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Ameritech Coin Line Interface Specifications

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1. GENERAL

This document describes the Network Interface (NI) specifications for the Ameritech Coin Line Service. Specifications as provided for a coin line interface as shown on Figure 1.

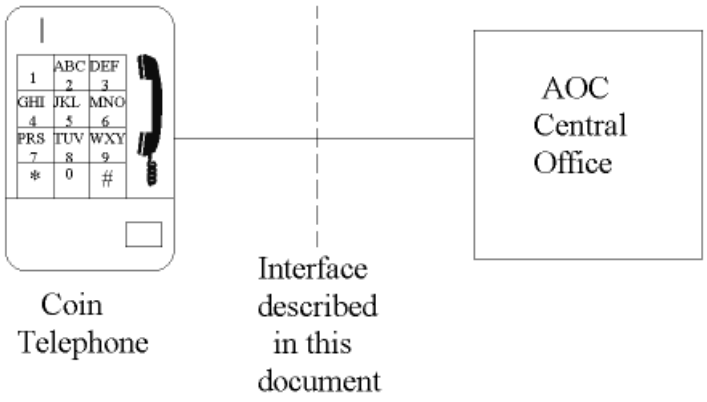
1.1. Coin Line Service

Coin Line Service is offered as a means to provide a public coin telephone service line to work with a properly equipped coin telephone set. This service will allow the third-party provider of public coin telephones to connect to the Ameritech operating company (AOC) coin control circuits in the local central office. The central office coin control circuits provide most of the coin control functions for the telephone set. Coin Line Service may not be available in all Ameritech central offices.

1.2. Change and Reissue

Changes contents or reissued documents will be noted in this section.

Figure 1. Coin Line Service



2. COIN LINE DESCRIPTION

Coin line service is provided to allow a calling customer to originate a call and to pay for the call at the coin telephone set.

The coin line service has the following features:

- Dial Tone First

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- Local Coin with Overtime
- Coin Overtime Announcement
- Automatic Coin Toll Service (ACTS)
- Touch Tone
- Loop Start Operation
- Touch Tone Fraud Prevention

2.1. Dial Tone First

The dial-tone-first option provides dial tone without an initial coin deposit. This option not only demonstrates the operational status of the coin station but also permits customers to dial certain calls without requiring an initial coin deposit. These include assistance calls to the operator, station-to-station tool calls, person-to-person calls, collect calls, credit card calls, toll information calls and three-digit service codes. When dialing a number with no deposit required, the number can be dialed immediately after dial tone is received and the call is allowed to proceed. When dialing a number that requires a deposit, the initial deposit should be made and the desired number dialed. When a deposit is required and the calling coin customer completes dialing without depositing the initial rate, a recording directs the customer to hang up and try the call again after first depositing the necessary coin(s).

2.2. Local Coin Call with Overtime

In areas with overtime charging, a local coin call is divided into two distinct periods: initial and overtime. The initial period begins after the called party answers. Between 24 and 30 seconds prior to the end of the initial period, the initial deposit is automatically collected by the network. (Customer hears movement of coins.) The sound of coins being collected is an indication to the coin customer that the initial period is near completion and that the customer must either hang up or make an overtime deposit in order to continue uninterrupted.

If the coin has not been deposited at the end of the initial period, an announcement prompts the coin customer for the overtime deposit. If the deposit cannot be obtained, the network will disconnect the call.

2.3. Automated Coin Toll Service (ACTS)

The implementation of the ACTS feature has no effect on the present customer procedures required for a coin toll call. Upon receipt of dial tone the customer dials one plus the 7- or 10-digit called number. The customer receives an announcement stating the required charges and then

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deposits the correct amount of coins. After the required rate has been deposited, the call is permitted to proceed. Upon approaching the end of the initial period the initial deposit is automatically collected by the network. An announcement may be sent to inform the customer the initial period is ending. The announcement asks the customer if he (she) wishes to continue the call, to signal by flashing the switch hook when the call is completed.

If the customer hangs up within the prescribed interval, no further charges will be due. If the call goes into overtime, the customer signals by flashing the switch hook or hangs up to indicate when the call is over. If the customer hangs up, the operator system recognized the hang-up and signals the local network to ring back the station. When the calling customer answers, an announcement is transmitted concerning the overtime charge due. When the charge has been satisfied, the operator system acknowledges, collects the deposit, and restores the circuits to normal.

2.4. Touch Tone

Ameritech Coin Line Service supports receipt of Touch Tone (Dual Tone Multi-Frequency) dialed digits.

2.5. Loop Start Operation

Loop start line origination is supported by Ameritech Coin Line Service.

2.6. Touch Tone Fraud Prevention

Touch tone fraud prevention is available with the dial-tone-first feature. Touch tone fraud prevention provides positive battery from the local network which can be used to disable the key pad during operator system functions. In addition, this function allows operator and ACTS recognition of overtime deposits less than the initial rate.

3. COIN LINE SIGNALING PROTOCOL

3.1. General

This section deals with the electrical characteristics of the coin line at the network interface. The coin line is a 2-wire, analog, local exchange line with a coin class of service. The coin line network interface supports MF signaling between the coin telephone and the local network. References to these characteristics can be found as indicated in the text and in the following references: Bellcore Document TR-TSY-000456 (Section 4), LSSGR - TR-TSY-000506 and EIA Standard 470-A in the reference section of this document.

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3.2. Signaling

This section identifies the various signals sent from the coin telephone set to the local exchange network and from the local exchange network to the telephone set. These signals pertain to the loop-start interface between the network and the coin telephone set.

For the Network Supervision, Dial Tone Detection, Flash Timing, Alerting and Address Signaling (DTMF) interface specifications, refer to documents ANSI T1.401-1988 and Bellcore Document TR-TSY-000456 (Section 4).

DTMF - Dual Tone Multi-Frequency (address signaling) is used with virtually all modern public terminals. This document pertains to DTMF tones; 1 through 0, * and #. Refer to TR-TSY-000456 and ANSI T1.401-1988 for the signaling specification in the Reference section of this document.

Voice Transmission - Voice transmission characteristics are described in Bellcore Document TR-TSY-000456, EIA Standard 470-A IEEE Standard 269-1983 and IEEE Standard 661-1979. These references are specified in the Reference section.

Flash - If the customer flashes the switch hook on an operator handled coin call, an “operator recall” signal is sent to the operator system for connection to an operator. Refer to LSSGR Section 6 - TR-TSY-000506 and TR-TSY-000528 for the interface specifications.

Coin Station Test Line - The Coin Station Test Line option allows installation or repair forces to make the following operational tests without using the local test desk facilities or requiring the services of an operator.

- Coin presence and ground removal
- Ground and loop resistance
- Loop leakage
- Coin collect
- Coin return
- Coin relay operating time
- Foreign EMF

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These test are initiated at the coin telephone set under test by depositing the initial rate and dialing a local telephone number. Test results are returned to the repair personnel in the form of tones, beeps or rings. Contact the local Ameritech operating company for details.

Network Integrity - The requirements outlines here pertain to terminal characteristics that, if improper, could degrade network performance. Public terminals should be capable of meeting selected requirements contained in Title 47, Part 68, Subpart D of the US Government Code of Federal Regulations.

Customer Signaling - The signals that the customer generates in using this feature is in making 0+, 0- or 1+ calls. Only the usual information signaling (dial tone, audible ringing, etc) is returned to the coin customer. Refer to document LSSGR Section 5 - TR-TSY-000505 and LSSGR Section 6 - TR-TSY-000506.

3.3. Coin Operation Signaling

This section covers the functions that enable the coin telephone set at accept coin as payment for telecommunications services. These requirements pertain to the loop-start, dial tone first, coin line (network interface) that involves a local exchange line that is assigned a “coin” class of service. The coin telephone set must be compatible with the network controlled coin control service specified in this technical reference. Capabilities of the interface to the local switch include the ability to distinguish between valid and nonvalid coins, to confirm to the network that the initial or overtime coin deposits have a been made, to inform the network of the number and denomination of the coins deposited and to respond to network signals for the collection or returning of coins.

Line Polarity - In the coin telephone set’s idle or on-hook state, the network provides battery poled negative on the ring lead with respect to the tip lead. This polarity is continued after the telephone set is off-hook and draws line current. Refer to LSSGR Section 6.2 - TR-TSY-000506.

Coin Deposit Tests - On coin calls, an initial coin deposit is required for call completion. The network tests for the initial coin deposit and overtime deposits and coin presence with negative voltages (for initial deposit) and positive voltage (for overtime deposit) applied to the tip lead. Prior to the overtime deposit test, a minimum of 600 milliseconds of talking battery reversal is applied to the ring lead with ground on the tip lead. These test requirements are described in Bellcore Document TR-TSY-000456 - Section 5, TR-TSY-000528 and LSSGR Section 6 - TR-TSY-000596.

Coin Deposit - The coin telephone set should respond to the coin disposal control signals generated by the local network. The coin deposal cycle starts when the network opens the ring lead and applies negative or positive 130 (125 to 135 volts) between the tip lead and ground. This -130 volts and +130 volts may be reversed in different local central offices. For example,

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one local central office may have -130 volts as coin collect and +130 volts as coin return and another local central office may have +130 volts as coin collect and -130 volts as coin return. Coin telephone installation forces should call the local Ameritech operating company for the correct voltage polarity designation. Refer to Bellcore Document TR-TSY-000528, TR-TSY-000456 - Section 5 and LSSGR Section 6.2 - TR-TSY-000506 for coin deposal information.

Coin Signaling - Coin signals comprise a number of bursts of a two-frequency tone for coin designation. Refer to Bellcore Document TR-TSY-000528 and TR-TSY-000456, Section 5, for coin signaling information.

Stuck Coin - A stuck coin condition exists when a coin fails to respond to a coin disposal action. Requirements for the stuck coin test are identified in LSSGR Section 6.2 - TR-TSY-000506 and TR-TSY-000456.

3.4. Operator Systems Coin Signaling

This section describes the operator coin signaling functionality for the following functions: coin return, coin collect, ringback, operator attached, operator released and operator release/coin collect. These signals consist of a pair of in-band MF tones transmitted simultaneously from the operator system to the local central office. Refer to documents LSSGR Section 5 - TR-TSY-000505, TR-TSY-000528 and TR-TSY-000456.

Coin Collect and Coin Return - Coin collect and coin return signals are generated at the operator system, as in-band MF tones to signal the local central office for disposition of the coins via negative and positive 130 volts.

Ringback - The ringback signal indicates to the local network that ringing current should be applied to the line.

Operator Released - The operator released signal indicates that monitoring for coins has been completed and this condition may be used to enable the dial pad for further use. The local network should apply negative 48 volts to the ring lead for the operator released condition. These signals may be required to implement new service that requires end-to-end signaling.

Operator Attached - The operator attached signal indicates that the operator is monitoring for coins and this condition may be used to disable the dial pad. The operator attached condition causes positive 48 volts to be applied to the line. This signal may be required to prevent red box fraud.

Coin Collect/Operator Released - The coin collect/operator release signal indicates that the monitoring of coin deposits has been completed and that a coin collect action should be performed at the local central office. When this signal is received, the local network performs a coin collect (130 volts) and then an operator release, which connects negative 48 volts.

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4. POWER

This document pertains to the characteristics of line power from the local telephone network. Line power derives DC voltage from sources in the local network. Refer to Bellcore Document TR-TSY-000456, Sections 4 and 8, for coin telephone power information.

5. REFERENCES

ANSI Documents:

- Interface Between Carriers and Customer Installations - Analog Voicegrade Switched Access Lines Using Loop-Start and Ground Start Signaling, ANSI T1.401 - 1988, American National Standards Institute (ANSI).

Telcordia (formerly Bellcore) Technical Documents:

- LATA Switching System Generic Requirements, Section 5, Call Processing, TR-TSY-000505
- LATA Switching System Generic Requirements, Section 6, Signaling, TR-TSY-000506
- LATA Switching System Generic Requirements, Section 6, Signaling, TR-NWT-000506
- LATA Switching Generic Requirements, Section 7, Transmission, TR-TSY-000507
- LATA Switching System Generic Requirements, Section 10, System interfaces, TR-TSY-000510
- LATA Switching System Generic Requirements, Coin and Coin Charge-a-Call, TR-TSY-000528
- Public Terminals Generic Requirements, TR-TSY-000456
- Lightning, Radio Frequency and 60-Hz Disturbances at the Bell Operating Company Network Interface - TR-EOP-000001
- General Requirements for Radio Frequency Interfaces Filters, TR-NWT-001048

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EIA Document:

- Telephone Instruments With Loop Signaling For Voiceband Applications, EIA Standard 470-A, Electronics Industries Association (EIA).

IEEE Document:

- Method for Measuring Transmission Performance of Telephone Sets, IEEE Standard 269-1988, Institute of Electrical and Electronic Engineers (IEEE).

US Government Document:

- Code of Federal Regulation - Telecommunications, Title 47 - Part 68, US Government

To obtain documents, contact:

ANSI - Ameritech National Standards Institute (ANSI), Attn: Sales Dept, 11 West 42nd Street, New York, NY 10036, (212) 842-4900

EIA - Electronics Industries Association (EIA), 2001 Eye St., NW, Washington, DC 20006, (202) 457-4966

IEEE - Institute of Electrical and Electronic Engineers (IEEE), IEEE Service Center, 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08854, (201) 981-0060

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