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INTRODUCTION

When using an HF transceiver, the operator must continuously adjust the frequency and/or change the operating channel in order to create an optimal communications environment. Now, the ALE (Automatic Link Establishment) feature performs these operations automatically.

FEATURES

With the KPE-2 unit attached to the transceiver, you can both transmit and receive the following:

- Individual calls
- Net calls
- All calls
- AMD messages
- GPS data * (requires a GPS receiver)
- Emergency calls *
- Soundings

* ALE is in accordance to the MIL-STD-188/141A protocol, thus the ALE features of this transceiver are compatible with other brand transceivers. However, the GPS data and emergency call features are **KENWOOD** specific features, and are therefore incompatible with transceivers other than **KENWOOD** transceivers.

BASIC OPERATIONS

Switching the Transceiver Power ON/OFF

Press and hold the ψ switch to turn the transceiver ON.

- A beep sounds and the power-on message momentarily appears. After approximately 1 second, "WAIT..." appears on the display. When a network is found, the transceiver enters standby mode.

Press and hold the ψ switch again to switch the transceiver OFF.

Adjusting the Transceiver Volume

Press the **VOL** \wedge key to increase the volume and the **VOL** \vee key to decrease the volume.

- Additionally, you can press and hold the **VOL** \wedge / \vee keys to continuously change the volume level, rather than adjusting it by only 1 step at a time.

Switching the ALE Function ON/OFF

The call type may have been preset by your dealer.

- 1 Access the transceiver Menu (refer to the transceiver instruction manual) and select Menu number 10, "CALL TYP".



- 2 Press the **<C** and **D>** keys to change the setting between "OFF" and "ALE".
- 3 Press the \blacktriangle key to save the selection and exit Menu mode.

Menu Configuration

Menus 11 and 12 appear only if the Call Type (Menu 10) is set to ALE.

Menu Number	Menu Name	Full Function Name
1	SQL LVL	Squelch Level adjustment
2	CLARI	Clarifier
3	NB	Noise Blanker
4	BRIGHT	LCD Brightness
5	DISP	Display: channel name or frequency
6	VOX	VOX ON/OFF
7	VOX DLY	VOX Delay Time
8	VOX GAIN	VOX Gain
9	ANTI VOX	Anti-VOX Gain
10	CALL TYP	Call Type
11	ALE MONI	ALE Monitor
12	TIME DISP	Time Display

ALE Call Menu

ALE Call menu allows you to start various ALE calls.

- 1 Press the key programmed as **ALE** to enter the ALE Call menu.
- 2 Press the **CH** \wedge / \vee keys to select your desired ALE Call menu item.

ALE Call Menu Item	Description	Reference Page
CALL ^{1,2}	Individual calls, Network calls, AMD message calls, and All calls	2 ~ 4
GPS CALL ^{1,2,3}	Manually transmit the GPS data	4
SOUNDING ^{1,4}	Manually transmit a Sounding	6
TERMINATION ⁵	Terminate an established link	4
BI-DIRECT ^{1,4}	Exchange the LQA score	6

- 3 Press the \blacktriangle key to exit the ALE Call menu.

¹ These menus cannot be selected when a link has been made.

² These menus cannot be selected when ALE operation mode is set to Channel mode and Net number 1 has not been selected.

³ The COM Port must be set by your dealer to GPS Data Input, to select GPS CALL.

⁴ These menus cannot be selected when ALE operation mode is set to Channel mode.

⁵ TERMINATION can be selected only when a link has been made.

ALE OPERATION MODE

There are 3 modes of operation when using ALE: Net mode, Channel mode, and VFO mode.

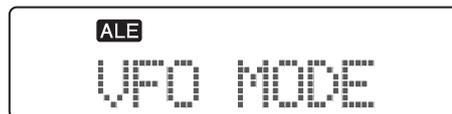
Net mode automatically scans the ALE channels configured as the scan list of the chosen network. You cannot transmit on a channel in this mode unless a link has been established. You can select an ALE network by pressing the **CH** \wedge / \vee keys. (If the automatically selected link does not provide a good connection, you can manually select a channel or frequency using Channel mode or VFO mode.)



Channel mode does not scan the ALE channels. You can manually select an ALE channel by pressing the **CH** \wedge / \vee keys, and you can transmit on the selected channel without first establishing a link. Additionally, the TK-90 can transmit and receive each type of ALE call using this mode.



VFO mode does not scan the ALE channels. You can manually select a transmit frequency by pressing the **CH** \wedge / \vee keys, and you can transmit on the selected frequency without first establishing a link. However, the TK-90 cannot transmit or receive ALE calls (excluding emergency calls) using this mode.



To select an operation mode:

- Press the key programmed as **ALE Operation Mode** to toggle between Net mode and Channel mode.
- Press and hold the key programmed as **ALE Operation Mode** for 1 second to toggle between VFO mode and either Net mode or Channel mode.
- When a link is established, it is possible to change from Net mode to VFO mode.

INDIVIDUAL CALLS

An Individual call is a call to a single member.

Receiving an Individual Call

When the TK-90 receives an Individual call, the **ALE** icon flashes. When a link is established, the ALE Link Tone sounds and the caller ALE address appears on the display.

- If an AMD message is received, the icon flashes.
- If the caller address has more than 12 characters, the address will automatically scroll across the display.
- While the link is engaged, the Transmit/Busy/Call indicator flashes orange.
- While the link is engaged, the audio mute is canceled.
- While the link is engaged, you can transmit by pressing the **PTT** switch.

Making an Individual Call

- 1 Press the key programmed as **ALE** to enter the ALE Call menu.
 - You can press the \blacktriangle key at any time to exit the ALE Call menu.
- 2 Press the **CH** \wedge / \vee keys to select "CALL".



- 3 Press the **D>** key to move to the called station selection mode.
 - The last called address appears on the display.
- 4 Press the **CH** \wedge / \vee keys to select the address of the station you want to call.



- 5 Optional: If you want to send an AMD message, press the **A** key to enter the TX Message Selection mode, then press the **CH** \wedge / \vee keys to select your desired message.
 - List numbers m1 to m10 are pre-programmed messages.
 - You can enter your own message {page 5} by pressing and holding the **A** key for 1 second.
 - If a message has more than 12 characters, the message will automatically scroll across the display. You can also manually scroll the message by using the **<C** and **D>** keys.
 - To return to the address selection mode without sending a message, press the **A** key.
- 6 Optional: If you want to select a specific channel, rather than being assigned one automatically by the LQA, press the **D>** key, then press the **CH** \wedge / \vee keys to select your desired channel.
 - The LQA score appears on the right side of the display. Press the **B** key to toggle the score display ON and OFF.



- The LQA score value is approximated, based on the continuous changing of the radio signals.
- 7 Press the **■** key or the **PTT** switch to start the call and/or send the message.
 - The **ALE** icon flashes and the called ALE address appears on the display.
 - When sending an AMD message, the ALE address and the \boxtimes icon flash.
 - When a link is established, the ALE Link Tone sounds, the Transmit/Busy/Call indicator flashes orange, and "<< LINKED>>" appears on the display.
 - When a link cannot be established, "<< NO REPLY >>" appears on the display.

NET CALLS

A Net call is a call to all members within the defined network.

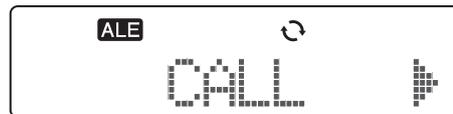
Receiving a Net Call

When the TK-90 receives a Net call, the **ALE** icon flashes. While receiving the signal, "NET CALL" appears on the display. When a link is established, the ALE Link Tone sounds, the caller address appears on the display, and "NET" appears on the sub-display.

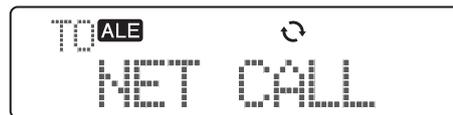
- If an AMD message is received, the \boxtimes icon flashes.
- If the caller address has more than 12 characters, the address will automatically scroll across the display.
- While the link is engaged, the Transmit/Busy/Call indicator flashes orange.
- While the link is engaged, the audio mute is canceled.
- While the link is engaged, you can transmit by pressing the **PTT** switch.

Making a Net Call

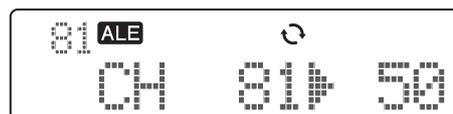
- 1 Press the key programmed as **ALE** to enter the ALE Call menu.
 - You can press the \triangle key at any time to exit the ALE Call menu.
- 2 Press the **CH** \wedge / \vee keys to select "CALL".



- 3 Press the **D>** key to move to the called station selection mode.
 - The last called address appears on the display.
- 4 Press the **CH** \wedge / \vee keys to select "NET CALL".



- 5 Optional: If you want to send an AMD message, press the **A** key to enter the TX Message Selection mode, then press the **CH** \wedge / \vee keys to select your desired message.
 - List numbers m1 to m10 are pre-programmed messages.
 - You can enter your own message {page 5} by pressing and holding the **A** key for 1 second.
 - If a message has more than 12 characters, the message will automatically scroll across the display. You can also manually scroll the message by using the **<C** and **D>** keys.
 - To return to the address selection mode without sending a message, press the **A** key.
- 6 Optional: If you want to select a specific channel, rather than being assigned one automatically by the LQA, press the **D>** key, then press the **CH** \wedge / \vee keys to select your desired channel.
 - The LQA score appears on the right side of the display. Press the **B** key to toggle the score display ON and OFF.



- The LQA score value is approximated, based on the continuous changing of the radio signals.
- 7 Press the **■** key or the **PTT** switch to start the call and/or send the message.
 - The **ALE** icon and "NET CALL" flash.
 - When sending an AMD message, "NET CALL" and the \boxtimes icon flash.
 - When a link is established, the ALE Link Tone sounds, the Transmit/Busy/Call indicator flashes orange, and "<< LINKED>>" appears on the display.
 - When a link cannot be established, "<< NO REPLY >>" appears on the display.

ALL CALLS

An All call is a call to all stations using ALE, that are on the same frequency.

Receiving an All Call

When the TK-90 receives an All call, the **ALE** icon flashes. When a link is established, the ALE Link Tone sounds, the caller address appears on the display, and "ALL" appears on the sub-display.

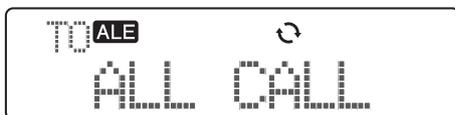
- If the caller address has more than 12 characters, the address will automatically scroll across the display.
- While the link is engaged, the Transmit/Busy/Call indicator flashes orange.
- While the link is engaged, the audio mute is canceled.
- While the link is engaged, you can transmit by pressing the **PTT** switch.

Making an All Call

- 1 Press the key programmed as **ALE** to enter the ALE Call menu.
 - You can press the **▲** key at any time to exit the ALE Call menu.
- 2 Press the **CH ▲ / ▼** keys to select "CALL".



- 3 Press the **D>** key to move to the called station selection mode.
 - The last called address appears on the display.
- 4 Press the **CH ▲ / ▼** keys to select "ALL CALL".



- 5 Optional: If you want to send an AMD message, press the **A** key to enter the TX Message Selection mode, then press the **CH ▲ / ▼** keys to select your desired message.
 - List numbers m1 to m10 are pre-programmed messages.
 - You can enter your own message {page 5} by pressing and holding the **A** key for 1 second.
 - If a message has more than 12 characters, the message will automatically scroll across the display. You can also manually scroll the message by using the **<C** and **D>** keys.
 - To return to the address selection mode without sending a message, press the **A** key.
- 6 Press the **■** key or the **PTT** switch to start the call and/or send the message.
 - The **ALE** icon and "ALL CALL" flash.
 - When a link is established, the ALE Link Tone sounds, the Transmit/Busy/Call indicator flashes orange, and "<< LINKED >>" appears on the display.

TERMINATING A LINK

There are 2 methods in which a link can be terminated: automatically and manually.

When a link is terminated automatically, the transceiver waits for a preset time of non-activity (not pressing the **PTT** switch), and then will automatically terminate the link.

To manually terminate a link:

- 1 During a link, press the key programmed as **ALE** to enter the ALE Call menu.
 - "TERMINATION" appears on the display.



- 2 Press the **■** key or the **PTT** switch to terminate the link.

DIRECT CALLS

Up to 4 keys can be programmed with the Direct Call feature, allowing you to easily make individual calls to those stations which you make frequent calls. To make the call, press the key programmed as **ALE Direct Call 1 ~ 4**.

- The **ALE** icon and the called ALE address flash.
- When a link is established, the ALE Link Tone sounds, the Transmit/Busy/Call indicator flashes orange, and "<< LINKED >>" appears on the display.

GPS CALLS

To transmit GPS data, you must first have the GPS unit (NMEA-0183) installed in your transceiver.

Auto GPS Transmission

Auto GPS transmission automatically transmits your GPS location data at a pre-programmed time interval. When the programmed GPS report interval time passes, the TK-90 automatically transmits the GPS data.

- The **ALE** icon and "<< SEND DATA >>" flash while transmitting the GPS data.
- To cancel the transmission, press the **▲** key during the data transmission.

Additionally, when a request is received, the transceiver will automatically transmit the GPS data.

Manual GPS Transmission

Manual GPS transmission can be performed without waiting for the programmed GPS report interval time.

- 1 Press the key programmed as **ALE** to enter the ALE Call menu.
 - You can press the **▲** key at any time to exit the ALE Call menu.
- 2 Press the **CH ▲ / ▼** keys to select "GPS CALL".



- 3 Press the **■** key or the **PTT** switch to begin the transmission.
 - The **ALE** icon and "<< SEND DATA >>" flash while transmitting the GPS data.
 - To cancel the transmission, press the **▲** key during the data transmission.

Receiving GPS Data

- 1 When an ALE signal is received, the **ALE** icon appears on the display and flashes.
- 2 When the GPS data reception is complete, the display returns to normal and the GPS data is output through the transceiver COM port.
 - Your dealer must first set the transceiver COM port to either PC command or GPS Data Output.

EMERGENCY CALLS

- 1 Press and hold the key programmed as **Emergency** for the pre-programmed time duration to enter Emergency mode.
 - Depending on the delay time programmed into your transceiver, the length of time you must hold the **Emergency** key will vary.
 - When the transceiver enters Emergency mode, the transceiver will change to the Emergency channel and begin transmitting based on how the transceiver is set up by your dealer. Transmit periods are also set by your dealer.
- 2 To exit Emergency mode, press and hold the **Emergency** key again, for the pre-programmed time duration.
 - If the Emergency mode completes the preset number of cycles, Emergency mode will automatically end and the transceiver will return to the channel that was in use before Emergency mode was entered.

AMD MESSAGES

Editing the Transmit AMD Message

- 1 Proceed to step 5 of making a call (Individual, Net, or All call), then press the **A** key to enter TX Message Selection mode.
- 2 Press the **CH** \wedge / \vee keys to select a message from m1 to m10.
 - List numbers m1 to m10 are pre-programmed messages.
- 3 Press and hold the **A** key for 1 second to enter Message Edit mode (m0).
 - A cursor will appear on the display.



- Text messages can have a maximum of 90 characters. If a message has more than 12 characters, the message will automatically scroll across the display. You can also manually scroll the message by using the **<C** and **D>** keys.
- Use the table below to edit the text message:

Transceiver Key	Operation
Δ	Complete editing the message
A	Press to delete the selected character Press and hold to delete all characters
<C	Shift the cursor to the left
D>	Shift the cursor to the right
\blacksquare	Complete editing the message and begin the call
CH \wedge / \vee	Scroll through and select a character

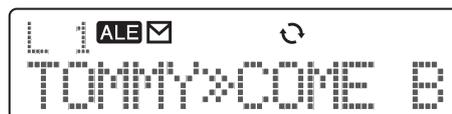
Transceiver Key	Operation
1	Select a character: 1
2	Select a character: A / B / C / 2
3	Select a character: D / E / F / 3
4	Select a character: G / H / I / 4
5	Select a character: J / K / L / 5
6	Select a character: M / N / O / 6
7	Select a character: P / Q / R / S / 7
8	Select a character: T / U / V / 8
9	Select a character: W / X / Y / Z / 9
0	Select a character: Space / 0 / * / #
*	Shift the cursor to the right
#	Press to delete the selected character Press and hold to delete all characters

- 3 Continue making your call as normal.

Reading a Received AMD Message

Received AMD messages are stored in the transceiver stack memory. A maximum number of 10 messages can be stored in the stack.

- 1 When a new message is received, the \boxtimes icon flashes.
 - If all messages in the stack have been read, the \boxtimes icon remains on the display but does not flash.
- 2 Press and hold the key programmed as **ALE** for 1 second to view the last received message in the stack.



- 3 Press the **CH** \wedge / \vee keys to scroll through all the messages in the stack.
 - If a message has more than 12 characters, the message will automatically scroll across the display. You can also manually scroll the message by using the **<C** and **D>** keys.
 - To view the time stamp of the message, press the **B** key. Press the **B** key again to return to the message.
- 4 Press the Δ key to exit.

Deleting a Received AMD Message

- 1 Press and hold the key programmed as **ALE** for 1 second to view the last received message in the stack.
- 2 Press the **CH** \wedge / \vee keys to select the message you want to delete.
- 3 Press the **A** key to select the message for deletion.
 - A confirmation message appears on the display.
 - To cancel the operation, press the Δ key.



- 4 Press the \blacksquare key to delete the message.
 - If there are no message remaining in the stack after deleting a message, "EMPTY" momentarily appears on the display.

Deleting All Received AMD Messages

- 1 Press and hold the key programmed as **ALE** for 1 second to view the last received message in the stack.
- 2 Press and hold the **A** key for 1 second to select all messages in the stack for deletion.
 - A confirmation message appears on the display.
 - To cancel the operation, press the **▲** key.



- 3 Press the **■** key to clear the stack memory.
 - "EMPTY" momentarily appears on the display.

SOUNDING

Sounding cannot be used in ALE Channel mode; it can be used only in ALE Net mode.

Auto Sounding

Auto Sounding automatically transmits a sounding signal on each scan channel at regular intervals. Intervals are programmed for 30, 60, 90, or 120 minutes by your dealer.

- When the programmed interval passes, the TK-90 automatically transmits the sound signal.
- The **ALE** icon and "SOUNDING" flash while transmitting the Sounding.
- When Sounding begins, the TK-90 performs the sound transmission on each channel configured in the network's scan list. After transmission is completed on one channel, the transceiver moves to the next channel in the scan sequence after a fixed time period.
- To cancel the Sounding, press the **▲** key during the sound transmission.

Manual Sounding

Manual Sounding can be performed without waiting for the programmed Auto Sounding time interval.

- 1 Press the key programmed as **ALE** to enter the ALE Call menu.
 - You can press the **▲** key at any time to exit the ALE Call menu.
- 2 Press the **CH ▲ / ▼** keys to select "SOUNDING".



- 3 Press the **■** key to begin the Sounding.
 - The **ALE** icon and "SOUNDING" flash while transmitting the Sounding.
 - When Sounding begins, the TK-90 performs the sound transmission on each channel configured in the network's scan list. After transmission is completed on one channel, the transceiver moves to the next channel in the scan sequence after a fixed time period.
 - To cancel the Sounding, press the **▲** key during the sound transmission.

Receiving a Sounding Signal

- 1 When an ALE signal is received, the **ALE** icon appears on the display and flashes.
- 2 When a Sounding signal is received, the caller's ALE address appears on the display.
- 3 When the Sounding is complete, the display returns to normal.

EXCHANGING THE LQA SCORE

- 1 Press the key programmed as **ALE** to enter the ALE Call menu.
 - You can press the **▲** key at any time to exit the ALE Call menu.
- 2 Press the **CH ▲ / ▼** keys to select "BI-DIRECT".



- 3 Press the **D>** key to move to the called station selection mode.
 - The last called address appears on the display.
- 4 Press the **CH ▲ / ▼** keys to select the address of the station you want to call or to make a Net call.



- 5 Optional: If you want to send an AMD message, press the **A** key to enter the TX Message Selection mode, then press the **CH ▲ / ▼** keys to select your desired message.
 - List numbers m1 to m10 are pre-programmed messages.
 - You can enter your own message {page 5} by pressing and holding the **A** key for 1 second.
 - If a message has more than 12 characters, the message will automatically scroll across the display. You can also manually scroll the message by using the **<C** and **D>** keys.
 - To return to the address selection mode without sending a message, press the **A** key.
- 6 Optional: If you want to select a specific channel, rather than being assigned one automatically by the LQA, press the **D>** key, then press the **CH ▲ / ▼** keys to select your desired channel.
 - The LQA score appears on the right side of the display. Press the **B** key to toggle the score display ON and OFF.



- The LQA score value is approximated, based on the continuous changing of the radio signals.
- 7 Press the **■** key or the **PTT** switch to start the LQA score exchange and/or send the message.
 - The **ALE** icon flashes and the called ALE address appears on the display.
 - When sending an AMD message, the **[envelope icon]** icon flashes.
 - When making a Net call, the LQA exchange is performed on all channels in the scan list.
 - When no connection is made, the LQA will not refresh.

ALE MONITOR

If the ALE Monitor is OFF, the speaker is muted while no link is present. If the ALE Monitor is ON, you will hear background noise while no link is established. To turn the ALE Monitor ON or OFF:

- 1 Press the key programmed as **Menu**.
 - You can press the Δ key at any time to exit the Menu mode.
- 2 Press the **CH** \wedge / \vee keys to select "ALE MONI".



- 3 Press the **<C** and **D>** keys to select "ON" or "OFF".



- 4 Press the Δ key to save the setting and exit.

ALE SCRAMBLER

The transceiver Scrambler function can also be used in ALE mode.

To toggle the Scrambler function ON and OFF, press the key programmed as **Scrambler**.

- The \diamond icon appears on the display when the Scrambler is ON.
- Ensure that all units are using the same scrambler code when using the Scrambler function. If a unit is using a different code than the one you have set on your transceiver, they will be unable to hear your calls. Refer to the TK-90 instruction manual for details on how to set up a Scrambler code.

CLOCK

Time Display

- 1 You can display the time on your screen by accessing the transceiver Menu and selecting Menu number 12, "TIME DISP".
 - Depending on your transceiver settings, the time will be displayed as either 12 or 24 hour time.

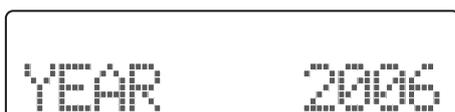


- 2 Press the Δ key to exit.

Time Setup

You can set the time and date on the ALE board.

- 1 With the transceiver power OFF, press and hold the **<C** key while turning the transceiver power ON.
 - "YEAR" appears on the display.
- 2 Press the **CH** \wedge / \vee keys to select the current year (from 2000 to 2099).



- 3 Press the **D>** key to save the setting and move to the month setup.

- "MONTH" appears on the display.

- 4 Press the **CH** \wedge / \vee keys to select the current month (from 01 to 12).



- 5 Press the **D>** key to save the setting and move to the day setup.

- "DAY" appears on the display.

- 6 Press the **CH** \wedge / \vee keys to select the current day (from 01 to 31).



- 7 Press the **D>** key to save the setting and move to the hour setup.

- "HOUR" appears on the display.

- 8 Press the **CH** \wedge / \vee keys to select the current hour (from 00 to 23).



- 9 Press the **D>** key to save the setting and move to the minute setup.

- "MINUTE" appears on the display.

- 10 Press the **CH** \wedge / \vee keys to select the current minute (from 00 to 59).



- 11 Press the \blacksquare key to save the setting.

- 12 Turn the transceiver power OFF and then back ON to return to normal operation.

APPENDIX: KEY FUNCTIONS

Transceiver Key	Standby (Net Address Display)	“CALL >” Display (Call Menu)	Address Selection Display	AMD Message Selection Display	Message Compilation Display	Call Channel Selection Display	Link Display	“TERMINATE” Display (Call Menu)	
	Change the Net	Change the Call menu item	Change the address	Select the programmed AMD message	Select a character	Select a Call channel	—	—	
	Change the Net	Change the Call menu item	Change the address	Select the programmed AMD message	Select a character	Select a Call channel	—	—	
	Press the key programmed as ALE to enter the ALE Call menu	Cancel the Call menu	Cancel the Call menu	Cancel the Call menu	Cancel the message compilation	Cancel the Call menu	Press the key programmed as ALE to begin the link termination	Cancel the link termination	
		Move to message selection	Move to message selection	Press to return to address selection Hold to begin composing a message	Press to delete a character Hold to delete all characters	Move to message selection		—	
		—	—	—	—	Toggle the LQA score display on and off		—	
		—	Return to the Call menu	Scroll the message to the left	Move the cursor to the left	Return to address selection		—	
		Move to address selection	Move to call channel selection	Scroll the message to the right	Move the cursor to the right	—		—	
		Begin the call	Begin the call	Begin the call	Begin the call	Begin the call		Begin the call	Terminate the link