Installation Information for ST-20B or ST-25B Series interfaced to Kenwood TK-280/380

General Information:

ST-20B: This application applies to the Selectone ST-20B simple frequency domain inversion scrambler operating with Kenwood TK-280/380. The cipher process inverts speech frequencies in reference to one of eight possible inversion carriers. The scrambled speech is unintelligible to the casual listener, but the recovered audio is very clear. Operation is virtually transparent to the user. The Clear/Cipher input, used to enable or disable the cipher mode, is the only user control.

Applications include commercial shared repeaters and other business and marine radio systems where protection is desired from co-channel users and casual eavesdroppers. The ST-20B does not require a license for export.

ST-25B: This application applies to the Selectone ST-25B Rolling Code Voice Encryption unit operating with the Kenwood TK-280/380. The ST-25B Rolling Code Encryption Module is a miniature, high security voice encryption device with up to four user programmable code keys, each selected from over four billion possible keys. The ST-25B may be used to communicate in a secure mode with up to four different groups on the same radio channel. To insure security, code keys are stored in a non-volatile EEPROM and are never transmitted over the air.

The Clear/Cipher select line is the only user control. Receive mode is automatic, clear speech or encrypted speech with the proper code key will be received regardless of the mode selected.

Programming is accomplished via the ST-954B programmer which plugs into a computer serial port. All software is available free at www.selectone.com.

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Technical Information:

General:

The installation will require solder point connections of 10 flying leads to designated junction points in the Kenwood TK-280/380 portable radio. The radio will require modification of the RX and TX audio path.

Operation:

This application uses the programmable (AUX) key to enable clear/cipher mode by a single push. On the display will appear the (DASH) indicator as well as an audible single beep in the speaker, this is an indication that you are now in the ciphered mode. Press the (AUX) button again the displayed (DASH) indication will disappear and you will hear two audible beeps, you are now in the clear mode. Press and hold the (AUX) key to enter the code setting mode. Codes 1 to 4 will be displayed. Set a code by pushing the [Up/Down] buttons. When the (AUX) key is pressed again, the code setting mode terminates.

- Note: This radio always will power up in the Clear Mode.

Installation Requirements:

- Experienced technician with radio and encryption experience.
- Radio service manual.
- Radio Service Monitor.
- Soldering Iron and required hand tools.
- ST-954B programmer and ST-25BPM software. **(ST-25B ONLY)**
- Kenwood TK-280/380 programming software (KPG49D version 1.00 or later) and adapter (KPG-36).
- PC compatible computer.

ST-25B Configuration:

See below (ST-25B Programming Parameters)

Installation Information:

Refer to the Wiring Connection Chart & NOTES and Radio Programming.

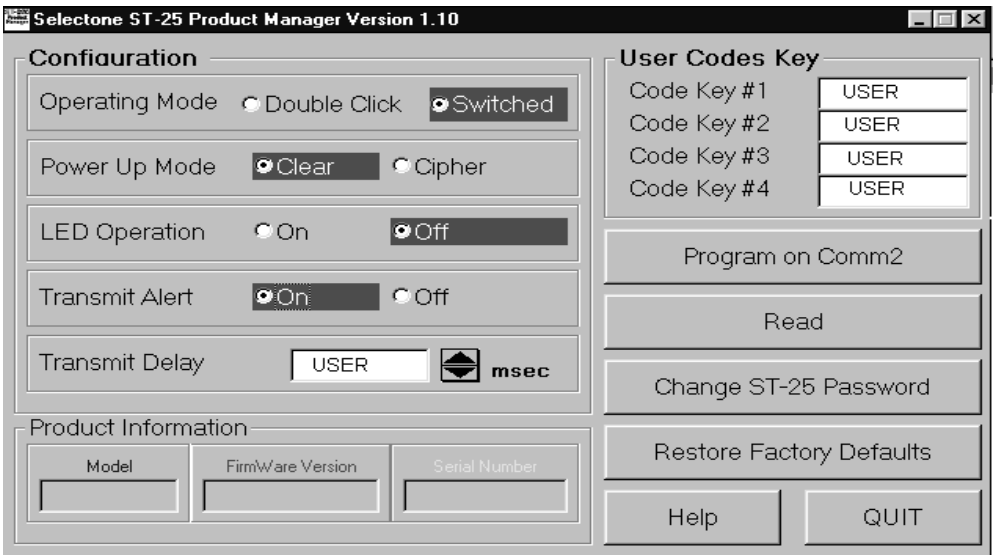
Modification Instruction for TK-280/380:

Remove R69 and R260 on the control unit.

Modification Instructions for ST-20B and ST-25B series: (See ST-20B/25B manual for resister locations)

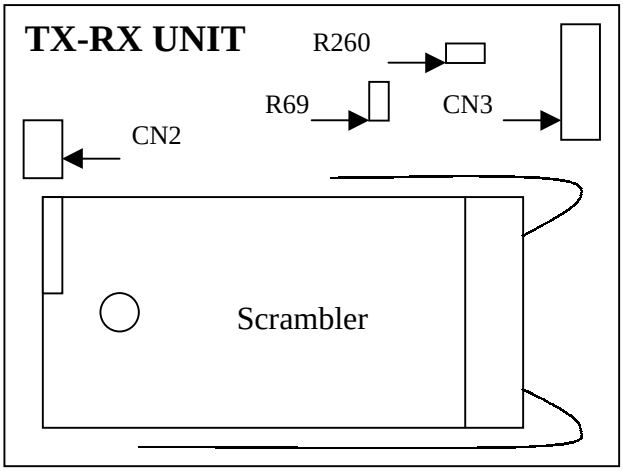
Install a 11K ohm resister into R4 and R21 customer select locations.
Install a 4.7K ohm resister into R28 and R35 customer select locations.

ST-25B Programming Parameters



Placement:

Position the Scrambler in the TX-RX UNIT as shown below.



Wiring Connection Chart & NOTES
for the ST-25B to
Kenwood TK-280/380

INSTALLATION:

Remove the two screws that secure the radio to the housing and remove radio from housing. Then remove the six screws on the display unit and open the radio.

NOTES:

Radio modification:

1. Remove R69 and R260 on the control unit.

ST-20B or ST-25B gain select resisters:

2. Install a 11K ohm resister into R4 and R21 customer select locations.
   Install a 4.7K ohm resister into R28 and R35 customer select locations.

- **The chart below is a guide to assist in locating the solder point connections required for this installation.**
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ST-20/25B Interface Cable				
J1 ST-20/25B PIN # COLOR	**ST-20/25B FUNCTION**		**TK280/380 DESIGNATION**	**LOCATION**
1. WHITE/BLUE	RECEIVE AUDIO	OUTPUT	**RXAO**	ON THE TX-RX UNIT
2. VIOLET	CODE SELECT 1	INPUT	**D1**	ON THE TX-RX UNIT
3. RED	POSITIVE (+) SUPPLY		**SB**	ON THE TX-RX UNIT
4. WHITE/ORANGE	SPEAKER BEEP	OUTPUT	**N/A**	
5. BLACK/ORANGE	CODE SELECT 2	INPUT	**D2**	ON THE TX-RX UNIT
6. YELLOW	PTT IN	INPUT	**PTTIN**	ON THE TX-RX UNIT
7. BROWN	CLEAR/CIPHERED	INPUT	**OPT**	ON THE TX-RX UNIT
8. BLACK/BROWN	AMP ENABLE (NOT USED)	OUTPUT	**N/A**	
9. BLACK	NEGATIVE (-) SUPPLY		**GND**	ON THE TX-RX UNIT
10. BLACK/YELLOW	CODE SELECT 3	INPUT	**N/A**	
11. BLUE	RECEIVE AUDIO	INPUT	**RXAI**	ON THE TX-RX UNIT
12. GREEN	TRANSMIT AUDIO	INPUT	**TXAI**	ON THE TX-RX UNIT
13. WHITE/GREEN	TRANSMIT AUDIO	OUTPUT	**TXAO**	ON THE TX-RX UNIT

Final Assembly

Mounting:

Use the supplied shrink sleeve to insulate the scrambler, then position it as described under **Placement**.

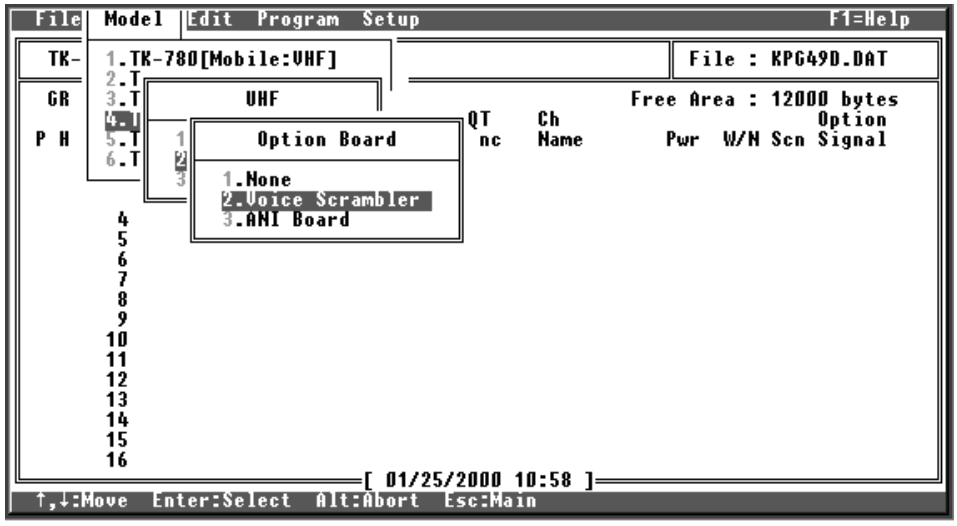
- ST-25B only: Go to Radio Programming then return.
- ST-25B only: Transmit in ciphered mode and adjust Sync to half system deviation.

Reassemble radio.

Required Radio Programming
for
TK-280/380 Portable Radio

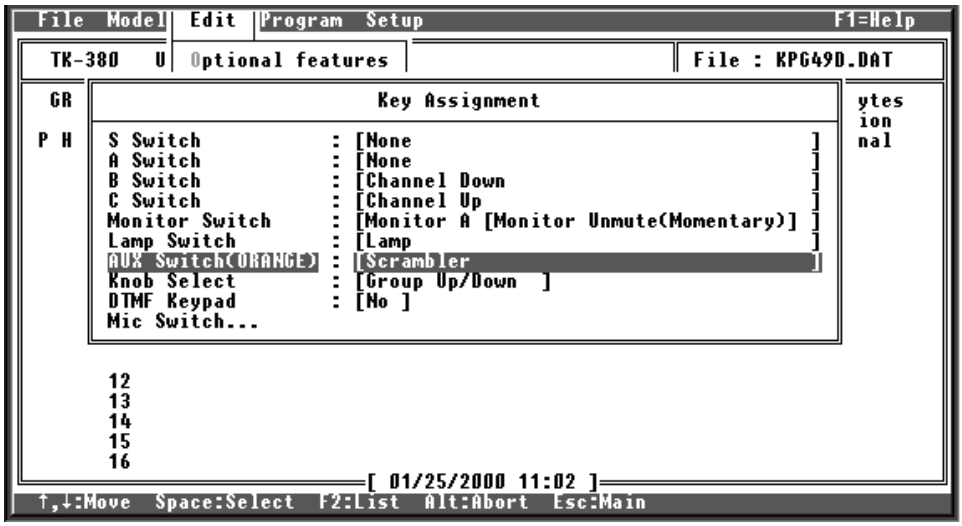
Scrambler Feature Enable:

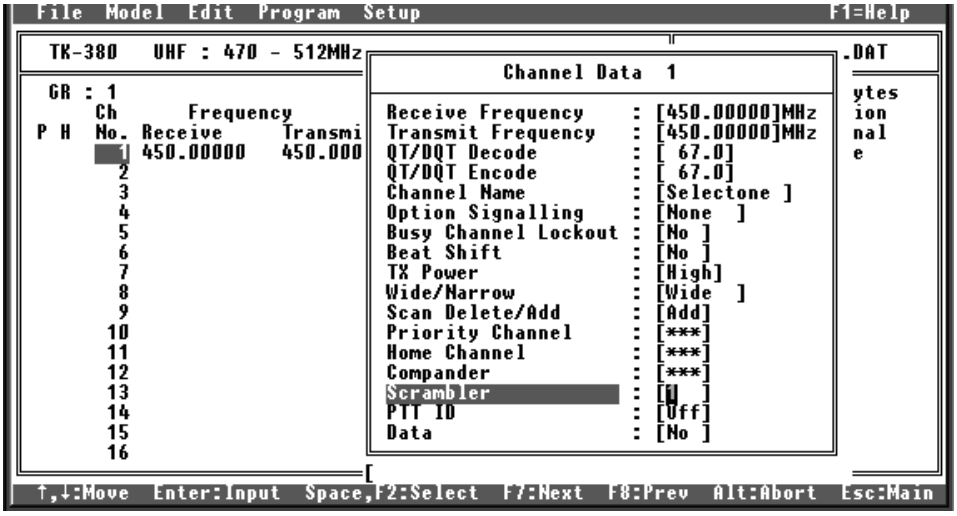
To enable the Scramble feature on your radio, you must first set it up through the initial radio setup. To do this run the radio programming software, go to **Model**, set all your features. When you come to Option Board choose **Voice Scrambler.**



Scrambler Enable and Disable Key Assignment:

Go to **Edit**, then **Key Assignment.** Select a button to provide the scrambler enable and disable function and assign it to the **Scrambler** function.



Required Radio Programming
for
TK-280/380 Portable Radio
Continued

Channel power up Code Select Assignment:
At the main menu press **F10** to edit channel. In the **Voice Scrambler** location you must assign each channel you wish to scramble with a power-up code select number.