Price: $17.50

INSTRUCTIONS
for
SLO-SYN. MICRO SERIES
MOTION CONTROL PROGRAMMER
MODEL SSP-525

Superior Electric reserves the right to make engineering refinements on all products. Such refinements may affect information given in instructions. Therefore, **USE ONLY THE INSTRUCTIONS THAT ARE PACKED WITH THE PRODUCT.**

INSPECTION

When unpacking the SSP-525, examine it carefully for any shipping damage. The "Damage and Shortage" instructions packed with the unit outlines the procedure to follow if any parts are missing or damaged.

Superior Electric

DANA

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SECTION 1. INTRODUCTION

PRODUCT DESCRIPTION

The SSP525 is a dedicated hand held programmer for the Superior Electric Company's SLO-SYN® Micro Series Indexers and Direct Drive Servo Positioning Systems. The parameters, data and commands for these devices can be easily entered, edited, uploaded and down-loaded. All information is clearly displayed on the two-line by 40-character Liquid Crystal Display (LCD) panel. The seven function keys; bi-directional cursor/locator, numeric keypad, DATA ENTRY and MODE keys provide easy and convenient data access and entry.

Programming functions are menu driven, and are presented in a clear, easy-to-follow sequence. Make sure to use the appropriate product manual for complete programming instructions.

The SSP525 is designed to be either held in the hand or fastened to an exterior surface using the supplied brackets. **If fastening the SSP525 to a surface, be sure that the temperature of the surface will remain within the operating temperature of 32° to 122° F (0° to 50° C).**

Any connections (power and I/O) that are required are via 10-ft (3m) long connector cable that is attached to the programmer.

INSPECTION PARTS LIST

SSP525 Programmer
Instruction Manual (213710-074)
Accessory Kit (216077-006)

USING THIS MANUAL

This manual provides information necessary to connect power to, and operate the SSP525.

Section 2, "SSP525 LAYOUT", depicts the SSP525 and provides a general overview of the key functions.

Section 3, "SSP525 CONNECTIONS AND SPECIFICATIONS", contains the RS232 communication connections and parameters, power connection requirements, and the electrical and operating specifications for the SSP525.

Section 4, "OPERATING THE SSP525", contains details on how the SSP525 is used to interface with various devices.

SECTION 2. SSP525 LAYOUT

FEATURES OF THE SSP525

Menu & Mode Display — The SSP525 displays pertinent information regarding Menu or Mode on the top line of the LCD display.

Function Key Display — Function key designations are displayed on the bottom line of the LCD display.

Function Keys — Choices from the menus are made via the seven function keys. The designation of these keys change with each menu.

Cursor Location Keys — In various editing modes the cursor can be moved to the left or the right using the "<--" and "-->" arrow keys.

Numeric Keys — All data entry consists of the numbers placed in the Code and Data fields. Numbers are selected by the numeric keys.

MODE SELECT MENU Key — This key is used to select the Operating Mode Menu as well as to exit certain modes of operation.

DATA ENTRY Key — In various editing modes this key is pressed to enter the displayed data.

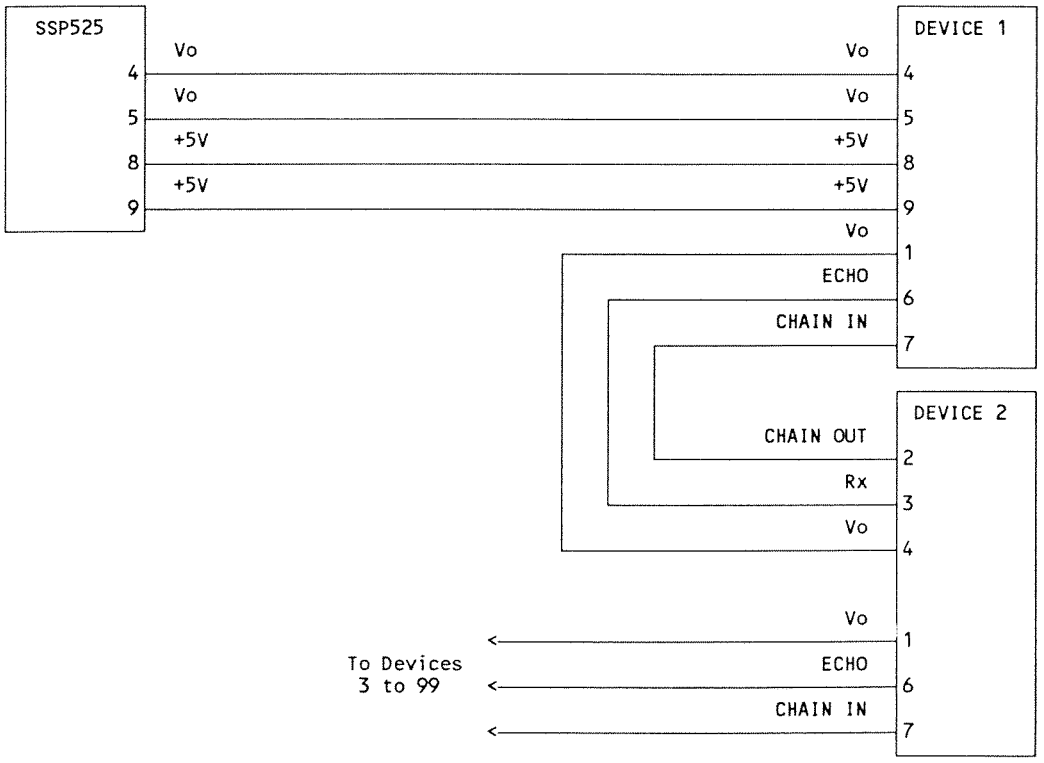
SECTION 3. SSP525 CONNECTIONS AND SPECIFICATIONS

CONNECTIONS

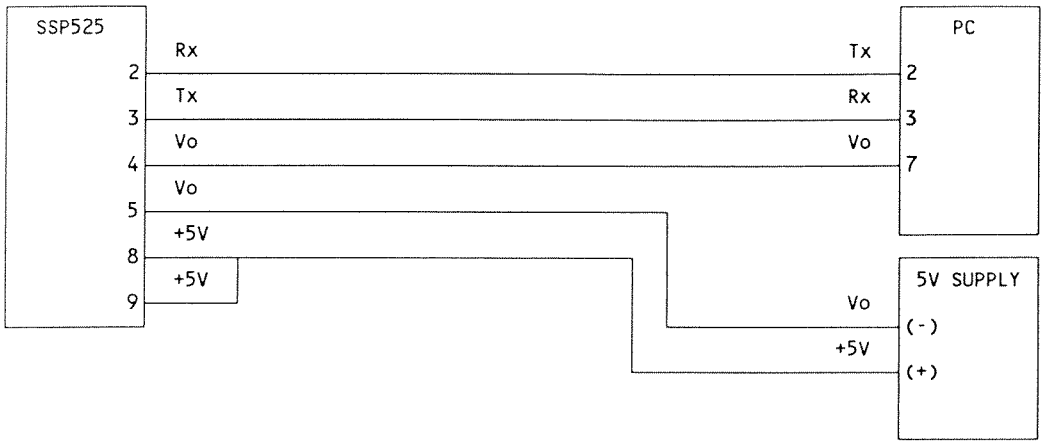
All necessary connections are made via the 9-pin "D" type connector cable provided. The pin assignments for this connector are as follows:

PIN	ASSIGNMENT
1	Vo, Signal Common
2	Rx (RS232 receiver input)
3	Tx (RS232 transmitter output)
4	Vo, Signal Common
5	Vo, Signal Common
6	no connection
7	no connection
8	+5 volts
9	+5 volts

The SSP525 can be used as the controlling device for 1 to 99 Micro Series Indexers or Direct Drive Systems. Communications with 1 Micro Series Indexer or Direct Drive System requires the 9 pin connector cable from the SSP525 to be connected to the 9 pin RS-232 port on the device. Communications with more than one Micro Series Indexer or Direct Drive system may be accomplished using the daisy chaining configuration in the following illustration.



To interface the SSP-525 to a device other than a Micro Series Indexer or Direct Drive System, such as a Personal Computer or Terminal, the SSP-525 may be connected as follows:



Note: Transmit (Tx), Receive (Rx) and ground (Vo) terminals on the PC may be different than labeled. Consult the the PC's owners manual for pin designations. SSP-525 Signal Common (Vo) terminals are internally connected and available on pins 1, 4 and 5. SSP-525 Power Supply input (+5V) terminals are internally connected and available on pins 8 and 9.

COMMUNICATION PARAMETERS

Baud Rate: 9600, 2400 or 1200, selectable on power up. (Refer to section 4 for details on changing the baud rate).
Parity: none
Word Length: 8 bits
Stop bits: 2 bits

POWER REQUIREMENTS

When interfacing with a Micro Series Indexer or Direct Drive System the SSP-525 obtains its power directly from the device. Power is supplied to the SSP-525 when the connection is made via the 9-pin connector.

The SSP-525 has the following power requirements:

Voltage: +5 volts dc to +5.25 volts dc
Current: 300 milliamperes

OPERATING TEMPERATURE

Range: 0°C to +50°C (+32°F to +122°F)

SECTION 4. OPERATING THE SSP525

OVERVIEW

This section of the manual explains the operating modes of the SSP525. The SSP525 will power up when 5 volts is applied or when connected to a Micro Series Indexer or Direct Drive System. It will be necessary to refer to the instruction manual of the Micro Series Indexer or Direct Drive System for specific explanations of the various parameters and data required. Maps of most SSP525 displays are located in SECTION 5. APPENDIX.

CONVENTIONS

The following conventions are used in this section.

"###"	Represents the unit types INDEXER, LPI, EPI and DDSPS.
"device"	Represents a Micro Series Standard, Preset or Enhanced Indexer, or Direct Drive System.
"etc"	Pressing this key will return to previous menu or exit function without changing data.

SOFTKEY DESCRIPTIONS

Several abbreviations are displayed during operation of the SSP525. The following is a list of definitions for all the abbreviations.

"abs"	Display Absolute Electrical Position or select the Absolute Position Mode of operation.
"all"	Select all id's for execution.
"auto"	Select Auto Execution Mode or setup encoder parameters.
"boost"	Toggle Boost Current Mode.
"both"	Download or upload both program lines and parameters.
"brk"	Enables and disables the motor brake.
"calc"	Calculate Resolver Offset.
"clear"	Select memory clear function or clear the motion cycle.
"cntrl"	Display the Control Status.
"code"	Select the security code function.
"cont"	Select Continuous Execution Mode or continue from a paused motion.
"cycst"	Execute program from present line or encoder setup move.
"ddsps"	Select the Direct Drive System or select the Direct Drive System for data storage.
"DDssp"	Upload data from the Direct Drive System to the SSP525 memory.
"del"	Delete current line data.
"down"	Decrement present velocity by the L73 value.
"drive"	Display the Drive Status.
"edit"	Select the editing mode.
"enc"	Display the Encoder Position or setup encoder.
"epi"	Select the Enhanced Indexer or select the Enhanced Indexer for data storage.
"EPIssp"	Upload data from the Enhanced Indexer to the SSP525 memory.
"error"	Display the Error Count value.
"etc"	Return to previous menu or exit function without changing data.
"exec"	Select Program Execution Mode.
"F"	Select the F field on the present line or the Feedrate Override value.
"fro"	Enter the Feedrate Override routine.
"G"	Select the G field on the present line.
"HIspd"	Select the High Speed Mode of operation.
"id"	Select the device id number.
"in1"	Display the Indexer conditional inputs.
"in2"	Display the Indexer switch inputs.
"inc"	Select the Incremental Position Mode.
"INDssp"	Upload data from the Standard Indexer to the SSP525 memory.
"indxr"	Select the Standard Indexer or select the Standard Indexer for data storage
"inh"	Enable and disable the drive inhibit.
"i/o"	Select the input/output status transfer mode.
"jog"	Select Jog Motion Mode.
"L"	Select parameter entry (L Code).
"line"	Select line editing mode.
"line#"	Display the current line number.
"LOspd"	Selects the Low Speed Mode of operation.
"lpi"	Select the Preset Indexer or select the Preset Indexer for data storage.
"LPIssp"	Upload data from the Preset Indexer to the SSP525 memory.
"man"	Select Manual Motion.
"mdi"	Allows execution of Line 000 for setup.
"mode"	Edit or display device Mode status or select motion mode setup.
"motion"	Display Indexer motion status or select the type of motion.

"N"	Allows selection of line number.
"new"	Allows entry of a new security code.
"next"	Go to next line number, L code or G code.
"no"	Abort the selected function.
"one"	Select Single Axis Execution.
"output"	Display the Indexer Output Status.
"parms"	Select parameter editing or download or upload parameters data.
"pause"	Commands a controlled motion stop.
"PCssp"	Upload from the host to the SSP525 memory.
"pos"	Allows selection of position data type to display.
"posvr"	Display Position Verification Status.
"prev"	Go to previous line number, L code or G code.
"prog"	Download or upload program line data.
"read"	Read the Resolver Offset.
"reduce"	Toggle Reduce Current Mode.
"reh"	Perform an Electrical Home cycle.
"rev"	Display the device revision date.
"rmh"	Perform a Mechanical Home cycle.
"scan"	Scan daisy chain for next id.
"seh"	Set the Electrical Home position.
"size"	Allows the step size value to be entered.
"sngl"	Selects the Single Execution Mode.
"speed"	Allows the Jog Speed value to be entered.
"ssp525"	Select the SSP525 for memory storage.
"SSPdd"	Download data from the SSP525 to the Direct Drive System memory.
"SSPepi"	Download data from the SSP525 to the Enhanced Indexer memory.
"SSPind"	Download data from the SSP525 to the Standard Indexer Memory.
"SSPIpi"	Download data from the SSP525 to the Preset Indexer Memory.
"SSPpc"	Download data from the SSP525 to the host.
"stat"	Allows examination of device status.
"step"	Selects the Step Motion Mode.
"stop"	Stop jog motion or program execution.
"up"	Increment the Present velocity by the L73 value.
"wnd"	Toggle Windings on, Windings off mode.
"X"	Select the X field of the current line.
"yes"	Continue on selected function.
"+"	Commands Clockwise motion.
"-"	Commands Counterclockwise motion.

CHANGING SSP-525 BAUD RATE

The SSP-525 Baud rate may be changed during the power up display which appears for 5 seconds. To change the baud rate press the "baud" function key.

```
SSP525 mm/yy/r *****        BAUD= nnnn
       baud

         f2
```

Select the desired baud rate of 1200, 2400 or 9600.

```
              SELECT SSP525 BAUD RATE
1200          2400          9600          etc

 f1            f3            f5
```

The SSP-525 will now attempt to change the baud rate of all communicating devices.

Note: "mm" represents the numeric value for the month of the SSP-525 revision date.
"yy" represents the numeric value for the year of the SSP-525 revision date.
"r" represents the SSP-525 revision letter.
"*" represents a one second interval.
"nnnn" is the present baud rate of the SSP-525.

SECURITY CODE OPTIONS

At various points during the operation of the SSP525 it may be necessary to enter a six digit security code to gain access to program and parameter data. This code entry is required only once each time the SSP525 is powered up.

```
......    ENTER SECURITY CODE
                                        etc
```

Enter the six digit access code and press the "DATA ENTRY" key. If an incorrect code is entered access will be denied. If the correct code is misplaced or forgotten call Superior Electric for assistance.

The security code may be changed anytime the selection "code" is displayed. The security code is preset from the factory as "000000". The value "000000" disables the security code feature. To change the security code press the "code" key.

```
          OPERATING MODE: ###
ssp525      code                ###    etc
```

f3

Press the "new" key. If the "new" key is not displayed the current security code must be entered prior to selecting a new security code.

```
......    ENTER SECURITY CODE
                          new           etc
```

f5

Enter the new six digit security code and then press the "DATA ENTRY" key. The "<-" and "->" keys can be used to reposition the cursor. This code now becomes the security code for the SSP525. After pressing the "DATA ENTRY" key the SSP525 will respond by requesting the new security code.

```
......    ENTER NEW SECURITY CODE
                          new           etc
```

arrow

f5

Enter the new security code and access will be granted. If the new security code was entered incorrectly access will not be granted. Press the "new" key to re-enter a new security code.

to reinitialize
while in "select operating
mode screen" press
both arrows at once &
mode selection button,
then select F2 = new 525"

SSP525 COMMUNICATIONS

Upon power up the SSP525 will attempt to establish communications with a Micro Series Indexer or Direct Drive System. The SSP525 performs an ID SCAN to determine if communications may be established. The ID SCAN may be repeated anytime during operation of the SSP525 by pressing the "MODE SELECT MENU" key. After completing the ID SCAN the SSP525 will display one of the following displays.

If the SSP525 could not communicate with a device, the following display will be shown. Editing data within the SSP525 will be the only operation allowed.

```
     SELECT OPERATING MODE: SSP525
indxr  lpi  epi  ddsps
```

If the SSP525 successfully established communications and the communicating device with the lowest ID number is a Micro Series Standard Indexer, the following display will be shown. Editing data within the SSP525, a Micro Series Standard Indexer and all other communicating devices is allowed.

```
          OPERATING MODE: INDEXER
ssp525      code                indxr  etc
```

If the SSP525 successfully established communications and the communicating device with the lowest ID number is a Micro Series Preset Indexer, the following display will be shown. The "enc" key will not be displayed when using a Preset Indexer without Position Verification capabilities. Editing data within the SSP525, a Micro Series Preset Indexer and all other communicating devices is allowed.

```
          OPERATING MODE: LPI
ssp525      code  enc         lpi    etc
```

If the SSP525 successfully established communications and the communicating device with the lowest ID number is a Micro Series Enhanced Indexer, the following display will be shown. The "enc" key will not be displayed when using a Enhanced Indexer without Position Verification capabilities. Editing data within the SSP525, a Micro Series Enhanced Indexer and all other communicating devices is allowed.

```
          OPERATING MODE: EPI
ssp525      code  enc         epi    etc
```

If the SSP525 successfully established communications and the communicating device with the lowest ID number is a Direct Drive System, the following display will be shown. Editing data within the SSP525, a Direct Drive System and all other communicating devices is allowed.

```
          OPERATING MODE: DDSPS
ssp525      code                ddsps  etc
```

VIEWING AND EDITING SSP525 DATA

The SSP525 has the ability to store program and parameter data for either the Standard, Preset or Enhanced Indexer (one at a time) and the Direct Drive System. To view and edit the program and parameter data stored in the SSP525 for one of these devices, the SSP525 Function Select menu for that device is used. Three different ways to locate the SSP525 Function Select menu for a device are shown below.

1. If the SSP525 was able to communicate with a device, the Operating Mode for that device will be automatically selected. To access the SSP525 Function Select Menu for that device press the "ssp525" key.

```
          OPERATING MODE: ###
ssp525      code              ###    etc
```

f1

The SSP525 Function Select Menu for that device will be displayed.

```
    SSP525 FUNCTION SELECT: ###
edit ###ssp code       PCssp SSPpc  etc
```

2. To access the SSP525 Function Select Menu for a device other than the one that is currently selected, press the "etc" key to exit the current Operating Mode.

```
          OPERATING MODE: ###
ssp525      code              ###    etc
```

f7

Select the desired device.

```
          SELECT OPERATING MODE
indxr  lpi  epi  ddsps
```

f1 f2 f3 f4

The SSP525 will "skip over" the following display and display the SSP525 FUNCTION SELECT Menu if the SSP525 was unable to communicate with the selected device. If the SSP525 was able to communicate with the selected device press the "ssp525" key.

```
          OPERATING MODE: ###
ssp525      code              ###    etc
```

f1

The SSP525 Function Select Menu for that device will be displayed.

```
    SSP525 FUNCTION SELECT: ###
edit ###ssp code       PCssp SSPpc  etc
```

If the SSP525 was unable to communicate with the selected device the "###ssp" key will not be displayed.

3. If the SSP525 was unable to communicate with a device, a device type must be selected.

```
     SELECT OPERATING MODE: SSP525
indxr  lpi  epi  ddsps

 f1    f2    f3    f4
```

The SSP525 Function Select menu for that device will be displayed.

```
    SSP525 FUNCTION SELECT: ###
edit          code        PCssp SSPpc  etc
```

SSP525 EDIT SELECT

The SSP525 Edit Select is used to access the program and parameters stored in the SSP525 for a device. Press the "edit" key.

```
    SSP525 FUNCTION SELECT: ###
edit ###ssp code        PCssp SSPpc  etc

 f1
```

The SSP525 Edit Select menu for the device will be displayed.

```
       SSP525 EDIT SELECT: ###
 line        clear              parms  etc

 f1          f3                 f6
```

Edit Select option are as follows:

"line" Press the "line" key to edit program lines stored in the SSP525 for the selected device. More information on editing program lines is found in the section titled "Editing Program Lines".

"clear" Press the "clear" key to clear the program stored in the SSP525 for the selected device. After selection of this option the SSP525 will question if this option is to be executed. Press the "yes" key to clear the program; press the "no" key to exit.

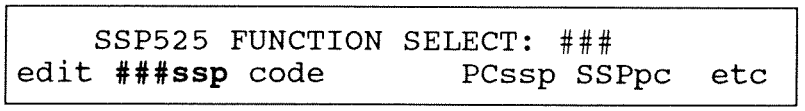
```
     CLEAR SSP525 PROGRAM? ###
                        yes          no

                        f5           f7
```

"parms" Press the "parms" key to edit parameters stored in the SSP525 for the selected device. More information on editing parameters is found in the section titled "Editing Parameters".

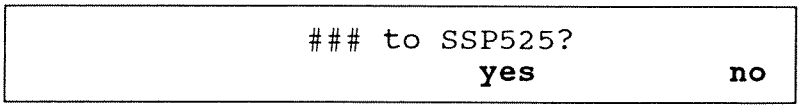
DEVICE TO SSP525 DATA TRANSFER

The Device to SSP525 Data Transfer function is accessed by pressing the "###ssp" key. This option is available only if the SSP525 is able to communicate with the selected device.



f2

The SSP525 will question if this option is to be executed. Press the "yes" key to copy the program and parameters from the selected device into the SSP525; press the "no" key to exit.



f5 **f7**

HOST TO SSP525 DATA TRANSFER

The Host to SSP525 Data Transfer function is accessed by pressing the "PCssp" key. This function is used to upload data from a host computer or other RS-232 device to the SSP525.

```
    SSP525 FUNCTION SELECT: ###
edit ###ssp code        PCssp SSPpc  etc
```

f5

The format used to transfer data from the Host to the SSP525 is as follows:

All L Codes used by the selected device.

Followed by all Program lines used by the selected device.

Followed by the end of transmission characters to terminate data transfer. This function is also terminated after N400 (N50 for the DDSPS) has been entered into memory, or if no data has been transferred after 60 seconds.

An example of the data transfer format is shown on next page.

SSP525 TO HOST DATA TRANSFER

The SSP525 to Host Data Transfer function is accessed by pressing the "SSPpc" key. This function is used to download data from the SSP525 to a host computer or other RS232 device.

```
    SSP525 FUNCTION SELECT: ###
edit ###ssp code        PCssp SSPpc  etc
```

f6

The format used to transfer data from the SSP525 to the Host is as follows:

All L Codes used by the selected device.

Followed by all Program lines used by the selected device.

Followed by the end of transmission characters to terminate data transfer.

An example of the data transfer format is shown on next page.

The following is an example of the format used to upload and download data between the SSP525 and a host computer:

L21 nnCRLF
L70 nCRLF
L06 nCRLF
L07 nnnnCRLF
L08 sCRLF
L09 nnnnnnnCRLF
L11 nnnnnnnnCRLF
L12 nnnnnnnCRLF
L13 nnnnnnnnCRLF
L14 nnnnnnnCRLF
L17 snnnnnnnnCRLF
L18 snnnnnnnnCRLF
L19 snnnnnnnnCRLF
L41 nnnCRLF
L43 nnnnCRLF
L44 nnnnCRLF
L45 nCRLF
L47 nnnnnnnnCRLF
L51 nCRLF
L16 nnnnnnnnCRLF
L20 nCRLF
L57 nnnCRLF
L66 snnnnnnnnCRLF
L67 nCRLF
L71 nnnnnnnCRLF
L72 nCRLF
L73 nnnnnnnnCRLF
L87 nnnnnnCRLF
L90 nCRLF
L93 nnnnnnCRLF
L94 nCRLF
L95 nCRLF
L96 nnnnnnCRLF
L97 nnnnnnCRLF
L98 nnnCRLF

N001 Gnn Xsnnnnnnnn FnnnnnnnCRLF
Nnnn Gnn Xsnnnnnnnn FnnnnnnnCRLF (lines 2 to 399 format)
N400 Gnn Xsnnnnnnnn FnnnnnnnCRLF
EotCRLF (terminates PCssp mode of operation)

Note: "n" is a numeric value 0 to 9
"s" is a + or - sign
"CR" is Carriage Return (ASCII code 13)
"LF" is a line Feed (ASCII code 10)
"Eot" is End Of Transmission (ASCII code 04).

Spaces are only required when uploading parameters and not required when uploading program lines.

Example: Line 400 has a G30 only. Line 400 could be uploaded as follows:
N400G30CRLF

The host may send an Xoff character (ASCII code 19) to temporarily stop data transmission. To resume transmission the host sends an Xon character (ASCII code 17).

VIEWING AND EDITING DEVICE DATA

To view and edit the data stored in a communicating device, the Device Function Select Menu is used. Two different ways to locate the Device Function Select Menu are shown below.

1. If the SSP525 was able to communicate with a device, the Operating Mode for that device will be automatically selected. To access the Device Function Select Menu press the "###" key.

```
          OPERATING MODE: ###
ssp525       code                ###     etc
```

f6

The Device Function Select Menu will be displayed.

```
nn       FUNCTION SELECT: ###
 edit SSP### rev    id   stat motion   etc
```

2. To access the Device Function Select Menu in a different communicating device than the device that is currently selected, press the "etc" key to exit the current Operating Mode.

```
          OPERATING MODE: ###
ssp525       code                ###     etc
```

f7

Select the desired device.

```
          SELECT OPERATING MODE
indxr  lpi   epi   ddsps
```

f1 f2 f3 f4

Press the "###" key to access the device.

```
          OPERATING MODE: ###
ssp525       code                ###     etc
```

f6

The Device Function Select Menu will be displayed.

```
nn       FUNCTION SELECT: ###
 edit SSP### rev    id   stat motion   etc
```

DEVICE EDIT SELECT

The Device Edit Select is used to access the program and parameters stored in the device. The Device Edit Select Menu is accessed by pressing the "edit" key.

```
nn       FUNCTION SELECT: ###
 edit SSP### rev   id  stat motion  etc
```

f1

The Device Edit Select Menu will be displayed.

```
nn          EDIT SELECT: ###
 line        clear  id   scan parms  etc
```

f1 **f3** **f4** **f5** **f6**

Edit Select options are as follows:

"line" Press the "line" key to edit program lines stored in the selected device. More information on editing program lines is found in the section titled "Editing Program Lines".

"clear" Press the "clear" key to clear the program stored in the selected device. After selection of this option the SSP525 will question if this option is to be executed. Press the "yes" key to clear the program; press the "no" key to exit.

```
nn            CLEAR PROGRAM? ###
                      id   yes          no
```

f5 **f7**

"id" Press the "id" key to switch communications to another device with a different id number. If communications with only one device are available this option will not be displayed. More information on switching id numbers is found in the section titled "Change ID Number Function Select".

"scan" Press the "scan" key to scan all the ID numbers to locate any communicating devices. After selection of this option the SSP525 will question if this option is to be executed. Press the "yes" key to have the SSP525 scan all the ID numbers; press the "no" key to exit.

```
                SCAN ALL IDS?
                          yes          no
```

f5 **f7**

"parms" Press the "parms" key to edit parameters stored in the selected device. More information on editing parameters is found in the section titled "Editing Parameters".

SSP525 TO DEVICE DATA TRANSFER

The SSP525 to Device Data Transfer function is accessed by pressing the "SSP###" key.

```
nn       FUNCTION SELECT: ###
 edit SSP### rev   id  stat motion  etc
```

f2

The SSP525 will question if this option is to be executed. Press the "yes" key to copy the program and parameters from the selected device into the SSP525; press the "no" key to exit.

```
nn          SSP525 to ### ?
                    id   yes          no
```

f4 f5 f7

The "id" key is used to switch communications to another device with a different id number. If communications with only one device are available this option will not be displayed.

DISPLAY DEVICE REVISION LEVEL

The Device Revision Level function is used to display the Revision Level of the device. The Device Revision Level function is accessed by pressing the "rev" key.

```
nn       FUNCTION SELECT: ###
 edit SSP### rev   id  stat motion  etc
```

f3

The SSP525 will display the Revision Level of the device.

```
nn REVISION LEVEL:  ### mm/yy/r
                    id              etc
```

f4

The "id" key is used to switch communications to another device with a different id number. If communications with only one device are available this option will not be displayed.

Note: "mm" represents the numeric value for the month.
"yy" represents the numeric value for the year.
"r" represents the revision letter.

CHANGE ID NUMBER

The Device ID may be changed to switch communications to another communicating device. If communications with only one device are available this option will not be displayed. The Device ID Function Select is accessed by pressing the "id" key.

```
nn       FUNCTION SELECT: ###
 edit SSP### rev    id  stat motion  etc
```

f4

Use the numeric keypad to enter the new device ID number and press the "DATA ENTRY" key, or press the "scan" key to scan to the ID number of the next communicating device. Upon communicating with a device the SSP525 will display the device type and ID number. Press the "DATA ENTRY" key to accept the new selection or press the "scan" key again to scan to the next selection.

```
_      ATTENTION (01 to 99):
scan
```

f1

If the device ID number selected was with the keypad and the SSP525 was unable to communicate with the new device, the selection will be discarded and another ID number requested.

VIEWING DEVICE STATUS

To view the Device Status press the "stat" key.

```
nn       FUNCTION SELECT: ###
 edit SSP### rev    id  stat motion  etc
```

f5

Indexer Status Displays

When viewing the status of an Indexer the following menu will be displayed. When using the Standard Indexer the "posvr" key will not be displayed. When using the Preset Indexer the "line#" key will not be displayed.

```
nn            STATUS: ###
line#  i/o  mode  id  motion posvr  etc
```

f1 f2 f3 f4 f5 f6

The following Device Status options are available:

"line#" Press the "line#" key to display the current line number.

```
nn Nnnn      LINE NUMBER: ###
                                   etc
```

"i/o" Press the "i/o" key to display the I/O Status. The following will be displayed when using the Standard or Preset Indexer. Refer to the device manual for an explanation of I/O Status.

```
nn nnnnnnnn I/O STATUS: ###
                                        etc
```

The following three options are displayed when obtaining the I/O status of an Enhanced Indexer.

```
              I/O STATUS: EPI
 in1          in2          output          etc

  f1           f3           f5
```

"in1" Press the "in1" key to display the Conditional Inputs status for the Enhanced Indexer. Refer to the Enhanced Indexer manual an explanation of the Conditional Inputs status.

```
nn nnnnnnnn CONDITIONAL INPUTS: EPI
                                              etc
```

"in2" Press the "in2" key to display the Switch Inputs status for the Enhanced Indexer. Refer to the Enhanced Indexer manual for an explanation of the Switch Inputs status.

```
nn nnnnnnnn SWITCH INPUTS: EPI
                                              etc
```

"output" Press the "output" key display the Output Status for the Enhanced Indexer. Refer to the Enhanced Indexer manual for an explanation of the Output Status.

```
nn nnnnnnnn OUTPUT STATUS: EPI
                                              etc
```

"mode" Press the "mode" key to display the Mode Status. Refer to the device manual for an explanation of the Mode Status.

```
nn nnnnnnnn MODE STATUS: ###
                                        etc
```

"id" Press the "id" key to switch communications to another communicating device. If communications with only one device are available this option will not be displayed.

"motion" Press the "motion" key to display the Motion Status. Refer to the device manual for an explanation of the Motion Status.

```
nn nnnnnnnn MOTION STATUS: ###
                                        etc
```

"posvr" When using an Indexer with Closed Loop Position Verification capabilities, press the "posvr" key to display the Position Verification Status. Refer to the device manual for an explanation of the Position Verification Status.

```
nn nnnnnnnn POS VER STATUS: ###
                                        etc
```

Direct Drive Status Displays

When viewing the status of a Direct Drive System the following menu will be displayed.

```
nn          STATUS: DDSPS
 cntrl i/o  mode  id  motion drive  etc

   f1   f2    f3   f4    f5   f6
```

The following Device Status options are available:

"cntrl" Press the "cntrl" key to display the Control Status. Refer to the Direct Drive System Instruction Manual for an explanation of the Control Status.

```
nn nnnnnnnn CONTROL STATUS: DDSPS
                                        etc
```

"i/o" Press the "i/o" key to display the I/O Status. Refer to the Direct Drive System Instruction Manual for an explanation of the I/O Status.

```
nn nnnnnnnn I/O STATUS: DDSPS
                                        etc
```

"mode" Press the "mode" key to display the Mode Status. Refer to the Direct Drive System Instruction Manual for an explanation of the Mode Status.

```
nn nnnnnnnn MODE STATUS: DDSPS
                                        etc
```

"id" Press the "id" key to switch communications to another communicating device. If communications with only one device are available this option will not be displayed.

"motion" Press the "motion" key to display the Motion Status. Refer to the Direct Drive System Instruction Manual for an explanation of the Motion Status.

```
nn nnnnnnnn MOTION STATUS: DDSPS
                                        etc
```

"drive" Press the "drive" key to display the Drive Status. Refer to the Direct Drive System Instruction Manual for an explanation of the Drive Status.

```
nn nnnnnnnn DRIVE STATUS: DDSPS
                                        etc
```

EXECUTING MOTION

To access the Motion Select Menu press the "motion" key.

```
nn       FUNCTION SELECT: ###
 edit SSP### rev   id  stat motion  etc
                                    f6
```

The following will be displayed when using the Enhanced or Preset Indexer. When using the Direct Drive System the "mode" key will be replaced by "brk/inh". When using the Standard Indexer the "mode" key will not be displayed.

Manual Motion

Press the "man" key to select manual motion.

```
nn        MOTION SELECT: ###
 man  mode   exec  id  HIspd LOspd  etc
  f1
```

The Manual Motion menu will be displayed.

```
nn        MANUAL MOTION: ###
 step  jog  mdi   rmh   seh  reh    etc
  f1   f2    f3   f4    f5   f6
```

The following options are available when executing manual motion:

"step" Press the "step" key to manually step the motor.

When using the Enhanced or Preset Indexer the following will be displayed. When using the Standard Indexer the "size" key will not be displayed.

```
nn  STEP MOTION: ###
  +    pos    -   id   size          etc
  f1   f2     f3   f4    f5
```

The "+" and "-" keys are used to step in the clockwise (+) or counter-clockwise (-) direction.
The "pos" key is used to display the absolute motor position.
The "id" key is used to switch to another communicating device.
The "size" key is used to change the step size parameter.

When using the Direct Drive System the following will be displayed.

```
nn  STEP MOTION: DDSPS
  +     pos     -    id     brk    inh    etc

   f1    f2     f3    f4     f5    f6
```

The "+" and "-" keys are used to step in the clockwise (+) or counter-clockwise (-) direction.
The "pos" key is used to display the absolute position.
The "id" key is used to switch to another communicating device.
The "brk" key is used to enable or disable the brake.
The "inh" key is used to enable or disable the drive inhibit.

"jog" Press the "jog" key to manually jog the motor.

When using the Enhanced, Preset or Standard Indexer the following will be displayed.

```
nn JOG MOTION: ###
  +     pos     -    id    speed          etc

   f1    f2     f3    f4    f5
```

The "+" and "-" keys are used to jog in the clockwise (+) or counter-clockwise (-) direction.
The "pos" key is used to display the absolute position.
The "id" key is used to switch to another communicating device.
The "speed" key is used to change the jog speed parameter.

When using the Direct Drive System the following will be displayed.

```
nn JOG MOTION: DDSPS
  +     pos     -    id     brk    inh    etc

   f1    f2     f3    f4     f5    f6
```

The "+" and "-" keys are used to jog in the clockwise (+) or counter-clockwise (-) direction.
The "pos" key is used to display the absolute motor position.
The "id" key is used to switch to another communicating device.
The "brk" key is used to enable or disable the brake.
The "inh" key is used to enable or disable the drive inhibit.

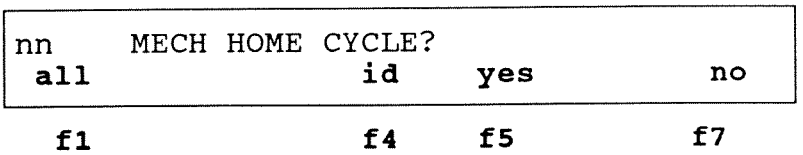
"mdi" Press the "mdi" key to access the Manual Direct Index Mode. The Manual Direct Index Mode allows manual execution of one program line. The Manual Direct Index Mode is not used with the Preset Indexer. For information on programming lines refer to the section titled "Editing Program Lines".

```
nn G    X              F              MDI: ###
cycst pos    edit    id                    etc

   f1    f2     f3    f4
```

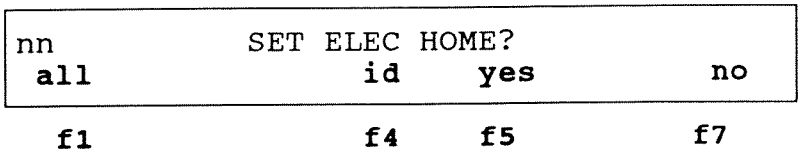
The "cycst" key is used to execute the Manual Index program line.
The "pos" key is used to display the absolute motor position.
The "edit" key is used to edit the Manual Index program line.
The "id" key is used to switch to another communicating device.

"rmh" Press the "rmh" key to run the motor to the mechanical home position.



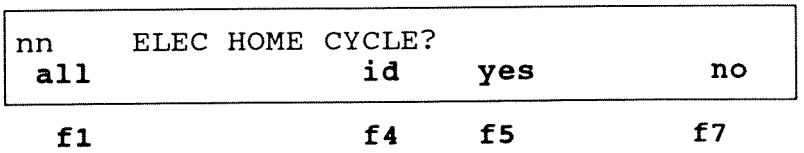
The "all" key is used to command all axis to return to mechanical home position.
The "id" key is used to switch to another communicating device.
The "yes" key is used to return to mechanical home.
The "no" key is used to exit.

"seh" Press the "seh" key to reference the current motor position as electrical home position.



The "all" key is used to command all axis to return to mechanical home position.
The "id" key is used to switch to another communicating device.
The "yes" key is used reference the current motor position as Electrical Home.
The "no" key is used to exit.

"reh" Press the "reh" key to return motor to the electrical home position.



The "all" key is used to command all axis to return to electrical home position.
The "id" key is used to switch to another communicating device.
The "yes" key is used to set electrical home.
The "no" key is used to exit.

Motion Mode

Press the "mode" key to select the Motion Mode.

```
nn        MOTION SELECT: ###
 man   mode    exec   id   HIspd LOspd   etc
```

f2

The Motion Mode selection display will be displayed.

```
nn       OFF    OFF    OFF      INCremental
         wnd   boost  reduce        abs     etc
```

f2 f3 f4 f6

The "wnd" key is used to toggle the motor windings on and off.
The "boost" key is used to toggle the motor boost current on and off.
The "reduce" key is used to toggle the motor reduce current on and off.
The "abs" key is used to change to the absolute motion mode.
The "inc" key, when displayed, is used to change to the incremental motion mode.

Programmed Motion

Press the "exec" key to select programmed motion.

```
nn        MOTION SELECT: ###
 man   mode    exec   id   HIspd LOspd   etc
```

f3

The Execute Motion menu will be displayed. If more than one axis is present the SSP525 will execute motion on all axes and "ALL AXIS" will be displayed instead of "ONE AXIS". When "ALL AXIS" is displayed the "all" key will be replaced by a "one" key to select motion for one axis.

```
nn      EXECUTE MOTION: ###       :ONE AXIS
 auto sngl   cont   all                 etc
```

f1 f2 f3 f4

The following options are available when Executing Programmed Motion:

"auto" Press the "auto" key to enter the Auto Execution mode. Executing a program using the Auto Execution mode will execute the entire program stored in the device once.

```
nn Nnnn AUTO EXEC MODE
cycst  pos  stat   N    id   mode   etc
```

f1 f2 f3 f4 f5 f6

The "pos" key is used to display the absolute position.
The "stat" key is used to view device status.
The "N" key is used to change the line number that program execution will begin from.
The "id" key is used to switch to another communicating device.
The "mode" key is used to view the motion mode.
The "cycst" key is used to begin program execution. The following will be displayed when using an Enhanced or Preset Indexer. When using a Standard Indexer the "fro", "Hlspd" and "LOspd" keys will not be displayed.

```
nn Nnnn AUTO EXECUTING nnnnnnnnp/s
pause  pos  stop  fro  HIspd LOspd clear
```

f1 f2 f3 f4 f5 f6 f7

The "pause" key is used to pause motion cycle.
The "pos" key is used to display the absolute position.
The "stop" key is used to stop the motion cycle.
The "fro" Feed Rate Override key is used to change the feedrate.
The "Hlspd" key selects the Hi Speed Mode.
The "LOspd" key selects the Lo Speed Mode.
The "clear" key clears all motion.

"sngl" Press the "sngl" key to enter the Single Line Execution mode. Executing a program using the Single Line Execution mode will execute one program line of the program stored in the device.

```
nn Nnnn SNGL EXEC MODE
cycst  pos  stat   N    id   mode   etc
```

f1 f2 f3 f4 f5 f6

The "pos" key is used to display the absolute position.
The "stat" key is used to view device status.
The "N" key is used to change the line number that will be executed.
The "id" key is used to switch to another communicating device.
The "mode" key is used to view the motion mode.
The "cycst" key is used to begin program execution. The following will be displayed when using an Enhanced or Preset Indexer. When using a Standard Indexer the "fro", "Hlspd" and "LOspd" keys will not be displayed.

```
nn Nnnn SNGL EXECUTING nnnnnnnnp/s
pause  pos        fro  HIspd LOspd clear
```

f1 f2 f4 f5 f6 f7

The "pause" key is used to pause motion cycle.
The "pos" key is used to display the absolute position.
The "fro" Feed Rate Override key is used to change the feedrate.
The "Hlspd" key selects the Hi Speed Mode.

The "LOspd" key selects the Lo Speed Mode.
The "clear" key clears all motion.

"cont" Press the "cont" key to enter the Continuous Execution mode. Executing a program using the Continuous Execution mode will continuously execute the entire program stored in the device.

```
nn Nnnn CONT EXEC MODE
cycst  pos  stat   N    id   mode   etc
  f1   f2    f3   f4    f5    f6
```

The "pos" key is used to display the absolute motor position.
The "stat" key is used to view device status.
The "N" key is used to change the line number that program execution will begin from.
The "id" key is used to switch to another communicating device.
The "mode" key is used to view the motion mode.
The "cycst" key is used to begin program execution and display the following:

```
nn Nnnn CONT EXECUTING nnnnnnnnp/s
pause  pos  stop  fro  HIspd LOspd clear
  f1   f2    f3   f4    f5    f6    f7
```

The "pause" key is used to pause motion cycle.
The "pos" key is used to display the absolute position.
The "stop" key is used to stop the motion cycle.
The "fro" Feed Rate Overide key is used to change the feedrate.
The "HIspd" key selects the Hi Speed Mode.
The "LOspd" key selects the Lo Speed Mode.
The "clear" key clears all motion.

"all" Press the "all" key to select programmed motion for all communicating devices. The "one" key will only appear if more than one communicating device is present. Upon executing this option the following will be displayed.

```
nn      EXECUTE MOTION: ###      :ALL AXIS
 auto sngl  cont  one                 etc
  f1   f2    f3   f4
```

The "one" key is used to return programmed motion to one device.

"one" Press the "one" key to select programmed motion for one communicating device. The "one" key will only appear if more than one communicating device is present. Upon executing this option the following will be displayed.

```
nn      EXECUTE MOTION: ###      :ONE AXIS
 auto sngl  cont  all                 etc
  f1   f2    f3   f4
```

The "all" key is used to return programmed motion to all devices.

High Speed Mode

Press the "HIspd" key to select the High Speed Mode.

```
nn        MOTION SELECT: ###
 man  mode   exec  id  HIspd LOspd  etc
```

f5

Refer to the device manual for information on High Speed Mode.

Low Speed Mode

Press the "LOspd" key to select the Low Speed Mode.

```
nn        MOTION SELECT: ###
 man  mode   exec  id  HIspd LOspd  etc
```

f6

Refer to the device manual for information on Low Speed Mode.

Toggling the Brake and Inhibit

This option is allowed only when using the Direct Drive System. Press the "brk/inh" key to select the Brake and Inhibit Mode.

```
nn        MOTION SELECT: ###
 man brk/inh exec  id  HIspd LOspd  etc
```

f2

The Brake and Inhibit mode selection display will be displayed. The Brake and Inhibit are active when displayed as "BRK" and "INH" in the top row of the display as shown below.

```
nn      DDSPS        BRK          INH
                     brk          inh     etc
```

f4 **f6**

The "brk" key is used to enable or disable the brake.
The "inh" key is used to enable or disable the drive inhibit.

EDITING FUNCTIONS

This option is selected from either the SSP525 Function Select Menu or the Device Function Select Menu. Press the "edit" key to access the Edit Function Select Menu.

```
nn       FUNCTION SELECT: ###
 edit SSP### rev   id  stat motion  etc
```

f1

EDITING PROGRAM LINES

Press the "line" key.

```
nn          EDIT SELECT: ###
 line         clear  id  scan  parms  etc
```

f1

The program line data will be displayed. When using the Preset Indexer the edit option menu described below is displayed without the "N" and "G" keys instead of the following display.

```
IDnn Nnnn Gnn X+nnnnnnnn Fnnnnnnn
  N   edit                 next  prev   etc
```

f1 f2 f5 f6

When editing program lines stored in the SSP525 for a device "IDnn" will be replaced with "SSP".

Line editing options are as follows:

"N" Press the "N" key to select a different line number.

"edit" Press the "edit" key to change the contents of the program line.

```
IDnn Nnnn Gnn X+nnnnnnnn Fnnnnnnn
  N     G     X    F          del    etc
```

f1 f2 f3 f4 f6

The "N" key is used to select a different line number.
The "G" key is used to change the G code.
The "X" key is used to change the move distance.
The "F" key is used to change the feedrate.
The "del" key is used to delete the program line.

Refer to the device manual for complete information on programming functions.

Press the "DATA ENTRY" when finished editing. The SSP525 will display "*MEM*" after saving the program line.

```
IDnn Nnnn Gnn X+nnnnnnnn Fnnnnnnn  *MEM*
  N   edit                 next  prev   etc
```

"next" Press the "next" key to advance to the next program line.

"prev" Press the "prev" key to advance to the previous program line.

EDITING PARAMETERS

Press the "parms" key.

```
nn          EDIT SELECT: ###
 line         clear  id        parms  etc
                                  f6
```

The parameter data will be displayed. When editing parameters stored in the SSP525 the "jog" key will not appear.

```
L06 n           PROG EXECUTION MODE
  L    jog                 next  prev   etc
 f1    f2                   f5    f6
```

If desired use the arrow and number keys to change the value of the L code, and press the "DATA ENTRY" key save the new value.

Parameter editing options are as follows:

"L" Press the "L" key to select a different parameter.

"jog" Press the "jog" key to manually jog the motor.

"next" Press the "next" key to advance to the next parameter.

"prev" Press the "prev" key to advance to the previous parameter.

ENCODER SETUP

The Encoder Setup options are available only with closed loop (-V option) Enhanced and Preset Indexers. The Encoder Setup options are accessed from the following display.

```
Asnnnnnnnnnn ENCODER SET UP Esnnnnnnnnnn
 cycst auto  dir          quad          etc
   f1    f2     f3           f5
```

Encoder Setup options are as follows:

"cycst" Upon pressing the "cycst" key the parameters L90 0 and L13 200 are set. STEP Mode (H02) and LOW SPEED mode (H05) are set, and PLUS MOTION mode (H06) is issued.

"auto" Press the "auto" key to automatically set up encoder direction and quadrature scale factor. An error message will be displayed if encoder can not be set up.

"dir" Press the "dir" key to manually set the encoder direction. Press the "0" key for true direction or press the "1" key to invert the direction.

```
L94 n ENCODER DIRECTION: 0,1  INVERT =1
                                   etc
```

"quad" Press the "quad" key to manually set the encoder scale factor. Responses of "0", "2", "4", "5" and "8" are allowed.

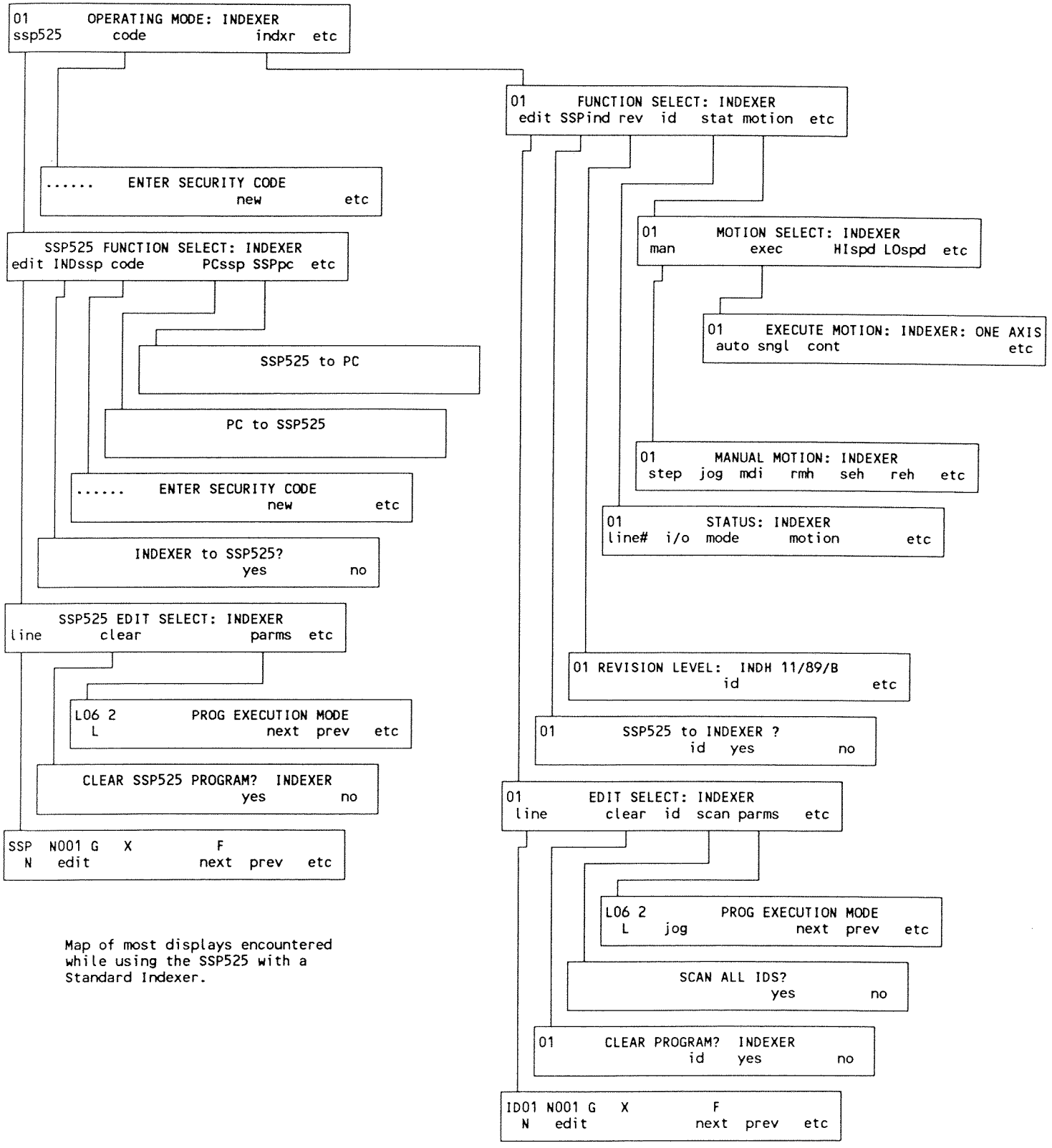
```
L95 n ENCODER SCALE FACTOR: 0,2,4,5,8
                                 etc
```

SECTION 5. APPENDIX

OVERVIEW

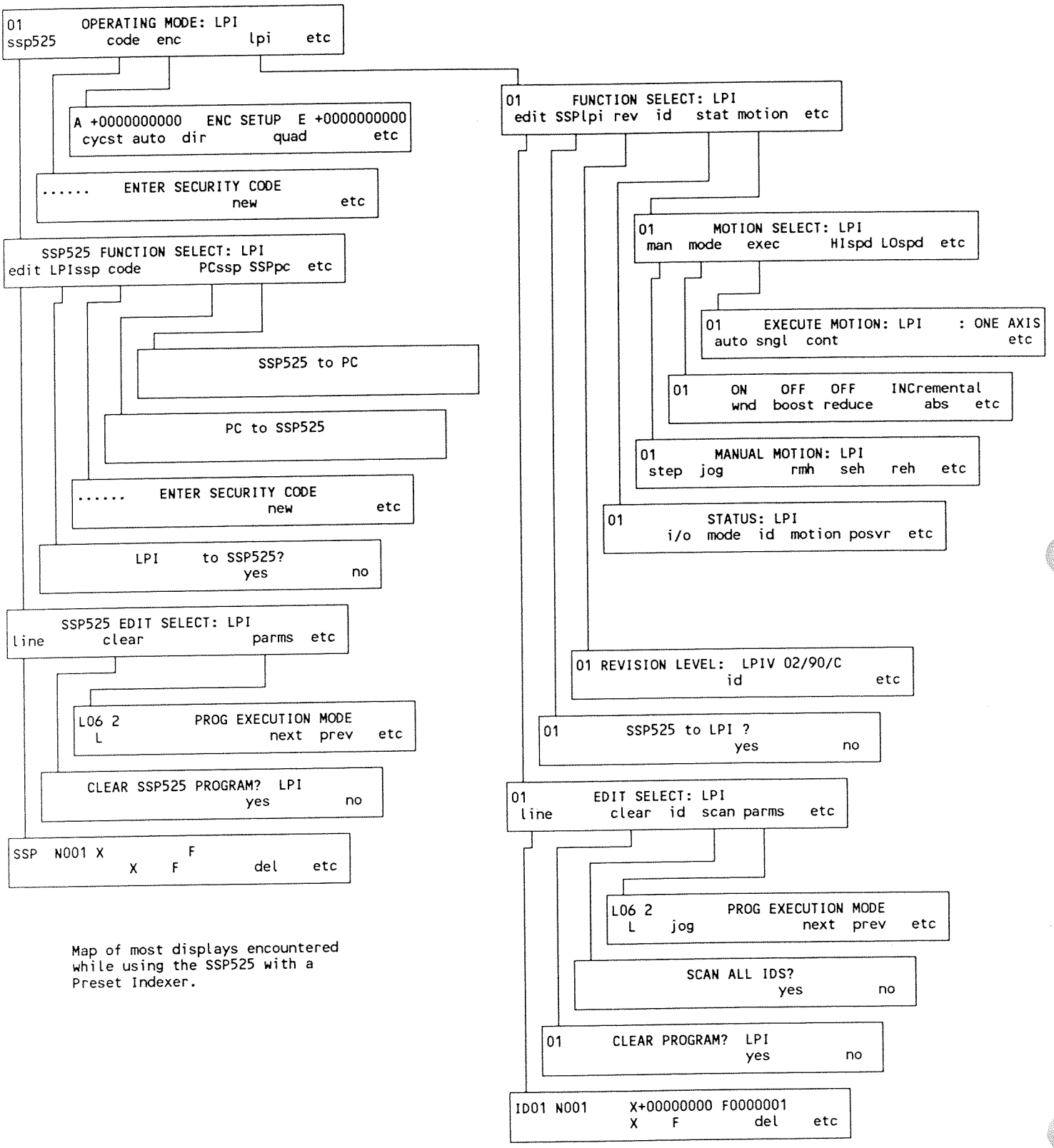
The following section contains maps of most displays encountered when using the SSP525 with a Micro Series Indexer or Direct Drive Servo Positioning System.

SSP525 TO STANDARD INDEXER DISPLAY MAP



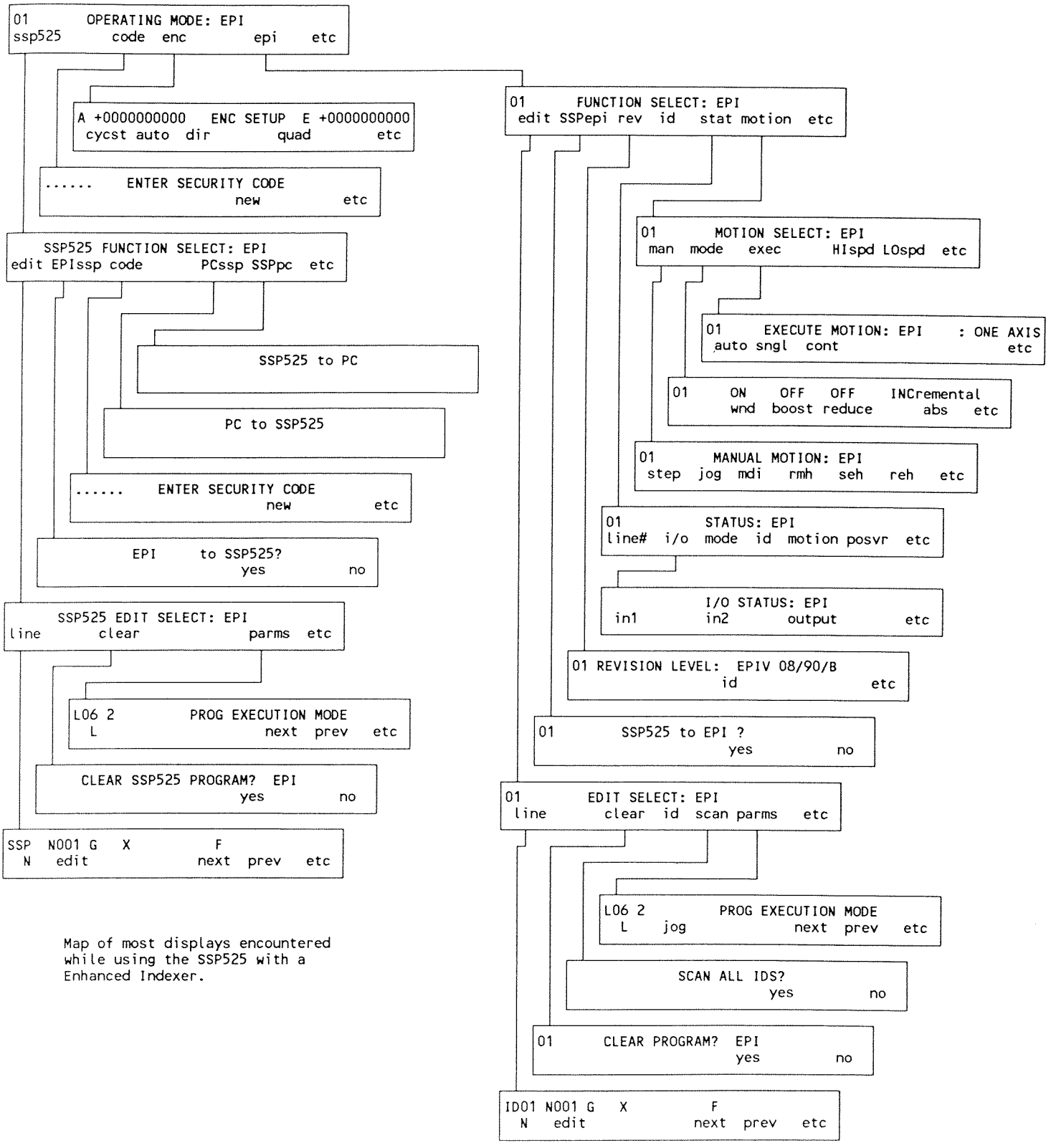
Map of most displays encountered while using the SSP525 with a Standard Indexer.

SSP525 TO PRESET INDEXER DISPLAY MAP



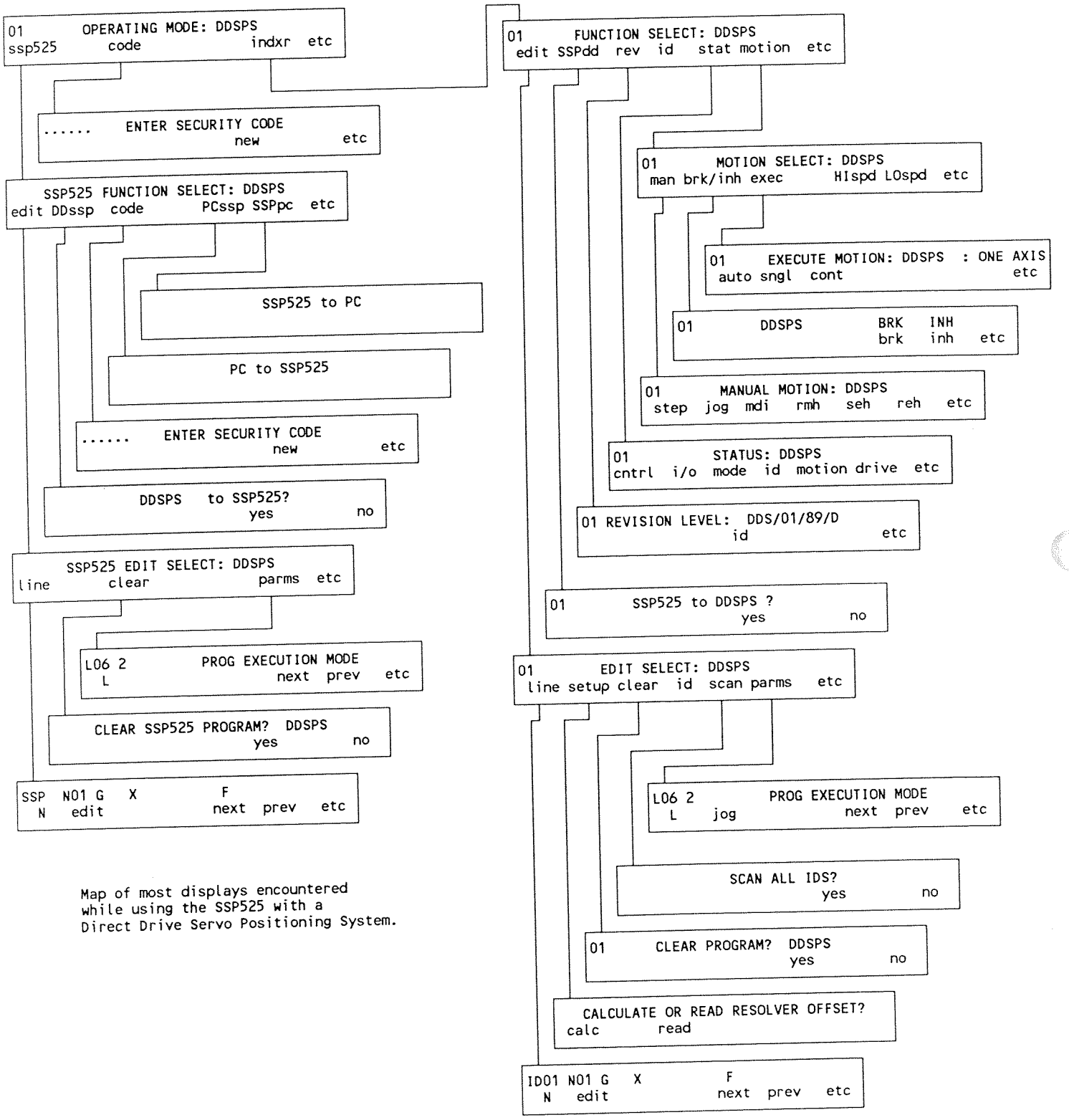
Map of most displays encountered while using the SSP525 with a Preset Indexer.

SSP525 TO ENHANCED INDEXER DISPLAY MAP



Map of most displays encountered while using the SSP525 with a Enhanced Indexer.

SSP525 TO DIRECT DRIVE SERVO POSITIONING SYSTEM DISPLAY MAP



Map of most displays encountered while using the SSP525 with a Direct Drive Servo Positioning System.

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