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50X1

24 January 1955

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To:

From:

Subject: Progress Report on Projects 319 and 321

P102 P103

Attached is original and one copy of the status report on Projects 319 and 321 dated 24 January 1955, signed by 50X1

Research Engineer. 50X1

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DOCUMENT NO.
NO CHANGE IN CLASS. ☒
☐ DECLASSIFIED
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AUTH:
DATE: 8/10/91 REVIEWER: 037169

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B-303

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Copy No. 1 of 1

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P-102

January 24, 1955

TO: [redacted] 50X1

SUBJECT: Status Report on Projects 2-319-E and 3-321-E

The status of projects 2-319-E and 3-321-E is approximately 80% complete. The Instruction Handbook for the use of the catalog is being edited for the final report. To date the status of the catalog work is as follows:

Number of data sheet transcriptions	1550
Number of finished punched cards/file	410

The financial status of the projects is as follows:

Total expenditure of 2-319-E	$35,301.69
Total expenditure of 3-321-E	14,680.51
Balance as of 15 January, 2-319-E	7,840.31
Balance as of 15 January, 3-321-E	10,229.49

At the present time there are two full-time technicians transcribing data from catalogs, coding, and notching the punched cards. Their present rate of production is 500 transcriptions per week. The rate of expenditure, including all personnel and supplies, is of the order of $500. per week.

The following items are submitted for your comment and/or approval.

1. The "Procedure for use of Punched Card Index" has been rewritten with the inclusion of a sample card. Final reproduction of the Handbook will be delayed pending your approval of the attached copy of this rewrite.

2. The scope of work, defining the two projects is not clear as to whether or not file cabinets are to be included with the catalogs. If file cabinets are required, then it is desirable to include a vibration table with each file. The use of a vibration table greatly reduces the work required for a given selection, and increases the probability of obtaining all cards that are punched according to the desired code.

3. If cabinets are required, then approval is requested of the enclosed file drawer design sketch. This design estimates at approximately $18 per drawer.

[redacted] 50X1

Research Engineer

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II. PROCEDURE FOR USE OF TRANSDUCER AND ACTUATOR INDEX

Unisort cards measuring 5 by 8 inches are used in this index. These cards have a double row of holes on each side, and four holes per linear inch. The indexing of these cards is done by using 11 punched hole codes which are arranged on the card as shown in Figure 2. These codes are:

CODE NO.	CODE TITLE	INFORMATION
1.	Application	Physical quantity measured or produced (transducer input or actuator output)
2.	Range	Range of physical variable shown in code No. 1
3.	Operating Principles	Method of energy conversion
4.	T A	Transducer or actuator
5.	Electrical variable	Electrical parameter changed as a function of input or output
6.	Sensitivity	Magnitude of electrical parameter change with application quantity shown in code No. 1.
7.	AM FM PM	Type of modulation of electrical parameter
8.	Size	Volume
9.	Frequency range	Dynamic frequency range of application quantity
10.	Aux. Power	Power other than signal power required to make device operate
11.	Manufacturer	Vendor

The procedure for locating an actuator or transducer, or punching of cards is as follows:

Code 1. The quantity to be measured or actuated is found in the "List of Measurable Physical Quantities" (alphabetized). When the parameter can be measured or actuated directly, the particular code to be used in Code 1 will be found opposite the term. In this and all other codes which involve deep and shallow holes, the deep holes will be designated by a line underscoring the code number. When the quantity cannot be found or a code is not given opposite the parameter, a device for performing the job is not on the market at the present time. The task, therefore, is left to the ingenuity of the designer. Also given in the list of "Measurable Physical Quantities" are the MLTQ units of the quantity which are also the

units that are used in the sensitivity code. The reciprocal of the sensitivity units is used as the range (code 2) units. The application of the device on the sample card, Figure 3, is Pressure; locating this quantity in the list of "Measurable Physical Quantities" it is seen that the code is 257 234, thus the punches are made appropriately.

Code 2. The Range of Variation of the quantity to be measured or actuated is selected according to the mnemonic printed on the punched card. This code is broken up into three units. The first, for the digit of the lower end of the range. The second, for the power of ten from the low end to the high end of the range. This unit will be punched in series, i.e., when a transducer has a range from 4×10^{-1} to 6×10^{4}, this unit will be punched 10^{-1}, 10^{0}, 10^{1}, 10^{2}, 103, 10^{4}. The third unit is the code for the digit of the upper end of the range. The units of the range code will be the reciprocal of the sensitivity unit. A given number is coded or located by notching the holes whose diagonals intersect at the number. In this code, a distinction must be made between the upper and lower figures. In the mnemonics used in this index two punches are required to indicate one number; one deep, and one shallow. For the upper number at the intersection of diagonals the deep punch is one the left, for the lower number the deep punch is on the right. Referring to Figure 3, the lower range digit is 0, the power of ten of the range is 10^{-3}, 10^{-2}, 10^{-1}, the upper range digit is 3, the closest inclusive digit is 2, therefore the appropriate holes have been notched.

Code 3. In the event that the associated amplifier or modification network electrical characteristics are known, it is possible to select units on the basis of their operating principle. This is done by referring to the chapter entitled "Operating Principles" to locate the holes that must be picked in order to select the desired operating principle. In Figure 3, the sample card is of the strain gage type, which is catalogued as "Variable Resistance, Crosssection," therefore the proper holes are notched 234.

Code 4. This code is used to separate the transducer cards from the actuator cards. Two holes are used; the first for transducer (T), the second for the actuator (A). Referring to Figure 3, since the input is mechanical and the output is electrical, the device is a transducer, therefore the appropriate hole is notched.

Code 5. This code permits the user to select a transducer or actuator according to the electrical variable parameter. The code consists of six linear holes labelled R,L,C,F,V,I which stand for variable resistance, inductance, capacitance, frequency voltage, and current. The deep holes in this code will not be used. Referring to Figure 3, since the device operates by changing its resistance the electrical variable is notched R.

Code 6. The sensitivity code consists of seven holes, and a printed mnemonic. This code is used to express the power of ten of the magnitude of the sensitivity which is expressed as the change in output parameter per unit change of input parameter for a transducer, and vice versa for the actuator, e.g. 2MV/°C, or 3 in oz/ampere. The mnemonic for this code

What are electrical units?

How do we know whether it is mV or V

is used exactly as the one for the range code. Referring to Figure 3, the sensitivity is .053V/PSI (on 5.3×10^{-2}); therefore the appropriate holes are punched.

Code 7. This code, which gives the type of modulation of the electrical signal, consists of three holes labelled AM, FM, PM which stand for amplitude modulation, frequency modulation, and pulse modulation. The deep holes are not used. Referring to Figure 3, the device varies resistance in a continuous manner. This has no effect on frequency, therefore the appropriate hole, AM, is notched.

Code 8. This code is the volume or size code. It consists of four holes, labelled 0,1,2,3 which stand for the power of ten of the volume expressed in cubic inches, 1, 10, 100, 1000 cu. in. The deep holes will not be used. Referring to Figure 3, the size is 6 cu. in., therefore the hole labelled, 1, is punched. The next larger power of ten is always used; ~~e.g.~~ i.e. the code is inclusive.

Code 9. This code, which states the dynamic frequency range of the input or output variable, consists of seven holes. The holes are labelled S, 1,2,3,4, 4.3,5; each stands for the power of ten of the frequency (static, 10 cps, 100 cps 1000 cps, 10,000 cps, 20,000 cps, 100,000 cps). The deep holes are punched only when the device responds from static to some higher value. Referring to Figure 3, the device is useful over the range from 0 to 10 cps; therefore S was punched deep, 1 was punched deep. 2 also punched in Fig. 3

Code 10. This code describes the type and amount of electrical power, other than signal power, required to make the device operate. The code consists of six double holes labelled:

A = active, auxiliary power not required
-1= 0.1 watt
0 = 1.0 watt
1 = 10.0 watts
2 = 100.0 watts
3 = 1000.0 watts

The shallow holes indicate AC power required; the deep holes that DC power is required. Referring to Figure 3, 0.2 watts either AC or DC is required, therefore the deep hole is notched.

Code 11. This is the manufacturer's code and is set up for use in servicing the index. The names of the manufacturers are listed in alphabetical order and have a code listed beside them. When new literature is obtained from the manufacturer, all of his cards may be dropped out and perused for the new material to determine whether or not it is duplicated.

It is understood that the codes punched for a particular device will include the capabilities of the device and will not magnify them. The remainder of the holes are not utilized; however, they can be used for future expansion of the code.

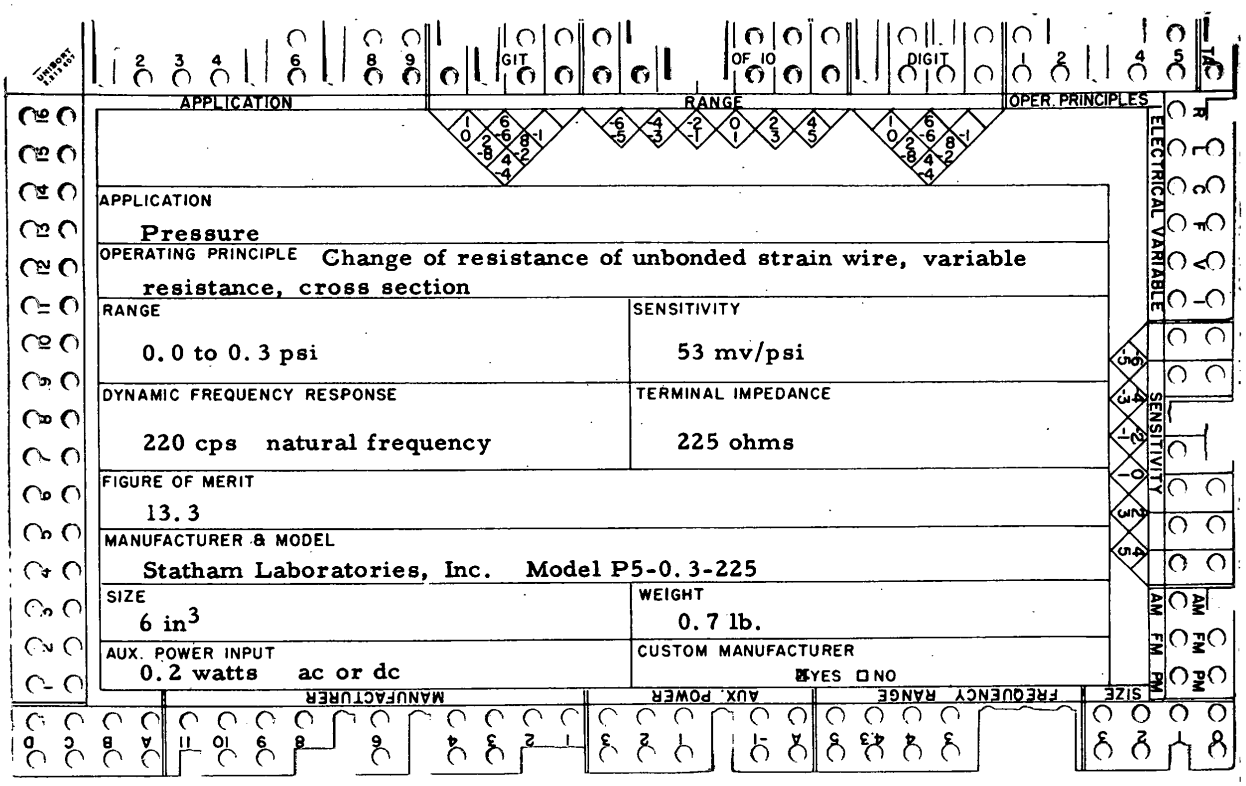

FIG. 3 EXAMPLE OF CODED UNISORT CARD.

File Drawer for Transducer & Actuator Card File