

COVER SHEET FOR TECHNICAL MEMORANDUM

TITLE— Computer Program to Compute Max,
Min, and Avg Operate and Release
Times of U, UA, and Y Type Relays

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AUTHOR(S) — W. B. Perkinson

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ABSTRACT

The purpose of this memorandum is to:

1. Describe a method of calculating the operate and release times of U, UA, and Y types relays introduced in 1938.
2. Describe a linearization technique which adapts this method for use on a digital computer.
3. Describe in detail the computer program which uses the above method to generate as an output, a list of the max, min, and average operate and release times of all U, UA and Y type relays.
4. Present a copy of the computer results, listing max, min and average operate and release times of U, UA and Y type relays.
5. Present the source of information and/or the derivation of all methods used, and assumptions made, so that the accuracy of the output may be verified.

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**BELL TELEPHONE LABORATORIES
INCORPORATED**

SUBJECT: Computer Program to Compute Max, Min,
and Avg Operate and Release Times of
U, UA, and Y Type Relays - Case 31029-1,
35600-1X, 35600-13

DATE: September 8, 1967
FROM: W. B. Perkinson
MM-67-5612-1

MEMORANDUM FOR FILE

I. INTRODUCTION

Unlike wire spring relays, operate and release time data on U, UA and Y type relays has not been available in an easily accessible table look-up form. This data could previously be obtained either by initiating a request to the relay group or by making lengthy calculations using available empirical graphs and methods established in two memoranda written in 1938.¹ In the latter case, because of the nature of the graphical manipulation involved, the accuracy of a quick calculation was questionable.

This lack of standardized data has led to serious inefficiencies, because each person requiring data for a particular relay had to make his own calculations, even though the same calculation may have been made many times before. The difficulty in obtaining timing data (and, therefore, the frequent lack of this data) has resulted in race conditions in existing circuits, and would continue to result in nonoptimal circuit design.

The above factors motivated a study to provide the desired times in an easily usable format. Because the digital computer is ideally suited for making large numbers of relatively simple, mathematical calculations of the type involved in making operate and release time calculations, it seemed obvious that it could provide an economical method to generate a table of operate and release times for U, UA and Y type relays.

A project was established in Department 5612 to write a computer program that would use existing empirical data and known methods of calculation, to generate all the required operate and release times, and print these results in a convenient table look-up format. It was decided that a secondary output would

¹ Data and Procedure for Estimating the Operating Times of Iron U Type Relays, July 1, 1938; and Data and Procedure for Estimating the Releasing Times of Iron U Type Relays, July 21, 1938, 332-B-2-B-PWS

also be desirable. This output would be in the form of punched cards (one per winding, for each relay code) listing the calculated operate and release times along with other fixed data. These cards would facilitate generating a rearranged listing of the relays using only a card sorter and printer, should this be desired in the future. They could also be used to furnish data to a relay selection program similar to the one now in existence for wire spring relays. Initial estimates indicated that the cost of program development and computer run time would be justified by use of the results within Department 5612. Use by persons outside of 5612 would be counted as a side benefit.

At the time the project was begun, the new PL/1 language and the IBM System 360 were not available at Columbus, therefore, it was decided to use FORTRAN II language on the IBM 7094 facility at Holmdel.

Because the program is used only once to generate the desired output, the goal was not one of elegant logic structure or minimum computer time, but rather minimum programming effort consistent with the desired accuracy. To this end, computer time is traded for straight forward programming whenever possible.

It is felt the availability of the data discussed above will achieve the following goals:

1. Precise operate and release times easily obtainable.
2. A common data source available to all interested persons.
3. Reduced design and analysis time of circuit changes involving these relays.
4. Increased design and analysis accuracy of circuit changes involving these relays.

II. STANDARD METHOD FOR CALCULATING OPERATE AND RELEASE TIMES

This section presents a step-by-step procedure for calculating operate and release times which was adapted from the relay time memos, ¹ and forms the main logic structure of the computer program.

Release Time Calculation

Neglecting the effects of magnetic interference, there are 6 primary factors which affect the release times of U, UA, and Y type relays when released by opening the operate path. These factors are:

1. The spring gram load (which can be determined from the spring combination and a table of gram loads).
2. The back tension (an additional gram load).
3. The releasing ampere turns.
4. The stop pin height.
5. The type of sleeve metal.
6. The type of core metal.

A table listing the gram load and back tension (Items 1 and 2 above) for all spring combinations is given in Section V page 31. Data pertaining to items 4 through 6 above are listed for each relay in the U, UA and Y type relay data book (X-75375). Curves given in the release time memo depict graphically:

1. The relationship between gram load, stop pin height and releasing ampere turns; and
2. The relationship between releasing ampere turns and electrical release time. These curves are nonlinear and in part empirical.

The procedure for finding max, min and avg release times for U type relays may be tabulated in a step-by-step procedure as follows: (All graphs referred to below are contained in the release time memo.)¹

1. Calculate the min, avg and max total gram load due to back tension and springs, using the gram load table in Section V.
2. Find the appropriate releasing amp turns graphically from the intersection of the gram load and stop pin curves on graph ES-456602. Use the min stop pin height and min gram load for max release

times; avg stop pin and gram load for avg release times; and max stop pin and gram load for min release times. The value of stop pins given in the relay book is the minimum value. Add .003 for max, and .0015 for average values.

3. Using the releasing amp turns calculated in (2) find its intersection with the appropriate sleeve metal curve (graph ES-456632) to determine the electrical release time. If the relay has no sleeve, find the intersection with the eddy current curve. Note that no direct average time calculation is possible on relays with sleeves, because no empirical data is plotted.*
4. Add to the electrical release time appropriate mechanical release time as determined from the table on page 16.

Operate Time Calculation

Neglecting the effects of magnetic interference; there are 6 primary factors which affect the operate times of U, UA, and Y type relays. These factors are:

1. The coil resistance (which determines the final current in the winding).
2. The number of turns on the coil.
3. The ratio of the current in the winding which just operates the relay to the final current in the winding.
4. The type of sleeve metal.
5. The degree of amp turn saturation of the coil, relative to 200 amp turns.
6. The type of core metal.

The information required to find items 1 through 6 above is tabulated for each relay in the U, UA and Y type relay data book.

* The average time for relays with sleeves may be estimated as the intermediate value between the max and min time with the same release amp turns.

Families of curves given in the operate time memo depict graphically the relationship between 1) resistance, turns and time constant of the winding, 2) time constant of the winding, current ratio and total time constant, 3) total time constant, sleeve metal and preliminary electrical operate time, 4) preliminary electrical operate time, amp turns through the coil and final electrical operate time, and 5) operate ampere turns and saturation factor. All curves are nonlinear and in part empirical; curves 1 through 4 are plotted on log-log paper.

The procedure for finding max, min and average operate times of U type relays may be tabulated in a step-by-step procedure as follows using the max time calculation as an example:

1. Calculate the maximum resistance of the winding (R_{max}) by multiplying the rated resistance by $(1.0 + \text{the resistance tolerance})$ if a resistance tolerance given, or by (1.1) if no tolerance is given. (The latter corresponds to 10% tolerance.)
2. Using the intersection of the rated turns and max resistance curves, determine the time constant of the energizing winding as read on the X axis of graph ES-456541 of the operate time memo.
3. Using the same graph, project the time constant vertically to the proper sleeve metal curve (or to the eddy current curve if the relay has no sleeve) and read the sum of the winding and eddy current time constants on the right hand Y axis.
4. Calculate i_{max} , the max current that will just operate the relay, by multiplying the operate readjust current listed in the relay book by 1.05.
5. Calculate I_{min} , the minimum actual current in the relay winding, using the formula $I_{min} = 45_v/R_{max}$.
6. Calculate the ratio i/I .
7. Project horizontally from the sum of the winding and eddy current time constant found in (3) to the proper i/I curve as found in (6), and read the max electrical operate time on the horizontal axis.
8. Calculate the amp turns factor by multiplying the rated number of turns by i_{max} (Ni_{max}).
9. If the amp turns factor is greater than 200, calculate the saturation factor by projecting Ni_{max} , vertically from the X axis, and reading saturation factor on the Y axis of graph ES-456544.

10. If N_i max was greater than 200, multiply the max electrical operate time by the saturation factor calculated in (9).
11. To find the total max operate time, multiply the max electrical time by 1.1.

The procedure for calculating the minimum and average operate times is the same as above with the following exceptions:

- A) In step 1, use minimum resistance for minimum time and rated resistance for average time. The minimum resistance is the rated resistance times (1.0 - the resistance tolerance) if a resistance tolerance is given, or .90 if no tolerance is given.
- B) In step 2, use minimum or rated resistance as appropriate and graph ES-456542.
- C) In step 4, calculate i min for min times and i avg for average time. The formula for i min is:
$$i \text{ min} = .95 \times (\text{the nonoperate readjust current}),$$
if this value is listed in the relay book or;
$$i \text{ min} = .5 \times (\text{the operate readjust current}),$$
if the nonoperate readjust current is not listed.
The formula for i avg is:
$$i \text{ avg} = .8 \times (\text{the operate readjust current}).$$
- D) In step 5, calculate I max for minimum times and I avg for average times.
$$I \text{ max} = 50_v/R \text{ min}$$
$$I \text{ avg} = 48_v/R \text{ avg}$$
- E) Skip steps 8, 9 and 10 for min and average times.
- F) In step 11, multiply by 1.1 to find minimum time, multiply by 1.0 for average time.

The above procedures were given for U type relays only. However, it has been found that UA, Y and permalloy types may be calculated using the same procedure with correction factors applied, depending on the type of core used in the relay. A table of correction factors is given in Section V page 32. This data was taken from an unpublished relay group training memo, and is incorporated in the computer program.

It should be noted that on some relays the above method results in min operate times lower than those allowed by the graphs on page 136 and 138 of the U and Y type relay book (labeled - min time required to move armature and close first contact). Since the methods given in this memo are well documented in reference 1, they were chosen as the basis of all calculations.

In the case of double wound relays which are used with their windings connected in parallel or series, a procedure must be devised to reduce them to a single, equivalent relay, which can be treated as outlined above. This procedure is developed in Section V.

III. LINEARIZATION TECHNIQUE

The graphs used in calculating operate and release times (Section II), represent a particular problem for handling by the computer because they are empirical in nature, and hence are not easily described mathematically.

Three methods were considered to reduce the graphical data to a workable format. They are:

1. Subject each graph to existing curve fitting programs,² generating a polynomial for each graph which would fit it to a desired accuracy over a specified range.
2. Use an algorithm such as Legendre's principal of Least Square Error³ to approximate each curve over equally spaced divisions of the X axis.
3. Linearize the graphs mechanically by drawing straight lines between adjacent points on the curve, using the degree of curvature to determine the distance between adjacent points.

Although methods 1 and 2 have the advantage of well developed mathematical procedure, it is felt that they are unduly sophisticated considering that the accuracy of any method is limited by the accuracy with which the graphs can be read. For this reason method 3 was chosen. This method also takes full advantage of the fact that most of the curves are nearly straight over a great portion of their length, leading to a small number

² See the Computer Abstracts Bulletin for a listing of such programs.

³ Buckingham, R. A., Numerical Methods, Tandem: Sir Isaac Pitman and Sons, Ltd.

of straight lines required to describe each curve. Ten is greatest number of divisions used to describe any of the curves. A typical example is shown in Figure 1 on the following page. Notice that the worst case accuracy of the approximation is equal to the maximum deviation of the straight line from the actual curve. Accuracy is discussed further on page 12. By observing this quantity as the approximations are made, the accuracy can be kept to any desired level. Several of the quantities represented on the graphs are families of straight lines plotted on log-log paper. The representation for these quantities is discussed on page 10. In the following discussion, X and Y refer to the abscissa and ordinate of graphs respectively.

Linearization Method

Once the straight line approximations for the curves have been made, the end points (both X and Y values) of each line are stored in memory as a one dimensional matrix and given a label identifying which curve the line segment is from. The designations assigned to the various curves are listed for reference in Section V, page 30.

In order to obtain a X value corresponding to a previously calculated Y value, or vice versa, the program executes a search to determine which set of end points the known value lies between. Once these are determined the unknown value is calculated as follows: - The program assigns a label of X high (XH), X low (XL), Y high (YH) and Y low (YL) to the end point sets, corresponding to the absolute value of their magnitude. For curves plotted on linear scale paper (release time graphs) the unknown value can then be calculated as follows:

By proportions -

$$\text{eq. (1)} \quad X = XL + \frac{XH-XL}{YH-YL} (Y - YL) \text{ (positive slope)}$$

$$\text{or eq. (2)} \quad Y = YL + \frac{YH-YL}{XH-XL} (XH - X) \text{ (negative slope)}$$

Note: The roles of X and Y are interchanged to show symmetry only, the slope of the line determines the form of the equation.

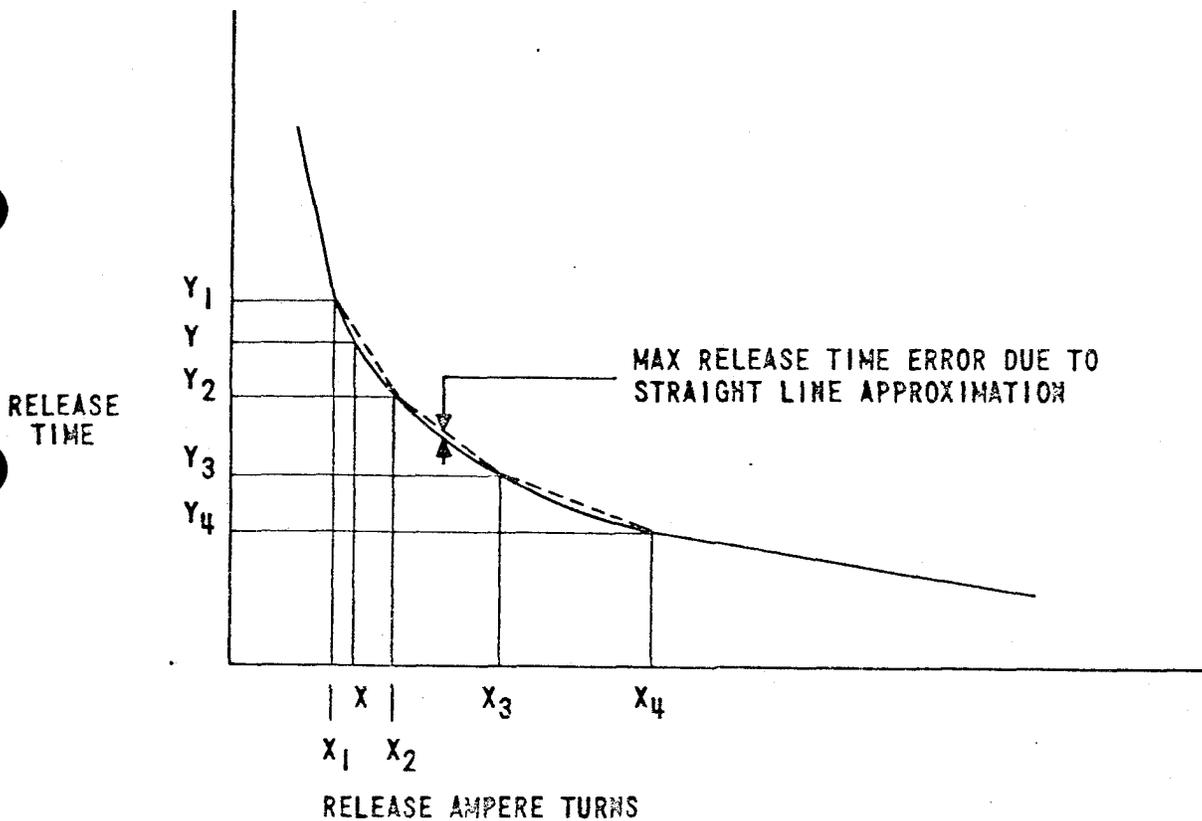


FIG. 1 - EXAMPLE GRAPH OF RELEASE TIME VS. RELEASE AMPERE TURNS.

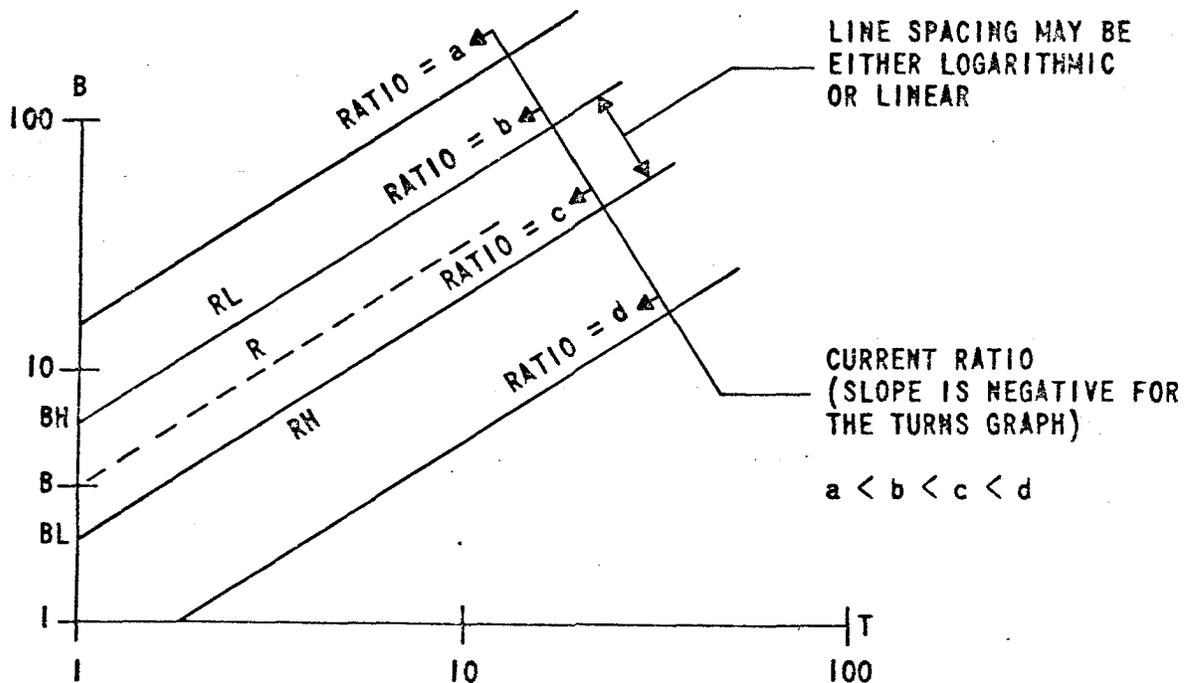


FIG. 2 - EXAMPLE OF LINEAR GRAPHS

For curves plotted on log-log paper (operate time graphs) the formulas are the same, except logarithms of the appropriate constants must be taken to satisfy proportionality.

The formulas for straight line segments on log-log paper become:

$$\log X = \log(XL) + \frac{\log(XH) - \log(XL)}{\log(YH) - \log(YL)} (\log(Y) - \log(YL))$$

$$X = 10^{**} \left[\log(XL) + \frac{\log(XH) - \log(XL)}{\log(YH) - \log(YL)} (\log(Y) - \log(YL)) \right]$$

or

eq (1A) $X = XL \left[10^{**} (\log(Y/YL) * \log(XH/XL) / \log(YH/YL)) \right]$
(positive slope)

similarly

eq (2A) $Y = YL \left[10^{**} (\log(XH/X) * \log(YH/YL) / \log(XH/XL)) \right]$
(negative slope)

Observe that on the graphs plotted on log-log paper, the turns and current ratio curves are families of straight lines, representing a set of values which cover the whole plane. For these curves the form of equations 1A and 2A would be very difficult to manipulate in the computer and therefore a new representation is developed.

First observe that a curve of the form:

eq (3) $Y = BX^m$

on linear coordinates will plot as a straight line on log-log coordinates. This can be shown as follows:

Taking the log of both sides of the equation -

$$\begin{aligned} \log(Y) &= \log(BX^m) \\ &= \log(X^m) + \log(B) \\ &= m \log(X) + \log(B) \end{aligned}$$

$$\text{let } Y' = \log(Y)$$

$$X' = \log(X)$$

$$B' = \log(B)$$

Now $Y' = mX' + B'$

which is the form of a straight line.

Note further that

$$\text{when } X = 1, X' = \log 1 = 0 \quad \therefore Y' = B' \quad (\text{at } X = 1)$$

$$\text{also } \log(Y) = \log(B) \quad \therefore Y = B \quad (\text{at } X = 1)$$

Thus B equals the Y value of the point where the straight line crosses the X = 1 axis.

The value of m can be found graphically by observing the following equalities:

$$\text{eq (4)} \quad m = \frac{\Delta Y'}{\Delta X'} = \frac{Y_1' - Y_2'}{X_1' - X_2'} = \frac{\log(Y_1) - \log(Y_2)}{\log(X_1) - \log(X_2)}$$

Where $X_1, X_2, Y_1,$ and Y_2 are values read from either log-log or linear coordinates. Since these lines have the same slope (m) within a given family, the B intercept determines the line. An example of these curves using current ratios is shown in Figure 2. Note that the lines can be spaced either linearly or logarithmically over the plane. The problem, then becomes, given a point on the line determine its B intercept. Once the B intercept and the slope m (determined from equation 4) are known, an unknown Y can be found from a given X (or vice versa) using equation 3.

Using the same principal as for the straight line approximations of the nonlinear curves, the B intercepts of selected lines in each family are stored in memory along with their associated line values. Given any line value the program determines the high and low known B values it lies between (BH and BL), and the associated current ratio or turns values (RH, RL or TH, TL). (Note: Although theoretically only two values of B would be necessary, a B value for each linear curve drawn, is stored, to minimize any error occurring from discrepancies in the linear or logarithmic distributions.) Using these values and the following equations 5 and 6, any required B value can be found.

- a) Assuming linear distribution (i.e. current ratio) by proportions:

$$\frac{\log(BH) - \log(BL)}{RH - RL} = \frac{\log(BH) - \log(B)}{R - RL}$$

$$\log(B) = \log(BH) - \frac{R - RL}{RH - RL} \left[\log\left(\frac{BH}{BL}\right) \right]$$

$$\text{eq (5)} \quad B = BH \left[10^{**} \left(\left(\frac{RL - R}{RH - RL} \right) * \log\left(\frac{BH}{BL}\right) \right) \right]$$

- b) Similarly assuming logarithmic distribution (i.e. turns) by proportions:

$$\frac{\log(BH) - \log(BL)}{\log(TH) - \log(TL)} = \frac{\log(B) - \log(BL)}{\log(T) - \log(TL)}$$

$$\log(B) = \log(BL) + \log(T/TL) * \frac{\log(BH/BL)}{\log(TH/TL)}$$

eq (6) $B = 10^{**}[\log(BL) + (\log(T/TL) * \log(BH/BL) / \log(TH/TL))]$

Data Interpolation

Unfortunately, during the calculation of an operate or release time, a value will occasionally exceed the range of the available data. Under these circumstances the program will automatically interpolate the required information by using the slope of the straight line approximation nearest the point where the plotted data ended. The error introduced by this procedure is not included in the estimations given in the next section; however, it is relatively small since all the curves exhibit a very small degree of curvature at their end points and the required data is usually not far from the available data. This procedure is an engineering method to obtain answers where no data is available.

Accuracy

Because the linearization technique is the main factor affecting the accuracy of the calculations, accuracy is discussed in this section.

To answer the question, "how accurate are the computer results", a frame of reference must first be established. Comparison with available lab measured timing data is virtually useless for separate max, min and average error calculation, because the available data does not consist of measurements from a large sample of each relay. The cost of obtaining this data makes such a method impractical. The alternate solution is comparison with a careful hand calculation using the method outlined in the operate and release memos previously described. If this is done, answers can be compared one by one and the differences noted. The only question that remains is which solution is more nearly correct on an absolute basis.

First, the difference to be expected between the computer results and a hand calculation will be discussed.

Release Times

The maximum deviation of the linearized curves with those plotted (minimum and maximum) is 1 millisecond (ms) high, the mean deviation is probably less than .1 ms although this is difficult to determine accurately. The curve for average times is not plotted but can be assumed to lie intermediate between the max and min curves. The computer constructs this curve mathematically to six place accuracy, so it can be assumed that the same limits as above apply. The deviation of the stop pin curves give a max turn deviation of .5 amp-turns low. A .5 amp-turn low deviation can result in a max release time deviation of 1 ms high. Since the max deviations discussed occur at different sections of the graph they are not additive and result in a total max deviation possible of + 1 ms.

On slow release relays with sleeves, a coarser time scale is used on release time, resulting in an expected max deviation of 4 ms.

Operate Times

Although more steps are involved in calculating operate times, all graphs are linear except the eddy current curve (or sleeve metal curve whichever is used). However, log-log paper is used for the plots, giving rise to different deviations for different time intervals. The highest degree of curvature occurs on the sleeve curves but here the deviation is almost immeasurable and is the same order of magnitude as the line width of the graphs. Additional deviation is introduced in reading the Y axis B intercepts used as data, however, this error can be minimized by careful reading and should be much less than the error in interpolating between the lines on a hand calculation. Adding the effect of the log scales, it is estimated that operate times less than 100 ms should be within + 1 ms of the best hand calculation and times greater than 100 ms should be within + 2 ms.

All of the above deviations were met in a sample of 24 relays (4 each of the 6 types) for which the min, max and average operate and release times were very carefully calculated by hand and rechecked several times on separate occasions.

The above values give only the expected deviation between the computer results and the best hand calculation. Considering the sources of error in making a hand calculation (reading log scales, interpolating between lines, extending lines beyond

their plotted range, etc.) it is not easy to determine which results are the most accurate on an absolute basis. It does seem fair to state, however, that the computer results are accurate enough for all engineering purposes and most probably are the best results obtainable with the available data.

The above discussion outlines the assumptions and methods used to reduce the graphical data available to a form that can be stored in the computer memory. All values are punched on cards and read in with the program as data, to avoid the programming effort involved in storing it on disks.

The following section describes the program itself.

IV. DESCRIPTION OF COMPUTER PROGRAM

Program Flow

The program is divided by function into 11 parts or modules. Module 1 functions as data input and master control. It directs the program flow by examining the input data for each relay code in the data deck (one data card per relay code except for multiple wound relays which have one card per winding) and calling for other modules (subroutines) as they are required. The result of each calculation is examined in sequence to determine what module should be called next. After all calculations for one relay code have been made, and the final operate and release times are known, master control causes the results to be stored on magnetic tape for future printing and punching in the formats shown in Figures 3 and 4 respectively. All output data except the operate and release time are read in from the input data cards and repeated for ease of use only. More data is punched on the cards than on the printed format, the extra data being used to make the cards as useful as possible for any future applications.

A simplified flow chart for the master control module is given at the end of this section. The logic structure follows exactly the procedures outlined in Section II for calculating operate and release times. If statement by statement detail is desired for the program, it is available from the author.

Travel Time

In calculating the total release times from the electrical release time, a factor is added to account for the travel time of the contacts. This factor is given in the table below:

COLUMN NO.

1-12	13-19	19-20	21	22-26	27-29	30-33	34-35	36-40	41-42	43-60	61	62-79	
MARGIN	CODE		NOTE	COIL RES		WINDING ARRANGEMENT		OPERATE CURRENT		TOTAL OPERATE TIME		TOTAL RELEASE TIME	
	ALPHA	NO.								MAX	MIN	AVG	
											MAX	MIN	AVG

FIG. 3 - FORMAT FOR PRINTED OUTPUT

COLUMN NO.

1	2	3	4	5	6	7-14	15	16-19	20	21-24	25-28	29-30	31-35	36-39	40-44	45-62	63-80			
REL TYPE 0 OR 1						CONTACT ARRANGEMENT 0 OR 1						REL CODE (NO.)	NOTE	COIL RES	WINDING ARRANGEMENT	OPERATE CURRENT	TOTAL OPERATE TIME	TOTAL RELEASE TIME		
U	UA	UD	US	UP	Y	M	B	BM	MB	NO.	OTHER	NO.	OTHER				MAX	MIN	AVG	
																		MAX	MIN	AVG

FIG. 4 - FORMAT FOR PUNCHED CARD OUTPUT

UD = DOUBLE WOUND
 US = REL WITH SLEEVE
 UP = PERMALLOY CORE

	<u>Travel Time in Milliseconds</u>	
	<u>Break A Make</u>	<u>Make A Break</u>
Min.	0.0	1.0
Avg.	1.0	3.0
Max.	2.0	5.0

The program assumes that release times are for breaking a make and adds the appropriate times. This means that if release times for making a break are desired the following corrections should be added to the results given by the program:

	<u>Correction Factor in Milliseconds</u>
Min.	1.0
Avg.	2.0
Max.	3.0

The following comment from the release time memo dated July 21, 1938, should be noted: "In certain cases the minimum time to make a break contact may be less than the time to break a make contact. This would be the case for such combinations as the 110, the 106, the 1-2 contact of 138, etc. When particular accuracy is required, therefore, these data should be reasonably applied."

Operate Calculation on Low Resistance Relays

Some of the relays calculated by this program have very low resistance coils on the order of 1 to 100 ohms. These relays are normally used in series with another relay or resistor, for detection purposes. Because of the low resistance and resultant high current and power, these relays cannot be operated directly on 48 volts; however, since it would be futile to attempt a calculation for every possible series resistance, the program assumes no series resistance. This assumption results in very fast operate times on the order of 1 millisecond. The operate times resulting from such relays should prove valuable for comparing one relay against the another of similar type, although the actual time will depend on the series resistance used. The release times are not seriously affected by the 48 volt assumption.

The remaining modules 2 through 11 perform the following functions respectively:

2. Calculates the release amp turns from gram load and stop pin information.
3. Calculates the release time from release amp turns and sleeve metal information.
4. Calculates the B intercept for turns, on the max operate time graphs.
5. Calculates the B intercept for turns, on the min operate time graphs.
6. Calculates the B intercept for current ratio, on the max operate time graphs.
7. Calculates the B intercept for current ratio, on the min operate time graphs.
8. Calculates the eddy current time constant from B intercept, resistance, and the slope of the turns graph.
9. Calculates the total time constant from eddy current time constant and sleeve type information.
10. Calculates the saturation factor from total amp turns information.
11. Calculates the electrical operate time from B intercept, total time constant and slope of the current ratio graph.

This modular method of programming is used to facilitate debugging and provide flexibility for change, in case future applications may make use of parts of the program.

Error Detection

A special error routine in master control causes the message "IERR = X" (where X is an integer from 1 to 9 indicating the program step causing the error) to be printed at the left hand margin of the output, in place of the relay calculation which would normally appear there. The program then automatically begins on the next calculation without interruption. This feature prevents the entire job from terminating in case an error occurs on a particular calculation.

The type of errors that are detected by this routine are:

1. Illegal character or characters appear on an input data card. (This is performed with the FORTRAN "Option 9" statement.)
2. Sense lights are not turned off after program initialization.
3. Negative values of sleeve metal descriptors occur.
4. Negative value of C note descriptor occurs.
5. Type of contact configuration occurs for which computer has no associated gram load data.
6. Relay type appears for which programmed operate and release time methods do not apply.
7. Negative value of R note descriptor occurs.
8. New page detector does not advance after last line on previous page is printed.
9. Illegal digit occurs in relay type specification (other than 0 or 1).

Input Data

The input data for each relay coil provided to the program is listed below:

1. Relay type - The relays are classified either U type, UA type, double wound type, U type with sleeve, U type with permalloy core or Y type. The type is indicated by a 1 in one of columns 1 through 6.
2. Contact arrangement - The number of make, break, break make, and make break contacts are indicated by the proper two digits in columns 7 through 14.

The less frequent contact configurations listed below are indicated by digits in columns 15 and 20 indicating the number of contacts, and the designations below in columns 16 through 19 and 21 through 24 to indicate the type. The allowed configurations are:

- MM - make make
- BMM - break make make
- M-M - make before make
- M-B - make before break

PB - preliminary break
PM - preliminary make
BMB - break make break
MBM - make break make
PBM - preliminary break make
BM-M - break make before make.

3. Relay code - The alphabetic designation and numeric code are given in columns 25 through 26 and 27 through 30 respectively.
4. Preferred codes - A preferred relay is indicated with a P in column 32 and an asterisk in column 34.
5. Turns - The number of turns is given in columns 35 through 39.
6. Resistance - The resistance is given in columns 40 through 44.
7. Sleeve type - The sleeve type is indicated by a single digit using the following code:
 - 1 or blank - no sleeve
 - 4 - 13/32 aluminum
 - 5 - 13/32 copper
 - 6 - 1/2 copper
 - 7 - 5/8 copper

The particular choice of digits is such that when multiplied by two, a new set of ten unique digits result. The above digits indicate values from the minimum operate graph while the multiplied set of digits (2,8,10,12,14) indicate corresponding values from the maximum operate time graph.

8. Stop pin height - The stop pin height is indicated by two digits in columns 46 and 47.

9. Winding arrangement - The winding arrangement for which the times are being calculated is indicated as P, S or P/S for primary, secondary or primary and secondary in series aiding, respectively, in columns 48 through 51 (ZP/S and UP/S indicate results for zero and unity coupling respectively - see Section V for explanation).
10. Operate current - The operate current in milliamps is given in columns 52 through 55.
11. Nonoperate current - The nonoperate current is given in columns 56 through 59 if known.
12. Y type release time - The minimum and maximum release time of Y type relays are already known. These are listed in columns 60 through 62 and 63 through 65 respectively.
13. Resistance tolerance - The resistance tolerance is given in columns 66 through 68 if different from 10%. The number listed is obtained by multiplying the resistance tolerance by 10 (i.e., 1% is listed as 10, 15% is listed as 150).
14. Core type - The core type is given in columns 69 and 70. Blank = Standard Core
 - CL = 5/16 inch core - 1/8 inch armature
 - CK = 1/4 inch core - 1/8 inch armature
 - CJ = 1/4 inch core - .083 armature
15. A 1 in column 71 indicates the last data card to be processed and terminates the program. A 2 in column 71 indicates the last data card of a particular type and causes the printer to skip to a new page.

KNOWLEDGE GAINED FROM AN INITIAL TRIAL RUN

The results in Appendix I represent the second run of the relay data. On the first run it became painfully obvious that operate times for several of the relays were extremely excessive, having filled up all the allotted space with a long string of digits. Naturally this anomaly was quickly examined, and in the process

some interesting facts emerged. In total there were nine relays which showed excessive operate times. At first faulty data was suspected but this proved not to be the case. A little more investigation and some slide rule work eventually showed that in all nine cases, the operate current listed for these relays could not be met under conditions of low voltage (45v) and maximum coil resistance (nominal + 10% of nominal), and in fact, two of the relays (the U1068 primary and secondary and the U1433 secondary) could not meet the listed operate currents, even assuming nominal battery (48v) and rated coil resistance values. A study of initial relay requests and several circuits using these relays showed that the relays are used in special ways; for example, the U1068 has two contacts which close under lower than the listed operate current and these contacts are used to place the windings in parallel. Since no warning of special conditions are given in the U & Y type relay book it was felt it would be useful to make a separate listing of these relays for immediate reference. This list appears behind the Y relay section in Appendix I. A note referring to this section appears by the relay at its normal location. Also listed are nine additional relays which have a very large max to min operate time ratio because the current under 45 volts and maximum resistance conditions only slightly exceeds the listed operate current. A note explains in which class each relay belongs.

Miscellaneous Program Facts

The following facts may aid in giving some feel for the size, complexity and efficiency of the program.

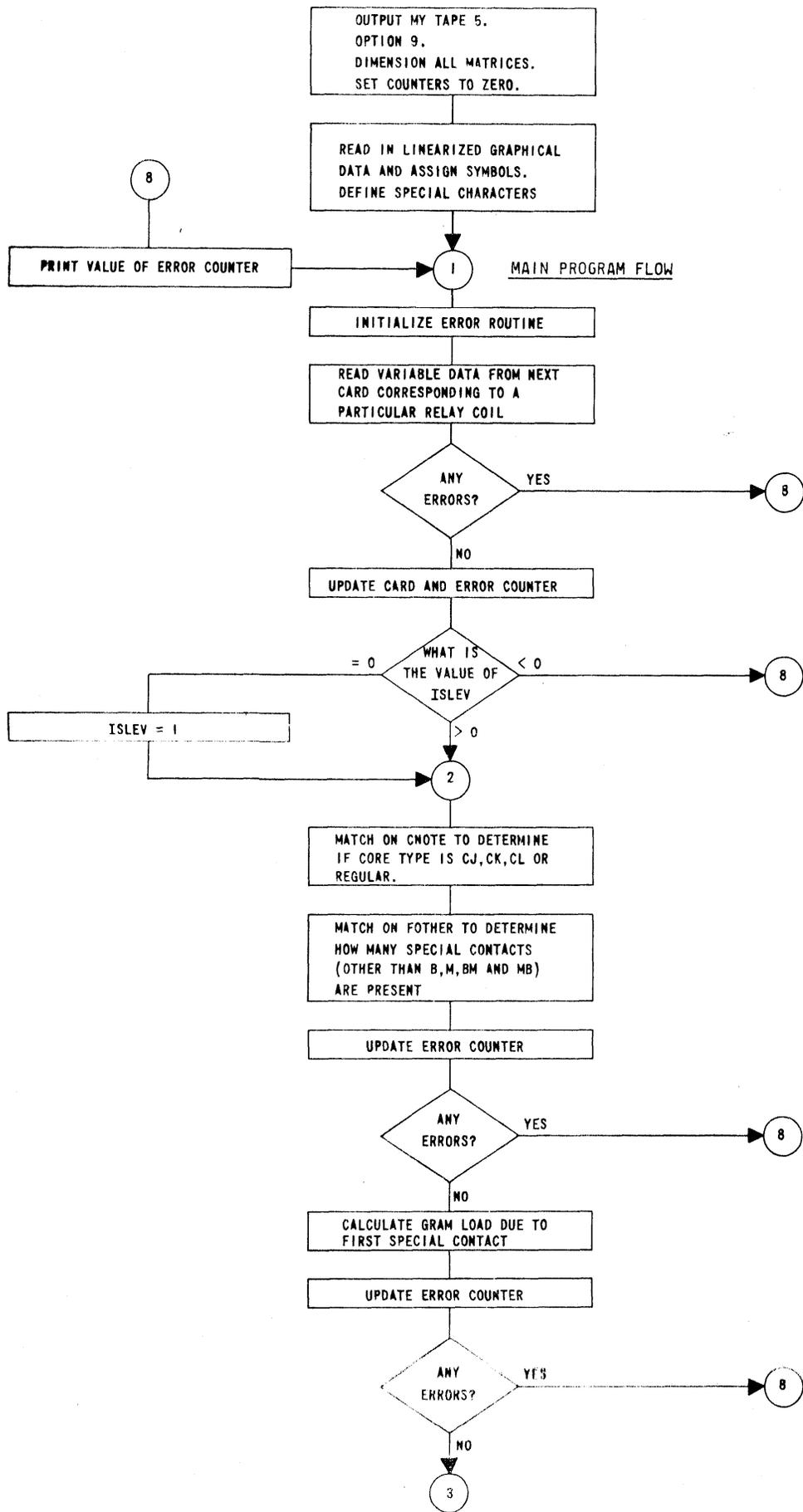
Number of input data cards	- 2037
Number of FORTRAN instructions	- 824
Assembly time	- .0891 hr.
Run time	- .0234 hr.
Total System time	- .1181 hr.

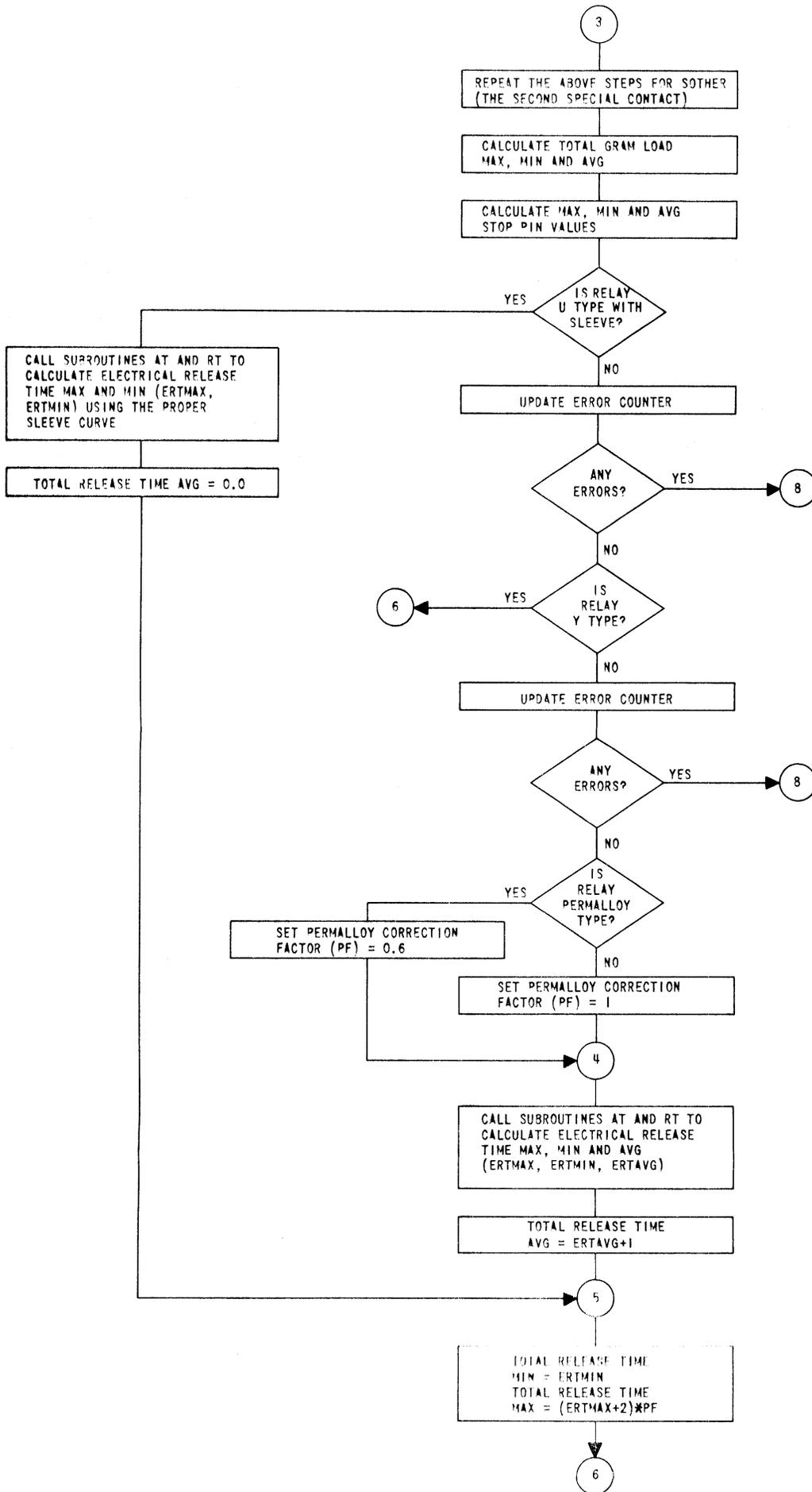
V. DERIVATIONS, SYMBOLS, AND DATA TABLES

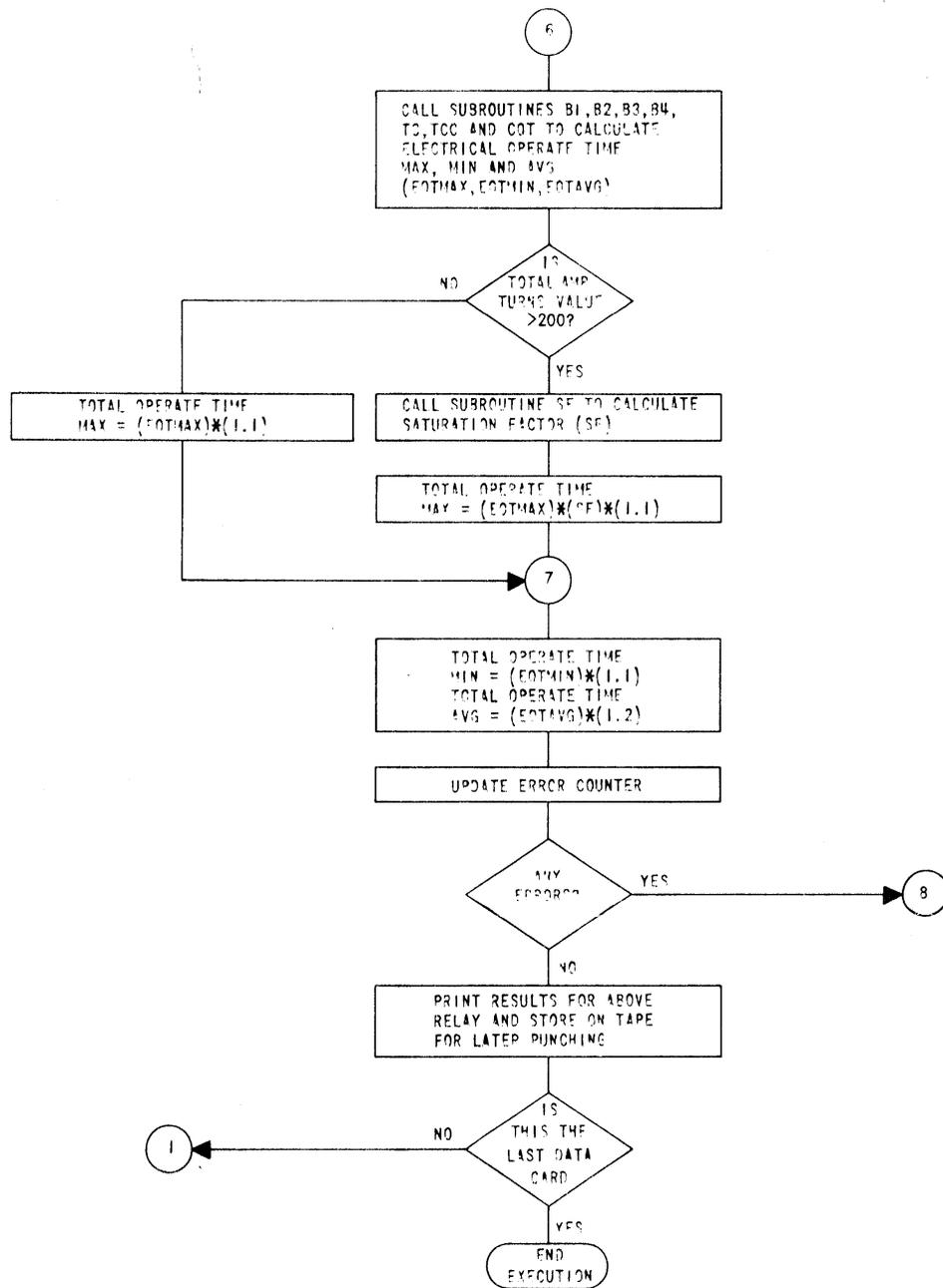
Discussion of Series Aiding Windings

Some U, UA and Y type relays are intended to be used with their primary and secondary connected in a series aiding arrangement. These relays are designated as ZP/S or UP/S under winding arrangement. Data is given for the operate current of relays

ABBREVIATED FLOW CHART
FOR RELAY TIME CALCULATION PROGRAM







connected in this manner; however, the turns and resistance of the primary and secondary are listed separately. The operate time curve is plotted for only a single value of turns and resistance, so if these curves are to be used, a method of reducing a circuit containing the primary and secondary in series aiding, to a circuit with an equivalent single coil must be found. The desired transformation is shown in Figure 5, with each relay coil shown as a resistance (R) in series with an inductance (L) having (N) turns and mutual inductance (m).

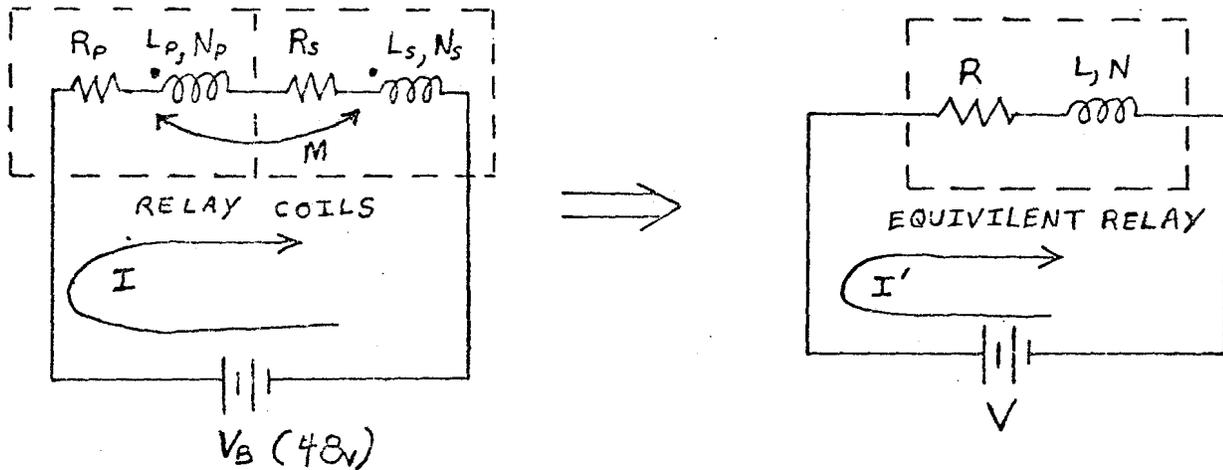


FIGURE 5

In this case, "equivalent", means equivalent for operate time calculations. The wire spring relay book (X75509, page VII-7) states two conditions for equivalent operate and release time circuits. These are:

1. The time constant of each circuit must remain the same. - This insures equivalent transient response.
2. The amp turns ($N \times I$) of each circuit must be the same at the end of the transient. - This insures equivalent magnetic force through the armature.

Condition (1) will be met if the two circuits are electrically equivalent. For series aiding circuits this requires:

$$L = L_p + L_s + 2m \text{ and } R = R_p + R_s$$

where the p and s subscripts denote primary and secondary respectively, and the mutual inductance m, equals $k\sqrt{L_p L_s}$. The constant k is the coefficient of coupling and is determined by physical properties of the relay.

Assuming that turns and inductance are related by a constant K in the following manner:

$$L = KN^2$$

we have for condition 1,

$$KN^2 = K(N_p^2 + N_s^2 + 2kN_p N_s)$$

or eq 1) A) $N = \sqrt{N_p^2 + N_s^2 + 2kN_p N_s}$

B) $R = R_p + R_s$

Condition 2 will be met if the steady state ampere turns of each circuit are equal. This requires:

$$(N_p + N_s)I = NI$$

substituting eq 1)

$$\frac{(N_p + N_s)V_B}{R_p + R_s} = \frac{\sqrt{N_p^2 + N_s^2 + 2kN_p N_s} V}{R_p + R_s}$$

or eq. 2)

$$V = \left(\frac{N_p + N_s}{\sqrt{N_p^2 + N_s^2 + 2kN_p N_s}} \right) V_B = F_1 V_B$$

Thus, equation 2 dictates that the equivalent circuit will not have a 48 volt battery but rather a battery equal to 48 times the factor

$$F_1 = \frac{N_p + N_s}{\sqrt{N_p^2 + N_s^2 + 2kN_p N_s}}$$

We are now in somewhat of a dilemma because the value of k is not known and measurements would have to be performed on each relay, individually, to determine it. It can be shown,⁴ however, that k is constrained to lie between -1 and 1. For the

⁴

Brenner and Javid, Analysis of Electric Circuits, McGraw-Hill Book Company, 1959, page 590.

series aiding case k is positive and therefore lies between 0 and 1. Thus, we can get a good feel for the effect of k by calculating times for k=0 and also k=1. Both values are listed in the print-out and if the answer must be known more precisely than the difference between the two, k can be measured and a hand calculation made.

The equations for both cases are given below considering k=0 first.

With k=0 equation 1 becomes:

$$\text{eq. (1a) A: } N = \sqrt{N_p^2 + N_s^2}$$

$$\text{B: } R = R_p + R_s$$

and equation 2 becomes:

$$\text{eq. (2a) } V = \left(\frac{N_p + N_s}{\sqrt{N_p^2 + N_s^2}} \right) V_B$$

$$\therefore F_1 = \frac{N_p + N_s}{\sqrt{N_p^2 + N_s^2}}$$

It is interesting to note that the ratio F_1 is maximum when $N_p = N_s$ (when it equals the square root of 2) and approaches 1, as N_p and N_s grow further apart. Since N_p and N_s are often of the same order of magnitude, this factor must be taken into account. The factor F_1 enters the operate time calculation via determination of the current ratio (i/I_{dc}) where i is the operate current listed in the relay book and I_{dc} is I' as shown in Figure 5 above. Since $I' = (F_1 \times V_B)/R$, the adjusted current ratio using a 48 volt battery to calculate I_{dc} , would be $i/(F_1 \times I_{dc})$ or $(i/F_1)(1/I_{dc})$.

For minimum programming effort, i/F_1 is read in as data for operate current, rather than having the program detect the P/S condition and adjust the battery voltage by F_1 . This means i/F_1 will be printed as the operate current for P/S coil arrangements rather than i . Equations (1a) A and B, specify the value of turns N , and resistance R used for ZP/S coils. The above discussion for i (operate current), also applies to the nonoperate current.

With k=1, equation 1 becomes:

$$\text{eq. (1b) A: } N = \sqrt{N_p^2 + N_s^2 + 2N_pN_s} = N_p + N_s$$

$$\text{B: } R = R_p + R_s$$

and equation 2 becomes:

$$\text{eq. (2b)} \quad V = \left(\frac{N_p + N_s}{N_p + N_s} \right) V_B = V_B$$

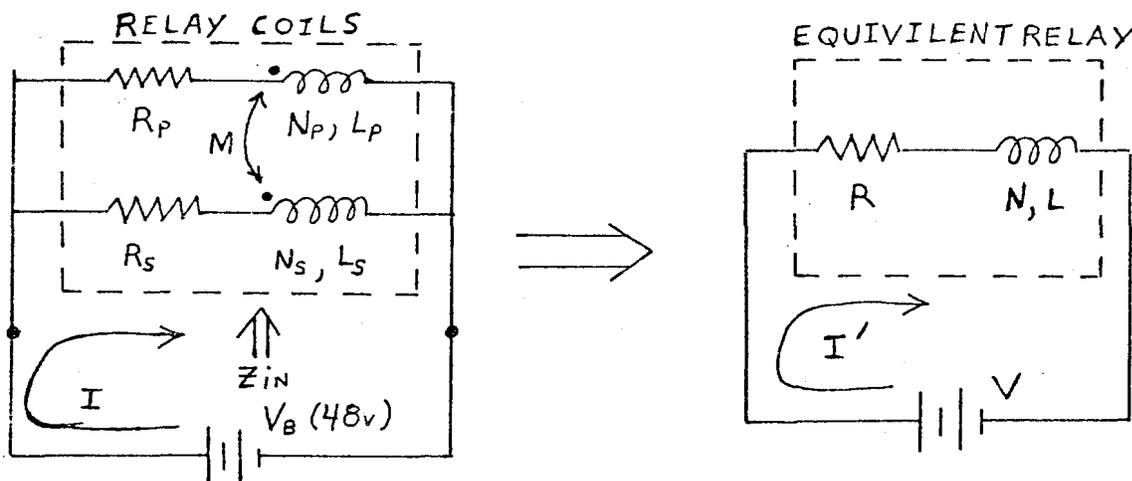
$$\therefore F_1 = 1$$

Because F_1 equals 1, the value of operate current i , will be the operate readjust value listed in the relay book for UP/S coils. Equations (1b) A and B specify the value of turns N , and resistance R , used for these coils.

Discussion of Parallel Windings

Some relays in the U type relay book provide for windings to be connected in parallel for operate and release. In all but a few cases, data is also provided to determine operate and release characteristics for each winding alone. For the sake of completeness, the feasibility of providing an analysis for parallel windings, similar to the one above for series windings, is investigated.

The desired transformation is shown in Figure 6 using the same notation as the series case.



See eqs. 3 and 4 for transformation equations.

FIGURE 6

Because it is the simplest, the case for $k=0$ is discussed first. To meet condition 1, we find the value of R and L for electrical equivalence. This can be done if the input impedance (Z_{in}) of the original circuit is known.

For $k=0$

$$Z_{in} = \frac{(R_p + j\omega L_p)(R_s + j\omega L_s)}{R_p + R_s + (L_p + L_s)j\omega} = \frac{A + j\omega D}{C + j\omega D}$$

where $A = R_p R_s - \omega^2 L_p L_s$

$$B = R_p L_s + R_s L_p$$

$$C = R_p + R_s$$

$$D = L_p + L_s$$

To find the value of L/R we rewrite Z_{in} in the form,

$$Z_{in} = m \angle \theta = m \cos\theta + jm \sin\theta$$

where in our case

$$m = \sqrt{(A^2 + B^2)/(C^2 + D^2)}$$

$$\theta = \text{TAN}^{-1}(\omega B/A) - \text{TAN}^{-1}(\omega D/C)$$

we now have

$$R = m \cos\theta$$

$$\omega L = m \sin\theta$$

$$\therefore \omega L/R = m \sin\theta/m \cos\theta = \text{TAN}(\theta)$$

expanding

$$\omega L/R = \frac{\omega BC - \omega DA}{AC - \omega^2 BD}$$

now

$$\frac{L}{R} = \frac{BC - DA}{AC - \omega^2 BD} = \frac{(R_p + R_s)(R_p L_s + R_s L_p) - (L_p + L_s)(R_p R_s - \omega^2 L_p L_s)}{(R_p + R_s)(R_p R_s - \omega^2 L_p L_s) + \omega^2 (R_p L_s + R_s L_p)(L_p + L_s)}$$

Since the L/R equality controls the transient calculations, it is fair to make a high frequency approximation for simplification.

Allowing ω to grow large we have,

$$\frac{L}{R} \approx \frac{(L_p + L_s)(L_p L_s)}{R_s L_p^2 + R_p L_s^2} = \frac{L_p + L_s}{R_s (L_p/L_s) + R_p (L_s/L_p)}$$

substituting

$$L = KN^2$$

we have

$$N^2/R = \frac{N_p^2 + N_s^2}{R_s(N_p^2/N_s^2) + R_p(N_s^2/N_p^2)}$$

So, for Condition 1 we can pick

eq. 3) A) $N \approx \sqrt{N_p^2 + N_s^2}$

and B) $R \approx R_s(N_p^2/N_s^2) + R_p(N_s^2/N_p^2)$

To meet Condition 2 the above equations require:

$$N_p I_p + N_s I_s = NI'$$

$$\left(\frac{N_p}{R_p} + \frac{N_s}{R_s}\right) V_B \approx \frac{\sqrt{N_p^2 + N_s^2} V}{R_s(N_p^2/N_s^2) + R_p(N_s^2/N_p^2)}$$

or

eq. 4)
$$V \approx \left(\frac{N_p R_s + N_s R_p}{R_p R_s}\right) \left(\frac{R_s(N_p^2/N_s^2) + R_p(N_s^2/N_p^2)}{\sqrt{N_p^2 + N_s^2}}\right) V_B$$

$$\approx F_2 V_B$$

where
$$F_2 = \frac{N_p R_s + N_s R_p}{R_p R_s} \left(\frac{R_s(N_p^2/N_s^2) + R_p(N_s^2/N_p^2)}{\sqrt{N_p^2 + N_s^2}}\right)$$

Note that equations 3 and 4 describe one of many possible equivalent circuits possible depending on what value is chosen for N.

Because of the complexity of F_2 , the approximation used in deriving it, and the relative few occurrences of P//S type coils, this calculation is not included in the program.

When $k=1$ the equations become even more complex and hence this calculation is also omitted.

MEANING OF SYMBOLS USED IN THE PROGRAM

- RT - Release Time
- ERT - Electrical Release Time
- AT - Ampere Turns

- TGL - Total Gram Load
- ISTP - Stop Pins
- ATC - Amp Turns Calculated
- TC - Time Constant of Energizing Winding
- TTC - Total Time Constant
- SMI - Small i (operate current)
- BCI - Big I (actual DC current)
- RI - Ratio of i/I
- BT - B Intercept for turns
- BI - B Intercept for i/I
- SF - Saturation factor
- SFC - Saturation factor calculated
- CF - C note factor (core type)
- TOT - Total Operate Time
- EOT - Electrical Operate Time
- COT - Calculated Operate Time

GRAM LOAD ASSUMPTIONS

(In order of most frequent occurrence)

<u>Configuration</u>	<u>Gram Load</u>			<u>How Obtained</u>
	<u>Min</u>	<u>Max</u>	<u>Avg</u>	
MM	85	150	240	Graph ES-456602 in the release time memo.
BMM	115	190	300	Graph ES-456602 in the release time memo.
M-M	55	95	165	Graph ES-456602 in the release time memo.
M-B	65	110	180	Graph ES-456602 in the release time memo.

<u>Configuration</u>	<u>Gram Load</u>			<u>How Obtained</u>
	<u>Min</u>	<u>Max</u>	<u>Avg</u>	
PB	25	50	100	Conversation with Relay Group
PM	25	50	100	Conversation with Relay Group
BMB	79	119	183	Avg of B+MB and BM+B
MBM	77	119	183	Avg of M+BM and MB+M
PBM	50	100	200	2 * PM
BM-M	88	137	229	B + M-M
Back Tension	28	70	40	Release time memo

Correction Factors for Core Type (C-Note)

Source - Unpublished Relay Group Training Memo

Time Correction Factor

<u>C-Note</u>	<u>Core Type</u>	<u>Operate Time</u>	<u>Release Time</u>
CJ	5/16 x .125	1.35 (U Operate)	Same as U Release
CK	1/4 x .125	1.25 (U Operate)	Same as U Release
CL	1/4 x .083	1.15 (U Operate)	.6 (U Release)
-	Permalloy	Same as U Operate	.6 (U Release)

The above factors (f) should be applied as follows:

Min Times - f (minimum electrical time)

Max Times - f (maximum total time)

VI. COMPUTER RESULTS

The results of the second computer run were successful in all respects. A printed output was obtained listing the min, max and average operate and release times of all U, UA and Y type

relays in the format given in Figure 3, page 15. A copy of this output is attached as Appendix I. A deck of punched cards was obtained, with each card containing the above information in the format given in Figure 4, page 15. This deck can be obtained from the author if a reorganized print-out, or input data for a selection program is required.

VII. SUMMARY AND CONCLUSIONS

A computer program to calculate max, min and average operate and release times of U, UA and Y type relays has been written, debugged and used to generate hard copy output in the form of a printed list and a deck of punched cards. Of the four goals established as a measure of a successful project, preliminary use of the results indicates at least two have been accomplished. These two are:

1. Precise operate and release times easily obtainable.
2. Reduced design and analysis time of circuit changes involving these relays.

If the remaining two goals (1 - a common data source available to all interested persons and, 2) - increased design and analysis accuracy of circuit changes involving these relays). are to be accomplished, the results must find wide distribution among U and Y type relay users and should carry verification from the relay group.

Concerning the latter, it is hoped that high interest from users will encourage the relay group to use these results as a basis for issuing standardized data.

In any event it appears that the computer results presented in this memorandum will be useful to design and analysis personnel, as a tool for more accurate and rapid circuit work.

CB-5612-WBP-BB

W. B. Perkinson
W. B. PERKINSON

REFERENCES

1. Data and Procedure for Estimating the Operating Times of Iron U Type Relays, July 1, 1933; and Data and Procedure for Estimating the Releasing Times of Iron U Type Relays, July 21, 1938; 332-B-2-B-PWS.
2. Computer Abstract Bulletin.
3. Buckingham, R. A., Numerical Methods, Tandem; Sir Isaac Pitman and Sons, Ltd.
4. Brenner and Javid, Analysis of Electric Circuits, McGraw-Hill Book Company, 1959, page 590.

APPENDIX I

Max, Min and Average Operate and Release Times of U, UA and Y Relays

This appendix contains the computer calculated results of all U, UA and Y type relay times. The following factors should be noted before using the results:

1. The release times are based on breaking a make contact. If times for making a break are desired the following times should be added to those printed:

Max - 3.0 ms, Min - 2.0 ms, Avg - 2.0 ms

2. Operate currents listed are readjust values, except on relays with primary and secondary in series aiding (ZP/S), zero coupling. On these relays a correction factor, F_1 , has been applied. (See Section V for explanation.)
3. All calculations are made assuming 48 volts across the relay coil, therefore, operate times for very low resistance coils (1 - 100 ohms) should be used for comparison only. These relays normally require a series resistor which lowers the voltage. (See page 16 for explanation.)
4. The results as given do not take into account the effects of long term heating in service and magnetic interference on operate and release times; or, the effect of specific hold and release current values applied, on release times.
5. The following notations are used:

An *, following the relay code indicates: preferred code.

An A, following the relay code indicates: use with relay group approval only.

A p, under winding arrangement indicates: primary coil.

An s, under winding arrangement indicates: secondary coil.

A (U,Z)P/S, under winding arrangement indicates: primary and secondary in series aiding with unity coupling (U) or zero coupling (Z).

6. The following accuracy limits apply to the calculated results:

Release Times -

Slow release relays with sleeves: less than
4 ms high.

All others: ± 1 ms.

Operate Times -

Times less than 100 ms: ± 1 ms.

Times greater than or equal to 100 ms: ± 2 ms.

SINGLE WOUND U TYPE

CODE	RES	WNDG ARNG	OPERATE CURRENT	OPERATE TIME			RELEASE TIME			
				MAX	MIN	AVG	MAX	MIN	AVG	
U	50	*	2500	9.8	49.4	8.3	17.1	19.6	2.5	7.8
U	51	*	1500	16.0	45.2	8.4	17.3	18.2	2.5	7.8
U	52	*	1500	19.0	58.1	10.2	21.3	18.5	2.5	8.1
U	53	*	2500	9.7	48.4	8.2	16.9	5.5	2.5	4.0
U	54	*	2500	10.4	55.4	8.8	18.3	18.4	2.5	7.1
U	55	*	2500	8.8	41.0	7.4	15.0	22.1	3.0	9.4
U	57	*	950	19.0	21.2	3.7	8.0	21.0	2.7	8.6
U	58	*	2500	10.7	58.6	9.1	19.0	17.7	2.5	7.1
U	59	*	700	29.5	29.4	6.4	13.3	16.6	2.5	7.1
U	60		2000	14.1	59.1	9.0	18.9	19.6	2.7	8.6
U	61		700	17.0	16.6	3.5	7.0	21.4	2.8	9.0
U	62		450	11.4	7.6	2.9	3.8	37.6	7.5	17.5
U	63		2500	8.7	40.2	7.3	14.8	23.7	3.4	10.5
U	64	*	700	19.5	19.6	4.0	8.1	18.6	2.5	7.1
U	65	*	700	19.5	19.6	4.0	8.1	18.6	2.5	7.1
U	66	*	2500	6.0	24.1	4.6	9.5	37.0	7.5	17.5
U	67	*	700	17.0	16.6	3.5	7.0	26.9	4.0	11.9
U	68	*	700	26.0	26.5	5.4	11.6	20.0	2.7	8.6
U	69	*	950	24.5	30.1	5.2	10.7	19.3	2.5	8.1
U	70		700	19.5	19.6	4.0	8.1	18.9	2.5	7.4
U	71		700	24.0	24.7	4.9	10.4	17.3	2.5	7.1
U	72		700	13.0	12.0	2.9	4.9	32.5	6.1	14.7
U	73	*	700	20.0	20.2	4.1	8.3	20.7	2.8	8.9
U	74	*	700	18.0	17.7	3.7	7.5	32.0	6.1	14.7
U	75	*	1500	10.5	25.8	5.0	10.4	36.3	7.5	17.5
U	76		450	36.5	23.9	6.2	12.9	7.3	2.5	4.2
U	77		2000	15.5	69.6	10.2	21.6	20.0	2.7	8.6
U	79	*	700	20.5	20.9	4.2	8.6	19.8	2.7	8.6
U	80		2000	17.0	84.6	11.5	25.1	16.3	2.5	6.7
U	81	*	950	20.5	23.6	4.1	8.6	18.6	2.5	7.1
U	82		700	12.7	11.7	2.9	4.8	29.3	4.8	13.3
U	84		700	25.5	26.1	5.3	11.3	23.4	3.2	10.2
U	86		700	24.5	25.1	5.1	10.7	19.6	2.7	8.6
U	87		700	16.0	15.4	3.4	6.4	23.6	3.1	9.8
U	88	*	700	32.0	31.0	7.2	14.6	16.5	2.5	7.1
U	92		700	23.5	24.3	4.8	10.1	17.3	2.5	7.1
U	93		700	21.5	22.1	4.4	9.1	18.6	2.5	7.8
U	95		2500	11.0	61.7	9.4	19.7	25.4	3.5	11.2
U	98	*	950	22.0	26.1	4.5	9.3	20.2	2.7	8.6
U	99		950	24.5	30.1	5.2	10.7	28.6	4.4	12.9
U	100		1000	21.0	36.2	7.7	15.8	19.0	2.7	8.6
U	101	*	700	17.0	16.6	3.5	7.0	22.5	3.0	9.4
U	104		950	21.0	24.5	4.2	8.9	25.7	4.0	11.9
U	105	*	2500	9.5	46.5	8.0	16.5	24.1	3.4	10.5
U	106		700	21.0	21.5	4.3	8.8	18.5	2.5	7.3
U	107		4000	6.5	53.5	8.4	17.5	32.5	6.1	14.7
U	108	*	2500	9.6	47.5	8.1	16.7	26.5	4.0	11.9
U	109	*	1500	14.9	41.1	7.8	15.8	16.9	2.5	7.1
U	112	*	700	11.6	10.6	2.7	4.4	33.7	6.1	14.7
U	113	*	2500	7.0	29.4	5.4	11.6	41.1	9.8	20.9
U	114	*	2500	9.2	44.0	7.8	15.8	36.6	8.0	18.4
U	115	*	2500	9.9	50.4	8.4	17.3	18.6	2.5	7.1

CODE	RES	WNDG OPERATE		OPERATE TIME			RELEASE TIME		
		ARNG	CURRENT	MAX	MIN	AVG	MAX	MIN	AVG
U 118	500		36.0	24.4	5.8	12.4	7.5	2.5	4.1
U 119	* 700		14.9	14.0	3.2	5.8	27.3	4.0	11.9
U 120	* 2500		7.9	34.9	6.3	13.2	24.9	3.4	10.5
U 121	1000		21.5	37.0	6.5	16.3	18.3	2.5	7.4
U 122	* 2500		9.9	50.4	8.4	17.3	26.7	4.2	12.4
U 123	2500		7.5	32.4	5.9	12.5	27.3	4.0	11.9
U 129	1000		13.3	21.6	4.6	9.2	25.6	3.5	11.1
U 130	2500		8.3	37.5	6.8	14.0	22.5	3.0	9.4
U 132	700		16.5	16.0	3.5	6.7	36.3	7.5	17.5
U 133	* 2500		10.4	55.4	8.8	18.3	27.7	4.8	13.3
U 134	1500		19.0	58.1	10.2	21.3	16.6	2.5	7.1
U 135	700		21.0	21.5	4.3	8.8	26.7	4.2	12.4
U 136	700		16.5	16.0	3.5	6.7	22.9	3.0	9.4
U 138	* 700		23.5	24.3	4.8	10.1	21.1	2.9	9.2
U 139	700		18.0	17.7	3.7	7.5	22.1	3.0	9.4
U 140	700		22.5	23.3	4.6	9.6	20.3	2.8	8.9
U 141	* 950		17.5	19.0	3.4	7.1	36.3	7.5	17.5
U 142	* 2500		8.9	41.7	7.5	15.2	28.9	4.8	13.3
U 143	* 2500		8.3	37.5	6.8	14.0	32.5	6.1	14.7
U 144	* 950		20.5	23.6	4.1	8.6	18.6	2.5	7.1
U 147	700		22.5	23.3	4.6	9.6	18.0	2.5	7.3
U 148	* 2500		8.5	38.8	7.0	14.4	29.3	4.8	13.3
U 149	950		18.5	20.4	3.6	7.7	28.9	4.8	13.3
U 150	1000		9.5	14.3	3.5	6.1	20.0	5.4	11.4
U 151	950		18.5	20.4	3.6	7.7	35.7	7.5	17.5
U 152	4000		5.2	36.3	6.5	13.4	30.3	4.8	13.3
U 153	4000		6.9	60.6	9.0	18.8	29.3	4.8	13.3
U 154	4000		5.0	34.2	9.2	12.8	20.0	5.4	11.4
U 155	700		28.5	28.6	6.1	12.8	7.4	2.5	4.2
U 157	* 2500		8.1	36.2	6.6	13.6	32.5	6.1	14.7
U 158	* 2500		7.5	32.4	5.9	12.5	37.0	7.5	17.5
U 159	1000		15.5	26.6	5.3	11.0	25.7	4.0	11.9
U 162	* 950		17.0	18.3	3.3	6.9	32.5	6.1	14.7
U 164	* 2500		8.3	37.5	6.8	14.0	35.0	7.5	17.5
U 165	* 950		18.0	19.7	3.5	7.4	15.7	3.9	9.1
U 166	* 1500		12.4	32.1	6.1	12.8	26.5	4.0	11.9
U 167	1000		17.0	29.4	5.9	12.4	20.0	2.7	8.6
U 168	* 700		18.5	18.3	3.8	7.7	32.8	6.5	15.6
U 171	2500		8.5	38.8	7.0	14.4	26.1	4.0	11.9
U 173	* 2500		9.1	43.2	7.7	15.6	24.1	3.4	10.5
U 175	2500		7.8	34.3	8.3	13.1	21.6	5.0	12.1
U 176	1500		16.5	47.3	8.6	17.9	27.6	4.2	12.4
U 177	* 1500		18.0	53.9	9.5	19.9	17.3	2.5	7.1
U 178	1500		18.0	53.9	9.5	19.9	19.9	2.5	8.4
U 179	* 950		18.5	20.4	3.6	7.7	22.1	3.0	9.4
U 180	* 950		15.5	16.2	3.0	6.1	37.0	7.5	17.5
U 181	950		19.5	22.0	3.8	8.2	19.8	2.5	7.8
U 182	1000		11.0	17.1	3.9	7.3	20.6	4.2	10.9
U 183	950		23.5	28.5	5.0	10.1	17.1	2.5	7.1
U 185	* 2500		6.9	28.9	5.3	11.3	41.1	9.8	20.9
U 187	1500		12.8	33.6	6.3	13.3	21.3	3.0	9.4
U 188	* 1500		17.5	51.6	9.2	19.2	16.1	2.5	6.5

CODE	RES	WNDG ARNG	OPERATE CURRENT	OPERATE TIME			RELEASE TIME		
				MAX	MIN	AVG	MAX	MIN	AVG
U 189	* 2500		9.6	47.5	8.1	16.7	23.7	3.4	10.5
U 190	2500		9.6	47.5	8.1	16.7	32.2	6.5	15.6
U 191	1000		13.2	21.4	4.5	9.2	26.9	4.0	11.9
U 192	* 950		20.0	22.8	4.0	8.4	26.5	4.0	11.9
U 193	700		18.0	17.7	3.7	7.5	20.8	2.7	8.6
U 194	1000		17.0	29.4	5.9	12.4	17.3	2.5	7.1
U 195	1000		13.5	22.0	4.6	9.4	26.9	4.0	11.9
U 196	300		46.5	11.5	2.0	4.0	19.8	2.5	7.8
U 197	1500		12.6	32.8	6.2	13.1	23.7	3.4	10.5
U 198	950		15.0	15.5	2.9	5.9	16.7	3.2	8.6
U 199	* 2500		10.4	55.4	8.8	18.3	23.7	3.4	10.5
U 200	* 2500		9.9	50.4	8.4	17.3	20.4	2.7	8.6
U 201	950		13.8	13.9	2.7	5.4	29.3	4.8	13.3
U 202	1500		19.0	58.1	10.2	21.3	16.7	2.5	7.1
U 203	220		28.0	8.9	3.0	4.2	32.8	6.5	15.6
U 204	220		31.0	10.2	3.1	4.6	29.1	5.0	13.7
U 206	2500		9.1	43.2	7.7	15.6	21.5	3.0	9.4
U 207	* 2500		6.8	28.3	5.3	11.1	30.3	4.8	13.3
U 208	500		20.0	14.1	3.3	6.0	28.9	4.8	13.3
U 209	500		21.5	15.4	3.5	6.5	23.7	3.4	10.5
U 211	220		35.0	11.9	3.3	5.1	28.9	4.8	13.3
U 213	1500		12.3	31.7	6.0	12.7	28.9	4.8	13.3
U 214	2500		9.6	47.5	8.1	16.7	28.5	4.8	13.3
U 216	* 2500		7.2	30.6	5.6	12.0	33.1	6.1	14.7
U 217	* 1500		10.5	25.8	5.0	10.4	32.5	6.1	14.7
U 218	* 2500		6.4	26.2	4.9	10.2	32.5	6.1	14.7
U 219	* 950		17.5	19.0	3.4	7.1	29.3	4.8	13.3
U 220	* 950		18.0	19.7	3.5	7.4	29.3	4.8	13.3
U 221	1500		22.0	72.2	12.3	26.5	11.5	2.5	5.4
U 222	2500		9.7	48.4	8.2	16.9	19.6	2.5	7.8
U 223	* 2500		7.0	29.4	5.4	11.6	27.7	4.0	11.9
U 226	* 400		47.0	18.2	3.4	7.2	17.3	2.5	7.1
U 227	2500		10.5	56.5	8.9	18.6	17.5	2.5	7.1
U 228	950		33.0	46.7	7.3	15.7	21.4	2.8	9.2
U 230	220		26.0	8.2	2.9	4.0	12.1	2.5	6.5
U 231	* 700		19.0	18.9	3.9	7.9	11.5	2.5	6.0
U 232	1300		11.0	20.9	4.5	9.1	28.9	4.8	13.3
U 233	1775		8.5	25.4	5.2	10.6	36.6	8.0	18.4
U 234	* 700		18.0	17.7	3.7	7.5	28.9	4.8	13.3
U 235	450		22.5	17.1	4.0	7.2	20.2	2.7	8.6
U 236	* 2500		8.6	39.5	7.1	14.6	21.0	2.7	8.6
U 237	2500		8.7	40.2	7.3	14.8	24.5	3.4	10.5
U 238	950		18.5	20.4	3.6	7.7	22.1	3.0	9.4
U 239	2500		7.2	30.6	5.6	12.0	26.9	4.0	11.9
U 240	450		16.5	12.1	3.3	5.1	35.7	7.5	17.5
U 241	1000		16.0	27.6	5.5	11.4	25.3	4.0	11.9
U 242	450		17.5	13.1	3.4	5.4	32.5	6.1	14.7
U 243	1000		16.0	27.6	5.5	11.4	20.2	2.7	8.6
U 251	700		16.0	15.4	3.4	6.4	22.0	2.9	9.3
U 252	450		19.0	14.2	3.6	5.9	32.0	6.1	14.7
U 254	* 700		16.5	16.0	3.5	6.7	29.3	4.8	13.3
U 255	950		22.0	26.1	4.5	9.3	23.7	3.4	10.5

CODE	RES	WNDG OPERATE		OPERATE TIME			RELEASE TIME		
		ARNG	CURRENT	MAX	MIN	AVG	MAX	MIN	AVG
U 256	950		19.0	21.2	3.7	8.0	28.9	4.8	13.3
U 258	2500		10.6	57.6	9.0	18.8	20.2	2.7	8.6
U 259	* 2500		9.0	42.4	7.6	15.4	28.9	4.8	13.3
U 263	1500		10.0	24.1	4.7	9.8	28.9	4.8	13.3
U 264	1500		12.0	30.6	5.8	12.4	26.5	4.0	11.9
U 265	1500		9.6	22.8	4.5	9.3	37.0	7.5	17.5
U 267	650		19.5	17.5	3.6	7.2	36.6	8.0	18.4
U 268	1500		11.8	29.9	5.7	12.1	21.5	3.0	9.4
U 269	1500		12.4	32.1	6.1	12.8	26.5	4.0	11.9
U 270	* 2500		7.9	34.9	6.3	13.2	32.0	6.1	14.7
U 275	* 2500		9.5	46.5	8.0	16.5	20.2	2.7	8.6
U 276	400		30.0	11.0	2.1	4.3	32.1	5.2	14.3
U 277	2500		8.7	40.2	7.3	14.8	32.8	6.5	15.6
U 278	450		19.5	14.6	3.7	6.1	28.9	4.8	13.3
U 279	450		18.0	13.5	3.5	5.6	29.3	4.8	13.3
U 280	150		45.0	5.4	1.5	2.2	21.6	5.0	12.1
U 281	150		53.5	6.9	1.7	2.6	21.1	5.0	12.1
U 284	1000		17.5	30.3	6.1	12.9	17.1	2.5	7.1
U 285	950		14.5	14.8	2.8	5.7	41.1	9.8	20.9
U 286	950		15.0	15.5	2.9	5.9	33.1	6.1	14.7
U 287	950		18.0	19.7	3.5	7.4	16.6	3.4	9.1
U 288	* 950		18.0	19.7	3.5	7.4	16.1	3.2	8.6
U 291	1000		13.4	21.8	5.9	9.3	25.3	3.4	10.5
U 293	700		16.5	16.0	3.5	6.7	36.3	7.5	17.5
U 297	2500		8.1	36.2	6.6	13.6	25.6	3.5	11.1
U 298	200		47.5	10.9	2.7	4.6	11.1	2.5	6.2
U 299	700		20.0	20.2	4.1	8.3	13.6	3.1	7.6
U 301	450		21.0	15.8	3.8	6.6	22.0	3.1	9.7
U 302	2000		6.3	17.9	3.6	7.3	37.6	7.5	17.5
U 305	220		23.5	7.3	2.8	3.7	27.5	3.6	11.7
U 308	2500		7.0	29.4	5.4	11.6	26.9	4.0	11.3
U 309	2500		6.3	25.7	4.8	10.0	20.0	5.4	11.4
U 310	700		20.5	20.9	4.2	8.6	26.2	3.6	11.5
U 311	* 950		23.0	27.7	4.8	9.8	11.7	2.5	6.5
U 312	700		22.0	22.7	4.5	9.3	19.9	2.5	8.4
U 312	350		31.0	16.9	4.2	7.8	18.8	2.5	7.8
U 313	1000		14.7	24.7	5.9	10.3	19.6	2.5	7.8
U 314	1000		25.0	42.6	9.4	19.6	16.4	2.5	7.1
U 316	145		22.0	5.1	2.7	3.0	37.0	7.5	17.5
U 317	2500		9.9	50.4	8.4	17.3	38.8	7.8	18.5
U 318	2500		11.1	62.8	9.5	19.9	17.5	2.5	7.1
U 319	1000		15.5	26.6	5.7	11.0	14.0	2.5	6.7
U 321	2500		8.1	36.2	6.6	13.6	24.5	3.4	10.5
U 322	450		18.0	13.5	4.1	5.6	25.1	3.5	11.0
U 323	145		60.0	11.4	3.6	6.0	16.4	2.5	7.1
U 324	145		60.0	11.4	3.6	6.0	16.5	2.5	7.1
U 325	350		35.0	18.4	4.6	9.2	17.1	2.5	7.1
U 326	950		18.5	20.4	3.6	7.7	32.0	6.1	14.7
U 327	950		21.0	24.5	4.2	8.9	29.1	5.0	13.7
U 328	1500		13.7	36.8	6.9	14.3	20.0	2.7	8.6
U 330	2500		11.6	68.1	10.0	21.1	20.0	2.7	8.6
U 331	2500		8.0	35.5	6.4	13.4	25.6	3.5	11.1

CODE	RES	WNDG ARNG	OPERATE CURRENT	OPERATE TIME			RELEASE TIME		
				MAX	MIN	AVG	MAX	MIN	AVG
U 332	2500		8.9	41.7	7.5	15.2	21.2	2.8	9.0
U 333	* 1500		14.4	39.3	7.4	15.1	17.3	2.5	7.1
U 334	700		16.0	15.4	3.4	6.4	26.5	4.0	11.9
U 338	* 700		19.5	19.6	4.0	8.1	17.7	2.5	7.1
U 339	1000		24.5	41.7	9.2	19.1	17.7	2.5	7.8
U 340	* 2500		7.6	33.0	6.0	12.7	14.2	3.1	7.6
U 341	700		20.0	20.2	4.1	8.3	20.2	2.7	8.6
U 342	2500		7.8	34.3	6.2	13.1	31.3	5.0	13.8
U 345	34		74.5	5.1	2.8	3.2	23.7	3.4	10.5
U 349	450		18.0	13.5	3.5	5.6	29.3	4.8	13.3
U 351	* 700		19.5	19.6	4.0	8.1	5.5	2.5	4.0
U 352	1000		12.7	20.5	4.4	8.8	29.3	4.8	13.3
U 355	220		26.5	8.3	2.9	4.1	32.8	6.5	15.6
U 357	1000		16.0	27.6	5.5	11.4	22.9	3.4	10.5
U 358	700		20.5	20.9	4.2	8.6	24.3	3.5	11.0
U 360	2500		11.7	69.2	10.1	21.3	21.6	3.1	9.7
U 361	2500		7.0	29.4	5.4	11.6	27.3	4.0	11.9
U 363	1000		23.5	40.0	8.8	18.2	24.8	3.5	11.1
U 364	1000		28.0	47.5	10.7	22.5	23.1	3.2	10.2
U 366	700		22.5	23.3	4.6	9.6	34.2	6.3	15.8
U 370	400		15.5	7.4	2.5	3.5	33.1	6.1	14.7
U 371	2500		11.3	64.8	9.7	20.4	10.8	2.5	5.7
U 372	700		20.0	20.2	4.1	8.3	25.7	4.0	11.9
U 378	400		27.5	9.9	2.0	3.8	32.5	6.1	14.7
U 380	400		60.0	22.0	4.6	9.6	23.5	3.2	10.2
U 382	700		29.5	29.4	6.4	13.3	16.6	2.5	7.1
U 383	2500		11.4	65.9	9.8	20.6	18.4	2.5	7.8
U 384	1500		15.0	41.5	7.8	15.9	20.6	3.0	9.4
U 386	* 2500		9.6	47.5	8.1	16.7	23.7	3.4	10.5
U 387	2500		8.5	38.8	7.0	14.4	12.1	2.5	6.5
U 388	1000		23.0	39.2	8.7	17.7	7.7	2.5	4.2
U 390	220		38.0	12.6	3.5	5.6	20.9	2.8	9.0
U 391	700		18.0	17.7	3.7	7.5	24.1	3.4	10.5
U 393	200		58.0	12.6	3.1	6.0	9.1	2.5	5.1
U 394	2500		6.7	27.8	5.2	10.9	39.5	7.9	18.6
U 395	2500		9.2	44.0	7.8	15.8	23.2	3.1	9.8
U 404	2500		10.1	52.4	8.5	17.7	29.1	5.0	13.7
U 407	* 2500		5.8	23.0	4.4	9.1	33.7	6.1	14.7
U 408	2500		6.7	27.8	5.2	10.9	31.8	5.0	13.8
U 410	1500		13.0	34.4	6.4	13.5	17.1	2.5	6.8
U 415	450		18.5	13.8	3.6	5.7	26.9	4.0	11.9
U 417	2500		9.3	44.8	7.8	16.0	19.0	2.5	7.8
U 419	* 700		14.8	13.9	3.2	5.8	37.0	7.5	17.5
U 420	700		16.0	15.4	3.4	6.4	32.5	6.1	14.7
U 421	* 700		12.3	11.3	2.8	4.6	36.3	7.5	17.5
U 422	* 700		13.7	12.7	3.0	5.2	41.1	9.8	20.9
U 423	450		18.0	13.5	3.5	5.6	36.3	7.5	17.5
U 424	660		44.5	21.6	2.4	4.9	29.1	5.0	13.7
U 425	* 950		16.0	16.9	3.1	6.4	35.7	7.5	17.5
U 426	* 700		18.0	17.7	3.7	7.5	26.5	4.0	11.9
U 430	700		31.0	30.4	6.9	14.1	23.9	3.2	10.2
U 432	700		30.5	30.0	6.7	13.8	20.9	2.9	9.2

CODE	RES	WNDG OPERATE		OPERATE TIME			RELEASE TIME		
		ARNG	CURRENT	MAX	MIN	AVG	MAX	MIN	AVG
U 433	235		63.0	9.3	1.4	2.9	15.9	4.3	9.6
U 434	350		48.5	13.0	2.0	4.4	11.0	2.5	5.7
U 435	350		56.5	15.6	2.5	5.2	10.8	2.5	5.7
U 437	1500		13.2	35.1	6.6	13.7	20.0	2.7	8.6
U 438	1500		12.9	34.0	6.4	13.4	18.2	2.5	7.1
U 439	700		18.5	18.3	3.8	7.7	25.7	3.3	10.8
U 440	* 2500		8.3	37.5	6.8	14.0	36.3	7.5	17.5
U 441	2500		10.7	58.6	9.1	19.0	17.7	2.5	7.1
U 442	1000		17.0	29.4	5.9	12.4	29.3	5.4	14.2
U 444	2500		12.0	72.3	10.5	22.1	25.6	3.5	11.1
U 445	* 2500		8.7	40.2	7.3	14.8	21.7	2.8	9.0
U 447	* 2500		9.4	45.6	7.9	16.3	32.8	6.5	15.6
U 450	2500		10.6	57.6	9.0	18.8	17.7	2.5	6.8
U 451	1000		25.5	43.4	9.6	20.0	15.9	2.5	6.4
U 452	2500		10.3	54.4	8.7	18.1	19.0	2.5	7.8
U 456	* 2500		7.0	29.4	5.4	11.6	27.3	4.0	11.9
U 457	* 1500		13.5	36.1	6.8	14.1	21.5	3.0	9.4
U 459	* 1500		10.2	24.8	4.8	10.0	26.5	4.0	11.9
U 460	* 1500		10.6	26.1	5.0	10.5	29.3	4.8	13.3
U 461	* 1500		8.9	20.7	4.2	8.6	41.1	9.8	20.9
U 470	34		80.0	5.2	2.9	3.3	29.1	5.0	13.7
U 474	1000		24.5	41.7	9.2	19.1	21.6	2.8	9.2
U 477	700		22.5	23.3	4.6	9.6	26.9	4.5	12.8
U 480	1000		13.2	21.4	4.5	9.2	13.9	3.1	7.6
U 482	10		100.0	3.3	2.0	2.2	41.1	9.8	20.9
U 485	* 700		28.0	28.3	6.0	12.5	21.5	3.2	10.1
U 488	1500		15.5	43.2	8.1	16.6	10.7	2.5	5.5
U 489	200		50.0	11.3	2.8	4.9	31.0	5.3	14.2
U 492	1000		24.5	41.7	9.2	19.1	21.6	2.8	9.2
U 493	950		24.0	29.3	5.1	10.4	28.7	5.0	13.7
U 494	200		41.5	9.8	2.5	4.0	24.3	3.5	11.0
U 495	* 1500		16.5	47.3	8.6	17.7	10.2	2.5	4.6
U 496	700		22.5	23.3	4.6	9.6	19.6	2.7	8.6
U 497	* 700		22.5	23.3	4.6	9.6	13.8	3.3	8.1
U 499	* 950		19.5	22.0	3.8	8.2	16.3	3.2	8.6
U 500	* 700		21.0	21.5	4.3	8.8	21.5	3.0	9.4
U 502	* 400		38.5	15.0	2.7	5.6	28.9	4.8	13.3
U 503	700		26.0	26.5	5.4	11.6	18.8	2.5	7.8
U 504	950		15.0	15.5	2.9	5.9	16.5	3.2	8.6
U 505	950		19.5	22.0	3.8	8.2	16.3	3.2	8.6
U 506	* 400		32.5	12.1	2.3	4.6	23.7	3.4	10.5
U 510	200		28.5	6.1	2.1	2.9	41.1	9.8	20.9
U 515	700		20.0	20.2	4.1	8.3	21.3	3.0	9.4
U 516	700		15.5	14.7	3.3	6.1	28.9	4.8	13.3
U 517	700		36.0	33.9	3.1	16.9	18.7	2.5	7.7
U 519	700		22.5	23.3	4.6	9.6	13.8	3.3	8.1
U 520	* 950		12.9	12.9	2.5	5.0	36.3	7.5	17.5
U 521	* 700		20.5	20.9	4.2	8.6	11.0	2.5	5.7
U 522	* 700		17.0	16.6	3.5	7.0	12.1	2.5	6.5
U 523	1500		11.0	27.3	5.2	11.0	36.6	8.0	18.4
U 530	* 2500		8.7	40.2	7.3	14.8	24.5	3.4	10.5
U 531	145		33.0	6.9	2.8	3.6	32.1	5.2	14.3

CODE	RES	WNDG OPERATE		OPERATE TIME			RELEASE TIME		
		ARNG	CURRENT	MAX	MIN	AVG	MAX	MIN	AVG
U 533	82		39.0	5.7	2.8	3.4	32.5	6.1	14.7
U 535	700		32.5	31.3	7.3	14.9	16.8	2.5	7.3
U 540	* 2500		10.1	52.4	8.5	17.7	26.7	4.2	12.4
U 541	* 1500		10.5	25.8	5.0	10.4	18.9	3.9	10.0
U 542	* 2500		8.1	36.2	6.6	13.6	32.5	6.1	14.7
U 543	* 2500		5.4	20.9	4.1	8.4	37.6	7.5	17.5
U 544	2500		7.6	33.0	6.0	12.7	33.3	6.5	15.6
U 548	34		58.0	4.6	2.7	3.0	35.7	7.5	17.5
U 549	34		61.5	4.7	2.7	3.1	32.5	6.1	14.7
U 553	34		62.5	4.7	2.7	3.1	29.3	4.8	13.3
U 554	2500		10.0	51.4	8.5	17.5	24.3	3.5	11.0
U 555	500		20.5	14.5	3.4	6.1	21.5	3.0	9.4
U 558	2500		7.8	34.3	6.2	13.1	14.2	3.1	7.6
U 559	* 700		19.5	19.6	4.0	8.1	27.3	4.5	12.8
U 562	700		14.8	13.9	3.2	5.8	37.3	8.0	18.4
U 564	1000		15.5	26.6	5.3	11.0	32.2	6.5	15.6
U 566	* 2500		6.2	25.2	4.7	9.8	36.3	7.5	17.5
U 568	200		55.0	12.1	3.0	5.6	10.1	2.5	5.5
U 573	1000		13.2	21.4	4.5	9.2	23.7	3.4	10.5
U 574	700		28.5	28.6	6.1	12.8	20.2	2.9	9.2
U 575	950		19.0	21.2	3.7	8.0	20.6	2.7	8.6
U 576	* 950		20.0	22.8	4.0	8.4	23.7	3.4	10.5
U 577	700		28.0	28.3	6.0	12.5	16.5	2.5	6.7
U 578	700		21.5	22.1	4.4	9.1	18.8	2.5	7.8
U 579	200		31.5	6.9	2.2	3.1	24.9	3.4	10.5
U 580	* 700		16.5	16.0	3.5	6.7	36.3	7.5	17.5
U 581	34		72.0	5.0	2.8	3.2	28.5	4.8	13.3
U 582	* 700		25.5	26.1	5.3	11.3	18.9	2.5	8.1
U 584	2500		8.0	35.5	6.4	13.4	27.5	4.2	12.4
U 585	700		22.5	23.3	4.6	9.6	30.7	4.9	13.8
U 588	* 1500		13.0	34.4	6.4	13.5	18.2	2.5	7.1
U 589	950		18.0	19.7	3.5	7.4	36.5	6.7	16.7
U 590	700		23.0	23.8	4.7	9.9	25.2	3.5	11.1
U 591	* 700		25.0	25.6	5.2	11.0	10.1	2.5	4.6
U 593	700		21.0	21.5	4.3	8.8	20.2	2.7	8.6
U 594	* 2500		6.5	26.7	5.0	10.5	29.8	4.8	13.3
U 595	2000		12.2	45.5	7.7	15.8	24.3	3.5	11.0
U 598	200		58.5	12.7	3.1	6.1	16.3	2.5	6.7
U 599	2500		7.6	33.0	6.0	12.7	28.4	4.2	12.5
U 600	2500		10.0	51.4	8.5	17.5	29.2	4.6	13.4
U 601	* 700		18.0	17.7	3.7	7.5	21.8	3.0	9.4
U 602	700		24.0	24.7	4.9	10.4	24.1	3.7	11.4
U 607	* 700		19.5	19.6	4.0	8.1	26.7	4.2	12.4
U 609	2500		9.5	46.5	8.0	16.5	24.1	3.4	10.5
U 610	2500		7.0	29.4	5.4	11.6	27.7	4.0	11.9
U 611	* 700		28.5	28.6	6.1	12.8	17.3	2.5	7.1
U 613	2500		12.8	82.2	9.4	24.4	20.1	2.8	8.9
U 616	1000		15.5	26.6	5.3	11.0	25.7	4.0	11.9
U 617	450		19.5	14.6	3.7	6.1	36.0	8.0	18.4
U 618	82		40.5	5.9	2.9	3.4	13.6	3.1	7.6
U 622	350		37.5	19.0	4.9	9.8	7.6	2.5	4.2
U 624	* 2500		6.3	25.7	4.8	10.0	20.0	5.4	11.4

CODE	RES	WNDG ARNG	OPERATE CURRENT	OPERATE TIME			RELEASE TIME		
				MAX	MIN	AVG	MAX	MIN	AVG
U 627	700		16.0	15.4	3.4	6.4	25.6	3.5	11.1
U 631	700		20.0	20.2	4.1	8.3	35.3	5.8	16.0
U 636	450		20.5	15.4	3.8	6.4	33.1	6.9	16.5
U 637	* 2500		58.6	30.5	7.2	14.6	36.6	8.0	18.4
U 638	700		22.5	23.3	4.6	9.6	16.2	2.5	6.4
U 639	* 700		32.0	31.0	7.2	14.6	7.1	2.5	4.0
U 641	450		30.5	22.0	5.1	10.4	20.2	2.9	9.2
U 642	1000		21.0	36.2	7.7	15.8	16.3	7.5	6.7
U 644	500		20.0	14.1	3.7	6.0	20.4	2.7	8.6
U 647	2500		13.1	86.7	9.4	25.3	25.8	3.6	11.5
U 648	450		30.0	21.8	5.1	10.3	15.6	2.5	6.1
U 650	1000		9.8	14.9	3.6	6.3	30.3	4.8	13.3
U 651	500		25.0	18.4	4.0	8.0	18.6	2.5	7.8
U 652	200		28.0	6.0	2.3	2.8	18.5	3.9	10.0
U 653	950		16.5	17.7	3.2	6.6	15.4	3.9	9.1
U 658	2500		10.7	58.6	9.1	19.0	17.7	2.5	7.1
U 662	700		16.5	16.0	3.5	6.7	31.4	6.1	14.7
U 664	1775		16.0	63.9	10.9	22.9	17.1	2.5	6.8
U 667	650		31.0	27.9	6.0	12.4	10.0	2.5	5.2
U 671	950		19.0	21.2	3.7	8.0	15.7	3.9	9.1
U 672	34		72.0	5.0	2.8	3.2	26.1	4.0	11.9
U 673	2500		10.8	59.7	9.2	19.2	9.9	2.5	5.2
U 674	2500		11.7	69.2	10.1	21.3	25.4	3.5	11.2
U 675	* 700		33.0	31.7	7.4	15.2	7.1	2.5	4.0
U 677	700		21.0	21.5	4.3	8.8	21.5	3.0	9.4
U 678	700		18.5	18.3	3.8	7.7	20.6	2.7	8.6
U 679	* 950		17.5	19.0	3.4	7.1	29.3	4.8	13.3
U 682	500		20.5	17.8	4.2	7.6	18.4	2.5	7.1
U 686	4000		7.2	66.1	9.5	19.9	28.9	4.8	13.3
U 692	1775		16.0	63.9	10.9	22.9	17.3	2.5	7.1
U 694	2500		9.8	49.4	8.3	17.1	22.3	3.1	9.7
U 695	2500		9.9	50.4	8.4	17.3	18.6	2.5	7.1
U 699	2500		7.8	34.3	6.2	13.1	25.3	3.4	10.5
U 700	500		30.5	24.7	5.9	12.3	16.2	2.5	6.4
U 704	1775		14.1	52.7	9.4	19.5	9.8	2.5	4.6
U 705	1775		17.5	72.6	12.2	26.0	10.2	2.5	4.9
U 708	145		52.0	10.8	3.4	5.2	21.5	3.2	10.1
U 717	* 700		15.0	14.1	3.2	5.9	13.9	3.1	7.6
U 719	350		40.0	19.5	5.2	10.6	16.4	2.5	7.1
U 720	500		23.0	20.2	4.6	8.9	20.3	2.8	8.9
U 721	700		20.5	20.9	4.2	8.6	23.7	3.4	10.5
U 722	* 700		21.0	21.5	4.3	8.8	9.1	2.5	4.9
U 726	220		38.5	12.7	3.5	5.7	20.0	2.5	8.5
U 729	700		13.1	12.1	2.9	5.0	29.3	4.8	13.3
U 730	1775		7.0	20.4	4.3	8.6	36.3	7.5	17.5
U 734	750		9.8	11.8	3.3	5.1	36.0	10.4	21.4
U 735	* 700		16.5	16.0	3.5	6.7	36.3	7.5	17.5
U 736	A 1775		8.1	24.5	4.9	10.0	47.5	12.3	26.0
U 737	750		13.2	16.5	4.0	7.0	26.5	4.0	11.9
U 739	1775		7.3	21.4	4.4	9.0	29.3	4.8	13.3
U 740	500		19.5	13.7	3.3	5.8	24.5	3.4	10.5
U 742	700		36.0	33.9	8.1	16.9	17.8	2.5	7.3

CODE	RES	WNDG ARNG	OPERATE CURRENT	OPERATE TIME			RELEASE TIME		
				MAX	MIN	AVG	MAX	MIN	AVG
U 743	500		20.0	14.1	3.3	6.0	29.5	5.0	13.7
U 747	4000		5.0	34.2	6.1	12.8	36.3	7.5	17.5
U 750	2500		7.0	29.4	5.4	11.6	26.9	4.0	11.9
U 753	2000		11.5	41.0	7.2	14.7	28.7	5.0	13.7
U 757	200		45.5	10.6	2.6	4.4	10.0	2.5	5.2
U 759	200		27.5	5.9	2.0	2.8	25.5	8.0	15.1
U 760	4000		6.0	45.7	7.7	15.9	37.3	8.0	18.4
U 765	1300		16.5	36.5	7.2	14.7	21.6	3.1	9.7
U 766	2500		7.3	31.1	5.7	12.2	29.8	4.8	13.3
U 767	1000		18.0	31.2	6.3	13.4	19.1	2.5	8.1
U 777	A 2500		7.2	30.6	5.6	12.0	47.5	12.3	26.0
U 779	2500		11.4	65.9	9.8	20.6	20.3	2.8	8.9
U 780	1775		17.0	69.7	11.8	24.9	16.0	2.5	6.5
U 781	500		25.0	21.2	4.9	9.9	9.1	2.5	5.0
U 782	2500		11.4	65.9	9.8	20.6	23.9	3.5	11.0
U 785	145		41.5	8.8	3.0	4.3	10.4	2.5	4.9
U 787	4000		6.3	50.2	8.1	16.8	31.3	5.0	13.8
U 794	950		21.0	24.5	4.2	8.9	18.2	2.5	7.1
U 801	1000		19.0	33.0	6.7	14.2	11.0	2.5	5.3
U 803	1000		17.5	30.3	6.1	12.9	23.9	3.5	11.0
U 807	2000		13.8	57.0	8.8	18.4	21.6	2.9	9.4
U 809	* 700		18.0	17.7	3.7	7.5	20.8	2.7	8.6
U 810	500		26.0	22.2	5.1	10.3	20.0	2.7	8.6
U 811	2000		16.0	74.2	10.6	22.7	16.7	2.5	6.7
U 812	2500		10.5	56.5	8.9	18.6	26.8	3.6	11.6
U 814	* 700		20.0	20.2	4.1	8.3	13.6	3.1	7.6
U 815	220		47.5	14.3	4.0	7.3	25.6	3.2	11.0
U 816	500		25.0	18.4	4.0	8.0	21.6	3.1	9.7
U 817	1500		21.5	69.4	11.9	25.5	17.0	2.5	6.3
U 821	1000		18.0	31.2	6.3	13.4	19.1	2.5	8.1
U 822	2500		9.8	49.4	8.3	17.1	24.7	3.5	11.0
U 826	* 1500		19.0	58.1	10.2	21.3	16.6	2.5	7.1
U 827	4000		7.5	72.2	10.0	21.0	24.7	3.5	11.0
U 828	* 700		16.5	16.0	3.5	6.7	22.9	3.0	9.4
U 829	700		21.0	21.5	4.3	8.8	26.7	4.2	12.4
U 832	4000		7.0	62.4	9.2	19.2	20.4	2.7	8.6
U 833	1775		17.0	69.7	11.8	24.9	16.3	2.5	6.7
U 834	* 700		20.0	20.2	6.1	8.3	14.4	2.5	6.7
U 835	* 950		27.5	35.9	5.8	12.2	20.0	2.7	8.6
U 841	1000		9.5	14.3	3.5	6.1	20.0	5.4	11.4
U 843	1000		19.5	33.9	7.0	14.6	23.9	3.0	10.0
U 844	* 700		25.0	25.6	5.2	11.0	8.1	2.5	4.4
U 869	950		23.0	27.7	4.8	9.8	11.0	2.5	5.9
U 874	2500		9.5	46.5	8.0	16.5	29.6	4.4	13.0
U 883	1775		15.5	61.0	10.5	21.9	17.3	2.5	7.2
U 885	1000		13.3	21.6	4.6	9.2	25.6	3.5	11.1
U 886	450		30.0	21.8	5.1	10.3	16.5	2.5	6.7
U 888	1000		28.0	47.5	10.7	22.5	23.1	3.2	10.2
U 893	2500		7.0	29.4	5.4	11.6	27.3	4.0	11.9
U 894	700		21.0	21.5	4.3	8.8	17.7	2.5	7.1
U 897	950		18.0	19.7	3.5	7.4	16.6	3.4	9.1
U 898	* 950		18.0	19.7	3.5	7.4	16.1	3.2	8.6

CODE	RES	WNDG ARNG	OPERATE CURRENT	OPERATE TIME			RELEASE TIME		
				MAX	MIN	AVG	MAX	MIN	AVG
U 899	200		28.0	6.0	2.1	2.8	41.1	9.8	20.9
U 900	950		18.5	20.4	3.6	7.7	32.0	6.1	14.7
U 902	750		14.4	18.0	4.2	7.8	12.1	2.5	6.5
U 903	700		24.0	24.7	4.9	10.4	20.1	2.8	8.9
U 908	4000		5.8	42.9	7.4	15.2	37.0	7.5	17.5
U 914	1775		11.0	37.0	7.0	14.6	22.0	3.1	9.7
U 918	450		29.5	21.6	5.0	10.1	19.0	2.7	8.6
U 920	305		32.0	11.7	2.8	4.9	12.4	2.5	6.5
U 921	2500		11.3	64.8	9.7	20.4	9.5	2.5	5.0
U 924	2500		10.5	56.5	8.9	18.6	18.2	2.5	7.1
U 930	1500		19.0	58.1	10.2	21.3	17.5	2.5	7.0
U 932	2500		10.5	56.5	8.9	18.6	29.5	3.9	12.7
U 934	* 700		28.0	28.3	6.0	12.5	17.3	2.5	7.1
U 936	1000		21.5	37.0	8.0	16.3	17.3	2.5	7.1
U 937	* 700		27.0	27.4	5.7	12.1	17.5	2.5	7.1
U 938	950		21.5	25.3	4.4	9.1	28.7	3.9	12.5
U 940	700		20.0	20.2	4.1	8.3	18.2	2.5	7.1
U 941	1000		21.5	37.0	8.0	16.3	16.5	2.5	6.7
U 942	1000		28.0	47.5	10.7	22.5	15.3	2.5	6.1
U 944	A 265		19.0	6.5	2.5	3.4	21.6	5.0	12.1
U 947	1500		22.5	75.1	12.7	27.5	16.1	2.5	6.7
U 948	4000		7.7	76.6	11.8	21.9	32.7	5.7	15.1
U 953	700		26.0	26.5	5.4	11.6	16.0	2.5	6.3
U 958	2500		8.7	40.2	7.3	14.8	29.1	5.0	13.7
U 962	2500		9.8	49.4	8.3	17.1	23.8	3.2	10.2
U 963	1000		15.0	25.4	5.4	10.6	11.6	2.5	5.5
U 964	700		44.5	38.2	10.5	22.3	9.1	2.5	4.5
U 966	145		33.0	6.9	2.8	3.6	32.0	6.1	14.7
U 967	145		38.0	8.0	2.9	4.0	26.1	4.0	11.9
U 968	300		14.5	6.6	2.9	3.7	37.6	7.5	17.5
U 969	450		21.5	16.2	3.9	6.8	20.7	2.8	8.9
U 970	82		36.0	5.4	2.9	3.3	32.5	6.1	14.7
U 972	700		16.0	15.4	4.0	6.4	27.5	4.2	12.4
U 973	220		40.0	13.0	3.6	5.9	20.0	2.5	8.5
U 975	700		21.5	22.1	4.4	9.1	20.0	2.7	8.6
U 977	220		28.0	8.9	3.1	4.2	15.0	2.8	7.5
U 978	700		19.5	19.6	4.0	8.1	10.5	2.5	5.4
U 979	700		31.0	30.4	6.9	14.1	21.4	2.8	9.2
U 980	1000		13.5	22.0	4.6	9.4	26.9	4.0	11.9
U 982	700		24.0	24.7	4.9	10.4	16.1	2.5	6.3
U 985	900		14.7	18.2	3.8	7.5	36.3	7.5	17.5
U 988	* 400		34.0	12.4	2.6	4.8	13.6	3.1	7.6
U 989	700		25.0	25.6	5.2	11.0	29.5	4.4	13.6
U 990	1000		14.6	24.4	5.0	10.2	26.5	4.0	11.9
U 991	* 1500		16.0	45.2	8.4	17.3	16.8	2.5	6.7
U 997	2500		10.4	55.4	8.8	18.3	25.3	4.0	11.9
U 999	220		19.5	6.1	2.6	3.3	29.3	4.8	13.3
U 1000	500		21.0	18.3	4.3	7.8	20.2	2.7	8.6
U 1001	220		19.5	6.1	2.6	3.3	30.3	4.8	13.3
U 1002	210		71.5	10.7	2.3	3.7	11.5	2.5	6.0
U 1003	200		58.0	12.6	3.1	6.0	9.5	2.5	4.6
U 1005	2500		11.2	63.8	9.6	20.1	16.6	2.5	6.4

CODE	RES	WNDG OPERATE			OPERATE TIME			RELEASE TIME		
		ARNG	CURRENT		MAX	MIN	AVG	MAX	MIN	AVG
U 1006	82		48.5		6.7	3.0	3.7	19.0	2.5	7.8
U 1008	500		26.0		19.4	3.7	8.3	16.9	2.5	7.1
U 1010	2500		11.0		61.7	11.3	19.7	21.6	3.1	9.7
U 1011	2500		8.3		37.5	6.8	14.0	32.5	6.1	14.7
U 1012	1000		17.5		30.3	6.1	12.9	10.2	2.5	5.3
U 1014	1500		18.0		53.9	9.5	19.9	9.6	2.5	4.6
U 1015	1775		17.0		69.7	11.8	24.9	40.9	8.4	20.1
U 1017	450		26.0		19.8	4.5	8.8	20.4	2.9	9.2
U 1018	* 950		19.5		22.0	3.8	8.2	14.8	2.8	7.5
U 1019	450		18.5		13.8	3.6	5.7	24.5	3.4	10.5
U 1020	700		25.0		25.6	5.2	11.0	10.2	2.5	4.6
U 1021	700		28.0		28.3	6.0	12.5	17.4	2.5	7.3
U 1022	700		25.0		25.6	5.2	11.0	29.1	3.9	12.7
U 1023	700		20.5		20.9	4.2	8.6	22.9	3.4	10.5
U 1024	950		29.5		39.8	6.3	13.4	16.5	2.5	6.7
U 1025	950		29.5		39.8	6.3	13.4	16.5	2.5	6.7
U 1026	450		26.5		20.1	4.5	9.0	20.5	2.6	6.7
U 1028	700		23.5		23.8	4.9	10.1	17.2	2.5	6.7
U 1029	700		16.0		15.4	3.4	6.4	23.2	3.1	9.8
U 1030	200		34.5		7.7	2.2	3.3	26.5	5.8	13.9
U 1031	2500		12.3		75.6	10.8	22.9	16.3	2.5	6.5
U 1033	2500		10.4		55.4	8.8	18.3	22.9	3.4	10.5
U 1034	220		44.0		13.7	3.8	6.6	20.0	2.5	8.5
U 1035	450		19.0		14.2	3.6	5.9	26.5	4.0	11.9
U 1036	500		18.0		15.2	3.8	6.5	13.8	2.5	6.7
U 1037	2500		8.3		37.5	6.8	14.0	28.5	4.9	13.3
U 1039	700		39.5		36.4	5.2	18.9	14.1	2.5	5.6
U 1044	500		21.0		14.9	3.4	6.3	37.0	8.7	19.5
U 1046	300		49.0		12.3	2.1	4.3	18.6	2.5	7.1
U 1047	1500		22.0		72.2	12.3	26.5	15.6	2.5	6.5
U 1051	400		30.5		11.2	2.2	4.3	21.8	3.0	9.4
U 1053	2500		13.2		88.2	11.9	25.7	16.6	2.5	6.7
U 1054	* 2500		8.2		36.8	6.7	13.8	24.1	3.4	10.5
U 1055	1000		22.0		37.8	8.2	16.7	24.2	3.3	10.7
U 1057	2500		13.0		85.1	11.7	25.0	16.7	2.5	6.7
U 1059	700		32.5		31.3	5.2	14.9	15.7	2.5	6.5
U 1060	500		39.5		26.3	5.1	16.8	14.9	2.5	6.0
U 1062	82		25.0		4.6	2.8	2.9	37.6	7.5	17.5
U 1063	2500		8.7		40.2	7.3	14.8	23.7	3.4	10.5
U 1065	650		26.0		23.6	4.9	10.1	9.3	2.5	5.0
U 1072	1775		17.0		69.7	11.8	24.9	16.0	2.5	6.5
U 1073	* 700		30.0		29.7	5.7	13.5	16.0	2.5	6.5
U 1075	500		26.0		19.4	4.1	8.3	21.0	3.0	9.4
U 1077	2000		13.4		54.1	7.9	17.7	23.9	3.5	11.0
U 1078	300		37.5		17.2	4.6	8.8	16.0	2.5	6.5
U 1080	500		22.0		18.8	4.4	8.4	18.8	2.5	7.8
U 1081	2500		9.0		42.4	7.6	15.4	20.4	2.7	8.6
U 1082	700		22.0		22.7	4.5	9.3	19.8	2.7	8.6
U 1083	700		20.5		20.9	4.2	8.6	21.0	3.0	9.4
U 1087	1000		23.0		39.2	9.9	17.7	17.2	2.5	6.9
U 1089	4000		7.7		76.6	10.3	21.9	20.6	2.7	8.6
U 1096	1200		9.6		15.8	3.6	6.9	29.3	4.8	13.3

CODE	RES	WNDG OPERATE		OPERATE TIME			RELEASE TIME		
		ARNG	CURRENT	MAX	MIN	AVG	MAX	MIN	AVG
U 1098	1000		22.0	37.8	5.8	16.7	17.7	2.5	7.4
U 1100	2500		11.1	62.8	9.5	19.9	18.8	2.5	7.8
U 1102	1775		13.8	50.9	9.2	19.1	19.9	2.8	8.9
U 1103	500		41.5	26.1	5.7	17.8	14.0	2.5	5.7
U 1104	1500		20.5	64.3	11.2	23.7	20.4	2.5	8.6
U 1105	2500		6.9	28.9	5.3	11.3	15.7	3.9	9.1
U 1106	700		20.5	20.9	4.2	8.6	26.2	3.6	11.5
U 1107	500		38.0	25.0	4.4	13.1	16.2	2.5	6.7
U 1108	34		95.0	5.5	2.8	3.5	10.5	2.5	5.5
U 1109	1775		18.0	76.3	12.7	27.2	29.1	3.9	12.7
U 1111	500		29.0	23.9	5.6	11.6	19.7	2.8	8.9
U 1112	1775		16.5	66.8	11.3	23.8	15.9	2.5	6.5
U 1113	* 700		21.0	21.5	4.3	8.8	17.7	2.5	7.1
U 1118	700		25.5	26.1	5.3	11.3	9.7	2.5	5.2
U 1119	700		16.0	15.4	3.4	6.4	32.4	5.3	14.4
U 1120	700		17.5	17.2	3.6	7.3	15.5	2.9	7.9
U 1121	300		45.0	18.1	5.4	11.0	24.5	2.8	10.4
U 1125	950		17.5	19.0	3.4	7.1	26.5	4.0	11.9
U 1128	200		32.0	7.0	2.5	3.1	22.1	3.0	9.4
U 1131	2500		14.6	**	13.3	30.5	16.4	2.5	6.6
U 1133	700		24.0	24.7	4.9	10.4	26.4	3.6	11.6
U 1136	700		26.0	26.5	5.4	11.6	18.8	2.5	7.8
U 1137	750		18.0	23.5	5.1	10.3	10.8	2.5	5.7
U 1143	200		74.0	13.4	3.8	7.9	8.7	2.5	4.4
U 1145	700		21.5	22.1	6.0	9.1	17.9	5.4	11.5
U 1146	1000		16.0	27.6	5.5	11.4	23.7	3.4	10.5
U 1148	700		16.5	16.0	3.5	6.7	40.4	8.4	19.8
U 1149	* 700		16.0	15.4	3.4	6.4	24.5	3.4	10.5
U 1150	220		44.5	13.8	3.8	6.7	17.3	2.5	7.0
U 1151	4000		6.8	58.8	12.1	18.5	18.4	5.4	11.4
U 1152	82		55.0	7.2	3.1	4.0	11.7	2.5	5.6
U 1155	220		35.0	11.9	3.3	5.1	20.3	2.8	8.9
U 1156	1775		18.5	80.1	13.2	28.4	16.3	2.5	6.7
U 1158	2500		10.8	59.7	9.2	19.2	16.0	2.5	6.2
U 1164	700		39.0	36.1	8.9	18.6	16.4	2.5	6.8
U 1170	305		32.0	11.7	2.8	4.9	15.4	3.9	9.1
U 1172	950		19.0	21.2	3.7	8.0	20.4	2.7	8.6
U 1173	1000		25.0	42.6	9.4	19.6	9.4	2.5	5.0
U 1174	300		34.0	16.1	4.3	7.8	8.5	2.5	4.5
U 1176	350		32.0	17.4	4.3	8.1	29.5	3.9	12.7
U 1180	750		20.5	26.7	6.9	11.9	11.3	2.5	5.5
U 1181	* 700		22.5	23.3	4.6	9.6	18.0	2.5	7.3
U 1182	700		30.0	29.7	6.6	13.5	16.0	2.5	6.5
U 1186	450		24.0	18.3	4.2	7.8	14.8	2.8	7.5
U 1188	* 700		27.0	27.4	4.5	12.1	20.2	2.9	9.2
U 1189	4000		6.0	45.7	11.8	15.9	13.9	3.1	7.6
U 1190	450		30.0	21.8	5.1	10.3	14.6	2.5	5.7
U 1193	1500		19.0	58.1	10.2	21.3	15.6	2.5	6.3
U 1198	450		29.5	21.6	5.0	10.1	17.7	2.5	7.8
U 1203	1775		18.0	76.3	12.7	27.2	24.7	3.2	10.9
U 1205	400		23.0	8.0	1.8	3.0	29.3	4.8	13.3
U 1208	2500		10.7	58.6	9.1	19.0	20.0	2.7	8.6

** See last page for special listing.

CODE	RES	WNDG OPERATE		OPERATE TIME			RELEASE TIME		
		ARNG	CURRENT	MAX	MIN	AVG	MAX	MIN	AVG
U 1212	* 400		38.5	15.0	2.7	5.6	28.9	4.8	13.3
U 1215	500		21.5	18.4	4.3	8.1	17.9	2.5	6.8
U 1217	1000		11.0	17.1	3.9	7.3	20.6	4.2	10.9
U 1222	* 2500		7.0	29.4	7.5	11.6	21.1	5.0	12.1
U 1223	82		28.0	4.8	2.7	3.0	22.3	5.0	12.1
U 1225	700		19.5	19.6	4.0	8.1	21.3	5.5	12.9
U 1226	220		21.5	6.7	2.7	3.5	21.1	5.0	12.1
U 1227	* 2500		6.1	24.6	4.7	9.7	36.3	7.5	17.5
U 1228	* 2500		6.0	24.1	4.6	9.5	22.3	5.0	12.1
U 1229	1000		8.9	13.3	3.4	5.6	22.3	5.0	12.1
U 1230	34		59.0	4.6	2.7	3.0	21.9	5.5	12.9
U 1232	50		95.0	2.1	0.6	0.8	22.3	5.0	12.1
U 1236	34		50.5	4.4	2.7	2.9	21.1	5.0	12.1
U 1237	2000		6.9	20.0	3.9	8.0	22.3	5.0	12.1
U 1238	* 950		13.3	13.3	2.6	5.2	21.6	5.0	12.1
U 1239	2500		7.7	33.6	6.1	12.9	27.3	7.1	14.7
U 1240	1000		10.7	16.5	3.8	7.1	21.1	5.0	12.1
U 1244	* 2500		6.3	25.7	4.8	10.0	21.6	5.0	12.1
U 1248	* 1500		7.7	17.4	3.7	7.3	22.3	5.0	12.1
U 1249	10		85.0	3.2	2.0	2.1	22.3	5.0	12.1
U 1250	* 2500		6.0	24.1	4.6	9.5	22.3	5.0	12.1
U 1252	500		15.5	12.7	3.5	5.5	27.3	7.1	14.7
U 1253	300		16.0	7.3	3.0	3.9	22.3	5.0	12.1
U 1254	1000		8.9	13.3	3.4	5.6	22.3	5.0	12.1
U 1255	10		85.0	3.2	2.1	2.1	22.3	5.0	12.1
U 1257	34		62.0	4.7	2.7	3.1	20.7	5.0	12.1
U 1259	* 1500		13.5	36.1	6.8	14.1	21.5	3.0	9.4
U 1261	* 2500		12.6	79.4	11.2	23.8	19.0	2.5	7.8
U 1262	* 1500		12.2	31.3	5.9	12.6	21.5	3.0	9.4
U 1263	16		85.0	3.5	2.3	2.4	27.3	7.1	14.7
U 1264	99		26.5	4.0	2.1	2.4	22.3	5.0	12.1
U 1268	1775		7.1	20.7	4.3	8.7	21.6	5.0	12.1
U 1270	220		21.5	6.7	2.7	3.5	21.1	5.0	12.1
U 1272	1500		10.6	26.1	5.0	10.5	21.9	5.5	12.9
U 1275	4000		4.6	30.3	5.5	11.7	22.3	5.0	12.1
U 1288	700		20.0	20.2	4.1	8.3	18.3	2.5	7.3
U 1289	* 700		23.5	24.3	4.8	10.1	10.3	2.5	4.9
U 1290	* 700		31.0	30.4	6.9	14.1	16.3	2.5	6.7
U 1298	* 400		41.0	16.0	2.9	6.1	15.1	2.9	7.0
U 1299	* 400		36.5	14.1	2.5	5.3	18.7	4.2	10.7
U 1300	* 16		61.0	3.3	2.1	2.2	37.6	7.5	17.5
U 1301	* 950		13.4	13.4	2.6	5.2	30.3	4.8	13.3
U 1304	* 16		110.0	3.8	2.2	2.5	11.6	2.5	5.5
U 1305	1500		16.5	47.3	8.6	17.9	8.2	2.5	4.4
U 1306	* 1500		9.6	22.8	4.5	9.3	37.3	8.0	18.4
U 1307	* 700		20.5	20.9	4.0	8.6	20.2	2.7	8.6
U 1310	* 2500		9.7	48.4	8.2	16.9	26.1	4.0	11.9
U 1311	700		31.0	30.4	6.9	14.1	9.0	2.5	4.9
U 1312	* 2500		11.3	64.8	9.7	20.4	17.1	2.5	7.1
U 1315	* 16		115.0	3.9	2.3	2.5	12.1	2.5	6.5
U 1316	* 16		130.0	4.0	2.3	2.6	10.2	2.5	5.3
U 1317	* 700		18.0	17.7	3.7	7.5	21.8	3.0	9.4

CODE	RES	WNDG ARNG	OPERATE CURRENT	OPERATE TIME			RELEASE TIME		
				MAX	MIN	AVG	MAX	MIN	AVG
U 1318	* 2500		8.9	41.7	7.5	15.2	32.0	6.1	14.7
U 1319	* 1500		11.7	29.6	5.6	12.0	21.8	3.0	9.4
U 1320	* 950		20.0	22.8	4.2	8.4	21.8	3.0	9.4
U 1322	* 950		30.0	40.8	6.5	13.7	16.2	2.5	6.7
U 1323	* 1500		12.3	31.7	6.0	12.7	24.1	3.4	10.5
U 1324	* 1500		21.5	69.4	11.9	25.5	8.7	2.5	4.4
U 1325	400		45.0	17.5	3.2	6.9	10.2	2.5	4.6
U 1326	* 700		21.0	21.5	4.3	8.8	18.0	2.5	7.3
U 1328	* 400		32.5	12.1	2.3	4.6	21.0	2.7	8.6
U 1329	* 2500		8.6	39.5	7.1	14.6	26.9	4.0	11.9
U 1330	* 950		23.5	28.5	5.0	10.1	19.6	2.7	8.6
U 1331	* 16		130.0	4.0	2.3	2.6	10.4	2.5	4.9
U 1332	* 1500		22.5	75.1	12.7	27.5	19.3	2.5	7.5
U 1333	* 700		29.0	29.0	6.3	13.0	17.5	2.5	7.6
U 1334	* 950		13.6	13.7	2.6	5.3	19.4	3.9	10.0
U 1336	* 16		120.0	3.9	2.3	2.5	18.7	4.2	10.7
U 1337	* 400		60.5	22.2	4.6	9.7	9.2	2.5	4.6
U 1338	1000		10.6	16.3	3.8	7.0	26.9	4.0	11.9
U 1339	4000		7.4	70.1	9.8	20.7	36.6	8.0	18.4
U 1340	* 950		26.0	32.9	5.5	11.5	10.3	2.5	5.5
U 1341	* 950		31.0	42.8	6.7	14.3	8.2	2.5	4.5
U 1342	* 700		29.0	29.0	6.3	13.0	17.5	2.5	7.6
U 1344	1500		18.5	56.0	9.8	20.6	21.6	2.6	9.1
U 1345	400		41.5	16.2	2.9	6.2	10.7	2.5	4.9
U 1346	400		25.0	8.8	1.9	3.3	41.1	9.8	20.9
U 1347	16		115.0	3.9	2.3	2.5	11.7	2.5	5.5
U 1348	* 16		170.0	3.9	2.4	2.8	9.1	2.5	4.5
U 1349	400		33.5	12.6	2.3	4.8	13.2	2.5	6.0
U 1350	34		65.5	4.8	2.8	3.1	13.9	3.1	7.6
U 1354	* 400		29.5	10.8	2.1	4.2	29.3	4.8	13.3
U 1355	400		36.5	14.1	2.5	5.3	11.6	2.5	5.5
U 1356	* 400		36.0	13.8	2.5	5.2	13.6	3.1	7.6
U 1357	16		135.0	4.0	2.3	2.6	10.7	2.5	4.9
U 1358	* 16		80.0	3.3	2.0	2.2	21.1	5.0	12.1
U 1359	* 16		105.0	3.8	2.2	2.5	16.3	3.2	8.6
U 1360	* 400		31.5	11.7	2.2	4.5	28.9	4.8	13.3
U 1361	* 400		34.0	12.8	2.4	4.8	19.6	2.5	7.8
U 1362	* 400		30.5	11.2	2.2	4.3	14.2	2.5	6.7
U 1363	* 700		20.0	20.2	4.1	8.3	11.8	2.5	5.5
U 1364	* 400		30.0	11.0	2.1	4.3	12.1	2.5	6.5
U 1366	400		25.5	9.0	1.9	3.4	16.7	3.2	8.6
U 1367	400		27.5	9.9	2.0	3.8	14.2	3.1	7.6
U 1368	400		38.5	15.0	2.7	5.6	11.3	2.5	5.2
U 1369	16		105.0	3.8	2.2	2.5	21.0	2.7	8.6
U 1370	* 16		73.5	3.4	2.2	2.3	29.3	4.8	13.3
U 1371	* 16		75.0	3.4	2.2	2.3	19.9	3.9	10.0
U 1373	* 950		12.8	12.7	2.5	5.0	26.8	8.0	15.1
U 1375	* 700		16.5	16.0	3.5	6.7	29.3	4.8	13.3
U 1377	* 400		45.5	17.6	3.2	7.0	11.2	2.5	5.5
U 1379	* 16		115.0	3.9	2.3	2.5	13.8	2.5	6.7
U 1381	* 400		44.5	17.3	3.2	6.8	10.1	2.5	4.6
U 1382	* 16		155.0	4.0	2.4	2.7	13.6	2.6	7.1

CODE	RES	WNDG ARNG	OPERATE CURRENT	OPERATE TIME			RELEASE TIME		
				MAX	MIN	AVG	MAX	MIN	AVG
U 1383	*	16	170.0	3.9	2.4	2.8	9.5	2.5	4.7
U 1384	*	16	145.0	4.0	2.3	2.7	10.2	2.5	4.6
U 1386	*	400	37.0	14.3	2.6	5.3	11.5	2.5	5.5
U 1387	*	950	23.0	27.7	4.8	9.8	14.8	2.8	7.5
U 1389		400	28.0	10.1	2.0	3.9	15.6	2.8	7.5
U 1390		400	34.5	13.1	2.4	4.9	11.7	2.5	6.5
U 1391	*	950	13.6	13.7	2.6	5.3	30.3	4.8	13.3
U 1392	*	400	28.0	10.1	2.0	3.9	24.9	3.4	10.5
U 1393	*	700	17.0	16.6	3.5	7.0	19.2	5.4	11.4
U 1394	*	16	85.0	3.5	2.2	2.4	16.7	3.2	8.6
U 1396	*	400	41.0	16.0	2.9	6.1	9.9	2.5	4.6
U 1398	*	16	110.0	3.8	2.2	2.5	11.1	2.5	5.7
U 1399	*	16	175.0	3.9	2.4	2.8	9.6	2.5	4.6
U 1401	*	16	135.0	4.0	2.3	2.6	10.6	2.5	4.9
U 1403		4000	8.6	**	12.1	26.2	15.1	3.9	9.1
U 1404	*	16	145.0	4.0	2.3	2.7	8.2	2.5	4.4
U 1405	*	16	175.0	3.9	2.4	2.3	7.4	2.5	4.2
U 1406	*	700	18.0	17.7	3.9	7.5	27.1	4.2	12.4
U 1407	*	950	17.0	18.3	3.3	6.9	22.5	3.0	9.4
U 1408	*	400	42.0	16.4	2.9	6.3	12.3	2.5	6.2
U 1412	*	950	19.5	22.0	3.8	8.2	15.1	2.9	7.9
U 1414	*	700	37.0	34.7	5.2	17.4	15.7	2.5	6.5
U 1415	*	400	42.5	16.6	3.0	6.4	9.3	2.5	4.6
U 1416		4000	6.5	53.5	8.4	17.5	32.5	6.1	14.7
U 1418	*	16	140.0	4.0	2.3	2.6	9.9	2.5	4.6
U 1421	*	2500	13.8	97.5	12.5	27.6	16.3	2.5	6.7
U 1422		1000	25.0	42.6	5.8	19.6	16.5	2.5	6.7
U 1423		700	34.0	32.4	5.2	15.8	15.0	2.5	6.0
U 1424		500	38.0	25.0	4.4	13.1	14.3	2.5	5.7
U 1426	*	700	25.0	25.6	4.3	11.0	18.9	2.5	8.1
U 1427	*	950	24.0	29.3	5.1	10.4	18.9	2.5	8.1
U 1430	*	400	41.0	16.0	2.9	6.1	21.6	3.1	9.7
U 1432		200	35.5	8.0	2.5	3.4	20.4	2.7	8.6
U 1434		700	23.5	24.3	4.8	10.1	19.8	2.5	8.5
U 1436		700	34.5	32.8	7.8	16.1	15.1	2.5	6.2
U 1437		450	29.0	21.3	4.9	9.9	21.4	2.9	9.5
U 1438		450	24.0	18.3	4.2	7.8	18.3	2.5	7.3
U 1439		16	165.0	4.0	2.4	2.8	16.5	2.5	6.7
U 1441		500	11.0	8.4	3.0	4.2	29.3	4.8	13.3
U 1442		16	195.0	3.7	2.5	2.9	8.7	2.5	4.4
U 1443		950	25.0	31.0	5.3	10.9	10.5	2.5	4.9
U 1444		2500	12.3	75.6	10.9	22.9	19.4	2.5	8.4
U 1448		450	23.0	17.5	4.1	7.4	11.0	2.5	5.7
U 1450		4000	8.9	**	12.3	27.8	20.5	2.8	8.9
U 1451		4000	8.1	87.3	11.1	23.7	26.7	4.2	12.4
U 1452		4000	5.8	42.9	7.4	15.2	47.8	10.8	24.5
U 1454		4000	4.8	32.2	5.8	12.2	28.3	7.1	14.7
U 1455	*	2500	8.9	41.7	7.5	15.2	20.6	2.7	8.6
U 1457		145	40.0	8.4	3.0	4.1	23.7	3.0	10.0
U 1458		2500	12.0	72.3	10.5	22.1	23.6	3.2	10.3

** See last page for special listing.

DOUBLE WOUND

U TYPE

CODE	RES	WNDG ARNG	OPERATE CURRENT	OPERATE TIME			RELEASE TIME			
				MAX	MIN	AVG	MAX	MIN	AVG	
U	56		P	12.0	44.2	7.5	15.5	10.1	2.5	5.2
U	78	*	P	39.0	32.0	5.5	11.5	20.4	3.0	9.4
U	78	*	S	39.5	32.7	5.6	11.8	20.4	3.0	9.4
U	89	*	P	34.5	26.9	4.8	9.9	20.0	2.7	8.6
U	89	*	S	34.5	27.1	4.8	10.0	20.0	2.7	8.6
U	90	*	P	17.0	15.2	2.8	5.8	27.3	4.0	11.9
U	90	*	S	13.8	28.3	4.4	9.2	27.3	4.0	11.9
U	91		P	19.5	10.6	1.8	3.7	36.3	7.5	17.5
U	91		S	6.8	29.5	5.1	10.4	36.3	7.5	17.5
U	102	*	P	22.0	21.5	3.8	8.0	24.1	3.4	10.5
U	102	*	S	18.0	49.5	6.1	13.0	24.1	3.4	10.5
U	103	*	P	19.0	17.7	3.2	6.6	29.3	4.8	13.3
U	103	*	S	15.5	35.8	5.0	10.6	29.3	4.8	13.3
U	110		P	15.5	69.6	10.2	21.6	9.9	2.5	4.6
U	111	*	P	23.0	22.9	4.0	8.4	23.3	3.4	10.5
U	111	*	S	19.0	56.9	6.5	14.2	23.3	3.4	10.5
U	116		P	35.5	37.0	5.1	10.9	23.4	3.2	10.2
U	116		S	26.5	51.1	7.3	15.6	23.4	3.2	10.2
U	117	*	P	27.5	28.8	5.0	10.3	16.9	2.5	7.1
U	117	*	S	21.0	80.8	7.3	16.9	16.9	2.5	7.1
U	125		P	12.6	20.3	5.4	8.7	36.3	7.5	17.5
U	126		P	14.6	24.4	5.0	10.2	28.5	4.8	13.3
U	127	*	P	20.5	19.5	3.4	7.4	26.5	4.0	11.9
U	127	*	S	17.0	43.5	5.6	11.9	26.5	4.0	11.9
U	145		P	18.0	29.0	4.9	10.1	26.5	4.0	11.9
U	145		S	21.5	40.6	4.9	10.4	26.5	4.0	11.9
U	161		P	12.8	20.7	4.4	8.9	15.7	3.9	9.1
U	169		P	19.5	19.8	3.3	6.9	40.4	8.4	19.8
U	169		S	11.4	50.7	6.5	14.0	40.4	8.4	19.8
U	170		P	150.0	2.8	0.8	1.1	28.9	4.8	13.3
U	170		ZP/S	18.1	8.8	2.1	3.7	28.9	4.8	13.3
U	170		UP/S	21.0	13.2	3.1	5.6	28.9	4.8	13.3
U	184		P	17.0	29.4	5.9	12.4	14.8	2.5	7.2
U	186		P	14.3	9.7	1.3	3.7	37.6	7.5	17.5
U	186		S	10.7	13.0	2.5	5.1	37.6	7.5	17.5
U	212		P	29.0	10.2	2.2	4.0	26.9	4.0	11.9
U	212		S	14.3	58.4	6.0	13.4	26.9	4.0	11.9
U	215	*	P	16.5	15.7	2.7	5.6	33.1	6.1	14.7
U	215	*	S	9.6	35.2	5.3	11.1	33.1	6.1	14.7
U	224	*	P	24.0	24.2	4.2	8.8	21.5	3.0	9.4
U	224	*	S	19.5	61.0	6.7	14.8	21.5	3.0	9.4
U	225		P	90.0	2.9	1.1	1.3	20.0	5.4	11.4
U	225		S	90.0	3.0	0.9	1.2	20.0	5.4	11.4
U	229		P	40.0	13.0	2.4	4.9	21.5	3.0	9.4
U	244		P	17.0	15.2	2.8	5.8	26.4	3.5	11.1
U	244		S	13.2	26.1	4.2	8.7	26.4	3.5	11.1
U	247	*	P	23.5	23.5	4.1	8.6	11.0	2.5	5.7
U	247	*	S	18.5	53.2	6.3	13.6	11.0	2.5	5.7
U	248		P	19.0	32.1	7.0	10.7	12.4	2.5	6.5
U	248		S	12.5	15.8	2.5	5.4	12.4	2.5	6.5
U	260	*	P	19.0	17.7	3.2	6.6	32.5	6.1	14.7
U	260	*	S	15.5	35.8	5.0	10.6	32.5	6.1	14.7

CODE	RES	WNDG ARNG	OPERATE CURRENT	OPERATE TIME			RELEASE TIME			
				MAX	MIN	AVG	MAX	MIN	AVG	
U 261	*	850	P	17.0	15.2	2.8	5.8	37.0	7.5	17.5
U 261	*	1750	S	13.8	28.3	4.4	9.2	37.0	7.5	17.5
U 266		155	P	58.5	10.8	3.0	5.0	17.4	2.5	7.3
U 266		385	ZP/S	25.5	8.8	1.9	3.4	17.4	2.5	7.3
U 266		385	UP/S	36.0	18.5	4.4	8.9	17.4	2.5	7.3
U 271	*	850	P	19.5	18.2	3.2	6.9	29.3	4.8	13.3
U 271	*	1750	S	16.0	38.2	5.2	11.0	29.3	4.8	13.3
U 272	*	850	P	13.5	11.5	2.3	4.5	33.1	6.1	14.7
U 272	*	1750	S	11.0	19.8	3.3	7.0	33.1	6.1	14.7
U 273		155	P	41.0	7.8	2.5	3.6	20.7	2.8	8.9
U 273		385	ZP/S	18.0	5.9	1.6	2.4	20.7	2.8	8.9
U 273		385	UP/S	25.5	13.6	3.3	5.9	20.7	2.8	8.9
U 274		155	P	47.5	9.3	2.7	4.1	23.9	3.5	11.0
U 274		385	ZP/S	22.4	7.7	1.8	2.9	23.9	3.5	11.0
U 274		385	UP/S	31.0	16.7	3.9	7.6	23.9	3.5	11.0
U 289		155	P	39.0	7.4	2.4	3.4	24.7	3.5	11.0
U 289		385	ZP/S	17.4	5.6	1.5	2.3	24.7	3.5	11.0
U 289		385	UP/S	24.5	13.0	3.3	5.6	24.7	3.5	11.0
U 290		155	P	42.0	8.1	2.5	3.6	26.7	4.2	12.4
U 290		385	ZP/S	19.2	6.4	1.6	2.5	26.7	4.2	12.4
U 290		385	UP/S	26.5	14.2	3.4	6.1	26.7	4.2	12.4
U 292		155	P	38.0	7.1	2.4	3.4	29.1	5.0	13.7
U 292		385	ZP/S	17.4	5.6	1.5	2.3	29.1	5.0	13.7
U 292		385	UP/S	24.0	12.7	3.2	5.4	29.1	5.0	13.7
U 294		155	P	41.0	7.8	2.5	3.6	24.7	3.5	11.0
U 294		385	ZP/S	18.5	6.1	1.6	2.4	24.7	3.5	11.0
U 294		385	UP/S	25.5	13.6	3.3	5.9	24.7	3.5	11.0
U 295		155	P	45.5	8.9	2.6	3.9	20.5	2.8	8.9
U 295		385	ZP/S	19.8	6.7	1.7	2.6	20.5	2.8	8.9
U 295		385	UP/S	28.0	15.1	3.6	6.6	20.5	2.8	8.9
U 296		1000	P	14.0	12.7	2.3	4.6	33.1	6.1	14.7
U 296		2700	S	8.2	26.4	4.5	9.2	33.1	6.1	14.7
U 300	*	850	P	20.0	18.8	3.3	7.1	21.8	3.0	9.4
U 300	*	1750	S	16.0	38.2	5.2	11.0	21.8	3.0	9.4
U 304		1300	P	22.5	43.9	6.3	13.3	28.0	4.2	12.4
U 304		1400	S	27.0	**	6.4	15.3	28.0	4.2	12.4
U 306	*	1000	P	12.5	11.0	2.0	4.1	37.6	7.5	17.5
U 306	*	2700	S	7.0	20.9	3.6	7.7	37.6	7.5	17.5
U 336		850	P	17.5	15.8	2.9	6.0	25.3	3.4	10.5
U 336		1750	S	13.5	27.2	4.3	8.9	25.3	3.4	10.5
U 346	*	1000	P	17.5	17.0	2.9	6.1	37.0	7.5	17.5
U 346	*	2700	S	10.3	40.8	5.8	12.1	37.0	7.5	17.5
U 350		265	ZP/S	15.9	2.6	0.9	1.2	40.3	9.8	20.9
U 350		265	UP/S	22.5	5.6	1.8	2.5	40.3	9.8	20.9
U 368	*	850	P	14.1	12.1	2.4	4.8	20.0	5.4	11.4
U 368	*	1750	S	11.5	21.1	3.5	7.4	20.0	5.4	11.4
U 373		800	P	33.0	36.8	7.1	14.9	16.5	2.5	7.1
U 375		300	P	22.5	9.4	3.0	4.4	36.3	7.5	17.5
U 376		300	P	22.5	9.4	3.0	4.4	32.5	6.1	14.7
U 385		780	P	15.5	11.7	2.3	4.6	29.8	4.8	13.3
U 389		850	P	30.5	28.6	4.3	9.0	28.7	5.0	13.7
U 389		1200	S	22.0	37.0	5.8	12.1	28.7	5.0	13.7

** See last page for special listing.

CODE	RES	WNDG ARNG	OPERATE CURRENT	OPERATE TIME			RELEASE TIME				
				MAX	MIN	AVG	MAX	MIN	AVG		
U	396		S	34.0	24.7	2.4	5.2	16.3	3.2	8.6	
U	397		S	27.0	15.4	1.9	3.9	19.4	3.9	10.0	
U	398		P	130.0	2.3	1.2	1.3	26.5	4.0	11.9	
U	398		S	19.5	16.2	2.6	5.5	26.5	4.0	11.9	
U	399		P	135.0	2.4	1.2	1.3	28.9	4.8	13.3	
U	399		S	23.0	20.8	3.2	6.7	28.9	4.8	13.3	
U	400		P	130.0	2.3	1.2	1.3	21.6	5.0	12.1	
U	400		S	22.0	19.3	3.1	6.4	21.6	5.0	12.1	
U	401		P	28.5	12.6	3.4	5.5	24.3	3.5	11.0	
U	402		P	125.0	2.3	1.2	1.3	16.3	3.2	8.6	
U	402		S	21.0	18.0	2.9	6.0	16.3	3.2	8.6	
U	409	*	P	850	23.5	23.7	4.1	8.7	16.3	2.5	6.4
U	409	*	S	1750	19.0	56.9	6.5	14.2	16.3	2.5	6.4
U	414	*	P	1000	21.0	22.0	3.6	7.5	29.5	5.0	13.7
U	414	*	S	2700	12.3	61.9	7.3	15.8	29.5	5.0	13.7
U	429		P	1300	26.0	58.8	7.6	16.6	25.2	3.5	11.1
U	429		S	1400	27.5	**	6.6	15.8	25.2	3.5	11.1
U	448		P	850	31.0	29.4	4.4	9.1	21.0	2.8	9.0
U	448		S	1200	23.5	41.4	6.2	13.1	21.0	2.8	9.0
U	454		P	1000	14.8	24.9	5.0	10.4	29.1	5.0	13.7
U	455		P	1000	14.0	23.1	4.8	9.8	26.5	4.0	11.9
U	462		P	1000	13.8	22.7	4.7	9.6	36.0	8.0	18.4
U	463		P	1000	12.7	20.5	4.4	8.8	32.5	6.1	14.7
U	464		P	1000	14.7	24.7	5.0	10.3	26.1	4.0	11.9
U	465		P	1000	13.6	22.3	4.7	9.4	32.0	6.1	14.7
U	466		P	1000	13.0	21.0	4.5	9.0	36.6	8.0	18.4
U	471		P	350	24.5	10.4	2.7	4.3	29.3	4.8	13.3
U	471		S	1150	25.0	29.5	3.6	7.7	29.3	4.8	13.3
U	472		P	34	70.0	3.8	2.1	2.4	28.5	4.8	13.3
U	478		P	850	34.0	34.4	4.9	10.3	34.5	6.7	16.7
U	478	A	S	1200	25.5	47.5	6.9	14.7	34.5	6.7	16.7
U	479	*	P	850	24.0	24.2	4.2	8.8	18.4	2.5	7.1
U	479	*	S	1750	19.5	61.0	6.7	14.8	18.4	2.5	7.1
U	490		P	1000	12.6	20.3	4.3	8.7	36.3	7.5	17.5
U	491		P	950	20.5	23.6	4.1	8.6	16.4	3.4	9.1
U	507		P	1000	18.0	18.9	3.4	7.2	36.3	7.5	17.5
U	507		S	1000	19.0	20.3	3.7	7.7	36.3	7.5	17.5
U	511		P	1100	15.5	16.7	3.0	6.2	41.1	9.8	20.9
U	511		S	1100	16.5	18.1	3.2	6.8	41.1	9.8	20.9
U	512		P	1100	17.5	19.6	3.5	7.2	32.5	6.1	14.7
U	513		P	1100	21.0	25.6	4.4	8.9	28.9	4.8	13.3
U	513		S	1100	22.5	28.6	4.7	9.6	28.9	4.8	13.3
U	527		P	1100	21.0	25.6	4.4	8.9	23.7	3.4	10.5
U	527		S	1100	22.5	28.6	4.7	9.6	23.7	3.4	10.5
U	532	*	P	850	19.0	17.7	3.2	6.6	29.3	4.8	13.3
U	532	*	S	1750	15.5	35.8	5.0	10.6	29.3	4.8	13.3
U	551		P	1000	18.5	18.3	3.1	6.5	24.9	3.4	10.5
U	551		S	2700	10.8	45.0	6.1	12.9	24.9	3.4	10.5
U	556		P	500	23.5	17.2	3.8	7.4	21.5	3.0	9.4
U	556		S	300	80.0	16.6	2.1	4.5	21.5	3.0	9.4
U	571		P	34	70.5	2.5	1.2	1.4	36.3	7.5	17.5
U	571		S	1500	12.5	18.6	3.1	6.7	36.3	7.5	17.5

** See last page for special listing.

CODE	RES	WNDG ARNG	OPERATE CURRENT	OPERATE TIME			RELEASE TIME		
				MAX	MIN	AVG	MAX	MIN	AVG
U 572	700	P	21.0	11.7	1.9	4.1	32.5	6.1	14.7
U 572	3300	S	7.7	37.0	5.8	12.1	32.5	6.1	14.7
U 586	1300	P	16.0	24.1	4.2	8.7	26.9	4.0	11.9
U 586	1400	S	19.0	31.3	4.2	8.9	26.9	4.0	11.9
U 587	1000	P	15.0	13.9	2.4	5.0	30.3	4.8	13.3
U 587	2700	S	8.8	29.7	4.8	10.0	30.3	4.8	13.3
U 596	300	P	23.0	9.7	3.0	4.5	15.7	3.9	9.1
U 597	1000	P	34.0	52.4	6.5	14.3	21.1	2.9	9.2
U 619	1200	P	14.1	21.4	3.9	8.3	15.7	3.9	9.1
U 619	475	S	47.5	11.9	2.4	3.0	15.7	3.9	9.1
U 623	200	P	39.0	7.3	1.8	2.8	15.4	2.8	7.5
U 623	200	S	40.0	7.3	1.8	2.8	15.4	2.8	7.5
U 626	1100	P	23.0	31.7	4.7	9.9	20.2	2.7	8.6
U 626	1100	S	24.5	35.6	5.1	10.7	20.2	2.7	8.6
U 628	200	P	28.0	4.7	1.5	2.1	33.7	6.1	14.7
U 628	200	S	28.0	4.6	1.5	2.1	33.7	6.1	14.7
U 629	370	P	38.0	7.9	1.2	2.5	30.3	4.8	13.3
U 629	400	S	40.0	9.5	1.3	2.8	30.3	4.8	13.3
U 629	400	T	42.5	9.8	1.3	2.8	30.3	4.8	13.3
U 630	1100	P	13.8	14.8	2.6	5.4	33.7	6.1	14.7
U 630	1100	S	14.5	15.8	2.7	5.7	33.7	6.1	14.7
U 632	590	P	22.0	17.1	4.7	7.2	36.5	6.7	16.7
U 632	920	S	36.5	39.6	3.8	8.3	36.5	6.7	16.7
U 643	1300	P	21.0	38.8	5.8	12.1	17.3	2.5	7.1
U 643	1400	S	24.0	52.9	5.7	12.4	17.3	2.5	7.1
U 646	1000	P	14.2	23.5	4.8	9.9	32.8	6.5	15.6
U 654	67	P	105.0	6.5	2.2	3.3	19.2	5.4	11.4
U 655	950	P	25.0	31.0	5.3	10.9	21.8	3.2	10.1
U 668	1000	ZP/S	8.8	8.3	1.9	3.1	18.5	3.9	10.0
U 668	1000	UP/S	12.4	20.6	4.5	9.0	18.5	3.9	10.0
U 669	500	P	47.0	24.1	4.9	10.2	22.1	3.0	9.8
U 669	500	S	45.5	23.6	5.0	10.2	22.1	3.0	9.8
U 670	500	P	33.0	17.3	3.2	6.7	23.7	3.4	10.5
U 670	500	S	32.5	17.4	3.2	6.8	23.7	3.4	10.5
U 676	A 700	P	29.5	29.4	6.4	13.3	31.7	4.7	14.1
U 680	A 700	P	29.5	29.4	6.4	13.3	28.7	3.9	12.7
U 681	300	P	41.5	8.2	1.4	2.8	27.3	4.0	11.9
U 681	850	S	16.5	17.0	3.3	6.7	27.3	4.0	11.9
U 683	100	P	95.0	7.6	1.9	3.2	14.1	2.5	6.9
U 683	1100	S	30.0	52.9	7.0	15.1	14.1	2.5	6.9
U 687	* 850	P	19.5	18.2	3.2	6.9	29.3	4.8	13.3
U 687	* 1750	S	16.0	38.2	5.2	11.0	29.3	4.8	13.3
U 691	300	P	31.0	6.4	1.3	2.2	36.3	7.5	17.5
U 691	700	S	31.5	14.1	1.8	3.7	36.3	7.5	17.5
U 693	1100	P	24.5	35.6	5.1	10.7	26.7	3.3	11.4
U 693	1100	S	26.0	39.5	5.5	11.5	26.7	3.3	11.4
U 696	* 1000	P	22.0	23.7	4.1	7.9	29.5	5.0	13.7
U 696	* 2700	S	12.9	71.0	7.6	17.1	29.5	5.0	13.7
U 701	200	P	80.0	13.1	3.1	6.5	19.3	2.5	8.1
U 701	200	S	80.0	13.1	3.0	6.4	19.3	2.5	8.1
U 703	200	P	63.0	11.6	2.5	5.0	24.7	3.2	10.9
U 703	200	S	64.5	11.7	2.4	5.0	24.7	3.2	10.9

CODE	RES	WNDG ARNG	OPERATE CURRENT	OPERATE TIME			RELEASE TIME			
				MAX	MIN	AVG	MAX	MIN	AVG	
U	709		P	15.5	20.6	4.2	8.6	19.6	6.1	12.4
U	711		P	17.0	26.4	4.6	9.4	35.8	6.7	16.7
U	711		S	20.5	36.6	4.6	9.8	35.8	6.7	16.7
U	712	*	P	22.0	21.5	3.8	8.0	21.8	3.0	9.4
U	712	*	S	18.0	49.5	6.1	13.0	21.8	3.0	9.4
U	714		P	20.5	37.1	5.6	11.8	17.5	2.5	7.1
U	714		S	22.0	42.6	5.1	10.8	17.5	2.5	7.1
U	723		ZP/S	5.5	4.5	1.4	1.9	18.9	3.9	10.0
U	723		UP/S	9.8	14.6	3.5	6.1	18.9	3.9	10.0
U	724		P	27.5	19.7	4.3	8.7	23.2	3.2	10.3
U	725		ZP/S	15.9	5.1	1.5	2.1	15.4	3.9	9.1
U	725		UP/S	22.5	12.6	3.2	5.4	15.4	3.9	9.1
U	728		ZP/S	18.4	6.2	1.6	2.4	13.6	3.1	7.6
U	728		UP/S	26.0	14.8	3.5	6.4	13.6	3.1	7.6
U	732		ZP/S	6.0	5.0	1.4	2.1	21.1	5.0	12.1
U	732		UP/S	8.5	12.5	3.2	5.2	21.1	5.0	12.1
U	733		P	16.5	9.8	2.0	3.8	41.1	9.8	20.9
U	733		S	9.9	20.6	3.8	7.9	41.1	9.8	20.9
U	741		ZP/S	16.7	5.4	1.1	1.8	13.6	3.1	7.6
U	741		UP/S	23.5	14.3	3.0	6.0	13.6	3.1	7.6
U	745		ZP/S	10.4	9.7	2.0	3.7	14.7	3.4	8.5
U	745		UP/S	14.7	24.4	4.9	10.0	14.7	3.4	8.5
U	751		P	8.7	18.8	3.6	7.5	37.0	7.5	17.5
U	751		S	13.5	25.4	3.4	7.2	37.0	7.5	17.5
U	758		P	110.0	4.1	1.8	2.3	10.8	2.5	5.7
U	758		S	120.0	9.0	1.4	3.0	10.8	2.5	5.7
U	763		P	18.5	30.5	5.0	10.4	26.7	4.2	12.4
U	763		S	22.0	42.6	5.1	10.8	26.7	4.2	12.4
U	768		P	21.5	40.5	5.9	12.5	17.7	2.5	7.1
U	768		S	23.0	47.5	5.4	11.6	17.7	2.5	7.1
U	769		P	20.5	37.1	5.6	11.8	19.8	2.7	8.6
U	769		S	22.0	42.6	5.1	10.8	19.8	2.7	8.6
U	770		P	21.0	38.8	5.8	12.1	20.2	2.7	8.6
U	770		S	22.5	44.9	5.2	11.2	20.2	2.7	8.6
U	771		P	19.5	33.7	5.3	11.1	18.6	2.5	7.1
U	771		S	21.0	38.6	4.8	10.1	18.6	2.5	7.1
U	772		P	14.6	24.4	5.0	10.2	26.5	4.0	11.9
U	776		P	17.0	29.4	5.9	12.4	29.3	5.4	14.2
U	798		P	17.0	9.9	2.7	4.3	24.5	3.4	10.5
U	798		S	30.0	28.2	2.6	5.7	24.5	3.4	10.5
U	802		ZP/S	7.1	6.3	1.6	2.4	16.0	3.9	9.1
U	802		UP/S	10.1	15.2	3.5	6.4	16.0	3.9	9.1
U	805		P	18.5	22.1	3.7	7.6	36.6	8.0	18.4
U	805		S	19.5	23.9	3.9	8.1	36.6	8.0	18.4
U	825		P	95.0	2.9	1.3	1.5	36.2	6.7	16.9
U	825		S	17.0	30.8	4.6	9.6	36.2	6.7	16.9
U	830		ZP/S	14.1	4.5	1.1	1.6	18.9	3.9	10.0
U	830		UP/S	20.0	9.9	2.3	4.1	18.9	3.9	10.0
U	831		P	41.0	15.9	2.8	6.0	24.0	3.2	10.3
U	831		S	25.5	39.3	5.6	11.9	24.0	3.2	10.3
U	836		P	110.0	2.8	1.2	1.5	18.4	5.4	11.4
U	836		S	33.0	12.3	2.3	4.7	18.4	5.4	11.4

CODE	RES	WNDG	OPERATE	ARRG	CURRENT	OPERATE TIME			RELEASE TIME		
						MAX	MIN	AVG	MAX	MIN	AVG
U	837			P	30.0	5.3	2.3	2.9	58.4	17.0	36.4
U	837			S	105.0	13.9	1.1	2.2	58.4	17.0	36.4
U	838			P	100.0	2.4	1.1	1.3	37.0	7.5	17.5
U	838			ZP/S	12.8	10.8	2.3	4.2	37.0	7.5	17.5
U	838			UP/S	14.7	15.5	3.3	6.5	37.0	7.5	17.5
U	851			ZP/S	20.0	51.3	6.8	14.5	32.2	4.7	14.1
U	851			UP/S	23.5	87.3	11.0	25.1	32.2	4.7	14.1
U	853			P	18.5	32.1	7.9	13.8	26.5	4.5	12.8
U	866			P	21.0	26.8	4.3	8.9	29.1	5.0	13.7
U	866			S	22.5	30.4	4.6	9.6	29.1	5.0	13.7
U	870			P	15.5	14.6	2.5	5.2	29.8	4.8	13.3
U	870			S	9.1	31.7	5.0	10.4	29.8	4.8	13.3
U	880			P	18.0	29.0	4.9	10.1	26.5	4.0	11.9
U	880			S	21.5	40.6	4.9	10.4	26.5	4.0	11.9
U	881			P	21.0	26.8	4.3	8.9	23.7	3.4	10.5
U	881			S	22.5	30.4	4.6	9.6	23.7	3.4	10.5
U	882			P	28.0	24.5	3.9	8.1	23.7	3.4	10.5
U	890	*		P	43.0	36.2	6.2	13.1	16.4	2.5	7.1
U	890	*		S	45.0	38.6	6.6	14.2	16.4	2.5	7.1
U	891	*		P	24.0	24.2	4.2	8.8	18.4	2.5	7.1
U	891	*		S	19.5	61.0	6.7	14.8	18.4	2.5	7.1
U	892	*		P	23.0	22.9	5.2	3.4	21.8	3.0	9.4
U	892	*		S	18.0	49.5	6.1	13.0	21.8	3.0	9.4
U	922			P	43.5	8.4	2.6	3.8	19.5	2.5	8.1
U	922			ZP/S	19.5	6.6	1.6	2.5	19.5	2.5	8.1
U	922			UP/S	27.5	14.8	3.5	6.5	19.5	2.5	8.1
U	923			P	50.0	9.9	2.7	4.3	21.4	3.1	9.7
U	923			ZP/S	22.4	7.7	1.8	2.9	21.4	3.1	9.7
U	923			UP/S	31.5	16.9	3.9	7.8	21.4	3.1	9.7
U	925			P	41.0	14.6	3.9	7.1	9.0	2.5	5.0
U	926			P	39.5	7.5	2.5	3.5	21.5	3.0	9.4
U	926			S	60.0	8.9	1.4	2.9	21.5	3.0	9.4
U	927			P	27.0	6.2	2.5	3.1	29.8	4.8	13.3
U	927			S	33.5	**	3.1	8.1	29.8	4.8	13.3
U	929			P	190.0	3.5	1.3	1.7	17.8	2.5	7.2
U	929			ZP/S	24.4	24.7	4.4	9.1	17.8	2.5	7.2
U	929			UP/S	28.0	32.7	6.7	13.7	17.8	2.5	7.2
U	935			P	21.5	28.0	4.4	9.1	25.7	4.0	11.9
U	935			S	23.0	31.7	4.7	9.9	25.7	4.0	11.9
U	939			P	30.5	33.6	5.6	11.7	17.5	2.5	7.1
U	943			P	28.0	36.2	5.1	10.7	26.0	3.6	11.6
U	943			S	14.6	**	8.7	21.4	26.0	3.6	11.6
U	946			P	16.0	27.6	4.4	9.1	33.3	6.5	15.6
U	946			S	100.0	11.1	1.4	2.2	33.3	6.5	15.6
U	951			ZP/S	28.4	7.1	1.4	2.6	11.3	2.5	5.7
U	951			UP/S	31.5	11.7	2.5	4.8	11.3	2.5	5.7
U	955			T	64.0	20.9	2.9	6.0	13.7	2.5	6.5
U	955			ZP/S	20.5	9.8	2.4	3.6	13.7	2.5	6.5
U	955			UP/S	29.0	22.8	4.5	9.4	13.7	2.5	6.5
U	957			P	35.0	26.3	3.8	7.9	17.5	3.3	9.1
U	957			S	31.0	17.3	3.5	7.0	17.5	3.3	9.1
U	959			P	47.0	40.6	5.1	11.2	18.5	2.5	7.4

** See last page for special listing.

CODE	RES	WNDG ARNG	OPERATE CURRENT	OPERATE TIME			RELEASE TIME		
				MAX	MIN	AVG	MAX	MIN	AVG
U 959	1400	S	25.0	70.8	9.5	21.3	18.5	2.5	7.4
U 960	1100	P	27.0	42.1	4.7	12.2	24.3	3.0	10.0
U 960	1100	S	28.5	46.5	6.2	13.2	24.3	3.0	10.0
U 961	850	P	14.7	12.7	2.5	5.0	36.3	7.5	17.5
U 961	1750	S	10.8	19.3	3.2	6.9	36.3	7.5	17.5
U 971	465	S	23.0	11.0	2.5	4.7	29.3	4.8	13.3
U 971	34	ZP/S	16.9	21.3	15.5	16.6	29.3	4.8	13.3
U 971	34	UP/S	19.5	29.8	20.8	22.4	29.3	4.8	13.3
U 983	120	P	31.5	5.0	2.5	2.7	41.1	9.8	20.9
U 983	1200	S	26.5	29.8	2.8	6.1	41.1	9.8	20.9
U 984	* 850	P	20.5	19.5	3.4	7.4	26.5	4.0	11.9
U 984	* 1750	S	17.0	43.5	5.6	11.9	26.5	4.0	11.9
U 986	85	P	85.0	6.0	2.0	2.6	9.7	2.5	5.0
U 986	560	S	60.5	35.7	3.2	7.2	9.7	2.5	5.0
U 986	550	T	57.5	31.1	3.2	7.0	9.7	2.5	5.0
U 992	850	P	20.0	14.9	2.6	5.4	20.4	2.7	8.6
U 992	1200	S	19.5	29.9	5.1	10.5	20.4	2.7	8.6
U 993	1000	P	11.4	17.5	4.0	7.7	37.3	8.0	18.4
U 995	230	ZP/S	22.3	3.7	1.2	1.6	20.0	2.7	8.6
U 995	230	UP/S	31.5	8.8	2.5	3.8	20.0	2.7	8.6
U 998	2650	P	11.4	64.8	8.9	18.8	38.8	7.8	18.5
U 998	500	S	90.0	**	3.2	6.7	38.8	7.8	18.5
U 1004	590	P	24.5	19.8	3.9	8.0	19.0	2.5	7.8
U 1004	920	S	36.5	39.6	3.8	8.3	19.0	2.5	7.8
U 1007	800	P	22.0	23.6	4.4	9.3	20.0	2.7	8.6
U 1007	1300	S	28.5	66.5	5.3	12.5	20.0	2.7	8.6
U 1013	700	P	19.5	12.8	2.4	5.0	28.9	4.8	13.3
U 1013	700	S	20.0	13.3	2.5	5.2	28.9	4.8	13.3
U 1041	1300	P	20.0	35.4	5.5	11.4	19.2	2.5	7.8
U 1041	1400	S	21.0	38.6	4.8	10.1	19.2	2.5	7.8
U 1048	1100	P	20.5	25.8	4.2	8.6	24.3	3.5	11.0
U 1048	1100	S	22.0	29.2	4.5	9.4	24.3	3.5	11.0
U 1050	1100	P	20.5	25.7	4.2	8.6	37.0	8.7	19.5
U 1050	940	S	36.5	40.7	3.6	8.1	37.0	8.7	19.5
U 1050	1075	T	32.0	43.0	3.9	8.8	37.0	8.7	19.5
U 1056	400	ZP/S	13.5	3.3	1.0	1.4	37.0	7.5	17.5
U 1056	400	UP/S	19.0	7.8	2.0	3.1	37.0	7.5	17.5
U 1067	330	P	49.5	12.6	2.1	4.4	13.9	3.1	7.6
U 1067	660	ZP/S	17.4	8.0	3.2	2.9	13.9	3.1	7.6
U 1067	660	UP/S	24.5	19.1	3.7	7.6	13.9	3.1	7.6
U 1068	1800	P	32.0		**		27.1	3.6	12.3
U 1068	1900	S	44.5		**		27.1	3.6	12.3
U 1070	300	S	130.0	62.8	3.7	9.2	23.5	3.0	10.0
U 1070	800	ZP/S	25.0	26.2	4.8	10.0	23.5	3.0	10.0
U 1070	800	UP/S	32.0	38.7	9.7	20.2	23.5	3.0	10.0
U 1076	1300	P	17.5	27.7	4.7	9.7	20.2	2.7	8.6
U 1076	1400	S	21.0	38.6	4.8	10.1	20.2	2.7	8.6
U 1084	2000	P	13.5	51.7	8.9	17.9	20.0	2.5	8.5
U 1085	435	P	41.0	18.1	3.3	7.2	11.0	2.5	5.7
U 1088	420	T	54.0	16.2	2.4	4.9	18.8	2.5	7.8
U 1088	660	ZP/S	17.4	8.0	2.1	2.9	18.8	2.5	7.8
U 1088	660	UP/S	24.5	19.1	5.6	7.6	18.8	2.5	7.8

** See last page for special listing.

CODE	RES	WNOG ARNG	OPERATE CURRENT	OPERATE TIME			RELEASE TIME		
				MAX	MIN	AVG	MAX	MIN	AVG
U 1091	1000	P	21.5	22.8	3.8	7.7	21.5	3.0	9.4
U 1091	2700	S	12.6	66.3	7.5	16.4	21.5	3.0	9.4
U 1095	590	P	18.0	13.6	3.0	5.6	39.8	8.4	19.8
U 1095	920	S	30.0	25.0	2.9	6.2	39.8	8.4	19.8
U 1099	1300	P	17.5	27.7	4.7	9.7	17.7	2.5	7.1
U 1099	1400	S	21.0	38.6	4.8	10.1	17.7	2.5	7.1
U 1110	250	P	37.5	13.8	3.7	6.4	21.7	2.8	9.3
U 1116	500	P	37.0	19.5	3.6	7.8	22.1	3.4	10.5
U 1116	500	S	36.0	19.2	3.6	7.9	22.1	3.4	10.5
U 1117	500	P	39.5	20.8	4.0	8.3	20.5	2.6	8.7
U 1117	500	S	38.5	20.5	4.0	8.4	20.5	2.6	8.7
U 1122	800	P	13.6	12.7	2.7	5.1	28.9	4.8	13.3
U 1122	740	S	20.0	10.6	1.7	3.6	28.9	4.8	13.3
U 1126	1425	P	13.7	28.4	5.3	11.1	27.1	4.2	12.4
U 1126	970	S	31.0	29.9	3.3	7.0	27.1	4.2	12.4
U 1127	1425	P	13.7	28.4	5.3	11.1	22.0	3.1	9.7
U 1127	970	S	31.0	29.9	3.3	7.0	22.0	3.1	9.7
U 1138	350	P	30.5	8.8	1.8	3.4	16.0	3.9	9.1
U 1138	500	S	22.0	10.7	3.3	4.5	16.0	3.9	9.1
U 1141	1300	P	16.0	24.1	5.8	8.7	22.5	3.0	9.4
U 1141	1400	S	19.0	31.3	4.2	8.9	22.5	3.0	9.4
U 1144	* 850	P	24.0	24.2	4.2	8.8	18.6	2.5	7.1
U 1144	* 1750	S	17.5	46.3	5.8	12.4	18.6	2.5	7.1
U 1147	1000	ZP/S	8.8	8.3	1.9	3.1	18.5	3.9	10.0
U 1147	1000	UP/S	12.4	20.6	4.5	9.0	18.5	3.9	10.0
U 1153	660	ZP/S	18.4	8.7	2.3	3.2	26.5	4.0	11.9
U 1153	660	UP/S	26.0	20.4	6.1	8.2	26.5	4.0	11.9
U 1154	660	ZP/S	18.4	8.7	2.3	3.2	29.3	4.8	13.3
U 1154	660	UP/S	26.0	20.4	6.1	8.2	29.3	4.8	13.3
U 1157	1300	P	24.0	49.3	6.8	14.6	16.6	2.5	6.5
U 1159	590	P	25.5	20.7	4.1	8.4	17.5	2.5	7.1
U 1159	920	S	38.0	44.3	3.9	8.9	17.5	2.5	7.1
U 1160	* 1000	P	24.0	27.4	4.3	8.8	21.6	3.1	9.7
U 1160	* 2700	S	14.0	**	8.3	19.7	21.6	3.1	9.7
U 1165	675	P	31.0	22.1	4.6	8.1	17.3	2.5	7.1
U 1165	1925	S	18.0	62.1	7.8	17.2	17.3	2.5	7.1
U 1169#	1300	P	26.0	58.3	7.6	15.6	25.2	3.5	11.1
U 1169	1400	S	27.5	**	6.6	15.8	25.2	3.5	11.1
U 1171	800	P	28.5	31.2	6.1	12.4	16.5	2.5	6.7
U 1175	700	P	17.0	10.8	2.8	4.3	29.3	4.8	13.3
U 1175	700	S	17.5	11.3	2.2	4.5	29.3	4.8	13.3
U 1178	* 850	P	25.5	26.2	4.6	9.4	19.8	2.7	8.6
U 1178	* 1750	S	18.5	53.2	6.3	13.6	19.8	2.7	8.6
U 1183	500	P	26.0	12.8	2.5	5.1	20.6	2.7	8.6
U 1183	500	S	26.0	13.2	2.6	5.3	20.6	2.7	8.6
U 1184	1150	ZP/S	7.8	8.6	2.0	3.4	48.9	12.3	26.0
U 1184	1150	UP/S	10.0	16.8	3.7	7.2	48.9	12.3	26.0
U 1192	800	P	17.5	17.6	3.4	7.0	24.5	3.4	10.5
U 1192	1300	S	22.5	32.4	4.0	8.5	24.5	3.4	10.5
U 1194	1300	P	20.0	35.4	5.5	11.4	17.5	2.5	7.1
U 1194	1400	S	24.0	52.9	5.7	12.4	17.5	2.5	7.1
U 1196	155	P	41.5	7.9	2.5	3.6	33.1	6.9	16.6

** See last page for special listing.

This relay has 10,000 turns on the primary. The U & Y relay book incorrectly lists 1,000.

CODE	RES	WNDG ARNG	OPERATE CURRENT	OPERATE TIME			RELEASE TIME		
				MAX	MIN	AVG	MAX	MIN	AVG
U 1196	230	S	63.0	9.5	1.5	3.1	33.1	6.9	16.6
U 1197	400	ZP/S	13.4	4.4	1.5	2.0	27.3	7.1	14.7
U 1197	400	UP/S	19.0	11.5	3.2	4.9	27.3	7.1	14.7
U 1202	300	S	125.0	43.1	1.7	8.6	26.9	3.4	11.8
U 1202	800	ZP/S	24.6	25.8	4.7	9.8	26.9	3.4	11.8
U 1202	800	UP/S	31.0	37.8	9.4	19.5	26.9	3.4	11.8
U 1204	1000	P	19.0	33.0	6.5	14.2	24.1	3.7	11.4
U 1207	A 200	P	18.0	4.9	2.5	2.8	42.0	9.8	20.9
U 1211	2000	P	13.2	52.6	8.3	17.4	26.9	4.5	12.8
U 1224	* 1000	P	14.8	13.6	2.4	4.9	21.6	5.0	12.1
U 1224	* 2700	S	8.3	26.9	4.6	9.3	21.6	5.0	12.1
U 1231	* 1000	P	19.5	19.8	3.3	6.9	21.9	5.5	12.9
U 1231	* 2700	S	11.0	46.8	6.2	13.2	21.9	5.5	12.9
U 1235	* 850	P	13.6	11.6	2.3	4.5	22.3	5.0	12.1
U 1235	* 1750	S	10.7	19.1	3.2	6.8	22.3	5.0	12.1
U 1241	300	P	22.5	9.4	3.0	4.4	21.9	5.5	12.9
U 1242	300	P	26.0	11.6	3.2	5.0	21.3	5.5	12.9
U 1245	* 1000	P	16.5	15.7	2.7	5.6	21.1	5.0	12.1
U 1245	* 2700	S	9.3	33.0	5.1	10.7	21.1	5.0	12.1
U 1246	* 850	P	14.4	12.4	2.4	4.9	21.6	5.0	12.1
U 1246	* 1750	S	11.2	20.4	3.4	7.2	21.6	5.0	12.1
U 1251	1100	P	13.6	14.0	2.6	5.3	21.6	5.0	12.1
U 1251	1100	S	13.8	14.3	2.6	5.4	21.6	5.0	12.1
U 1259	200	P	27.5	4.6	1.5	2.1	22.3	5.0	12.1
U 1259	200	S	30.5	5.1	1.5	2.2	22.3	5.0	12.1
U 1260	55	P	62.5	2.5	1.0	1.2	22.3	5.0	12.1
U 1260	1000	S	12.7	12.6	2.5	5.0	22.3	5.0	12.1
U 1260	1055	ZP/S	9.1	9.1	2.0	3.5	22.3	5.0	12.1
U 1260	1055	UP/S	10.6	13.6	2.9	5.6	22.3	5.0	12.1
U 1265	60	P	80.0	2.6	0.9	1.1	21.6	5.0	12.1
U 1266	100	P	55.5	3.3	1.1	1.4	21.6	5.0	12.1
U 1266	1000	S	21.5	16.0	2.3	4.7	21.6	5.0	12.1
U 1267	300	P	27.5	6.2	1.3	2.2	47.8	18.7	36.7
U 1267	700	S	27.5	12.1	1.6	3.5	22.3	5.0	12.1
U 1269	1000	P	12.6	20.3	4.3	8.7	27.8	7.7	16.4
U 1276	500	P	17.5	12.1	3.0	5.0	27.3	7.1	14.7
U 1278	450	P	14.4	7.9	2.5	3.7	22.3	5.0	12.1
U 1278	1050	S	24.5	18.2	2.0	4.3	22.3	5.0	12.1
U 1282	200	P	36.5	6.6	1.8	2.6	25.3	3.4	10.5
U 1282	200	S	37.5	6.8	1.7	2.6	25.3	3.4	10.5
U 1283	350	P	36.5	15.8	3.1	7.1	21.2	2.8	9.3
U 1283	1150	S	35.5	**	5.5	14.0	21.2	2.8	9.3
U 1284	350	P	34.0	15.0	3.3	6.6	26.9	4.5	12.8
U 1284	1150	S	33.0	80.1	5.0	12.1	26.9	4.5	12.8
U 1286	700	P	39.0	32.0	5.5	11.5	17.9	2.5	7.8
U 1286	700	S	39.5	32.7	5.6	11.8	17.9	2.5	7.8
U 1291	800	P	26.5	28.8	5.5	11.2	17.6	2.5	7.3
U 1291	740	S	44.0	38.4	4.4	9.7	17.6	2.5	7.3
U 1292	215	P	57.5	10.6	2.0	4.0	9.9	2.5	5.1
U 1292	950	S	26.0	31.1	5.0	10.4	9.9	2.5	5.1
U 1295	1000	P	20.0	34.7	7.2	15.0	16.5	2.5	6.7
U 1296	640	P	29.0	28.7	6.9	14.6	9.1	2.5	4.5

** See last page for special listing.

CODE	RES	ARNG	CURRENT	MAX	MIN	AVG	MAX	MIN	AVG
U 1302	200	P	50.0	9.5	2.1	3.7	18.6	2.5	7.1
U 1302	200	S	50.0	9.3	2.0	3.6	18.6	2.5	7.1
U 1303	200	P	37.0	6.8	1.7	2.7	14.2	3.1	7.6
U 1303	200	S	37.0	6.6	1.7	2.6	14.2	3.1	7.6
U 1308	100	P	44.5	3.5	1.5	1.7	29.3	4.8	13.3
U 1308	1200	ZP/S	8.4	9.2	1.9	3.5	29.3	4.8	13.3
U 1308	1200	UP/S	10.5	16.3	3.3	6.7	29.3	4.8	13.3
U 1309	100	P	52.0	4.1	1.5	1.9	24.5	3.4	10.5
U 1309	1200	ZP/S	9.9	11.3	2.2	4.3	24.5	3.4	10.5
U 1309	1200	UP/S	12.3	19.9	3.9	7.9	24.5	3.4	10.5
U 1313	* 700	P	38.0	30.9	3.4	11.1	19.9	2.8	8.9
U 1313	* 700	S	38.0	31.0	5.3	11.2	19.9	2.8	8.9
U 1314	* 850	P	26.0	26.9	4.7	9.6	28.7	5.0	13.7
U 1314	* 1750	S	20.0	65.3	6.9	15.5	28.7	5.0	13.7
U 1321	* 850	P	25.0	25.5	4.5	9.2	20.5	2.8	8.9
U 1321	* 1750	S	19.5	61.0	6.7	14.8	20.5	2.8	8.9
U 1327	* 850	P	22.5	22.2	3.9	8.2	26.7	4.2	12.4
U 1327	* 1750	S	17.5	46.3	5.8	12.4	26.7	4.2	12.4
U 1335	100	P	46.5	3.7	1.3	1.7	31.8	5.0	13.8
U 1335	1100	S	14.2	16.1	2.8	5.8	31.8	5.0	13.8
U 1365	850	P	26.0	26.9	4.7	9.6	30.7	4.9	13.8
U 1365	1750	S	20.0	65.3	6.9	15.5	30.7	4.9	13.8
U 1372	1000	P	18.0	18.9	3.4	7.2	36.3	7.5	17.5
U 1372	1000	S	18.5	19.6	3.6	7.5	36.3	7.5	17.5
U 1374	1100	P	22.5	28.6	4.7	9.6	23.7	3.4	10.5
U 1374	1100	S	23.0	31.7	4.7	9.9	23.7	3.4	10.5
U 1380	* 700	P	26.5	19.2	3.4	7.3	17.9	2.5	7.1
U 1380	* 700	S	26.5	19.4	3.4	7.4	17.9	2.5	7.1
U 1402	660	ZP/S	20.2	9.7	1.7	3.5	12.1	2.5	6.5
U 1402	660	UP/S	28.5	22.4	4.4	9.2	12.1	2.5	6.5
U 1409	5.5	P	105.0	2.9	2.0	2.0	22.3	5.0	12.1
U 1409	570	S	23.5	8.2	1.3	2.6	22.3	5.0	12.1
U 1410	2.2	P	185.0	2.8	1.9	1.8	16.0	3.9	9.1
U 1410	570	S	26.5	9.6	1.4	3.0	16.0	3.9	9.1
U 1411	* 700	P	20.5	13.6	2.6	5.3	33.3	6.5	15.6
U 1411	* 700	S	20.0	13.3	2.5	5.2	33.3	6.5	15.6
U 1413	* 700	P	37.0	29.7	5.1	10.7	17.3	2.5	7.1
U 1413	* 700	S	37.0	29.9	5.2	10.9	17.3	2.5	7.1
U 1417	420	T	68.0	23.1	3.1	6.5	10.3	2.5	4.9
U 1417	660	ZP/S	21.9	10.7	1.9	3.8	10.3	2.5	4.9
U 1417	660	UP/S	31.0	24.3	5.0	10.1	10.3	2.5	4.9
U 1420	* 850	P	25.0	25.5	4.5	9.2	17.4	2.5	7.3
U 1420	* 1750	S	19.5	61.0	6.7	14.8	17.4	2.5	7.3
U 1425	660	ZP/S	18.7	8.8	2.2	3.2	15.7	3.9	9.1
U 1425	660	UP/S	26.5	20.8	5.9	8.5	15.7	3.9	9.1
U 1428	660	ZP/S	19.5	9.3	2.3	3.4	26.7	4.2	12.4
U 1428	660	UP/S	27.5	21.6	6.3	8.9	26.7	4.2	12.4
U 1429	* 850	P	21.0	20.1	3.5	7.6	20.6	2.7	8.6
U 1429	* 1750	S	16.5	40.8	5.4	11.5	20.6	2.7	8.6
U 1431	* 700	P	35.5	28.0	4.9	10.2	16.3	2.5	6.7
U 1431	* 700	S	37.0	29.9	5.2	10.9	16.3	2.5	6.7
U 1433	200	P	38.5	9.6	2.6	4.1	26.1	4.0	11.9

CODE	RES	WNDG ARNG	OPERATE CURRENT	OPERATE TIME			RELEASE TIME		
				MAX	MIN	AVG	MAX	MIN	AVG
U 1433	1300	S	46.0		**		26.1	4.0	11.9
U 1445	1425	P	15.5	34.0	6.3	12.8	18.2	2.5	7.1
U 1445	970	S	34.5	39.4	3.8	8.3	18.2	2.5	7.1
U 1446	850	P	22.0	21.5	3.8	8.0	17.7	2.5	7.1
U 1446	1750	S	17.0	43.5	5.6	11.9	17.7	2.5	7.1
U 1447	250	P	66.5	14.1	2.7	5.7	17.4	2.5	7.3
U 1447	235	S	90.0	14.7	2.6	5.4	17.4	2.5	7.3
U 1449	425	P	36.5	13.3	2.2	4.6	21.8	3.0	9.4
U 1449	415	S	35.5	13.2	2.3	4.8	21.8	3.0	9.4

** See last page for special listing.

SLOW ACTING

U TYPE

CODE	RES	WNDG ARNG	OPERATE CURRENT	OPERATE TIME			RELEASE TIME			
				MAX	MIN	AVG	MAX	MIN	AVG	
U	94	*	1300	20.0	116.9	18.1	40.9	105.6	32.6	
U	128		2300	11.9	72.9	10.6	22.7	50.7	6.9	
U	137	*	1200	17.0	64.2	11.7	25.9	94.1	20.8	
U	172		1200	13.9	48.5	13.0	20.4	363.6	96.2	
U	174		1200	16.0	58.8	10.8	24.2	79.4	22.9	
U	205		1000	P 18.0	41.8	12.1	18.7	355.5	90.1	
U	205		1000	S 18.0	41.8	8.9	18.7	355.5	90.1	
U	246		650		27.5	32.1	5.9	13.0	65.5	12.4
U	283		2000		7.8	35.2	6.6	14.3	144.5	47.4
U	303		235		50.5	36.8	8.1	16.7	99.7	26.3
U	307	*	1200		15.0	53.7	10.0	22.7	119.3	47.4
U	320		1300		21.0	129.5	19.2	43.5	107.9	32.6
U	335	*	1300		26.5	225.2	25.7	61.5	187.4	40.3
U	348		430		22.5	21.4	5.1	9.2	84.6	13.9
U	353	A	255	P	24.0	10.5	4.0	5.1	168.8	45.0
U	353	A	250	S	43.5	16.2	3.2	6.4	168.8	45.0
U	354		235		53.5	41.5	8.3	17.8	246.5	65.3
U	356		235		44.5	33.0	10.2	14.0	140.0	52.1
U	379		850	P	31.0	84.7	17.0	28.5	180.9	43.3
U	379		2000	S	18.0	198.4	19.6	48.0	180.9	43.3
U	381	*	1200		14.2	49.9	13.0	21.0	194.2	45.0
U	413		2000		8.9	41.6	7.6	17.1	142.4	32.7
U	418		1300		19.5	111.0	17.6	39.7	163.7	68.5
U	431	*	1300		21.0	129.5	19.2	43.5	107.9	32.6
U	443		285		26.5	8.8	2.0	3.3	120.2	30.3
U	446	*	1300		19.5	111.0	22.6	39.7	121.1	41.4
U	453		550		44.0	98.6	17.0	38.1	86.2	20.1
U	467	*	1300		21.0	129.5	25.1	43.5	277.0	74.7
U	475	*	1300		19.5	111.0	24.9	39.7	215.0	45.7
U	476	*	2000		17.5	236.8	34.7	62.8	170.3	68.5
U	481	*	2300		10.6	57.6	9.3	19.8	86.8	20.4
U	486		1000		29.0	116.5	21.0	43.3	140.0	52.1
U	524		2000		11.4	59.9	10.6	22.6	97.9	19.1
U	525	A	1300		18.5	100.2	25.1	37.4	361.9	112.5
U	536	*	2300		10.0	51.8	8.8	18.4	53.5	18.5
U	546	*	1300		27.0	237.4	26.2	63.5	87.6	20.1
U	547	A	2300		10.7	71.7	11.8	25.4	96.4	19.1
U	552	A	2000		6.9	29.7	5.8	12.4	175.2	45.0
U	557		235		36.5	26.3	6.3	11.0	356.6	106.7

CODE	RES	WNDG ARNG	OPERATE CURRENT	OPERATE TIME			RELEASE TIME		
				MAX	MIN	AVG	MAX	MIN	AVG
U 560	850	P	34.0	102.6	14.2	32.1	151.6	31.3	
U 560	2000	S	19.0	300.0	20.8	52.9	151.6	31.3	
U 561	850	P	31.0	84.7	12.7	28.5	151.6	31.3	
U 561	2000	S	18.0	198.4	19.6	48.0	151.6	31.3	
U 563	850	P	32.5	93.5	13.4	30.3	167.4	36.8	
U 563	2000	S	19.0	300.0	20.8	52.9	167.4	36.8	
U 567	* 2000		15.5	169.3	22.3	51.5	320.5	92.1	
U 569	* 1300		25.0	192.3	24.0	55.8	97.0	26.3	
U 570	850	P	29.5	76.6	12.0	26.9	178.6	43.3	
U 570	2000	S	17.0	160.1	18.4	43.5	178.6	43.3	
U 592	* 2300		12.4	96.6	14.0	30.5	97.1	19.9	
U 603	* 1300		25.0	192.3	26.2	55.8	137.4	52.1	
U 604	1000		17.0	34.7	7.2	13.9	32.4	8.2	
U 608	* 850		15.5	36.8	7.3	15.8	134.7	44.9	
U 620	* 2300		9.5	58.3	10.4	22.0	77.5	22.2	
U 621	* 2300		11.8	87.6	13.2	28.6	86.1	16.5	
U 625	2300		9.9	50.9	8.7	18.2	77.0	16.8	
U 640	375		39.0	47.4	11.0	20.9	202.2	41.7	
U 645	850	P	38.0	133.3	16.4	37.9	139.5	28.9	
U 645	1300	S	24.5	133.8	17.3	39.5	139.5	28.9	
U 656	1200		24.5	118.1	16.9	40.6	120.6	22.0	
U 660	* 1300		22.0	142.4	20.3	46.2	194.2	40.3	
U 661	* 1300		18.0	95.2	16.2	36.1	252.0	62.7	
U 663	* 1300		26.0	213.8	36.8	59.6	191.6	40.3	
U 665	* 2300		10.6	70.4	11.7	25.1	113.8	26.5	
U 684	2000		14.0	135.9	29.7	44.6	257.0	62.7	
U 685	1300		30.0	317.4	67.5	76.8	90.3	20.1	
U 688	150	P	155.0	80.8	14.5	32.4	223.2	48.5	
U 688	475	S	75.0	223.1	24.7	60.8	223.2	48.5	
U 690	1000		16.0	32.2	6.0	12.9	45.7	11.3	
U 697	* 850		30.0	86.7	23.4	34.7	72.4	9.8	
U 702	* 1200		21.5	94.4	15.5	34.3	115.2	18.2	
U 706	* 1300		24.0	172.3	23.6	52.3	242.0	62.7	
U 707	430		30.0	29.3	6.3	13.3	96.4	20.9	
U 713	375		39.0	50.2	10.9	20.9	164.1	52.7	
U 715	850	P	32.5	93.5	13.4	30.3	153.9	31.3	
U 715	2000	S	19.0	300.0	20.8	52.9	153.9	31.3	
U 716	2000		11.2	55.2	12.1	22.1	147.5	38.4	
U 727	45		95.0	7.9	3.4	4.4	131.8	27.1	
U 746	225	P	51.5	22.0	4.8	9.9	103.3	20.4	
U 746	800	S	56.0	**	14.7	42.3	103.3	20.4	
U 748	A 2000		10.7	82.3	14.5	32.1	367.2	106.7	
U 783	1300		13.7	63.3	17.7	26.4	461.0	127.7	
U 790	2000		14.6	124.2	18.0	40.3	169.6	40.5	
U 806	* 1300		24.5	182.1	28.8	54.1	231.5	56.1	
U 808	640		18.5	27.3	5.7	11.6	126.9	31.4	
U 813	2300		11.2	78.5	12.4	26.8	107.3	23.7	
U 823	1000		14.1	32.9	6.5	13.8	146.1	36.6	
U 840	550		23.5	35.7	7.3	15.7	162.9	36.8	
U 879	1000		31.5	156.1	26.2	51.9	95.7	26.3	
U 887	235		50.5	38.8	7.9	16.7	228.5	45.0	
U 889	* 2300		12.3	77.7	11.0	23.7	58.3	10.4	

** See last page for special listing.

CODE	RES	WNDG OPERATE		OPERATE TIME			RELEASE TIME		
		ARNG	CURRENT	MAX	MIN	AVG	MAX	MIN	AVG
U 895	1300		24.5	182.1	34.6	54.1	107.9	32.6	
U 919	A 210		56.0	29.3	7.6	12.6	100.7	35.8	
U 931	* 1200		26.5	135.8	20.0	45.7	106.2	16.0	
U 933	850		36.0	109.6	17.0	44.1	92.8	11.8	
U 945	500		25.0	32.5	10.4	14.9	198.9	51.8	
U 952	* 2300		10.6	70.4	16.8	25.1	78.6	28.9	
U 954	235		56.5	44.0	9.9	18.8	207.5	47.2	
U 956	2000		18.0	225.8	43.6	66.0	145.7	43.4	
U 965	A 85	P	85.0	7.6	2.4	3.1	34.2	8.5	
U 965	A 270	S	55.0	17.9	3.0	6.5	34.2	8.5	
U 965	A 275	T	54.5	18.1	3.0	6.5	34.2	8.5	
U 974	235		50.0	38.4	9.1	16.5	227.0	53.6	
U 976	2300		7.4	33.4	5.9	12.9	55.6	18.5	
U 981	2000		17.0	178.3	21.9	51.0	150.5	32.3	
U 994	430		20.5	19.3	4.8	8.3	146.1	36.6	
U 996	A 720	P	26.0	44.6	8.8	18.8	264.3	74.7	
U 996	A 890	S	25.5	57.6	16.6	23.0	264.3	74.7	
U 1009	1300		25.0	103.5	11.6	28.6	95.7	19.9	
U 1016	1200		21.5	94.4	15.5	34.3	112.8	18.2	
U 1027	2000		7.1	30.9	6.0	12.8	151.9	36.6	
U 1032	850		26.5	73.5	13.8	29.8	61.1	9.1	
U 1042	1300		24.5	182.1	25.3	54.1	144.0	43.4	
U 1045	850	P	25.5	59.3	10.2	22.5	104.6	35.8	
U 1045	2000	S	14.8	112.4	15.4	35.0	104.6	35.8	
U 1049	650		30.5	44.4	8.5	18.8	100.4	19.6	
U 1058	850		14.6	34.3	7.0	14.9	104.6	35.8	
U 1061	850	P	27.0	50.5	8.6	18.5	191.8	46.7	
U 1061	1250	S	24.5	83.6	12.9	24.3	191.8	46.7	
U 1069	210		56.0	29.3	7.6	12.6	89.0	28.6	
U 1071	225	P	32.0	13.1	5.0	5.7	114.9	24.3	
U 1071	800	S	39.0	79.8	9.5	21.9	114.9	24.3	
U 1090	850	P	24.0	54.2	9.4	21.0	180.9	43.3	
U 1090	2000	S	13.9	98.5	14.2	32.2	180.9	43.3	
U 1097	1200		17.0	64.2	11.7	25.9	178.6	43.3	
U 1114	850		14.0	32.7	6.7	14.2	124.6	36.2	
U 1115	450	P	56.6	103.5	16.2	36.7	299.5	87.7	
U 1115	450	S	52.0	88.9	15.0	33.5	299.5	87.7	
U 1123	1200		24.5	118.1	18.1	40.6	53.3	9.3	
U 1124	1000		25.0	80.3	15.3	32.1	63.2	13.1	
U 1129	2000		17.0	192.2	48.4	59.7	311.5	87.7	
U 1132	850		22.5	60.2	11.0	24.7	122.4	21.2	
U 1135	550		31.0	57.5	20.5	25.1	140.0	52.1	
U 1139	850		33.0	98.5	17.5	39.1	103.7	13.9	
U 1140	850		29.0	82.7	15.1	33.3	101.0	10.0	
U 1142	1300		23.0	156.6	23.6	49.1	314.5	92.1	
U 1163	600		37.5	90.0	20.3	35.0	206.0	45.7	
U 1168	1000		17.0	42.2	7.9	17.4	105.8	23.7	
U 1177	235		50.0	38.4	9.1	16.5	164.8	26.5	
U 1179	900		20.0	40.8	10.1	16.6	114.5	27.6	
U 1185	425	P	47.0	38.9	7.0	15.3	86.5	17.3	
U 1185	415	S	45.0	36.3	6.6	14.8	86.5	17.3	
U 1200	2000		12.9	96.0	15.5	34.4	91.0	28.6	

CODE	RES	ARNG	CURRENT	MAX	MIN	AVG	MAX	MIN	AVG
U 1201	1300		23.0	156.6	24.6	49.1	202.2	41.7	
U 1206	375		42.5	53.3	11.0	23.2	189.1	40.3	
U 1220	550		31.5	61.9	16.2	25.7	227.0	53.6	
U 1221	A 640		13.2	18.2	5.6	7.6	222.5	54.4	
U 1233	2000		7.8	35.2	6.6	14.3	89.9	27.5	
U 1234	* 2300		7.5	41.5	7.6	16.7	87.2	27.5	
U 1243	* 2300		7.0	38.0	7.0	15.3	89.9	27.5	
U 1247	* 1300		16.0	79.0	14.0	31.3	190.0	64.9	
U 1271	* 1300		14.5	64.6	19.8	28.1	195.5	64.9	
U 1273	* 1300		19.5	111.0	22.6	39.7	121.1	41.4	
U 1294	2000		15.0	131.7	18.6	41.8	77.8	22.9	
U 1385	830		32.5	126.2	27.3	43.0	185.7	40.3	
U 1456	125		4.0	3.1	2.0	2.2	52.7	14.0	

PERMALLOY CORE

U TYPE

CODE	RES	WNDG OPERATE		OPERATE TIME			RELEASE TIME			
		ARNG	CURRENT	MAX	MIN	AVG	MAX	MIN	AVG	
U 6000	A	520	ZP/S	12.7	3.6	0.9	1.3	16.1	4.8	9.5
U 6000	A	520	UP/S	18.0	8.1	1.8	3.0	16.1	4.8	9.5
U 6001	A	520	ZP/S	21.2	6.8	1.2	2.2	11.2	3.3	7.3
U 6001	A	520	UP/S	30.0	15.3	2.7	5.6	11.2	3.3	7.3
U 6002	A	520	ZP/S	12.7	3.6	0.9	1.3	17.0	4.2	9.2
U 6002	A	520	UP/S	18.0	8.1	1.8	3.0	17.0	4.2	9.2
U 6004		1000		17.5	30.3	6.1	12.9	9.0	1.7	5.1
U 6005		2500		7.9	34.9	8.5	13.2	12.0	3.2	7.3
U 6006		1000		17.0	29.4	5.9	12.4	8.2	2.0	5.2
U 6007		45	P	62.0	3.0	1.5	1.7	29.3	7.4	16.0
U 6007		6	S	180.0	2.2	1.2	1.2	29.3	7.4	16.0
U 6008		200		34.0	7.6	2.2	3.3	11.5	3.2	7.3
U 6009		200		21.5	4.6	1.9	2.4	16.1	4.8	9.5
U 6010		200		85.0	10.7	1.9	3.9	7.0	1.6	4.5
U 6011		550		44.5	17.0	2.5	5.1	17.3	2.9	8.4
U 6013		1000		24.0	16.1	2.2	4.6	9.4	2.3	5.9
U 6014		300		64.0	8.9	1.0	2.0	12.0	3.2	7.3
U 6015		850	P	14.7	12.7	3.2	5.0	16.1	2.4	7.5
U 6015		1750	S	12.0	22.5	3.7	7.7	16.1	2.4	7.5
U 6016		700		17.5	17.2	3.9	7.3	17.7	3.0	8.6
U 6017		700		18.5	18.3	3.8	7.7	17.7	3.0	8.6
U 6018		850	P	13.7	11.7	2.9	4.6	17.9	2.9	8.4
U 6018		1750	S	11.1	20.1	3.4	7.1	17.9	2.9	8.4
U 6019		1000		13.6	22.3	4.7	9.4	6.6	1.5	3.8
U 6020		300	P	28.0	6.3	1.6	2.2	29.3	7.4	16.0
U 6020		700	S	28.5	12.8	1.7	3.6	29.3	7.4	16.0
U 6021		120	P	33.5	4.0	1.6	2.1	21.8	4.5	10.9
U 6021		125	S	43.0	4.0	1.3	1.7	21.8	4.5	10.9
U 6022		400		28.0	6.5	1.1	2.1	30.1	7.4	16.0
U 6023		2500		12.6	79.4	14.9	23.8	6.2	1.5	3.5
U 6024		400	P	28.0	6.5	1.1	2.1	30.1	7.4	16.0
U 6024		65	S	57.5	2.3	0.8	1.1	30.1	7.4	16.0
U 6025		1200		20.5	18.7	2.7	5.6	11.1	2.4	6.4
U 6026		440		24.5	18.0	4.2	7.7	7.2	1.6	4.5
U 6027		1000	P	12.3	10.5	2.0	4.0	30.1	7.4	16.0

CODE	RES	WNDG ARNG	OPERATE CURRENT	OPERATE TIME			RELEASE TIME		
				MAX	MIN	AVG	MAX	MIN	AVG
U 6027	950	S	25.0	13.8	1.7	3.5	30.1	7.4	16.0
U 6028	700		19.0	18.9	3.9	7.9	12.0	1.5	5.3
U 6029	700		17.0	16.6	3.5	7.0	15.7	2.4	7.5
U 6030	700		18.0	17.7	3.7	7.5	9.1	1.7	4.9
U 6031	700		22.0	22.7	4.5	9.3	12.8	1.8	6.1
U 6032	700		21.0	21.5	4.3	8.8	14.2	2.0	6.7
U 6033	400		21.0	7.2	1.7	2.7	19.5	3.6	9.2
U 6034	400		23.0	8.0	1.8	3.0	9.4	2.3	5.9
U 6035	700		18.0	17.7	3.7	7.5	22.2	5.2	12.1
U 6036	700		18.0	17.7	3.7	7.5	10.4	1.5	4.6
U 6037	200		37.5	8.7	2.3	3.6	17.2	2.6	8.1
U 6038	950		24.0	29.3	5.1	10.4	12.2	1.7	5.7
U 6039	950		23.5	28.5	5.0	10.1	8.2	2.0	5.2
U 6041	700		16.0	15.4	3.4	6.4	9.2	2.3	5.9
U 6042	700		18.5	18.3	3.8	7.7	11.4	1.5	4.8
U 6043	700		19.5	19.6	4.0	8.1	7.0	1.5	4.3
U 6044	2500		11.2	63.8	9.6	20.1	8.3	2.1	5.6
U 6045	145		20.0	4.8	2.4	2.9	30.1	7.4	16.0
U 6046	145	P	33.0	6.0	2.4	3.1	20.0	3.9	9.8
U 6046	1345	ZP/S	11.0	9.8	1.6	3.3	20.0	3.9	9.8
U 6046	1345	UP/S	15.5	23.2	4.0	8.2	20.0	3.9	9.8
U 6047	300	P	47.5	11.8	2.0	4.1	16.0	2.5	7.8
U 6047	700	S	48.5	37.0	3.2	7.2	16.0	2.5	7.8
U 6048	300	P	60.0	15.0	2.6	5.6	13.1	1.9	6.5
U 6048	700	S	61.0	**	4.2	11.1	13.1	1.9	6.5
U 6049	950		17.5	19.0	3.4	7.1	11.5	3.2	7.3
U 6050	700		14.6	13.7	3.2	5.7	21.4	4.5	10.9
U 6051	700	P	34.5	23.7	3.5	7.4	6.6	1.5	3.8
U 6051	1400	S	16.5	33.6	5.8	11.9	6.6	1.5	3.8
U 6052	245	P	24.5	7.1	2.4	3.3	8.3	1.9	4.9
U 6052	1800	S	17.5	36.1	3.9	8.5	8.3	1.9	4.9
U 6053	200		29.0	6.2	2.1	2.9	9.4	2.3	5.9
U 6054	700		11.9	10.9	2.8	4.5	18.2	2.9	8.4
U 6055	700		12.1	11.1	2.8	4.6	28.5	7.4	16.0
U 6056	700		18.0	17.7	3.7	7.5	17.3	2.9	8.4
U 6057	220		29.5	9.5	3.0	4.4	10.8	1.5	4.6
U 6058	82		48.5	6.7	3.0	3.7	13.2	1.9	6.2
U 6059	2		190.0	3.0	2.0	1.9	29.3	7.4	16.0
U 6060	100		57.0	6.8	2.3	3.3	5.4	1.5	3.3
U 6061	220		31.5	10.4	3.8	4.7	6.6	1.5	3.8
U 6062	300	P	34.0	7.8	1.5	2.8	9.4	2.3	5.9
U 6062	700	S	35.0	17.8	2.2	4.6	9.4	2.3	5.9
U 6063	1000		9.5	14.3	4.6	6.1	11.6	2.4	6.4
U 6064	400		26.0	9.8	2.1	3.8	18.8	3.0	8.7
U 6065	450		20.0	15.0	3.7	6.2	16.3	2.5	7.8
U 6066	400		28.0	10.1	2.0	3.9	17.6	2.9	8.4
U 6067	450		16.5	12.1	3.3	5.1	9.1	1.7	4.9
U 6070	145		22.0	5.1	2.5	3.0	17.0	4.2	9.2
U 6071	1000		9.3	14.0	3.5	5.9	28.5	7.4	16.0
U 6072	700		13.5	12.5	3.0	5.2	9.4	2.3	5.9
U 6073	1025	ZP/S	7.6	6.9	2.0	2.6	9.4	2.3	5.9
U 6073	1025	UP/S	10.8	16.5	5.0	7.0	9.4	2.3	5.9

** See last page for special listing.

CODE	RES	WNDG ARNG	OPERATE CURRENT	OPERATE TIME			RELEASE TIME		
				MAX	MIN	AVG	MAX	MIN	AVG
U 6074	220		31.5	10.4	3.8	4.7	7.6	1.5	4.0
U 6078	700		19.5	19.6	3.8	8.1	7.5	1.5	4.0
U 6079	2500		6.8	27.7	10.2	11.1	9.4	2.3	5.9
U 6080	520	ZP/S	18.7	5.8	1.1	1.9	21.8	4.5	10.9
U 6080	520	UP/S	26.5	12.9	2.4	4.9	21.8	4.5	10.9
U 6081	700		29.0	29.0	6.3	13.0	9.7	1.5	4.4
U 6082	350	P	18.5	5.9	1.8	2.5	22.6	4.5	10.9
U 6082	2720	ZP/S	4.6	10.6	2.0	4.1	22.6	4.5	10.9
U 6082	2720	UP/S	6.1	22.8	4.2	8.8	22.6	4.5	10.9
U 6083	200		45.5	10.6	2.6	4.4	8.3	2.1	5.6
U 6084	500	P	18.0	8.2	1.9	3.2	20.8	6.3	13.3
U 6084	500	S	18.5	8.7	2.0	3.4	20.8	6.3	13.3
U 6085	A 1000		9.1	13.7	3.4	5.8	29.3	7.4	16.0
U 6086	450		19.0	14.2	3.6	5.9	8.4	1.5	4.4
U 6087	950		20.5	23.6	4.1	8.6	11.6	1.5	5.1
U 6088	179	ZP/S	24.1	2.6	0.9	1.1	22.2	4.5	10.9
U 6088	179	UP/S	34.0	5.6	1.7	2.5	22.2	4.5	10.9
U 6089	200		25.5	5.4	2.0	2.6	9.6	2.3	5.9
U 6090	200		32.0	7.0	2.2	3.1	9.2	2.3	5.9
U 6092	220		46.0	14.1	3.9	7.0	5.7	1.5	3.2
U 6093	1000		17.5	30.3	6.1	12.9	6.1	1.5	3.6
U 6094	300	P	60.0	15.0	2.6	5.6	12.3	1.7	5.9
U 6094	700	S	61.0	**	4.2	11.1	12.3	1.7	5.9
U 6095	700	P	16.0	10.0	2.1	4.0	18.2	2.9	8.4
U 6095	700	S	17.0	11.0	2.2	4.4	18.2	2.9	8.4
U 6097	700		20.0	20.2	4.1	8.3	7.0	1.5	3.7
U 6100	700		24.5	25.1	5.1	10.7	6.1	1.5	3.2
U 6101	100		66.5	7.7	2.4	3.7	6.5	1.5	4.0
U 6102	500		11.7	9.0	3.7	4.4	21.6	6.3	13.3
U 6103	200		50.0	11.3	2.6	4.9	4.9	1.5	3.0
U 6104	800	P	13.9	13.1	2.8	5.2	16.1	2.4	7.5
U 6104	740	S	21.5	11.7	1.9	4.0	16.1	2.4	7.5
U 6106	30	P	100.0	1.8	0.8	0.8	30.1	7.4	16.0
U 6106	2105	ZP/S	6.8	17.1	3.3	6.7	30.1	7.4	16.0
U 6106	2105	UP/S	7.2	20.4	3.8	7.8	30.1	7.4	16.0
U 6107	200	ZP/S	16.6	2.5	1.0	1.2	22.2	4.5	10.9
U 6107	200	UP/S	23.5	5.1	2.0	2.6	22.2	4.5	10.9
U 6108	700		22.0	22.7	4.5	9.3	12.3	1.6	5.6
U 6109	16		90.0	3.6	2.2	2.4	17.3	2.9	8.4
U 6110	82		40.5	5.9	2.9	3.4	12.3	1.6	5.6
U 6112	82		35.5	5.4	2.8	3.3	9.2	1.7	4.9
U 6113	82		36.0	5.4	2.8	3.3	9.1	1.7	4.9
U 6114	82		35.5	5.4	2.8	3.3	11.1	2.4	6.4
U 6115	5		110.0	3.4	2.2	2.3	13.4	3.0	7.7
U 6116	200	ZP/S	17.3	2.5	1.0	1.2	19.8	3.6	9.2
U 6116	200	UP/S	24.5	5.3	2.0	2.6	19.8	3.6	9.2
U 6117	400		46.5	18.0	3.3	7.1	6.0	1.5	3.2
U 6124	16		130.0	4.0	2.3	2.6	6.6	1.5	4.0
U 6125	5		145.0	3.5	2.3	2.3	17.3	2.9	8.4
U 6131	82		38.5	5.7	2.8	3.4	12.4	1.6	5.6
U 6132	200		85.0	10.7	1.9	3.9	6.5	1.5	4.0
U 6133	400		28.5	10.4	2.6	4.0	14.5	2.0	6.7

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CODE	RES	WNDG ARNG	OPERATE CURRENT	OPERATE TIME			RELEASE TIME		
				MAX	MIN	AVG	MAX	MIN	AVG
U 6134	400		26.0	9.2	2.3	3.5	9.8	1.9	5.6
U 6135	82		42.0	6.0	2.9	3.5	9.7	1.9	5.6
U 6136	700		19.5	19.6	4.2	8.1	16.3	2.5	7.8
U 6137	16		90.0	3.5	2.2	2.4	8.2	1.9	4.9

UA TYPE

CODE	RES	WNDG ARNG	OPERATE CURRENT	OPERATE TIME			RELEASE TIME				
				MAX	MIN	AVG	MAX	MIN	AVG		
UA	1		400	ZP/S	12.7	3.6	1.1	1.5	9.1	2.1	5.1
UA	1		400	UP/S	18.0	8.4	2.3	3.5	9.1	2.1	5.1
UA	2		400	ZP/S	14.5	4.2	1.2	1.7	11.2	3.3	6.3
UA	2		400	UP/S	20.5	9.9	2.5	3.9	11.2	3.3	6.9
UA	3		400	ZP/S	9.5	2.8	1.1	1.3	11.2	3.3	6.9
UA	3		400	UP/S	13.5	5.9	2.4	2.8	11.2	3.3	6.9
UA	4		2650		3.1	16.7	5.4	6.8	50.2	12.3	26.0
UA	5		500		21.0	24.7	5.8	10.6	17.7	2.5	7.5
UA	6		1025	ZP/S	5.2	4.7	1.5	2.0	21.1	5.0	12.1
UA	6		1025	UP/S	8.5	16.8	4.3	7.0	21.1	5.0	12.1
UA	9		1800	P	5.7	13.7	3.2	5.7	21.6	6.3	12.9
UA	10		145		21.0	6.6	3.5	4.0	32.5	6.1	14.7
UA	11		21	P	67.5	4.6	2.7	3.0	31.4	4.7	14.0
UA	11		1200	S	24.5	30.9	3.5	7.3	31.4	4.7	14.0
UA	12		400	ZP/S	15.2	4.4	1.2	1.7	11.1	2.4	6.0
UA	12		400	UP/S	21.5	10.4	2.5	4.2	11.1	2.4	6.0
UA	13		2500		6.1	33.2	6.3	13.0	36.3	7.5	17.5
UA	14		145		15.0	5.3	3.0	3.4	30.1	7.4	15.6
UA	15		2500		5.0	21.2	4.2	8.5	24.7	5.9	12.5
UA	16		145	P	30.0	6.5	2.7	3.5	20.0	3.9	9.4
UA	16		1345	ZP/S	8.6	10.3	1.9	3.6	20.0	3.9	9.4
UA	16		1345	UP/S	11.9	23.4	4.3	9.1	20.0	3.9	9.4
UA	17		45	P	52.5	3.2	1.7	1.9	29.3	7.4	15.6
UA	17		6	S	145.0	2.5	1.4	1.5	29.3	7.4	15.6
UA	18		1000		16.0	33.9	6.7	13.9	15.1	2.9	7.9
UA	19		2500		6.5	29.8	8.0	11.5	12.0	3.2	6.9
UA	20		1000		14.7	30.3	6.1	12.6	13.8	3.3	8.1
UA	21		700	P	25.5	21.5	3.7	8.0	30.3	4.8	13.3
UA	21		700	S	25.5	22.3	4.0	8.5	30.3	4.8	13.3
UA	22		1000		10.4	18.0	4.2	7.6	11.6	2.4	6.0
UA	23		700		15.5	17.9	4.0	7.4	28.9	4.8	13.3
UA	28		200		85.0	13.8	2.3	4.9	11.7	2.7	6.8
UA	29		200		55.0	8.3	1.5	2.9	28.9	4.8	13.3
UA	31		200		28.0	6.6	2.2	3.1	11.5	3.2	6.9
UA	33		400		28.5	11.4	2.2	4.3	9.5	2.6	5.8
UA	34		1000		8.9	15.1	3.8	6.3	24.2	5.9	12.5
UA	35		200		14.4	6.6	3.6	4.2	12.0	3.2	6.9
UA	36		400	ZP/S	16.3	4.8	1.2	1.8	8.8	2.1	5.1
UA	36		400	UP/S	23.0	11.1	2.6	4.5	8.8	2.1	5.1
UA	37		700		12.5	12.8	3.7	5.2	12.9	3.0	7.3
UA	38		200		14.2	6.5	3.6	4.2	12.9	3.0	7.3
UA	39		1800	S	6.8	14.9	3.5	5.8	32.5	6.1	14.7
UA	40		23		55.0	5.8	3.9	4.1	36.3	7.5	17.5
UA	41		34		29.0	5.1	3.4	3.6	48.9	12.3	26.0

CODE	RES	WNDG ARNG	OPERATE CURRENT	OPERATE TIME			RELEASE TIME			
				MAX	MIN	AVG	MAX	MIN	AVG	
UA 42	400		ZP/S	11.3	3.2	1.1	1.4	9.1	2.1	5.1
UA 42	400		UP/S	16.0	7.1	2.2	3.1	9.1	2.1	5.1
UA 43	700			13.3	15.1	3.7	6.3	28.9	4.8	13.3
UA 44	720			10.3	16.7	4.4	7.2	36.3	7.5	17.5
UA 45	1000			6.2	10.5	3.4	4.9	27.3	7.1	14.7
UA 46	95		P	23.5	5.7	3.1	3.5	32.5	6.1	14.7
UA 46	535		ZP/S	11.0	4.5	1.2	1.7	32.5	6.1	14.7
UA 46	535		UP/S	15.0	9.6	2.3	3.7	32.5	6.1	14.7
UA 47	400		ZP/S	16.2	4.8	1.2	1.8	11.3	2.4	6.0
UA 47	400		UP/S	23.5	11.4	2.7	4.6	11.3	2.4	6.0
UA 48	1070			3.4	7.1	3.2	4.0	30.1	7.4	15.6
UA 49	500			6.9	7.4	3.6	4.3	30.1	7.4	15.6
UA 50	640			7.2	11.0	4.3	5.8	48.9	12.3	26.0
UA 51	750			14.2	24.4	5.6	10.4	26.1	4.0	11.9
UA 52	5000		P	5.7	62.0	11.1	19.4	8.8	2.1	5.1
UA 53	300			8.8	6.4	3.8	4.0	37.6	7.5	17.5
UA 54	6000		P	5.0	51.1	7.1	14.7	27.3	7.1	14.7
UA 54	1000		S	25.5	21.6	2.3	4.9	27.3	7.1	14.7
UA 55	400		ZP/S	20.2	6.4	1.4	2.2	9.1	2.1	5.1
UA 55	400		UP/S	28.5	14.5	3.1	5.9	9.1	2.1	5.1
UA 56	850		P	30.0	37.4	5.7	11.9	20.8	2.8	8.9
UA 56	1200		S	21.0	46.0	7.4	15.4	20.8	2.8	8.9
UA 57	475		P	17.0	7.8	2.1	2.8	37.6	7.5	17.5
UA 57	3050		S	5.6	27.0	4.8	10.2	37.6	7.5	17.5
UA 58	1500		P	8.9	19.2	4.3	7.5	40.3	9.8	20.9
UA 59	1200			11.9	28.5	5.8	11.9	21.6	3.1	9.7
UA 60	6000			4.2	49.4	8.2	16.7	22.2	4.5	10.5
UA 61	1200			13.4	33.4	6.6	13.8	20.4	2.9	9.2
UA 62	260		ZP/S	15.3	3.5	1.3	1.6	29.1	3.9	12.7
UA 62	260		UP/S	21.5	7.4	2.5	3.5	29.1	3.9	12.7
UA 63	475		P	17.0	7.8	1.7	2.8	42.0	9.8	20.9
UA 63	3050		S	5.4	25.8	4.6	9.7	42.0	9.8	20.9
UA 65	2500			6.3	30.4	5.8	12.0	21.9	5.5	12.9
UA 66	750			7.8	11.8	4.1	5.7	21.6	5.0	12.1
UA 69	500			9.5	8.3	3.3	4.4	17.0	4.2	8.8
UA 70	5			140.0	4.8	3.0	3.2	12.1	2.6	6.6
UA 71	2500			4.4	21.9	6.3	8.9	42.0	9.8	20.9
UA 72	300			15.5	9.5	4.0	5.2	41.1	9.8	20.9
UA 74	2500		P	8.5	23.9	4.0	8.0	36.3	7.5	17.5
UA 74	2500		S	8.7	24.7	4.1	8.2	36.3	7.5	17.5
UA 75	85		P	47.0	4.9	1.9	2.5	12.1	2.6	6.6
UA 75	1800		S	11.7	30.3	5.5	10.9	12.1	2.6	6.6
UA 76	220			16.5	7.3	3.4	4.2	41.6	10.5	22.3
UA 77	82			35.5	7.3	3.7	4.4	26.1	4.0	11.9
UA 78	950			32.0	60.3	9.5	20.2	15.7	2.5	6.5
UA 79	5500			4.1	65.6	11.0	23.1	36.3	7.5	17.5
UA 80	850		P	22.0	29.0	5.1	10.8	20.1	2.8	8.9
UA 81	400		ZP/S	13.4	3.8	1.8	1.6	8.8	2.1	5.1
UA 81	400		UP/S	19.0	9.1	4.4	3.7	8.8	2.1	5.1
UA 83	850		P	21.0	27.1	4.8	10.3	21.4	2.8	9.3
UA 83	1750		S	16.0	51.6	7.0	14.8	21.4	2.8	9.3
UA 84	295		P	12.3	3.9	1.7	2.1	16.1	4.8	9.1

CODE	RES	WNDG ARNG	OPERATE CURRENT	OPERATE TIME			RELEASE TIME		
				MAX	MIN	AVG	MAX	MIN	AVG
UA 84	590	ZP/S	4.3	3.1	1.7	1.8	16.1	4.8	9.1
UA 84	590	UP/S	6.1	6.5	3.4	3.8	16.1	4.8	9.1
UA 86	100	P	45.5	4.9	1.8	2.3	18.5	3.9	10.0
UA 86	1100	S	14.0	21.3	3.7	7.8	18.5	3.9	10.0
UA 88	15		32.0	4.5	3.3	3.3	17.0	4.2	8.8
UA 89	16		73.0	4.6	2.9	3.1	28.5	4.8	13.3
UA 90	700	P	27.0	22.1	3.5	7.5	30.7	4.9	13.8
UA 90	3300	S	9.3	74.3	9.8	21.0	30.7	4.9	13.8
UA 91	850	P	22.0	22.3	3.8	8.2	8.2	1.9	4.5
UA 91	1750	S	14.5	40.1	6.2	13.0	8.2	1.9	4.5
UA 92	200		38.0	12.0	3.2	4.9	7.8	2.5	4.4
UA 93	2500		4.9	25.1	5.1	10.3	36.3	7.5	17.5
UA 94	2500		5.4	28.2	5.6	11.3	29.3	4.8	13.3
UA 95	700		8.0	8.9	3.1	4.3	42.0	9.8	20.9
UA 96	840	P	16.0	14.3	2.7	5.5	20.2	2.7	8.6
UA 96	7140	ZP/S	3.6	32.7	4.3	9.1	20.2	2.7	8.6
UA 96	7140	UP/S	4.8	86.1	9.0	19.9	20.2	2.7	8.6
UA 97	1040	ZP/S	6.7	6.2	1.6	2.3	12.7	3.0	7.3
UA 97	1040	UP/S	9.5	14.6	3.4	6.0	12.7	3.0	7.3
UA 99	90		14.4	4.4	2.8	3.0	35.1	10.2	21.8
UA 100	21	P	57.0	4.4	2.6	2.9	28.8	4.4	13.0
UA 100	1200	S	20.0	20.8	2.8	5.7	28.8	4.4	13.0
UA 101	1000	S	11.7	14.6	2.9	5.8	37.0	7.5	17.5
UA 102	500		17.5	19.9	5.1	8.5	23.7	3.4	10.5
UA 103	590	ZP/S	6.6	4.0	1.7	2.1	12.0	3.2	6.9
UA 103	590	UP/S	9.4	9.6	3.5	4.8	12.0	3.2	6.9
UA 104	1000	P	21.6	31.1	5.1	10.5	23.8	3.3	10.7
UA 104	2700	S	12.1	79.9	9.6	20.7	23.8	3.3	10.7
UA 105	590	ZP/S	6.6	4.0	1.7	2.1	8.8	2.1	5.1
UA 105	590	UP/S	9.4	9.6	3.5	4.8	8.8	2.1	5.1
UA 106	4000		3.7	33.3	6.3	12.9	36.3	7.5	17.5
UA 107	400		40.0	21.1	3.8	7.9	17.5	2.5	7.6
UA 108	1000	P	19.5	26.7	4.4	9.3	21.7	2.8	9.3
UA 108	2700	S	10.6	58.4	8.0	17.0	21.7	2.8	9.3
UA 109	5.0		155.0	5.0	3.3	3.4	9.8	1.9	5.2
UA 110	700		29.5	39.7	8.7	17.9	15.9	2.5	6.5
UA 111	700		29.5	39.7	8.7	17.9	15.9	2.5	6.5
UA 112	1775		3.9	13.6	4.0	5.9	50.2	12.3	26.0
UA 114	400	ZP/S	13.1	3.7	1.1	1.6	13.4	3.0	7.3
UA 114	400	UP/S	18.5	10.6	3.0	4.6	13.4	3.0	7.3
UA 115	700		15.0	19.1	4.3	7.9	17.4	2.5	7.3
UA 116	1425	P	14.4	41.1	7.7	15.8	20.3	2.8	8.9
UA 116	970	S	32.5	45.2	4.7	10.2	20.3	2.8	8.9
UA 117	21	P	69.0	4.7	2.7	3.0	29.1	3.9	12.7
UA 117	1200	S	24.0	32.0	2.7	7.1	29.1	3.9	12.7
UA 118	850	P	22.0	29.0	5.1	10.8	18.7	2.5	8.1
UA 118	1750	S	17.0	58.7	7.6	16.1	18.7	2.5	8.1
UA 119	720		8.0	12.0	4.2	5.9	32.5	6.1	14.7
UA 121	82		36.5	7.4	4.0	4.4	36.6	8.0	18.4
UA 123	300		33.0	21.3	5.7	10.1	16.5	2.5	7.1
UA 125	6375		1.6	20.4	4.3	7.6	35.1	10.2	21.8
UA 126	4475		3.4	37.8	6.9	14.4	32.0	6.1	14.7

CODE	RES	WNDG ARNG	OPERATE CURRENT	OPERATE TIME			RELEASE TIME		
				MAX	MIN	AVG	MAX	MIN	AVG
UA 127	4000		4.7	42.2	6.6	16.1	16.3	3.2	8.6
UA 128	1000	P	8.9	8.3	1.8	3.0	22.6	4.5	10.5
UA 128	2030	S	6.6	13.1	2.3	4.7	22.6	4.5	10.5
UA 128	2780	T	6.6	16.5	2.5	5.5	22.6	4.5	10.5
UA 129	200	ZP/S	13.1	2.9	1.3	1.5	37.0	7.5	17.5
UA 129	200	UP/S	18.5	5.6	2.5	3.1	37.0	7.5	17.5
UA 130	200	ZP/S	15.2	3.2	1.3	1.6	33.1	6.1	14.7
UA 130	200	UP/S	21.5	6.4	2.6	3.3	33.1	6.1	14.7
UA 131	134	ZP/S	13.1	2.7	1.5	1.6	16.4	4.2	8.8
UA 131	134	UP/S	18.5	5.2	2.8	3.2	16.4	4.2	8.8
UA 132	700		17.0	22.4	4.8	9.5	16.4	2.5	7.1
UA 133	186	ZP/S	7.1	2.5	1.5	1.6	42.0	9.8	20.9
UA 133	186	UP/S	10.0	4.7	2.9	3.1	42.0	9.8	20.9
UA 134	115		16.5	5.3	3.2	3.5	17.0	4.2	8.8
UA 135	6375		2.3	32.2	5.8	11.9	34.2	10.2	21.8
UA 137	800	ZP/S	5.3	4.6	1.8	2.3	13.4	3.0	7.3
UA 137	800	UP/S	7.5	11.0	3.7	5.3	13.4	3.0	7.3
UA 138	700		17.0	18.6	3.0	7.7	11.3	2.4	6.0
UA 139	950		12.1	16.3	3.5	6.8	21.8	4.5	10.5
UA 140	3525	ZP/S	2.1	8.8	2.9	3.6	58.4	17.0	36.4
UA 140	3525	UP/S	2.6	15.8	4.9	6.4	58.4	17.0	36.4
UA 141	700		12.0	14.8	3.8	6.1	36.3	7.5	17.5
UA 142	220		20.0	8.5	3.6	4.6	18.5	3.9	10.0
UA 143	3525	ZP/S	2.1	8.9	2.9	3.6	50.2	12.3	26.0
UA 143	3525	UP/S	2.6	15.8	4.9	6.4	50.2	12.3	26.0
UA 144	880	P	8.7	7.7	1.2	2.8	50.2	12.3	26.0
UA 144	3100	S	4.1	18.1	3.5	7.0	50.2	12.3	26.0
UA 145	400	ZP/S	13.8	4.3	1.3	1.7	26.9	4.0	11.9
UA 145	400	UP/S	19.5	10.2	2.6	4.1	26.9	4.0	11.9
UA 146	1.9	P	285.0	1.9	1.0	1.0	37.6	7.5	17.5
UA 146	1.9	S	300.0	2.0	1.0	1.0	37.6	7.5	17.5
UA 147	115		28.0	6.9	3.5	4.1	11.1	2.4	6.0
UA 148	1000		10.2	21.0	5.0	8.9	23.7	3.4	10.5

Y TYPE

CODE	RES	WNDG ARNG	OPERATE CURRENT	OPERATE TIME			RELEASE TIME		
				MAX	MIN	AVG	MAX	MIN	AVG
Y	50	*	1300	17.0	86.7	15.3	33.6	565.0	235.0
Y	53	*	2000	11.9	82.0	14.2	31.3	395.0	85.0
Y	54		600	31.0	68.9	12.4	28.2	570.0	255.0
Y	55		235	42.5	31.2	6.9	13.2	420.0	110.0
Y	56		34	80.0	5.8	2.9	3.5	255.0	95.0
Y	57	*	800	26.0	41.8	8.5	18.0	125.0	27.0
Y	59		880	32.5	59.6	11.6	25.1	100.0	30.0
Y	60		1300	22.5	149.4	20.9	47.6	585.0	150.0
Y	61		225	52.5	36.4	7.3	15.6	565.0	255.0
Y	62	*	1300	19.5	111.0	17.6	39.7	555.0	245.0
Y	63	*	1300	18.5	100.2	16.7	37.4	585.0	295.0
Y	64		850	P 48.0	**	21.4	57.5	330.0	60.0
Y	64		1300	S 25.0	141.8	17.6	40.8	330.0	60.0
Y	67	*	830	24.0	74.7	13.2	29.9	585.0	290.0
Y	68		235	40.5	29.5	6.7	12.4	525.0	105.0

** See last page for special listing.

CODE	RES	WNDG ARNG	OPERATE CURRENT	OPERATE TIME			RELEASE TIME		
				MAX	MIN	AVG	MAX	MIN	AVG
Y	69	*	1300	17.0	86.7	15.3	33.6	585.0	130.0
Y	71		100	62.0	13.3	4.1	6.2	420.0	180.0
Y	72		235	36.0	26.0	6.2	10.9	585.0	245.0
Y	73	*	1300	21.5	135.8	19.7	44.8	585.0	190.0
Y	74	A	235	40.0	27.8	6.8	12.3	580.0	255.0
Y	75		235	43.0	31.6	7.0	13.4	555.0	275.0
Y	78	*	880	16.0	31.8	6.3	13.4	255.0	110.0
Y	79	A	200	P 74.0	8.4	1.2	2.5	125.0	75.0
Y	80	*	1300	21.0	129.5	19.2	43.5	585.0	277.0
Y	81	*	600	23.5	45.1	9.5	20.0	580.0	215.0
Y	82		640	24.5	37.9	7.3	15.9	220.0	40.0
Y	83		225	56.5	39.6	7.8	17.0	580.0	255.0
Y	84		225	48.0	32.3	6.8	13.8	585.0	240.0
Y	85		830	37.5	164.0	22.7	52.4	560.0	160.0
Y	86	*	2000	13.3	102.3	16.0	35.7	395.0	80.0
Y	87		640	15.5	21.8	5.0	9.1	250.0	70.0
Y	88	*	2300	9.6	48.5	8.4	17.5	155.0	80.0
Y	90		225	59.0	41.7	8.1	17.7	585.0	290.0
Y	91		1200	21.5	94.4	15.5	34.3	415.0	100.0
Y	93		285	71.0	35.6	6.7	14.9	220.0	50.0
Y	95	*	1300	20.0	116.9	18.1	40.9	585.0	250.0
Y	98	*	1300	21.0	129.5	19.2	43.5	585.0	285.0
Y	99		2000	10.5	52.7	9.5	20.5	255.0	115.0
Y	101		235	40.0	27.8	6.8	12.3	580.0	255.0
Y	102		830	35.5	148.6	21.2	48.3	450.0	150.0
Y	103	*	830	22.5	68.1	12.2	28.0	585.0	197.0
Y	104		640	S 18.0	15.9	3.4	6.5	90.0	40.0
Y	105		830	23.5	72.5	12.9	29.3	560.0	230.0
Y	107	*	2000	13.6	107.3	16.5	36.7	355.0	160.0
Y	109	*	1300	20.5	123.0	18.7	42.2	585.0	180.0
Y	110		235	40.0	29.0	6.7	12.3	580.0	290.0
Y	111	*	600	37.0	88.3	15.8	34.4	540.0	110.0
Y	112		450	P 53.5	92.7	15.3	34.3	580.0	255.0
Y	112		450	S 49.5	82.0	14.3	31.5	580.0	255.0
Y	113		600	P 57.0	202.9	23.0	54.9	370.0	70.0
Y	113		500	S 50.0	101.7	16.2	36.5	370.0	70.0
Y	114	A	55	P 75.0	2.8	1.0	1.3		
Y	114	A	1000	S 15.0	16.0	2.9	6.0		
Y	115	*	880	15.0	29.3	6.0	12.5	255.0	117.0
Y	117	A	1000	20.0	33.7	7.4	15.0		
Y	118		125	39.0	7.5	2.8	3.7	170.0	80.0
Y	119	*	2000	12.6	91.6	15.1	33.4	435.0	193.0
Y	120		235	37.0	26.7	6.3	11.2	580.0	220.0
Y	122		850	P 18.0	28.5	5.2	11.4	255.0	90.0
Y	122		1250	S 17.5	43.2	7.3	15.9		
Y	123		2.0	P 205.0	2.6	1.5	1.6	70.0	35.0
Y	125		1100	ZP/S 16.3	59.1	10.5	24.5	575.0	290.0
Y	125		1100	UP/S 23.0	108.7	17.3	39.0	575.0	290.0
Y	126	*	1300	20.0	116.9	18.1	40.9	585.0	295.0
Y	127	*	850	17.0	39.5	8.3	17.5	415.0	205.0
Y	129	*	880	17.5	29.4	5.6	11.8	170.0	45.0
Y	130		165	P 64.5	10.8	2.6	4.9		

CODE	RES	WNDG ARNG	OPERATE CURRENT	OPERATE TIME			RELEASE TIME		
				MAX	MIN	AVG	MAX	MIN	AVG
Y 130	225		S 80.0	13.7	2.6	5.6			
Y 131	235		44.0	32.5	7.1	13.8	490.0	200.0	
Y 139	* 1300		20.0	116.9	18.1	40.9	585.0	277.0	
Y 141	600		48.0	130.3	21.0	47.5	350.0	65.0	
Y 142	2000		16.5	200.0	24.4	56.8	565.0	295.0	
Y 143	1200		15.5	56.2	10.4	23.5	415.0	175.0	
Y 144	830		21.0	61.9	11.2	25.8	585.0	240.0	
Y 147	1300		22.5	149.4	20.9	47.6	575.0	180.0	
Y 148	850		P 22.5	38.4	6.8	15.0	195.0	65.0	
Y 149	235		39.0	28.2	6.6	11.9	580.0	194.0	
Y 150	125		30.0	7.3	3.2	4.1	260.0	65.0	
Y 151	A 500		33.5	55.6	11.3	24.3	575.0	290.0	
Y 153	* 830		23.5	72.5	12.9	29.3	585.0	230.0	
Y 154	640		15.5	21.8	5.0	9.1	220.0	75.0	
Y 155	1000		P 28.0	128.3	18.4	42.0	505.0	125.0	
Y 155	775		S 43.0	187.5	22.2	52.2			
Y 157	A 1300		17.5	90.8	15.8	34.8	625.0	135.0	
Y 166	* 2300		10.9	74.4	12.0	26.0	235.0	80.0	
Y 169	235		42.0	30.7	6.9	13.0	585.0	210.0	
Y 171	270		31.0	14.2	3.5	5.8	175.0	44.0	
Y 172	3.0		220.0	4.3	2.5	2.8	255.0	95.0	
Y 174	2000		16.0	152.7	20.3	46.2	355.0	100.0	
Y 176	* 600		27.0	57.3	10.5	23.7	585.0	285.0	
Y 177	200		44.5	23.0	5.5	9.8	415.0	120.0	
Y 178	235		43.5	32.0	7.0	13.6	555.0	255.0	
Y 180	285		35.0	15.9	3.3	6.3	255.0	85.0	
Y 182	2500		8.1	36.2	6.6	13.6			
Y 183	1300		21.0	129.5	19.2	43.5	585.0	295.0	
Y 184	A 830		33.0	129.9	19.4	43.9	650.0	240.0	
Y 185	* 1300		23.0	156.6	21.5	49.1	495.0	90.0	
Y 186	880		21.0	45.0	8.5	18.9	255.0	45.0	
Y 187	* 850		18.0	42.6	8.9	18.8	385.0	185.0	
Y 189	A 235		44.5	33.0	7.2	14.0	585.0	290.0	
Y 191	A 235		44.5	33.0	7.2	14.0	585.0	290.0	
Y 192	235		44.0	32.5	7.1	13.8	490.0	210.0	
Y 193	425		P 31.5	23.7	4.4	9.5	250.0	95.0	
Y 193	415		S 32.0	24.1	4.6	9.3	250.0	95.0	
Y 195	550		28.0	44.8	8.7	19.2	410.0	90.0	
Y 196	1300		25.5	202.8	24.7	57.7	585.0	185.0	
Y 198	175		60.0	19.6	5.1	9.7	185.0	40.0	
Y 201	550		23.5	35.7	7.3	15.7	365.0	70.0	
Y 203	1300		18.5	100.2	16.7	37.4	585.0	290.0	
Y 204	880		18.0	30.6	5.7	12.3	108.0	46.0	
Y 205	* 830		24.5	76.9	13.6	30.6	430.0	110.0	
Y 206	4000		6.6	55.2	8.5	17.8	55.0	22.0	
Y 207	A 200		P 59.0	6.4	1.0	2.0	215.0	90.0	
Y 208	1300		19.5	111.0	17.6	39.7	385.0	160.0	
Y 209	430		23.0	21.4	5.2	9.5	195.0	85.0	
Y 210	830		33.5	133.4	19.7	44.7	585.0	205.0	
Y 212	* 850		24.5	67.0	12.4	27.2	415.0	83.0	
Y 213	640		21.0	31.7	6.3	13.3	140.0	55.0	
Y 215	450		42.0	63.6	11.2	25.9	580.0	175.0	

CODE	RES	WNDG ARNG	OPERATE CURRENT	OPERATE TIME			RELEASE TIME		
				MAX	MIN	AVG	MAX	MIN	AVG
Y 215	450		38.5	57.0	10.2	23.6	580.0	175.0	
Y 216	880		32.0	71.7	14.2	31.0	255.0	45.0	
Y 218	600		41.0	102.5	17.5	39.1	520.0	135.0	
Y 219	450	P	58.0	108.8	16.7	37.7	580.0	195.0	
Y 219	450	S	53.0	92.1	15.3	34.4	580.0	195.0	
Y 220	* 800		21.0	41.1	8.0	17.5	113.0	48.0	
Y 221	235		51.0	39.3	7.9	17.0	585.0	285.0	
Y 223	* 830		27.0	89.2	15.6	34.3	450.0	230.0	
Y 224	830		29.0	101.0	16.8	37.6	415.0	200.0	
Y 225	* 830		25.0	79.2	14.0	31.3	385.0	185.0	
Y 226	830		24.5	76.9	13.6	30.6	535.0	225.0	
Y 227	* 880		21.5	46.3	8.8	19.3	205.0	40.0	
Y 228	A 3.8		295.0	4.5	2.6	2.9	255.0	75.0	
Y 230	A 600		48.0	130.3	21.0	47.5	585.0	240.0	
Y 231	1200		22.0	98.5	15.9	35.3	415.0	80.0	
Y 232	850		13.1	30.0	6.4	12.9	415.0	140.0	
Y 234	285		47.5	23.1	4.2	9.2	210.0	97.0	
Y 235	500		32.5	56.4	10.3	23.4	575.0	280.0	
Y 236	285		60.5	30.7	5.5	12.4	255.0	70.0	
Y 237	A 200	P	74.0	8.4	1.2	2.5	125.0	75.0	
Y 239	1450	P	17.5	67.8	10.9	23.9	225.0	45.0	
Y 240	830		23.5	72.5	12.9	29.3	585.0	280.0	
Y 241	* 850		18.0	44.9	8.5	18.8	360.0	145.0	
Y 242	830		21.0	61.9	11.2	25.8	560.0	280.0	
Y 243	* 600		29.0	59.5	12.0	26.0	425.0	218.0	
Y 244	2300		9.3	56.5	10.1	21.4	270.0	95.0	
Y 245	1300		20.5	112.5	19.8	42.2	585.0	300.0	
Y 246	A 850		15.0	35.4	7.1	15.3	480.0	190.0	
Y 247	A 850		22.5	60.2	11.0	24.7	465.0	110.0	
Y 248	2000		10.6	53.5	9.6	20.7	205.0	75.0	
Y 249	3000		9.5	108.5	18.1	38.4	395.0	170.0	
Y 250	* 830		32.0	122.4	18.7	42.2	560.0	130.0	
Y 252	830		22.5	68.1	12.2	28.0	560.0	255.0	
Y 253	1200		21.0	90.5	15.1	33.4	380.0	110.0	
Y 254	* 830		27.0	89.2	15.6	34.3	560.0	160.0	
Y 255	830		18.5	52.6	9.7	21.8	560.0	200.0	
Y 256	2000		15.5	141.3	19.4	43.9	395.0	115.0	
Y 257	235		55.0	42.7	8.5	18.3	575.0	160.0	
Y 258	A 600		40.0	98.7	17.1	38.0	680.0	250.0	
Y 259	830		19.5	56.3	10.3	23.3	560.0	260.0	
Y 260	830		19.5	56.3	10.3	23.3	560.0	260.0	
Y 261	225		67.5	49.9	9.2	20.7	585.0	175.0	
Y 262	225		67.5	49.9	9.2	20.7	585.0	175.0	
Y 263	* 830		25.0	79.2	14.0	31.3	560.0	275.0	
Y 264	200		42.5	22.0	5.4	9.4	405.0	125.0	
Y 265	285		47.5	23.1	4.2	9.2	255.0	100.0	
Y 266	1200		23.0	106.4	16.7	37.3	360.0	105.0	
Y 267	285		46.5	22.5	4.2	9.0	230.0	90.0	
Y 268	1450	P	20.0	87.1	12.8	28.2	240.0	63.0	
Y 269	* 850		20.0	51.4	9.5	21.5	360.0	160.0	
Y 270	830		23.0	70.3	12.5	28.6	560.0	210.0	
Y 271	A 235		51.5	39.7	8.0	17.1	575.0	150.0	

CODE	RES	WNDG ARNG	OPERATE CURRENT	OPERATE TIME			RELEASE TIME		
				MAX	MIN	AVG	MAX	MIN	AVG
Y 272	830		24.0	74.7	13.2	29.9	560.0	205.0	
Y 274	550		24.5	37.6	7.6	16.4	410.0	125.0	
Y 275	* 1300		17.5	90.8	15.8	34.8	555.0	165.0	
Y 276	* 830		35.0	144.7	20.8	47.4	560.0	150.0	
Y 277	600		40.0	98.7	17.1	38.0	565.0	165.0	
Y 278	850	P	25.5	46.1	8.0	17.3	255.0	50.0	
Y 278	1250	S	24.0	79.8	10.4	23.6	255.0	50.0	
Y 279	* 1300		21.0	129.5	19.2	43.5	585.0	180.0	
Y 280	640		18.5	27.3	5.7	11.6	220.0	85.0	
Y 281	850		18.0	44.9	8.5	18.8	415.0	145.0	
Y 282	235		39.5	28.6	6.6	12.1	585.0	240.0	
Y 283	1300		26.5	198.6	27.0	61.5	525.0	140.0	
Y 284	235		47.0	35.4	7.4	15.1	575.0	160.0	
Y 285	* 2000		13.0	97.6	15.6	34.7	355.0	95.0	
Y 286	285		65.0	32.9	6.0	13.5	235.0	65.0	
Y 288	2000		9.7	47.0	8.5	18.7	285.0	110.0	
Y 291	* 1300		26.5	225.2	25.7	61.5	585.0	160.0	
Y 292	* 830		21.5	63.9	11.5	26.6	490.0	145.0	
Y 293	850		21.5	56.6	10.4	23.6	365.0	95.0	
Y 294	* 830		28.5	97.7	16.5	36.8	585.0	125.0	
Y 295	* 600		29.0	62.8	11.4	26.0	590.0	165.0	
Y 296	* 880		18.0	30.6	5.7	12.3	100.0	25.0	
Y 297	* 600		25.5	53.2	9.9	22.0	590.0	240.0	
Y 298	* 2000		14.4	120.7	17.6	39.5	355.0	140.0	
Y 299	* 880		17.5	29.4	5.6	11.8	100.0	25.0	
Y 300	830		28.5	97.7	16.5	36.8	585.0	125.0	
Y 301	* 880		30.0	54.6	10.6	22.7	100.0	30.0	
Y 302	A 2000		13.8	86.8	13.0	28.5	255.0	50.0	
Y 303	A 200	P	74.0	8.4	1.2	2.5	125.0	75.0	
Y 304	* 850		20.5	53.1	9.8	22.2	340.0	80.0	
Y 306	500		16.0	13.6	3.6	5.7	50.0	17.0	
Y 308	500		22.5	19.2	4.5	8.6	38.0	12.0	
Y 309	500		17.0	14.5	3.7	6.1	45.0	10.0	
Y 311	500		16.0	13.4	3.6	5.7	55.0	24.0	
Y 312	550		20.0	29.3	6.4	12.9	485.0	195.0	
Y 313	* 830		26.0	84.1	14.8	32.8	410.0	135.0	
Y 314	2500		11.9	71.3	10.4	21.8	72.0	11.0	
Y 315	235		29.5	20.2	5.6	9.0	665.0	225.0	
Y 316	830		25.0	79.2	14.0	31.3	600.0	195.0	
Y 317	1000		10.7	16.5	3.8	7.1	50.0	13.0	
Y 318	220		27.5	8.7	3.0	4.2	57.0	12.0	
Y 319	400		22.0	7.6	1.7	2.9	66.0	35.0	
Y 320	550		19.0	27.4	6.2	12.0	357.0	147.0	
Y 321	550		18.5	26.6	6.1	11.6	270.0	135.0	
Y 322	2000		15.0	131.7	18.6	41.8	262.0	120.0	
Y 324	500		20.0	17.3	4.1	7.4	46.0	15.0	
Y 325	1300		23.5	164.3	22.1	50.7	525.0	110.0	
Y 326	500		17.5	14.9	3.8	6.3	28.0	17.0	
Y 327	500		17.5	14.9	3.8	6.3		21.0	
Y 328	300		39.0	7.7	1.3	2.6			
Y 328	850		15.5	15.7	3.1	6.3			
Y 329	1080	P	23.0	62.2	10.1	22.0	255.0	65.0	

CODE	RES	WNOG ARNG	OPERATE CURRENT	OPERATE TIME			RELEASE TIME		
				MAX	MIN	AVG	MAX	MIN	AVG
Y 329	1000	S	36.0	130.5	12.5	30.3	255.0	65.0	

MISCELLANEOUS
SECTION

CODE	RES	WNDG ARNG	OPERATE CURRENT	OPERATE TIME			RELEASE TIME		
				MAX	MIN	AVG	MAX	MIN	AVG
NOTE									
U 1131	2500	1	14.6	119.4	13.3	30.5	16.4	2.5	6.6
U 1403	4000	1	8.6	102.7	12.1	26.2	15.1	3.9	9.1
U 1450	4000	1	8.9	115.8	12.3	27.8	20.5	2.8	8.9
U 304	1400	1	S 27.0	92.8	6.4	15.3	28.0	4.2	12.4
U 429	1400	1	S 27.5	112.1	6.6	15.8	25.2	3.5	11.1
U 943	2700	1	S 14.6	182.5	8.7	21.4	26.0	3.6	11.6
U 1160	* 2700	1	S 14.0	116.6	8.3	19.7	21.6	3.1	9.7
U 1169	1400	1	S 27.5	112.1	6.6	15.8	25.2	3.5	11.1
U 1283	1150	1	S 35.5	174.8	5.5	14.0	21.2	2.8	9.3
U 927	1300	2	S 33.5		3.1	8.1	29.8	4.8	13.3
U 998	500	2	S 90.0		3.2	6.7	38.8	7.8	18.5
U 746	800	2	S 56.0		14.7	42.3	103.3	20.4	
U 6048	700	2	S 61.0		4.2	11.1	13.1	1.9	6.5
U 6094	700	2	S 61.0		4.2	11.1	12.3	1.7	5.9
Y 64	850	2	P 48.0		21.4	57.5	330.0	60.0	
U 1068	1800	3	P 32.0				27.1	3.6	12.3
U 1068	1900	3	S 44.5				27.1	3.6	12.3
U 1433	1300	3	S 46.0				26.1	4.0	11.9

NOTE 1 - Large max to min operate time ratios result, because the current through the relay under conditions of 45 volt battery and max coil resistance only slightly exceeds the listed operate current.

NOTE 2 - Max operate time calculations are not possible because the current through the relay under conditions of 45 volt battery and max coil resistance is below the listed operate current.

NOTE 3 - Operate time calculations are not possible because the current through the relay under any condition of battery voltage (45 to 50 volts) and coil resistance is below the listed operate current.