TSS Display Driver
(Revision A - 7-6-70)

amends:
- Operators Manual:
  - amends: sections II, III, IV, V
  - add: section VI

PROGRAMMING MANUAL:
- amends: sections III
- rename: section III as IV
- replace section IV
- append to (new) section V
DATE AND TIME

/DATE, MM/DD/YY @
/TIME, HH.MM.SS CV

note that there is no period following the seconds field in a time command!

note also: 1) the delimiters '/' and '_' are interchangeable. Thus
/DATE, MM.DD/YY @ will be accepted,
2) each of the fields (MM; DD; YY; SS; MM:SS) is considered to be a string of digits
of from 0 to 2 decimal digits. Thus:
/DATE, @1/5/70 gives 01/05/70
/TIME, 5.. gives 05:00:00

3) No zero fields are allowed in the date command. Other than that, no checking for validity is done on either command.
II B (insout) addition of a regular command (system does not need to be unprotected)

/RESTORE @ replaces the 'RESTORE' key discussed in Section III.
If more 'system unprotected' commands channel manipulating commands

basic format
/CCC
[nn][mmm]

where CCC is command

nn is channel number (octal)

mmm is octal output value

nn and mmmm are truncated and used right justified, 0 filled

Example: n = 5 = 05  mmmm = 15 = 0115

the following commands are provided

/ACN nn - activate channel nn
/DCN nn - disconnect channel nn
/FAN nn, mmmm function mmmm on channel nn
/PAN nn, mmmm output mmmm on channel nn

conditions are checked and these commands refused with an error message

NOT SAFE if the channel status precludes their execution. In order to use these commands, screen M must
be currently displayed on the least one screen. If not, an error message is issued, 'NEED SCREEN M'.

NOTE: CURRENTLY THE DISPLAY MAY CRASH IF THESE COMMANDS ARE USED ON THE DISPLAY CHANNEL (108).
The 'restore' key is not implemented. A restore command is provided instead.
Chapter IV

Screen Headers

The right screen contains the header title TSS, the 'system unprotected' flag, the p-counter and the right screen name. The left screen header contains, in the left corner, the channel statuses, and, directly under these, the system state flags.

Chapter V

Addition to the M display.
The M display also contains the current time and date (or the time and date both starting at 0 from deadstart if never entered by the operator)
II Disasters: This section is intended to allow the convey what the operator may and may not do till the doctor comes, and to tell the doctor how not to kill the patient.

Within the display driver, there is a section of program whose sole job is to check for system disasters. When one occurs, this part of the program re-initializes the other programs in the display driver, puts the M display on the right screen, clears the left screen and commits suicide. The M display then flashes disaster.

When this occurs, the system is dead. The display driver is therefore very frail, as it does not depend on the system to
do anything for it. Thus any display driver action requiring the systems help may (or in fact, quite likely will) hang up the display driver program segment requesting it.

Thus the following conditions exist: 1) the disaster check routine has committed suicide 2) the clocked event channel driver dies within one or 100 msec by trying to make clocked event channels tick.

These two things are expected and are not serious. The keyboard accepts commands normally. Thus CM may be examined and modified. Three possibilities now exist 1. no one does anything or the dead-start button is pushed. repercussions—none. 2. someone uses the display carefully—repercussions—may find what's wrong!
2. Someone *may* type a command for which the display driver requires help from the system. Result: display driver, keyboard interpreter may hang, leaving the keyboard dead. This may be considered fatal, as the display driver is not much use anymore.

3. Someone may try to display ECS. This probably will hang the display updater. This is not serious.

Now: to avoid situation 2.

Simple: do not use any of the following commands:
- Sending messages to logical keyboards
- DATE or TIME
- LOCK or UNLOCK
- ECS store

Note: RESTORE does strange things; it re-encarnates the disaster detector, which does its thing.
now: case 3 is trivial:
  Suppose: someone brings up a Core/ECS display which tries to
display ECS. The updater hangs. However, the keyboard still works.
Set the screen to contain only CM. Then type /RESTORE. Then
bring the screen up again.
  eg /A c0     (contains ECS)
      /4,0 c0
      /RESTORE c0
      /A       (desired result!)
Programming

III The keyboard space bar maps to a 008 character in the message, not 560 (blank). Again beware: The bytes following CR (608) in the message are not zeroed.

addition Section IV

IV Timed event channels. There are now event channels on which an event will be sent for each process hung on every clock tick. Each channel has a different clock rate. Each clock ticks on an even interval of the real time clock as queried by the operator. Channels are provided for the following intervals:

  Tenth second  minute
  second  ten minutes
  TEN seconds  hour
The event sent contains the value of the master (micro-second) clock at the time of the tick.

These event channels are the device following the display # in Howards funny file and are created from faster to slower intervals.

NEW ECS action returns
* operator time and date
  in ASCII, right justified as follows

\[ X6 = \text{HH:MM:SS} \quad \text{(time)} \]
\[ X7 = \text{MM/DD/YY} \quad \text{(date)} \]