
257 T1 Echo Canceller System Release Notes

Contents

Section 1. Overview	page 1
Section 2. New Features and Enhancements	page 2
Section 3. CLEARCALL Noise Reduction	page 2
Section 4. CLEARCALL Acoustic Coupling Elimination	page 2
Section 5. CLEARCALL Automatic Level Control and Dynamic Noise Substitution	page 3
Section 6. Subassemblies	page 4
Section 7. Technical Assistance	page 6

Revision Notice

This document has been revised to provide information about the increased idle code integration time for the 257 T1 Echo Canceller System, available with the use of the 82.25VX5 Subassembly.

Reference Documentation

For additional information about the 257 T1 Echo Canceller System, refer to the following documents, which can be obtained through your Tellabs representative:

- 2571 and 2572 T1 Echo Canceller Modules technical manual 76.81257X
- 257 T1 Echo Canceller User Interface Document. 76.U81257X
- 2500-Series Universal Firmware Download Program (UFDP)
technical manual 76.812500UFDP

1. Overview

This document provides a description of major feature options for the 257 T1 Echo Canceller System. The features are available with the addition of an 82.25VX1, 82.25VX2, 82.25VX3, or 82.25VX5 Subassembly.

All CLEARCALL features are bypassed on individual channels when they go idle.

All CLEARCALL features are transparent to fax and modem transmissions.

Note: The Dynamic Noise Substitution (DNS) feature is not supported by the 82.25VX5 Subassembly. The DNS menu option will be disabled and the front panel option will not appear when this subassembly is installed.

2. New Features and Enhancements

This release improves fax performance by increasing idle code integration time to ~120ms.

3. CLEARCALL Noise Reduction

The CLEARCALL Noise Reduction (NR) feature applies proprietary processing techniques to remove background noise and enhance voice quality in cellular applications. The feature is not optionable on a per-channel basis, but can be enabled or disabled on a per-channel basis along with all other CLEARCALL enhancements.

Cellular service operators can select from three noise-reduction percentages — low, normal, or maximum — to optimize the overall system performance. The operator should first select the low percentage of noise reduction, which subdues the noise at a minimum level. If that level is still not acceptable, the normal percentage reduces the noise even further, and the maximum percentage reduces it at the highest level. In a highly-noisy environment, the normal and maximum percentages are most beneficial.

In summary, the NR feature provides the following benefits:

- Minimizes degradation due to high mobile background noise to provide clearer calls.
- Provides call quality comparable to wireline networks.
- Transparent operation and seamless integration with the Tellabs family of Echo Cancellers.
- Acts as a state-of-the-art tool for voice quality enhancements.
- Provides up to 12dB reduction of mobile background noise.
- Independent processing of each voice channel.
- Transparent to fax and modem transmissions.
- Provides alternate noise reduction profiles for optimum performance.

Note: A 28ms delay can be expected when the NR feature is enabled.

4. CLEARCALL Acoustic Coupling Elimination

The CLEARCALL Acoustic Coupling Elimination (ACE) feature works with 257 T1 Echo Canceller Modules in cellular telephone networks where the landline subscriber hears an echo from a mobile set. This feature cancels that echo from the mobile set.

The ACE feature works with Time Division Multiple Access (TDMA), Code Multiple Division Access (CDMA), and Global System for Mobile Communications (GSM) cellular technologies. Insufficient acoustic echo control on digital mobile handsets and hands-free mobile systems can cause echo to be audible to the landline subscriber. The ACE feature eliminates this impairment and brings digital wireless networks one step closer to wireline quality.

User-Selectable Options

The ACE feature is not optionable on a per-channel basis, but can be enabled or disabled on a per-channel basis along with all other CLEARCALL enhancements. The ACE feature can be optimized for the amount of Weighted Acoustic Echo Path Loss (WAEPL, the loss in dB from the ear piece to the mouth piece of the mobile phone) that is being experienced. The ACE feature should be set for the worst-case WAEPL that is experienced. Note that WAEPL varies widely with differing mobile phone models and manufacturers. Available WAEPL options are 25dB, 35dB, and 45dB.

ACE Noise Injection may be enabled or disabled when using an 82.25VX5 Subassembly.

The ACE feature can be configured from the module's front panel controls or Serial Communications Ports (SCPs).

More information about front panel modes and menu screens can be found in the *257 T1 Echo Cancellor User Interface Document*, which includes an illustration of the 257X Module's front panel, a system configuration table with factory defaults specified, and sample menu screens.

Note: The ACE feature is present only in the Receive path of the Echo Cancellor.

5. CLEARCALL Automatic Level Control and Dynamic Noise Substitution

CLEARCALL Automatic Level Control (ALC)

The CLEARCALL ALC feature enhances the audio quality of landline and wireless telephone calls by automatically compensating for unfavorable audio levels on a call-by-call basis. This feature makes it easier for callers to communicate effectively by improving the clarity and intelligibility of speech.

The ALC feature can be activated in the Send and/or Receive paths of the module, where it can reduce or increase speech levels to correct for network level problems. The level control makes adjustments in incremental steps based on the measured average speech level.

The user-selectable target levels are -15dBm , -18dBm , -21dBm , and -24dBm .

The ALC feature is not optionable on a per-channel basis, but can be enabled or disabled on a per-channel basis along with all other CLEARCALL enhancements.

The ALC feature operates on a call-by-call, DS0-by-DS0 basis to assure that each call is independently adjusted to the optimum level, no matter what impairments exist on the facility.

After a call is initiated, the module monitors the call to determine an average speech level for reference. This average is used to determine the amount of gain or loss that is to be introduced. Averaging the voice level keeps the processor from overcompensating for abrupt changes in the call, resulting in momentary changes in level. Minimum/maximum levels of compensation are $\pm 9\text{dB}$.

If the speech is too loud (greater than 3dB above the target level), the module starts attenuating the output during brief pauses in speech. This continues until the level is within 3dB of the Target Audio Level (TAL).

If the speech is too low (3dB or more below the target level, to a minimum level of -30dBm), the module starts providing gain to the output. This continues until the level is within 3dB of the TAL.

If the instantaneous level of the signal is so high as to result in overdriving the analog reconstruction circuitry, immediate adjustments (no wait for speech pauses) of -3dB are added to bring the signal level down to a lower level, up to the maximum amount of loss available (-9dB).

The adjustment step-size can be set to 3dB (fixed) or to 6dB .

CLEARCALL Dynamic Noise Substitution (DNS)

The CLEARCALL DNS feature enhances the background audio quality of wireless networks that make use of low bit rate voice encoding. In these networks, the DNS feature provides masking of call impairments such as swirl, warble, and acoustical echo.

The DNS feature masks poorly encoded background sounds as well as acoustical echo from the mobile end of a digital mobile-to-Public Switched Telephone Network (PSTN) call.

The DNS feature can be introduced in one or both directions, depending on the application and the installed 25VX Subassembly.

Notes:

1. **This feature must be disabled in the Receive direction when the ACE feature is enabled.**
 2. **This feature is not supported by the 82.25VX5 Subassembly.**
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6. Subassemblies

Description

If you have purchased a 257 Echo Canceller Module with a pre-installed 25VX Subassembly, no additional hardware installation is required to add voice quality enhancements (see Note below bullets).

If you are adding voice quality enhancements to an existing 257 Echo Canceller Module, refer to the remainder of this section.

If your 257 firmware revision is lower than FP1.3.0 (Rev. F, as viewed from the front panel), you must purchase an upgrade kit, which includes the subassembly and necessary firmware. Order numbers are as follows:

- 257 ALC/ACE unidirectional upgrade kit 257VX1UG
- 257 ALC/ACE bidirectional upgrade kits. 257VX2UG and 257VX3UG
- 257 ALC/ACE/NR bidirectional upgrade kit 257VX5UG

Note: In order for the NR feature to operate, you must purchase and install the optional 82.25VX5 Subassembly.

The kits can be obtained through your Tellabs representative.

Refer to **Configurations** on page 5 for further information on subassembly configurations.

Installation

Caution: **STATIC-SENSITIVE EQUIPMENT!** This equipment is shipped in a protective box. When unpacking and handling the equipment, be sure to wear a grounded wrist strap to protect it from possible electrostatic-discharge damage.

Note: Inspect the equipment upon its arrival to detect any shipping damage. If damage is found, immediately file a claim with the carrier. If the equipment has been in storage, reinspect it prior to installation.

Mounting

The 25VX Subassemblies mount on the 257X Module as shown in Figure 6-1.

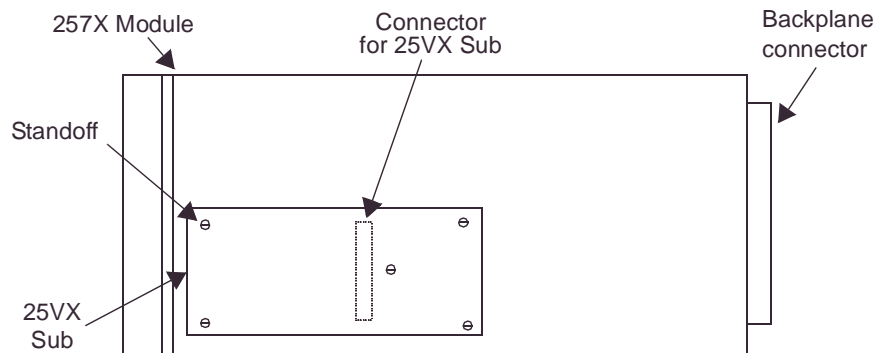


Figure 6-1 25VX Subassembly Mounting on a 257X Module

Firmly insert the subassembly's pins into the connector on the module and screw down the five standoffs.

Configurations

Depending upon the model of subassembly used (82.25VX1, 82.25VX2, 82.25VX3, or 82.25VX5), voice quality enhancements can operate unidirectionally (Send OR Receive path) or bidirectionally (Send AND Receive paths).

See Table 6-1 for a list of the subassemblies and the enhancements they provide.

Model	Description	Application
82.25VX1	Unidirectional ALC/ACE Subassembly	Provides unidirectional ALC feature or ACE feature for 257X Modules
82.25VX2	Bidirectional ALC/ACE Subassembly	Provides bidirectional ALC or unidirectional ALC feature and ACE feature for 257X Modules
82.25VX3	Bidirectional ALC/ACE Subassembly	Provides bidirectional ALC feature and ACE feature for 257X Modules
82.25VX5	Bidirectional ALC/ACE/NR Subassembly	Provides bidirectional ALC feature, ACE feature, and NR feature for 257X Modules

Table 6-1 Subassembly Configurations

Subassembly Specifications

<i>Dimensions</i>	<ul style="list-style-type: none"> • Height: 2.70 inches • Width: 6.38 inches • Depth: 0.72 inches
<i>Weight</i>	<ul style="list-style-type: none"> • 3.0 ounces (max)
<i>Operating Temperature</i>	<ul style="list-style-type: none"> • +32° to +122° F (0° to +50° C)
<i>Storage Temperature</i>	<ul style="list-style-type: none"> • -58° to +185° F (-50° to +85° C)

7. Technical Assistance

General Repair and Return Information

Tellabs will repair or replace Tellabs products provided that the need for this repair or replacement arises from the ordinary use of the products as intended by the manufacturer or otherwise stated in Tellabs literature.

For more information about in-warranty and out-of-warranty repairs and returns, see the Tellabs Global Repair and Return Policy, available on the Tellabs website at www.tellabs.com. Click the **Services and Support** link and navigate to **Technical Support**.

Complete any applicable troubleshooting procedures to troubleshoot the module. If the module is suspected of being defective, replace the faulty module with a new module and conduct the test again.

- If the substitute operates correctly, the original should be considered defective and returned to Tellabs as explained in Contacting Tellabs Repair Centers, page 6.
- If normal troubleshooting procedures do not solve the problem, contact Tellabs Technical Support Center.

Tellabs strongly recommends that no internal (component-level) testing or repairs be attempted on the equipment. Unauthorized testing or repairs may void the warranty. Also, if the equipment is part of a registered system, unauthorized repairs result in noncompliance with Parts 15 and/or 68 of the FCC Rules and Regulations.

Although repair service always includes an attempt to remove any permanent markings made by customers on Tellabs products, the success of such attempts cannot be guaranteed. Therefore, if equipment must be marked defective or bad, Tellabs recommends that it be done with non-permanent materials and, where appropriate, in a manner consistent with the correct handling of electrostatically sensitive devices.

Contacting Tellabs Repair Centers

Contact Tellabs Repair and Return Services to return a suspected module for repair or replacement. For shipping the suspected module, you must use a Return Material Authorization (RMA) number, which is used for tracking purposes.

For North American customers, Tellabs has a convenient web-based tool to request repair services and to obtain an Return Material Authorization (RMA) number. The website gives you an RMA when you submit the request on-line, and allows you to check the ongoing status of the module. To use the Repair Services website, you need a user name and login, which you must obtain from Tellabs by calling one of the telephone numbers below (see Table 7-1, page 7). Use your designated user name and login whenever you want to use the Repair Services Website.

If unable to use the Repair Services Website, call one of the numbers below to request an RMA:

Location	Telephone Number	Fax Number	Email Address
Finland for Tellabs EMEA products	+358.9.4131.2920	+358.9.4131.2022	emea.repair@ tellabs.com
North America	+1.888.2BFIXED (888.223.4933) or +1.630.679.7600	+1.630.679.7551	repairs@tellabs.com
Latin America and All Other Regions			
Japan	+81.3.3595.7400	+81.3.3595.7401	n/a

Table 7-1 Tellabs Return and Repair Contact Information

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Contact Information

In an effort to improve the quality of this document, please notify Tellabs Technical Assistance at 1.800.443.5555 in North America or 1.630.798.7040 outside North America if any anomalous conditions are observed.