

C. Test Results: Electronic Communications Trouble Administration (ECTA) Functional Test of Resale Lines (M&R13)

1.0 Description

The ECTA Functional Test evaluated the functionality of BellSouth's ECTA Gateway for Maintenance and Repair trouble report processing. The objectives of the test were to evaluate ECTA Gateway functionality and to measure ECTA Gateway response times. This test was conducted by submitting trouble administration transactions against test bed accounts to the ECTA Gateway and analyzing ECTA Gateway responses to these transactions¹.

2.0 Methodology

This section summarizes the test methodology.

2.1 Business Process Description

See Section VI, "Maintenance & Repair Overview" for a description of BellSouth's maintenance and repair processes, the ECTA Gateway, and CLEC interface options.

2.2 Scenarios

The following table outlines the scenarios and functional elements used in this test. In addition, the table denotes the number of transactions that were valid ("valid") and the number of transactions that contained intentional errors ("error"). The transactions used in this evaluation were chosen to test the applicable ECTA functions across line types specified in Table VI-3.1 below and were not intended to demonstrate statistical significance.

¹ See Section VI, "M & R Overview," for details on the Maintenance and Repair test bed.

Table VI-3.1: Test Scenarios

	Line Description	Trouble	Enter Trouble Ticket	Request Trouble Ticket Status	Add Trouble Information	Modify Trouble Administration Information	Cancel Trouble Report	Verify Repair Completion	Perform MLT
1	POTS	No Dial Tone	1 Valid + 1 Error	1 Valid		1 Valid + 1 Error			2 Valid
2	POTS	No Dial Tone	1 Valid + 1 Error	2 Valid	1 Valid	1 Valid + 1 Error	1 Valid		
3	PBX ²	Receives Calls for Wrong Number	1 Valid						
4	PBX	Can't Call Out							
5	Synchronet	Can't Be Heard (Distant)	4 Valid + 2 Error	1 Valid	1 Valid	1 Valid + 2 Error	2 Valid + 1 Error		
6	POTS	No Dial Tone	1 Valid					1 Valid	2 Valid

2.3 Test Targets & Measures

The test target was the maintenance and repair functionality for resale lines as provided via the ECTA Gateway. Sub-processes, functions, and evaluation criteria are summarized in the following table. The last column “Test Cross-Reference” indicates where the particular measures are addressed in Section 3.1 “Results & Analysis.”

Table VI-3.2: Test Target Cross-Reference

Sub-Process	Function	Evaluation Criteria	Test Cross-Reference
Trouble Reports	Create trouble report	Presence of Functionality Timeliness of Response	M&R-13-1-1 M&R-13-2-1
	Request trouble ticket status	Presence of Functionality Timeliness of Response	M&R-13-1-2 M&R-13-2-2

² A trouble ticket could not be created, therefore no other tests could be performed.

Sub-Process	Function	Evaluation Criteria	Test Cross-Reference
	Add trouble information	Presence of Functionality Timeliness of Response	M&R-13-1-3 M&R-13-2-3
	Modify trouble report	Presence of Functionality Timeliness of Response	M&R-13-1-4 M&R-13-2-4
	Cancel trouble report	Presence of Functionality Timeliness of Response	M&R-13-1-5 M&R-13-2-5
	Verify repair completion	Presence of Functionality Timeliness of Response	M&R-13-1-6 M&R-13-2-6
Access to Test Capabilities	Conduct Mechanized Line Test	Presence of Functionality Timeliness of Response	M&R-13-1-7 M&R-13-2-7

2.4 Data Sources

The data collected for the test are summarized in the table below.

Table VI-3.3: Data Sources for ECTA Functional Test of Resale Lines

Document	File Name	Location in Work Papers	Source
<i>Joint Implementation Agreement for Electronic Communications Trouble Administration (ECTA) Gateway for Local Service Version 10/07/98³</i>	CLEC_JIA.doc	M&R-2-A-1	BLS
<i>American National Standard for Telecommunications – Operations, Administration, Maintenance and Provisioning (OAM&P) – Extension to Generic Network Information Model for Interfaces between Operations Systems across Jurisdictional Boundaries to Support Fault Management (Trouble Administration) (ANSI T1.227-1995)</i>	ANSI+T1[1].227-1995.pdf	M&R-2-A-2	American National Standards Institute

³ This document outlines points specific to the implementation of an ANSI T1.227-, T1.228-, and T1.262-compliant CLEC interface to BellSouth's ECTA Gateway. BLS provided KCI with a generic version of this document for use in the M&R-2, M&R-3, M&R-4, and M&R-13 evaluations. In addition, this document was evaluated, along with JIAs actually enacted with CLECs, in M&R-9: ECTA Documentation Evaluation.

Document	File Name	Location in Work Papers	Source
<i>American National Standard for Telecommunications – Operations, Administration, Maintenance and Provisioning (OAM&P) – Services for Interfaces between Operations Systems across Jurisdictional Boundaries to Support Fault Management (Trouble Administration) (ANSI T1.228-1995)</i>	ANSI+T1[1].228-1995+(R1999).pdf	M&R-2-A-3	American National Standards Institute
<i>American National Standard for Telecommunications – Operations, Administration, Maintenance and Provisioning (OAM&P) – Extension to Generic Network Model for Interfaces across Jurisdictional Boundaries to Support the Service Test Function (ANSI T1.262-1998)</i>	ANSI+T1[1].262-1998.pdf	M&R-2-A-4	American National Standards Institute
E-Mail Communication Re: ECTA Functionality	No Electronic Copy	M&R-2-A-5	BLS
Functional Test Logs	No Electronic Copy	M&R-2-A-6	KCI

2.4.1 Data Generation/Volumes

ECTA system responses were captured for M&R scenarios processed using the Test Interface to the ECTA Gateway. No volume testing was required for this evaluation.

2.5 Evaluation Methods

The ECTA Functional Test evaluated the functional elements of the trouble reporting and screening process for both telephone number-assigned and circuit identified resale lines, as delivered to CLECs via the ECTA system. The objective of the ECTA Functional Test was to validate the existence and timeliness of ECTA trouble reporting and screening functionality for both telephone number-assigned and circuit identified resale customers, in accordance with BellSouth's specifications and the American National Standards Institute (ANSI) T1.227, T1.228 and T1.262 standards for trouble administration.

This test cycle was executed by exercising a defined set of ECTA functions associated with trouble management activities against test bed accounts⁴. The functional elements targeted by this test included access to test capabilities,

⁴ See Section VI, "M & R Overview" for a description of the M&R test bed.

trouble report entry, query and receipt of trouble report status information, modification and addition of information to trouble reports, and cancellation/closure of trouble reports. In addition, error conditions were included to assess the ECTA Gateway's response to incorrect information. The ECTA Functional Test was conducted against BellSouth's production system.

The functional evaluation tested each of the ECTA functional processes against two criteria: presence of functionality and timeliness of system responses.

The following steps outline the test approach:

1. A list of test scenarios was developed to exercise the full functionality of the ECTA Gateway across all available resale line types (see Table VI-3.1). To obtain an exhaustive list of available ECTA Gateway functionality, KCI simulated the normal process followed by a CLEC in implementing an interface to the BellSouth ECTA Gateway. The normal process involves a CLEC requesting that BellSouth support certain functionality/system objects in the ECTA Gateway, and negotiations between BellSouth and the CLEC to define final functionality and object support. KCI replicated this request/negotiation process by presenting BellSouth ECTA managers and developers with a list of T1M1 compliant functions⁵ and asking BellSouth to cull from that list an exhaustive set of available ECTA Gateway functions.
2. A Test Scenario Portfolio was developed for each scenario. These portfolios included:
 - Data Entry Files for each ECTA function within a scenario that requires data to be entered into the Test Interface⁶.
 - System steps to be submitted to the Test Interface.
 - BellSouth Maintenance Administrator steps for functions that required responses from back-end systems.
 - Expected results for each function.

Data entry was based on information obtained from the *Joint Implementation Agreement (JIA) for Electronic Communications Trouble Administration (ECTA) Gateway for Local Service* version 10/07/98, and information provided by BellSouth Maintenance and Systems Development personnel on use of the BellSouth Test Interface.

⁵ The ANSI T1.228 standard lists 18 functions that can be included in a T1M1 compliant gateway. In addition, ANSI T1.262 adds the POTS line testing function (MLT) to the original 18.

⁶ See Section VI, "M & R Overview" for details on the BellSouth ECTA Test Interface.

3. Data Entry Files from Step 2 were uploaded into the BellSouth Test Interface system.
4. Using the Test Scenario Portfolios, the test scenarios were executed by:
 - Using the Test Interface to access and submit Data Entry Files to the ECTA Gateway.
 - Using the Test Interface to submit transactions directly to the ECTA Gateway.
 - Prompting a BellSouth Maintenance Administrator to submit responses to the ECTA Gateway from a back-end system.
5. The ECTA Gateway system agent log⁷ and response messages to the ECTA Test Interface were analyzed to evaluate responses and determine response times from the ECTA Gateway. System responses were documented in a test log and errors were categorized by the following underlying causes:
 - ECTA functional deficiency
 - User error (transactions containing user errors were corrected and resubmitted)
6. Data from Step 5 were compiled and mapped against the individual assessment criteria.

2.6 Analysis Methods

The ECTA Functional Test included a checklist of evaluation criteria developed by KCI during the initial phase of the BellSouth - Georgia OSS Evaluation. These evaluation criteria provided the framework of norms, standards and guidelines for the ECTA Functional Test.

3.0 Results Summary

This section identifies the evaluation criteria and test results.

3.1 Results & Analysis

The results of this test are presented in the table below. Definitions of evaluation criteria, possible results, and exceptions are provided in Section II.

⁷ A sample of agent log transactions was audited to validate the veracity of the information contained therein.

Table VI-3.4: M&R-13: Evaluation Criteria and Results – Presence of Functionality

Test Cross-Reference	Evaluation Criteria	Result	Comments
M&R-13-1-1	The user is able to enter a trouble report into ECTA and receive a satisfactory response.	Satisfied	<p>ECTA was used to enter 12 trouble reports. Satisfactory responses were received for eight of the 12 reports.</p> <p>One test transaction failed when attempting to create a trouble ticket for a PBX circuit. KCI issued Exception 96 on this issue. BLS replied to this exception by stating that: 1) as of yet, no CLECs had requested that ECTA allow trouble tickets to be issued on PBX circuits; and 2) if a CLEC were to request this ability, the CLEC and BLS would negotiate the necessary changes to the ECTA Gateway using BLS's change control process. Given the low relative incidence of PBX troubles that could be reported using the ECTA Gateway, and the fact that alternative methods exist to report these troubles (BLS's TAFI interface and a call to a BLS Service Center), KCI concurred with BLS that changes to the ECTA Gateway were unnecessary at this time and closed Exception 96. See Exception 96 for additional information on this issue.</p> <p>In addition, the ECTA Gateway failed to notify the user that invalid information had been entered into the commitmentTimeRequest object on one trouble ticket. KCI issued Exception 81 on this issue stating that in the absence of any specifically delineated standard set of responsibilities, standard programming practices dictate that both parties in a Manager/Agent electronic communications system relationship should validate data to the degree reasonably possible.</p>

Test Cross-Reference	Evaluation Criteria	Result	Comments
			<ul style="list-style-type: none"> BLS replied to this exception by stating that it does not plan to add attribute value error checking, which is beyond its commitment in the response to Exception 12⁸. BLS stated that the Manager (CLEC) is responsible for insuring that their users enter correct information into their 'front end' system and that their system correctly translates the user's input to the ANSI standard values defined in the JIA, which are transmitted to ECTA. In addition, production clients have been successfully reporting their customers' troubles without incident. BLS further contended that modifications that would be necessary to validate data would be costly (and that cost would be passed along to the CLECs using ECTA), that the necessary modifications to the ECTA Gateway would slow down the response time of the gateway, and that these modifications would require modifications to the existing CLEC interfaces. <p>Two other trouble tickets contained intentional errors: one in the 'managedObjectHours' field and one in the 'tspPriority' field. As with the above, the ECTA Gateway did not indicate that invalid data had been entered into the trouble tickets.</p> <p>To address the error validation issue,</p>

⁸ Exception 12 was issued as a part of the M&R-2 ECTA Functional Test and dealt with the lack of data validation in the ECTA Gateway. BellSouth responded to that exception by modifying the programming of the ECTA Gateway to include validation of data entered into the 'closeOutVerification' object.

Test Cross-Reference	Evaluation Criteria	Result	Comments
			BLS elected to bring the issue to the CLEC community via the Change Control Process and to make the programming changes if the CLECs requested them. At the October 25, 2000 Change Control Meeting, the CLEC community did not prioritize ECTA attribute validation, and BLS cancelled this specific item as an issue to be addressed. While the lack of data validation limits the functionality of the interface, CLECs have been given an appropriate opportunity to address the issue via the Change Control Process. Exception 81 is closed.
M&R-13-1-2	The user is able to request trouble report status from ECTA and receive an satisfactory response.	Satisfied	ECTA was used to check the status of four trouble tickets. Satisfactory responses were received for all four.
M&R-13-1-3	The user is able to add trouble information to an ECTA trouble report and receive a satisfactory response.	Satisfied	ECTA was used to add information to two trouble tickets. Satisfactory responses were received for both.
M&R-13-1-4	The user is able to modify trouble administration information on an ECTA trouble report and receive a satisfactory response.	Satisfied	<p>ECTA was used to modify information on seven trouble tickets. Satisfactory responses were received for three.</p> <p>On two modify transactions, the ECTA Gateway failed to notify the user that improper information had been entered. The fields that contained intentional errors were repeatReport and perceivedTroubleSeverity. These issues were addressed in Exception 81. See the discussion of the data validation issue in the comments for criterion M&R-13-1-1.</p> <p>Two other trouble modify transactions contained intentional errors: one in the preferredPriority</p>

Test Cross-Reference	Evaluation Criteria	Result	Comments
			field and one in the aLocationAccessHours field. As with the above, the ECTA Gateway did not indicate that invalid data had been entered into the trouble tickets.
M&R-13-1-5	The user is able to cancel a trouble report in ECTA and receive a satisfactory response.	Satisfied	ECTA was used to cancel three trouble tickets. Satisfactory responses were received for two of the three transactions. On one transaction, the ECTA Gateway failed to notify the user that invalid information had been entered into the 'cancelRequestedByManager' field. The transaction did, however, properly cancel the trouble ticket.
M&R-13-1-6	The user is able to respond to trouble repair completion notifications and receive a satisfactory response	Satisfied	When KCI first tested this function, the ECTA Gateway was unable to properly change the trouble ticket status to accept this transaction because the functionality had not been properly created to interpret a negative MLT result and change the trouble ticket status to "request close." KCI issued Exception 85 and BLS modified the ECTA Gateway's programming to correct the issue. During retesting, the ECTA Gateway was able to properly update the trouble ticket status, indicating that Exception 85 had been addressed. Exception 85 is closed. See Exception 85 for additional information on this issue. During retesting, ECTA was used to verify repair completion on two trouble tickets. Satisfactory responses were received for both. In one instance, a BLS maintenance technician accessed the trouble ticket while an MLT was running. As a result of this, the ECTA Gateway was unable to change the trouble ticket status to "request close." This instance was not, however, a

Test Cross-Reference	Evaluation Criteria	Result	Comments
			breakdown in the ECTA Gateway itself and therefore does not affect the result of this criterion.
M&R-13-1-7	The user is able to conduct a Mechanized Line Test and receive a satisfactory response.	Satisfied	ECTA was used to conduct four MLTs. Satisfactory results were received for all four.

Table VI-3.5: M&R-13 Evaluation Criteria and Results -- Timeliness of Response

Test Cross-Reference	Evaluation Criteria	Result	Comments
M&R-13-2-1	The user receives a timely response when entering a trouble report using ECTA ⁹ .	Satisfied	All responses to trouble ticket creates were received within eight to 17 seconds. The response for an invalid create transactions was received within one second.
M&R-13-2-2	The user receives a timely response when requesting trouble report status using ECTA ⁹ .	Satisfied	All responses to status requests were received within one second.
M&R-13-2-3	The user receives a timely response when adding trouble information using ECTA ⁹ .	Satisfied	All responses when adding trouble information were received within six to 14 seconds.
M&R-13-2-4	The user receives a timely response when modifying trouble report administration information using ECTA ⁹ .	Satisfied	All responses when modifying trouble administration information were received within six to 14 seconds.
M&R-13-2-5	The user receives timely response when canceling a trouble report using ECTA ⁹ .	Satisfied	All responses when canceling a trouble ticket were received within six to eight seconds.

⁹ BellSouth's *Joint Implementation Agreement (JIA) for Electronic Communications Trouble Administration (ECTA) Gateway for Local Service* Version 10/07/98 states "The end-to-end protocol target response time will be 30 seconds or less for 90% of the requests while handling 40 messages per minute. End to End [sic] maximum response time will not exceed 180 seconds." This benchmark was used for criteria M&R-13-2-1 through M&R-13-2-6. Due to the low level of ECTA usage, actual messages per minute during functional testing were well below 40.

Test Cross-Reference	Evaluation Criteria	Result	Comments
M&R-13-2-6	The user receives a timely response when responding to a verify repair completion ⁹ .	Satisfied	All responses when responding to a verify completion request were received within eight to 10 seconds.
M&R-13-2-7	The user receives a timely response when conducting an Mechanized Line Test using ECTA.	Satisfied	All responses when conducting an MLT were received within 66 to 73 seconds. The benchmark used for M&R-13-2-7 was two to three minutes as outlined for MLT test response time in the <i>CLEC TAFI End-User Training and User Guide</i> , Issue 6.