.00	2.23	.03	5.83*
Unemployment	1	.24	.62	.44	.28
Relatives; Friends In Armed Services	1	.30	.06	.67	.25
Regular Radio Listener	1	.02	.24	.16	.14
Remainder	<u>31</u>				

¹ It is recognized that this form of analysis ignores the lack of independence stemming from multi-service use of markets. However, separate analysis for individual services generally support the patterns evident here.

* F ratio significant at .05 level

From the standpoint of the objectives of the test, the asterisk flagging the treatment effects on awareness ($F = 14.65$) is, of course, of the greatest importance. It indicates that treatment effects are large and statistically significant for the awareness of radio advertising. The table of adjusted means presented below indicates also that awareness changes increased sharply when more than one service used radio. On average, awareness changes were almost twice as high (.115) for services using radio along with other services as they were for single service advertising (.069). Put another way, it can be concluded that when those services used radio, the level of awareness for any given service was higher than it would have been had that service been the only one using radio.

A closer examination of the table entitled Changes in Awareness on the following page shows apparent differences between patterns of response by service to variations in treatment conditions. Despite the fact that the service by treatment interaction is not significant, these may be of some interest. For example, the Army experienced large gains in awareness whether it alone was using radio or whether the other services were also using it. The Navy shows a similar pattern.

The Marines are not far different from the overall pattern of response. However, the Air Force did best when it was not the only service employing radio.

CHANGES IN AWARENESS
(Adjusted For Covariates)

<u>Treatment</u>	<u>Air Force</u>	<u>Army</u>	<u>Marines</u>	<u>Navy</u>	<u>Average Change</u>
Using radio with other services	.087	.182	.135	.055	.115
Using radio alone	.001	.189	.042	.045	.069
Not using radio	<u>.022</u>	<u>.068</u>	<u>-.049</u>	<u>-.037</u>	<u>.001</u>
Overall average by service	.037	.146	.043	.021	.062

A similar table of adjusted means is included for accessions. It should be cautioned here, however, that unlike awareness of radio advertising, treatment effects for accessions are not statistically significant. A look at the table shows why. As reported earlier (See Chart 3, P.16), Navy showed a slightly lower rate of change in accessions in radio markets than it did in control markets. This traces to a slightly lower change (.026) in markets in which it used radio with other services than in control markets (.028)

Each of the other three services showed higher rates of change in markets using radio than in those not using it. This held true both for single service markets and for those in which several services were using radio simultaneously.

CHANGES IN ACCESSIONS *
(Adjusted For Covariates)

<u>Treatment</u>	<u>Air Force</u>	<u>Army</u>	<u>Marines</u>	<u>Navy</u>
Using radio with other services	.018	.033	.016	.026
Using radio alone	.019	.032	.012	.031
Not using radio	<u>.013</u>	<u>.020</u>	<u>.011</u>	<u>.028</u>
Overall average by service	.017	.029	.013	.028

* Accessions of high school graduates, mental categories I, II and III divided by QMA

Asterisks on the Summary Table of F Ratios designating significant differences also appear in the "Service" row next to accessions ($F = 2.94$) and awareness ($F = 3.86$). These, however, do not involve the radio variable. Rather, the accessions result indicates that changes in accessions for the Army and the Navy were larger during the test period than they were for the other two services, both among control markets and test markets (see the column totals in the table on changes in accessions above). Similarly, the awareness result traces back to the fact that changes in awareness for the Army were larger than those for the other three services (see the column totals in the table on changes on awareness of radio advertising, P.73) both among control markets and test markets.

4. First Half/Second Half Comparisons

As mentioned earlier, the results of the experiment showed a high degree of internal consistency. The following table of changes in criterion measures illustrates this fact. Only the signs that are circled changed direction between the first half results and the conclusion of the test. For example, at the midpoint in the test the local inquiry audits of phone inquiries for the Air Force showed a slightly superior net performance for non-broadcast markets and therefore carried a "-" sign. However, final results favored radio markets and thus are labeled with a "+". The "+" has been circled to denote the change in sign.

Note that almost all of the changes are in the direction of improved consistency. Only the Marine Corps figures for the total of recalled mail, toll free, and coupon inquiries shows a change to a direction that is less compatible with the directions of change in the other services.

5. Equivalencies

The necessity of adding matching print to control markets in many cases (to balance the radio additions) raised the issue of whether any lack of observed changes traceable to the use of radio might be the fault of the levels at which the tests were being conducted. In other words, was the test being run at or close to saturation levels? If so, any lack of observed effects might be attributable to the level of the test rather than to the effects of differing media mixes.

To test this possibility, the magnitudes of the changes obtained in the behavioral criteria accessions and inquiries were related to the per capita (per QMA) total media spending levels in individual markets. If the largest gains were obtained in markets with relatively low spending rates, there would be reason to further consider this possibility.

Results showed no clear pattern of relationship, suggesting that, in general, the levels of the test were not so high as to cause consistent "ceiling effects." The negative relationships that might signal a potential problem appear in only five of eight comparisons involving the two key behavioral measures -- accessions and inquiries (See Page 78). Moreover, the highest single correlation coefficient is positive. Also

First Half vs. Second Half Test Measures

(Directional Changes)

<u>Criterion Variables</u>	<u>DOD</u>	<u>AIR FORCE</u>	<u>ARMY</u>	<u>MARINE CORPS</u>	<u>NAVY</u>
*Accessions	+	+	+	+	-
National Inquiries -					
Total	+	+	+	-	+
Phone	+	-	+	-	+
Mail	+	+	+	-	+
Local Inquiry Audits -					
*Total	+	+	+	+	+
Phone	+	⊕	+	+	+
Walk-in	+	+	+	+	⊕
First male app.	+	+	+	+	⊕
Recalled Actions -					
Read direct mail	⊕	⊕	⊕	+	-
Responded to mailing	-	-	-	+	-
Called toll free no.	-	-	+	-	+
Sent in coupon	-	-	-	+	-
Mail + toll free + coupon	-	-	-	⊕	-
Attitudes-In Plans For Next					
Few Years	-	-	⊖	-	-
Some possibility of joining	-	-	-	-	-
Very/fairly likely to join	-	⊖	-	-	-
Probability (linear)	-	⊖	-	-	-
*Probability (log)	-	⊖	-	-	-
Idea Of Enlistment	+	+	+	⊕	+
Awareness Of Advertising	+	+	+	+	+
*Awareness Of Radio Advertising	+	+	+	+	+

+ = favors radio markets
 - = favors non-broadcast markets

*Variables tested for significance

○ Sign reversed by second half test results

the largest negative relationship occurs for the Air Force, a service that is spending at lower per capita rates than some other services. The Army, with the highest spending rates, shows no signs of suffering from it. Its performance on criterion measures is at least the equal of the other services.

Correlations with \$/QMA

	<u>Air Force</u>	<u>Army</u>	<u>Marines</u>	<u>Navy</u>
Accessions	-.47	-.04	-.17	.72
Inquiries	-.78	-.54	.26	.82