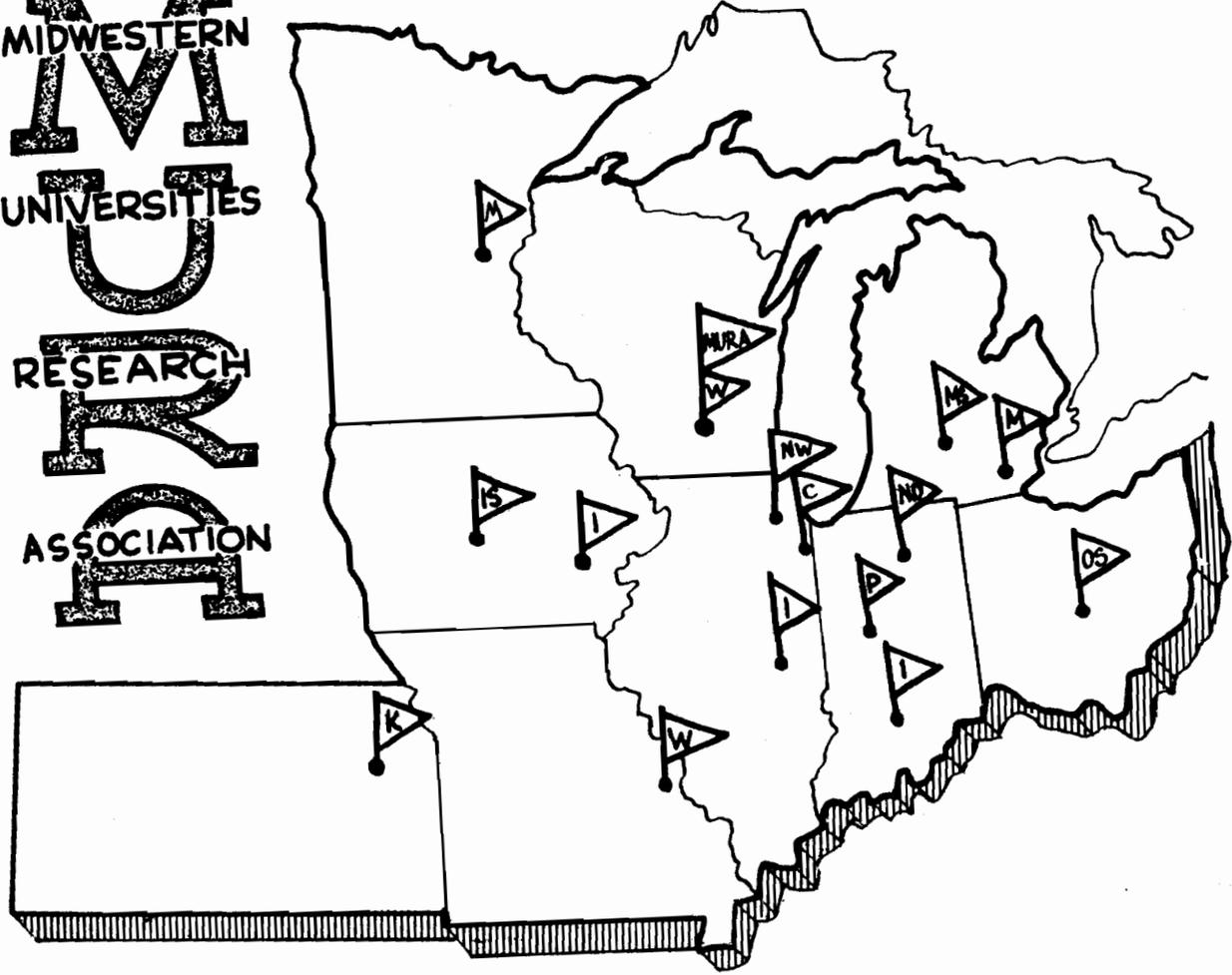


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REPORT MISHMASH
(Program F23)
DATACHECK
(Program F28)
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Computer Programs
(Internal)

MISHMASH
(Program F23)
&
DATA CHECK (Program F28)

G. A. Westlund

As work progresses on the two-way model, many field measurements are made. The values are punched on cards. Since tape is over 30 times faster than cards as an input medium, this program was designed to make these fields readily available to other computer programs via tape.

For the purposes of this program, the two-way model is divided angularly into eight blocks of 45 degrees each. The block numbers are four digit combinations of the first and last (fourth) magnets within each block. They are:

1122
1525
0119
0405
1729
0934
0328
0826

Measurements are accepted at one centimeter intervals along a radius and one degree intervals around the machine within a block.

The range of radii for Mishmash is 100 to 225 centimeters, and the range of angle numbers within a block is 1 to 45.

CARD FORMATS

Only one of the eight blocks can be processed by Mishmash during a run. The cards for that block must be divided into groups of constant angle number and varying radius. If the scale factor changes within a group, that group must be further divided to reflect the change.

Each group of cards must be preceded by three "control" cards and terminated by one "end data" card.

The three control cards specify the (1) the block number, (2) the angle number, and (3) the scale factor. Starting in column one or two of the card, the number 1, 2, or 3 is punched. This is followed by a blank column and then the value of the control. The block number has four digits, the angle number has two digits, and the scale factor has five digits plus a decimal point (and negative sign if minus).

The field data cards are punched as follows (starting in column one or two): Three digit value of the radius (in centimeters) blank, field value of five digits plus decimal point (and negative sign if minus).

The "end data" card contains the words END DATA starting in column 37. The first two columns must be blank.

Any card can contain comments, provided at least two blank spaces appear between the data and comments.

TAPE FORMAT

Before the first Mishmash run is made on a tape, the tape must be prepared by PRELUDE TO MISHMASH (program F23A). This program needs no external data. It merely writes 1008 records on the tape. Each record consists of 47 words. The first word contains the block number, the second word contains the radius in centimeters, and the 3rd through 47th contain the value zero. These last 45 eventually receive the field values from Mishmash. Of the 1008 records, the first 126 are identified by the block number 1122, the second 1525, etc. The first record within a block is identified by the radius value 100, the second 101, the last 225.

As each run of Mishmash is made, the old value of a field is replaced by the new.

PRINTING

As each group of cards is read, the field values are listed via the 716 on-line printer. They are then multiplied by the scale factor and stored in core memory. This process is repeated until all the cards are read. Then an image of the tape within the block, and within the range of radii encountered, is printed. This print includes all 45 angles for each radius whether encountered or not.

TAPES USED

Modifications to the magnets are reflected in different sets of measurements. There are currently four such sets. The tapes prepared from these sets are labeled MISHMASH 1, MISHMASH 2, etc.

In order to have an old and an updated tape within each set, they are further labeled MISHMASH 1A, MISHMASH 1B, MISHMASH 2A, etc.

When making a Mishmash run, the current tape (either MISHMASH A or MISHMASH B of the proper set) is mounted on tape drive 2. The older of the two is mounted on tape drive 3. When the run is complete, the updated tape on drive 3 is labeled NEW and the other on drive 2 is labeled OLD. To alleviate later failures in running with the new tape, it is checked for machine errors by copying it onto an erasable tape. This is ~~done~~ by loading the MISHMASH program

deck again, but without any data cards. Since the duplication process requires reading of the new tape, it can be considered free from machine error if the duplication is successful.

DATACHECK
(Program F28)

G. A. Westlund

This program, suggested by G. Parzen, provides a check on the accuracy of field measurements stored on a MISHMASH tape. It plots values of H_z/r^k versus r for each θ , where H_z denotes the field measured on the two-way model, r is the radius in centimeters, θ is the angle in degrees, and k is set to 9.3 unless otherwise specified.

A plot scale factor (set to .00035 unless otherwise specified) is available. The plot contains a point at $r = 101$ and $H_z/r^k = S + H_z/r^k_{\min}$, where S is the scale factor. Since the range of non-zero values of H_z/r^k determines the scale of the plot, a large value of S tends to shrink the rest of the plot accordingly.

The field measurements on the MISHMASH tape are grouped in eight blocks of 45 angles each. This program provides plots from angle θ_1 within block B_1 to angle θ_2 within block B_2 . Within each plot, points appear from radius R_1 to R_2 . The block numbers, in the order found on the tape, are 1122, 1525, 0119, 0405, 1729, 0934, 0328, and 0826.

The parameters are entered on a standard MURA-FORTRAN agendum sheet. Each run must be entered on a separate sheet, since DATACHECK is incapable of providing for a series of runs. The parameters with their addresses are:

1	B_1	5	k
2	θ_1	6	S
3	B_2	7	R_1
4	θ_2	8	R_2

