

TO: Bill Henry
Gary Musgrave
FROM: A.B. White
SUBJECT: ST-8000A KEYPAD OPERATION
DATE: December 23, 1990

The ST-8000A keypad provides complete control over the operation of the ST-8000A modem. It is used to set the MARK and SPACE or CENTER and SHIFT frequencies for the demodulator (channel 1) and the modulator (channel 2) as well as set various other parameters for both channels and activate built in test routines.

Whenever parameters are entered, the ENTER key indicator flashes to signal the change. To save this new parameter in the non-volatile memory, the user need only press the ENTER key. At any time before ENTER is pressed, the CLEAR key may be pressed to ignore the new setting and return the ST-8000A to the previously saved parameters.

In the following sections, the function of each of the keypad function keys is summarized. The keys are presented in keypad order starting with the left hand column.

1. NUMBER KEYS

The number keys, 0 to 9 and 0.5, are used to enter new frequencies, baud rates, and regeneration word length, and select internal BIT tests. The number keys are only active after one of the following function keys has been pressed: MARK, SPACE, BAUD RATE, or SYNC. When entering a number, the corresponding display window shows the new setting, but the new parameter is not activated until the ENTER key is pressed. If the CLEAR key is pressed before ENTER, the modem will return to the previously stored settings and will ignore the new setting.

2. ENTER KEY

The ENTER key stores the current modem parameters in non-volatile memory and turns OFF the flashing ENTER indicator. Pressing any parameter key causes the ENTER indicator to flash. If the CLEAR key is pressed before ENTER, the modem returns to the previously stored parameters. Note: the REMOTE key does not require the ENTER key.

3. M/S CENT KEY

The M/S key determines the front panel display mode and the parameter entry mode. Pressing the M/S key turns ON the MARK and SPACE indicators and displays the MARK and SPACE filter center frequencies when channel 1 is selected, or the transmit tone frequencies when channel 2 is selected. In this mode, the MARK and SPACE keys set the MARK and SPACE frequencies directly for the selected channel.

Pressing 2ND then M/S changes the front panel display to show the CENTER and SHIFT frequencies for either channel 1 or 2. In this mode, the indicators next to the CENTER and SHIFT labels are turned ON. In addition, the MARK and SPACE keys load the CENTER and SHIFT frequencies, respectively, for the selected channel.

To save the new display and parameter entry mode, the ENTER key must be pressed.

4. BIT KEY

The BIT routines are activated by pressing 2ND the BIT followed by ENTER or a number and ENTER. If ENTER alone is pressed, the complete BIT procedure is performed. The table below summarizes the available test features and the corresponding BAUD display message.

KEY	DESCRIPTION	BAUD DISPLAY
-----	-----	-----
ENTER	Automatic BIT procedure	-
1	Automatic BIT procedure	-
2	Constant MARK	" ---"
3	Constant SPACE	" <u> </u> "
4	Alternating MARK/SPACE at TX BAUD	"Alt "
7	Internal Loopback at 0 dBm	"LP 1"
8	Internal Loopback at -20 dBm	"LP 2"
9	Internal Loopback at -40 dBm	"LP 3"

5. 2ND KEY

The 2ND key accesses the second level functions on certain keys. The ST-8000A has second level functions only on the following keys: M/S CENT, BIT, MARK ONLY, SPACE ONLY, AMH HOLD, NORM REV, and SYNCH REGEN. Pressing any key other than those listed above returns the keypad to first level functions.

6. FSK KEY

The FSK key is used with MARK ONLY and SPACE ONLY to set the demodulator discriminator mode. Pressing FSK turns ON the FSK indicator and selects the MARK/SPACE discriminator mode. This key is functional whether channel 1 or channel 2 is selected.

KEYS	ACTION
-----	-----
FSK	Select demodulator MARK/SPACE mode. Turns ON the FSK indicator.

To save the new demodulator mode, the ENTER key must be pressed.

7. MARK ONLY KEY

The MARK ONLY key has both a first and a second level function.

7.1 MARK (first level):

Press MARK alone to enter the MARK filter frequency (channel 1) or the MARK transmit tone (channel 2) when the MARK/SPACE display mode is active. The following example assumes that the demodulator, channel 1, is selected.

KEYS	ACTION
-----	-----
MARK	Blank the MARK display window, ENTER turns ON
2125	"2125.0" shows in the MARK window
ENTER	"2125.0" flashes, ENTER turns OFF The MARK filter is set to 2125.0 Hz

When the display mode is set for CENTER/SHIFT, the MARK key sets a new CENTER frequency for the demodulator filters, channel 1, or the transmit tones, channel 2. The following example assumes that the demodulator, channel 1, is selected.

KEYS	ACTION
-----	-----
MARK	Blank the CENTER display window, ENTER turns ON
2210	"2210.0" shows in the CENTER window
0.5	"2210.5" shows in the CENTER window
0.5	"2210.0" shows in the CENTER window
ENTER	"2210.0" flashes, ENTER turns OFF The demodulator center frequency is set to 2210 Hz

Note: When the center changes, the previous shift frequency is

maintained. If previous MARK and SPACE were 1000.0 and 1200.0 Hz (Shift = 200.0 Hz), setting center to 2210 Hz will maintain 200 Hz shift and change MARK to 2110.0 Hz and SPACE to 2310.0 Hz.

To save the new center frequency, the ENTER key must be pressed.

7.2 MARK ONLY (2nd level):

Pressing 2ND then MARK enables the MARK ONLY demodulator mode and turns ON the MK ONLY indicator. If the FSK indicator was ON, that indicator turns OFF. If the SP ONLY indicator was on, that indicator turns OFF.

KEYS	ACTION
-----	-----
2nd	Enable second level function
MARK	Select demodulator MARK ONLY mode. Turn ON the MK ONLY indicator.

To save the new demodulator mode, the ENTER key must be pressed.

8. SPACE ONLY KEY

The SPACE ONLY key has both a first and a second level function.

8.1 SPACE (first level):

Press SPACE alone to enter the SPACE filter frequency (channel 1) or the SPACE transmit tone (channel 2) when the MARK/SPACE display mode is active. The following example assumes that the demodulator, channel 1, is selected.

KEYS	ACTION
-----	-----
SPACE	Blank the SPACE display window, ENTER turns ON
2295	"2295.0" shows in the SPACE window
ENTER	"2295.0" flashes, ENTER turns OFF The SPACE filter is set to 2295.0 Hz

When the display mode is set for CENTER/SHIFT, the SPACE key sets a new SHIFT frequency for the demodulator filters, channel 1, or the transmit tones, channel 2. The following example assumes that the demodulator, channel 1, is selected.

KEYS	ACTION
-----	-----
SPACE	Blank the SHIFT display window, ENTER turns ON

200	" 200." shows in the SHIFT window
ENTER	" 200." flashes, ENTER turns OFF

The demodulator shift frequency is set to 200 Hz.

Note: When the shift changes, the previous center frequency is maintained. If previous center and shift were 2210.0 and 170.0 Hz, setting shift to 200 Hz will retain the 2210 Hz center frequency and change MARK to 2110.0 Hz and SPACE to 2310.0 Hz.

To save the new shift frequency, the ENTER key must be pressed.

8.2 SPACE ONLY (2nd level):

Pressing 2ND then SPACE enables the SPACE ONLY demodulator mode and turns ON the SP ONLY indicator. If the FSK indicator was ON, that indicator turns OFF. If the MK ONLY indicator was on, that indicator turns OFF.

KEYS	ACTION
-----	-----
2nd	Enable second level function
SPACE	Select demodulator SPACE ONLY mode.
	Turn ON the SP ONLY indicator.

To save the new demodulator mode, the ENTER key must be pressed.

9. DIV KEY

The DIV key toggles the demodulator diversity option ON and OFF. When ON, the DIV indicator turns ON.

KEYS	ACTION
-----	-----
DIV	Turn DIVERSITY option ON; turn ON DIV indicator
DIV	Turn DIVERSITY option OFF; turn OFF DIV indicator

To save the new demodulator mode, the ENTER key must be pressed.

10. MUTE KEY

The MUTE key toggles the modulator mute feature ON and OFF. This feature operates correctly only when the internal modulator jumper is set for MUTE. When the mute option is ON and transmit data stops, the transmit tones are turned OFF with the PTT output after the keyline delay expires. The MUTE indicator is ON when this feature is enabled. When the mute option is OFF, the PTT output and the transmit tones are always ON.

KEYS	ACTION
-----	-----
MUTE	Turn MUTE option ON; turn ON the MUTE indicator
MUTE	Turn MUTE option OFF; turn OFF the MUTE indicator

To save the new mute setting, the ENTER key must be pressed.

11. REMOTE KEY

The REMOTE key selects local and remote control of the ST-8000A. When REMOTE is enabled, the REMOTE indicator turns ON and all parameter control is via the rear panel remote control port. The REMOTE LED is ON whenever Remote control is active. When remote control mode is enabled, all keypad keys are disabled except for the REMOTE key.

Keypad or local control is restored by pressing the REMOTE key.

KEYS	ACTION
-----	-----
REMOTE	Enable REMOTE control; turn ON REMOTE indicator
REMOTE	Enable LOCAL control; turn OFF REMOTE indicator

The local or remote control status is saved in the non-volatile memory immediately; no ENTER key press is required.

12. AMH HOLD KEY

The AMH HOLD key has both a first and a second level function.

12.1 AMH (first level):

The AMH key toggles the Automatic Mark-Hold receive feature ON and OFF. When AMH is ON, the AMH indicator is turned ON.

KEYS	ACTION
-----	-----
AMH	Turn AMH option ON; turn ON the AMH indicator
AMH	Turn AMH option OFF; turn OFF the AMH indicator

To save the new AMH setting, the ENTER key must be pressed.

12.2 HOLD (2nd level):

Pressing 2ND then HOLD toggles the MARK hold feature for the selected channel. When channel 1 is selected, the demodulator output is held in the MARK condition. When channel 2 is selected, the transmit tone output is held in the MARK state. The HOLD indicator on the front panel shows the current state for the selected channel. The following example assumes that the transmit channel 2 is selected.

KEYS	ACTION
-----	-----

2ND	Enable second level function
HOLD	Turn HOLD option ON; turn ON the HOLD indicator
2ND	Enable second level function
HOLD	Turn HOLD option OFF; turn OFF the HOLD indicator

To save the new HOLD setting, the ENTER key must be pressed.

13. NORM REV KEY

The NORM REV key has both a first and second level function.

13.1 NORM (first level):

The NORM key sets the selected channel polarity to NORMAL and turns OFF the REV indicator.

KEYS	ACTION
-----	-----
NORM	Enable NORMAL polarity; turn OFF REV indicator

To save the new polarity setting, the ENTER key must be pressed.

13.2 REV (2nd level):

Pressing 2ND then REV sets the selected channel polarity to REVERSE and turns ON the REV indicator.

KEYS	ACTION
-----	-----
2ND	Enable second level function
REV	Enable REVERSE polarity; turn ON REV indicator

To save the new polarity setting, the ENTER key must be pressed.

14. SYNCH REGEN KEY

The SYNCH REGEN key has both a first and second level function.

14.1 SYNCH (first level)

The SYNCH key toggles the clocked synchronous data mode ON and OFF. When ON, the SYNC indicator turns ON and the modem receive data outputs are internally re-clocked with a recovered mid-bit clock. When OFF, the SYNC indicator turns OFF and the modem receive data outputs are directly connected to the demodulator output.

When the SYNC indicator turns OFF, the bit display prompts for the receive data regeneration word length. The current setting is shown, and it may be set to 5, 6, 7, or 8 bits. If the current setting is correct, ENTER only is pressed.

KEYS	ACTION
-----	-----
SYNCH	Enable SYNC mode; turn ON the SYNC indicator If REGEN mode was ON, it is turned OFF
SYNCH	Disable SYNC mode; turn OFF the SYNC indicator "L=5 " is displayed in the BAUD window.
8	"L=8 " is displayed in the BAUD window.
ENTER	Flash the BAUD window and restore BAUD RATE The new configuration is saved immediately.

13.2 REGEN (2nd level)

Pressing 2ND then REGEN toggles the receive data regeneration mode ON and OFF. When ON, the REGEN indicator turns ON, the SYNC indicator turns OFF, and data characters received from the demodulator are regenerated for the receive data outputs.

KEYS	ACTION
-----	-----
2ND	Enable second level function
REGEN	Enable REGENERATION; turn ON the REGEN indicator If SYNCH mode was ON, it is turned OFF.
2ND	Enable second level function
REGEN	Disable REGENERATION; turn OFF the REGEN indicator

To save the regeneration mode, the ENTER key must be pressed.

15. CHAN KEY

The CHAN key alternately selects channel 1 and channel 2 for the front panel display and parameter entry.

KEYS	ACTION
-----	-----
CHAN	Display channel 1, the demodulator
CHAN	Display channel 2, the modulator

To save the new channel selection, the ENTER key must be pressed.

16. BAUD RATE KEY

Press BAUD RATE to enter the baud rate for the selected channel. If channel 1 is selected, the BAUD RATE sets the bandwidth for the receive filters, the regeneration data rate, and the receive data mid-bit clock center frequency. When channel 2 is selected, the BAUD RATE loads the new synchronous transmit clock frequency.

KEYS	ACTION
-----	-----
BAUD RATE	Blank the BAUD display window, ENTER turns ON
110	" 110." shows in the BAUD window
ENTER	" 110." flashes, ENTER turns OFF
	The BAUD RATE is set to 110 bits per second.

17. CLEAR KEY

The CLEAR key restores the last saved modem parameter settings whenever the ENTER key indicator is flashing. This key may be used to restore the old MARK, SPACE, and BAUD RATE settings if CLEAR is pressed before ENTER as a new value is entered.