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COCOT Access to Voice Messaging Network Interface Specifications

Technical Reference

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COCOT ACCESS TO VOICE MESSAGING NETWORK INTERFACE SPECIFICATIONS

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COCOT ACCESS TO VOICE MESSAGING NETWORK INTERFACE SPECIFICATIONS

1. GENERAL INTRODUCTION

1.1 COCOT (Customer Owned Coin Operated Telephone) Access to Voice Messaging Service is a new feature offering which may optionally be placed on measured,message, and/or flat−rated business lines serving customer−owned customer−operated telephone station sets when ordered by the station set owner. When provided, this feature should not interfere with normal functioning of the COCOT service, and does not interfere with the network. A caller using the COCOT station equipped with "Access to Voice Messaging" may decline the voice messaging service by taking no action, allowing the feature to time out and the offering to expire at no charge to the caller.

1.2 The Customer Owned Coin Operated Telephone is in the non−regulated environment. Therefore, the service described by this Technical Reference constitutes an interface between the regulated network and the COCOT station for access to voice messaging. Figure 1 shows the generic architecture of COCOT access to a voice messaging system, and indicates the demarcations between the regulated network and the unregulated environments. Figure 2 shows the interactions between the caller and the COCOT station, the network, and the Voice Messaging System as a "DECISION TREE", along which the caller makes his choices of service.

1.3 COCOT stations have been in operation on business lines for a number of years. Transmission & signalling characteristics are as provided for normal business lines. Implementation of Access to Voice Messaging will not alter those characteristics for normal call processing and communications. However, no assurance is implied, and none should be inferred, that existing COCOT stations are currently equipped to interoperate with the new feature offering described here. The following discussion is based on current understanding of the workings of certain COCOT stations, and may not be descriptive of all such equipment in the marketplace.

1.4 The Access to Voice Messaging feature is implemented by a line card unit placed on the business line at the serving dial tone switch. The line card is part of the regulated network, and performs functions useful to the network including access to voice messaging providers. The line card unit and its interactions with the caller and the network comprise the COCOT Access to Voice Messaging Service.

1.5 The COCOT Owner must specify the VMS Provider at which his station will obtain voice messaging and the voice messaging service must obtain access from the serving Central Office. The COCOT owner must be certain that his station is compatible with the operational requirements of the VMS Provider.

2. ACRONYMS, DEFINITIONS & SYMBOLS

ACCOUNT NUMBER	The caller's credit card or calling card number. Maximum field length of 22 digits. "Sent−Paid" (coin) calls will have no account number.
CALLER	Person who places the phone call. Also referred to as user, end user, or consumer.
CALLED TELEPHONE NUMBER	The number the end user dialed. Maximum of eleven digits, e.g., 02059991234.
CALLING TELEPHONE NUMBER	The identity of the COCOT station will always be ten digits long, e.g., 4045550022.
COCOT	Customer Owned Coin Operated Telephone
COIN CALL RATE	Initial rate the caller deposited to start the original call in cents. Maximum value four digits, e.g., 9995.
DTMF SIGNALLING	Dual Tone MultiFrequency ("TOUCHTONE"©) See ANSI T1.401−1988 paragraph 7.2
LANGUAGE TYPE	The first network prompt may allow the caller to select a preferred language where a choice is available. The network expects one DTMF digit as a response. At present, English (DTMF "0" zero) is the prompt provided. Also, Spanish (DTMF "1") has been assigned. Digits 2−9 are unassigned.
MLHG	Multi−Line Hunt Group
PREFERRED IX CARRIER CODE:	The number of the Interexchange Carrier used for the original call. Maximum field length eleven digits, e.g., 12125551212. (If not supplied by the customer or the calling card, defaults to the PIC CODE shown below.)
PIC CODE	The "Preferred Interexchange Carrier" code default will be selected and established by the COCOT station owner.
VMS	VOICE MESSAGING SERVICE
VMS FEE	The price of the Voice Messaging Service in cents. Maximum value four digits, e.g., 9995. Field may be zero (0) when paid by calling/credit card. (This charge is set by the VMS provider.)
−−>>−−	Interface Jack

3. OVERVIEW

3.1 A complete description of an interactive call is lengthy. The following outline provides landmarks for the discussion below.

```
COCOT STATION========INTERFACE & NET-
WORK====================VMS==========
Caller makes call>..>Processes Call>
Idle
Caller listens<.....<Network reaches “Busy” or “RNA”
Idle
Caller hears<.......<Interface recites VMS offer
Idle
Caller accepts>.....<Stops VMS offer.Drops call attempt.
Idle
Hears “Thank You”<..<Sends”Thank You” & Calls VMS>......<VMS answers
call
Hears announcement<..................<”At the tone, record your mes-
sage”
Hears tone<.................................................<Sends
tone
Dictates message>.....................................>Records mes-
sage
Caller hangs up<..................<”Thank you for using VMS” & times
out
Idle>..............>Interface re-
leases>............................Idle
Idle                                Idle
Idle
COCOT STATION========INTERFACE & NET-
WORK====================VMS==========
```

3.2 The COCOT station, the Access Interface, the network, and the VMS host service provider are then in an idle state until a COCOT caller again initiates the access interface.

4. OPERATIONAL DETAILS

The following sequence of activities describes the overall process of a phone call from a COCOT station equipped with the Access to Voice Messaging feature. The caller at a COCOT station first interacts with the station; then, with the network; and finally, with the Voice Messaging Service. The availability of COCOT Access to Voice Messaging is not intended to alter the station operation, so it is described only in generic terms. The network and the VMS interactions are described generally here, and in additional detail in Section 6 and Figure 2.

4.1 A caller picks up the handset of a COCOT station, and hearing dial tone from the serving central office, he makes a call according to the instructions posted at the station including the insertion of coins as appropriate. The COCOT station returns “ON HOOK” to the central office after the first digit is dialed, and the caller continues to input the called telephone number. The COCOT station stores the input, and analyzes the digits. The next action depends on the number the caller has dialed.

(a) If the caller dialed a seven−digit local number, the COCOT station will go off−hook and deliver the dialed number to the serving central office.

(b) If the caller dialed 1−800−XXX−XXXX, the COCOT station will go off−hook and deliver the dialed number to the network.

(c) If the caller dialed 950−XXXX, the COCOT will send the dialed digits, then the caller will hear a tone to input the “CALLED TELEPHONE NUMBER” and another tone to prompt for the caller’s “ACCOUNT NUMBER”.

(d) If the caller dialed a "PREFERRED IX CARRIER CODE" followed by 0+ (zero plus) the "CALLED TELEPHONE NUMBER", some COCOT providers will block the call and recite a message. Other COCOT providers may send forward the entire digit stream as dialed. If so, the caller then hears a tone to prompt the "ACCOUNT NUMBER".

(e) If the caller dialed 1+ (one plus) or 0+ (zero plus) the "CALLED TELEPHONE NUMBER", the COCOT station will prefix the dialed digits with the PIC CODE programmed by the COCOT station owner, and send the assembled digit stream to the network. The COCOT station is responsible for rating the call and collecting the coins for this type call without network participation in those functions.

At this point in the flow of the call, the caller will begin to interact with the network interface, and not with the COCOT station.

4.2 A caller using a COCOT station equipped with Access to Voice Messaging feature will experience one of the following three dispositions when the network begins to ring the called line:

(a) The called party answers immediately, or in a few rings;

(b) The network returns "BUSY" signal; or,

(c) The network returns "RINGING" signal.

4.3 After the network detects either a "busy" or "extended ringing" condition, the interface reduces the tone level, sends a "disable answer supervision" tone to the station, and superimposes a service availability announcement to the customer. The announcement also advises the customer how to accept the service. For example, calls placed with coin payment will continue to VMS by depositing additional coin(s), and charges for VMS will be authorized on credit card calls by pressing the keypad in response to the recorded prompt message.

4.4 The default language of announcements in the Access to Voice Messaging System is English. When a choice of languages is available, the initial offering of the service will also prompt the caller to select an alternate language by keypad response.

4.5 If the called party answers or if the network interface aborts the call during the service availability announcement, the interface will stop the announcement, send a "quit" tone to the station, connect the parties, and resume normal tone levels to the customer.

4.6 If the voice messaging feature is not accepted within a programmed time interval, the network will send "quit" tone to the station.

4.7 If the network is unable to complete the connection with the voice messaging service provider, the network will send a different "quit" tone to the station, and recite to the customer a message that the service is not available at the moment. This "quit tone" will give the COCOT station provider the ability to refund the customer's deposited coins.

4.8 At this point, the caller would be expected to accept the offer of Access to Voice Messaging, or to hang up, or to do nothing. (Doing nothing implies the caller is still hearing "ringing".) If the caller accepts optional voice messaging as prompted in 4.3 above, he begins to interact with the Voice Messaging System.

4.9 The Voice Messaging System will prompt the caller to announce his name, begin his message at the tone, provide tone prompt, and record his message. Some systems provide a "thank you" message at

the end of the message period. The VMS then times out, disconnects, and starts its schedule of programmed delivery attempts.

Technical Reference 73551 describes the Interface Protocol between the network and the VMS. The COCOT must be capable of providing the relevant data to the network for transmission to the VMS. This leads to three conditions, as follows:

(a) When the COCOT station is arranged for "sent paid" (coins) voice messaging, the customer accepts the service feature by depositing additional coins after the announcement, and the network expects the station to transmit a DTMF sequence equivalent to the amount deposited for the "VMS FEE".

(b) If, in addition to (a) above, the COCOT station owner wants separate accounting for the charges for the original coin call, the network expects the station to transmit a DTMF sequence equivalent to "COIN CALL RATE".

(c) When the COCOT station is arranged for "non−sent paid" (credit card) voice messaging, the customer accepts the service feature by pressing the keypad in response to the recorded prompt message, and the network expects the station to transmit a DTMF sequence equivalent to "VMS FEE".

5. INTERFACE PARAMETERS

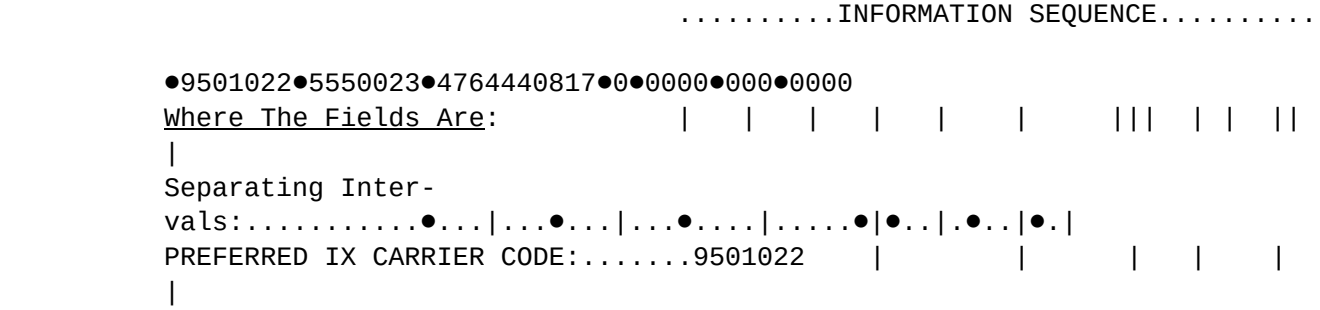
5.1 The physical connecting arrangement for the COCOT station is a standard RJ−11C or RJ−11W Jack.

5.2 All signalling between the COCOT station and the network will be Dual−Tone MultiFrequency tones including the fourth column tones, A,B,C, and D. Electrical signal specifications for DTMF network control are described in American National Standard ANSI T1.401−1988, paragraph 7.2. DTMF signals generated by the interface for the benefit of the COCOT station will be attenuated by the intervening access facility, i.e., the local loop. Network−sourced DTMF signals appearing at the COCOT station will be as described in ANSI T1.401−1988, but the steady−state rms power of each tone pair will be in the range of −2 to −24 dBm. The difference in power between the two tones of any pair shall not exceed 5dB.

5.3 Callers using the nation−wide switched network are accustomed to hearing side tone of dialing pulses or "TOUCHTONE"©. When the COCOT station is arranged to forward "CALLED TELEPHONE NUMBER" and "ACCOUNT NUMBER" to the interface simultaneously as the caller inputs the numbers, the caller should be allowed to hear the side tone. When the station is arranged to delay forwarding or to concatenate additional signals together, the COCOT should prevent the caller from hearing the side tone.

6. INTERFACE PROTOCOL

6.1 INFORMATION SEQUENCE FROM COCOT STATION TO INTERFACE



```
CALLED TELEPHONE NUMBER:.................5550023     |      |   |    |
|
ACCOUNT NUMBER:................................4764440817 |   |    |
|
LANGUAGE TYPE: (Caller Response When Option Available)......0   |    |
|
COIN CALL RATE:.............................................0000   |
|
Caller Response to Prompt (Credit Card Calls only) (Max. 3 keys)....000
|
VMS
FEE:.....................................................................0000
```

6.2 Paragraph 6.1 represents the data which the network interface must forward to the VMS. The data in the information fields must be provided by the COCOT station, partly from caller inputs. Note that fields of this data will be separated by other transactions as described, below. Refer to Paragraphs 4.1−4.9 for operational details. The interface monitors the COCOT call progress and stores data in sequence. The interface remains inactive until the receipt of "BUSY" or "RINGS, NO ANSWER" as described in 4.3.

(a) The caller dialed a seven−digit local number. The interface stores the number as the station forwards it to the network. If this call is not answered, the handling of the call moves from the description in Paragraph 4.1(a) directly to 4.3.

(b) The caller dialed 1+800+XXX+XXXX. The interface stores the number as the station forwards it to the network. If this call is not answered, the call handling moves from 4.1(b) to 4.3.

(c) The caller dialed 950+XXXX. The interface stores the number as the station forwards it to the network. The caller then hears a tone which prompts him to input 0 + Called Telephone Number to the network, then another tone which prompts entry of his Account Number. The interface stores each of these numbers as they are input. The exact specification of these tones is not important to the interface. If this call is not answered, call handling moves to Paragraph 4.3.

(d) The caller dialed a "PREFERRED IX CARRIER CODE" (10XXX) followed by 0 + or 1+ "CALLED TELEPHONE NUMBER". Some COCOTs who use another preferred IX carrier may choose to block this call, and give the caller a message. The disposition of such calls is unknown, and depends on the COCOT owner. If the COCOT is arranged to forward the call to the caller's preferred carrier, the digit stream is forwarded and the caller hears a tone prompt to enter his "ACCOUNT NUMBER". The exact specification of this tone is not important to the interface. The interface stores these numbers as they are forwarded to the network. The call handling goes to Paragraph 4.3.

(e) The caller dialed 0+ or 1+ "CALLED TELEPHONE NUMBER". The COCOT station prefixes the PIC CODE selected by the station owner, and forwards the assembled digit stream to the network. The interface stores the numbers simultaneously. If not answered, the handling of this call continues as in Paragraph 4.3.

6.3 When the network attempts to complete a call to a line which is busy, the network returns the call progress tone "busy signal" (60 ipm) to the caller. The interface line card unit can recognize busy signal after one complete cycle. If the "CALLED TELEPHONE NUMBER" is not resident in the "Do Not Offer" table in the interface, the interface will reduce the level of the busy tone to the caller, send a burst of

DTMF "A" to the COCOT station, and initiate the service availability announcement for Access to Voice Messaging to the caller. The "Do Not Offer" table permits exclusion of certain called numbers, such as emergency 911, from this optional feature offering. DTMF "A" is a signal to the COCOT station that the announcement to follow should not be validated as a voice answer from the called party. This permits the station to suspend its timing functions for rating the call and collecting the coins (if applicable).

6.4 When an alternate "LANGUAGE TYPE" is available, the offering announcement will prompt the caller's choice of language. The expected response is one DTMF tone burst. This may result in a second offering announcement, in the caller's preferred language.

6.5 If the caller makes a coin paid call and accepts voice messaging, he deposits additional coins according to the prompt, and the COCOT station verifies the proper additional deposit and sends the DTMF equivalent of "VMS FEE" to the interface. If the caller makes a credit card call and accepts voice messaging, he presses the keypad in response to the recorded prompt message, and the COCOT station forwards the DTMF equivalent of "VMS FEE" to the interface.

6.6 When the network attempts to complete a call to a line which is idle, the network returns a call progress tone "ringing" toward the caller. The interface unit can recognize a programmable number of rings (e.g., 2,4,6,8). BellSouth has selected four rings as standard. If the "CALLED TELEPHONE NUMBER" is not present in the "Do Not Offer" table, the interface will reduce the level of ringing signal to the caller, send a burst of DTMF "A" to the COCOT station, and initiate the service availability announcement for Access to Voice Messaging to the caller. Paragraphs 6.4 and 6.5 also apply.

6.7 If the called party answers (See Paragraph 4.5) during the announcement but before the caller has accepted the offer, the interface will resume normal tone levels to the caller, send DTMF tones "A" & "B" (QUIT tone number one) to the COCOT station, and remain inactive until the next call is initiated from the COCOT station. The receipt of DTMF tones "A" & "B" signals the COCOT to cancel its suspension of timing functions described in Paragraph 6.3. This should not be construed as answer supervision. It merely indicates the interface has discontinued announcements.

6.8 The caller may decline the offering by not depositing additional coins or not responding with the keypad. The interface will time out after approximately ten (10) additional ringing cycles, send DTMF "A" & "B" to the COCOT station, and become inactive until the next call is initiated from that station.

6.9 When the caller accepts the offering, the interface abandons the original call, and initiates a call to the Voice Messaging System.

(a) While this connection is being established, the interface is equipped (optionally) to transmit a "Thank You for Using Access to Voice Messaging" message to the caller. When the VMS is connected, VMS prompts the caller for his name and message as described in Paragraph 4.9, times out, and disconnects. The interface is inactive. The COCOT station should collect coins and reinitialize its memory fields.

(b) If for any reason the interface is unable to complete the connection to the VMS, the interface will recite an appropriate message to the caller, send DTMF tones "A" & "D" (QUIT tone number two) to the COCOT station, and expect the station to go on−hook. The interface is then idle until the next call is placed. Since the network was not able to complete the original call and the interface was unable to complete the VMS call, the receipt of DTMF tones "A" & "D" signals the COCOT station to refund all coins and reinitialize all memory fields.

7. REFERENCES

7.1 Related Documents
The following are documents referenced in this technical reference:

(a) ANSI T1.401−1988 “Interface between Carriers and Customer Installations − Analog Voicegrade Switched Access Lines Using Loop−Start and Ground−Start Signalling”.

This document can be ordered through ANSI:
The American National Standards Institute, Inc.
1430 Broadway
New York, New York 10018
(Telephone Number 212−642−4900)
Price: $24.00

(b) Bellcore PUB 48501 “Local Switching System General Requirements” (LSSGR) Feature Specification Document (FSD) No.01−02−0802.

Bellcore TR−TSY−000506 Rev.2, June 1990 “Signalling − LATA Switching Systems Generic Requirements (LSSGR): Section 6”

These documents can be ordered through:
Bellcore Customer Service
60 New England Avenue
Piscataway, New Jersey 08854
(Telephone Number 1−800−521−CORE)

(c) BellSouth Technical Reference TR−73551 “Public Telephone Access to Voice Messaging − Network Interface Specifications

This document can be ordered from:
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Birmingham Alabama 35243
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8. FIGURES

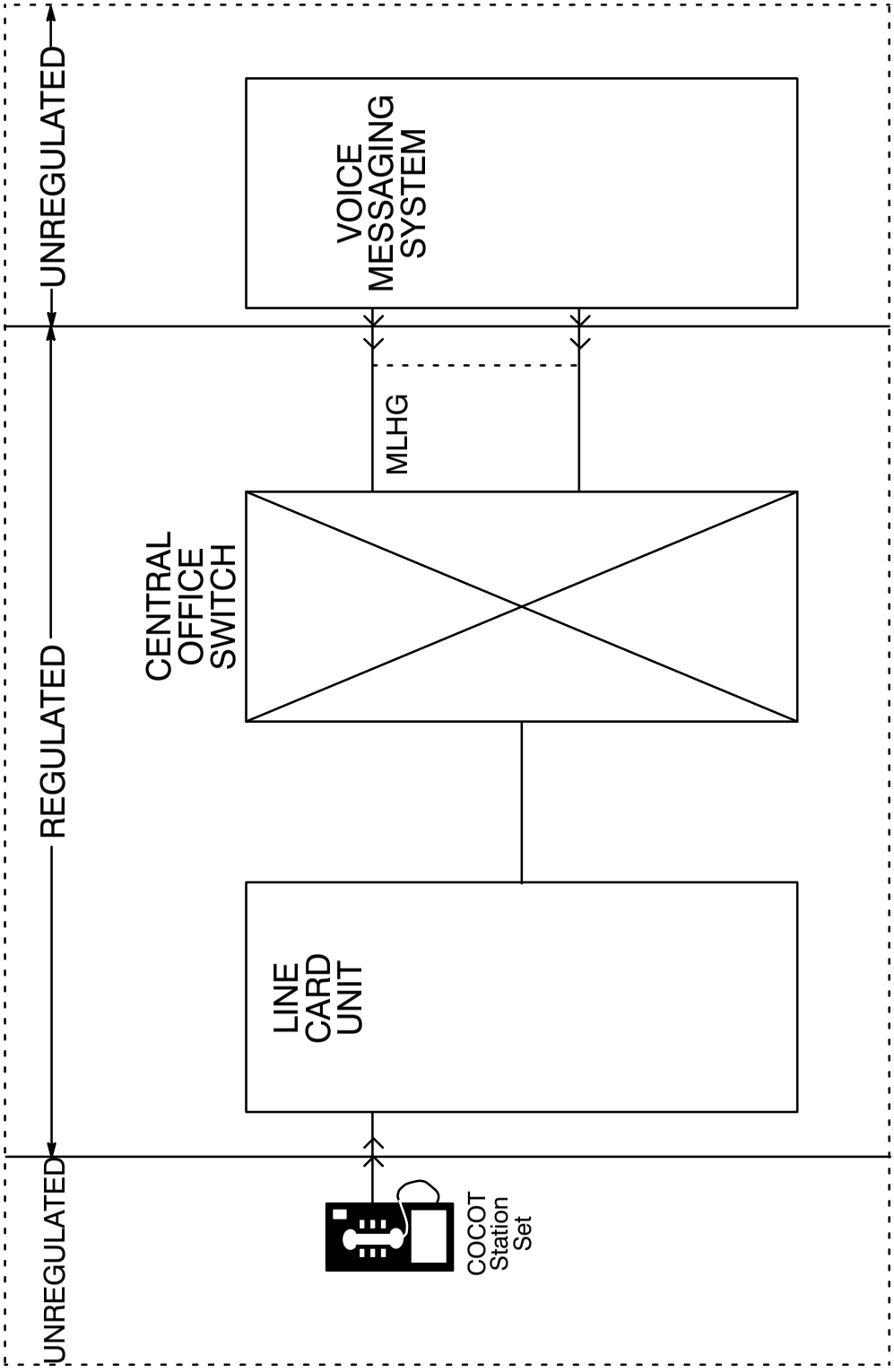

FIGURE 1 – COCOT ACCESS TO VOICE MESSAGING GENERIC ARCHITECTURE

The Caller Decision Tree

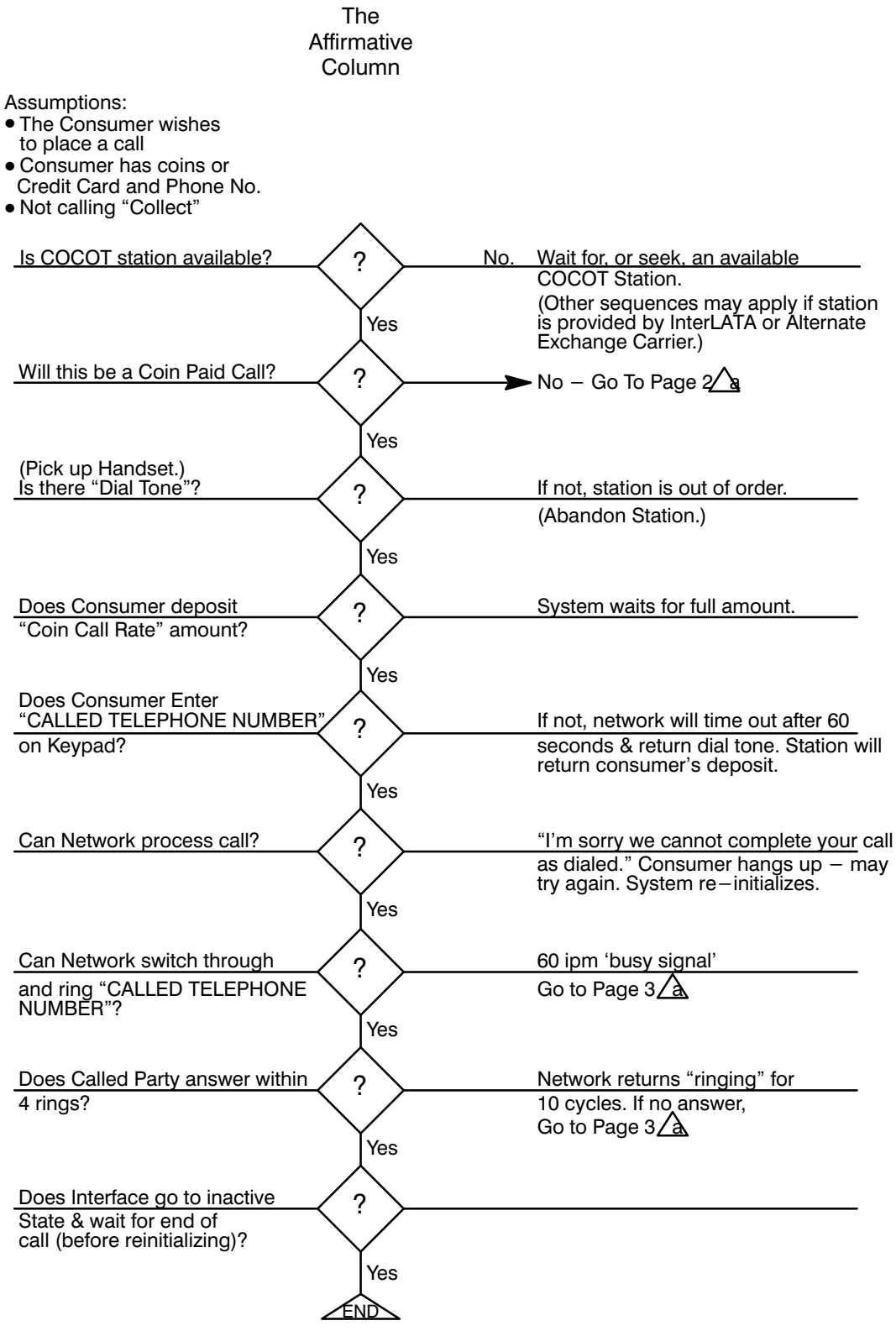

FIGURE 2 – CALLER DECISION TREE
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The Caller Decision Tree

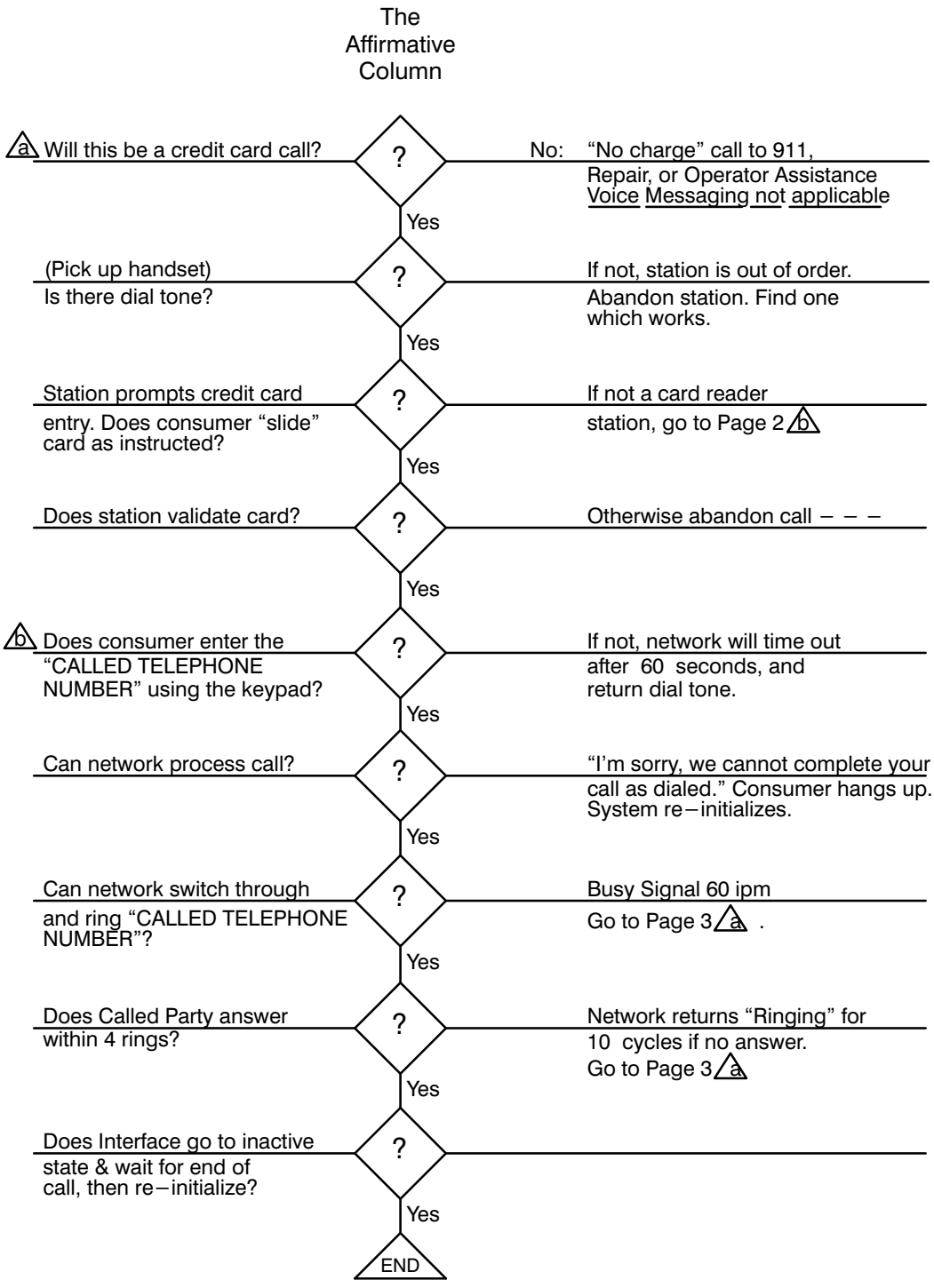

FIGURE 2 – CALLER DECISION TREE
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The Caller Decision Tree

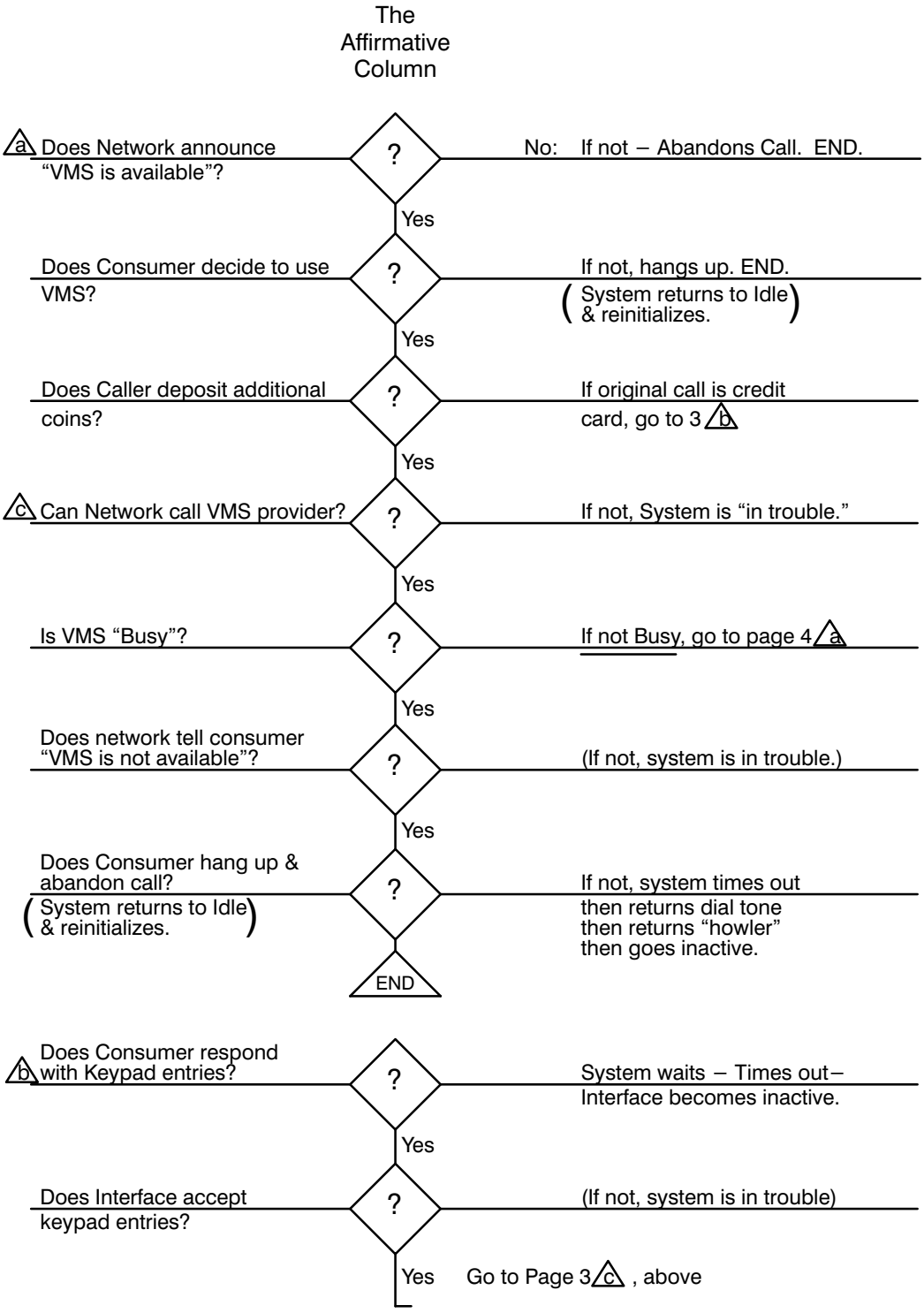

FIGURE 2 – CALLER DECISION TREE
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The Caller Decision Tree

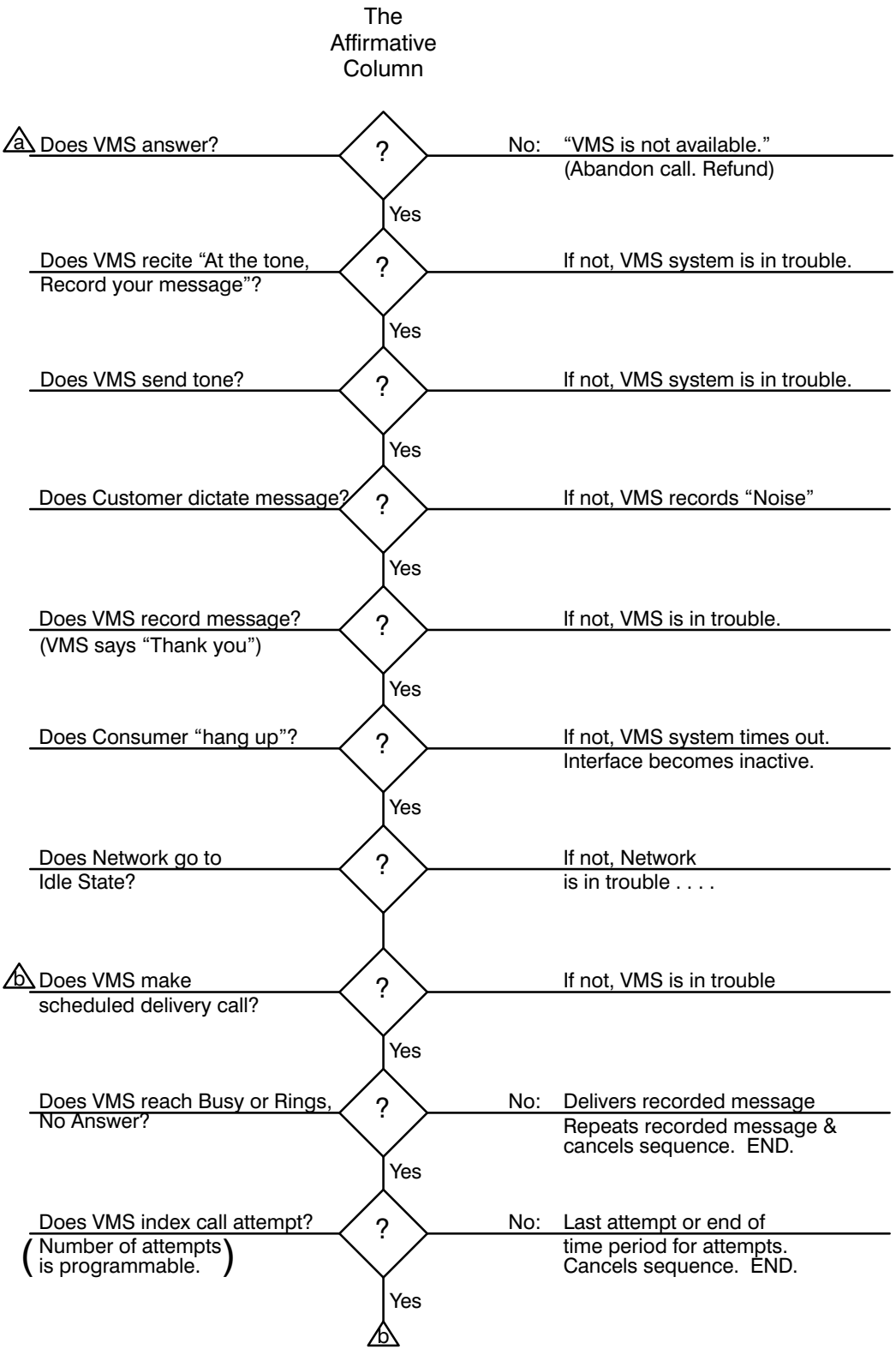

FIGURE 2 – CALLER DECISION TREE
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