Console Defining Routine

While the definition of the console display and entry devices are under program control and therefore arbitrary, an initial console defining routine has been provided for running programs under operator control. Provisions have been made for the running programs in several different modes and with a variety of display and entry formats. Both the formats themselves and the keys governing them have been chosen so as to be easily understandable.

Display and Entry

Display and entry of information may occur during the running of program under console control or when no program is actually being executed. In both cases the choice of what information is to be displayed and the information in which it is to be displayed is controlled by the setting of certain mode switches. In the later case display or entry actions must be initiated by setting one or more of the key-light action switches on. Ordinarily, if no program is being executed, the unit signal key must be pressed after the console switches have been set, however, in certain situations the latching of one of the action keys on will result in the computer repeating a read and write cycle on the console every one half second.

Mode Switches

The mode switches may be divided into 2 groups, those specifying the memory location to be displayed or entered and those specifying the format.

Address Mode Switches

1. Address per Data Entry Address ADE

The Data Entry Address is a running address, remembered by the console defining routine, primarily used for displaying or entering a sequence of locations in memory. After each reference to it is made, it is incremented by one. When this switch is on the address will be taken from the DEA and the DEA itself will appear in the right hand address digits.

2. Address per Digital Potentiometers ADP

When this switch is on, the address of the displayed or entered location will be taken from the right digital potentiometer. Any address from 0 to 127 may be specified by setting the Digital Potentiometer to the appropriate place. The address of the displayed or entered location will appear in the right hand address digits.

NOTE

If neither of the above switches are on, the address will be taken from the Data Display Instruction. The Data Display Instruction specifies both an address and a format. It may be used to specify the format, the address, or both. It is explained under the heading of Format Mode Switches.

Format Mode Switches

In determining a Format Mode, both the Format of the information in memory and the format on the display must be established. In some cases, one of these may be implied while in others both must be specified.

If none of the format mode switches are on, the memory format is implied to be an instruction and the display is implied instruction display. The instruction display format depends on the particular instruction displayed. Table III gives the display format for all of the instructions.

3. Effective address EFA

This switch, when on, will cause any instruction displayed to have its effective address displayed rather than the nominal address. In the case of Integer Arithmetic and connect instructions, the length, byte size, and offset will also be displayed as they would be after indexing. In the case of entry, EFA on will cause a reversal of the indexing process to occur so that the stored instruction will have a nominal address which when indexed will have an effective address equal to the displayed address.

If the EFA switch is on when a display or entry address is being taken from the Data Display Instruction, the effective address of the instruction will be used.

4. Index or Control Word XCW

This switch causes the memory word to be interpreted as an index or control word and be displayed in the Index or Control Word Display as in Table II. The display will be in decimal unless the octal switch is on in which case the display will be in octal.

5. Display Floating Point DFP

This switch causes the display to be in either decimal or octal floating point, as in Table II, depending on the setting of the octal switch. This switch does not imply a memory format. Either MFP or DIM must be on.

6. Memory Floating Point MFP

This switch specifies that the memory format is floating point, and may be used either alone or with DFP. If DFP is on, then the display will be in floating point format. If not, the display will be in fixed point format, as in Table II.

7. Data Display Instruction Mode DIM

Because the computer has the facilities for handling variable field lengths and both binary and decimal fields of varying byte size, display or entry format of a large class of numbers may be specified by providing an instruction that would typically handle such a number. This also allows the operator to view the operand of a displayed instruction in its most likely format. If an instruction from the Data Display has been entered as the Data Display instruction, various parts of the memory and display formats may be specified as a function of that instruction by having DIM on. Because the effect of DIM on is not independent of the setting of the other switches, a complete understanding is best obtained by studying all possible combinations of formats, while a list of the various formats specified by the several settings is given in Table II. Table IV indicates the effect of the DIM format on the display format.

8. Octal DOC

This switch specifies that any numerical information present in the display be in octal rather than in decimal format. It may be used with other display modes, however, if used alone it will result in a full word of memory being displayed in octal just as it appears in memory.

9. Binary Lights or Binary Keys BLK

This switch is used if it is desired to display a half word of memory on the binary lights or to enter a half word from the binary keys. The address of the word entered or displayed will be obtained from the same source as it would have if the BLK switch were off.

Display and Entry Actions

There are six action key-lights. These are ordinarily used for "one time" actions and are therefore usually "touched" on, being turned off after having been read. All of these actions must be initiated by the unit signal with the exception of the continuous display feature.

1. Display DIS

This key causes the specified location in memory to be interpreted and displayed in the specified format. Latching this switch on results in repeated reading and writing on the console at half second intervals. A common use of DIS latched on is in conjunction with ADP. This permits the operator to run backward and forward through the arithmetic and index registers, stopping at will.

2. Enter ENT

This key causes the contents of the Data Display to be entered into the specified location in memory. The same set of mode switches cause inverse routines to those evoked by DIS to interpret the display and prepare the desired memory format.

3. Establish Data Display Instruction EDI

This key causes the contents of the Data Display to be entered as the Data Display instruction. The EFA determines whether inverse indexing is performed or not prior to its being stored.

4. Set Data Entry Address = Right address switches DER

5. Set Data Entry Address = Left address switches DEL

6. Set Data Entry Address = Data Display DED

These three cause the Data Entry address to be set to the contents of the Right or Left address switches or the data display.

R. F. Arnold

RFA/pkb

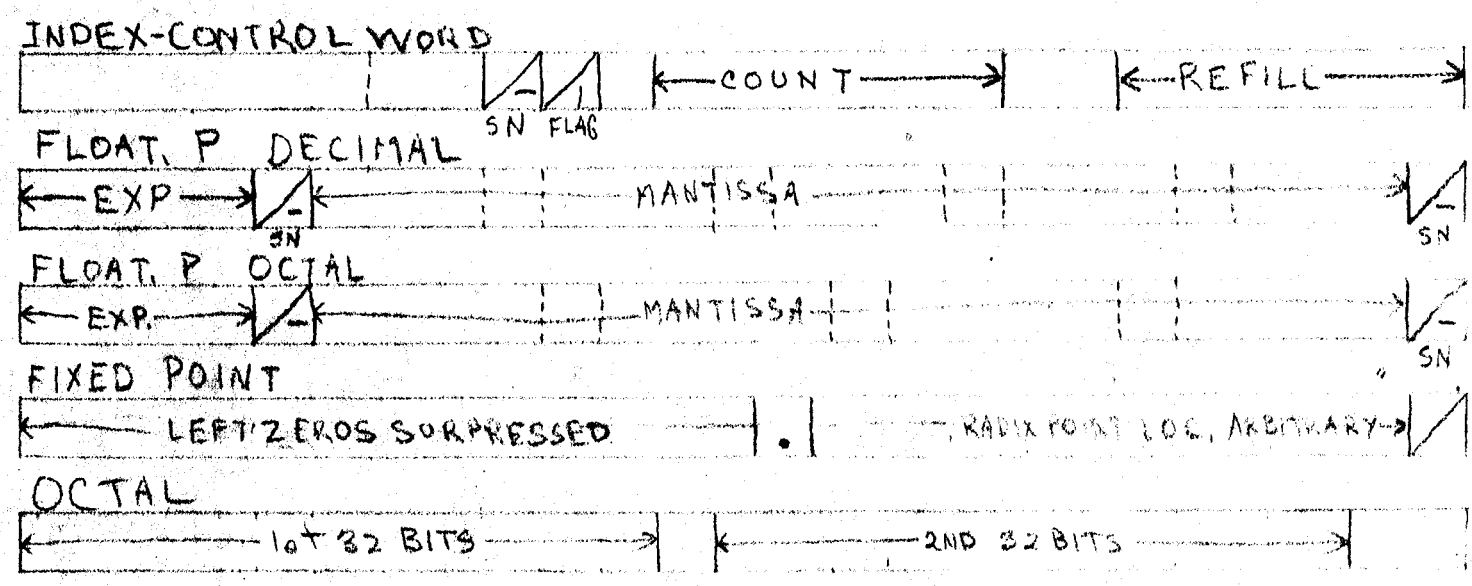
I MODE SWITCH SETTINGS

I MEMORY FORMAT

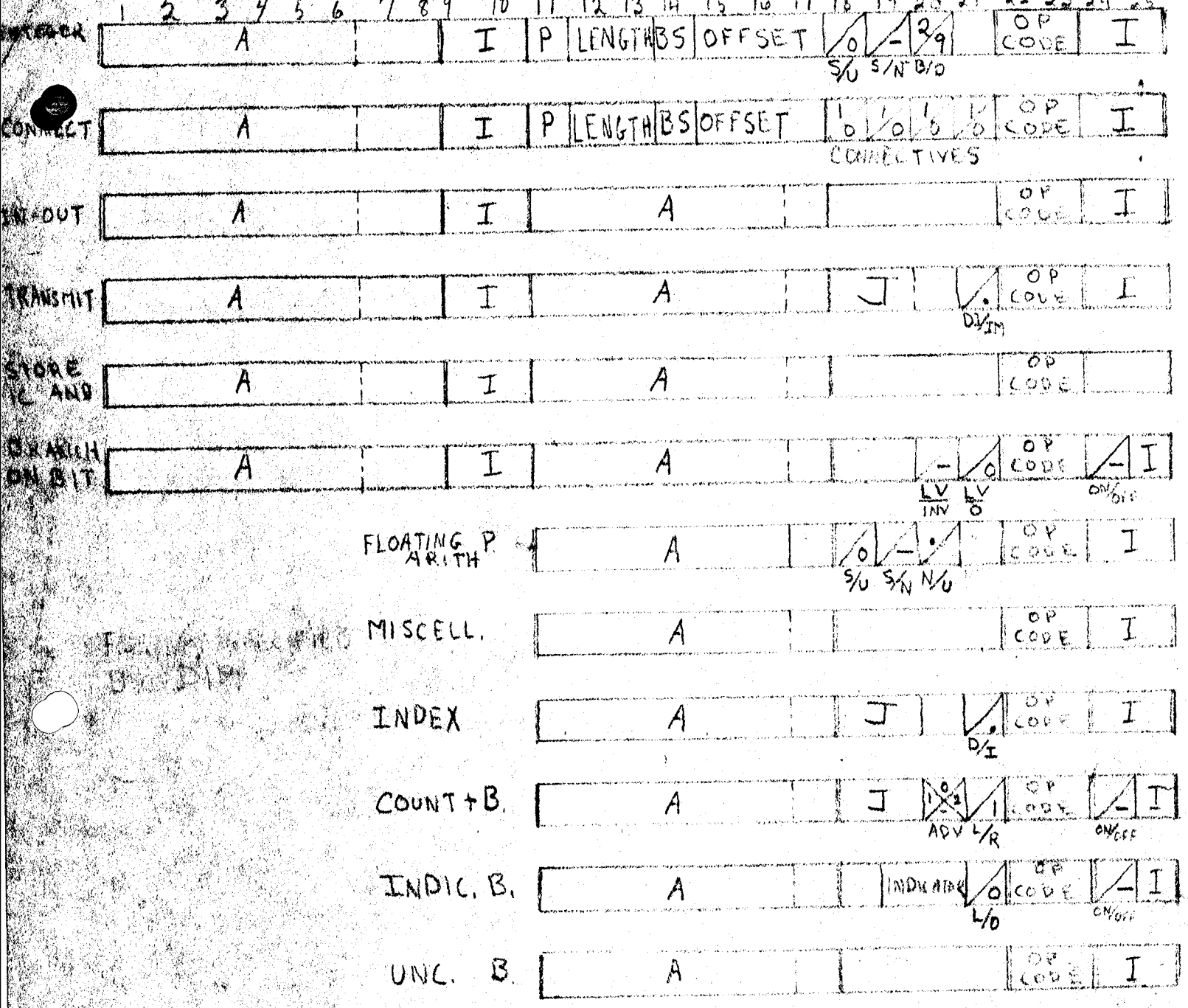
DISPLAY FORMAT

	INSTRUCT.	FLOAT. P.	BINARY OR B.C.D.	INDEX OR CONTROL
INSTRUCT.	NO SWITCH			
FLOAT. P.		DFP MFP OCT(OPTION)	DIM DFP OCT(OPTION)	
FIXED P.		MFP OCT(OPTION)	DIM OCT(OPTION)	
INDEX OR CONTROL				XCW
OCTAL (STRAIGT)	OCT	OCT	OCT	OCT

II DISPLAY FORMATS



III INSTRUCTION DISPLAY



THE P FIELD

I Bits	DISPLAY
000	☒
100	•
001	1
010	2
011	3
101	5
110	6
111	7

IV FORMAT SPECIFIED BY VARIOUS ORDER TYPES FOR DIM

INST.	DISPLAY
INTEGER ARITH - RADIX POINT SPECIFIED BY OFFSET BYTE SIZE, LENGTH, DECIMAL/BINARY SPECIFIED BY INSTRUCTION	FIXED POINT
CONNECT	
OCT ON -	STRAIGT
OCT OFF -	FIXED POINT
IN-OUT INDEX	INDEX-CW
TRANSMIT	STRAIGT
STORE IC + BRANCH ON BIT MISCEL COUNT + BRANCH INDICATOR BRANCH UNC. BRANCH	INSTRUC.
FLOATING POINT	FLOATING P.