

Memorandum M-2570

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Division 6 - Lincoln Laboratory
Massachusetts Institute of Technology
Cambridge 39, Massachusetts

SUBJECT: MAGNETIC DEVICES INC., A TRIP REPORT

To: Those Listed

From: F. Sandy

Date: December 15, 1953

ABSTRACT:

Magnetic Devices, Inc. of Fredrick, Maryland was visited to determine whether rotary relays showed enough promise for either marginal checking or power distribution use to warrant further investigation. It was our conclusion that such was the case and some of these relays should be obtained for the purpose of laboratory test.

On December 10, 1953, R. Sugatt & F. Gewickie of IBM, J. Gano, and F. Sandy of MIT visited Mr. Price of Magnetic Devices, Inc. in Fredrick, Maryland for the purpose investigating the possible use of rotary relays in the power distribution and/or marginal checking systems for XD-1 and XD-2.

The actuating mechanism of the relay is essentially a motor whose shaft rotates a series of cams which close or open contacts as desired. The motor rotates approximately 30° when energized.

The contacts are mounted on insulating rings. The movable contact is riveted to a spring of phospher bronze and soldered. The spring is wrapped around a solid silver post and held there by pressure. It is also soldered to the post to give additional conductance. The posts and the flat of the spring are mounted in a plane parallel to the motor shaft. The post is held in position by a copper bar mounted on the insulating ring and extending inward in a radial direction. The stationary contact is another solid silver post mounted in the same manner.

Normally open contacts are driven closed by the cam. Normally closed contacts are driven open by the cam. The N.O. contacts follow the cam when opening due to the spring pressure. The N.C. contacts follow the cam when closing. This makes positive closing of the N.O. contact and positive opening of the N.C. contact.

When the N.O. contact is closed by the cam, the cam deflects the spring, causing the movable contact to wipe against the post. The N.C. contact also wipes against the post when it closes due to the spring tension.

One insulating ring with its associated contacts, cams, etc is called a deck. 2 SPDT switches or 4 SPST switches may be obtained per deck. The standard deck can accommodate three different sizes of contacts which are referred to as "5 Amp", "10 Amp", and "20 Amp". However, these ratings are for 110V. A.C.

The motors are available in three basic sizes, depending on the number and size of contacts required. The intermediate size can be obtained in either of two coil sizes, giving in effect 4 different motor sizes.

Mr. Price is going to make up five special relays for IBM and send MIT duplicates for testing purposes at no cost. We are, in turn, to supply him with our test data.

The five relays that Mr. Price will supply will be designed as follows:

Relay # 1-P-3600 (smallest size) driving motor with 48V. D.C. coil, with 2 make-before-break SPDT contacts of "5 Amp" rating. These contacts will handle 5 Amp at 250V. D.C. if it is not required to break the current. It is believed that this relay can be used for the marginal checking relay.

Relay # 2- A relay with suitable N.O. contacts and driving mechanism to make and break the following voltages and currents:

| | |
|--------|--------------------|
| +250V. | $\frac{1}{4}$ Amp. |
| +150V. | .7 Amp. |
| +90V. | .2 Amp. |
| -15V. | .015 Amp. |
| -30V. | .015 Amp. |
| -150V. | .075 Amp. |

Relay # 3- A relay with suitable N.O. contacts and driving mechanism to make and break the following voltages & currents:

| | |
|--------|---------------------|
| +250V. | $2\frac{1}{2}$ Amp. |
| +150V. | 4.2 Amp. |
| +90V. | .7 Amp. |
| +10V. | 10 Amp. |
| -15V. | 1.2 Amp. |
| -30V. | 4.2 Amp. |
| -150V. | 4.2 Amp. |
| -300V. | .05 Amp. |

Relay # 4- A relay with suitable N.O. contacts and driving mechanism to make and break the following voltages & currents:

| | |
|--------|---------------------|
| +250V. | 19 Amp. |
| +150V. | 15 Amp. |
| +90V. | 20 Amp. |
| +10V. | 10 Amp. |
| -15V. | 5 Amp. |
| -30V. | $2\frac{1}{2}$ Amp. |
| -150V. | 15 Amp. |
| -300V. | 1 Amp. |

Relay # 5- A relay with suitable N.O. contacts and driving mechanism to make and break the following voltages & currents:

| | |
|--------|-----------|
| +500V. | .6 Amp. |
| +250V. | .722 Amp. |
| +150V. | .6 Amp. |
| +90V. | .12 Amp. |
| +10V. | .5 Amp. |
| -150V. | .9 Amp. |
| -300V. | .006 Amp. |

It is hoped that relays #2, #3, #4, & #5 can be used to provide all the power distribution switching needed for the XD1 & XD2.

B. Paine at MIT has agreed to test these relays to see if they are suitable for our application.

Signed *G. Ferrell Sandy*
G. Ferrell Sandy

Approved *Hugh Wainwright*
Hugh Wainwright

GFS:cd

cc:

S. Dodd
J. Gano
H. Hogdon
A. Kromer
A. Nelson
B. Paine
C. Watt

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