AD-A138 172 DEVELOPMENT OF A GUN WEAR DATA BANK(U) NAVAL SURFACE 1/1
WEAPONS CENTER DAHLGREN VA C S SMITH NOV 79
NSWC/TR-79-150

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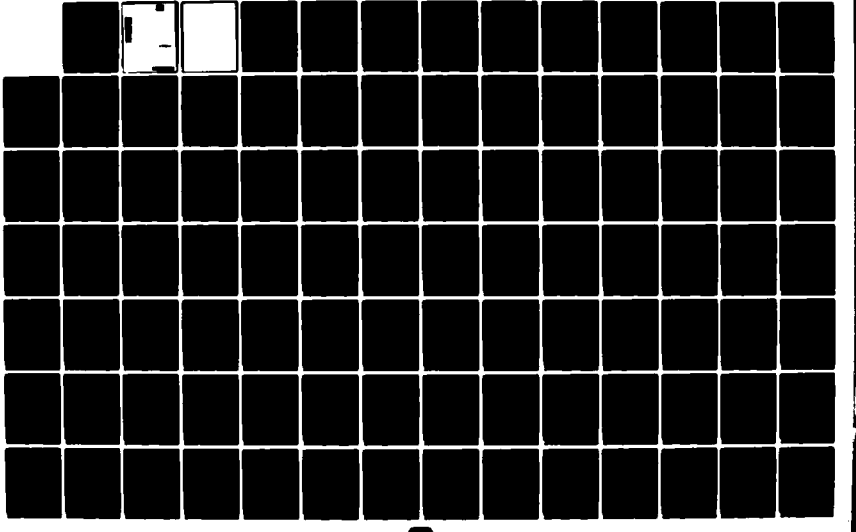

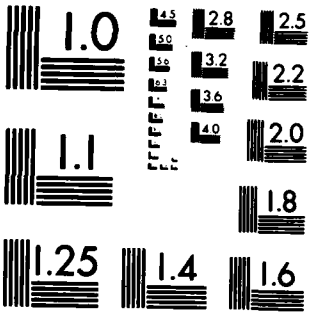

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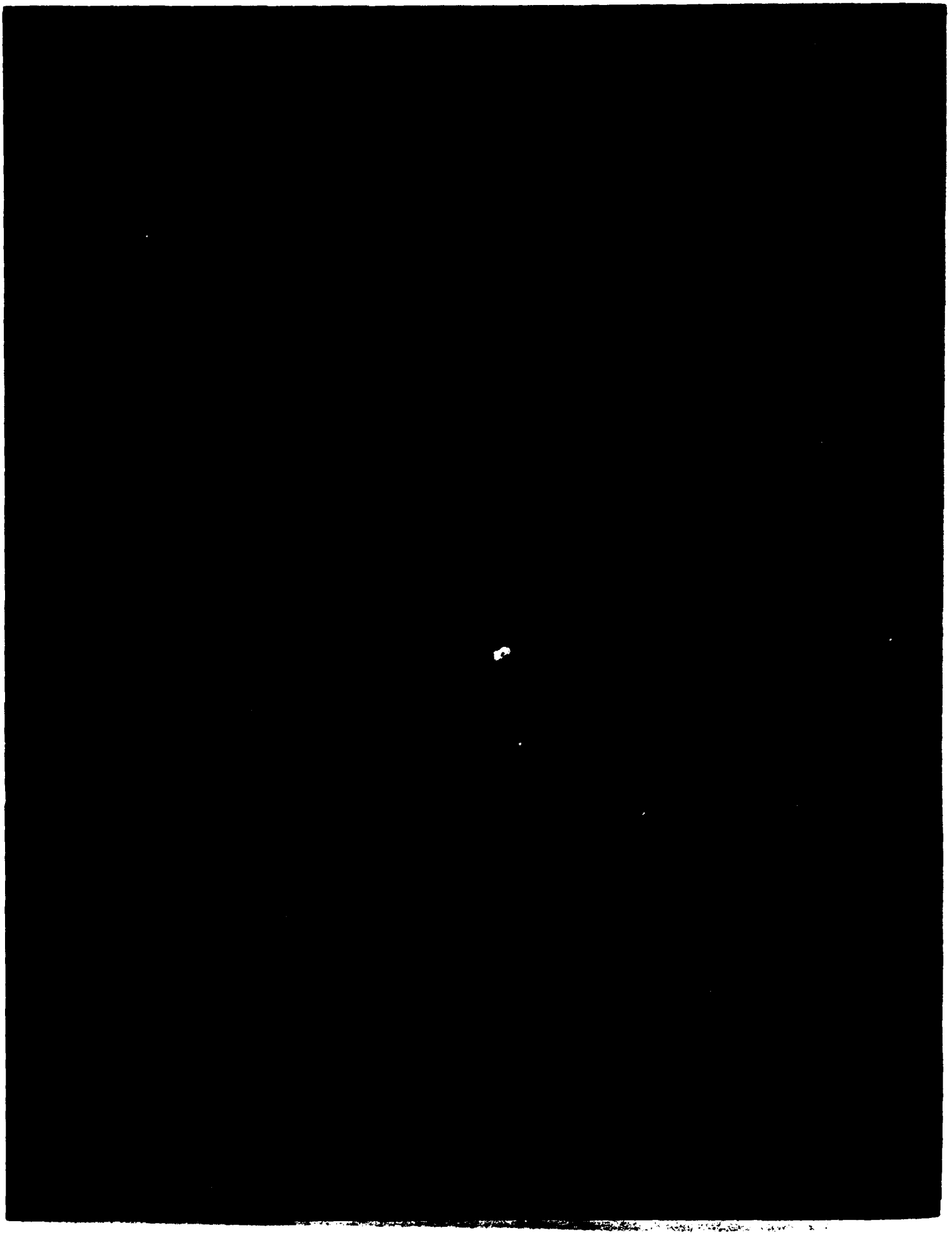

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

A computer code that stores and retrieves gun firing data was written. A data bank generated using this code would permit the easy storage and retrieval of large quantities of firing data and would be useful in constructing semiempirical gun wear models.

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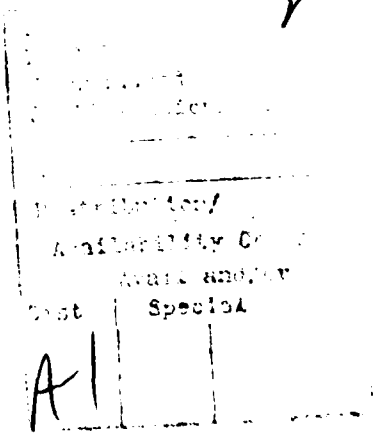
FOREWORD

The work reported herein was conducted as part of the U. S. Army Armament Research and Development Command's Gun Barrel Erosion Program. The task was funded by and coordinated with the Ballistic Research Laboratories, Aberdeen, Maryland.

This report has been reviewed by T. N. Tschirn, Propulsion Branch; K. G. Thorsted, Head, Propulsion Branch; D. H. George, Gun Specialist; and C. A. Cooper, Head, Gun Systems and Munitions Division.

Released by:

LEMMUEL L. HILL, Head
Weapons Systems Department



CONTENTS

INTRODUCTION

This report details the development of a gun wear data bank used to store and retrieve firing data. These data can be used to (1) generate or check out proposed gun wear models, (2) compare the gun wear rates of various gun systems, (3) study the effect of firing schedule on gun wear, and (4) aid in predicting wear rates for proposed gun systems.

BACKGROUND

Attempts to predict gun wear rates in order to reduce costly empirical determinations include (1) expressions that relate wear caused by a reduced charge round with wear caused by a full charge round[1,2], (2) calculations of bore surface temperature[3,4], and (3) semiempirical methods of estimating gun wear rates and gun life[4,5].

It has been necessary to employ both theory and empiricism when devising a method of gun wear prediction. Accurate prediction of gun wear by theoretical methods alone has not been successful because gun erosion is not a simple phenomenon. For example, the attempts of Nordheim, et al.[3] and Jones and Breithart[6] to predict gun erosion based on melting of the steel at the bore surface were not sucessful because the steel does not melt in most guns.[3]

The purely empirical methods of predicting gun wear have not been successful because there are too many variables affecting the wear of a gun. For example, Riel's empirical formula[2] to relate gun wear caused by a reduced charge with that caused by a full charge implies that the charge weight is twice as important as the propellant energy level in causing erosion. This (combined with knowledge of interior ballistics and a bit of thermochemistry of propellants) leads to the unlikely conclusion that gun wear may be reduced by substituting higher-flame-tmeperature (or more energetic) propellants for the current propellants. The problem is that an empirical prediction scheme was devised without adequate data.

Semiempirical methods of predicting gun wear include those of Frankle and Kruse[5] and Smith and O'Brasky.[4] Frankle and Kruse determined the empirical constants used in their method from published estimates of wear rates for various cannon. These data are easy to use, but do not normally give any information concerning the effect of firing rate on gun wear. In addition to these official gun wear estimates, Smith and O'Brasky used actual firing data in constructing and verifying their method of predicting gun wear. The labor involved in the use of these actual firing data was considerable; this limited the

amount of data examined. Had the firing data been available in an easy-to-use computerized format, more data could have been considered and the accuracy of the gun wear prediction method improved.

Use of the data bank outlined in this report should help in future attempts to derive and check out improved gun wear prediction schemes by making the available data more accessible. It should also serve as a convenient source of data to review the wear history of the particular gun type.

APPROACH

The computer language used to construct and access this data bank is CDC FORTRAN[7]. This data bank was designed to make it feasible to store all medium- and major-caliber (3 in. and above) gun firing data on a computerized medium and to retrieve the data desired with a minimum of effort and computer time. The file type chosen, the FORTRAN mass storage file, has the following advantages for this type of data:

1. Records can be conveniently and rapidly stored and retrieved in any order.
2. By the use of subindices, groupings of the records are possible.

A FORTRAN mass storage file must reside on disc storage. Since the volume of firing data accumulated by the various proving grounds is immense, the mapping of several logical numbers into one machine word would be a space-saving measure for long-term disc storage.

Star gauge, firing, and comment data are stored. The star gauge data used to determine the wear state of a gun consist of measurements of the inside diameter of the gun bore at various points along its length. The firing data include (1) what was fired (propellant weight and type, projectile type, wear-reducing liner type, etc.), (2) the conditions under which it was fired (temperature, rate of fire, time, etc.), and (3) measured performance data (peak pressure and projectile velocity). These data are used in various wear-rate prediction schemes. Provision is made to add alphanumeric comments to the data bank. These comments might concern unusual wear conditions, special gun construction details, special instrumentation, or similar items.

PROCEDURE

This data bank employs four separate programs to input, sort, and output data.. A group of subprograms is available for use by all of the programs. Each of these programs deals with data on local file TAPE4. Figure 1 shows the order in which the various porgrams of this data bank may be executed.

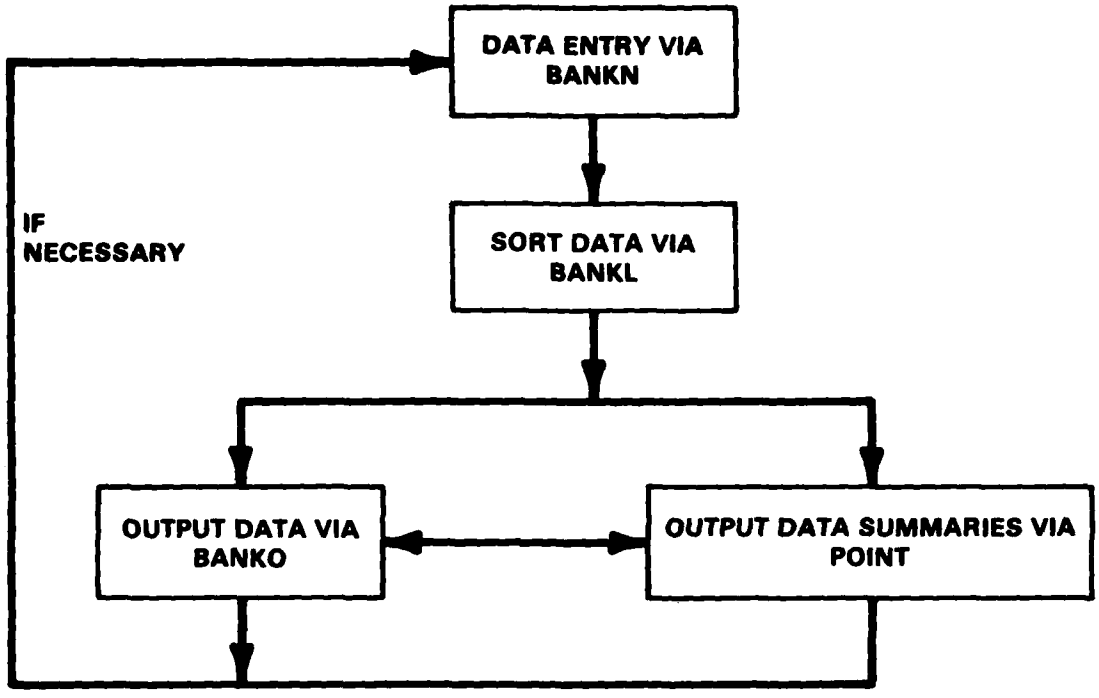


Figure 1. Execution of Gun Wear Data Bank Programs

Program BANKN is used to store data in the data bank. Data are stored on local file TAPE4; this file should be cataloged or extended as a permanent file. A separate permanent file should be used for each gun type (3"/50, 5"/38, 5"/54, etc.), but data from all guns of a given gun type will normally be stored on one file. The format used for the input of data is outlined in Appendix A, and the data structures used to store the data are outlined in Appendix B.

A data record is created for each firing date, stargauge report, or comment entered. An entry is created in the ISEAS array for each of these data records; these entries contain references to the data record. These data records do not have to be created in any particular order, nor do all records for one gun have to be created before records for

another gun can be created. It is, however, necessary that program BANKL be executed for a given gun before data are output for that gun (follow the procedure outlined in Appendix A) to sort the ISEAS array by date. This ISEAS array is then used to help the computer find the desired data records. See Appendix B for the word structure of the ISEAS array.

Appendix C outlines methods of outputting data from the data bank by using programs BANKO and POINT. Program BANKO is used to retrieve and output data. All available data may be output for a given gun number, or the data output may be limited (as outlined in Appendix C). Program POINT is used to compile and output a summary of the data in a form convenient for plotting by a user program.

Appendix D contains the programs used by the data bank; Appendix E contains flow diagrams that will help clarify the programs listed in Appendix D. The programs used by the data bank are listed in Appendix F. Appendix G contains sample output for several computer runs.

RESULTS AND CONCLUSIONS

Computer codes to construct and to retrieve data from a gun wear data bank have been written. Data have been entered, and the codes have been validated. Further data entry awaits additional funding.

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2. R. H. Riel, ***An Empirical Method for Predicting Equivalent Full-Charge (EFC) Factors for Artillery Ammunition***, Aberdeen Proving Ground Report DPS/7W-417/2, Aberdeen, MD, July 1961.

3. L. W. Nordheim, Harry Soodak, and G. Nordheim, ***Thermal Effects of Propellant Gases in Erosion Vents and Guns***, National Defense Research Committee Armor and Ordnance Report A-262, OSRD No. 3447, 24 May 1944.

4. C. S. Smith and J. S. O'Brasky, ***Preliminary Calculations for the 203mm Marine Corps Gun Howitzer Propulsion Package***, Naval Surface Weapons Center, Dahlgren Laboratory Technical Report NSWC/DL TR-3734 (Appendix B), Dahlgren, VA, August 1977.

5. J. M. Frankle and L. R. Kruse, ***A Method for Estimating the Service Life of a Gun or Howitzer***, Ballistics Research Laboratories MR 1852, Aberdeen, MD, June 1967.

6. R. N. Jones and S. Breithart, ***A Thermal Theory for Erosion of Guns by Powder Gases***, Ballistics Research Laboratories Report 747, Aberdeen, MD, 1951.

7. Control Data Corporation, ***FORTRAN EXTENDED, Version 4, Reference Manual*** (Revised Edition), Publiation #60305601K, March 1976.

APPENDIX A

DATA INPUT

Data are entered into the data bank when PROGRAM BANKN is executed. A card (or group of cards) is designated by a card code in card columns 1 through 5. This card code is designated ICD; the last digit of this number should be in column 5.

The first time a data file (gun type) is opened, use ICD = 1. Then starting in column 6 of this card, input the following:

Variable	Field	Card Columns	Description
CODE	A10	6-15	Alphanumeric gun description
NG1	I5	20*	Number of ***long*** stargauge readings (≤ 100)
NG2	I5	25*	Number of ***short*** stargauge readings (≤ 12)
NOB1	I5	30*	Number of the origin reading for the ***long*** stargauging
NOB2	I5	35*	Number of the origin reading for the ***short*** stargauging
DIAM	F5.3	36-40	Gun caliber (in.) (use decimal point)
NDAYS	I5	45*	Estimated number of firing days

*Last digit of the number should be in this column.

Follow this card with a list of ***long*** stargauge distances from the reference point; use 16F5.2 format. Then list the ***short*** stargauge distances in 16F5.2 format.

Lines 1 to 5 (Figure A-1) list the above data in the correct form for the 16"/50 Mk 7 gun. Note from line 1 that there are to be 39 stargauge readings in each ***long*** gauging and six starguage readings in each ***short*** gauging (the first such reading corresponding to the origin of rifling for both the ***short*** and ***long*** gaugings), the gun caliber is 16 in., and the estimated number of firing days per gun is 75. The distance from the breech face to each of the 39 long (λ) gaugings is listed in lines 2-4, and the distance from the breech face to each of the short (normally γ) gaugings is listed in line 5. Note that these cards appear only when the data file is started, not on subsequent runs.

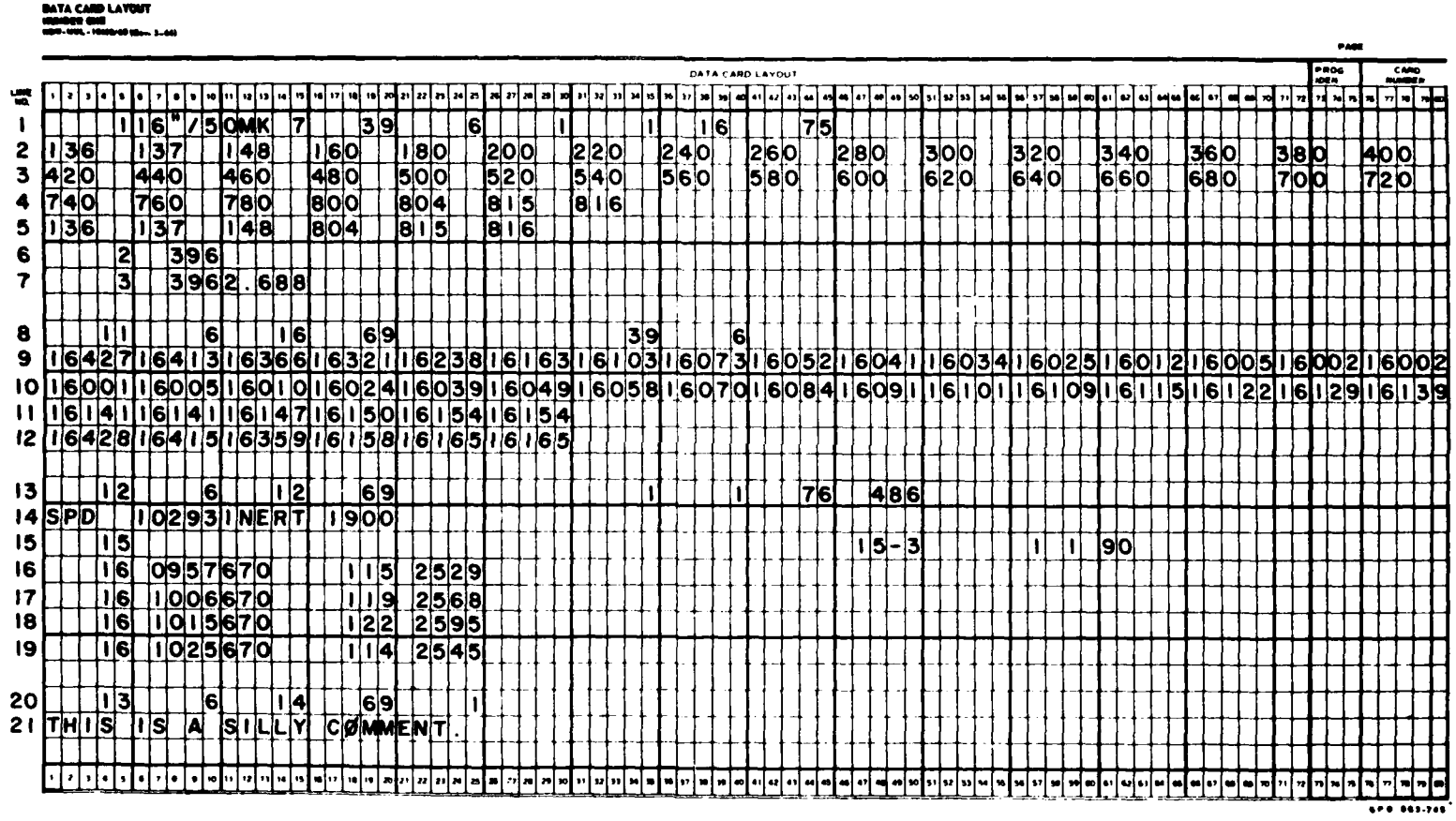


Figure A-1. Sample Data Entry

The first time that data are written for a particular gun number, ICD = 2 is used. Enter the gun number on this card, being sure the last digit is in column 10 (see line 6 of Figure A-1, for a sample).

ICD = 3 is used as the first card (other than ICD = 1 or 2) of an input deck for a given gun number. The gun number is entered in columns 6 through 10 (I5 format), and a ***pressure factor*** in F5.0 format is entered in columns 11 through 15. Now pressure data are stored in this bank in kpsi; if other units are used to enter the pressure data, a pressure factor is entered to multiply the pressure readings before storage in the bank. For example, 1 tsi(Cu) = 2688 psi; therefore, if the pressure data are in tsi(Cu), a pressure factor of 2.688 is used. [Line 7 of Figure A-1 gives a sample of such a card. This card indicates that data are to be entered for gun number 396 and that the pressure readings are in tsi(Cu).]

Following the ICD = 3 card, data are input for the gun number listed until a card with ICD = 0 (or blank), 2, or 3 is encountered. ICD = 0 will properly terminate program execution; ICD = 2 or 3 has been previously explained. ICD = 11, 12, or 13 is used for the input of one day's stargauging, firing, or comments, respectively. For any of these, the next 15 card columns (columns 6 through 20) contain the month (e.g., 1 for January, 12 for December), date (1 through 31), and year (last two digits only) in 3I5 format.

For stargauge data (ICD = 11), enter the number of readings available for the point up (λ) readings and point down (γ) readings in columns 31 through 40 in 2I5 format. The number of λ readings should be 0, NG1, or NG2; the number of γ readings should be 0 or NG2, where NG1 and NG2 are given under ICD = 1 above. Plug gauge readings (if available) are given in A5 format beginning in columns 21 or 26 (or both).

Follow this card with a list of measured gun diameters for the λ stargaugings in 16F5.3 format. The distance from the reference point to the point where the diameter reading is taken was given under ICD = 1 for either ***long*** or ***short*** stargauging. (Omit this if there are zero λ gaugings.)

Similarly, the γ stargauge diameters are listed (if any) for the distances listed for the ***short*** gaugings. These readings are listed on a card separate from the λ readings. Lines 8-12 of Figure A-1 give the input for a stargauging performed on June 16, 1969. Thirty-nine λ readings and six γ readings are listed; the first γ reading is 16.427 in., and the first γ reading is 16.428 in.

For firing data (ICD = 12), enter, beginning in column 31 in 5I5 format, the number of indexes of powder used, the number of projectile types used, the ambient temperature (°F), the number of rounds previously fired from the gun, and the previous equivalent service rounds (ESRs) shot from the gun. If desired, a wear measurement may be entered in columns 21 through 25 or columns 26 through 30 (or both).

The second card of this sequence lists the propellant index (10 columns of alphanumeric data per index) and the projectile types (10 columns of alphanumeric data per projectile type). If more than eight such fields are needed, use an extra card. Lines 13-14 of Figure A-1 show that on June 12, 1969 a firing took place using SPD 10293 propellant and inert 1900-lb projectiles, the ambient temperature was 76°F, and 486 rounds had previously been fired through this tube.

The next card used will be the firing setup card (ICD = 15). List the case, plug, wad, wear-reducing agent, primer, number of the propellant, number of the projectile, and propellant conditioning temperature in 5A10, 2I2, I3 format beginning in column 6. Use an ICD = 15 card whenever the data on the previous ICD = 15 card are not valid for the next round. The ICD = 15 card image of line 15 of Figure A-1 indicates that the Mk 15 Mod 3 primer was used with the first propellant (SPD 10293) and first projectile type (INERT 1900). The propellant was conditioned at 90°F. As this is a bag gun, no case, plug, or wad are noted. No wear-reducing agent was used with these rounds.

To list round-by-round data (for one round), use an ICD = 16 card. List, beginning in column 6, the time (24-hr clock), charge weight (lb), pressure (kpsi/pressure factor), and velocity (ft/s) in I5, F5.2, F5.1, F5.0 format. Lines 16-19 of Figure A-1 give examples of this type of card. Note from line 16 that, at 9:57 a.m., a 670-lb charge yielded a chamber pressure of 11.5 tsi(Cu) and a projectile velocity of 2529 ft/s.

Burst data are given by an ICD = 17 card or card sequence. On the first card (the one with "17" in columns 4 and 5), place the time (24-hr clock) of the first shot of the burst, the charge weight per shot (lb), the rate of fire (rd/min), the number of rounds in the burst, and the pressure of the last round fired (kpsi/pressure factor) in I5, F10.2, F10.0, I10, F10.1 format. Place a 1 in column 51 if velocity data are available for the burst.

If a 1 is in column 51, follow this card with a list of velocities (ft/s) of rounds in the burst. Use 16I5 format, and use as many cards as necessary to list all the velocities. Leave a blank if velocity data are missing for a round.

When data for all rounds are listed for the day's firing, terminate by using a card with ICD $\leq$ 13.

An ICD = 13 card is used to initiate a comment. The number of comment cards following this card is listed in I5 format beginning in column 21. Each comment card used is assumed to contain 80 columns of alphanumeric data. Lines 20-21 of Figure A-1 indicate the proper format for entering a comment. The comment pertains to the date, which is June 14, 1969; and, the one-line comment is "THIS IS A SILLY COMMENT."

Program BANKL should be executed after all data for a given gun are entered or before any attempt is made to recall any data for this gun (with POINT or BANKO). BANKL expects the gun number to be entered in I5 format on the first card; subsequent cards may be used with the same format to reference other guns. Use a blank card as the last card of the input file for BANKL. BANKL sorts the references to the records in order of date (BANKO and POINT expect the references in order of date). BANKL may be executed more than once for a given gun. This will be necessary if the data for a gun are to be accessed by BANKL or POINT before all data are entered.

APPENDIX B

DATA STORAGE

GENERAL SETUP

The data are stored in a FORTRAN mass storage file with one level of subindexes. A numeric main index and numeric subindexes are used.* A separate file is used for each type of gun for which data are to be stored. The amount of data written or read by one statement is called a record.

The first record of the file contains general data concerning the gun - an alphanumeric identifier, gun diameter in inches, the number of stargauge points to be stored, and a place to keep track of what cases, plugs, wads, primers, and wear-reducing agents have been used in the gun (30 words are allowed for each of the cases, plugs, etc.).

The second record is a listing of the distances from the reference point to where stargauge readings are taken. Distances (in inches) are listed for a ***long*** stargauging (usually 20-35 points) and a ***short*** gauging (usually six points). The data are recorded in A format, five characters per distance (or two distances/word); the program will decode (or internally read) the data in F5.2 format.

GUN REFERENCES

The third record contains an array, ISEAM (2,200), which contains data to aid in locating each gun for which data are stored on the file. Table B-1 lists what is stored in this array and where. (The ***first word*** refers to the first word for the gun in question, and the ***second word*** refers to the second word for that gun.)

All charge weight data are stored as 6000 CW/d^3, where CW is the charge weight in pounds and d is the caliber of the gun in inches. Units of other variables are given in the tables or writeup telling how the variables are stored.

Table B-1. Data in ISEAM Array

Word	Bits	Description
1	1-15	Total number of rounds fired in gun
1	16-30	Maximum charge weight ever used in gun
1	31-45	Maximum velocity of any round shot from gun (ft/s)
1	46-60	Gun number
2	1-12	Number of subrecords (i.e., days of firing, stargauging, etc.); this is a ***flexible limit*** used by the program and will be changed by the program as necessary
2	13-24	Maximum pressure (psi/100) ever achieved in gun

*A description of how to use a FORTRAN mass storage file is given in: Control Data Corporation, *FORTRAN EXTENDED, Version 4, Reference Manual* (Revised Edition), Publication #60305601K, March 1976.

Table B-1. Data in ISEAM Array (Continued)

Word	Bits	Description
2	25-36	Maximum stargauge reading
2	37-48	Maximum burst length (rd)
2	49-60	Maximum burst rate-of-fire (rd/min)

Now INDEX, the main file index, is dimensioned at 201. The last space (201) is unusable, and three spaces have been used (1, 2, and 3) to reference the first three records. The fourth element of INDEX contains references to the subindex for the same gun that is referenced by the 4th word pair of ISEAM. This correspondence is maintained for the fifth, sixth, etc., words up to a maximum of 200; thus, data for 197 guns may be stored on this file.

SUBINDEXES

At any time, the subindex being used is INDEXS dimensioned at 1001; thus, 1000 records per gun are permitted. They are now considered to be numbered 1, 2, 3, ..., n, which results in n such records ($n \leq 1000$). The first such record is ISEAS, dimensioned at 2 and 1000. ISEAS bears the same relationship to INDEXS as ISEAM bears to INDEX. Thus, up to 999 data records can be referenced for each gun.

The first word of each ISEAS pair (except the first pair) contains the data listed in Table B-2.

Table B-2. Data Always Found in 1st Word of ISEAS Pair

Bits	Description
52-60	Year (1900 would be *0*, 1901 would be *1*, etc.)
43-50	Month and date; if this field is called IDATES, the month is (IDATES - 1)/31 and the date is IDATES - 31 * month
1-3	ICOD (values have meaning given below): 0 Plug gauge date only 1 Stargauge record 2 Not used 3 Firing data; no rapid fire 4 Firing data; includes rapid fire 5-6 Not used 7 Comment (an alphanumeric comment)

If ICOD is 1, the first word of the ISEAS pair contains the origin readings (in./1000) for the λ and γ stargauge readings in bits 13 through 27 and 27 through 42, respectively. The second word of the ISEAS pair will contain the number of words in the referenced record in bits 1 to 11 and the number of the record referenced in bits 12 to 21.

If ICOD is 3 or 4, the additional information listed in Table B-3 is contained in the ISEAS pair.

Table B-3. Information Contained in ISEAS Pair for ICOD = 3 or 4

Word	Bits	Description
1	31-42	Number of words in referenced record
1	16-30	Maximum rate of fire (0 if ICOD = 3) (rd/min)
1	4-15	Number of rounds fired on date referenced
2	46-60	Maximum charge weight for day
2	31-45	Maximum velocity for day (ft/s)
2	22-30	Maximum pressure for day (psi/100)
2	12-21	Number of the record referenced
2	1-11	Maximum burst length (rd)

If ICOD = 7, the second word of the ISEAS pair will contain the number of words in the referenced record in bits 1 to 11 and the number of the referenced record in bits 12-21.

STARGAUGE RECORDS (ICOD = 1)

The first word of a stargauge record contains the number of λ readings in the right side of the word and the number of γ readings ending in bit 31. The second word contains two plug readings; and, the format used is 2A5. (In the 5"/54 gun, the first of these plug gauge readings is to be the Mk 2 Bore Erosion Gauge Reading, and the second is to be the Projectile Seating Distance Gauge Reading.)

The λ stargauge readings are listed starting in the third word. The readings listed are in in./1000; and, the numbers are regarded as 15-bit integers. Four such readings are stored per word. The γ stargauge readings follow the λ readings, but they start in a new word. Note that the distances at which the stargauge readings were taken are stored in the second record of the file and are not repeated.

GUN FIRING DATA RECORDS

The first word of this record contains two five-character alphanumeric fields – the first is the previous number of rounds fired, and the second is the ESR on the gun to date. The second word contains two plug gauge readings in 2A5 format. The third word contains the ambient temperature (°F), the number of propellant types (m), and the number of projectile types (n) used in that day's firings (encoded using I3, 2I2 format).

The next m words each contain a 10-character alphanumeric description of the propellant type, which is followed by n words, each containing an alphanumeric description of one projectile type.

The balance of the record contains setup words, round words, and burst word sequences as outlined in Tables B-4, B-5, and B-6, respectively. A setup word should be the first word of this sequence (a new setup word is required whenever the data listed in this word changes). The setup word, for the most part, contains references to other data. (Note that the first record of the file contains a listing of cases, plugs, wads, primers, and wear-reducing agents and that m propellants and n projectiles used this day have been listed). Table B-4 gives the item referenced and the bits containing the reference to the item. The reference number tells the user to pick item 1, 2, ..., or n from the list. This word also contains the quantity (powder conditioning temperature +100) in bits 10 through 18; bits 1 through 9 are zero. The zero in bit 1 identifies this word as a setup word.

Table B-4. References Contained in Setup Word

Bits	Referenced
55-60	Case
49-54	Plug
43-48	Wad
37-42	Primer
31-36	Wear-reducing agent
25-30	Propellant
19-24	Projectile

Table B-5. Data in Round Word

Bits	Data
46-60	Time of day (24-hr clock)
31-45	Charge weight
16-30	Velocity (ft/s)
4-15	Pressure (psi/100)
1-3	The number *1*

Table B-6. Data in First Two Words of Burst Sequence

Word	Bits	Data
1	46-60	Time of day (24-hr clock)
1	31-45	Charge weight
1	16-30	Number of rounds in the burst
1	4-15	Maximum pressure for the last round (psi/100)
1	1-3	The number *2*
2	46-60	Rate of fire (rd/min)
2	2	One if velocities are available for this burst

If velocity data are available, the data are stored 15 bits per velocity (four velocities per word) starting in the next word. Velocities are in ft/s.

COMMENT DATA

The first word of a comment record contains the number *4* in the right-hand side, and the number of words is the comment ending in bit 31. (The number of words in the comment is eight times the number of comment cards.) This is followed by the comment.

APPENDIX C

DATA RETRIEVAL

BANKO is usually used to retrieve data from the data bank; however, POINT may be used for obtaining certain data to plot or may be used when very limited data are desired.

BANKO expects input in a form similar to that expected by BANKN – a card code ICD in I5 format followed by a 75-character alphanumeric string DATA to be decoded. (DATA starts in card column 6.) ICD = 0 (or blank) properly terminates program execution. If ICD = 1, enter the number of gun numbers to be considered, and the gun numbers in 1515 format. If ICD is greater than one but less than 10, enter two numbers (AMINV and AMAXV) in 2F5.0 format. A given gun number will be chosen if the maximum value for the parameter called for by the choice of ICD lies between AMINV and AMAXV (Table C-1).

Table C-1. ICD and Corresponding Parameters ($2 \leq ICD \leq 10$)

ICD	Parameter
2	Velocity (ft/s)
3	Charge weight (lb)
4	Number of rounds shot to date
5	Rate of fire (rd/min)
6	Number of rounds per burst
7	Stargauge readings (in./1000)
8	Peak pressure (psi/1000)
9,10	Not used

If ICD is greater than 10, it is desired to choose records for a gun number (or numbers) that have been previously selected. The data in the selected records are then printed out.

If ICD = 11, enter the number of records for each gun to be printed and the record numbers in 2513 format.

If ICD = 12, the records are selected by date and record type. The DATA part of this card is defined as having 1515 fields. The first three fields are the starting date (month, day, and year; the year is the calendar year less 1900); the second three fields are the ending date; and the seventh field is the number of record type codes, which are listed in the remaining fields (Table C-2). Data records are selected only if it is in the date range selected and is of a type listed in the list of record codes.

Table C-2. Record Type Codes

Code	Record Description
0	Plug gauge data only
1	Stargauge record
3	Firing data; no rapid fire
4	Firing data; rapid fire
7	Comment record

If ICD = 13 or greater, enter two numbers (AMAXV and AMINV) in 2F5.0 format. A record will be selected if the desired parameter (as listed in Table C-3) is greater than AMINV but less than AMAXV. (ICD = 17 calls for stargauge data, and other values of ICD call for firing data.)

Table C-3. ICD and Corresponding Parameters

ICD	Parameter
13	Maximum charge weight (lb)
14	Number of rounds fired that day
15	Maximum rate of fire (rd/min)
16	Maximum burst length (rd)
17	Origin reading (in.)
18	Maximum peak pressure for the day (psi/100)
19	Maximum velocity for day (ft/s)

Program POINT expects unformatted data as input. The first card (or line, if entered from a terminal) should have the gun number and a round count code. (If the gun number is 396 and the code is 1, the line would read 396, 1). Round count codes are given in Table C-4.

Table C-4. Round Count Codes

Code	Action
1	Count number of rounds fired from data in ISEAS array
2	Obtain number of rounds fired previously from data in record
3	Obtain ESR (equivalent service record) on gun from data in record
4	Count ESR from data in ISEAS array

These ESR (or, for Army users, equivalent full charge) factors are calculated based on the wear estimation methods of Smith and O'Brasky*. If this is not satisfactory, the user may substitute his own FUNCTION PESR to compute ESR factors by his specifications.

The second card or line entered should contain the stargauge selection code (1 for λ readings, 2 for γ readings), the number of stargauge distances of interest, and the distance from the reference point to the points of interest. (Make sure stargauge readings are available for the distances listed!)

If data for additional guns are desired, repeat cards 1 and 2 for each gun. If a gun number of 0 is entered, the program stops.

*C. S. Smith and J. S. O'Brasky, *Preliminary Calculations for the 203mm Marine Corps Gun Howitzer Propulsion Package*, Naval Surface Weapons Center, Dahlgren Laboratory Technical Report NSWC/DL TR-3734 (Appendix B), Dahlgren, VA, August 1977.

APPENDIX D

PROGRAM LISTINGS

PROGRAM BANKN

```
      PROGRAM BANKN (INPUT,OUTPUT,TAPE4,TAPE1=INPUT,TAPE2=OUTPUT)
      IMPLICIT LOGICAL (E)
      COMMON INDEX (201),INDEXS(1001),ISEAM(2,200),ISEAS(2,1000),
     1     DATA(81,SG1(100),SG2(12),SG(56)
      COMMON/ONE/ CODE,NGA,NGB,NOB1,NOB2,DIAM,NG,NRECM,SAVE1,SAVE2,
     1      CASE(30 ), PLUG(30 ), WAD(30 ), PRIMER(30 ), AGENT(30 )
      INTEGER DATE
      DIMENSION REC1(160),       ITORE(1000),DATE(3),SG(56),PROL(30),
     1     PROJ(30),SR1(100),SR2(12)
      EQUIVALENCE (REC1,CODE)
      DIMENSION IDATE(12)
      DATA IDATE /3HJAN,3HFEB,5HMARCH,5HAPRIL,3HMAY,4HJUNE,4HJULY,
     1     3HAUG,4HSEPT,3HOCT,3HNOV,3HDEC/
      IFUN (I,J,K,L,M)=OR (SHIFT(I,45),SHIFT(J,30),SHIFT(K,15),SHIFT
     1     (L,3),M)
      DATA BLANK/10H           /,EOPEN/.FALSE./,NRECM/201/
      NCASE=NPLUG=NWAD=NPRIMER=NAGENT=1
      CASE(1)=PLUG(1)=WAD(1)=PRIMER(1)=AGENT(1)=BLANK
   10 READ (1,1000) ICD,DATA
 1000 FORMAT (I5,7A10,A5)
  126 ICD1=ICD+1
      GO TO (9,1,2,3),  ICD1
    9 CALL WRITMS( 4,REC1,160,1,-1)
      CALL WRITMS (4,ISEAM,400,3,-1)
      CALL CLOSMS( 4)
      IF (DATA(1) .EQ. BLANK) STOP 1
      GO TO 10
    1 DECODE (75,1002,DATA) CODE,NGA,NGB,NOB1,NOB2,DIAM,NDAYS
 1002 FORMAT (A10,4I5,F5.3,I5)
      CALL OPENMS ( 4,INDEX,201,0)
      NG1H=(NGA+1)/2
      NG1H1=NG1H+1
      READ (1,1004) (SG(I),I=1,NG1H)
      NG=(NGA+1)/2+(NGB+1)/2
      READ(1,1004) (SG(I),I=NG1H1,NG)
 1004 FORMAT (8A10)
      CALL WRITMS ( 4,SG,NG,2)
      CALL WRITMS ( 4,REC1,160,1)
      CALL WRITMS ( 4,ISEAM,400,3)
      DECODE (560,1006,SG) (SG1(I),I=1,NG1)
      DECODE (200,1006,SG(NG1H1))(SG2(I),I=1,NG2)
 1006 FORMAT (112F5.2)
      WRITE (2,1008) CODE,DIAM
 1008 FORMAT ( 8H1GUN IS A10, 3H OF,F10.3,17H INCHES DIAMETER.)
      WRITE ( 2,1010) SG1(NOB1),SG2(NOB2)
 1010 FORMAT (20H0ORIGIN OF RIFLING =F7.2,3H ORF7.2, 8H INCHES.)
      WRITE (2,1012) (SG1(I),I=1,NG1)
 1012 FORMAT (1H058X19HLONG GAUGING POINTS/(1X12F10.2))
      WRITE (2,1014) (SG2(I),I=1,NG2)
 1014 FORMAT (1H058X20HSHORT GAUGING POINTS/1X12F10.2)
      EOPEN=.TRUE.
      GO TO 10
    2 IF (EOPEN) GO TO 100
C --  CALL ONLY BEFORE THE FIRST TIME DATA IS WRITTEN FOR A GUN.
      CALL OPENRE ( 4)
      EOPEN=.TRUE.
  100 DECODE (75,1000,DATA) IGUN
      CALL GUNCAL ( 4,IGUN,ENEXT,JJ)
      IF        (ENEXT) GO TO 105
      PRINT 1016
 1016 FORMAT (57H1ATTEMPTED TO OPEN FOR 1ST TIME GUN FOR WHICH DATA EXIS
     1TS)
      STOP 2
  105 DECODE (75,1019,DATA) NODAYS
```

```
 1019 FORMAT (5X15)
      NRECS=2*NODAYS+15
      IF (NODAYS .EQ. 0 .OR. NRECS .GE. 500)  NRECS=500
      DO 110 I=1,NRECS
  110 ISEAS(1,I)=ISEAS(2,I)=INDEXS(I)=0
      ISEAM(1,JJ)=SHIFT(IGUN,45)
      ISEAM (2,JJ)=NRECS
      CALL STINDX ( 4,INDEXS,NRECS)
      CALL WRITMS ( 4,ISEAS,2*NRECS,1)
      CALL STINDX ( 4,INDEX ,NRECM)
      CALL WRITMS ( 4,INDEXS,NRECS+1,JJ,0,1)
      GO TO 10
    3 EJJ=.FALSE.
      IF (EOPEN) GO TO 115
      CALL OPENRE ( 4)
      EOPEN=.TRUE.
  115 DECODE (75,1013,DATA) IGUN,PRESF
 1013 FORMAT (I5,F5.0)
      IF (PRESF .EQ. 0) PRESF=1.
      CALL GUNCAL ( 4,IGUN,ENEXT,JJ)
      IF (ENEXT) STOP 3
      NRECS=AND(7777B,ISEAM(2,JJ))
      CALL READMS ( 4,INDEXS,NRECS,JJ)
      CALL STINDX ( 4,INDEXS,NRECS)
      CALL READMS (4,ISEAS,2*NRECS,1)
  120 READ (1,1000) ICD,DATA
  121 ICDH=ICD-10
      IF (ICDH) 125,125,130
  125 CALL WRITMS( 4,ISEAS,2*NRECS,1,-1)
      CALL STINDX ( 4,INDEX ,NRECM)
      CALL WRITMS ( 4,INDEXS,NRECS,JJ,-1,1)
C --  ADD TO MAIN SEARCH ARRAY
      IF (.NOT. EJJ) GO TO 126
      CALL MARRAY (ISEAM(1,JJ),ISEAM(2,JJ),MVEL,MCW,NRDTOT,MRATE,NRDB,
     1                  MDB,MP,NRECS)
      GO TO 126
  130 CONTINUE
C --  WRITE DATA TO FILES
      EJJ=.TRUE.
      GO TO (11,12,13) ICDH
   11 DECODE (75,1018,DATA) DATE,PLUG1,PLUG2,NG1,NG2,IST01,IST02
 1018 FORMAT (3I5,2A5,5I5)
      JK=JREC(ISEAS,DATE,NRECS,1)
      ID=DATE(1)
      WRITE (2,1017) IDATE(ID),DATE(2),DATE(3)
 1017 FORMAT(1H0A6,I3,4H, 19,I2)
      PRINT 1020,NG1,NG2,PLUG1,PLUG2
 1020 FORMAT ( 1H0I5,7H UP AND15,26H DOWN GAUGINGS WERE TAKEN./17H PLUG
     1READING 1 =A6,17H PLUG READING 2 =A6)
      IF(NG1 .EQ. 0) NG1=0
      IF(NG2 .EQ. 0) NG2=0
      ITORE(1)=NG1 .OR. SHIFT(NG2,30)
      ENCODE (10,1022,ITORE(2)) PLUG1,PLUG2
 1022 FORMAT (2A5)
      ID01=ID02=0
      ICOD=0
      ICOUNT=2
      IF (NG1 .EQ. 0) GO TO 135
      CALL GAUGIN(NG1,SR1,100,ITORE,ICOUNT,IST01)
      ICOD=1
  135 IF (NG2 .EQ. 0.) GO TO 140
      CALL GAUGIN (NG2,SR2,12,ITORE,ICOUNT,IST02)
      ID02=SR2(NO02)
  140 ID01=SR1(NO01)
      JK1=JK
      IF (ISEAS(1,JK) .NE. 0) JK1=AND(SHIFT(ISEAS(2,JK),-11),17777)
```

```
      CALL WRITMS (4,ITORE,ICOUNT,JK1,-1)
      ISEAS(1,JK)=OR (SHIFT(DATE(3),51),SHIFT(31*DATE(1)+DATE(2),42),
     1     SHIFT(ID01,27),SHIFT(ID02,12),ICOD)
      ICOD=0
      ISEAS(2,JK)=ICOUNT .OR. SHIFT(JK1,11)
      MD0=MAX0(MD0,ID01,ID02)
      GO TO 120
   12 DECODE (75,1018,DATA) DATE,PLUG1,PLUG2,NPROL,NPROJ,IAMB,NRPR,NESR
      ENCODE (10,1023,ITORE(1)) NRPR,NESR
 1023 FORMAT (2I5)
      WRITE (2,1025) NRPR,NESR
 1025 FORMAT (I6,17H PREVIOUS ROUNDS, I7,14H PREVIOUS ESR.)
      JK=JREC(ISEAS,DATE,NRECS,4)
      ID=DATE(1)
      WRITE (2,1017) IDATE(ID),DATE(2),DATE(3)
      ENCODE (10,1022,ITORE(2)) PLUG1,PLUG2
      ICOUNT=2
      READ ( 1,1024) (PROL(I),I=1,NPROL),(PROJ(I),I=1,NPROJ)
 1024 FORMAT (8A10)
      KOU=10*(1+NPROL+NPROJ)
      IF (IAMB .EQ. 0 .AND. AND(18,IAMB) .EQ. 1) IAMB=999.
      ENCODE (KOU,1026,ITORE(3)) IAMB,NPROL,NPROJ,(PROL(I),I=1,NPROL),
     1    (PROJ(IP,I=1,NPROJ)
 1026 FORMAT (I3,2I2,3X,60A10)
      NRDTOT=MCW=MVEL=MP=MRATE=NRD8=ICOD=0
      ICOUNT=ICOUNT + KOU/10
      DIAM3=6000./(DIAM*DIAM*DIAM)
  165 READ ( 1,1000) ICD,DATA
      ICDH=ICD-14
      IF (ICDH)170,170,145
  145 GO TO (150,155,160)     ,ICDH
C --  ROUND SETUP
  150 DECODE (75,1028,DATA) CASES,PLUGS,WADS,AGENTS,PRIMERS,IPROL,IPROJ,
     1     IRDTEMP
 1028 FORMAT (5A10,2I2,I3)
      ICASE=LOOK(CASES,NCASE,CASE)
      IPLUG=LOOK (PLUGS,NPLUG,PLUG)
      IWAD= LOOK (WADS,NWAD,WAD)
      IAGENT=LOOK (AGENTS,NAGENT,AGENT)
      IPRIMER=LOOK(PRIMERS,NPRIMER,PRIMER)
      WRITE (2,1029) CASES,PLUGS,WADS,AGENTS,PRIMERS,PROL(IPROL),
     1     IRDTEMP,PROJ(IPROJ)
 1029 FORMAT (6H CASE=A10,5X,5HPLUG=A10,5X4HWAD=A10,7HAGENT= A10,5X
     1   7HPRIMER= A10/5XA10,10H PROL AT  I4,11H DEG. PROJ= A10)
      ICOUNT=ICOUNT+1
      ITORE(ICOUNT)=OR (SHIFT(ICASE,54),SHIFT(IPLUG,48),SHIFT(IWAD,42),
     1     SHIFT(IAGENT,36),SHIFT(IPRIMER,30),SHIFT(IPROL,24),
     2     SHIFT(IPROJ,18),SHIFT(IRDTEMP+100,9))
      GO TO 165
C --  SLOW FIRE
  155 DECODE (75,1030,DATA) ITIME,CW,P,VEL
 1030 FORMAT (I5,F5.2,F5.1,F5.0)
      P=P*PRESF
      NRDTOT=NRDTOT+1
      ICW=CW*DIAM3 +.5
      MCW=MAX0(ICW,MCW)
      IVEL=VEL
      MVEL=MAX0(IVEL,MVEL)
      IP=P*10  +.5
      MP=MAX0(IP,MP)
      ICOUNT=ICOUNT + 1
      IF (IVEL .EQ. 0) IVEL=0
      IF (ITIME .EQ. 0) ITIME=0
      WRITE (2,1031) ITIME,CW,VEL,P
 1031 FORMAT (3H AT16,11H HOURS CW= F10.3,6H VEL = F10.0,7H PRES =F10.1)
      ITORE(ICOUNT)=IFUN(ITIME,ICW,IVEL,IP,1)
```

```
      ICOD=MAX0(ICOD,3)
      GO TO 165
C --  BURST
  160 DECODE (75,1032,DATA) ITIME,CW,RATE,NRDS,PRESL,ICV,ICP
      PRESL=PRESL*PRESF
 1032 FORMAT (I5,F10.2,F10.0,I10,F10.1,2I1)
      IF (ICV .NE. 1) ICV=0
      IF (ICP .NE. 1) ICP=0
      WRITE(2,1033) ITIME,NROS,RATE,CW,PRESL
 1033 FORMAT (3H ATI6,11H A BURST OFI5,10H ROUNDS ATF10.2,13H RD/MIN. CW
     1 = F10.3,12H LAST PRES = F10.1)
      ICW=CW*DIAM3 +.5
      IRATE=25.*RATE +.5
      IPRESL=PRESL*10. +.5
      MCW=MAX0(MCW,ICW)
      MP=MAX0(IPRESL,MP)
      NROTOT=NROTOT+NRDS
      NR08=MAX0(NR08,NRDS)
      MRATE=MAX0(MRATE,IRATE)
      ICOD=4
      I=2
      ITORE(ICOUNT+1)=IFUN (ITIME,ICW,NRDS,IPRESL,2)
      ICCUNT=ICOUNT+2
      ITORE(ICOUNT)=OR (SHIFT(IRATE,45),SHIFT(ICV,1),ICP)
      IF (ICP .EQ. 1) CALL BURST (ICOUNT,NRDS,ITORE)
      IF (ICV .EQ. 1) CALL BURST (ICOUNT,NRDS,ITORE)
      GO TO 165
  170 JK1=JK
      IF (ISEAS(1,JK) .NE. 0) JK1=AND(SHIFT(ISEAS(2,JK),-11),17778)
      CALL WRITMS (4,ITORE,ICOUNT,JK1,-1)
      ISEAS (1,JK1=OR (SHIFT(DATE(3),51),SHIFT(31*DATE(1)+DATE(2),42),
     1      SHIFT(ICOUNT,30),SHIFT(MRATE,15),SHIFT(NROTOT,3),ICOD)
      ISEAS (2,JK1=OR (SHIFT(MCW,45),SHIFT(MVEL,30),SHIFT(MP/10,21),
     1      NR08,SHIFT(JK1,11))
C --  BITS 13 TO 21 ARE UNUSED.
      GO TO 121
   13 ICCUNT=1
      DECODE (20,1036,DATA) DATE,NCOS
 1036 FORMAT (4I5)
      JK=JREC(ISEAS,DATE,NRECS,7)
      ID=DATE(1)
      WRITE (2,1017) IDATE(ID),DATE(2),DATE(3)
      ITORE(ICOUNT)=OR (4,SHIFT(8*NCOS,30))
      ICOUNT=ICOUNT+1
      DO 180 I=1,NCOS
      READ (1,1038) DATA
 1038 FORMAT (8A10)
      ENCODE (80,1038,ITORE(ICOUNT  )) DATA
  180 ICCUNT=ICOUNT+8
      ICCUNT=ICOUNT-1
C --  WRITMS ITORE TO DISK
      WRITE (2,1040) (ITORE(I),I=2,ICOUNT)
 1040 FORMAT (1X8A10)
      JK1=JK
      IF (ISEAS(1,JK) .NE. 0) JK1=AND(SHIFT(ISEAS(2,JK),-11),17778)
      CALL WRITMS (4,ITORE,ICOUNT,JK1,-1)
      ISEAS (1,JK1=OR (SHIFT(DATE(3),51),SHIFT(31*DATE(1)+DATE(2),42),7)
      ISEAS (2,JK1=ICOUNT .OR. SHIFT(JK1,11)
      GO TO 120
      END
      SUBROUTINE MARRAY (I1,I2,MVEL,ICWM,NRDS,IRATE,NRDO,ID8,IPRES,
     1      NSUBREC)
      IBYTE (I,J,K)=SHIFT(I,1-J) .AND. COMPL(MASK(59+J-K))
      IFUN1(I,J,K,L)=  OR(SHIFT(I,45),SHIFT(J,30),SHIFT(K,15),L)
      IFUN2(I,J,K,L,M) = OR (SHIFT(I,48),SHIFT(J,36),SHIFT(K,24),
     1      SHIFT(L,12),M)
```

```
      I1=IFUN1(IBYTE(I1,46,60),MAX0(IBYTE(I1,31,45),MVEL),
     1     MAX0(IBYTE(I1,16,30),ICWM),IBYTE(I1,1,15)+NROS)
      I2=IFUN2(MAX0(IBYTE(I2,49,60),IRATE),MAX0(NROD,IBYTE(I2,37,48)),
     1     MAX0(IOB,IBYTE(I2,25,36)),MAX0(IPRES,IBYTE(I2,13,24)),
     2     MAX0(IBYTE(I2,1,12),NSUBREC))
      RETURN
      END
      SUBROUTINE BURST (ICOUNT,NROS,ITORE)
      DIMENSION ITORE(1000),L(603)
      READ ( 1,1) (L(I),I=1,NROS)
    1 FORMAT (16I5)
      L(NROS+1)=L(NROS+2)=L(NROS+3)=0
      DO 3 IL=1,NROS
    3 IF(L(IL) .EQ. 0) L(IL)=0
      M=(NROS+3)/4
      DO 2 I=1,M
      ICOUNT=ICOUNT+1
    2 ITORE(ICOUNT)=OR (SHIFT(L(4*I  ),45),SHIFT(L(4*I-1),30),
     1     SHIFT(L(4*I-2),15),L(4*I-3))
      RETURN
      END
      FUNCTION LOOK (CS,N,C)
      DIMENSION C(30)
      DO 1 I=1,N
      IF (C(I).EQ.CS) GO TO 2
    1 CONTINUE
      N=N+1
      C(N)=CS
      LOOK=N
      RETURN
    2 LOOK=I
      RETURN
      END
      SUBROUTINE GAUGIN (NG,SG,NNG,ITORE,J,ISTD)
      INTEGER SG
      DIMENSION SG(NNG),ITORE(1000)
      DIMENSION A(2)
      DATA A /4HUP  ,4HDOWN/
      IA=1
      IF (NNG .EQ. 12) IA=2
      NGA=(NG+3)/4
      NGB=4*NGA
      SG(NGB)=SG(NGB-1)=SG(NGB-2)=0.
      IF (ISTD .NE. 0) GO TO 20
      READ (1,1) (SG(I),I=1,NG)
    1 FORMAT (16I5)
      DO 5 I=1,NG
    5 IF (SG(I) .EQ. 0) SG(I)=0
      GO TO 7
   20 CALL PBYP (NG,SG,ISTD,IA)
    7 DO 2 I=1,NGA
      J=J+1
    2 ITORE(J)= OR(SG(4*I),SHIFT(SG(4*I-1),15),SHIFT(SG(4*I-2),30),
     1     SHIFT(SG(4*I-3),45))
      WRITE (2,10) NG,A(IA),(SG(I),I=1,NG)
   10 FORMAT (1X15,1XA4,17H READINGS FOLLOW. /(12I10))
      RETURN
      END
      SUBROUTINE PBYP(NG,SG,IA,IB)
C --  READ GAUGE DATA FOR DISTANCES OTHER THAN STANDARD.  CONVERT TO
C --       STANDARD READINGS AND STORE.
      DIMENSION SG(NG),SDR(100 ),SGR(100)
      COMMON CRAP(3610),SG1(112),SGCODE(56)
      COMMON/ONE/TRASH(3),NOB(2),TRASHN(155)
      INTEGER SG
      READ (1,100) IORD,NACT,PT, PACT,(SDR(I),SGR(I),I=1,NACT)
```

```
  100 FORMAT (2I5,2F5.2/(8(F5.2,F5.3)))
      DO 101 I=1,NG
  101 SG(I)=0
      GO TO (1,2) IORD
    1 CORR=PACT-PT
      DO 3 I=1,NACT
    3 SDR(I)=SDR(I)+CORR
      GO TO 5
    2 CORR=PACT+PT
      DO 4 I=1,NG
    4 SDR(I)=CORR-SDR(I)
      SDR(NG+1)=SDR(NG)+1.
C --  DISTANCES ARE NOW MEASURED FROM THE PROPER REFERENCE.
C --  FIND DESIRED READINGS BY INTERPOLATION
    5 CONTINUE
      DO 7 I=1,NG
      IF(SDR(1) .GE.SG1(I)) GO TO 15
    7 CONTINUE
      CALL OUT (4HPBYP)
   15 K=1
      IF (I .EQ. 1) GO TO 16
      IF (SDR(1)-SG1(I-1) .LE. 0.15) SG(I-1)=SGR(1) *1000.
   16 DO 25 J=I,NG
      SGA=SG1(100*(IA-1)+J)
   30 IF(SDR(K+1) .LE. SGA   ) GO TO 35
      K=K+1
      GO TO 30
   35 SG(J) = 1000. * (.0005+SGR(K) + (SGR(K+1) -SGR(K)) *
     1     (SGA - SDR(K)) / ( SDR(K+1) - SDR(K)))
   25 CONTINUE
      RETURN
      END
      FUNCTION JREC(ISEAS,DATE,NRECS,ICOD)
      DIMENSION ISEAS(2,1000),DATE(3)
      INTEGER DATE
      I1=OR(SHIFT(DATE(3),51),SHIFT(31*DATE(1)+DATE(2),42))
      DO 1 I=3,NRECS
      I2=AND(ISEAS(1,I),777777000000000000B)
      IF (I2 .EQ. I1) GO TO 3
      IF(I2) 1,2,1
    1 CONTINUE
      I=NRECS+1
      NRECS=500*(NRECS/500)+500
      IF (NRECS .GT. 1000) CALL OUT(4HJREC)
    2 JREC=I
      RETURN
    3 IC=ISEAS (1,I) .AND. 7B
      IF(IC .NE. ICOD .AND. IC .NE. ICOD-1) GOTO 1
      JREC=I
      WRITE (2,10)
   10 FORMAT (18H OVERWRITE RECORD.)
      RETURN
      END
```

PROGRAM BANKL

```
      PROGRAM BANKL (INPUT=65,OUTPUT=65,TAPE1=INPUT,TAPE2=OUTPUT,TAPE4)
      IMPLICIT LOGICAL (E)
C  --  SORT SUBFILE SEARCH ARRAYS BY DATE.
      COMMON INDEX (201),INDEXS(1001),ISEAM(2,200),ISEAS(2,1000),
     1     DATA(8),SG1(100),SG2(12),SG(56)
      DIMENSION REC1(160),IS(1000),IT(2,1000)
      COMMON /ONE/ CODE,NG1,NG2,NOB1,NOB2,DIAM,NG,NRECM,SAVE1,SAVE2,
     1     CASE(30),PLUG(30),WAD(30),PRIMER(30),AGENT(30)
      EQUIVALENCE (REC1,CODE)
      CALL OPENRE (4)
      READ (1,1000) IGUN
 1000 FORMAT (I5)
    1 CALL GUNCAL (4,IGUN,ENEXT,JJ)
      IF(ENEXT) STOP 100
      NRECS=AND(7777B,ISEAM(2,JJ))
      CALL READMS (4,INDEXS,NRECS+1,JJ)
      CALL STINDX (4,INDEXS,NRECS+1)
      CALL READMS(4,ISEAS,2*NRECS,1)
      DO 10 I=3,NRECS
      IF (ISEAS(1,I) .EQ. 0) GO TO 5
   10 IS(I)=OR( 7B .AND. ISEAS(1,I),
     1     SHIFT (ISEAS(1,I),-39) .AND. 77777700B)
      NR=NRECS
      GO TO 15
    5 NR=I-1
   15 DO 30 I=3,NR
      IMINV=77777777B
      DO 20 J=3,NR
      IF ( IS(J) .GE. IMINV) GO TO 20
      K=J
      IMINV=IS(J)
   20 CONTINUE
      IS(K)=77777777B
      IT(1,I)=ISEAS(1,K)
   30 IT(2,I)=ISEAS(2,K)
      CALL WRITMS ( 4,IT,2*NRECS,1,1)
      CALL STINDX (4,INDEX,NRECM+1)
      READ (1,1000) IGUN
      IF (IGUN .NE. 0) GO TO 1
      CALL CLOSMS (4)
      END
```

PROGRAM BANKO

```
      PROGRAM BANKO (INPUT=65,OUTPUT=514,TAPE4=514,TAPE1=INPUT,
     1     TAPE2=OUTPUT)
      IMPLICIT LOGICAL (E)
      COMMON INDEX (201),INDEXS(1001),ISEAM(2,200),ISEAS(2,1000),
     1     DATA(81,SG1(100),SG2(12),SG(56)
      DIMENSION SR1(100),SR2(12)
      COMMON/ONE/ CODE,NG1,NG2,NOB1,NOB2,DIAM,NG,NRECM,SAVE1,SAVE2,
     1     CASE(30),PLUG(30),WAD(30),PRIMER(30),AGENT(30)
      DIMENSION REC1(160),            DATE(3),SG(56),PROL(30),PROJ(30),
     1     IHELP(14 ),IH(24 ),IDATE(3),IDAT1(3),IDAT2(3)
      EQUIVALENCE (REC1,CODE),(DATE,IDATE)
      COMMON /TWO/INDM(200),MINV,MAXV,HOL,ICOM,IRMIN,IRMAX,JGUNS,
     1           IGDI,HOLS,KODE(8),M ,J,INDL(500),JM
      DIMENSION  NOGUN(200),NORS(200),DATES(12)
      COMMON /THREE/ ITORE(1000)
      DIMENSION HOLD ( 8,12)
      IBYTE(I,J,K)=SHIFT(I,1-J) .AND. COMPL(MASK(59+J-K))
      CALL OPENRE ( 4)
      DIAM3=6000./(DIAM*DIAM*DIAM)
  999 READ ( 1,1000) ICD,DATA
 1000 FORMAT (I5,7A10,A5)
  998 IF(ICD-1) 110,1,105
  110 CALL STINDX(4,INDEX ,201)
      CALL CLOSMS ( 4)
      STOP
    1 DECODE (75,1002,DATA) NGUN,(IHELP(I),I=1,NGUN)
 1002 FORMAT (15I5)
      DO 100 I=1,NGUN
      CALL GUNCAL ( 4,IHELP(I),ENEXT,INDM(I))
      IF (ENEXT) STOP 1
  100 CONTINUE
      JGUNS=NGUN
      DATA HOA/10HGUN NOS   /
      HOL=HOA
      GO TO 150
  105 DECODE (75,1004,DATA) AMINV,AMAXV
 1004 FORMAT (2F5.0)
      ICOM=ICD-1
      IRMIN=4
      IRMAX=NRECM
      GO TO (2,3,4,5,6,7,8) ICOM
C --  VELOCITY
    2 MINV=AMINV
      MAXV=AMAXV
      CALL SELECT (1,31,45)
      GO TO 150
C --  CHARGE WEIGHT
    3 CONTINUE
      MINV=DIAM3*AMINV
      MAXV=DIAM3*AMAXV
      CALL SELECT (1,16,30)
      GO TO 150
C --  NUMBER OF ROUNDS SHOT
    4 MINV=AMINV+.1
      MAXV=AMAXV+.1
      CALL SELECT (1,1,15)
      GO TO 150
C --  RATE OF FIRE (RDS/MIN)
    5 MINV=25.*AMINV+.1
      MAXV=25.*AMAXV+.1
      CALL SELECT(2,49,60)
      GO TO 150
```

```
C --  NUMBER RDS/BURST
    6 MINV=AMINV+.1
      MAXV=AMAXV+.1
      CALL SELECT(2,37,48)
      GO TO 150
C  -- GAUGINGS
    7 MINV=1000.*AMINV+.1
      MAXV=1000.*AMAXV+.1
      CALL SELECT (2,25,36)
      GO TO 150
C --  MAX PRES
    8 MINV=AMINV+.5
      MAXV=AMAXV+.5
      CALL SELECT (2,13,24)
  150 WRITE ( 2,1006) JGUNS,HOL
 1006 FORMAT (1H0I5,27H GUNS WERE CHOSEN BASED ON A10,28H LIST OF GUN NU
     1MBERS FOLLOW: )
      IF (JGUNS .NE. 0) GO TO 155
C --  BYPASS UNNEEDED CARDS
  160 READ 1000,ICD,DATA
      IF (ICD .LE. 10) GO TO 998
      GO TO 160
  155 DO 165 I=1,JGUNS
      IN=INDM(I)
      NOGUN(I)=IBYTE(ISEAM(1,IN),46,60)
  165 NORS(I)=IBYTE (ISEAM(2,IN),1,12)
      WRITE ( 2,1008) (NOGUN(I),I=1,JGUNS)
 1008 FORMAT (1X12I10)
      IZ=1
  170 READ (1,1007) (HOLD(I,IZ),I=1,8)
 1007 FORMAT (8A10)
      DECODE (5,1000,HOLD(1,IZ)) ICD
      IZ=IZ+1
      IF (ICD .GT. 10) GO TO 170
      IZ=IZ-2
C --  CALL UP DESIRED SUBINDEX
      DO 997 KITTY=1,JGUNS
      CALL READMS ( 4,INDEXS(1), NORS(KITTY)+1,INDM(KITTY))
      CALL STINDX ( 4,INDEXS,NORS(KITTY)+1)
      CALL READMS ( 4,ISEAS, 2*NORS(KITTY),1)
C --  SELECT RECORDS TO BE READ FROM DISK
      DO 257 IY=1,IZ
      DECODE (80,1000,HOLD(1,IY)) ICD,DATA
  995 IRMIN=3
      IRMAX=NORS(KITTY)+1
      IF (ICD-11) 998,200,205
C --  SELECT BY RECORD NUMBER
  200 DECODE (75,1010,DATA)  NS,(INDL(I),I=1,NS)
 1010 FORMAT (25I3)
      DATA HOA1/10HRECORD NO /
      HOLS=HOA1
      IF (NS .EQ. 0) GO TO 201
      J=NS
      GOTO 250
  201 J=IRMAX-IRMIN+1
      DO 203 I=1,J
  203 INDL(I)=I+2
      GO TO 250
  205 IF (ICD .NE. 12) GO TO 210
      DECODE (75,1012,DATA)IDAT1,IDAT2,M,(KODE(I),I=1,M)
 1012 FORMAT (15I5)
      MINV =SHIFT(MOD(IDAT1(3),100),9) .OR.(31*IDAT1(1)+IDAT1(2))
      MAXV = SHIFT(MOD(IDAT2(3),100),9) .OR.(31*IDAT2(1)+IDAT1(2))
      CALL SEL4    (1,43,60)
      GO TO 250
  210 ICDI=ICD-12
```

```
      DECODE (75,1804,DATA) AMINV,AMAXV
      GO TO(13,14,15,16,17,18,19),ICDI
   13 CONTINUE
      MINV=DIAM3*AMINV
      MAXV=DIAM3*AMAXV
      CALL SEL2 (2,46,60)
      GO TO 250
   14 MINV=AMINV+.1
      MAXV=AMAXV+.1
      CALL SEL2  (1,4,15)
      GOTO 250
   15 MINV=25.*AMINV+.5
      MAXV=25.*AMAXV+.5
      CALL SEL2 (1,16,30)
      GO TO 250
   16 MINV=AMINV+.1
      MAXV=AMAXV+.1
      CALL SEL2(2,1,12)
      GO TO 250
   17 MINV=AMINV+.1
      MAXV=AMAXV+.1
      CALL SEL3 (1,28,42)
      GO TO 250
   18 MINV=AMINV+.5
      MAXV=AMAXV+.5
      CALL SEL2 (2,22,30)
   19 MINV=AMINV+.5
      MAXV=AMAXV+.5
      CALL SEL2 (2,31,45)
C --  WRITE OUT DATA
C --  THE WORD NUMBERS OF THE INDEX ARRAY CONTAINING DATA OF INTEREST
C --       ARE STORED IN INDL.
  250 CONTINUE
      WRITE (2,1015) NOGUN(KITTY),J
 1015 FORMAT (11H1GUN NUMBER I6,1H.I6,19H RECORDS REQUESTED.)
      IF(J) 251,251,252
  251 WRITE (2,1013)
 1013 FORMAT (8H NO DATA )
      GOTO 256
  252 DO 255 LOOP=1,J
      LOO=INDL(LOOP)
      ISEA1=ISEAS(1,LOO )
      ISEA2=ISEAS(2,LOO )
      J1=IBYTE(ISEA2,12,21)
      ISEA3=AND(ISEA2,37778)
      IF (ISEA1 .EQ. 0) GOTO 257
      IDATE(1)=IBYTE(ISEA1,52,60)
      IDATES=IBYTE(ISEA1,43,51)
      IDATE(3)=(IDATES-1)/31
      IDATE(2)=IDATES-31*IDATE(3)
      IDATE1=IDATE(3)
      DATA DATES /3HJAN,3HFEE,5HMARCH,5HAPRIL,3HMAY,4HJUNE,4HJULY,3HAUG,
     1     4HSEPT,3HOCT,3HNOV,3HDEC/
      WRITE ( 2,1014) DATES(IDATE1),IDATE(2),IDATE(1)
 1014 FORMAT(1H0/1H0A5,I3,4H, 19I2)
      IC1=AND (7B,ISEA1)+1
      GO TO (260,261,262,262,262,264,264,267),IC1
C --  PLUG GAUGE ONLY
  260 CALL READMS ( 4,ITORE,2,J1)
      WRITE ( 2,1016) ITORE(2),ITORE(2)
 1016 FORMAT (20H0PLUG GAGE READINGS:A5,5H AND R5)
      GO TO 255
C -- STARGAUGE RECORD
  261 CALL READMS ( 4,ITORE,ISEA3,J1)
      WRITE (2,1016) ITORE(2),ITORE(2)
      NG1=77777777778 .AND. ITORE(1)
```

```
      NG2=IBYTE (ITORE(1),31,60)
      CALL SGR (NG1+3,ITORE,1,NOB1,SG1,SR1)
      IF (NG2 .NE.0) CALL SGR(NG2+3,ITORE,2,NOB2,SG2,SR2)
      GO TO 255
C --  FIRING DATA
  262 ISEAH=IBYTE(ISEA1,31,42)
      CALL READMS (4,ITORE,ISEAH,J1)
      WRITE (2,1011) ITORE(1),ITORE(1)
 1011 FORMAT (1XA5,20H PREVIOUS ROUNDS OR, R5,5H ESR.)
      WRITE (2,1016) ITORE(2),ITORE(2)
      DECODE (10,1018,ITORE(3)) IAMB,NPROL,NPROJ
 1018 FORMAT (I3,2I2)
      IF (IAMB .NE. 999) WRITE (2,1017) IAMB
 1017 FORMAT (25H AMBIENT TEMPERATURE WAS  I4)
      II=10* (NPROL+NPROJ)
      DECODE(II,              1019,ITORE(4)) (PROL(I),I=1,NPROL),
     1      (PROJ(I),I=1, NPROJ)
 1019 FORMAT (8A10)
      NEXTI=4+NPROL+NPROJ
C--   ROUND SETUP
  271 IF (NEXTI .GT. ISEAH) GO TO 255
      IT=ITORE (NEXTI)
      NEXTI=NEXTI+1
      IDIR=1+AND(78,IT)
      GO TO (270,275,280),IDIR
  270 CASES=CASE(IBYTE(IT,55,60))
      PLUGS=PLUG(IBYTE(IT,49,54))
      WADS=WAD(IBYTE(IT,43,48))
      AGENTS=AGENT(IBYTE(IT,37,42))
      PRIMERS=PRIMER(IBYTE(IT,31,36))
      PROLS=PROL(IBYTE(IT,25,30))
      PROJS=PROJ(IBYTE(IT,19,24))
      IROTEMP=IBYTE(IT,10,18)-100
      WRITE (2,1020) CASES,PLUGS,WADS,AGENTS,PRIMERS,PROJS,PROLS,IROTEMP
 1020 FORMAT (6HOCASE: A10,8H  PLUG: A10,7H  WAD: A10,9H  AGENT: A10,10H
     1  PRIMER: A10,14H  PROJECTILE: A10/6X12HPROPELLANT: A10,15H CONDIT
     2IONED AT15,9H DEGREES.)
      GO TO 271
  275 ITIME=IBYTE(IT,46,60)
C --  SINGLE FIRE
      CW=FLOAT(IBYTE(IT,31,45))/DIAM3
      VEL=FLOAT(IBYTE(IT,16,30))
      PRES=FLOAT(IBYTE(IT,4,15))/10.
      WRITE ( 2,1022) ITIME,CW,VEL,PRES
 1022 FORMAT (6H TIME:I6, 8H CHARGE:F9.4,16H LBS. VELOCITY: F6.0,15H F/S
     1. PRESSURE:F6.1,6H KPSI.)
      GO TO 271
C --  RAPID FIRE
  280 ITIME=IBYTE(IT,46,60)
      CW=FLOAT(IBYTE(IT,31,45))/DIAM3
      NRDS=IBYTE(IT,16,30)
      PRESL=FLOAT(IBYTE(IT,4,15))/10.
      IT=ITORE(NEXTI)
      NEXTI=NEXTI+1
      RATE=FLOAT(IBYTE(IT,46,60))/25.
      WRITE ( 2,1024) ITIME,CW,NRDS,RATE,PRESL
 1024 FORMAT (6H TIME:I6,8H CHARGE:F9.4,I10,16H ROUNDS FIRED AT F10.2,11H
     1 RDS/MIN.  19H THE LAST PRESSURE:F6.1)
      IF (AND(1B,IT) .EQ. 1) CALL RBU(NRDS,1,ITORE,NEXTI)
      IF (AND(2B,IT) .GT. 0) CALL RBU(NRDS,2,ITORE,NEXTI)
      GO TO 271
  264 WRITE ( 2,1026) IC1
 1026 FORMAT ( 1H0/12H0ERROR--IC1=I2)
      STOP
C  -- ALPHA RECORD
  267 CALL READMS (4,ITORE,ISEA3,J1)
```

```
      WRITE (2,1028) (ITORE(I),I=2,ISEA3)
 1028 FORMAT (1X8A10)
  255 CONTINUE
  257 CONTINUE
  256 CALL STINDX (4,INDEX ,201)
  997 CONTINUE
      DECODE (80,1000,HOLD(1,IZ+1)) ICD,DATA
      GO TO 998
      END
      SUBROUTINE SELECT      (N,I1,I2)
      DIMENSION HO(7),HP(8)
      COMMON INDEX (201),INDEXS(1001),ISERM(2,200),ISERS(2,1000),
     1      DATA(8),SG1(100),SG2(12),SG(56)
      COMMON/TWO/INDM(200),K,L,HOL,ICDM,IRMIN,IRMAX,JGUN,          ICDI,
     1      HOLS,KODE(8),M,J,INDL(500),JM
      IBYTE (I,J,K)=SHIFT(I,1-J) .AND. COMPL(MASK(59+J-K))
      DATA HO/10HVELOCITY   ,10HCHARGE WT ,10HNO OF RDS ,10HBURST RATE,
     1      10HRDS/BURST ,10HBORE DIAM ,10HMAX PRES  /
      JGUN=0
      DO 1 I=IRMIN,IRMAX
      II=IBYTE (ISERM(N,I),I1,I2)
      IF (II .LT. K .OR.  II .GT. L) GO TO 1
      JGUN=JGUN+1
      INDM(JGUN)=I
    1 CONTINUE
      HOL=HO(ICDM)
      RETURN
      ENTRY SEL2
      DATA HP/10HDATE       ,10HBOB DIAM    , 10HBURST RATE, 10HRDS FIRED ,
     1  10HCHARGE WT , 10HVELOCITY  , 10HPRESSURE  , 10HRDS/BURST /
      J=0
      DO 2 I=IRMIN,IRMAX
      II=IBYTE (ISERS(N,I),I1,I2)
      IJ=78 .AND. ISERS(1,I)
      IF((II .LT. K .OR. II .GT. L) .OR.  IJ .EQ.7 .OR.  IJ .LE. 1)GOTO2
      J=J+1
      INDL(J)=I
    2 CONTINUE
      HOL=HP(ICDI)
      RETURN
      ENTRY SEL3
      J=0
      DO 3 I=IRMIN,IRMAX
      II=IBYTE (ISERS(N,I),I1,I2 )
      IJ=78 .AND. ISERS(1,I)
      IF (IJ .GE.2 .OR. II .LT. K .OR. II .GT. L) GO TO 3
      J=J+1
      INDL(J)=I
    3 CONTINUE
      HOLS=HP(ICDI)
      RETURN
      ENTRY SEL4
      J=0
      DO 4 I=IRMIN,IRMAX
      IJ=78 .AND. ISERS (1,I)
      DO 5 I9=1,M
      IF (IJ .EQ. KODE(I9)) GO TO 6
    5 CONTINUE
      GO TO 4
    6 II=IBYTE(ISERS(N,I),I1,I2)
      IF(II .LT. K .OR. II .GT. L) GO TO 4
      J=J+1
      INDL(J)=I
    4 CONTINUE
      RETURN
      END
```

```
      SUBROUTINE RBU (N,I,ITCRE,NEXTI)
      DIMENSION A(2),ITORE(1000),PAR(600)
      REAL IBYTE
      DATA A/10HPRESSURES , 10HVELOCITIES/
      IBYTE(I,J,K)=8*FLOAT(SHIFT(I,1-J) .AND. COMPL(MASK(59+J-K)))
      I2=(N+3)/4
      B=1
      IF (I.EQ.1)B=0.1
      DO 1 I1=1,I2
      IT=ITORE(NEXTI+I1-1)
      PAR(4*I1-3)=IBYTE(IT,46,60)
      PAR(4*I1-2)=IBYTE(IT,31,45)
      PAR(4*I1-1)=IBYTE(IT,16,30)
    1 PAR(4*I1)=IBYTE(IT,1,15)
      NEXTI=NEXTI+I2
      WRITE ( 2,2) A(I),(PAR(I),I=1,N)
    2 FORMAT ( 7H BURST A10,32H FOLLOW. (READ ACROSS THE PAGE.)/(1X12F10
     1.1) )
      RETURN
      END
      SUBROUTINE SGR (NT,ITORE,ITIME,NOB,SG,SR)
      DIMENSION ITORE(1000),SG(NT),SR(NT),TYPE(2)
      REAL IBYTE
      DATA TYPE /5HALPHA,5HGAMMA/
      IBYTE(I,J,K)=FLOAT(AND(SHIFT(I,1-J),COMPL(MASK(59+J-K))))/1000.
      ICT=NT/4
      IF (ITIME .EQ. 1) ICOUNT=2
      DO 1 I=1,ICT
      ICOUNT=ICOUNT + 1
      IT=ITORE(ICOUNT)
      SR(4*I -3)=IBYTE(IT,46,60)
      SR(4*I -2)=IBYTE(IT,31,45)
      SR(4*I -1)=IBYTE(IT,16,30)
    1 SR(4*I )=IBYTE(IT,1,15)
      NG=NT-3
      WRITE ( 2,2) TYPE(ITIME),   SR(NOB),(SG(I),SR(I),I=1,NG)
    2 FORMAT      (21H0STARGAUGE READINGS (A5,25H).  THE ORIGIN READING I
     1S F7.3,1H./1H0 6(20HDISTANCE  READING   )/(1X6(F10.2,F10.3)))
      RETURN
      END
```

PROGRAM POINT

```
      PROGRAM POINT (INPUT=256,OUTPUT=256,TAPE4=513,          TAPE1=
     1    INPUT,TAPE2=OUTPUT)
      IMPLICIT LOGICAL (E)
      COMMON INDEX(201),INDEXS(1001),ISEAM(2,200),ISEAS(2,1000),
     1    DATA(6),SG1(100),SG2(12),SG(56)
      COMMON /ONE/ CODE,NGA,NGB,NOB1,NOB2,NIAP,NG,NRECM,SAVE1,SAVE2,
     1    CASE(30),PLLG(30),WAD(30),PRIMER(30),AGENT(30)
      DIMENSION ITORE (1000),ISAVE(1000),REC1(160),DIST(15),ILIST(15),
     1    JLIST(6),SHOT(500),SGARR(6,500),ISG(6)
      DIMENSION ILIST1 (15)
      DIMENSION SR1(100),SR2(12)
      EQUIVALENCE (REC1,CODE)
      DATA (SHOT(I),I=1,500) /500*1.0E0/,NFOOT/0/,LEGOT/0/
      IBYTE (I,J,K)= SHIFT(I,1-J) .AND. COMPL(MASK(59+J-K))
C--THIS PROGRAM WILL FETCH NEAR VS NUMBER OF ROUNDS FIRED DATA FOR
C      PLOTTING.
      CALL CONNEC (5LINPUT)
      CALL CONNEC (6LOUTPUT)
      PRINT 1040
      READ 1070,HELP
 1070 FORMAT (A10)
      IF (HELP .EQ. 2LNO) GO TO 150
      PRINT 1050,(SG1(I1),I1=1,NGA)
 1050 FORMAT ("0CODE=1 FOR ROUND COUNT FROM ISEAS ARRAY, =2 FOR NUMBER
     1IN RECORD,"/" =3 FOR ESP COUNT FROM USER FUNCTION, =4 FOR ESP FROM
     2ISEAS ARRAY"/" POSSIBLE STARGAUGE DISTANCES (ALPHA) FOLLOW:"/
     3(1X9F8.2))
      PRINT 1060,(SG2(I1),I1=1,NGB)
 1060 FORMAT ("POSSIBLE STARGAUGE DISTANCES (GAMMA) FOLLOW:"/(1X9F8.2))
      CALL OPENNE (4)
  150 DIAM3=6000./DIAM**3
      PRINT 1020
 1040 FORMAT (" DO YOU NEED INSTRUCTIONS?")
 1020 FORMAT ("ENTER GUN NUMBER, JCODE")
    1 READ (1,*    ) IGUNNO,JCODE
      IF (IGUNNO .EQ. 0) CALL CLOSM (4)
      IF (IGUNNO .EQ. 0) STOP
      CALL GUNCAL ( 4,IGUNNO,ENEXT,LGUN)
      IF (ENEXT) CALL OUT (5HPOINT)
      NCRS = IBYTE(ISEAM(2,LGUN),1,12)
C--CALL UP SUBINDEX
      CALL READMS ( 4,INDEXS,NCRS+1,LGUN)
      CALL STINDX ( 4,INDEXS,NCRS+1)
      CALL READMS ( 4,ISEAS,2*NCRS,1)
      PRINT 1030
 1030 FORMAT (" ENTER 1 FOR ALPHA, 2 FOR GAMMA:NUMBER OF DISTANCES: DIST
     1 ANCES")
      READ (1,*    ) IUP,II,(DIST(I),I=1,II)
      EUP=IUP .EQ. 1
      IF (EUP) GO TO 10
      DO 15 I=1,II
      DO 20 J=1,NGB
      IF (ABS(DIST (I)-SG2(J)).GT. 0.1) GO TO 20
      ILIST(I)=J
      GO TO 15
   20 CONTINUE
      STOP2
   15 CONTINUE
      GO TO 35
   10 DO 25 I=1,II
      DO 30 J=1,NGA
```

```
      IF (ABS(DIST(I)-SG1(J)) .GT. 0.1) GO TO 30
      ILIST (I) =J
      GO TO 25
   30 CONTINUE
      STOP3
   25 CONTINUE
      ELIST=.TRUE.
      DO 40 I=1,II
      DO 45 J=1,NGB
      IF (ABS(DIST(I)-SG2(J)).GT. 0.1) GO TO 45
      ILIST1(I)=J
      GO TO 40
   45 CONTINUE
      ELIST=.FALSE.
      GO TO 35
   40 CONTINUE
   35 NSUB=1
      NRDCT=0
      NESR=0
      EGAUGE=.FALSE.
      ESTART=.TRUE.
      NRECS=AND(7777B,ISEAM(2,LGUN))
      DO 50 I=3,NRECS
      ISEA1=ISEAS(1,I)
      IF (ISEA1 .EQ. 0) GO TO 51
      ISEA2=ISEAS(2,I)
      J1=IBYTE(ISEA2,12,21)
      IC1=AND(7B,ISEA1)+1
      ISEA3=AND(ISEA2,3777B)
      GO TO (50,55,60,60,60,50,50,50),IC1
   55 CONTINUE
       IF (EGAUGE) GO TO 50
      CALL READMS ( 4,ITORE,ISEA3,J1)
      NG1=AND (7777777777B,ITORE(1))
      NG2=IBYTE (1TORE(1),31,60)
      CALL SGZ (NG1+3,ITORE,1,NOB1,SG1,SR1)
      IF (      EOF) GO TO 70
      IF (NG2 .EQ. 0) GO TO 50
      CALL SGZ (NG2+3,ITORE,2,NOB2,SG2,SR2)
      DO 75 N=1,II
      K=ILIST(N)
   75 SGARR (N,NSUB)=SR2(K)
      NSUB=NSUB+1
      EGAUGE=.TRUE.
      GO TO 50
   70 DO 80 N=1,II
      K=ILIST(N)
   80 SGARR (N,NSUB)=SR1(K)
      NSUB=NSUB+1
      EGAUGE=.TRUE.
      GO TO 50
   60 EGAUGE=.FALSE.
      LSUB=NSUB
      ICOUNT=IBYTE (ISEAS(1,I),31,42)
      JK=IBYTE (ISEAS(2,I),12,21)
      GO TO (101,102,103,104),JCODE
C +-  COUNT NUMBER OF ROUNDS FIRED
  101 CONTINUE
      SHOT(NSUB)=NRDCT=NRDCT+IBYTE(ISEAS(1,I),4,15)
      GO TO 50
C --  OBTAIN NUMBER OF ROUNDS FIRED FROM RECORD
  102 CALL READMS ( 4,ITORE,ICOUNT,JK)
      DECODE (10,1000,ITORE) NRDCT
 1000 FORMAT (I5)
      SHOT(NSUB)=NRDCT+IBYTE(ISEAS(1,I),4,15)
      GO TO 50
```

```
C --   OBTAIN ESR BY COUNT                                                    001367
  103 CALL READMS ( 4,ITORE,ICOUNT,JK)                                       001370
      NROM=IBYTE (ISEAS(1,I),4,15)                                           001380
      RDEQ=COMESR(ITORE,ICOUNT,CIAM3)                                        001390
      RCEQCT=RCEQCT+RDEQ                                                     001400
      SHOT(NSUB)=RCEQCT                                                      001410
  110 IF (LSUB .EQ. 1) GO TO 50                                              001420
      IF (SHOT(LSUB-1) .LE. SHOT(NSUB))GO TO 50                              001430
      LSUB=LSUB-1                                                            001440
      SHOT (LSUB)=SHOT(NSUB)                                                 001450
      GO TO 110                                                              001460
C --   OBTAIN ESR FROM NUMBER IN RECORD                                       001470
  104 CALL READMS (4,ITORE,ICOUNT,JK)                                        001480
      DECODE (10,1005,ITORE) RDEQCT                                          001490
 1005 FORMAT (5X15)                                                          001500
      SHOT(NSUB)=RCEQCT                                                      001510
      GO TO 110                                                              001520
   50 CONTINUE                                                               001530
   51 NSUB=NSUB-1                                                            001540
      DO 120 I=1,NSUB                                                        001550
      ISHOT=SHOT(I)                                                          001560
      DO 125 J=1,II                                                          001570
  125 ISG(J)=1000.*SGARR(J,I)                                                001580
  120 WRITE ( 2,1010) (ISG(J),J=1,II),ISHOT                                  001590
 1010 FORMAT (7I6)                                                           001600
      CALL STINDX (4,INDEX,201)                                              001610
      GO TO 1                                                                001620
      END                                                                    001630
      SUBROUTINE SGZ (NT,ITORE,ITIME,NOB,SG,SR)                              001640
      DIMENSION ITORE(1000),SG(NT),SR(NT),TYPE(2)                            001650
      REAL IBYTE                                                             001660
      DATA TYPE /5HALPHA,5HGAMMA/                                            001670
      IBYTE(I,J,K)=FLOAT(AND(SHIFT(I,1-J),COMPL(MASK(59+J-K))))/1000.        001680
      ICT=NT/4                                                               001690
      IF (ITIME .EQ. 1) ICOUNT=2                                             001700
      DO 1 I=1,ICT                                                           001710
      ICOUNT=ICOUNT + 1                                                      001720
      IT=ITORE(ICOUNT)                                                       001730
      SR(4*I -3)=IBYTE(IT,46,60)                                             001740
      SR(4*I -2)=IBYTE(IT,31,45)                                             001750
      SR(4*I -1)=IBYTE(IT,16,30)                                             001760
    1 SR(4*I )=IBYTE(IT,1,15)                                                001770
      NG=NT-3                                                                001780
      RETURN                                                                 001790
      END                                                                    001800
396,1                                                                        001820
1,2,136.,160.                                                                001830
376,1                                                                        001840
1,1,136.                                                                     001850
0,0                                                                          001860
```

```
**********          IN4P05J  //// END OF LIST ////
**********          IN4P05J  //// END OF LIST ////
```

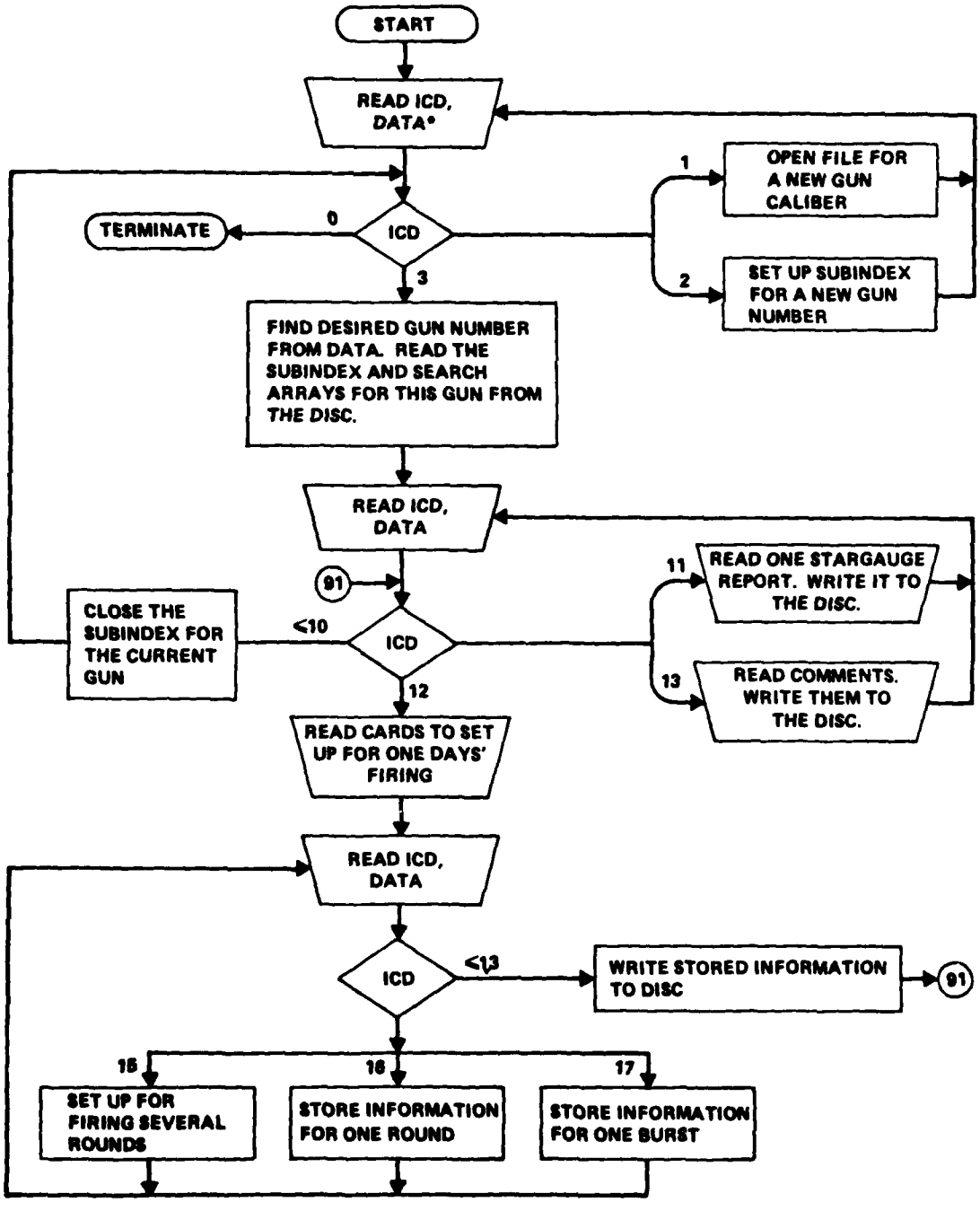
LISTING USED BY ALL PROGRAMS

```
      SUBROUTINE OUT(SUB)
      COMMON INDEX (201),INDEXS(1001),ISEAM(2,200),ISEAS(2,1000),
     1     DATA(81,SG1(100),SG2(12),SG(56)
      CALL STINDX ( 4,INDEX,201)
      CALL CLOSMS( 4)
      PRINT 1,SUB
    1 FORMAT (19H1ERROR--SUBPROGRAM  A10)
      STOP
      END
      SUBROUTINE GUNCAL (IFN,IGUN,ENEXT,JJ)
      LOGICAL ESTOP,ENEXT
      COMMON INDEX (201),INDEXS(1001),ISEAM(2,200),ISEAS(2,1000),
     1     DATA(8),SG1(100),SG2(12),SG(56)
      COMMON /ONE/ TRASH(7),NRECM ,OTH(152)
      IBYTE (I,J,K)=SHIFT(I,1-J) .AND. COMPL(MASK(59+J-K))
      WRITE (  2,15) IGUN
   15 FORMAT (11HOGUN NUMBER I7)
    1 DO 2 I=4,NRECM
      I1=IBYTE(ISEAM(1,I),46,60)
      IF (I1 .EQ. IGUN) GO TO 5
      IF(I1) 2,4,2
    2 CONTINUE
      WRITE (2,10) NRECM,IGUN
   10 FORMAT (27H MAIN ARRAY FILLED. NRECM = I5,7H IGUN = I5)
      CALL OUT (6HGUNCAL)
    5 JJ=I
      ENEXT=.FALSE.
      RETURN
    4 JJ=I
      ENEXT=.TRUE.
      RETURN
      END
      SUBROUTINE OPENRE (IFN)
      EXTERNAL LEAVE
      COMMON INDEX (201),INDEXS(1001),ISEAM(2,200),ISEAS(2,1000),
     1     DATA(8),SG1(100),SG2(12),SG(56)
      COMMON /ONE/ CODE,NG1,NG2,NOB1,NOB2,DIAM,NG,NRECM,S1,S2,S(150)
      DIMENSION REC1(160)
      EQUIVALENCE (REC1,CODE)
      CALL RECOVR (LEAVE,778,0)
      CALL OPENMS (IFN,INDEX,201,0)
      CALL READMS (IFN,REC1,160,1)
      CALL READMS (IFN,SG,NG,2)
      NG0=NG1
      IF (MOD(NG1,2) .EQ. 1) NG0=NG1+1
      DECODE (560,1,SG) (SG1(I),I=1,NG0),(SG2(I),I=1,NG2)
    1 FORMAT (112F5.2)
      CALL READMS (IFN,ISEAM,400,3)
      RETURN
      END
      SUBROUTINE LEAVE (IA,IB,IFIELD)
      IB=1
      CALL OUT(5HLEAVE)
      END
```

APPENDIX E

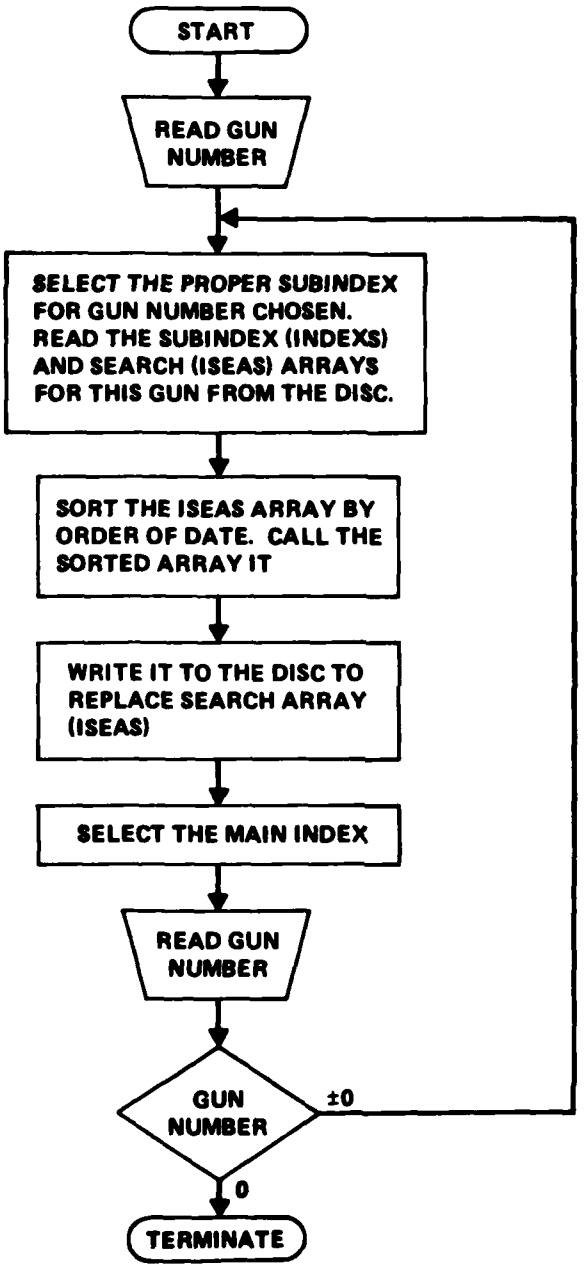
FLOW DIAGRAMS

PROGRAM BANKN

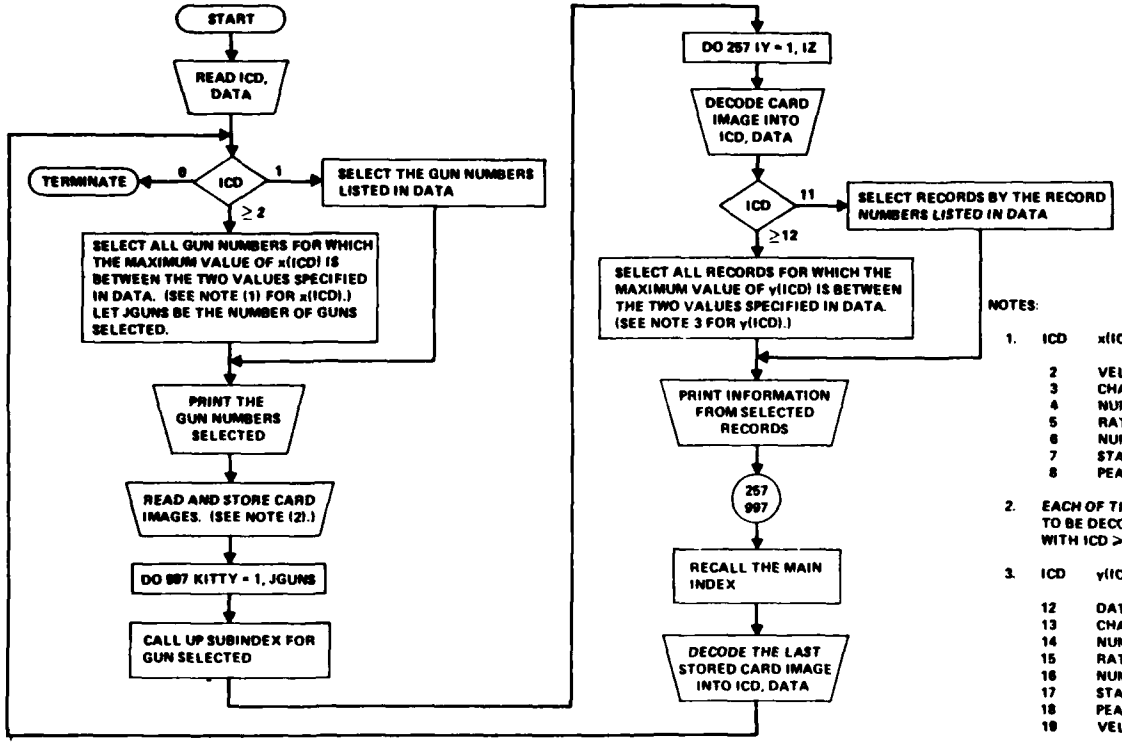


*THE DATA ARRAY IS USED FOR TEMPORARY STORAGE OF ALPHANUMERIC INFORMATION READ FROM A CARD. THIS INFORMATION IS THEN DECODED AS NEEDED.

PROGRAM BANKL



PROGRAM BANKO



NOTES:

1. ICD x(ICD)

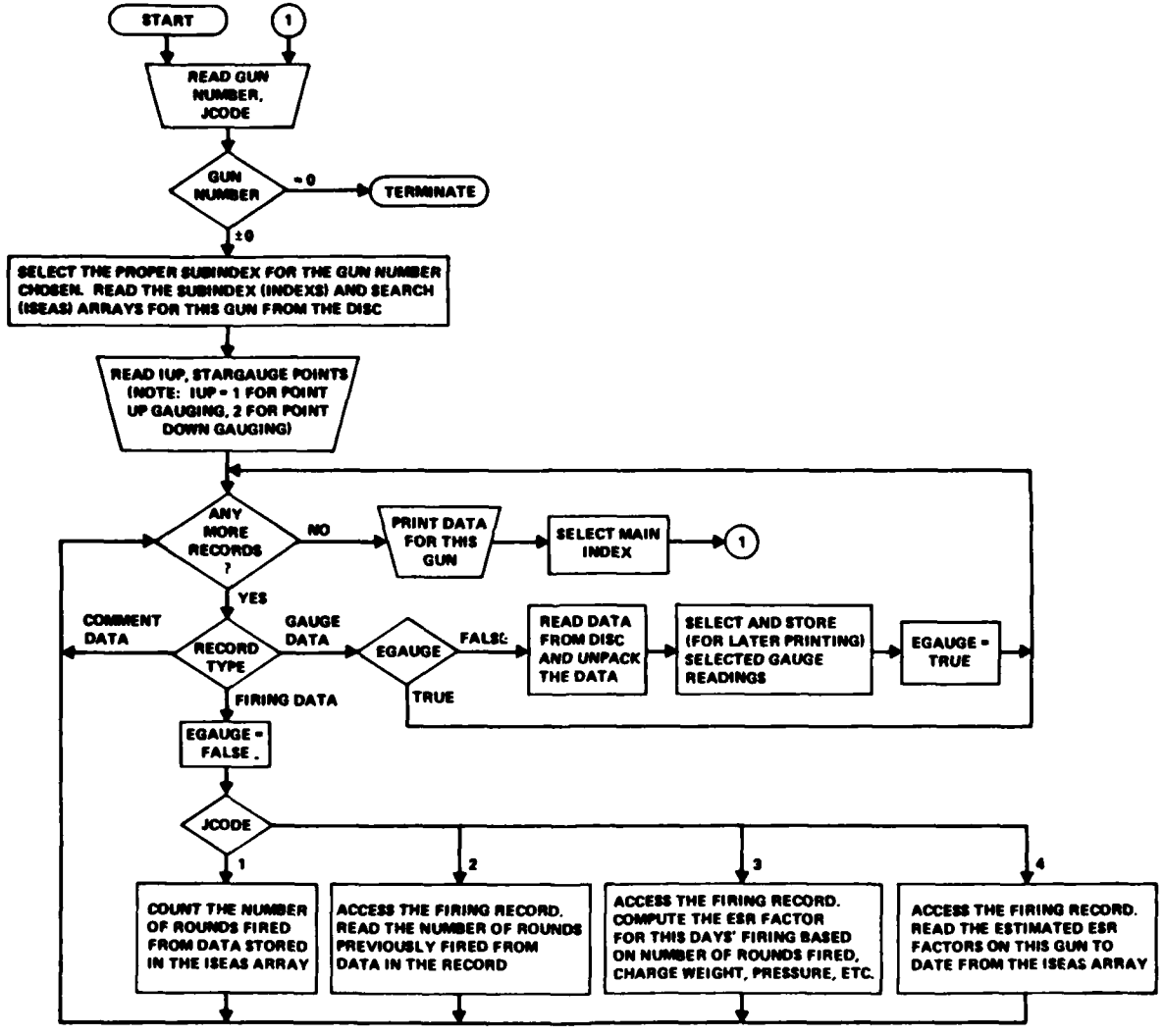
2	VELOCITY (ft/sec)
3	CHARGE WEIGHT (lb)
4	NUMBER OF ROUNDS ON GUN
5	RATE OF FIRE (rd/min)
6	NUMBER OF ROUNDS IN ONE BURST
7	STARGAUGE READING AT ORIGIN (in.)
8	PEAK PRESSURE (Kpsi)

2. EACH OF THESE CARD IMAGES CONTAIN INSTRUCTIONS TO BE DECODED LATER. IZ IS THE NUMBER OF CARDS WITH ICD ≥11; WE READ IZ + 1 CARDS.

3. ICD y(ICD)

12	DATE
13	CHARGE WEIGHT
14	NUMBER OF ROUNDS FIRED THAT DAY
15	RATE OF FIRE
16	NUMBER OF ROUNDS IN ONE BURST
17	STARGAUGE READING AT ORIGIN (in.)
18	PEAK PRESSURE
19	VELOCITY

PROGRAM POINT



APPENDIX F

NOTES ON PROGRAMS AND SUBPROGRAMS USED BY THE DATA BANK

PROGRAM BANKN controls the reading of data from cards into the data bank. The following subprograms are associated with BANKN:

1. SUBROUTINE MARRY is used to place data in the ISEAM array, which is used to determine which gun subfiles contain requested data (Appendix B).

2. SUBROUTINE BURST is used to enter velocity data for multiple round bursts into the data bank.

3. SUBROUTINE LOOK stores the name of the cases, wads, plugs, wear-reducing agents, and primers. These data are stored in the first record of the file and are referenced as needed (Appendix B).

4. SUBROUTINE GAUGIN places stargauge data in the data bank. If the stargauge data are entered in a nonstandard (for this program) form, SUBROUTINE PBYP is called to help keep things straight.

5. FUNCTION JREC selects the record number of each record written. (As explained in Appendix B, there are provisions in the subindex for each gun for 1000 record numbers.)

The following subprograms are used by all programs used with the data bank:

1. SUBROUTINE OPENRE calls OPENMS to properly open the mass storage file and reads certain data from it.

2. SUBROUTINE GUNCAL finds the index number of the gun requested.

3. SUBROUTINE LEAVE and SUBROUTINE OUT help cause the mass storage file to be properly indexed to the main index and to be closed in the event of an abnormal exit (seek RECOVR below).

The following system subroutines are among those used by these programs:

1. RECOVR is called by OPENRE at the beginning of each run. This causes any abnormal exit to be via LEAVE rather than an abnormal end of job (an abnormal end of job would most likely destroy the mass storage file).

2. OPENMS properly opens the mass storage file.

3. READMS reads data from the mass storage file.

4. WRITMS writes data to the mass storage file.

5. STINDX charges the index used in referencing the mass storage file. The program first uses the main index (INDEX array) to reference the desired gun number, and then it uses a subindex (INDEXS array) to reference records for gun firing days or stargauging desired.

6. CLOSMS properly closes the mass storage file.

PROGRAM BANKL is used to sort the ISEAS array. The ISEAS array will contain references (via the INDEXS array) to firing, comment, and stargauge data. After BANKL is executed for a given gun number, these references will be by order of date.

PROGRAM BANKO will output data from the data bank. The following subprograms are associated with PROGRAM BANKO:

1. SUBROUTINE SELECT (main entry point) will find the guns with the data requested by the input data. ENTRY SEL2, SEL3, or SEL4 will find data for each requested gun that also meets the requirements for selected records.

2. SUBROUTINE RBU will unpack velocity data for a burst.

3. SUBROUTINE SGR unpacks stargauge data.

PROGRAM POINT is used to output data in a form convenient for graphing. This program will output stargauge readings vs rounds fired or stargauge reading vs estimated ESR factors. This program produces little output, so it can be conveniently run interactively. The following subprograms are used:

1. SUBROUTINE SGZ unpacks stargauge data.

2. FUNCTION COMESR either counts rounds fired or computes ESR factors as needed. It uses SUBROUTINE VPCAL to fill in missing velocities and pressures and user-defined FUNCTION PESR to compute ESR factors. (The PESR function computes ESR factors by the method of Smith and O'Brasky*.)

*C. S. Smith and J. S. O'Brask, *Preliminary Calculations for the 203mm Marine Corps Gun Howitzer Propulsion Package*, Naval Surface Weapons Center, Dahlgren Laboratory Technical Report NSWC/DL TR-3734 (Appendix B), Dahlgren, VA, August 1977.

APPENDIX G

SAMPLE OUTPUT

OUTPUT FROM PROGRAM BANKN

```
GUN IS 16IN/50MK7 OF     16.000 INCHES DIAMETER.

ORIGIN OF RIFLING = 136.00 OR 136.00 INCHES.

                                                                    LONG GAUGING POINTS
    136.00     137.00     148.00     160.00     180.00     200.00     220.00     240.00     260.00     280.00     300.00     320.00
    340.00     360.00     380.00     400.00     420.00     440.00     460.00     480.00     500.00     520.00     540.00     560.00
    580.00     600.00     620.00     640.00     660.00     680.00     700.00     720.00     740.00     760.00     780.00     800.00
    804.00     815.00     816.00

                                                                    SHORT GAUGING POINTS
    136.00     137.00     148.00     804.00     815.00     816.00

GUN NUMBER     396

GUN NUMEER     396
  486 PREVIOUS ROUNDS,       0 PREVIOJS ESR.

JUNE    12, 1969
CASE=                    PLUG=                    WAD=              AGENT=                    PRIMER=15-3
     SPD   10293 PROL AT     90 DEG. PROJ=INERT 1900
AT    957 HOURS CW=     670.000 VEL =      2529. PRES =       30.9
AT   1006 HOURS CW=     670.000 VEL =      2568. PRES =       32.0
AT   1015 HOURS CW=     670.000 VEL =      2595. PRES =       32.8
AT   1025 HOURS CW=     670.000 VEL =      2545. PPES =       30.6
AT   1035 HOURS CW=     670.000 VEL =      2537. PRES =       31.2
AT   1047 HOURS CW=     670.000 VEL =      2550. PRES =       31.4
AT   1058 HOURS CW=     670.000 VEL =      2566. PRES =       32.3
AT   1521 HOURS CW=     670.000 VEL =      2647. PRES =       34.7
AT   1539 HOURS CW=     670.000 VEL =      2633. PRES =       34.1
AT   1549 HOURS CW=     670.000 VEL =         0. PPES =       35.5
  470 PREVIOUS ROUNDS,       0 PREVIOJS ESR.

APRIL    7, 1969
CASE=                    PLUG=                    WAD=              AGENT=                    PRIMER=15-2
     SPD    9606 PROL AT     90 DEG. PROJ=13-2  1900
AT   1001 HOURS CW=     500.000 VEL =      2244. PRES =       27.1
AT   1010 HOURS CW=     500.000 VEL =      2238. PRES =       23.1
AT   1020 HOURS CW=     500.000 VEL =      2250. PRES =       22.6
AT   1031 HOURS CW=     625.000 VEL =      2713. PRES =       36.4
AT   1042 HOURS CW=     590.000 VEL =      2570. PRES =        0.0
AT   1109 HOURS CW=     590.000 VEL =      2579. PRES =       32.8
AT   1119 HOURS CW=     590.000 VEL =      2569. PRES =       32.3
AT   1127 HOURS CW=     590.000 VEL =      2585. PRES =       33.1
AT   1136 HOURS CW=     590.000 VEL =      2589. PRES =        0.0
AT   1210 HOURS CW=     590.000 VEL =      2598. PPES =       33.9
CASE=                    PLUG=                    WAD=              AGENT=                    PRIMER=15-2
     IPIC     14 ,.JL AT     90 DEG. PROJ=13-2  1900
AT   1343 HOURS CW=     654.000 VEL =      2599. PRES =       33.1
AT   1440 HOURS CW=     654.000 VEL =      2546. PRES =       32.0
AT   1543 HOURS CW=     654.000 VEL =      2574. PRES =       31.7
AT   1547 HOURS CW=     654.000 VEL =      2553. PRES =       31.4
AT   1559 HOURS CW=     654.000 VEL =      2565. PRES =       32.3
AT   1607 HOURS CW=     654.000 VEL =      2582. PRES =       32.3
  469 PREVIOUS ROUNDS,       0 PREVIOJS ESR.
```

```
SEPT   19, 1968
CASE=                PLUG=                WAD=          AGENT=                PRIMER=15-3
    PLYRO       PROL AT    75 DEG. PROJ=19-0  1910
AT  1425 HOURS CW=     658.000 VEL =      2463. PRES =      34.7
  468 PREVIOUS ROUNDS,       0 PREVIOJS ESR.

JUNE   28, 1968
CASE=                PLUG=                WAD=          AGENT=                PRIMER=15-3
    SPG   8102 PROL AT    80 DEG. PROJ=19-0  1950
AT  1735 HOURS CW=     659.000 VEL =      2516. PRES =      31.2
  456 PREVIOUS ROUNDS,       0 PREVIOJS ESR.

MAY    22, 1968
CASE=                PLUG=                WAD=          AGENT=                PRIMER=15-2
    SPG   8102 PROL AT    30 DEG. PROJ=9-1   2700
AT  1026 HOURS CW=     659.000 VEL =      2323. PRES =      37.6
AT  1037 HOURS CW=     659.000 VEL =      2323. PRES =      37.4
AT  1052 HOURS CW=     659.000 VEL =      2343. PRES =      38.2
AT  1103 HOURS CW=     659.000 VEL =      2321. PRES =      37.9
AT  1111 HOURS CW=     659.000 VEL =      2319. PRES =      34.9
AT  1120 HOURS CW=     659.000 VEL =      2320. PRES =      37.4
AT  1129 HOURS CW=     659.000 VEL =      2294. PRES =      34.9
AT  1136 HOURS CW=     659.000 VEL =      2293. PRES =      37.1
AT  1145 HOURS CW=     659.000 VEL =      2305. PRES =      35.2
AT  1318 HOURS CW=     659.000 VEL =      2316. PRES =      35.2
AT  1356 HOURS CW=     659.000 VEL =      2307. PRES =      35.5
AT  1407 HOURS CW=     659.000 VEL =      2320. PRES =      36.6
  444 PREVIOUS ROUNDS,       0 PREVIOJS ESR.

MAY    21, 1968
CASE=                PLUG=                WAD=          AGENT=                PRIMER=15-2
    SPG   8102 PROL AT    30 DEG. PROJ=13-2  1900
AT  1350 HOURS CW=     659.000 VEL =      2378. PRES =      28.0
AT  1403 HOURS CW=     659.000 VEL =      2403. PRES =      28.2
AT  1414 HOURS CW=     659.000 VEL =      2374. PRES =      26.6
AT  1424 HOURS CW=     659.000 VEL =      2396. PRES =      26.9
AT  1434 HOURS CW=     659.000 VEL =      2389. PRES =      27.1
AT  1444 HOURS CW=     659.000 VEL =      2392. PRES =      27.7
AT  1456 HOURS CW=     659.000 VEL =      2436. PRES =      29.6
AT  1514 HOURS CW=     659.000 VEL =      2379. PRES =      25.8
AT  1523 HOURS CW=     659.000 VEL =      2387. PRES =      26.6
AT  1531 HOURS CW=     659.000 VEL =      2401. PRES =      27.7
AT  1541 HOURS CW=     659.000 VEL =      2434. PRES =      28.0
AT  1551 HOURS CW=     659.000 VEL =      2440. PRES =      28.2
  432 PREVIOUS ROUNDS,       0 PREVIOJS ESR.

MAY    20, 1968
CASE=                PLUG=                WAD=          AGENT=                PRIMER=15-2
    SPDN  9991 PROL AT    30 DEG. PROJ=13-2  1900
AT  1055 HOURS CW=     306.000 VEL =         0. PRES =      26.3
AT  1106 HOURS CW=     306.000 VEL =      2002. PRES =      26.3
AT  1115 HOURS CW=     306.000 VEL =      2001. PRES =      26.1
AT  1122 HOURS CW=     306.000 VEL =      1998. PRES =      25.0
AT  1131 HOURS CW=     306.000 VEL =      1996. PRES =      25.8
AT  1142 HOURS CW=     306.000 VEL =      1996. PRES =      25.8
AT  1330 HOURS CW=     306.000 VEL =      1998. PRES =      26.3
AT  1340 HOURS CW=     306.000 VEL =      2003. PRES =      26.3
AT  1347 HOURS CW=     306.000 VEL =      1994. PRES =      25.3
AT  1355 HOURS CW=     306.000 VEL =      2002. PRES =      26.3
AT  1406 HOURS CW=     306.000 VEL =      2001. PRES =      26.3
AT  1415 HOURS CW=     306.000 VEL =      2000. PRES =      26.1
  430 PREVIOUS ROUNDS,       0 PREVIOJS ESR.
```

```
MAY    19, 1968
CASE=                  PLUG=                  WAD=              AGENT=                PRIMER=15-2
    SPD   3734 PROL AT    90 DEG. PROJ=9-1   2700
AT      0 HOURS CW=    320.000 VEL =         0. PRES =       17.2
AT      0 HOURS CW=    320.000 VEL =         0. PRES =       17.2
  416 PREVIOUS ROUNDS,      0 PREVIOUS ESR.

MAY    17, 1969
CASE=                  PLUG=                  WAD=              AGENT=                PRIMER=15-2
    SFDN  9991 PROL AT    30 DEG. PROJ=SPD   8102
AT    538 HOURS CW=    306.000 VEL =      1752. PRES =       32.0
AT    959 HOURS CW=    306.000 VEL =      1744. PRES =       32.?
AT   1014 HOURS CW=    306.000 VEL =      1742. PRES =       32.?
AT   1028 HOURS CW=    306.000 VEL =      1741. PRES =       32.8
AT   1038 HOURS CW=    306.000 VEL =      1740. PRES =       31.7
AT   1048 HOURS CW=    306.000 VEL =      1741. PRES =       31.4
AT   1108 HOURS CW=    306.000 VEL =      1739. PRES =       31.7
AT   1123 HOURS CW=    306.000 VEL =      1740. PRES =       31.4
AT   1131 HOURS CW=    306.000 VEL =      1743. PRES =       32.?
AT   1140 HOURS CW=    306.000 VEL =      1744. PRES =       32.?
AT   1147 HOURS CW=    306.000 VEL =      1742. PRES =       32.8
AT   1155 HOURS CW=    306.000 VEL =      1741. PRES =       32.8
CASE=                  PLUG=                  WAD=              AGENT=                PRIMER=15-2
    IHIC    14 PROL AT    90 DEG. PROJ=SPD   8102
AT   1531 HOURS CW=    659.000 VEL =      2400. PRES =       40.1
AT   1541 HOURS CW=    659.000 VEL =      2423. PRES =       42.5
  414 PREVIOUS ROUNDS,      0 PREVIOUS ESR.

MAY    16, 1968
CASE=                  PLUG=                  WAD=              AGENT=                PRIMER=15-2
    SPD   8102 PROL AT    90 DEG. PROJ=9-1   2695
AT      0 HOURS CW=    659.000 VEL =      2376. PRES =       40.1
AT      0 HOURS CW=    659.000 VEL =      2384. PRES =       39.8
  406 PREVIOUS ROUNDS,      0 PREVIOUS ESR.

MARCH  25, 1968
CASE=                  PLUG=                  WAD=              AGENT=                PRIMER=15-2
    SPD  10335 PROL AT    90 DEG. PROJ=SPD   3734
AT      0 HOURS CW=    663.000 VEL =         0. PRES =       30.4
AT      0 HOURS CW=    663.000 VEL =         0. PRES =       29.6
AT      0 HOURS CW=    663.000 VEL =         0. PRES =       28.8
AT      0 HOURS CW=    663.000 VEL =         0. PRES =       29.6
CASE=                  PLUG=                  WAD=              AGENT=                PRIMER=15-2
    IHIC    14 PROL AT    90 DEG. PROJ=SPD   3734
AT      0 HOURS CW=    320.000 VEL =         0. PRES =       13.7
AT      0 HOURS CW=    320.000 VEL =         0. PRES =       13.7
AT      0 HOURS CW=    320.000 VEL =         0. PRES =       13.4
AT      0 HOURS CW=    320.000 VEL =         0. PRES =       13.4
  401 PREVIOUS ROUNDS,      0 PREVIOUS ESR.

MARCH   8, 1968
CASE=                  PLUG=                  WAD=              AGENT=                PRIMER=15-2
    SPD  10335 PROL AT    90 DEG. PROJ=9-1   2700
AT   1056 HOURS CW=    663.000 VEL =      2361. PRES =       38.2
AT   1116 HOURS CW=    663.000 VEL =      2384. PRES =       37.9
AT   1126 HOURS CW=    663.000 VEL =      2385. PRES =       39.8
AT   1137 HOURS CW=    663.000 VEL =      2374. PRES =       38.2
AT   1147 HOURS CW=    663.000 VEL =      2388. PRES =       40.3
  396 PREVIOUS ROUNDS,      0 PREVIOUS ESR.
```

```
FEB    28, 1968
CASE=                  PLUG=                  WAD=              AGENT=                PRIMER=15-2
    SPD   8102 PROL AT    90 DEG. PROJ=9-3   2780
AT   937 HOURS CW=    659.000 VEL =     2428. PRES =     39.2
AT  1004 HOURS CW=    659.000 VEL =     2396. PRES =     37.9
AT  1014 HOURS CW=    659.000 VEL =     2400. PRES =     38.4
AT  1022 HOURS CW=    659.000 VEL =     2402. PRES =     39.2
AT  1033 HOURS CW=    659.000 VEL =     2410. PRES =     41.1
   39 PREVIOUS ROUNDS,  30000 PREVIOJS ESR.

FEB    26, 1968
CASE=                  PLUG=                  WAD=              AGENT=                PRIMER=15-2
    SPD  10335 PROL AT    90 DEG. PROJ=9-3   2694
AT  1007 HOURS CW=    663.000 VEL =     2382. PRES =     37.9
AT  1017 HOURS CW=    663.000 VEL =     2383. PRES =     37.6
AT  1048 HOURS CW=    663.000 VEL =     2388. PRES =     38.4
  385 PREVIOUS ROUNDS,      0 PREVIOJS ESR.

FEB    23, 1968
CASE=                  PLUG=                  WAD=              AGENT=                PRIMER=15-2
    SPD   8102 PROL AT    90 DEG. PROJ=9-3   2700
AT  1019 HOURS CW=    659.000 VEL =     2410. PRES =     39.8
AT  1037 HOURS CW=    659.000 VEL =     2401. PRES =     38.4
AT  1048 HOURS CW=    659.000 VEL =     2415. PRES =     39.2
AT  1115 HOURS CW=    659.000 VEL =     2369. PRES =     37.9
AT  1125 HOURS CW=    659.000 VEL =     2374. PRES =     38.2
AT  1136 HOURS CW=    659.000 VEL =     2371. PRES =     37.6
AT  1145 HOURS CW=    659.000 VEL =     2375. PRES =     38.2
AT  1155 HOURS CW=    659.000 VEL =     2483. PRES =     39.2
  379 PREVIOUS ROUNDS,      0 PREVIOJS ESR.

FEB    20, 1968
CASE=                  PLUG=                  WAD=              AGENT=                PRIMER=15-2
    IMIC    14 PROL AT    90 DEG. PROJ=AJ    3 21
AT     0 HOURS CW=    654.000 VEL =     2411. PRES =     41.4
AT     0 HOURS CW=    654.000 VEL =     2425. PRES =     40.9
AT     0 HOURS CW=    654.000 VEL =     2447. PRES =     42.2
CASE=                  PLUG=                  WAD=              AGENT=                PRIMER=15-2
    IMIC    14 PROL AT    90 DEG. PROJ=AJ    3 21
AT     0 HOURS CW=    744.000 VEL =     2441. PRES =     44.6
AT     0 HOURS CW=    744.000 VEL =     2426. PRES =     44.1
AT     0 HOURS CW=    744.000 VEL =     2476. PRES =     40.1
  369 PREVIOUS ROUNDS,      0 PREVIOJS ESR.

FEB    15, 1968
CASE=                  PLUG=                  WAD=              AGENT=                PRIMER=15-2
    SPD   8102 PROL AT    90 DEG. PROJ=SPD   3734
AT  1100 HOURS CW=    659.000 VEL =        0. PRES =     30.6
AT  1115 HOURS CW=    659.000 VEL =        0. PRES =     31.4
CASE=                  PLUG=                  WAD=              AGENT=                PRIMER=15-2
    IMIC    14 PROL AT    90 DEG. PROJ=SPD   3734
AT  1128 HOURS CW=    320.000 VEL =        0. PRES =     14.0
AT  1141 HOURS CW=    320.000 VEL =        0. PRES =     14.0
AT  1158 HOURS CW=    320.000 VEL =        0. PRES =     14.2
AT  1346 HOURS CW=    320.000 VEL =        0. PRES =     14.0
AT  1355 HOURS CW=    320.000 VEL =        0. PRES =     13.4
AT  1404 HOURS CW=    320.000 VEL =        0. PRES =     13.7
AT  1418 HOURS CW=    320.000 VEL =        0. PRES =     13.4
AT  1430 HOURS CW=    320.000 VEL =        0. PRES =     13.7
  362 PREVIOUS ROUNDS,      0 PREVIOJS ESR.
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FEB     8, 1968
CASE=                   PLUG=                   WAD=            AGENT=                  PRIMER=15-2
    SPD   8102 PROL AT    90 DEG. PROJ=13-6  1900
AT  1112 HOURS CW=     659.000 VEL =      2610. PRES =      32.3
AT  1150 HOURS CW=     659.000 VEL =      2583. PRES =      30.4
AT  1329 HOURS CW=     659.000 VEL =      2563. PRES =      30.4
AT  1406 HOURS CW=     659.000 VEL =      2593. PRES =      31.7
AT  1427 HOURS CW=     659.000 VEL =      2571. PRES =      30.4
AT  1440 HOURS CW=     659.000 VEL =      2557. PRES =      30.1
AT  1449 HOURS CW=     659.000 VEL =      2564. PRES =      30.4
  361 PREVIOUS ROUNDS.      0 PREVIOJS ESR.

FEB     6, 1968
CASE=                   PLUG=                   WAD=            AGENT=                  PRIMER=15-?
    SPD   8102 PROL AT    90 DEG. PROJ=9-3   2700
AT     0 HOURS CW=     659.000 VEL =         0. PRES =      37.9
  344 PREVIOUS ROUNDS.      0 PREVIOJS ESR.

FEB     5, 1968
CASE=                   PLUG=                   WAD=            AGENT=                  PRIMER=15-?
    IHIC    14 PROL AT    90 DEG. PROJ= 9-3  2700
AT   957 HOURS CW=     654.000 VEL =      2415. PRES =      40.9
AT  1008 HOURS CW=     654.000 VEL =      2407. PRES =      41.7
AT  1016 HOURS CW=     654.000 VEL =      2436. PRES =      43.5
AT  1027 HOURS CW=     654.000 VEL =      2433. PRES =      42.7
AT  1039 HOURS CW=     654.000 VEL =      2411. PRES =      40.3
AT  1103 HOURS CW=     654.000 VEL =      2423. PRES =      42.2
CASE=                   PLUG=                   WAD=            AGENT=                  PRIMER=15-?
    AJ  3  20  PROL AT    90 DEG. PROJ= 9-3  2700
AT  1118 HOURS CW=     500.000 VEL =      1586. PRES =      14.8
AT  1128 HOURS CW=     600.000 VEL =      1912. PRES =      22.8
AT  1308 HOURS CW=     700.000 VEL =      2270. PRES =      36.3
AT  1336 HOURS CW=     770.000 VEL =      2530. PRES =      55.4
CASE=                   PLUG=                   WAD=            AGENT=                  PRIMER=15-?
    AJ   3 19  PROL AT    90 DEG. PROJ= 9-3  2700
AT  1346 HOURS CW=     500.000 VEL =      1351. PRES =      11.8
AT  1404 HOURS CW=     600.000 VEL =      1686. PRES =      16.1
AT  1415 HOURS CW=     700.000 VEL =      1952. PRES =      24.2
AT  1429 HOURS CW=     800.000 VEL =      2311. PRES =      36.8
CASE=                   PLUG=                   WAD=            AGENT=                  PRIMER=15-2
    AJ   3 21  PROL AT    90 DEG. PROJ= 9-3  2700
AT  1442 HOURS CW=     600.000 VEL =      1921. PRES =      22.8
AT  1454 HOURS CW=     700.000 VEL =      2261. PRES =      34.9
AT  1539 HOURS CW=     800.000 VEL =      2616. PRES =      58.9
  343 PREVIOUS ROUNDS.      0 PREVIOJS ESR.

NOV    20, 1967
CASE=                   PLUG=                   WAD=            AGENT=                  PRIMER=15-2
    SPD   8102 PROL AT    90 DEG. PROJ=9-3   2700
AT     0 HOURS CW=     659.000 VEL =      2375. PRES =      38.2
  340 PREVIOUS ROUNDS.      0 PREVIOJS ESR.

NOV     9, 1967
CASE=                   PLUG=                   WAD=            AGENT=                  PRIMER=15-2
    SPD   8102 PROL AT    90 DEG. PROJ=9-3   2700
AT  1123 HOURS CW=     659.000 VEL =      2358. PRES =      38.4
AT  1146 HOURS CW=     659.000 VEL =      2370. PRES =      38.7
AT  1202 HOURS CW=     659.000 VEL =      2351. PRES =      37.1
  337 PREVIOUS ROUNDS.      0 PREVIOJS ESR.
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NOV     1, 1967
CASE=                PLUG=                MAD=          AGENT=              PRIMER=15-2
    IMIC    14 PROL AT    90 DEG. PROJ=9-1   2700
AT  1121 HOURS CW=    654.000 VEL =     2424. PRES =      41.4
AT  1140 HOURS CW=    654.000 VEL =     2469. PRES =      40.6
AT  1153 HOURS CW=    654.000 VEL =     2398. PRES =      40.3
  336 PREVIOUS ROUNDS,      0 PREVIOUS ESR.

AUG     23, 1967
CASE=                PLUG=                MAD=          AGENT=              PRIMER=15-3
    SPD   8102 PROL AT    90 DEG. PROJ=13-6  1908
AT     0 HOURS CW=    659.000 VEL =     2527. PRES =      38.6
  335 PREVIOUS ROUNDS,      0 PREVIOUS ESR.

AUG     22, 1967
CASE=                PLUG=                MAD=          AGENT=              PRIMER=15-3
    SPD   8102 PROL AT    90 DEG. PROJ=13-6  1908
AT     0 HOURS CW=    659.000 VEL =     2555. PRES =      38.9
  334 PREVIOUS ROUNDS,      0 PREVIOUS ESR.

AUG     17, 1967
CASE=                PLUG=                MAD=          AGENT=              PRIMER=15-3
    SPD   8102 PROL AT    90 DEG. PROJ=9-3   2699
AT     0 HOURS CW=    659.000 VEL =     2383. PRES =      39.8
  330 PREVIOUS ROUNDS,      0 PREVIOUS ESR.


MAY     21, 1960
CASE=                PLUG=                MAD=          AGENT=              PRIMER=15-3
    IMIC    14 PROL AT    90 DEG. PROJ=9-1   2700
AT     0 HOURS CW=    475.000 VEL =        0. PRES =      19.9
AT     0 HOURS CW=    475.000 VEL =        0. PRES =      20.4
AT     0 HOURS CW=    475.000 VEL =        0. PRES =      20.2
AT     0 HOURS CW=    475.000 VEL =        0. PRES =      20.2
  328 PREVIOUS ROUNDS,      0 PREVIOUS ESR.

MAY     17, 1960
CASE=                PLUG=                MAD=          AGENT=              PRIMER=15-3
    IMIC    14 PROL AT    90 DEG. PROJ=9-1   2700
AT     0 HOURS CW=    475.000 VEL =     1806. PRES =      20.2
AT     0 HOURS CW=    475.000 VEL =     1821. PRES =      20.2
  324 PREVIOUS ROUNDS,      0 PREVIOUS ESR.

MAY     16, 1959
CASE=                PLUG=                MAD=          AGENT=              PRIMER=15-4
    IMIC    14 PROL AT    90 DEG. PROJ=9-1   2700
AT     0 HOURS CW=    654.000 VEL =     2416. PRES =      42.5
AT     0 HOURS CW=    654.000 VEL =     2426. PRES =      42.5
AT     0 HOURS CW=    654.000 VEL =     2423. PRES =      42.7
AT     0 HOURS CW=    654.000 VEL =     2419. PRES =      42.2
  283 PREVIOUS ROUNDS,      0 PREVIOUS ESR.

APRIL   26, 1956
CASE=                PLUG=                MAD=          AGENT=              PRIMER=15-2
    IMIC    45 PROL AT    90 DEG. PROJ=9-1   2697
AT     0 HOURS CW=    475.000 VEL =     1807. PRES =      20.7
AT     0 HOURS CW=    475.000 VEL =     1812. PRES =      20.7
AT     0 HOURS CW=    475.000 VEL =     1822. PRES =      20.7
AT     0 HOURS CW=    475.000 VEL =     1820. PRES =      20.7
AT     0 HOURS CW=    650.000 VEL =     2383. PRES =      41.1
AT     0 HOURS CW=    650.000 VEL =     2389. PRES =      41.4
AT     0 HOURS CW=    650.000 VEL =     2394. PRES =      41.7
AT     0 HOURS CW=    670.000 VEL =     2457. PRES =      45.2
CASE=                PLUG=                MAD=          AGENT=              PRIMER=15-2
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    IMIC    14 PROL AT    90 DEG. PROJ=9-1   2697
AT      0 HOURS CW=    654.000 VEL =      2404. PRES =      41.9
AT      0 HOURS CW=    654.000 VEL =      2406. PRES =      41.4
AT      0 HOURS CW=    654.000 VEL =      2403. PRES =      42.7
  268 PREVIOUS ROUNDS,      0 PREVIOUS ESR.

FEB    14, 1956
CASE=                 PLUG=                 WAD=            AGENT=                PRIMER=15-2
    IMIC    44 PROL AT    90 DEG. PROJ=9-1   2700
AT      0 HOURS CW=    475.000 VEL =      1799. PRES =      19.9
AT      0 HOURS CW=    475.000 VEL =      1817. PRES =      21.0
AT      0 HOURS CW=    475.000 VEL =      1814. PRES =      20.4
AT      0 HOURS CW=    475.000 VEL =      1811. PRES =      20.4
AT      0 HOURS CW=    655.000 VEL =      2396. PRES =      40.6
AT      0 HOURS CW=    655.000 VEL =      2402. PRES =      41.4
AT      0 HOURS CW=    655.000 VEL =      2399. PRES =      41.1
AT      0 HOURS CW=    655.000 VEL =      2396. PRES =      40.6
AT      0 HOURS CW=    655.000 VEL =      2396. PRES =      40.9
AT      0 HOURS CW=    675.000 VEL =      2449. PRES =      44.4
CASE=                 PLUG=                 WAD=            AGENT=                PRIMER=15-2
    IMIC    14 PROL AT    90 DEG. PROJ=9-1   2700
AT      0 HOURS CW=    654.000 VEL =      2411. PRES =      42.5
AT      0 HOURS CW=    654.000 VEL =      2403. PRES =      41.4
CASE=                 PLUG=                 WAD=            AGENT=                PRIMER=15-2
    IMIC    14 PROL AT    90 DEG. PROJ=18-0  2700
AT      0 HOURS CW=    654.000 VEL =      2403. PRES =      42.2
AT      0 HOURS CW=    654.000 VEL =      2402. PRES =      41.4
AT      0 HOURS CW=    654.000 VEL =      2406. PRES =      42.2
  257 PREVIOUS ROUNDS,      0 PREVIOUS ESR.

JAN    24, 1956
CASE=                 PLUG=                 WAD=            AGENT=                PRIMER=15-2
    IMIC    43 PROL AT    90 DEG. PROJ=9-1   2700
AT      0 HOURS CW=    475.000 VEL =      1800. PRES =      20.7
AT      0 HOURS CW=    475.000 VEL =      1812. PRES =      20.4
AT      0 HOURS CW=    475.000 VEL =      1809. PRES =      20.4
AT      0 HOURS CW=    475.000 VEL =      1808. PRES =      20.7
AT      0 HOURS CW=    655.000 VEL =      2391. PRES =      39.8
AT      0 HOURS CW=    655.000 VEL =      2390. PRES =      40.1
AT      0 HOURS CW=    655.000 VEL =      2393. PRES =      40.6
AT      0 HOURS CW=    675.000 VEL =      2458. PRES =      43.5
CASE=                 PLUG=                 WAD=            AGENT=                PRIMER=15-2
    IMIC    14 PROL AT    90 DEG. PROJ=9-1   2700
AT      0 HOURS CW=    654.000 VEL =      2410. PRES =      41.4
AT      0 HOURS CW=    654.000 VEL =      2418. PRES =      42.7
AT      0 HOURS CW=    654.000 VEL =      2409. PRES =      41.7
  242 PREVIOUS ROUNDS,      0 PREVIOUS ESR.

NOV    22, 1955
CASE=                 PLUG=                 WAD=            AGENT=                PRIMER=15-2
    IMIC    42 PROL AT    89 DEG. PROJ=9-3   2700
AT      0 HOURS CW=    475.000 VEL =      1784. PRES =      20.4
AT      0 HOURS CW=    475.000 VEL =      1795. PRES =      20.2
AT      0 HOURS CW=    475.000 VEL =      1798. PRES =      20.2
AT      0 HOURS CW=    475.000 VEL =      1815. PRES =      20.2
AT      0 HOURS CW=    660.000 VEL =      2390. PRES =      39.8
AT      0 HOURS CW=    660.000 VEL =      2407. PRES =      40.6
AT      0 HOURS CW=    660.000 VEL =      2401. PRES =      40.9
AT      0 HOURS CW=    660.000 VEL =      2401. PRES =      40.9
AT      0 HOURS CW=    660.000 VEL =      2398. PRES =      40.1
AT      0 HOURS CW=    680.000 VEL =      2468. PRES =      44.1
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CASE=                PLUG=                MAD=          AGENT=          PRIMER=15-2
    IMIC    14 PROL AT    90 DEG. PROJ=9-7   2700
AT      0 HOURS CW=    654.000 VEL =      2408. PRES =      41.7
AT      0 HOURS CW=    654.000 VEL =      2416. PRES =      42.2
AT      0 HOURS CW=    654.000 VEL =      2415. PRES =      41.9
AT      0 HOURS CW=    654.000 VEL =      2416. PRES =      41.7
AT      0 HOURS CW=    654.000 VEL =      2411. PRES =      41.9
  239 PREVIOUS ROUNDS,      0 PREVIOUS ESR.

OCT   27, 1955
CASE=                PLUG=                MAD=          AGENT=          PRIMER=15-2
    IMIC    14 PROL AT    90 DEG. PROJ=9-1   2700
AT      0 HOURS CW=    654.000 VEL =      2416. PRES =      42.5
AT      0 HOURS CW=    654.000 VEL =      2417. PRES =      42.5
AT      0 HOURS CW=    654.000 VEL =      2408. PRES =      40.3
  318 PREVIOUS ROUNDS,      0 PREVIOUS ESR.

SEPT  25, 1957
CASE=                PLUG=                MAD=          AGENT=          PRIMER=
    IMIC    14 PROL AT    90 DEG. PROJ=13-6  1900
AT      0 HOURS CW=    666.000 VEL =      2605. PRES =      32.8
AT      0 HOURS CW=    666.000 VEL =      2644. PRES =      33.6
AT      0 HOURS CW=    666.000 VEL =      2635. PRES =      33.6
AT      0 HOURS CW=    666.000 VEL =      2644. PRES =      34.1
AT      0 HOURS CW=    666.000 VEL =      2658. PRES =      33.6
AT      0 HOURS CW=    666.000 VEL =      2643. PRES =      33.9
  389 PREVIOUS ROUNDS,      0 PREVIOUS ESR.

JULY  27, 1956
CASE=                PLUG=                MAD=          AGENT=          PRIMER=15-3
    IMIC    14 PROL AT    90 DEG. PROJ=EX4-0 1900
AT      0 HOURS CW=    654.000 VEL =      2600. PRES =      32.3
AT      0 HOURS CW=    654.000 VEL =      2591. PRES =      32.0
AT      0 HOURS CW=    654.000 VEL =      2587. PRES =      32.5
AT      0 HOURS CW=    654.000 VEL =      2577. PRES =      32.3
AT      0 HOURS CW=    654.000 VEL =      2562. PRES =      31.7
AT      0 HOURS CW=    654.000 VEL =      2566. PRES =      32.0
AT      0 HOURS CW=    654.000 VEL =      2594. PRES =      32.3
AT      0 HOURS CW=    654.000 VEL =      2580. PRES =      33.1
AT      0 HOURS CW=    654.000 VEL =      2588. PRES =      32.5
  294 PREVIOUS ROUNDS,      0 PREVIOUS ESR.

MAY   19, 1956
CASE=                PLUG=                MAD=          AGENT=          PRIMER=15-2
    IMIC    46 PROL AT    90 DEG. PROJ=9-1   2898
AT      0 HOURS CW=    475.000 VEL =      1799. PRES =      19.9
AT      0 HOURS CW=    475.000 VEL =      1810. PRES =      20.2
AT      0 HOURS CW=    475.000 VEL =      1809. PRES =      20.2
AT      0 HOURS CW=    475.000 VEL =      1800. PRES =      20.2
AT      0 HOURS CW=    655.000 VEL =      2386. PRES =      40.6
AT      0 HOURS CW=    655.000 VEL =      2390. PRES =      40.9
AT      0 HOURS CW=    655.000 VEL =      2390. PRES =      41.1
AT      0 HOURS CW=    655.000 VEL =      2395. PRES =      41.9
AT      0 HOURS CW=    655.000 VEL =      2384. PRES =      41.9
AT      0 HOURS CW=    670.000 VEL =      2434. PRES =      44.6
CASE=                PLUG=                MAD=          AGENT=          PRIMER=15-2
    IMIC    14 PROL AT    90 DEG. PROJ=9-1   2898
AT      0 HOURS CW=    654.000 VEL =      2402. PRES =      41.4
AT      0 HOURS CW=    654.000 VEL =      2395. PRES =      40.3
AT      0 HOURS CW=    654.000 VEL =      2405. PRES =      41.1
AT      0 HOURS CW=    654.000 VEL =      2403. PRES =      41.4
AT      0 HOURS CW=    654.000 VEL =      2404. PRES =      41.9
  224 PREVIOUS ROUNDS,      0 PREVIOUS ESR.
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OCT    13, 1955
CASE=                    PLUG=                    WAD=              AGENT=                    PRIMER=15-1
    IHIC    41 PROL AT    90 DEG. PROJ=9-1   2700
AT      0 HOURS CW=     475.000 VEL =      1776. PRES =      20.4
AT      0 HOURS CW=     475.000 VEL =      1787. PRES =      20.4
AT      0 HOURS CW=     475.000 VEL =      1778. PRES =      20.2
AT      0 HOURS CW=     475.000 VEL =      1774. PRES =      19.9
AT      0 HOURS CW=     670.000 VEL =      2402. PRES =      41.7
AT      0 HOURS CW=     670.000 VEL =      2409. PRES =      41.4
AT      0 HOURS CW=     670.000 VEL =      2413. PRES =      41.7
AT      0 HOURS CW=     670.000 VEL =      2413. PRES =      41.1
AT      0 HOURS CW=     670.000 VEL =      2413. PRES =      41.4
AT      0 HOURS CW=     690.000 VEL =      2465. PRES =      44.6
CASE=                    PLUG=                    WAD=              AGENT=                    PRIMER=15-1
    IHIC    14 PROL AT    90 DEG. PROJ=9-1   2700
AT      0 HOURS CW=     654.000 VEL =      2409. PRES =      42.5
AT      0 HOURS CW=     654.000 VEL =      2407. PRES =      43.0
AT      0 HOURS CW=     654.000 VEL =      2401. PRES =      42.7
AT      0 HOURS CW=     654.000 VEL =      2412. PRES =      42.7
AT      0 HOURS CW=     654.000 VEL =      2406. PRES =      42.7
  209 PREVIOUS ROUNDS,      0 PREVIOUS ESR.

SEPT   13, 1955
CASE=                    PLUG=                    WAD=              AGENT=                    PRIMER=15-1
    IHIC    40 PROL AT    90 DEG. PROJ=9-1   2700
AT      0 HOURS CW=     475.000 VEL =      1789. PRES =      19.9
AT      0 HOURS CW=     475.000 VEL =      1799. PRES =      20.2
AT      0 HOURS CW=     475.000 VEL =      1798. PRES =      20.4
AT      0 HOURS CW=     475.000 VEL =      1789. PRES =      19.9
AT      0 HOURS CW=     665.000 VEL =      2399. PRES =      41.1
AT      0 HOURS CW=     665.000 VEL =      2398. PRES =      41.7
AT      0 HOURS CW=     665.000 VEL =      2400. PRES =      42.2
AT      0 HOURS CW=     665.000 VEL =      2393. PRES =      41.4
AT      0 HOURS CW=     665.000 VEL =      2394. PRES =      42.2
AT      0 HOURS CW=     685.000 VEL =      2457. PRES =      44.9
CASE=                    PLUG=                    WAD=              AGENT=                    PRIMER=15-1
    IHIC    14 PROL AT    90 DEG. PROJ=9-1   2700
AT      0 HOURS CW=     654.000 VEL =      2413. PRES =      43.0
AT      0 HOURS CW=     654.000 VEL =      2406. PRES =      41.9
AT      0 HOURS CW=     654.000 VEL =      2400. PRES =      41.7
AT      0 HOURS CW=     654.000 VEL =      2409. PRES =      44.1
AT      0 HOURS CW=     654.000 VEL =      2402. PRES =      43.0
  205 PREVIOUS ROUNDS,      0 PREVIOUS ESR.

AUG     8, 1955
CASE=                    PLUG=                    WAD=              AGENT=                    PRIMER=15-1
    IHIC    14 PROL AT    90 DEG. PROJ=9-1   2700
AT      0 HOURS CW=     654.000 VEL =      2424. PRES =      42.5
AT      0 HOURS CW=     654.000 VEL =      2419. PRES =      44.4
AT      0 HOURS CW=     654.000 VEL =      2430. PRES =      41.9
AT      0 HOURS CW=     654.000 VEL =      2435. PRES =      43.3
  201 PREVIOUS ROUNDS,      0 PREVIOUS ESR.

MAY    21, 1955
CASE=                    PLUG=                    WAD=              AGENT=                    PRIMER=15-1
    IHIC    14 PROL AT    91 DEG. PROJ=9-1   2700
AT      0 HOURS CW=     654.000 VEL =      2426. PRES =      42.5
AT      0 HOURS CW=     654.000 VEL =      2421. PRES =      44.1
AT      0 HOURS CW=     654.000 VEL =      2415. PRES =      43.3
AT      0 HOURS CW=     654.000 VEL =      2422. PRES =      41.7
  197 PREVIOUS ROUNDS,      0 PREVIOUS ESR.
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APRIL  28, 1955
CASE=                    PLUG=                    WAD=          AGENT=                    PRIMER=15-2
    IMIC    14 PROL AT    90 DEG. PROJ=9-1 18-8
AT     0 HOURS CW=    654.000 VEL =     2438. PRES =     42.2
CASE=                    PLUG=                    WAD=          AGENT=                    PRIMER=15-2
    IMIC    14 PROL AT    90 DEG. PROJ=18-0  2700
AT     0 HOURS CW=    654.000 VEL =     2417. PRES =     42.2
AT     0 HOURS CW=    654.000 VEL =     2416. PRES =     42.2
AT     0 HOURS CW=    654.000 VEL =     2421. PRES =     40.9
  191 PREVIOUS ROUNDS,      0 PREVIOUS ESR.

DEC    16, 1954
CASE=                    PLUG=                    WAD=          AGENT=                    PRIMER=15-2
    SPD   4549 PROL AT    90 DEG. PROJ=13-2 19801
AT     0 HOURS CW=    653.000 VEL =     2576. PRES =     31.7
CASE=                    PLUG=                    WAD=          AGENT=                    PRIMER=15-2
    SPD  18293 PROL AT    90 DEG. PROJ=3-6   1900
AT     0 HOURS CW=    670.000 VEL =     2597. PRES =     32.8
AT     0 HOURS CW=    670.000 VEL =     2585. PRES =     32.0
AT     0 HOURS CW=    670.000 VEL =     2586. PRES =     31.7
AT     0 HOURS CW=    670.000 VEL =     2576. PRES =     32.5
AT     0 HOURS CW=    670.000 VEL =     2561. PRES =     32.0
  170 PREVIOUS ROUNDS,      0 PREVIOUS ESR.

DEC    15, 1954
CASE=                    PLUG=                    WAD=          AGENT=                    PRIMER=15-2
    SPD   4549 PROL AT    88 DEG. PROJ=13-2  1900
AT     0 HOURS CW=    653.000 VEL =     2571. PRES =     32.3
CASE=                    PLUG=                    WAD=          AGENT=                    PRIMER=15-2
    IMIC    14 PROL AT    88 DEG. PROJ=18-0  2700
AT     0 HOURS CW=    654.000 VEL =     2448. PRES =     43.8
AT     0 HOURS CW=    654.000 VEL =     2429. PRES =     43.5
AT     0 HOURS CW=    654.000 VEL =     2419. PRES =     43.3
CASE=                    PLUG=                    WAD=          AGENT=                    PRIMER=15-2
    SPD  18293 PROL AT    88 DEG. PROJ=13-6  1900
AT     0 HOURS CW=    670.000 VEL =     2590. PRES =     33.3
AT     0 HOURS CW=    670.000 VEL =     2579. PRES =     31.2
AT     0 HOURS CW=    670.000 VEL =     2571. PRES =     31.7
AT     0 HOURS CW=    670.000 VEL =     2580. PRES =     30.4
AT     0 HOURS CW=    670.000 VEL =     2577. PRES =     31.7
AT     0 HOURS CW=    670.000 VEL =     2579. PRES =     32.5
AT     0 HOURS CW=    670.000 VEL =     2577. PRES =     32.0
AT     0 HOURS CW=    670.000 VEL =     2575. PRES =     31.7
AT     0 HOURS CW=    670.000 VEL =     2585. PRES =     32.3
AT     0 HOURS CW=    670.000 VEL =     2578. PRES =     32.0
AT     0 HOURS CW=    670.000 VEL =     2571. PRES =     31.2
AT     0 HOURS CW=    670.000 VEL =     2578. PRES =     32.3
AT     0 HOURS CW=    670.000 VEL =     2578. PRES =     32.3
AT     0 HOURS CW=    670.000 VEL =     2571. PRES =     32.3
AT     0 HOURS CW=    670.000 VEL =     2565. PRES =     31.4
AT     0 HOURS CW=    670.000 VEL =     2577. PRES =     32.8
AT     0 HOURS CW=    670.000 VEL =     2579. PRES =     32.3
  144 PREVIOUS ROUNDS,      0 PREVIOUS ESR.

NOV    16, 1954
CASE=                    PLUG=                    WAD=          AGENT=                    PRIMER=15-2
    IMIC    14 PROL AT    80 DEG. PROJ=13-6  1900
AT     0 HOURS CW=    654.000 VEL =     2567. PRES =     31.2
CASE=                    PLUG=                    WAD=          AGENT=                    PRIMER=15-2
    SPD  18293 PROL AT    89 DEG. PROJ=18-0  2700
AT     0 HOURS CW=    670.000 VEL =     2427. PRES =     40.3
AT     0 HOURS CW=    670.000 VEL =     2429. PRES =     41.7
AT     0 HOURS CW=    670.000 VEL =     2427. PRES =     38.7
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CASE=                    PLUG=                    WAD=              AGENT=                    PRIMER=15-2
     IHIC    14 PROL AT    89 DEG. PROJ=13-6  1900
AT      0 HOURS CW=     654.000 VEL =      2616. PRES =      33.3
AT      0 HOURS CW=     654.000 VEL =      2621. PRES =      32.8
AT      0 HOURS CW=     654.000 VEL =      2624. PRES =      33.1
AT      0 HOURS CW=     654.000 VEL =      2615. PRES =      33.1
AT      0 HOURS CW=     654.000 VEL =      2631. PRES =      32.5
AT      0 HOURS CW=     654.000 VEL =      2633. PRES =      33.1
AT      0 HOURS CW=     654.000 VEL =      2622. PRES =      32.0
AT      0 HOURS CW=     654.000 VEL =      2758. PRES =      32.5
AT      0 HOURS CW=     654.000 VEL =      2625. PRES =      32.8
CASE=                    PLUG=                    WAD=              AGENT=                    PRIMER=15-2
     SPD  10293 PROL AT    89 DEG. PROJ=18-8  2700
AT      0 HOURS CW=     670.000 VEL =      2589. PRES =      32.0
AT      0 HOURS CW=     670.000 VEL =      2581. PRES =      31.7
AT      0 HOURS CW=     670.000 VEL =      2597. PRES =      33.3
AT      0 HOURS CW=     670.000 VEL =      2595. PRES =      32.5
AT      0 HOURS CW=     670.000 VEL =      2604. PRES =      33.3
AT      0 HOURS CW=     670.000 VEL =      2598. PRES =      32.8
AT      0 HOURS CW=     670.000 VEL =      2605. PRES =      33.1
AT      0 HOURS CW=     670.000 VEL =      2595. PRES =      33.1
AT      0 HOURS CW=     670.000 VEL =      2589. PRES =      33.1
AT      0 HOURS CW=     670.000 VEL =      2595. PRES =      33.6
AT      0 HOURS CW=     670.000 VEL =      2601. PRES =      33.3
CASE=                    PLUG=                    WAD=              AGENT=                    PRIMER=15-2
     JHIC    14 PROL AT    89 DEG. PROJ=13-6  1900
AT      0 HOURS CW=     654.000 VEL =      2590. PRES =      33.1
AT      0 HOURS CW=     654.000 VEL =      2599. PRES =      32.8
  135 PREVIOUS ROUNDS,      0 PREVIOJS ESR.

OCT    20, 1954
CASE=                    PLUG=                    WAD=              AGENT=                    PRIMER=15-2
     SPD   4549 PROL AT    90 DEG. PROJ=13-6  1900
AT      0 HOURS CW=     653.000 VEL =      2583. PRES =      32.0
CASE=                    PLUG=                    WAD=              AGENT=                    PRIMER=15-2
     SPD  10293 PROL AT    90 DEG. PROJ=13-6  1900
AT      0 HOURS CW=     670.000 VEL =      2594. PRES =      30.9
AT      0 HOURS CW=     670.000 VEL =      2601. PRES =      32.3
AT      0 HOURS CW=     670.000 VEL =     26090. PRES =     327.9
AT      0 HOURS CW=     670.000 VEL =      2600. PRES =      32.3
AT      0 HOURS CW=     670.000 VEL =      2618. PRES =      32.5
AT      0 HOURS CW=     670.000 VEL =      2603. PRES =      32.8
AT      0 HOURS CW=     670.000 VEL =      2609. PRES =      31.7
AT      0 HOURS CW=     670.000 VEL =      2585. PRES =      32.0
  126 PREVIOUS ROUNDS,      0 PREVIOJS ESR.

SEPT   30, 1954
CASE=                    PLUG=                    WAD=              AGENT=                    PRIMER=15-2
     SPD   4549 PROL AT    90 DEG. PROJ=13-6  1900
AT      0 HOURS CW=     653.000 VEL =      2599. PRES =      32.3
CASE=                    PLUG=                    WAD=              AGENT=                    PRIMER=15-2
     SPD  10293 PROL AT    90 DEG. PROJ=13-6  1900
AT      0 HOURS CW=     670.000 VEL =      2608. PRES =      32.8
AT      0 HOURS CW=     670.000 VEL =      2602. PRES =      33.3
AT      0 HOURS CW=     670.000 VEL =      2615. PRES =      33.1
AT      0 HOURS CW=     670.000 VEL =      2606. PRES =      32.5
AT      0 HOURS CW=     670.000 VEL =      2612. PRES =      33.3
AT      0 HOURS CW=     670.000 VEL =      2614. PRES =      33.9
AT      0 HOURS CW=     670.000 VEL =      2604. PRES =      33.3
AT      0 HOURS CW=     670.000 VEL =      2608. PRES =      33.1
  111 PREVIOUS ROUNDS,      0 PREVIOJS ESR.
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AUG    12, 1954
CASE=                    PLUG=                    WAD=          AGENT=          PRIMER=15-2
    IMIC     39 PROL AT    91 DEG. PROJ=9-1   2700
AT      0 HOURS CW=    475.000 VEL =      1753. PRES =      19.1
AT      0 HOURS CW=    475.000 VEL =      1783. PRES =      19.4
AT      0 HOURS CW=    475.000 VEL =      1781. PRES =      19.4
AT      0 HOURS CW=    475.000 VEL =      1818. PRES =      18.5
AT      0 HOURS CW=    680.000 VEL =     24260. PRES =      42.5
AT      0 HOURS CW=    680.000 VEL =      2433. PRES =      41.9
AT      0 HOURS CW=    680.000 VEL =      2436. PRES =      41.9
AT      0 HOURS CW=    680.000 VEL =      2441. PRES =      42.2
AT      0 HOURS CW=    680.000 VEL =      2420. PRES =      43.0
AT      0 HOURS CW=    700.000 VEL =      2482. PRES =      45.4
CASE=                    PLUG=                    WAD=          AGENT=          PRIMER=15-2
    IMIC     14 PROL AT    90 DEG. PROJ=9-1   2700
AT      0 HOURS CW=    654.000 VEL =      2437. PRES =      44.6
AT      0 HOURS CW=    654.000 VEL =      2440. PRES =      45.2
AT      0 HOURS CW=    654.000 VEL =      2428. PRES =      44.4
AT      0 HOURS CW=    654.000 VEL =      2434. PRES =      44.1
AT      0 HOURS CW=    654.000 VEL =      2428. PRES =      43.5
  180 PREVIOUS ROUNDS,      0 PREVIOJS ESR.

AUG     5, 1954
CASE=                    PLUG=                    WAD=          AGENT=          PRIMER=15-2
    SPCG   9576 PROL AT    90 DEG. PROJ=13-2  1900
AT      0 HOURS CW=    330.000 VEL =      2876. PRES =      31.7
AT      0 HOURS CW=    330.000 VEL =      2857. PRES =      31.2
AT      0 HOURS CW=    330.000 VEL =      2858. PRES =      30.6
AT      0 HOURS CW=    330.000 VEL =      2858. PRES =      30.1
CASE=                    PLUG=                    WAD=          AGENT=          PRIMER=15-2
    HRDD     11 PROL AT    90 DEG. PROJ=13-2  1900
AT      0 HOURS CW=    316.000 VEL =      2838. PRES =      32.5
AT      0 HOURS CW=    316.000 VEL =      2843. PRES =      32.7
AT      0 HOURS CW=    316.000 VEL =      2838. PRES =      31.7
AT      0 HOURS CW=    316.000 VEL =      2841. PRES =      32.3
AT      0 HOURS CW=    330.000 VEL =      2100. PRES =      35.5
AT      0 HOURS CW=    330.000 VEL =      2101. PRES =      34.4
AT      0 HOURS CW=    330.000 VEL =      2107. PRES =      34.9
   79 PREVIOUS ROUNDS,      0 PREVIOJS ESR.

JULY   28, 1954
CASE=                    PLUG=                    WAD=          AGENT=          PRIMER=15-2
    SPD    4549 PROL AT    91 DEG. PROJ=13-6  1900
AT      0 HOURS CW=    653.000 VEL =      2624. PRES =      34.1
CASE=                    PLUG=                    WAD=          AGENT=          PRIMER=15-2
    SPD   18293 PROL AT    91 DEG. PROJ=13-6  1900
AT      0 HOURS CW=    670.000 VEL =      2629. PRES =      34.4
AT      0 HOURS CW=    670.000 VEL =      2634. PRES =      33.3
AT      0 HOURS CW=    670.000 VEL =      2637. PRES =      33.6
AT      0 HOURS CW=    670.000 VEL =      2634. PRES =      33.6
AT      0 HOURS CW=    670.000 VEL =      2620. PRES =      33.3
AT      0 HOURS CW=    670.000 VEL =      2628. PRES =      34.4
AT      0 HOURS CW=    670.000 VEL =      2633. PRES =      33.9
AT      0 HOURS CW=    670.000 VEL =      2622. PRES =      33.3
AT      0 HOURS CW=    670.000 VEL =      2636. PRES =      34.7
AT      0 HOURS CW=    670.000 VEL =      2620. PRES =      34.4
AT      0 HOURS CW=    670.000 VEL =      2619. PRES =      34.1
AT      0 HOURS CW=    670.000 VEL =      2625. PRES =      34.4
AT      0 HOURS CW=    670.000 VEL =      2625. PRES =      34.4
AT      0 HOURS CW=    670.000 VEL =      2620. PRES =      33.6
AT      0 HOURS CW=    670.000 VEL =      2628. PRES =      34.1
AT      0 HOURS CW=    670.000 VEL =      2615. PRES =      33.9
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AT      0 HOURS CW=     670.000 VEL =      2625. PRES =       34.1
AT      0 HOURS CW=     670.000 VEL =      2607. PRES =       34.1
AT      0 HOURS CW=     670.000 VEL =      2628. PRES =       34.4
AT      0 HOURS CW=     670.000 VEL =      2616. PRES =       34.1
   68 PREVIOUS ROUNDS,      0 PREVIOJS ESR.

JULY   15, 1954
CASE=                  PLUG=                 WAD=            AGENT=                PRIMER=15-2
    IMIC    14 PROL AT    91 DEG. PRJJ=9-1   2700
AT      0 HOURS CW=     654.000 VEL =      2461. PRES =       45.7
AT      0 HOURS CW=     654.000 VEL =      2483. PRES =       46.0
AT      0 HOURS CW=     654.000 VEL =      2466. PRES =       46.0
AT      0 HOURS CW=     654.000 VEL =      2478. PRES =       45.7
CASE=                  PLUG=                 WAD=            AGENT=                PRIMER=15-2
    IMIC    38 PROL AT    91 DEG. PRJJ=9-1   2700
AT      0 HOURS CW=     680.000 VEL =      2477. PRES =       46.0
AT      0 HOURS CW=     680.000 VEL =      2480. PRES =       43.8
AT      0 HOURS CW=     680.000 VEL =      2474. PRES =       44.4
AT      0 HOURS CW=     695.000 VEL =      2529. PRES =       49.2
AT      0 HOURS CW=     475.000 VEL =      1827. PRES =       20.2
AT      0 HOURS CW=     475.000 VEL =      1815. PRES =       20.7
AT      0 HOURS CW=     475.000 VEL =      1827. PRES =       20.2
   53 PREVIOUS ROUNDS,      0 PREVIOJS ESR.

JUNE    5, 1954
CASE=                  PLUG=                 WAD=            AGENT=                PRIMER=15-2
    IMIC    37 PROL AT    91 DEG. PRJJ=9-1   2700
AT      0 HOURS CW=     475.000 VEL =      1836. PRES =       22.0
AT      0 HOURS CW=     475.000 VEL =      1850. PRES =       21.5
AT      0 HOURS CW=     475.000 VEL =      1846. PRES =       21.2
AT      0 HOURS CW=     475.000 VEL =      1857. PRES =       21.5
AT      0 HOURS CW=     665.000 VEL =      2438. PRES =       44.6
AT      0 HOURS CW=     665.000 VEL =      2457. PRES =       43.5
AT      0 HOURS CW=     665.000 VEL =      2459. PRES =       43.8
AT      0 HOURS CW=     665.000 VEL =      2455. PRES =       44.9
AT      0 HOURS CW=     665.000 VEL =      2439. PRES =       44.1
AT      0 HOURS CW=     685.000 VEL =      2489. PRES =       46.0
CASE=                  PLUG=                 WAD=            AGENT=                PRIMER=15-2
    IMIC    14 PROL AT    91 DEG. PRJJ=9-1   2700
AT      0 HOURS CW=     654.000 VEL =         0. PRES =       45.4
AT      0 HOURS CW=     654.000 VEL =      2465. PRES =       46.0
AT      0 HOURS CW=     654.000 VEL =      2443. PRES =       43.8
AT      0 HOURS CW=     654.000 VEL =      2451. PRES =       46.2
AT      0 HOURS CW=     654.000 VEL =      2448. PRES =       46.2
   42 PREVIOUS ROUNDS,      0 PREVIOJS ESR.


APRIL  22, 1954
CASE=                  PLUG=                 WAD=            AGENT=                PRIMER=15-2
    IMIC    30 PROL AT    90 DEG. PRJJ=9-1   2700
AT      0 HOURS CW=     685.000 VEL =      2489. PRES =       47.3
CASE=                  PLUG=                 WAD=            AGENT=                PRIMER=15-2
    IMIC    14 PROL AT    90 DEG. PRJJ=9-1   2700
AT      0 HOURS CW=     654.000 VEL =      2479. PRES =       46.2
AT      0 HOURS CW=     654.000 VEL =      2486. PRES =       46.8
AT      0 HOURS CW=     654.000 VEL =      2486. PRES =       46.0
CASE=                  PLUG=                 WAD=            AGENT=                PRIMER=15-2
    IMIC    36 PROL AT    90 DEG. PRJJ=9-1   2700
AT      0 HOURS CW=     685.000 VEL =      2522. PRES =       47.8
AT      0 HOURS CW=     670.000 VEL =      2481. PRES =       44.1
AT      0 HOURS CW=     670.000 VEL =      2456. PRES =       43.5
AT      0 HOURS CW=     670.000 VEL =      2473. PRES =       44.1
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AT      0 HOURS CW=     475.000 VEL =      1837. PRES =       21.2
AT      0 HOURS CW=     475.000 VEL =      1833. PRES =       21.2
AT      0 HOURS CW=     475.000 VEL =      1837. PRES =       20.2
   27 PREVIOUS ROUNDS,       0 PREVIOJS ESR.

MARCH   8, 1954
CASE=                 PLUG=                 WAD=            AGENT=                PRIMER=15-2
    IHIC    35 PROL AT    91 DEG. PROJ=18-1  2700
AT      0 HOURS CW=     475.000 VEL =     18980. PRES =        0.0
AT      0 HOURS CW=     475.000 VEL =      1918. PRES =       23.7
AT      0 HOURS CW=     475.000 VEL =      1915. PRES =       22.8
AT      0 HOURS CW=     475.000 VEL =      1907. PRES =       22.3
AT      0 HOURS CW=     660.000 VEL =      2487. PRES =       46.2
AT      0 HOURS CW=     660.000 VEL =      2477. PRES =       45.7
AT      0 HOURS CW=     660.000 VEL =      2483. PRES =       44.9
AT      0 HOURS CW=     660.000 VEL =      2487. PRES =       45.7
AT      0 HOURS CW=     660.000 VEL =      2487. PRES =       46.2
AT      0 HOURS CW=     680.000 VEL =      2545. PRES =       50.5
CASE=                 PLUG=                 WAD=            AGENT=                PRIMER=15-2
    IHIC    14 PROL AT    91 DEG. PROJ=18-1  2700
AT      0 HOURS CW=     654.000 VEL =      2582. PRES =       46.2
AT      0 HOURS CW=     654.000 VEL =      2488. PRES =       45.2
AT      0 HOURS CW=     654.000 VEL =      2485. PRES =       46.0
AT      0 HOURS CW=     654.000 VEL =      2480. PRES =       44.9
AT      0 HOURS CW=     654.000 VEL =      2483. PRES =       46.5
   16 PREVIOUS ROUNDS,       0 PREVIOJS ESR.

FEB    17, 1954
CASE=                 PLUG=                 WAD=            AGENT=                PRIMER=15-2
    IHIC    34 PROL AT    90 DEG. PROJ=IHIC    14
AT      0 HOURS CW=     475.000 VEL =      1835. PRES =       22.6
AT      0 HOURS CW=     475.000 VEL =      1878. PRES =       22.8
AT      0 HOURS CW=     475.000 VEL =      1876. PRES =       22.3
AT      0 HOURS CW=     475.000 VEL =      1882. PRES =       23.1
AT      0 HOURS CW=     665.000 VEL =      2478. PRES =       44.9
AT      0 HOURS CW=     665.000 VEL =      2483. PRES =       46.8
AT      0 HOURS CW=     665.000 VEL =      2484. PRES =       46.5
AT      0 HOURS CW=     685.000 VEL =      2536. PRES =       48.7
CASE=                 PLUG=                 WAD=            AGENT=                PRIMER=15-2
    IHIC    14 PROL AT    90 DEG. PROJ=IHIC    14
AT      0 HOURS CW=     654.000 VEL =      2474. PRES =       46.5
AT      0 HOURS CW=     654.000 VEL =      2475. PRES =       45.7
AT      0 HOURS CW=     654.000 VEL =      2470. PRES =       46.8
    0 PREVIOUS ROUNDS,       0 PREVIOJS ESR.

DEC     7, 1945
CASE=                 PLUG=                 WAD=            AGENT=                PRIMER=15-1
    IHIC 16455 PROL AT    90 DEG. PROJ=9-1   2700
AT      0 HOURS CW=     500.000 VEL =      1944. PRES =       25.0
CASE=                 PLUG=                 WAD=            AGENT=                PRIMER=15-1
    IHIC 16414 PROL AT    90 DEG. PROJ=9-1   2700
AT      0 HOURS CW=     660.000 VEL =      2522. PRES =       47.8
CASE=                 PLUG=                 WAD=            AGENT=                PRIMER=15-1
    IHIC    14 PROL AT    90 DEG. PROJ=9-1   2700
AT      0 HOURS CW=     684.000 VEL =         0. PRES =       51.1
AT      0 HOURS CW=     710.000 VEL =         0. PRES =       57.8
AT      0 HOURS CW=     655.000 VEL =      2511. PRES =       47.6
AT      0 HOURS CW=     655.000 VEL =      2514. PRES =       46.2
CASE=                 PLUG=                 WAD=            AGENT=                PRIMER=15-1
    IHIC     2 PROL AT    90 DEG. PROJ=9-1   2700
AT      0 HOURS CW=     678.000 VEL =      2495. PRES =       45.7
AT      0 HOURS CW=     670.000 VEL =      2489. PRES =       45.2
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CASE=                PLUG=                WAD=            AGENT=                PRIMER=15-1
     IHIC    15 PROL AT    90 DEG. PROJ=9-1   2700
AT      0 HOURS CW=     641.000 VEL =      2491. PRES =      47.6
AT      0 HOURS CW=     641.000 VEL =      2494. PRES =      45.4
AT      0 HOURS CW=     641.000 VEL =      2492. PRES =      46.1
AT      0 HOURS CW=     641.000 VEL =      2492. PRES =      46.8
CASE=                PLUG=                WAD=            AGENT=                PRIMER=15-1
     IHIC    15 PROL AT     3 DEG. PROJ=9-1   2700
AT      0 HOURS CW=     641.000 VEL =      2343. PRES =      38.2
AT      0 HOURS CW=     641.000 VEL =      2345. PRES =      37.4
AT      0 HOURS CW=     641.000 VEL =      2345. PRES =      37.9
AT      0 HOURS CW=     641.000 VEL =      2345. PRES =      37.9
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OUTPUT FROM PROGRAM BANKO

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GUN NUMBER    396

    1 GUNS WERE CHOSEN BASED ON GUN NOS    LIST OF GUN NUMBERS FOLLOW:
      396

GUN NUMBER   396.   164 RECORDS REQUESTED.


DEC    7, 1945
    0 PREVIOUS ROUNDS OR,    0 ESR.

PLUG GAGE READINGS:      AND
AMBIENT TEMPERATURE WAS   49

CASE:            PLUG:            WAD:            AGENT:            PRIMER: 15-1       PROJECTILE: 9-1   2700
     PROPELLANT: IHIC 16455 CONDITIONED AT   90 DEGREES.
TIME:     0 CHARGE: 499.7120 LBS. VELOCITY:  1944. F/S. PRESSURE:  25.8 KPSI.

CASE:            PLUG:            WAD:            AGENT:            PRIMER: 15-1       PROJECTILE: 9-1   2700
     PROPELLANT: IHIC 16414 CONDITIONED AT   90 DEGREES.
TIME:     0 CHARGE: 660.1387 LBS. VELOCITY:  2522. F/S. PRESSURE:  47.8 KPSI.

CASE:            PLUG:            WAD:            AGENT:            PRIMER: 15-1       PROJECTILE: 9-1   2700
     PROPELLANT: IHIC    14 CONDITIONED AT   90 DEGREES.
TIME:     0 CHARGE: 684.8320 LBS. VELOCITY:     0. F/S. PRESSURE:  51.1 KPSI.
TIME:     0 CHARGE: 789.9733 LBS. VELOCITY:     0. F/S. PRESSURE:  57.8 KPSI.
TIME:     0 CHARGE: 654.6773 LBS. VELOCITY:  2511. F/S. PRESSURE:  47.6 KPSI.
TIME:     0 CHARGE: 654.6773 LBS. VELOCITY:  2514. F/S. PRESSURE:  46.2 KPSI.

CASE:            PLUG:            WAD:            AGENT:            PRIMER: 15-1       PROJECTILE: 9-1   2700
     PROPELLANT: IHIC     2 CONDITIONED AT   90 DEGREES.
TIME:     0 CHARGE: 669.6960 LBS. VELOCITY:  2495. F/S. PRESSURE:  45.7 KPSI.
TIME:     0 CHARGE: 669.6960 LBS. VELOCITY:  2489. F/S. PRESSURE:  45.2 KPSI.

CASE:            PLUG:            WAD:            AGENT:            PRIMER: 15-1       PROJECTILE: 9-1   2700
     PROPELLANT: IHIC    15 CONDITIONED AT   90 DEGREES.
TIME:     0 CHARGE: 641.0240 LBS. VELOCITY:  2491. F/S. PRESSURE:  47.6 KPSI.
TIME:     0 CHARGE: 641.0240 LBS. VELOCITY:  2494. F/S. PRESSURE:  45.4 KPSI.
TIME:     0 CHARGE: 641.0240 LBS. VELOCITY:  2492. F/S. PRESSURE:  48.1 KPSI.
TIME:     0 CHARGE: 641.0240 LBS. VELOCITY:  2492. F/S. PRESSURE:  46.8 KPSI.
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CASE: PLUG: WAD: AGENT: PRIMER: 15-1 PROJECTILE: 9-1 2700
PROPELLANT: IMIC 15 CONDITIONED AT 3 DEGREES.
TIME: 0 CHARGE: 641.0248 LBS. VELOCITY: 2343. F/S. PRESSURE: 38.2 KPSI.
TIME: 0 CHARGE: 641.0248 LBS. VELOCITY: 2345. F/S. PRESSURE: 37.4 KPSI.
TIME: 0 CHARGE: 641.0248 LBS. VELOCITY: 2345. F/S. PRESSURE: 37.9 KPSI.
TIME: 0 CHARGE: 641.0248 LBS. VELOCITY: 2345. F/S. PRESSURE: 37.9 KPSI.

FEB 17, 1954
16 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 59

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: IMIC 14
PROPELLANT: IMIC 34 CONDITIONED AT 98 DEGREES.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1835. F/S. PRESSURE: 22.6 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1878. F/S. PRESSURE: 22.8 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1876. F/S. PRESSURE: 22.3 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1882. F/S. PRESSURE: 23.1 KPSI.
TIME: 0 CHARGE: 664.9173 LBS. VELOCITY: 2478. F/S. PRESSURE: 46.9 KPSI.
TIME: 0 CHARGE: 664.9173 LBS. VELOCITY: 2483. F/S. PRESSURE: 46.8 KPSI.
TIME: 0 CHARGE: 664.9173 LBS. VELOCITY: 2484. F/S. PRESSURE: 46.5 KPSI.
TIME: 0 CHARGE: 684.7147 LBS. VELOCITY: 2536. F/S. PRESSURE: 49.7 KPSI.

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: IMIC 14
PROPELLANT: IMIC 16414 CONDITIONED AT 90 DEGREES.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2474. F/S. PRESSURE: 46.5 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2475. F/S. PRESSURE: 45.7 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2470. F/S. PRESSURE: 46.8 KPSI.

MARCH 8, 1954
27 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 53

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 18-1 2700
PROPELLANT: IMIC 35 CONDITIONED AT 91 DEGREES.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 18980. F/S. PRESSURE: 0.0 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1918. F/S. PRESSURE: 23.7 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1915. F/S. PRESSURE: 22.8 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1907. F/S. PRESSURE: 22.3 KPSI.
TIME: 0 CHARGE: 660.1387 LBS. VELOCITY: 2487. F/S. PRESSURE: 46.2 KPSI.
TIME: 0 CHARGE: 660.1387 LBS. VELOCITY: 2477. F/S. PRESSURE: 45.7 KPSI.
TIME: 0 CHARGE: 660.1387 LBS. VELOCITY: 2483. F/S. PRESSURE: 46.9 KPSI.
TIME: 0 CHARGE: 660.1387 LBS. VELOCITY: 2487. F/S. PRESSURE: 45.7 KPSI.
TIME: 0 CHARGE: 660.1387 LBS. VELOCITY: 2487. F/S. PRESSURE: 46.2 KPSI.
TIME: 0 CHARGE: 679.9360 LBS. VELOCITY: 2545. F/S. PRESSURE: 50.5 KPSI.

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 18-1 2700
PROPELLANT: IMIC 14 CONDITIONED AT 91 DEGREES.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2502. F/S. PRESSURE: 46.2 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2488. F/S. PRESSURE: 45.2 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2485. F/S. PRESSURE: 46.8 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2480. F/S. PRESSURE: 46.9 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2483. F/S. PRESSURE: 46.5 KPSI.

APRIL 22, 1954
42 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 80

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 9-1 2700
PROPELLANT: IMIC 30 CONDITIONED AT 90 DEGREES.
TIME: 0 CHARGE: 684.7147 LBS. VELOCITY: 2469. F/S. PRESSURE: 47.3 KPSI.

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 9-1 2700
PROPELLANT: IMIC 14 CONDITIONED AT 90 DEGREES.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2479. F/S. PRESSURE: 46.2 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2486. F/S. PRESSURE: 46.8 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2486. F/S. PRESSURE: 46.8 KPSI.

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 9-1 2700
PROPELLANT: IMIC 36 CONDITIONED AT 90 DEGREES.
TIME: 0 CHARGE: 684.7147 LBS. VELOCITY: 2522. F/S. PRESSURE: 47.8 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2481. F/S. PRESSURE: 44.1 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2456. F/S. PRESSURE: 43.5 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2473. F/S. PRESSURE: 44.1 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1837. F/S. PRESSURE: 21.2 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1833. F/S. PRESSURE: 21.2 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1837. F/S. PRESSURE: 20.2 KPSI.

JUNE 5, 1954
93 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 60

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 9-1 2700
PROPELLANT: IMIC 37 CONDITIONED AT 91 DEGREES.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1836. F/S. PRESSURE: 22.0 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1850. F/S. PRESSURE: 21.5 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1846. F/S. PRESSURE: 21.2 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1857. F/S. PRESSURE: 21.5 KPSI.
TIME: 0 CHARGE: 664.9173 LBS. VELOCITY: 2438. F/S. PRESSURE: 44.6 KPSI.
TIME: 0 CHARGE: 664.9173 LBS. VELOCITY: 2457. F/S. PRESSURE: 43.5 KPSI.
TIME: 0 CHARGE: 664.9173 LBS. VELOCITY: 2459. F/S. PRESSURE: 43.8 KPSI.
TIME: 0 CHARGE: 664.9173 LBS. VELOCITY: 2455. F/S. PRESSURE: 44.9 KPSI.
TIME: 0 CHARGE: 664.9173 LBS. VELOCITY: 2439. F/S. PRESSURE: 44.1 KPSI.
TIME: 0 CHARGE: 684.7147 LBS. VELOCITY: 2489. F/S. PRESSURE: 46.8 KPSI.

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 9-1 2700
PROPELLANT: IMIC 14 CONDITIONED AT 91 DEGREES.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 0. F/S. PRESSURE: 45.4 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2465. F/S. PRESSURE: 46.8 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2443. F/S. PRESSURE: 43.8 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2451. F/S. PRESSURE: 45.2 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2448. F/S. PRESSURE: 46.2 KPSI.

JULY 15, 1954
68 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 74

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 9-1 2700
PROPELLANT: IMIC 14 CONDITIONED AT 91 DEGREES.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2461. F/S. PRESSURE: 45.7 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2483. F/S. PRESSURE: 46.0 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2466. F/S. PRESSURE: 46.0 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2470. F/S. PRESSURE: 45.7 KPSI.

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 9-1 2700
PROPELLANT: IMIC 38 CONDITIONED AT 91 DEGREES.
TIME: 0 CHARGE: 679.9360 LBS. VELOCITY: 2477. F/S. PRESSURE: 46.8 KPSI.
TIME: 0 CHARGE: 679.9360 LBS. VELOCITY: 2480. F/S. PRESSURE: 43.8 KPSI.
TIME: 0 CHARGE: 679.9360 LBS. VELOCITY: 2474. F/S. PRESSURE: 44.4 KPSI.
TIME: 0 CHARGE: 694.9547 LBS. VELOCITY: 2529. F/S. PRESSURE: 49.2 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1827. F/S. PRESSURE: 20.2 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1815. F/S. PRESSURE: 20.7 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1827. F/S. PRESSURE: 20.2 KPSI.

JULY 28, 1954
79 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 82

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 13-6 1900
PROPELLANT: SPD 4549 CONDITIONED AT 91 DEGREES.
TIME: 0 CHARGE: 653.3120 LBS. VELOCITY: 2624. F/S. PRESSURE: 34.1 KPSI.

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 13-6 1900
PROPELLANT: SPD 18293 CONDITIONED AT 91 DEGREES.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2629. F/S. PRESSURE: 34.4 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2634. F/S. PRESSURE: 33.3 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2637. F/S. PRESSURE: 33.6 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2634. F/S. PRESSURE: 33.6 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2628. F/S. PRESSURE: 33.3 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2628. F/S. PRESSURE: 34.4 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2633. F/S. PRESSURE: 33.9 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2622. F/S. PRESSURE: 33.3 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2636. F/S. PRESSURE: 34.7 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2628. F/S. PRESSURE: 34.4 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2619. F/S. PRESSURE: 34.1 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2625. F/S. PRESSURE: 34.4 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2625. F/S. PRESSURE: 34.4 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2628. F/S. PRESSURE: 33.6 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2628. F/S. PRESSURE: 34.1 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2615. F/S. PRESSURE: 33.9 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2625. F/S. PRESSURE: 34.1 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2607. F/S. PRESSURE: 34.1 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2628. F/S. PRESSURE: 34.4 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2616. F/S. PRESSURE: 34.1 KPSI.

AUG 5, 1954
100 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 71

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 13-2 1900
PROPELLANT: SPCG 9576 CONDITIONED AT 90 DEGREES.
TIME: 0 CHARGE: 329.7200 LBS. VELOCITY: 2076. F/S. PRESSURE: 31.7 KPSI.
TIME: 0 CHARGE: 329.7200 LBS. VELOCITY: 2057. F/S. PRESSURE: 31.2 KPSI.
TIME: 0 CHARGE: 329.7200 LBS. VELOCITY: 2058. F/S. PRESSURE: 30.6 KPSI.
TIME: 0 CHARGE: 329.7200 LBS. VELOCITY: 2058. F/S. PRESSURE: 30.1 KPSI.

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 13-2 1900
PROPELLANT: HKDO 11 CONDITIONED AT 90 DEGREES.
TIME: 0 CHARGE: 316.8747 LBS. VELOCITY: 2038. F/S. PRESSURE: 32.5 KPSI.
TIME: 0 CHARGE: 316.8747 LBS. VELOCITY: 2043. F/S. PRESSURE: 32.3 KPSI.
TIME: 0 CHARGE: 316.8747 LBS. VELOCITY: 2038. F/S. PRESSURE: 31.7 KPSI.
TIME: 0 CHARGE: 316.8747 LBS. VELOCITY: 2041. F/S. PRESSURE: 32.3 KPSI.
TIME: 0 CHARGE: 329.7200 LBS. VELOCITY: 2108. F/S. PRESSURE: 35.5 KPSI.
TIME: 0 CHARGE: 329.7200 LBS. VELOCITY: 2101. F/S. PRESSURE: 34.6 KPSI.
TIME: 0 CHARGE: 329.7200 LBS. VELOCITY: 2107. F/S. PRESSURE: 34.9 KPSI.

AUG 12, 1954
111 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 75

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 9-1 2700
PROPELLANT: IMIC 39 CONDITIONED AT 91 DEGREES.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1753. F/S. PRESSURE: 19.1 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1783. F/S. PRESSURE: 19.4 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1781. F/S. PRESSURE: 19.4 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1818. F/S. PRESSURE: 18.5 KPSI.
TIME: 0 CHARGE: 679.9360 LBS. VELOCITY: 24260. F/S. PRESSURE: 42.5 KPSI.
TIME: 0 CHARGE: 679.9360 LBS. VELOCITY: 2433. F/S. PRESSURE: 41.9 KPSI.
TIME: 0 CHARGE: 679.9360 LBS. VELOCITY: 2436. F/S. PRESSURE: 41.9 KPSI.
TIME: 0 CHARGE: 679.9360 LBS. VELOCITY: 2441. F/S. PRESSURE: 42.2 KPSI.
TIME: 0 CHARGE: 679.9360 LBS. VELOCITY: 2420. F/S. PRESSURE: 43.8 KPSI.
TIME: 0 CHARGE: 699.7333 LBS. VELOCITY: 2482. F/S. PRESSURE: 45.4 KPSI.

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 9-1 2700
PROPELLANT: IMIC 14 CONDITIONED AT 90 DEGREES.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2437. F/S. PRESSURE: 44.6 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2440. F/S. PRESSURE: 45.2 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2428. F/S. PRESSURE: 44.4 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2434. F/S. PRESSURE: 44.1 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2428. F/S. PRESSURE: 43.5 KPSI.

SEPT 30, 1954
126 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 80

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 13-6 1900
PROPELLANT: SPD 4549 CONDITIONED AT 90 DEGREES.
TIME: 0 CHARGE: 653.3120 LBS. VELOCITY: 2599. F/S. PRESSURE: 32.9 KPSI.

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CASE:          PLUG:          WAD:          AGENT:          PRIMER: 15-2      PROJECTILE: 13-6  1900
     PROPELLANT: SPD  10293 CONDITIONED AT   90 DEGREES.
TIME:     0 CHARGE: 669.6960 LBS. VELOCITY:  2608. F/S. PRESSURE:  32.8 KPSI.
TIME:     0 CHARGE: 669.6960 LBS. VELOCITY:  2602. F/S. PRESSURE:  33.3 KPSI.
TIME:     0 CHARGE: 669.6960 LBS. VELOCITY:  2615. F/S. PRESSURE:  33.1 KPSI.
TIME:     0 CHARGE: 669.6960 LBS. VELOCITY:  2606. F/S. PRESSURE:  32.5 KPSI.
TIME:     0 CHARGE: 669.6960 LBS. VELOCITY:  2612. F/S. PRESSURE:  33.3 KPSI.
TIME:     0 CHARGE: 669.6960 LBS. VELOCITY:  2614. F/S. PRESSURE:  33.9 KPSI.
TIME:     0 CHARGE: 669.6960 LBS. VELOCITY:  2604. F/S. PRESSURE:  33.3 KPSI.
TIME:     0 CHARGE: 669.6960 LBS. VELOCITY:  2608. F/S. PRESSURE:  33.1 KPSI.


OCT   20, 1954
  135 PREVIOUS ROUNDS OF,    0 ESR.

PLUG GAGE READINGS:      AND
AMBIENT TEMPERATURE WAS   53

CASE:          PLUG:          WAD:          AGENT:          PRIMER: 15-2      PROJECTILE: 13-6  1900
     PROPELLANT: SPD   4549 CONDITIONED AT   90 DEGREES.
TIME:     0 CHARGE: 653.3120 LBS. VELOCITY:  2583. F/S. PRESSURE:  32.8 KPSI.

CASE:          PLUG:          WAD:          AGENT:          PRIMER: 15-2      PROJECTILE: 13-6  1900
     PROPELLANT: SPD  10293 CONDITIONED AT   90 DEGREES.
TIME:     0 CHARGE: 669.6960 LBS. VELOCITY:  2594. F/S. PRESSURE:  30.9 KPSI.
TIME:     0 CHARGE: 669.6960 LBS. VELOCITY:  2601. F/S. PRESSURE:  32.3 KPSI.
TIME:     0 CHARGE: 669.6960 LBS. VELOCITY: 26090. F/S. PRESSURE: 327.9 KPSI.
TIME:     0 CHARGE: 669.6960 LBS. VELOCITY:  2600. F/S. PRESSURE:  32.3 KPSI.
TIME:     0 CHARGE: 669.6960 LBS. VELOCITY:  2610. F/S. PRESSURE:  32.5 KPSI.
TIME:     0 CHARGE: 669.6960 LBS. VELOCITY:  2603. F/S. PRESSURE:  32.8 KPSI.
TIME:     0 CHARGE: 669.6960 LBS. VELOCITY:  2609. F/S. PRESSURE:  31.7 KPSI.
TIME:     0 CHARGE: 669.6960 LBS. VELOCITY:  2585. F/S. PRESSURE:  32.0 KPSI.


NOV   16, 1954
  144 PREVIOUS ROUNDS OF,    0 ESR.

PLUG GAGE READINGS:      AND
AMBIENT TEMPERATURE WAS   54

CASE:          PLUG:          WAD:          AGENT:          PRIMER: 15-2      PROJECTILE: 13-6  1900
     PROPELLANT: IMIC    14 CONDITIONED AT   80 DEGREES.
TIME:     0 CHARGE: 653.9947 LBS. VELOCITY:  2567. F/S. PRESSURE:  31.2 KPSI.

CASE:          PLUG:          WAD:          AGENT:          PRIMER: 15-2      PROJECTILE: 18-0  2700
     PROPELLANT: SPD  10293 CONDITIONED AT   89 DEGREES.
TIME:     0 CHARGE: 669.6960 LBS. VELOCITY:  2427. F/S. PRESSURE:  40.3 KPSI.
TIME:     0 CHARGE: 669.6960 LBS. VELOCITY:  2429. F/S. PRESSURE:  41.7 KPSI.
TIME:     0 CHARGE: 669.6960 LBS. VELOCITY:  2427. F/S. PRESSURE:  38.7 KPSI.

CASE:          PLUG:          WAD:          AGENT:          PRIMER: 15-2      PROJECTILE: 13-6  1900
     PROPELLANT: IMIC    14 CONDITIONED AT   89 DEGREES.
TIME:     0 CHARGE: 653.9947 LBS. VELOCITY:  2616. F/S. PRESSURE:  33.3 KPSI.
TIME:     0 CHARGE: 653.9947 LBS. VELOCITY:  2621. F/S. PRESSURE:  32.8 KPSI.
TIME:     0 CHARGE: 653.9947 LBS. VELOCITY:  2624. F/S. PRESSURE:  33.1 KPSI.
TIME:     0 CHARGE: 653.9947 LBS. VELOCITY:  2615. F/S. PRESSURE:  33.1 KPSI.
TIME:     0 CHARGE: 653.9947 LBS. VELOCITY:  2631. F/S. PRESSURE:  32.5 KPSI.
TIME:     0 CHARGE: 653.9947 LBS. VELOCITY:  2633. F/S. PRESSURE:  33.1 KPSI.
TIME:     0 CHARGE: 653.9947 LBS. VELOCITY:  2622. F/S. PRESSURE:  32.0 KPSI.
TIME:     0 CHARGE: 653.9947 LBS. VELOCITY:  2750. F/S. PRESSURE:  32.5 KPSI.
TIME:     0 CHARGE: 653.9947 LBS. VELOCITY:  2625. F/S. PRESSURE:  32.8 KPSI.
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CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 18-8 2788
PROPELLANT: SPD 10293 CONDITIONED AT 89 DEGREES.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2589. F/S. PRESSURE: 32.0 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2581. F/S. PRESSURE: 31.7 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2597. F/S. PRESSURE: 33.1 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2595. F/S. PRESSURE: 32.5 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2604. F/S. PRESSURE: 33.3 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2598. F/S. PRESSURE: 32.8 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2605. F/S. PRESSURE: 33.1 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2595. F/S. PRESSURE: 33.1 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2589. F/S. PRESSURE: 33.1 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2595. F/S. PRESSURE: 33.6 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2601. F/S. PRESSURE: 33.3 KPSI.

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 13-6 1988
PROPELLANT: IMIC 14 CONDITIONED AT 89 DEGREES.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2590. F/S. PRESSURE: 33.1 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2599. F/S. PRESSURE: 32.8 KPSI.

DEC 15, 1954
178 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 42

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 13-2 1988
PROPELLANT: SPD 4549 CONDITIONED AT 88 DEGREES.
TIME: 0 CHARGE: 653.3120 LBS. VELOCITY: 2571. F/S. PRESSURE: 32.3 KPSI.

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 18-8 2788
PROPELLANT: IMIC 14 CONDITIONED AT 88 DEGREES.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2440. F/S. PRESSURE: 43.8 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2429. F/S. PRESSURE: 43.5 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2419. F/S. PRESSURE: 43.3 KPSI.

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 13-6 1988
PROPELLANT: SPD 10293 CONDITIONED AT 88 DEGREES.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2590. F/S. PRESSURE: 33.3 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2579. F/S. PRESSURE: 31.2 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2571. F/S. PRESSURE: 31.7 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2588. F/S. PRESSURE: 30.4 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2577. F/S. PRESSURE: 31.7 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2579. F/S. PRESSURE: 32.5 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2577. F/S. PRESSURE: 32.8 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2575. F/S. PRESSURE: 31.7 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2585. F/S. PRESSURE: 32.3 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2578. F/S. PRESSURE: 32.8 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2571. F/S. PRESSURE: 31.2 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2578. F/S. PRESSURE: 32.3 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2578. F/S. PRESSURE: 32.3 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2571. F/S. PRESSURE: 32.3 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2565. F/S. PRESSURE: 31.4 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2577. F/S. PRESSURE: 32.8 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2579. F/S. PRESSURE: 32.3 KPSI.

DEC 16, 1954
191 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 40

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 13-2 19881
PROPELLANT: SPD 4569 CONDITIONED AT 90 DEGREES.
TIME: 0 CHARGE: 653.3120 LBS. VELOCITY: 2576. F/S. PRESSURE: 31.7 KPSI.

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 3-6 1988
PROPELLANT: SPD 10293 CONDITIONED AT 90 DEGREES.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2597. F/S. PRESSURE: 32.8 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2585. F/S. PRESSURE: 32.8 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2586. F/S. PRESSURE: 31.7 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2576. F/S. PRESSURE: 32.5 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2561. F/S. PRESSURE: 32.8 KPSI.

APRIL 28, 1955
197 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 59

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 9-1 18-8
PROPELLANT: IMIC 14 CONDITIONED AT 90 DEGREES.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2430. F/S. PRESSURE: 42.2 KPSI.

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 3-6 1988
PROPELLANT: IMIC 14 CONDITIONED AT 90 DEGREES.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2417. F/S. PRESSURE: 42.2 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2418. F/S. PRESSURE: 42.2 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2421. F/S. PRESSURE: 40.9 KPSI.

MAY 21, 1955
201 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 79

CASE: PLUG: WAD: AGENT: PRIMER: 15-1 PROJECTILE: 9-1 2788
PROPELLANT: IMIC 14 CONDITIONED AT 91 DEGREES.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2426. F/S. PRESSURE: 42.5 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2421. F/S. PRESSURE: 44.1 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2415. F/S. PRESSURE: 43.3 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2422. F/S. PRESSURE: 41.7 KPSI.

AUG 8, 1955
205 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 75

CASE: PLUG: WAD: AGENT: PRIMER: 15-1 PROJECTILE: 9-1 2788
PROPELLANT: IMIC 14 CONDITIONED AT 90 DEGREES.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2424. F/S. PRESSURE: 42.5 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2419. F/S. PRESSURE: 44.4 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2430. F/S. PRESSURE: 41.9 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2435. F/S. PRESSURE: 43.3 KPSI.

SEPT 13, 1955
209 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 70

CASE: PLUG: WAD: AGENT: PRIMER: 15-1 PROJECTILE: 9-1 2700
PROPELLANT: IMIC 40 CONDITIONED AT 90 DEGREES.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1789. F/S. PRESSURE: 19.9 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1799. F/S. PRESSURE: 20.2 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1798. F/S. PRESSURE: 20.4 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1789. F/S. PRESSURE: 19.9 KPSI.
TIME: 0 CHARGE: 664.9173 LBS. VELOCITY: 2399. F/S. PRESSURE: 41.1 KPSI.
TIME: 0 CHARGE: 664.9173 LBS. VELOCITY: 2398. F/S. PRESSURE: 41.7 KPSI.
TIME: 0 CHARGE: 664.9173 LBS. VELOCITY: 2400. F/S. PRESSURE: 42.2 KPSI.
TIME: 0 CHARGE: 664.9173 LBS. VELOCITY: 2393. F/S. PRESSURE: 41.4 KPSI.
TIME: 0 CHARGE: 664.9173 LBS. VELOCITY: 2394. F/S. PRESSURE: 42.2 KPSI.
TIME: 0 CHARGE: 684.7147 LBS. VELOCITY: 2457. F/S. PRESSURE: 44.9 KPSI.

CASE: PLUG: WAD: AGENT: PRIMER: 15-1 PROJECTILE: 9-1 2700
PROPELLANT: IMIC 14 CONDITIONED AT 90 DEGREES.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2413. F/S. PRESSURE: 43.0 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2406. F/S. PRESSURE: 41.9 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2408. F/S. PRESSURE: 41.7 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2409. F/S. PRESSURE: 44.1 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2402. F/S. PRESSURE: 43.0 KPSI.

OCT 13, 1955
224 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 78

CASE: PLUG: WAD: AGENT: PRIMER: 15-1 PROJECTILE: 9-1 2700
PROPELLANT: IMIC 41 CONDITIONED AT 90 DEGREES.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1776. F/S. PRESSURE: 20.4 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1787. F/S. PRESSURE: 20.4 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1778. F/S. PRESSURE: 20.2 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1774. F/S. PRESSURE: 19.9 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2402. F/S. PRESSURE: 41.7 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2409. F/S. PRESSURE: 41.4 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2413. F/S. PRESSURE: 41.7 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2413. F/S. PRESSURE: 41.1 KPSI.
TIME: 0 CHARGE: 669.6960 LBS. VELOCITY: 2413. F/S. PRESSURE: 41.4 KPSI.
TIME: 0 CHARGE: 690.1760 LBS. VELOCITY: 2465. F/S. PRESSURE: 44.6 KPSI.

CASE: PLUG: WAD: AGENT: PRIMER: 15-1 PROJECTILE: 9-1 2700
PROPELLANT: IMIC 14 CONDITIONED AT 90 DEGREES.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2489. F/S. PRESSURE: 42.5 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2407. F/S. PRESSURE: 43.0 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2401. F/S. PRESSURE: 42.7 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2412. F/S. PRESSURE: 42.7 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2406. F/S. PRESSURE: 42.7 KPSI.

OCT 27, 1955
239 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 64

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 9-1 2780
PROPELLANT: IMIC 14 CONDITIONED AT 90 DEGREES.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2416. F/S. PRESSURE: 42.5 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2417. F/S. PRESSURE: 42.5 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2408. F/S. PRESSURE: 40.3 KPSI.

NOV 22, 1955
242 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 48

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 9-3 2780
PROPELLANT: IMIC 42 CONDITIONED AT 89 DEGREES.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1784. F/S. PRESSURE: 20.4 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1795. F/S. PRESSURE: 20.2 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1798. F/S. PRESSURE: 20.2 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1815. F/S. PRESSURE: 20.2 KPSI.
TIME: 0 CHARGE: 660.1387 LBS. VELOCITY: 2390. F/S. PRESSURE: 39.8 KPSI.
TIME: 0 CHARGE: 660.1387 LBS. VELOCITY: 2407. F/S. PRESSURE: 40.6 KPSI.
TIME: 0 CHARGE: 660.1387 LBS. VELOCITY: 2401. F/S. PRESSURE: 40.9 KPSI.
TIME: 0 CHARGE: 660.1387 LBS. VELOCITY: 2401. F/S. PRESSURE: 40.9 KPSI.
TIME: 0 CHARGE: 660.1387 LBS. VELOCITY: 2398. F/S. PRESSURE: 40.1 KPSI.
TIME: 0 CHARGE: 679.9360 LBS. VELOCITY: 2468. F/S. PRESSURE: 44.1 KPSI.

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 9-3 2780
PROPELLANT: IMIC 14 CONDITIONED AT 90 DEGREES.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2408. F/S. PRESSURE: 41.7 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2416. F/S. PRESSURE: 42.2 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2415. F/S. PRESSURE: 41.9 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2416. F/S. PRESSURE: 41.7 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2411. F/S. PRESSURE: 41.9 KPSI.

JAN 24, 1956
257 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 25

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 9-1 2780
PROPELLANT: IMIC 43 CONDITIONED AT 90 DEGREES.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1800. F/S. PRESSURE: 20.7 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1812. F/S. PRESSURE: 20.4 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1809. F/S. PRESSURE: 20.4 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1808. F/S. PRESSURE: 20.7 KPSI.
TIME: 0 CHARGE: 654.6773 LBS. VELOCITY: 2391. F/S. PRESSURE: 39.9 KPSI.
TIME: 0 CHARGE: 654.6773 LBS. VELOCITY: 2390. F/S. PRESSURE: 40.1 KPSI.
TIME: 0 CHARGE: 654.6773 LBS. VELOCITY: 2393. F/S. PRESSURE: 40.6 KPSI.
TIME: 0 CHARGE: 675.1573 LBS. VELOCITY: 2458. F/S. PRESSURE: 43.5 KPSI.

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 9-1 2700
PROPELLANT: IMIC 14 CONDITIONED AT 90 DEGREES.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2410. F/S. PRESSURE: 41.4 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2418. F/S. PRESSURE: 42.7 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2409. F/S. PRESSURE: 41.7 KPSI.

FEB 14, 1956
268 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 48

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 9-1 2700
PROPELLANT: IMIC 44 CONDITIONED AT 90 DEGREES.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1799. F/S. PRESSURE: 19.9 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1817. F/S. PRESSURE: 21.8 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1814. F/S. PRESSURE: 20.4 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1811. F/S. PRESSURE: 20.4 KPSI.
TIME: 0 CHARGE: 654.6773 LBS. VELOCITY: 2396. F/S. PRESSURE: 40.6 KPSI.
TIME: 0 CHARGE: 654.6773 LBS. VELOCITY: 2402. F/S. PRESSURE: 41.4 KPSI.
TIME: 0 CHARGE: 654.6773 LBS. VELOCITY: 2399. F/S. PRESSURE: 41.1 KPSI.
TIME: 0 CHARGE: 654.6773 LBS. VELOCITY: 2396. F/S. PRESSURE: 40.6 KPSI.
TIME: 0 CHARGE: 654.6773 LBS. VELOCITY: 2396. F/S. PRESSURE: 40.9 KPSI.
TIME: 0 CHARGE: 675.1573 LBS. VELOCITY: 2449. F/S. PRESSURE: 44.4 KPSI.

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 9-1 2700
PROPELLANT: IMIC 14 CONDITIONED AT 90 DEGREES.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2411. F/S. PRESSURE: 42.5 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2403. F/S. PRESSURE: 41.4 KPSI.

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 10-8 2700
PROPELLANT: IMIC 14 CONDITIONED AT 90 DEGREES.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2403. F/S. PRESSURE: 42.2 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2402. F/S. PRESSURE: 41.4 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2406. F/S. PRESSURE: 42.2 KPSI.

APRIL 26, 1956
283 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 59

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 9-1 2697
PROPELLANT: IMIC 45 CONDITIONED AT 90 DEGREES.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1807. F/S. PRESSURE: 20.7 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1812. F/S. PRESSURE: 20.7 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1822. F/S. PRESSURE: 20.7 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1820. F/S. PRESSURE: 20.7 KPSI.
TIME: 0 CHARGE: 649.8987 LBS. VELOCITY: 2383. F/S. PRESSURE: 41.1 KPSI.
TIME: 0 CHARGE: 649.8987 LBS. VELOCITY: 2389. F/S. PRESSURE: 41.4 KPSI.
TIME: 0 CHARGE: 649.8987 LBS. VELOCITY: 2394. F/S. PRESSURE: 41.7 KPSI.
TIME: 0 CHARGE: 669.6660 LBS. VELOCITY: 2457. F/S. PRESSURE: 45.2 KPSI.

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 9-1 2697
PROPELLANT: IMIC 14 CONDITIONED AT 90 DEGREES.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2404. F/S. PRESSURE: 41.9 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2406. F/S. PRESSURE: 41.4 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2403. F/S. PRESSURE: 42.7 KPSI.

MAY 19, 1956
294 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 78

CASE:	PLUG:		WAD:	AGENT:		PRIMER: 15-2	PROJECTILE: 9-1	2898
PROPELLANT: IMIC	46 CONDITIONED AT	90 DEGREES.						
TIME:	0 CHARGE: 475.1360 LBS.	VELOCITY:	1799. F/S.	PRESSURE:	19.9 KPSI.			
TIME:	0 CHARGE: 475.1360 LBS.	VELOCITY:	1810. F/S.	PRESSURE:	20.2 KPSI.			
TIME:	0 CHARGE: 475.1360 LBS.	VELOCITY:	1809. F/S.	PRESSURE:	20.2 KPSI.			
TIME:	0 CHARGE: 475.1360 LBS.	VELOCITY:	1800. F/S.	PRESSURE:	20.2 KPSI.			
TIME:	0 CHARGE: 654.6773 LBS.	VELOCITY:	2386. F/S.	PRESSURE:	40.6 KPSI.			
TIME:	0 CHARGE: 654.6773 LBS.	VELOCITY:	2390. F/S.	PRESSURE:	40.7 KPSI.			
TIME:	0 CHARGE: 654.6773 LBS.	VELOCITY:	2390. F/S.	PRESSURE:	41.1 KPSI.			
TIME:	0 CHARGE: 654.6773 LBS.	VELOCITY:	2395. F/S.	PRESSURE:	41.9 KPSI.			
TIME:	0 CHARGE: 654.6773 LBS.	VELOCITY:	2384. F/S.	PRESSURE:	41.9 KPSI.			
TIME:	0 CHARGE: 669.6960 LBS.	VELOCITY:	2434. F/S.	PRESSURE:	44.6 KPSI.			

CASE:	PLUG:		WAD:	AGENT:		PRIMER: 15-2	PROJECTILE: 9-1	2898
PROPELLANT: IMIC	14 CONDITIONED AT	90 DEGREES.						
TIME:	0 CHARGE: 653.9947 LBS.	VELOCITY:	2402. F/S.	PRESSURE:	41.4 KPSI.			
TIME:	0 CHARGE: 653.9947 LBS.	VELOCITY:	2395. F/S.	PRESSURE:	40.7 KPSI.			
TIME:	0 CHARGE: 653.9947 LBS.	VELOCITY:	2405. F/S.	PRESSURE:	41.1 KPSI.			
TIME:	0 CHARGE: 653.9947 LBS.	VELOCITY:	2403. F/S.	PRESSURE:	41.4 KPSI.			
TIME:	0 CHARGE: 653.9947 LBS.	VELOCITY:	2404. F/S.	PRESSURE:	41.9 KPSI.			

JULY 27, 1956
309 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND

CASE:	PLUG:		WAD:	AGENT:		PRIMER: 15-3	PROJECTILE: EX4-8	1988
PROPELLANT: IMIC	14 CONDITIONED AT	90 DEGREES.						
TIME:	0 CHARGE: 653.9947 LBS.	VELOCITY:	2608. F/S.	PRESSURE:	32.3 KPSI.			
TIME:	0 CHARGE: 653.9947 LBS.	VELOCITY:	2591. F/S.	PRESSURE:	32.0 KPSI.			
TIME:	0 CHARGE: 653.9947 LBS.	VELOCITY:	2587. F/S.	PRESSURE:	32.5 KPSI.			
TIME:	0 CHARGE: 653.9947 LBS.	VELOCITY:	2577. F/S.	PRESSURE:	32.3 KPSI.			
TIME:	0 CHARGE: 653.9947 LBS.	VELOCITY:	2562. F/S.	PRESSURE:	31.7 KPSI.			
TIME:	0 CHARGE: 653.9947 LBS.	VELOCITY:	2566. F/S.	PRESSURE:	32.0 KPSI.			
TIME:	0 CHARGE: 653.9947 LBS.	VELOCITY:	2594. F/S.	PRESSURE:	32.3 KPSI.			
TIME:	0 CHARGE: 653.9947 LBS.	VELOCITY:	2580. F/S.	PRESSURE:	33.1 KPSI.			
TIME:	0 CHARGE: 653.9947 LBS.	VELOCITY:	2588. F/S.	PRESSURE:	32.5 KPSI.			

SEPT 25, 1957
318 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 68

CASE:	PLUG:		WAD:	AGENT:		PRIMER:	PROJECTILE: 13-6	1988
PROPELLANT: IMIC	14 CONDITIONED AT	90 DEGREES.						
TIME:	0 CHARGE: 666.2827 LBS.	VELOCITY:	2605. F/S.	PRESSURE:	32.8 KPSI.			
TIME:	0 CHARGE: 666.2827 LBS.	VELOCITY:	2644. F/S.	PRESSURE:	33.6 KPSI.			
TIME:	0 CHARGE: 666.2827 LBS.	VELOCITY:	2635. F/S.	PRESSURE:	33.6 KPSI.			
TIME:	0 CHARGE: 666.2827 LBS.	VELOCITY:	2644. F/S.	PRESSURE:	34.1 KPSI.			
TIME:	0 CHARGE: 666.2827 LBS.	VELOCITY:	2656. F/S.	PRESSURE:	33.6 KPSI.			
TIME:	0 CHARGE: 666.2827 LBS.	VELOCITY:	2643. F/S.	PRESSURE:	33.9 KPSI.			

MAY 16, 1959
324 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 63

CASE: PLUG: WAD: AGENT: PRIMER: 15-4 PROJECTILE: 9-1 2788
PROPELLANT: IMIC 14 CONDITIONED AT 90 DEGREES.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2416. F/S. PRESSURE: 42.5 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2426. F/S. PRESSURE: 42.5 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2423. F/S. PRESSURE: 42.7 KPSI.
TIME: 0 CHARGE: 653.9947 LBS. VELOCITY: 2419. F/S. PRESSURE: 42.2 KPSI.

MAY 17, 1960
328 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 75

CASE: PLUG: WAD: AGENT: PRIMER: 15-3 PROJECTILE: 9-1 2788
PROPELLANT: IMIC 14 CONDITIONED AT 90 DEGREES.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1806. F/S. PRESSURE: 20.2 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 1821. F/S. PRESSURE: 20.2 KPSI.

MAY 21, 1960
338 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 82

CASE: PLUG: WAD: AGENT: PRIMER: 15-3 PROJECTILE: 9-1 2788
PROPELLANT: IMIC 14 CONDITIONED AT 90 DEGREES.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 0. F/S. PRESSURE: 19.9 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 0. F/S. PRESSURE: 20.4 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 0. F/S. PRESSURE: 20.2 KPSI.
TIME: 0 CHARGE: 475.1360 LBS. VELOCITY: 0. F/S. PRESSURE: 20.2 KPSI.

AUG 17, 1967
334 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 80

CASE: PLUG: WAD: AGENT: PRIMER: 15-3 PROJECTILE: 9-3 2699
PROPELLANT: SPD 8102 CONDITIONED AT 90 DEGREES.
TIME: 0 CHARGE: 658.7733 LBS. VELOCITY: 2383. F/S. PRESSURE: 39.8 KPSI.

AUG 22, 1967
335 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 69

CASE: PLUG: WAD: AGENT: PRIMER: 15-3 PROJECTILE: 13-6 1986
PROPELLANT: SPD 8102 CONDITIONED AT 90 DEGREES.
TIME: 0 CHARGE: 658.7733 LBS. VELOCITY: 2555. F/S. PRESSURE: 30.9 KPSI.

AUG 23, 1967
336 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 67

CASE: PLUG: MAD: AGENT: PRIMER: 15-3 PROJECTILE: 13-6 1988
PROPELLANT: SPC 8102 CONDITIONED AT 90 DEGREES.
TYPE: 0 CHARGE: 658.7733 LBS. VELOCITY: 2527. F/S. PRESSURE: 38.6 KPSI.

NOV 1, 1967
337 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 57

CASE: PLUG: MAD: AGENT: PRIMER: 15-2 PROJECTILE: 9-1 2700
PROPELLANT: IMIC 14 CONDITIONED AT 90 DEGREES.
TYPE: 1121 CHARGE: 653.9947 LBS. VELOCITY: 2424. F/S. PRESSURE: 41.4 KPSI.
TYPE: 1140 CHARGE: 653.9947 LBS. VELOCITY: 2469. F/S. PRESSURE: 40.6 KPSI.
TYPE: 1153 CHARGE: 653.9947 LBS. VELOCITY: 2398. F/S. PRESSURE: 40.3 KPSI.

NOV 9, 1967
340 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 58

CASE: PLUG: MAD: AGENT: PRIMER: 15-2 PROJECTILE: 9-3 2700
PROPELLANT: SPC 8102 CONDITIONED AT 90 DEGREES.
TYPE: 1123 CHARGE: 658.7733 LBS. VELOCITY: 2358. F/S. PRESSURE: 38.4 KPSI.
TYPE: 1146 CHARGE: 658.7733 LBS. VELOCITY: 2370. F/S. PRESSURE: 38.7 KPSI.
TYPE: 1202 CHARGE: 658.7733 LBS. VELOCITY: 2351. F/S. PRESSURE: 37.1 KPSI.

NOV 20, 1967
343 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 40

CASE: PLUG: MAD: AGENT: PRIMER: 15-2 PROJECTILE: 9-3 2700
PROPELLANT: SPC 8102 CONDITIONED AT 90 DEGREES.
TYPE: 0 CHARGE: 658.7733 LBS. VELOCITY: 2375. F/S. PRESSURE: 38.2 KPSI.

FEB 5, 1968
344 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 42

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 9-3 2700
PROPELLANT: IMIC 14 CONDITIONED AT 90 DEGREES.
TIME: 957 CHARGE: 653.9947 LBS. VELOCITY: 2415. F/S. PRESSURE: 40.9 KPSI.
TIME: 1008 CHARGE: 653.9947 LBS. VELOCITY: 2402. F/S. PRESSURE: 41.7 KPSI.
TIME: 1016 CHARGE: 653.9947 LBS. VELOCITY: 2436. F/S. PRESSURE: 43.5 KPSI.
TIME: 1027 CHARGE: 653.9947 LBS. VELOCITY: 2433. F/S. PRESSURE: 42.7 KPSI.
TIME: 1039 CHARGE: 653.9947 LBS. VELOCITY: 2411. F/S. PRESSURE: 40.3 KPSI.
TIME: 1103 CHARGE: 653.9947 LBS. VELOCITY: 2423. F/S. PRESSURE: 42.2 KPSI.

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 9-3 2700
PROPELLANT: AJ 3 20 CONDITIONED AT 90 DEGREES.
TIME: 1118 CHARGE: 499.7120 LBS. VELOCITY: 1586. F/S. PRESSURE: 14.8 KPSI.
TIME: 1128 CHARGE: 600.0640 LBS. VELOCITY: 1912. F/S. PRESSURE: 22.8 KPSI.
TIME: 1138 CHARGE: 699.7333 LBS. VELOCITY: 2270. F/S. PRESSURE: 36.3 KPSI.
TIME: 1336 CHARGE: 770.0480 LBS. VELOCITY: 2530. F/S. PRESSURE: 55.4 KPSI.

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 9-3 2700
PROPELLANT: AJ 3 19 CONDITIONED AT 90 DEGREES.
TIME: 1346 CHARGE: 499.7120 LBS. VELOCITY: 1351. F/S. PRESSURE: 11.0 KPSI.
TIME: 1404 CHARGE: 600.0640 LBS. VELOCITY: 1806. F/S. PRESSURE: 16.1 KPSI.
TIME: 1415 CHARGE: 699.7333 LBS. VELOCITY: 1952. F/S. PRESSURE: 24.2 KPSI.
TIME: 1429 CHARGE: 800.0853 LBS. VELOCITY: 2311. F/S. PRESSURE: 36.8 KPSI.

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 9-3 2700
PROPELLANT: AJ 3 21 CONDITIONED AT 90 DEGREES.
TIME: 1442 CHARGE: 600.0640 LBS. VELOCITY: 1921. F/S. PRESSURE: 22.8 KPSI.
TIME: 1454 CHARGE: 699.7333 LBS. VELOCITY: 2261. F/S. PRESSURE: 34.9 KPSI.
TIME: 1539 CHARGE: 800.0853 LBS. VELOCITY: 2616. F/S. PRESSURE: 58.9 KPSI.

FEB 6, 1968
361 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 48

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 9-3 2700
PROPELLANT: SPD 8102 CONDITIONED AT 90 DEGREES.
TIME: 0 CHARGE: 658.7733 LBS. VELOCITY: 0. F/S. PRESSURE: 37.9 KPSI.

FEB 8, 1968
362 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 33

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 13-6 1900
PROPELLANT: SPD 8102 CONDITIONED AT 90 DEGREES.
TIME: 1112 CHARGE: 658.7733 LBS. VELOCITY: 2618. F/S. PRESSURE: 32.3 KPSI.
TIME: 1150 CHARGE: 658.7733 LBS. VELOCITY: 2583. F/S. PRESSURE: 30.4 KPSI.
TIME: 1329 CHARGE: 658.7733 LBS. VELOCITY: 2563. F/S. PRESSURE: 30.4 KPSI.
TIME: 1406 CHARGE: 658.7733 LBS. VELOCITY: 2593. F/S. PRESSURE: 31.7 KPSI.
TIME: 1427 CHARGE: 658.7733 LBS. VELOCITY: 2571. F/S. PRESSURE: 30.4 KPSI.
TIME: 1440 CHARGE: 658.7733 LBS. VELOCITY: 2557. F/S. PRESSURE: 30.1 KPSI.
TIME: 1449 CHARGE: 658.7733 LBS. VELOCITY: 2564. F/S. PRESSURE: 30.4 KPSI.

FEB 15, 1968
389 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 34

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: SPD 3734
PROPELLANT: SPD 8102 CONDITIONED AT 98 DEGREES.
TYPE: 1100 CHARGE: 658.7733 LBS. VELOCITY: 0. F/S. PRESSURE: 38.6 KPSI.
TYPE: 1115 CHARGE: 658.7733 LBS. VELOCITY: 0. F/S. PRESSURE: 31.4 KPSI.

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: SPD 3734
PROPELLANT: AJ 3 20 CONDITIONED AT 98 DEGREES.
TYPE: 1120 CHARGE: 320.1707 LBS. VELOCITY: 0. F/S. PRESSURE: 14.0 KPSI.
TYPE: 1141 CHARGE: 320.1707 LBS. VELOCITY: 0. F/S. PRESSURE: 14.0 KPSI.
TYPE: 1158 CHARGE: 320.1707 LBS. VELOCITY: 0. F/S. PRESSURE: 14.2 KPSI.
TYPE: 1346 CHARGE: 320.1707 LBS. VELOCITY: 0. F/S. PRESSURE: 14.0 KPSI.
TYPE: 1355 CHARGE: 320.1707 LBS. VELOCITY: 0. F/S. PRESSURE: 13.4 KPSI.
TYPE: 1404 CHARGE: 320.1707 LBS. VELOCITY: 0. F/S. PRESSURE: 13.7 KPSI.
TYPE: 1418 CHARGE: 320.1707 LBS. VELOCITY: 0. F/S. PRESSURE: 13.4 KPSI.
TYPE: 1430 CHARGE: 320.1707 LBS. VELOCITY: 0. F/S. PRESSURE: 13.7 KPSI.

FEB 20, 1968
379 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 34

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: AJ 3 21
PROPELLANT: IMIC 14 CONDITIONED AT 98 DEGREES.
TYPE: 0 CHARGE: 653.9947 LBS. VELOCITY: 2411. F/S. PRESSURE: 41.4 KPSI.
TYPE: 0 CHARGE: 653.9947 LBS. VELOCITY: 2425. F/S. PRESSURE: 40.9 KPSI.
TYPE: 0 CHARGE: 653.9947 LBS. VELOCITY: 2447. F/S. PRESSURE: 42.2 KPSI.

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: AJ 3 21
PROPELLANT: AJ 3 20 CONDITIONED AT 98 DEGREES.
TYPE: 0 CHARGE: 744.1067 LBS. VELOCITY: 2441. F/S. PRESSURE: 44.6 KPSI.
TYPE: 0 CHARGE: 744.1067 LBS. VELOCITY: 2426. F/S. PRESSURE: 44.1 KPSI.
TYPE: 0 CHARGE: 744.1067 LBS. VELOCITY: 2476. F/S. PRESSURE: 48.1 KPSI.

FEB 23, 1968
385 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 34

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 9-3 2700
PROPELLANT: SPD 8102 CONDITIONED AT 98 DEGREES.
TYPE: 1019 CHARGE: 658.7733 LBS. VELOCITY: 2410. F/S. PRESSURE: 39.8 KPSI.
TYPE: 1037 CHARGE: 658.7733 LBS. VELOCITY: 2401. F/S. PRESSURE: 38.4 KPSI.
TYPE: 1048 CHARGE: 658.7733 LBS. VELOCITY: 2415. F/S. PRESSURE: 39.2 KPSI.
TYPE: 1115 CHARGE: 658.7733 LBS. VELOCITY: 2369. F/S. PRESSURE: 37.9 KPSI.
TYPE: 1125 CHARGE: 658.7733 LBS. VELOCITY: 2374. F/S. PRESSURE: 38.2 KPSI.
TYPE: 1136 CHARGE: 658.7733 LBS. VELOCITY: 2371. F/S. PRESSURE: 37.6 KPSI.
TYPE: 1145 CHARGE: 658.7733 LBS. VELOCITY: 2375. F/S. PRESSURE: 38.2 KPSI.
TYPE: 1155 CHARGE: 658.7733 LBS. VELOCITY: 2483. F/S. PRESSURE: 39.2 KPSI.

FEB 26, 1968
39 PREVIOUS ROUNDS OR, 38888 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 28

CASE: PLUG: MAD: AGENT: PRIMER: 15-2 PROJECTILE: 9-3 2694
PROPELLANT: SPD 10335 CONDITIONED AT 90 DEGREES.
TIME: 1007 CHARGE: 662.8693 LBS. VELOCITY: 2382. F/S. PRESSURE: 37.9 KPSI.
TIME: 1017 CHARGE: 662.8693 LBS. VELOCITY: 2383. F/S. PRESSURE: 37.6 KPSI.
TIME: 1048 CHARGE: 662.8693 LBS. VELOCITY: 2388. F/S. PRESSURE: 38.4 KPSI.

FEB 28, 1968
396 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 36

CASE: PLUG: MAD: AGENT: PRIMER: 15-2 PROJECTILE: 9-3 2788
PROPELLANT: SPD 8102 CONDITIONED AT 90 DEGREES.
TIME: 937 CHARGE: 658.7733 LBS. VELOCITY: 2428. F/S. PRESSURE: 39.2 KPSI.
TIME: 1004 CHARGE: 658.7733 LBS. VELOCITY: 2396. F/S. PRESSURE: 37.9 KPSI.
TIME: 1014 CHARGE: 658.7733 LBS. VELOCITY: 2408. F/S. PRESSURE: 38.4 KPSI.
TIME: 1022 CHARGE: 658.7733 LBS. VELOCITY: 2402. F/S. PRESSURE: 39.? KPSI.
TIME: 1033 CHARGE: 658.7733 LBS. VELOCITY: 2410. F/S. PRESSURE: 41.1 KPSI.

MARCH 8, 1968
401 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 52

CASE: PLUG: MAD: AGENT: PRIMER: 15-2 PROJECTILE: 9-1 2788
PROPELLANT: SPD 10335 CONDITIONED AT 90 DEGREES.
TIME: 1056 CHARGE: 662.8693 LBS. VELOCITY: 2361. F/S. PRESSURE: 38.2 KPSI.
TIME: 1116 CHARGE: 662.8693 LBS. VELOCITY: 2384. F/S. PRESSURE: 37.9 KPSI.
TIME: 1126 CHARGE: 662.8693 LBS. VELOCITY: 2385. F/S. PRESSURE: 39.8 KPSI.
TIME: 1137 CHARGE: 662.8693 LBS. VELOCITY: 2374. F/S. PRESSURE: 38.2 KPSI.
TIME: 1147 CHARGE: 662.8693 LBS. VELOCITY: 2388. F/S. PRESSURE: 40.3 KPSI.

MARCH 25, 1968
486 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 48

CASE: PLUG: MAD: AGENT: PRIMER: 15-2 PROJECTILE: SPD 3734
PROPELLANT: SPD 10335 CONDITIONED AT 90 DEGREES.
TIME: 0 CHARGE: 662.8693 LBS. VELOCITY: 0. F/S. PRESSURE: 30.4 KPSI.
TIME: 0 CHARGE: 662.8693 LBS. VELOCITY: 0. F/S. PRESSURE: 29.6 KPSI.
TIME: 0 CHARGE: 662.8693 LBS. VELOCITY: 0. F/S. PRESSURE: 28.8 KPSI.
TIME: 0 CHARGE: 662.8693 LBS. VELOCITY: 0. F/S. PRESSURE: 29.6 KPSI.

CASE: PLUG: MAD: AGENT: PRIMER: 15-2 PROJECTILE: SPD 3734
PROPELLANT: AJ 3 20 CONDITIONED AT 90 DEGREES.
TIME: 0 CHARGE: 320.1707 LBS. VELOCITY: 0. F/S. PRESSURE: 13.7 KPSI.
TIME: 0 CHARGE: 320.1707 LBS. VELOCITY: 0. F/S. PRESSURE: 13.7 KPSI.
TIME: 0 CHARGE: 320.1707 LBS. VELOCITY: 0. F/S. PRESSURE: 13.4 KPSI.
TIME: 0 CHARGE: 320.1707 LBS. VELOCITY: 0. F/S. PRESSURE: 13.4 KPSI.

MAY 16, 1968
414 PREVIOUS ROUNDS OR, 8 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 70

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 9-1 2695
PROPELLANT: SPD 8102 CONDITIONED AT 90 DEGREES.
TYPE: 0 CHARGE: 658.7733 LBS. VELOCITY: 2376. F/S. PRESSURE: 40.1 KPSI.
TYPE: 0 CHARGE: 658.7733 LBS. VELOCITY: 2384. F/S. PRESSURE: 39.8 KPSI.

MAY 19, 1968
430 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 71

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 9-1 2708
PROPELLANT: SPD 3734 CONDITIONED AT 90 DEGREES.
TYPE: 0 CHARGE: 320.1707 LBS. VELOCITY: 0. F/S. PRESSURE: 17.2 KPSI.
TYPE: 0 CHARGE: 320.1707 LBS. VELOCITY: 0. F/S. PRESSURE: 17.2 KPSI.

MAY 20, 1968
432 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 65

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 13-2 1980
PROPELLANT: SPDN 9991 CONDITIONED AT 30 DEGREES.
TYPE: 1055 CHARGE: 305.8347 LBS. VELOCITY: 0. F/S. PRESSURE: 26.3 KPSI.
TYPE: 1106 CHARGE: 305.8347 LBS. VELOCITY: 2002. F/S. PRESSURE: 25.9 KPSI.
TYPE: 1115 CHARGE: 305.8347 LBS. VELOCITY: 2001. F/S. PRESSURE: 26.1 KPSI.
TYPE: 1122 CHARGE: 305.8347 LBS. VELOCITY: 1998. F/S. PRESSURE: 25.8 KPSI.
TYPE: 1131 CHARGE: 305.8347 LBS. VELOCITY: 1996. F/S. PRESSURE: 25.8 KPSI.
TYPE: 1142 CHARGE: 305.8347 LBS. VELOCITY: 1996. F/S. PRESSURE: 25.8 KPSI.
TYPE: 1330 CHARGE: 305.8347 LBS. VELOCITY: 1998. F/S. PRESSURE: 26.3 KPSI.
TYPE: 1340 CHARGE: 305.8347 LBS. VELOCITY: 2003. F/S. PRESSURE: 26.3 KPSI.
TYPE: 1347 CHARGE: 305.8347 LBS. VELOCITY: 1994. F/S. PRESSURE: 25.3 KPSI.
TYPE: 1355 CHARGE: 305.8347 LBS. VELOCITY: 2002. F/S. PRESSURE: 26.3 KPSI.
TYPE: 1406 CHARGE: 305.8347 LBS. VELOCITY: 2001. F/S. PRESSURE: 26.3 KPSI.
TYPE: 1415 CHARGE: 305.8347 LBS. VELOCITY: 2000. F/S. PRESSURE: 25.1 KPSI.

MAY 21, 1968
444 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 74

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 13-2 1980
PROPELLANT: SPD 8102 CONDITIONED AT 30 DEGREES.
TYPE: 1350 CHARGE: 658.7733 LBS. VELOCITY: 2378. F/S. PRESSURE: 28.0 KPSI.
TYPE: 1403 CHARGE: 658.7733 LBS. VELOCITY: 2403. F/S. PRESSURE: 28.2 KPSI.
TYPE: 1414 CHARGE: 658.7733 LBS. VELOCITY: 2374. F/S. PRESSURE: 26.6 KPSI.
TYPE: 1424 CHARGE: 658.7733 LBS. VELOCITY: 2396. F/S. PRESSURE: 26.9 KPSI.
TYPE: 1434 CHARGE: 658.7733 LBS. VELOCITY: 2389. F/S. PRESSURE: 27.1 KPSI.
TYPE: 1444 CHARGE: 658.7733 LBS. VELOCITY: 2392. F/S. PRESSURE: 27.7 KPSI.
TYPE: 1456 CHARGE: 658.7733 LBS. VELOCITY: 2436. F/S. PRESSURE: 29.6 KPSI.

TIME: 1514 CHARGE: 658.7733 LBS. VELOCITY: 2379. F/S. PRESSURE: 25.8 KPSI.
TIME: 1523 CHARGE: 658.7733 LBS. VELOCITY: 2387. F/S. PRESSURE: 26.6 KPSI.
TIME: 1531 CHARGE: 658.7733 LBS. VELOCITY: 2401. F/S. PRESSURE: 27.7 KPSI.
TIME: 1541 CHARGE: 658.7733 LBS. VELOCITY: 2434. F/S. PRESSURE: 28.8 KPSI.
TIME: 1551 CHARGE: 658.7733 LBS. VELOCITY: 2440. F/S. PRESSURE: 29.2 KPSI.

MAY 22, 1968
456 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 66

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 9-1 270(
PROPELLANT: SPC 8102 CONDITIONED AT 30 DEGREES.
TIME: 1026 CHARGE: 658.7733 LBS. VELOCITY: 2323. F/S. PRESSURE: 37.6 KPSI.
TIME: 1037 CHARGE: 658.7733 LBS. VELOCITY: 2323. F/S. PRESSURE: 37.4 KPSI.
TIME: 1052 CHARGE: 658.7733 LBS. VELOCITY: 2343. F/S. PRESSURE: 38.2 KPSI.
TIME: 1103 CHARGE: 658.7733 LBS. VELOCITY: 2321. F/S. PRESSURE: 37.9 KPSI.
TIME: 1111 CHARGE: 658.7733 LBS. VELOCITY: 2319. F/S. PRESSURE: 34.9 KPSI.
TIME: 1120 CHARGE: 658.7733 LBS. VELOCITY: 2320. F/S. PRESSURE: 37.4 KPSI.
TIME: 1129 CHARGE: 658.7733 LBS. VELOCITY: 2294. F/S. PRESSURE: 34.9 KPSI.
TIME: 1136 CHARGE: 658.7733 LBS. VELOCITY: 2293. F/S. PRESSURE: 33.1 KPSI.
TIME: 1145 CHARGE: 658.7733 LBS. VELOCITY: 2305. F/S. PRESSURE: 35.2 KPSI.
TIME: 1318 CHARGE: 658.7733 LBS. VELOCITY: 2316. F/S. PRESSURE: 35.2 KPSI.
TIME: 1356 CHARGE: 658.7733 LBS. VELOCITY: 2307. F/S. PRESSURE: 35.5 KPSI.
TIME: 1487 CHARGE: 658.7733 LBS. VELOCITY: 2320. F/S. PRESSURE: 36.6 KPSI.

JUNE 28, 1968
468 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND

CASE: PLUG: WAD: AGENT: PRIMER: 15-3 PROJECTILE: 19-8 1958
PROPELLANT: SPD 8102 CONDITIONED AT 80 DEGREES.
TIME: 1735 CHARGE: 658.7733 LBS. VELOCITY: 2516. F/S. PRESSURE: 31.2 KPSI.

SEPT 19, 1968
469 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND

CASE: PLUG: WAD: AGENT: PRIMER: 15-3 PROJECTILE: 19-8 1918
PROPELLANT: PLYRO CONDITIONED AT 75 DEGREES.
TIME: 1425 CHARGE: 658.0907 LBS. VELOCITY: 2483. F/S. PRESSURE: 34.7 KPSI.

APRIL 7, 1969
478 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 78

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 13-2 1988
PROPELLANT: SPD 9606 CONDITIONED AT 90 DEGREES.

TIME:	1001	CHARGE: 499.7120 LBS.	VELOCITY:	2244. F/S. PRESSURE:	23.1 KPSI.
TIME:	1010	CHARGE: 499.7120 LBS.	VELOCITY:	2238. F/S. PRESSURE:	23.1 KPSI.
TIME:	1020	CHARGE: 499.7120 LBS.	VELOCITY:	2250. F/S. PRESSURE:	22.6 KPSI.
TIME:	1031	CHARGE: 625.3227 LBS.	VELOCITY:	2713. F/S. PRESSURE:	38.4 KPSI.
TIME:	1042	CHARGE: 589.8240 LBS.	VELOCITY:	2570. F/S. PRESSURE:	8.0 KPSI.
TIME:	1109	CHARGE: 589.8240 LBS.	VELOCITY:	2579. F/S. PRESSURE:	32.8 KPSI.
TIME:	1119	CHARGE: 589.8240 LBS.	VELOCITY:	2569. F/S. PRESSURE:	32.3 KPSI.
TIME:	1127	CHARGE: 589.8240 LBS.	VELOCITY:	2585. F/S. PRESSURE:	33.1 KPSI.
TIME:	1136	CHARGE: 589.8240 LBS.	VELOCITY:	2589. F/S. PRESSURE:	8.0 KPSI.
TIME:	1210	CHARGE: 589.8240 LBS.	VELOCITY:	2598. F/S. PRESSURE:	33.9 KPSI.

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: 13-2 1988
PROPELLANT: IMIC 14 CONDITIONED AT 90 DEGREES.

TIME:	1343	CHARGE: 653.9947 LBS.	VELOCITY:	2599. F/S. PRESSURE:	33.1 KPSI.
TIME:	1440	CHARGE: 653.9947 LBS.	VELOCITY:	2546. F/S. PRESSURE:	32.0 KPSI.
TIME:	1543	CHARGE: 653.9947 LBS.	VELOCITY:	2574. F/S. PRESSURE:	31.7 KPSI.
TIME:	1547	CHARGE: 653.9947 LBS.	VELOCITY:	2553. F/S. PRESSURE:	31.4 KPSI.
TIME:	1559	CHARGE: 653.9947 LBS.	VELOCITY:	2565. F/S. PRESSURE:	32.3 KPSI.
TIME:	1607	CHARGE: 653.9947 LBS.	VELOCITY:	2582. F/S. PRESSURE:	32.3 KPSI.

MAY 17, 1969
416 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 75

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: SPD 8102
PROPELLANT: SPDN 9991 CONDITIONED AT 30 DEGREES.

TIME:	938	CHARGE: 305.8347 LBS.	VELOCITY:	1752. F/S. PRESSURE:	32.0 KPSI.
TIME:	959	CHARGE: 305.8347 LBS.	VELOCITY:	1744. F/S. PRESSURE:	32.3 KPSI.
TIME:	1014	CHARGE: 305.8347 LBS.	VELOCITY:	1742. F/S. PRESSURE:	32.0 KPSI.
TIME:	1028	CHARGE: 305.8347 LBS.	VELOCITY:	1741. F/S. PRESSURE:	32.0 KPSI.
TIME:	1038	CHARGE: 305.8347 LBS.	VELOCITY:	1748. F/S. PRESSURE:	31.7 KPSI.
TIME:	1048	CHARGE: 305.8347 LBS.	VELOCITY:	1741. F/S. PRESSURE:	31.4 KPSI.
TIME:	1108	CHARGE: 305.8347 LBS.	VELOCITY:	1739. F/S. PRESSURE:	31.7 KPSI.
TIME:	1123	CHARGE: 305.8347 LBS.	VELOCITY:	1740. F/S. PRESSURE:	31.4 KPSI.
TIME:	1131	CHARGE: 305.8347 LBS.	VELOCITY:	1743. F/S. PRESSURE:	32.3 KPSI.
TIME:	1140	CHARGE: 305.8347 LBS.	VELOCITY:	1744. F/S. PRESSURE:	32.3 KPSI.
TIME:	1147	CHARGE: 305.8347 LBS.	VELOCITY:	1742. F/S. PRESSURE:	32.0 KPSI.
TIME:	1155	CHARGE: 305.8347 LBS.	VELOCITY:	1741. F/S. PRESSURE:	32.0 KPSI.

CASE: PLUG: WAD: AGENT: PRIMER: 15-2 PROJECTILE: SPD 8102
PROPELLANT: IMIC 14 CONDITIONED AT 90 DEGREES.

TIME:	1531	CHARGE: 658.7733 LBS.	VELOCITY:	2408. F/S. PRESSURE:	40.1 KPSI.
TIME:	1541	CHARGE: 658.7733 LBS.	VELOCITY:	2423. F/S. PRESSURE:	42.5 KPSI.

JUNE 12, 1969
486 PREVIOUS ROUNDS OR, 0 ESR.

PLUG GAGE READINGS: AND
AMBIENT TEMPERATURE WAS 76

CASE: PLUG: WAD: AGENT: PRIMER: 15-3 PROJECTILE: INERT 1988
PROPELLANT: SPD 10293 CONDITIONED AT 90 DEGREES.

TIME:	957	CHARGE: 669.6960 LBS.	VELOCITY:	2529. F/S. PRESSURE:	30.9 KPSI.
TIME:	1006	CHARGE: 669.6960 LBS.	VELOCITY:	2568. F/S. PRESSURE:	32.0 KPSI.
TIME:	1015	CHARGE: 669.6960 LBS.	VELOCITY:	2595. F/S. PRESSURE:	32.8 KPSI.
TIME:	1025	CHARGE: 669.6960 LBS.	VELOCITY:	2545. F/S. PRESSURE:	30.6 KPSI.
TIME:	1035	CHARGE: 669.6960 LBS.	VELOCITY:	2537. F/S. PRESSURE:	31.2 KPSI.

```
TIME:  1047 CHARGE: 669.6960 LBS. VELOCITY:  2550. F/S. PRESSURE:  31.4 KPSI.
TIME:  1058 CHARGE: 669.6960 LBS. VELOCITY:  2566. F/S. PRESSURE:  32.3 KPSI.
TIME:  1521 CHARGE: 669.6960 LBS. VELOCITY:  2647. F/S. PRESSURE:  34.7 KPSI.
TIME:  1539 CHARGE: 669.6960 LBS. VELOCITY:  2633. F/S. PRESSURE:  34.1 KPSI.
TIME:  1549 CHARGE: 669.6960 LBS. VELOCITY:     0. F/S. PRESSURE:  35.5 KPSI.
```

OUTPUT FROM PROGRAM POINT

```
DO YOU NEED INSTRUCTIONS?
   CM LWA+1 = 44303B. LOADER USED  41600BYES
CODE=1 FOR ROUND COUNT FROM ISEAS ARRAY, =2 FOR NUMBER  IN RECORD,
=3 FOR ESR COUNT FROM USER FUNCTION, =4 FOR ESR FROMISEAS ARRAY
POSSIBLE STARGAUGE DISTANCES (ALPHA) FOLLOW:
  136.00  137.00  148.00  160.00  180.00  200.00  220.00  240.00  260.00
  280.00  300.00  320.00  340.00  360.00  380.00  400.00  420.00  440.00
  460.00  480.00  500.00  520.00  540.00  560.00  580.00  600.00  620.00
  640.00  660.00  680.00  700.00  720.00  740.00  760.00  780.00  800.00
  804.00  815.00  816.00
POSSIBLE STARGAUGE DISTANCES (GAMMA) FOLLOW:
  136.00  137.00  148.00  804.00  815.00  816.00
POSSIBLE GUN NUMBERS
     396       376       288       453       311
ENTER GUN NUMBER,JCODE
396,1

GUN NUMBER    396
ENTER 1 FOR ALPHA, 2 FOR GAMMA:NUMBER OF DISTANCES: DIST ANCES
1,4,136,137,148,816
16080 16059 16027 15998    27
16115 16097 16044 16000    42
16136 16115 16064 16000    53
16217 16190 16141 16033   100
16216 16191 16139 16031   111
16242 16217 16160 16056   126
16244 16222 16167 16054   135
16250 16227 16172 16056   144
16271 16252 16194 16069   170
16283 16263 16206 16077   197
16316 16299 16242 16109   224
16327 16313 16257 16122   239
16346 16330 16274 16129   257
16350 16336 16283 16126   268
16364 16350 16297 16136   283
16373 16359 16308 16137   294
16135 16369 16319 16144   309
16387 16375 16323 16147   318
16393 16380 16312 16147   328
16395 16382 16332 16149   344
16402 16389 16340 16150   362
16405 16392 16342 16150   369
16405 16391 16343 16149   379
16405 16392 16343 16150   385
16406 16394 16347 16152   393
```

```
16408 16395 16348 16150   396
16413 16400 16352 16149   401
16415 16401 16352 16151   406
16414 16400 16353 16148   414
16420 16408 16356 16150   430
16423 16408 16361 16151   442
16424 16411 16363 16152   454
16422 16409 16360 16146   472
16426 16412 16365 16153   496
ENTER GUN NUMBER,JCODE
396,3

GUN NUMBER    396
ENTER NOMINIAL FLAME TEMP, CHARGE WEIGHT, PRESSUFE, AND  VELOCITY
2424.,654.,48.,2500.
ENTER 1 FOR ALPHA, 2 FOR GAMMA:NUMBER OF DISTANCES: DIST ANCES
1,4,136,137,148,816
16080 16059 16027 15998    16
16115 16097 16044 16000    22
16136 16115 16064 16000    26
16217 16190 16141 16033    41
16216 16191 16139 16031    42
16242 16217 16160 16056    46
16244 16222 16167 16054    47
16250 16227 16172 16056    47
16271 16252 16194 16069    54
16283 16263 16206 16077    57
16316 16299 16242 16109    62
16327 16313 16257 16122    66
16346 16330 16274 16129    70
16350 16336 16283 16126    72
16364 16350 16297 16136    77
16373 16359 16308 16137    80
16135 16369 16319 16144    84
16387 16375 16323 16147    84
16393 16380 16312 16147    84
16395 16382 16332 16149    84
16402 16389 16340 16150    93
16405 16392 16342 16150    93
16405 16391 16343 16149    93
16405 16392 16343 16150    95
16406 16394 16347 16152    95
16408 16395 16348 16150    95
16413 16400 16352 16149    95
16415 16401 16352 16151    95
16414 16400 16353 16148    96
16420 16408 16356 16150    96
16423 16408 16361 16151    96
16424 16411 16363 16152    96
16422 16409 16360 16146    97
16426 16412 16365 16153    98
ENTER GUN NUMBER,JCODE
0,0
     STOP
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G		U	
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G31		X211	(2)
G33	(35)		
G61 (Jablovskis)			

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