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DIBBUK Users Guide

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Introduction

DIBBUK is a computer aided system for DATACON instrumented beams based on user keyboard commands. It replaces a variety of obsolete manual controls of secondary beam line power supplies that have been used at the AGS. At present, DIBBUK performs such functions as running magnet power supplies, monitoring them and alarming on faults, saving and restoring different running configurations and providing a TUNE BOX for a computer aided manual control. This users guide will be updated as other types of devices are added to the system. The report consists of four sections. Section I describes the available tasks and how they may be used while Sections II and III describe the instruction formats and nomenclatures used. Section IV applies only to the console terminal (EAO).

I. Task Description

A. ABORT

The ABORT task terminates the execution of all active tasks at the user terminal except for TUNE and SET. Should the above two tasks be running, ABORT will not be scheduled.

B. CALBRT

The CALBRT task calibrates the digitizing circuitry. Should the calibration exceed predetermined limits, the element is placed on deferred status. This task may be scheduled by the user, although it is automatically scheduled by MONITR, UP, and IDLE. Unlike the other tasks, CALBRT will not automatically remove an element from deferred status when it is initially scheduled. (See Section II.)

C. DUMP and RESTOR

These two tasks permit the user to store (DUMP) and retrieve (RESTOR) up to 20 element parameter files. Every user has a preassigned core area and disk space where the element parameters are stored. With the SET and TUNE tasks (as described elsewhere) the user may specify the setpoint, tolerance, and polarity of any element. These new parameters may be stored for a future running configuration by scheduling DUMP. The task requests the user to specify the file where the information is to be stored (I2 format). If the file number is not within range, the task exits. If the task experiences a disk hardware error, the user is informed and asked to tell the EAO Watch. RESTOR types back the time and date when the requested file was created.

D. IDLE

To bring an element to its minimum regulating current one uses the IDLE task. The element must have its rectifiers on to be affected.

E. LIST

The LIST task outputs the present status of the specified elements. The first output line consists of the file number that is being used, the terminal number, the Julian date and the time of day. If there is a discrepancy between the polarity read back and that which is stored in the working file, a series of brackets < > is printed. If a particular element is being monitored a * is printed. LIST is automatically scheduled to run at one minute intervals when MONITR is running. Both the automatic scheduling by MONITR and the user scheduling of UNDEFR alters any previous operation subset for LIST, i.e. obviates the user of the LI, R <CR> command. (See Section II.)

F. MONITR

MONITR examines the status of the specified elements every five seconds. Should an element be out of tolerance, off etc., the element will be placed on deferred status. This results in a written message, an audible alarm on

the TUNE BOX (there is a reset button) as well as TTL and NIM levels obtainable at the BNC connectors on the front (NIM) and rear (TTL) of the TUNE BOX. If an element is deferred, it ceases being monitored. To continue the monitoring process for this element, one must schedule the UNDEFR task. In addition, there is a time interval select switch and an audible alarm or light switch on the TUNE BOX that controls the maximum allowable time interval for no transmissions from the computer. If for example, one sets the dial for a 10 second sampling period and there have been no transmissions during this time, an alarm is sounded. This is of particular use when the user is running MONITR, but is not near his terminal and he doesn't notice that DIBBUK has gone down. He will then receive either a visual or audible alarm and a TTL and NIM pulse. To terminate the MONITR task, one schedules ENDMON by typing EN.

G. OFF

To bring an element to rectifiers and blowers off, one uses the OFF task. One must first bring it to standby (see STNDBY). The element must be in the standby state to be affected. Should the element have its rectifiers on, it will be deferred.

H. ON

To bring an element to rectifiers and blowers on, one uses the ON task. The element is not necessarily in regulation. The initial state of the element is of no consequence.

I. SET

SET allows one to change the setpoint, tolerance, polarity software bit, and the hardware polarity of an element. The routine queries for input with the character #. The user must answer with a/, Element ID., No., and S = SETPOINT, T = TOLERANCE, P = POLARITY (Hardware), A = A SOFTWARE POLARITY BIT, B = B SOFTWARE POLARITY BIT.
e.g. /D03S <CR> (Change the setpoint of D03).
For a setpoint and tolerance change, the task outputs the present value, e.g., SETPOINT MAGNITUDE = 1514.

Task now awaits new input, e.g. 2306 (no decimal point is required).
By typing only a line feed, one does not alter the original value.
Task now types #, for a new command.
If the maximum setpoint or tolerance (100) is exceeded, a message is typed, but the original value is not altered.
e.g. 'MAXIMUM SETPOINT EXCEEDED = 3798', when user enters 3799 at the keyboard.
To exit from the task, the user must type X when the task is waiting for a new command, i.e. #.

When a hardware polarity change is requested, the element is read. If the element has its rectifiers on, the request is aborted and a message is typed out. If during the process of a polarity change there is a fault indication, several attempts are made to reset, and if that fails, the element is placed on deferred status.

When 'A' is specified, the task requests the scale factor which all the setpoints are to be multiplied by. The range of values is $0.0 < \text{scale factor} < 10.0$. The task then alters the setpoint values of all elements except for those that are inactive. It does not affect the element magnitudes. One must schedule the UP task to change the element magnitudes. If the setpoint exceeds the maximum allowable value, the task stores the extrema as the new setpoint.

J. STNDBY

To bring an element to rectifiers off and blowers on (standby) one uses the STNDBY task. The standby state is mandatory when the AGS is in a "Save-A-Watt" mode. The initial state of the element is of no consequence.

K. TUNE

The TUNE task permits the user to alter the element magnitude by manually changing the value of an up-down counter (TUNE BOX). The element specified by the dialed in octal address must be on, otherwise a new device will be requested. At the termination of tuning an element the setpoint is

set to the final tuned magnitude. TUNE outputs the following series of messages to the user (see below). Line #1 is the task identification. Lines #2 and #3 are messages for setting the element address on the TUNE BOX. When the address is set, the request of Line #4 should be executed. If the address is valid, Line #5 is printed. When the switch is enabled then Line #6; i.e., element identification, is printed and tuning begins. By putting the switch in the off position, tuning ceases and Line #3 is printed. The task can be terminated at any time by scheduling EXTUNE (EX).

1. (TUNE) TASK V01.
2. Set tune switch to off.
3. Set address and then set tune switch to on.
4. Set tune switch to off.
5. Set tune switch to on.
6. PS # 0479 element D03 is being tuned.

The green "locked in" light on the TUNE BOX indicates that the computer is actively scanning the box. After following the previous instructions, the red "tuning" light will also come on. This indicates that a particular element is actually being modified, i.e. being tuned. An element may be tuned even though MONITR is running and even if it is on deferred status.

L. UNDEFR

The UNDEFR task allows the user to remove the specified elements from deferred status; i.e., temporary software inactive status. The elements are specified in the task scheduling command. The task informs the user that the requested elements have been removed from deferred status. UNDEFR can be run while MONITR is running. The tasks IDLE, OFF, ON, STNDBY, UP and MONITR initially remove all deferred members of the operation subset from deferred status. (See Section II.)

M. UP

To bring an element to a specified setpoint, one uses the UP task. The initial state of the element is of no consequence.

II. Scheduling Tasks

All tasks are scheduled (enabled or disabled) by typing at the experimenters console in one of the following formats:

1. Task <CR> ..... <CR> = Return
2. Task, D03, Q45 ..... <CR>
3. Task, X, D03, Q45 .... <CR>
4. Task, R <CR>

Task refers to the name of the function desired. Only the first two letters of the task name are acceptable, otherwise the task is not scheduled. All elements are designated by a single character digit and a two character number. D03 or D3 is a valid entry. D037 is interpreted as D03.

The type (1) format requests that the task named, acts upon all the active elements that belong to that terminal. 'Active' means that the element is powered and available; i.e., not 'inactive'.

The type (2) format specifies which elements should be affected by the task named. If any of the elements cannot be acted on because of the reasons described previously, the element is ignored.

The type (3) format specifies that all elements except those named should be affected by the task named.

The type (4) format specifies, for MONITR, LIST and UNDEFR only, that the previously defined operation subset for that task be repeated again. This for example, obviates the necessity of retyping the string of elements to be listed every time one wants that list updated, i.e., it is a repeat command.

The software is structured to prevent the simultaneous running of logically conflicting tasks. If one requests a task that cannot run with one that is already running, a message to that affect is made. For example, one can run UP, MONITR, TUNE and LIST simultaneously, however, OFF and UP, cannot be. A bit pattern is typed out which specifies as to what is running (see below). One must either terminate (ABORT) or wait for the natural

termination of the conflicting task before one can schedule the new task.

The following tasks require only the task name. All other input is ignored:

1. ENDMON (EN)
2. DUMP (DU)
3. RESTOR (RE)
4. SET (SE)
5. TUNE (TU)
6. EXTUNE (EX)
7. ABORT (AB)

The SET and TUNE request their own element information. See separate task write-ups.

Upon the initial scheduling of MONITR, IDLE, OFF, ON, STNDBY and UP, those elements that are to be acted upon and are on a deferred status, are removed from the deferred state. This is NOT the case for CALBRT.

The bit pattern of active tasks is:

BIT #	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
	Terminal Active = Ø Inactive = 1	UNUSED	UNUSED	IDLE/OFF/ON/STNDBY/UP	MONITR/ENDMON	UNDEFR	UNUSED	DUMP/RESTOR	SET	LIST	TUNE/EXTUNE	UNUSED	CALBRT	ABORT	UNUSED	UNUSED

III. Nomenclature

1. Current Operation Subset: That group of elements which are being acted upon by a specific task.

2. Deferred Status: Status which prevents, other than by a manual intervention by the user, the software from acting upon the specified element. Elements that experience faults, drift out of tolerance, etc., are placed on this status.

3. Idle Status: An element that is at its minimum current setting is defined to be at idle.

4. In Regulation: The element is tracking the computer magnitude commands.

5. Inactive Status: The specified element is unavailable for any computer operations.

6. Invalid ADC Conversion: Hardware error. The hardware has sensed a faulty voltage digitization by the A/D circuitry.

7. Invalid Datacon Read Operation: Hardware error. The computer was unable to successfully read the magnitude and status bits of a particular element.

8. Invalid Datacon Set Operation: Hardware error. The computer was unable to successfully set the magnitude and sub-address of a particular element.

9. Minimum Value: The minimum regulated shunt voltage obtainable by the specified element.

10. Not = Shunt: The digitizing circuitry (A/D) is looking at a calibration reference voltage. The element shunt is currently not being monitored.

11. Off Status: The specified element is completely shutdown; i.e., blowers and rectifiers are off.

12. On Status: The specified element has its rectifiers on.

13. Reversing Switch Fault: Hardware error. The polarity reversing switch is sensed to be in an indeterminate state.

14. Schedule: To schedule a task, is to request its execution.

15. Setpoint Value: The stored magnitude at which the element is to be during its normal operation (target point). A magnitude of 1 count is equivalent to a 25 μV reading with a DVM.

16. Shared Status: Elements that are controlled and/or monitored by more than one user are said to be shared. The shared designation for a given user implies that he can only read the magnitude and status for that element, and that in no way can he interfere with the operation of that element.

17. Shunt: The digitizing circuitry (A/D) is looking at the element shunt.

18. Software Polarity Bit: That polarity which the software expects the element to be at. 'A' = polarity of the AGS main ring magnets.

19. Standby Status: The specified element has its blowers on, and its rectifiers off.

20. Sub-Address: The hardware multiplexer address which defines the voltage input presented to the digitizing circuitry (A/D).

21. Task: A task is any set of programmed logic that is separate from other sets of programmed logic, and whose execution can be directed by the operating system and whose initiation is caused by the user.

22. Tuning Status: An element which is tracking the magnitude settings of the TUNE BOX is said to be in TUNE status.

IV. Console Terminal Tasks (EAO only)

The console terminal allows one to get into the system monitor, therefore caution must be used in issuing commands to avoid bombing the computer. The console terminal has the ability to run three tasks. These are not available to other uses. They are BEAMS, FAILSF and STATUS. Terminals are numbered 0-7.

BEAMS

BEAMS lists on the console terminal or the line printer the present status of the specified beam line elements. The following are examples of how to run BEAMS.

(1) List terminal #2 just once.

```
↑C
.SC,BEAMS,2 <CR>
```

(2) List terminal #2 and repeat it every 120 seconds.

```
↑C
.SC,BEAMS,2, 120 <CR>
```

(3) Stop listing.

```
↑C
.DE,BEAMS <CR>
```

When the typing stops then type:

```
↑C
.SC,BEAMS,8 <CR>
```

(4) To output to the line printer.

```
↑C
.AS LP:,ERR <CR>
```

(5) To return output to the console terminal.

```
↑C
.AS,,ERR <CR>
```

FAILSF

FAILSF saves the user running files on a preassigned disk area. This is done every 20 seconds. FAILSF need only be scheduled at the initial loading of the system from the disk. The disk must be write enabled, otherwise FAILSF will print back an error message that there is a disk error. If this occurs, one must reschedule FAILSF. The following is an example of how to run FAILSF.

(1) To enter the Julian date.

↑C

.SC,FAILSF,2 <CR>

Enter Julian date (DDD)

#072 <CR> (Type 3 character date e.g. 72 is not acceptable)

(2) To start failsafe updating procedure.

↑C

.SC,FAILSF,1 <CR>

*NOTE: The command SC,FAILSF <CR> is not to be used. This command starts the failsafe procedure by taking what is in memory and storing it onto the disk. The correct procedure is to take what is stored on the disk and load it into memory.

(3) To enter the time of day.

↑C

.TI HH:MM:SS <CR>

STATUS

This task enables the console user to alter the status of any element recognized by DIBBUK. The task is scheduled by typing.

↑C

.SC,STATUS <CR>

It types back:

ENTER TERMINAL #, ELEMENT, COMMAND, MAGNITUDE (N,XYY,C,MMMM)

#

Should it not respond or type a ?, then type X <CR> and start the sequence over again.

(1) To make an element active.

2,Q13,A <CR> (Terminal #2, element Q13)

(2) To make an element inactive

2,Q13,I <CR>

(3) To change the software polarity bit of an element.

2,Q13,P <CR>

(4) To make an element shared.

2,Q13,S <CR>

(5) To remove an element from shared status.

2,Q13,N <CR>

(6) To alter the maximum setpoint permitted for an element.

2,Q13,M,3824 <CR> (Maximum is set to 3824)

(7) To disable a user terminal.

2,,D <CR>

(8) To enable a user terminal.

2,,E <CR>

(9) To exit from the task.

X <CR>

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