

Appendix A—The 9300 ALE Controller

This appendix describes the operation of the 8528 series transceiver when connected to the 9300 Automatic Link Establishment (ALE) controller. Various operations and settings on the 8528 transceiver are different when used in conjunction with the 9300. Full details of the controller and how to interface it with your transceiver are available in the 9300 ALE Controller User Guide.



Before you can use the 9300 ALE Controller you will need option ‘RS’ fitted to your 8528 transceiver.

ALE operation

The 9300 ALE Controller allows you to automatically establish a transceiver link with another transceiver user.

When you call another station, the 9300 chooses the first suitable frequency from a pre-set list of channels and attempts to establish a link on that channel. If this fails, it selects its next best channel and so on until a link is established.

The 9300 also maintains a database of historical link information.

ALE station addressing

The 9300 ALE Controller automatically adopts the 8528 transceiver's Selective Calling Self Address as its own. For example, if the transceiver's self address is '1234', then the 9300 can be contacted by calling ALE station '1234'.

ALE scanning

You can program up to 15 channels for the 9300 ALE Controller to scan. If the 9300 detects an incoming ALE signal or Selective Calling signal, it will pause to listen to the signal.

When the 9300 receives a valid ALE call, it transmits the appropriate response, tuning the antenna first if necessary.

ALE sounding

To maintain up-to-date information on the quality of its channel set, the 9300 ALE Controller periodically sends a sounding signal. Each station receiving this signal uses it to measure the link quality and updates its internal channel database.

The sounding interval is adjustable in several steps between 30 minutes and 16 hours. The sounding interval is set to 30 minutes by default but you may need to increase this depending on the number of stations in your network.

Each sounding lasts for 5 seconds. Soundings from other stations may interfere with an established voice link. If this is a problem, you can turn sounding off.

LQA exchange

In addition to conducting periodic soundings, the 9300 ALE Controller automatically exchanges Link Quality Analysis (LQA) data with any station it attempts to call or vice-versa.



Setting up the ALE system

Before you can use your 9300 ALE Controller, you must first set the 8528 self-identification address and program a set of channels for scanning.





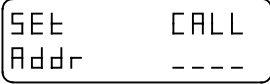

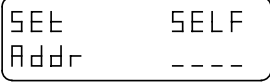
The 8528 transceiver will transfer this information to the 9300 ALE Controller when the transceiver is first turned on. If an ALE Controller is not connected, the 8528 will revert to normal operation.

In addition to the above settings, you can modify the Sounding interval and alter the operation of the Selcall Mute.



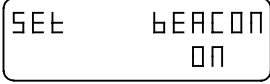
Refer to the *'9300 ALE Controller User Guide'*.

Setting the self-identification address

The 9300 ALE Controller uses the same address as the 8528's Selective Calling self-identification address. This address is automatically transferred to the 9300 from the 8528 when the units are first turned on. The procedure for setting the self-identification address is as follows:

Step	Action...	Display shows...	Remarks...
1.	Hold down  and press 		Hold the Call button down for approximately three seconds. This turns the transceiver on and into the preamble set-up mode. Use any numeric key for changing the preamble mode (LONG, SHORT or ALE). Refer to page A-8.
2.	Press 		Once call has been pressed, you are in called address set up mode.
3.	Press 		Once call has been pressed, you are ready to set the self-identification address.



Step	Action...	Display shows...	Remarks...
4.	Use the numeric buttons to enter the self-identification address number. E.g. Type 4012. To delete an address, enter four zeros.		You can override an existing address by entering a new number. Your station address can be from 1 to 4 numbers in length.
5.	Press 		Once Enter has been pressed, the self identification address has been set and can only be changed by repeating this procedure.

Refer to section 5-7, 'Setting the self-identification address'.



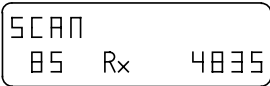
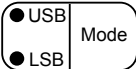
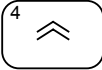

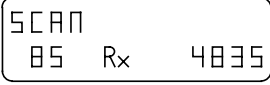
Note: The address you set will not be transferred to the ALE Controller until the transceiver is next switched on.




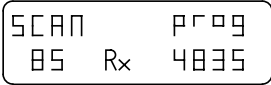


Programming the channels to scan

The channels which the 9300 ALE system will scan are those programmed using the normal 8528 transceiver scan programming procedure. This procedure is outlined below:

Ensure your transceiver is switched on and scan program has been enabled.

Step	Action...	Display shows...	Remarks...
1.	Press  and then  within one second.		The Scan button indicator flashes. Any previous programming of channels to be scanned will be erased.
2.	Select the required mode Press 		The appropriate mode indicator will light.
3.	Select the relevant channel Press  or 		Refer to section 4, <i>Selecting channels</i> . Channels required to operate on selective call must be enabled. Refer to section 5, <i>Enabling a channel for selective call</i> .



Step	Action...	Display shows...	Remarks...
4.	Press 		<p>The channel is programmed for scanning.</p> <p>Repeat this procedure from step 3 until all channels you want to scan have been programmed.</p>
5.	Press  and then  within one second.		<p>The channels you have programmed are now registered within the transceiver.</p>

Refer to section 6-6, 'Programming the channels to be scanned'.

Notes: If you want to scan for selective calls as well as ALE calls, do not program more than 8 scan channels unless other stations in the network have selected the ALE preamble. Refer to page A-8.

The channels you program will not be transferred to the 9300 ALE Controller until the transceiver is next switched on.



Setting the preamble time period

In addition to a SHORT/LONG preamble (via Power-On + Call key sequence), the 8528 supports an ALE preamble selection when used with the 9300.

Refer to section 5-4, '*Setting up selective call*' and '*Setting the self-identification address*'.



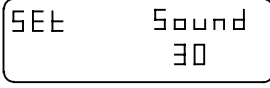


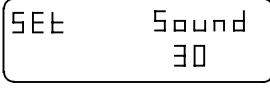
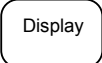
The ALE signal preamble must be long enough to cater for the number of channels used by the remote station. The 8528 transceiver calculates the preamble length automatically based on the number of scan channels used.

If your 8528 scans fewer channels than other stations in the network you should use the ALE preamble setting. This setting uses a preamble corresponding to 15 channels. This selection also extends the Selcall preamble length to 12 seconds.

Set Call	Sel Preamble (secs)	ALE Preamble
Short	2	Automatic
Long	6	Automatic
ALE	12	15 channels

Changing the sounding interval

You can turn sounding off altogether, or you can adjust the interval between soundings from 30 minutes to 16 hours. It is set to 30 minutes by default.

Step	Action...	Display shows...	Remarks...
1.	Ensure power is supplied to your transceiver.		
2.	Press  while holding 		
3.	Use channel  &  keys to select desired sounding interval.		
4.	Press 	Normal channel display.	

Note: The sounding interval you program will not be transferred to the ALE Controller until the transceiver is next switched on.



Using the 9300

The 9300 ALE Controller has no operator controls. All operation is conducted using the 8528 transceiver front control panel.

Scanning



Once you have programmed the channels to be scanned, you can turn Scanning on and off using the Scan button.

Channels are scanned at the rate of 0.75 seconds per channel.

An automatic timer causes scanning to start or resume after 2 minutes of inactivity.

Turning on Scan automatically selects Selcall Mute.

Pressing the PTT button while the system is scanning causes scanning to stop. The first channel programmed in the scan programming sequence is automatically selected. This is a useful feature for selecting a particular channel in an emergency situation.





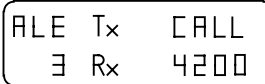


Note: Unlike normal Selcall scanning, the scan rate or number of channels scanned is the same irrespective of the transceiver's mute setting.




Calling a remote ALE station

To call an ALE station you dial the station address, in the same way as making a Selective Beacon Call.

Note: You do not need to turn scanning off before making a call.

Step	Action...	Display shows...	Remarks...
1.	Press 		
2.	Use number keys to enter the desired address (e.g. 1234).		Display shows channel number in preset scan list and the destination station ID.
3.	Press 		Display shows channel number in preset scan list and the frequency for the channel.
4.	When a successful link is made, the transceiver beeps and displays...		
5.	If no link is made, the transceiver beeps and displays...		









Step	Action...	Display shows...	Remarks...
6.	Once a link is established, press 		This causes a termination message to be sent to the remote end and scanning resumes.

When a link is successfully made the Selcall Mute is automatically opened, ready for you to speak to the person you have called. Scan resumes automatically after 2 minutes of inactivity.




Making a selective call to an ALE station

Before making a call you must stop scanning and select a channel. To call another station you simply dial the station address.

Step	Action...	Display shows...	Remarks...
1.	Press 		To stop scanning
2.	Press 		
3.	Use number keys to enter the desired address (1234 in this example).		
4.	Press 		Display shows channel number and call address.
5.	When a successful call is made, you hear revertive signals from remote station.	Normal channel display.	



Step	Action...	Display shows...	Remarks...
6.	Press 		To resume scanning after you have finished talking.

Note: Scanning will resume automatically after 2 minutes of inactivity.



Receiving an ALE call

If your 8528 transceiver receives an ALE call, whether it is scanning or not, it will beep and display 'CALL PASS' to indicate that an ALE link has been successfully established. The Selcall Mute will automatically open when a call is received.

When a sounding signal is received, channel quality information is derived from it and stored. This information is used to select a suitable channel for transmission.

Note: If you want, you can make the transceiver emit a very short beep every time a sounding signal is heard. This is a useful method of discerning the level of network sounding activity. To enable this facility, fit link 4 on the microprocessor PCB of the 8528 transceiver.

Refer to section 11, *'The microprocessor PCB link'*.







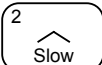




9300 settings

The 9300 ALE Controller has 17 system settings and 8 memory purge options which can be modified using the 8528 transceiver control panel.

Refer to the *'9300 ALE Controller User Guide'*.

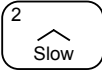
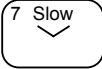



The following steps show how to modify these system settings and make use of the memory purge options.

Step	Action...	Display shows...	Remarks...
1.	Press  &  buttons together to get into the ALE setup mode.	 Displays System Option 00 which has current setting of nn.	
2.	Press  or  button.	 Displays System Option 01 which has current setting of nn.	Pressing the Enter button saves any changes made, whereas pressing the ALE button skips to the next option setting without saving changes.
3.	Press  or 		Use slow or fast buttons to increment or decrement the value. Use the Display button to terminate the 9300 setting mode. The Fast button will only work for options 05, 08, 09, 10, 13 and 16.



Step	Action...	Display shows...	Remarks...
4.	Press <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-bottom: 5px;">Enter</div> or <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-bottom: 5px;">ALE</div> button.	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> SEE ALE 02 nn </div>	If Enter is pressed, System Option 01 is programmed with value 01. Otherwise the change is discarded. System Option 02 is now displayed.
5.	Press <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-bottom: 5px;">Enter</div> or <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-bottom: 5px;">ALE</div> button 14 more times.	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> SEE ALE 16 nn </div>	Displays System Option 16 which has current setting of nn.
6.	Press <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-bottom: 5px;">Enter</div> or <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-bottom: 5px;">ALE</div> button.	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> CLR ALE TYPE 0 </div>	Quick Purge is the first of the 8 memory purge options. Refer to the '9300 ALE Controller User Guide'. Press Enter to clear (send 'type 0') or press the ALE button to skip the setting without clearing ALE.



Step	Action...	Display shows...	Remarks...
7.	Press  or 		Displays the next memory purge option—Full purge. Refer to the <i>'9300 ALE Controller User Guide'</i> . Press Enter to clear (send 'type 1') or press the ALE button to skip the setting without clearing ALE.
8.	If Enter was pressed...		Displays until clearing is completed then skips to next memory purge setting.
9.	If ALE was pressed...		Skips back to initial display (step 1).

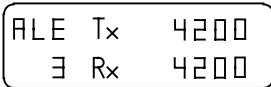

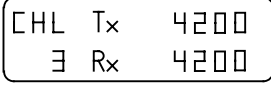

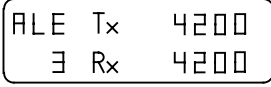
Note: After 9300 option programming and resetting you should switch the 8528 transceiver off and back on again to ensure the changes have taken effect.



Disabling the 9300 ALE Controller

When the 8528 transceiver powers up, it automatically detects the presence of the 9300 ALE Controller and enables the ALE facilities as described in this appendix.

When ALE mode is active, the Selective Beacon and normal channel scan facilities are replaced by ALE Call and ALE Scan respectively. If you need to use these facilities or you wish to temporarily disable the 9300, you can do so by pressing the ALE button.

Step	Action...	Display shows...	Remarks...
1.			ALE functions active.
2.	Press  button.		ALE disabled.
3.	Press  button.		ALE functions active.



HF Link establishment time

The HF link establishment time will depend on channel conditions at the time a link is attempted and the number of channels to be scanned.

The worst case link time is the time for the transceiver to report a call fail error (i.e. no answering stations). This depends on the number of channels selected, as shown in the table:

No. of channels	Worst case link time (secs)
1	20
8	120
15	160



Limitations

The limitations below are inherent in the implementation of the 9300 ALE Controller and its interface to the 8528 transceiver. Many arise due to compromises made to minimise the complexity of the system.

- A maximum of 15 channels can be scanned.
- Multiple self identification addresses and channel groups cannot be programmed without an external computer.
- A maximum scan speed of 0.75 seconds per channel is required to ensure reliable Selcall operation.



