

## DATE AND TIME CHANGE PROCEDURES

### NO. 1 AUTOMATIC MESSAGE ACCOUNTING

### RECORDING CENTER (AMARC)

#### 1. GENERAL

**1.01** This section provides information and procedures for performing No. 1 AMARC date and/or time change. Also, procedures are provided for performing clock compensation in systems utilizing the Generic 4 or 5 program.

**1.02** This section is reissued to update the procedures for Generic 4 and 5 programs.

**1.03** The following procedures are provided in this section.

**A. *Date and Time Change:*** This procedure provides a method for changing the date and/or time either simultaneously or separately of the No. 1 AMARC.

**B. *Time Drift Compensation:*** This procedure provides a method for applying plus or minus compensation to correct for drift in the active and standby system real-time clocks. This procedure is applicable to Generic 4 and 5 programs only.

**1.04** System responses that occur as a result of an input message entry are designated in the procedures of this section as RSP. In addition, output messages that occur as a result of an input message are designated in the procedures of this section as MSG. If system response or output messages are invalid, refer to Input Message Manual (IM) and Output Message Manual (OM) for analysis of failure messages to determine possible cause of trouble. Reference is made within parentheses in this section to either the IM or OM messages as they are referenced in the associated table of contents of the IM or OM.

**1.05** Reference should be made to the No. 1 AMARC IM/OM manuals for detailed

explanations of input and output messages where the need arises.

**1.06** Execute commands, acknowledgment messages, and priority symbols are used in the procedures of this section. Some of the most commonly used are:

! = execute command

PF = printout follows

M = manual action

tt = minutes after hour.

Other symbols used and their explanations may be obtained in Section B of both the IM and OM.

**1.07** Examination of the IM and OM are required for explanation of the variable fields of the input and output messages. Reference is made within parentheses to the input or output message as it appears in the IM or OM.

**1.08** While performing the procedures of the section, various other output messages may be printed due to time period or configuration of the system. Any automatic output messages *not* associated with a trouble condition may be disregarded. Any trouble conditions generated by the system either automatically or in response to an input message request should be analyzed using the IM and OM before continuing with the procedure.

**1.09** Information provided in parentheses is either supplemental information describing action that is taking place or reference information.

**Example:** The reference information (such as IM-RMV TAPE) is intended for direction to the Input Message Manual table of contents

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to the message RMV TAPE for obtaining variable field data, clearing trouble conditions, etc. Likewise (OM-RMV TAPE) is intended for direction to the Output Message Manual table of contents to the message RMV TAPE for obtaining information.

**1.10** Generic 4 and 5 program applications provide for a functional I/O terminal arrangement feature. When this feature is enabled, the terminal normally associated with processor 0 is dedicated to the active processor and becomes the alerting terminal. The other terminal normally associated with processor 1 is dedicated to the standby processor and becomes the analysis terminal. All active system input and output messages are entered and printed out at the alerting terminal. All input and output messages for the standby system are entered and printed out at the analysis terminal. To determine if the I/O terminals are in the functional mode before beginning a procedure in this section, a REPT SYS! input message is entered at either terminal for a REPT SYS STA report. Provided in this report is the state of the I/O terminals.

**1.11 Lettered Steps:** A letter a, b, c, etc, added to a step number in Part 2 of this section indicates an action which may or may not be required depending on local conditions. The condition under which a lettered step or a series of lettered steps should be made is given in the ACTION/INPUT MESSAGE column, and all steps governed by the same condition are designated by the same letter within a procedure. Where a condition does not apply, all steps designated by that letter should be omitted.

## 2. PROCEDURES

### A. Date and Time Change

#### Preliminary Requirements and Information for Performing Date and Time Change Procedure

**2.01** The current data and time, as recorded by the system, can be ascertained by performing the time check procedure as outlined in Section 201-900-301.

**2.02** The time change procedure of this section should be performed when, through a check of the time in accordance with Section 201-900-301, it is found that real time and system time are not

in agreement, or for standard and daylight saving time adjustments.

**2.03** Date and/or time changes made on an active processor are automatically transferred to a standby processor.

**2.04** ♦Special entries are made on the AMA tape at noon and midnight. Furthermore, at midnight the date is automatically advanced. Therefore, the clock should **not** be set back or forward over midnight or noon. Should the clock be found to be fast or slow and immediate correction would mean setting the clock back or forward over either boundary, it is recommended that the time change be delayed until the correct time has passed noon or midnight sufficient enough to make the clock correction.♦

**Example 1:** If the correct time is 23:30:00 but the AMARC clock indicates 00:30:00, wait until the AMARC clock indicates 01:01:00 before correcting.

♦**Example 2:** For the case of Generic 5, consider the situation where the time on an AMARC is 23:00:00 on September 5, 1978, and it is desired to set the clock to 23:59:59 on September 5, 1978. Assume that it takes 20 seconds to verify the request (SET CLK...) when the affirmative response is finally inputted, the clock will be updated to 00:00:19 on September 6, 1978. This means AMARC did not go through its midnight routine and thus did not correctly process calls in progress over midnight.♦

**2.05** In the following procedure, an unconditional (UCL) input can be used to set time/date on a standby or out-of-service (OOS) processor if necessary. (SET CLK UCL DATE mmddy, TIME hhmmss!).

**2.06** Date and time may be changed simultaneously or separately. To change date and time simultaneously, the following input format should be used:

SET CLK DATE mmddy, TIME hhmmss!

When it is desired to change the date or time independently, omit the unwanted parameter from

the input message. The following input format should be used:

To change time only:

SET CLK TIME hhmmss!

To change date only:

SET CLK DATE mmddyy!

Reference should be made to the input message SET CLK for further details.

STEP	ACTION/INPUT MESSAGE	RESPONSE (RSP)/MESSAGE (MSG)
1	Establish a telephone connection to a precise time announcement machine if not already established. See Section 030-125-501 for information on and connection to precise time announcement.  <b>Note:</b> Do not type execute command ! in the following step.	
2	At active processor I/O terminal— Type: <b>SET CLK DATE mmddyy, TIME hhmmss</b> (Request to set system clock date and/or time.)  <b>Note:</b> The date and/or time chosen for the SET CLK input message should be some reference time point within 45 seconds ahead in relation to audible time machine.  <b>Generic 3 or 4 Applications</b>	
3	Making note of precise time to be announced— When precise time tone heard which matches SET CLK date and/or time of Step 2— Type: ! (System time updated to real time and request made for printout of system date and time.)	RSP: <b>PF</b> (See IM—SET CLK.) At both I/O terminals MSG: <b>M # OP CLK mmddyy, TIME hhmmss</b> (See OM—OP CLK.)  <b>Note:</b> The time printed in output message is precise time that occurred when execute command ! was typed.
4	Compare precise time announcement reference point to output message printout.  Time match—No settings or adjustments required. Perform time check procedure of Section 201-900-301.  Time mismatch—Repeat this procedure using new time reference until time match obtained.  <b>Generic 5 Applications</b>	
5	Making note of precise time to be announced— When precise time tone heard which matches	RSP: <b>PF</b> (See IM-SET CLK.)

STEP	ACTION/INPUT MESSAGE	RESPONSE (RSP)/MESSAGE (MSG)
	SET CLK date and/or time of Step 2— Type: ! (System time updated to real time and request made for printout of system date and time.)	At active I/O terminals—
	(M) tt yz SET CLK TIME: HH:MM:SS.T DATE: MM/DD/YR tt yz CURRENT : h h:n n : s s.t mm/dd/yy tt yz REQUESTED: h h:n n : s s.t mm/dd/yy aaa . . . . bbb . . . tt yz CHANGES : ccc . . . tt yz YOU HAVE 30 SECONDS TO RESPOND BY TYPING: tt yz SET CLK OK! IF YOU ARE SATISFIED, OR tt yz SET CLK CANCEL! IF YOU ARE NOT SATISFIED	

(See OM—SET CLK.)

**Note:** Response of Step 6a or 7b must take place within 30 seconds after the printing of the previous output message. If a time-out should occur (SET CLK TIMEOUT) return to Step 2 and repeat procedure.

**Note:** The current time printed in output message is precise time that occurred when execute command ! was typed followed by request time and/or date change.

6a	If satisfied with clock setting— Type: SET CLK OK! (Clocks of both processors are updated to the requested time and date.)	RSP: PF (See IM-SET CLK OK.) At both I/O terminals— MSG: M tt OP CLK mm/dd/yy hh:nn:ss.a (See OM—OP CLK).
7b	If an error is recognized in output message of Step 5— Type: SET CLK CANCEL! (Clock change request canceled.)	RSP: OK (See IM-SET CLK CANCEL.) At both I/O terminals— MSG: M tt OP CLK mm/dd/yy hh:mm:ss.a (See OM-OP CLK.)
8b	Return to Step 2 and repeat procedure.	

## B. Time Drift Compensation

### Preliminary Requirements and Information for Performing Time Drift Compensation

**2.07** This procedure is applicable to No. 1 AMARC with Generic 4 or 5 program. This procedure does not apply to Generic 3.

**2.08** Clock drift is verified by performing time check procedures as outlined in Section 201-900-301. When drift occurs, the amount and direction are determined over a 24-hour period. The drift is converted into a number of 1/10-second intervals and applied as plus or minus compensation to the OOS processor.

**Example:** If the system clock loses 3 seconds in a 24-hour period, this would be thirty

1/10-second intervals. If previous compensation has not been entered, then the compensation factor entered is +030.

**2.09** If only one clock requires compensation, this can be entered on an OOS system by specifying which processor the compensation applies to in the input message RC CLK COMP. When the OOS system is restored to standby, a system switch is performed and the previous active system (now standby) is made OOS. The new NPD is then updated to the OOS processor using the input message UPD MEM NFD. This insures that the NPD is identical for each processor. The OOS system is then restored to standby. ♦It should be noted that the RC CLK COMP is no different from all other recent change (RC) messages in terms of operations needed to arrange for the data to be in both sides of the system.♦

**2.10** When performing procedures and it is determined that both system clocks require compensation adjustments, one system is kept active while the other is placed OOS for clock correction. After the respective clock compensation factors are entered for each processor, the OOS system is

restored to standby and a system switch is performed. The previous active system (now standby) is placed OOS, and the NPD is updated from the active to the OOS processor using the input message UPD MEM NPD. Both processors now contain clock compensation data for their respective clocks. The OOS system is then restored to standby. ♦Again, this operation is no different than the operations used for other RC messages. The process defined in this and the previous paragraph is stated simply to provide an overview of the operations which must take place to perform a CLK COMP change.♦

**2.11** After compensation is applied for clock drift, a system time check is again performed using time check procedures of Section 201-900-301. System time setting is accomplished by using Procedure A of this section.

**2.12** ♦AMA tapes do not necessarily have to be removed to make clock compensation changes. However, it is convenient for accounting purposes that the clock compensation, when required, be made at the time of normal tape change. The following procedure assumes the tape change.♦

STEP	ACTION/INPUT MESSAGE	RESPONSE (RSP)/MESSAGE (MSG)
1	Perform time check procedure of Section 201-900-301.	
2	Determine amount of time that clock is gaining or losing over a 24-hour period for each processor.  <b>Note:</b> Clock compensation may be applied for a maximum of 20 seconds error. When either clock consistently and consecutively drifts more than 8.6 seconds in a 24-hour period, consult Digital Equipment Corporation maintenance personnel.	
3	Convert time drift for clock into number of 1/10-second intervals and record for later use. (See IM—RC CLK COMP.)  <b>Note:</b> The number of 1/10-second intervals is the system clock compensation factor. This compensation factor is preceded by a plus sign if the clock is losing time or by a minus sign if the clock is gaining time.	

STEP	ACTION/INPUT MESSAGE	RESPONSE (RSP)/MESSAGE (MSG)
4	At active or standby system I/O terminal— Type: <b>DUMP MEM NPD CLK!</b> (Requests the decimal dump of the clock compensation factor in memory for each processor.)	RSP: <b>PF</b> (See IM-DUMP MEM NPD CLK.)  <b>Note:</b> The compensation factor prints out for each processor.
5a	If compensation factor is zero in memory of processor requiring clock compensation— Go to Step 7.	
6b	If a compensation factor exists in memory of processor requiring clock compensation— Take the appropriate clock compensation factor found in Step 3 and make the proper adjustments to the compensation found in Step 4 for corresponding clock. The adjusted compensation factor is an algebraic sum of the new compensation required and the compensation already in memory for the processor clock. Go to Step 7. (See IM-RC CLK COMP.)	
7	Make standby system OOS by ♦typing <b>RMV TAPE!</b> if associated tape drive contains an AMA tape or by typing <b>RMV SYS!</b> if no tape is mounted.♦	
8a	If compensation factor is zero in memory of processor requiring clock compensation— At OOS system I/O terminal, enter appropriate clock compensation found in Step 3. ♦Type: <b>RC CLK COMP a bccc!</b> (This message allows a compensation to be applied to AMARC's real-time clock.)♦	RSP: <b>OK</b> ♦(Factor was accepted.)♦ (See IM-RC CLK COMP.)
9b	If a compensation factor exists in memory of the processor requiring clock compensation— At OOS system I/O terminal, enter appropriate clock compensation found in Step 6b using RC CLK COMP input message for the processor.	RSP: <b>OK</b> (See IM-RC CLK COMP.)
10	At OOS system I/O terminal— Type: <b>DUMP MEM NPD CLK!</b> (Requests the decimal dump of the clock compensation factor in memory for each processor.)  <b>Note:</b> New compensation factor for correcting system clock drift is verified in memory.	RSP: <b>PF</b> (See IM-DUMP MEM NPD CLK.)  <b>Note:</b> The correction factor prints out for each processor. The clock compensation factor should agree with that entered in Step 8a or 9b.
11c	If other system requires clock compensation, repeat Steps 8a through 10.	

STEP	ACTION/INPUT MESSAGE	RESPONSE (RSP)/MESSAGE (MSG)
12	◆Remount on AMA tape at OOS system.	
13	At OOS system— Type: <b>INIT SYS!</b>	RSP: None MSG: ** tt <b>INIT SYS</b> x <b>yyyyyy</b> etc (See OM-INIT SYS.)
14	Type: <b>RST TAPE!</b>	RSP: <b>PF</b> MSG: <b>M</b> tt <b>yz RST TAPE AMA</b> etc (See OM-RST TAPE.)
15	At active processor— Type: <b>SW SYS!</b>	RSP: <b>PF</b> MSG: <b>M</b> tt <b>yz SW SYS 0 aaaaaa, 1bbbbbb</b> <b>000001</b> (See OM-SW SYS.)
16	Type: <b>RMV TAPE!</b>	RSP: <b>PF</b> <b>RMV TAPE AMA</b> etc <b>RMV SYS OOS</b> (See OM-RMV TAPE AMA.)
17	Remove AMA tape from tape drive.◆	
18	At active system I/O terminal— Type: <b>UPD MEM UPD!</b> (Used to update NPD from active to OOS system.)	RSP: <b>PF</b> (See IM-UPD MEM NPD.) ◆At both I/O terminals◆  MSG: <b>M</b> tt <b>UPD MEM NPD COMPLETE</b> (See DM-UPD MEM COMPLETE.)
19	◆At OOS system I/O terminal— Type: <b>DUMP MEM NPD CLK!</b> (Requests the decimal dump of the clock compensation factor in memory for each processor.)	RSP: <b>PF</b> (See IM-DUMP MEM NPD CLK.)  <i>Note:</i> The correction factor prints out for each processor. The clock compensation factor should agree with that entered in Step 8a or 9b.
20	Remount an AMA tape.	
21	Type: <b>INIT SYS!</b>	RSP: None MSG: ** tt <b>INIT SYS</b> x <b>yyyyyy</b> etc (See OM-INIT SYS.)
22	Type: <b>RST TAPE!</b> (System restored to standby state.)	RSP: <b>PF</b> MSG: <b>M</b> tt <b>yz RST TAPE AMA</b> etc (See OM-RST TAPE.)◆