ATIS-0300076

NUMBERING AND DIALING PLAN WITHIN THE UNITED STATES

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For ordering information, please contact:

ATIS
1200 G Street N.W., Suite 500
Washington, DC 20005
(202) 628-6380
inc@atis.org

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http://www.atis.org/inc/docs/.asp

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The Industry Numbering Committee (INC) provides an open forum to address and resolve industry-wide issues associated with planning, administration, allocation, assignment and use of North American Numbering Plan (NANP) numbering resources within the NANP area.

This document is maintained under the direction of ATIS and the INC. Suggestions for improvement of this document are welcome. They should be sent to the Alliance for Telecommunications Industry Solutions, INC Staff, 1200 G Street NW, Suite 500, Washington, DC 20005. All changes to this document shall be made through the INC issue resolution process and adopted by the INC as set forth in the *ATIS Operating Procedures*.

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1.0 Scope and Overview

The purpose of this document is to consolidate the information contained in earlier industry documents into a single standard document that may be used by the industry as the North American Numbering Plan (NANP) evolves. Further, this document serves as a "snapshot" for anyone interested in numbering issues.

This technical document seeks to document the format and values of telephone numbers in the United States portion of the NANP, thereby coining a "United States Numbering Plan" and a "United States Dialing Plan." It further defines the other telecommunications industry uses of numbers and describes these uses in the United States. The NANP exists under Country Code 1, shared among 19 countries, under the International Telecommunication Union (ITU) Recommendation E.164, "The international public telecommunication numbering plan" (Rec. E.164).

2.0 Introduction

2.1 International Numbering Standards and Conventions

The ITU Telecommunication Standardization Sector (ITU-T) is one of the three Sectors of the International Telecommunication Union, a specialized agency of the United Nations with headquarters in Geneva, Switzerland. The ITU-T studies technical, operating and tariff questions and produces Recommendations and other publications that are used to guarantee the interconnectivity and interoperability of networks and enables telecommunication services to be provided worldwide. The ITU-T website is at http://www.itu.int/ITU-T/index.html.

In the United States telephone numbers follow international standards and are compliant with the major recommendations contained in ITU Rec. E.164 "The international public telecommunications numbering plan" (See TABLE 1 in the Appendix). This is essential for participation in International Direct Distance Dialing (IDDD).

United States compliance with ITU Rec. E.164 is contained in the Appendix, TABLE 2. In the NANP, the Numbering Plan Area code is very similar to the National Destination Code contained in ITU-T Rec. E.164, and the Central Office (CO) Code and Line Number are very similar to the Station Number contained in ITU-T Rec. E.164.

3.0 Historical References and Perspectives

3.1 NANP Management

AT&T developed and evolved the numbering portion of the NANP from its inception in 1947 until the breakup of AT&T (Modification of Final Judgment) on January 1, 1984. The NANP was then managed by Bell Communications Research Corporation (Bellcore, now Telcordia Technologies), on behalf of the Regional Bell Operating Companies (RBOC), from 1984 until the enactment of the Telecommunications Act of 1996 (TA-96). In this time period, Bellcore maintained and coordinated the evolution of the NANP by working with regulators and industry consensus fora through the Alliance for Telecommunications Industry Solutions' (ATIS) Industry Carriers Compatibility Forum (ICCF).

Since 1996, the ATIS Industry Numbering Committee (INC) has been responsible for the technical definition and use of NANP resources. Numbering policy decisions in the United States are made by the Federal Communications Commission (FCC) under Section 251(e) of the Communications Act of 1934 as amended by the Telecom Act of 1996. State regulators may also create policies that do not contradict FCC decisions.

In addition, Section 251(e) of the Communications Act of 1934 (Communications Act), as amended by TA-96, grants the FCC plenary jurisdiction over the NANP and related telephone numbering issues in the United States.

The FCC has delegated the overall responsibility for the neutral administration of NANP numbering resources to the North American Numbering Plan Administration (NANPA), subject to directives from regulatory authorities in the countries that share the NANP. NANPA's responsibilities include assignment of NANP resources, and, in the U.S. and its territories, coordination of area code relief planning and collection of utilization and forecast data. NANPA is not a policy-making entity. In making assignment decisions, NANPA follows regulatory directives and industry-developed guidelines. In the U.S., central office codes are assigned by the NANPA and, where applicable, thousands blocks are assigned by the Pooling Administrator.

3.2 Historical NANP Evolution

- 1947: Original NANP Format and Values = N (0 or 1)[1] X – NNX – XXXX where N = digits 2 through 9 and X = any digit of 0 through 9. Initially the NN digits in the NNX portion of a NANP number had "exchange" names whose first two letters corresponded to letters associated with the NN digits on North American telephone dials. (e.g., BEachwood 4 was BE 4)

[1] The use of the parenthesis in this instance indicates that the central digit of the Area Code could only be a 1 or a 0.

- 1958: All Number Calling where the NNX was listed as all numbers rather than 2-letters and 1-number.

- 1973: Initial introduction of Interchangeable CO Code NANP format: N (0 or 1)[1] X – NXX – XXXX

- 1995: Interchangeable NPA codes implemented NANP format: NXX – NXX – XXXX

4.0 United States Telephone Number Format and Values

The telephone numbering address is a ten-digit number that consists of the following three basic parts:

1) A 3-digit Numbering Plan Area (NPA) code, commonly called the area code.

2) A 3-digit Central Office (CO) code referred to as the NXX code. The term Central Office, or CO, code is used in this document because of its long-standing use and because the NXX format is used for both CO Codes and NPA codes.

3) A 4-digit line number, previously referred to as a station number.

The format of a NANP Number is NXX-NXX-XXXX2 where N = digits 2 through 9 and X = any digit of 0 through 9. The digit positions in the NANP format can be identified by alphabetical characters using the following format ABC-DEF-GHIJ, where ABC is the NPA, DEF is the CO Code, and GHIJ is the Line Number.

Therefore:
A United States telephone number is a ten-digit number that contains two 3-digit codes and a 4-digit line number. The values of these telephone numbers are the decimal digits 0 through 9.

When written or printed, these groups of digits should be visually separated by dashes, spaces or periods in accordance with ITU-T Rec. E.123 “Notation for national and international telephone numbers, e-mail addresses and Web addresses” in order to make them easier to recognize and remember (e.g., NXX-NXX-XXXX).

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[2] The use of the Area Code is optional in some areas that permit 7 digit local dialing.

When a United States telephone number is written or printed as an international number, the number should be prefixed by "+1" and a space (e.g., +1 NXX-NXX-XXXX).

Some documents define telephone numbers and line numbers as being synonymous. In switching systems, line numbers define the physical location of the line equipment that connects a wireline customer to a wireline switch. This distinction is important to some industry segments. Most stored program controlled switching systems can associate multiple numbers with a single line. They can also associate multiple lines to a single number.

5.0 United States Dialing Plan

In the United States, there is no single dialing plan that applies universally in all areas. In general, local calling within a defined geographic area requires dialing the last 7 digits of the NANP number (i.e., the CO Code and Line Number). In certain locations where overlay NPAs have been implemented or where local calling crosses an NPA boundary, local calling requires dialing all 10-digits of the NANP number. In general, long distance calling to NANP locations outside the originating caller's local calling area requires dialing the prefix 1 plus the 10-digit NANP number for direct dialed calls or dialing the prefix 0 plus the 10-digit NANP number for operator assisted calls (see TABLE 3 in the Appendix for further information regarding prefix dialing requirements). For long distance calling outside Country Code 1, the dialing plan is the appropriate international calling prefix (e.g., 01 and 011) plus the international telephone number.

In the late 1990s, the INC examined the need for a Uniform Dialing Plan (UDP). After consideration of many options, the INC concluded that adoption of a UDP would be beneficial for the industry and customers. The INC recommended to regulators of all NANP nations that a Uniform Dialing Plan (see ATIS-0300059) be adopted. The benefits of a Uniform Dialing Plan include reduced customer confusion in today's mobile society, and support for a consistent, fair and equitable competitive environment. Specifically the INC recommended that 10-Digit Dialing be adopted as the UDP for both local and toll calling. The INC noted that implementation of the recommendation requires regulatory approval and resolution of the need for "1+" as a toll indicator. In Canada, some carriers supported the implementation of a toll warning indicator tone when additional toll charges would apply. The need for a toll warning indicator is lessening over time as the charges for toll services decline.

The INC suggested that migration to the UDP should begin by first adopting the following dialing arrangements as interim steps:

1) 10-digit local dialing within the home NPA with 1+ 10-digit dialing on a permissive basis

2) 10-digit local dialing to a foreign NPAs with 1+10 digit dialing on a permissive basis

In conjunction with the migration to the UDP, the INC recommended that the industry address the need for the continued use of a toll indicator. The successful completion of the above steps would allow for the implementation of the UDP throughout the NANP area.

All other numbers used by telephone systems fall in the category of prefixes or access codes. All of the numbers, access codes and prefixes comprise the United States Dialing Plan found in TABLE 6 in the Appendix.

6.0 Other Codes

The industry has always employed prefixes and access codes to activate certain capabilities or call types.

6.1 Other Codes: Prefixes

The most commonly used prefixes in the wireline sector are the digit 1 (preceding a sent paid toll call) and the digit 0 (preceding an operator handled toll call). The current list of commonly used wireline prefixes is shown below. Prefixes are usually deleted or processed in the originating switch before the NANP number digits are used to route the call to its final destination.

PREFIX	USE OF CODE
0+ NANP 10-digit Number	Person Paid Collect Special (PPCS) Call
01+ International Number	International PPCS Call
011 + International Number	International Station to Station Sent Paid (SSSP) Call
1+ NANP 10-digit Number	Toll Access for SSSP Calls

6.2 Other Codes: Operator Access Codes

Two other codes can be dialed to access operators, as per the table below:

OPERATOR ACCESS CODE	USE OF CODE
0	Telephone Company Operator
00	Long Distance Carrier Operator

6.3 Other Codes: Codes 000-199

The codes, 000-199 are not part of the defined NANP format for either of the NPA or CO Code portions of a NANP number. The codes 000-199 were excluded from the original NANP format and all subsequent redefinitions implemented to date. The values 0 and 1 in the first and fourth digit positions of a ten-digit NANP number, creates the codes 000-199.

The codes 000-199 are used by the telephone industry for Test Codes, Inward Operator Codes, Special Billing Numbers, Revenue Accounting Office (RAO) Credit Card Numbers and special routing of calls. Various switching systems have software checks that block calls to and from numbers with these values. These software checks were installed to minimize fraud. Operator Services switching systems have software tables to validate credit card calls that utilize these codes. Numbers utilizing the codes 000-199 are not dialable by the public.

6.4 Other Codes: Star * and Number Sign # [3]

The dialing use of * and # is standardized in order to minimize confusion with the public. It is also important that consistent terminology be known and used when referring to these characters. The * and the # should be called the star and the number sign, respectively. Use of the terms asterisk for * and pound sign for # should be avoided in documentation dealing with dialing procedures.

Currently, the characters # and * have the following general applications:

1) The first use of the number sign (#) is as an end-of-dialing indicator or to conclude the present action and to proceed to the next action indicator. This end-of-dialing use exists today and avoids a timing period used in certain types of switching systems. The conclude-and-proceed use also occurs in some telephone credit card services where the customer wants to indicate that the present call is over and a new call is about to be placed (for example, sequence calling).

2) The second use of the number sign (#) is as the first character when dialing a call that is a wideband or other data call requiring special treatment. In certain types of data calls, both an initial and concluding # may be required. Functionally, this is similar in many respects to the KP + (address) + ST multi-frequency signaling format used by operators.

   There are also a number of non-standard uses of the # sign for PIN Number Calling features. The # sign is also used in ancillary services offered via the Public Switched Telephone Network (PSTN). An example of this is voice mail.

3) The first use of the star * is as a prefix when dialing a Vertical Service Code (VSC) (for example, call forwarding) of the form *XX(X). In this application, the * indicates to the switching system that the digits following specify a certain desired feature/service.

[3] AT&T Technical Advisory #3, NPL 81-09-27, Issue 2, December 1, 1981, and “Notes on the Networks” SR-2275, Issue 04, Telcordia Technologies, October 2000.

In order to allow rotary dial telephone access to VSCs, the digits 11 are translated to simulate the star key in stored program controlled switches.

VERTICAL SERVICE CODE FORMAT	USE OF CODE
*XX (*XXX)	Vertical Service Code Access
11XX (11XXX)	Vertical Service Code Alternate (Permissive) Access

Vertical Service Codes are considered numbering resources and are therefore administered by NANPA. The current assignments of VSCs are available at the web site: http://www.nanpa.com. NANPA follows the INC's Vertical Service Code (VSC) Assignment Guidelines (ATIS-0300058) in making such assignments.

4) The second major use of the * is to provide an error correcting function for customer-dialing of various strings on a sequential basis in response to prompting. This could include a customer interactive session with an operator services system when placing automated calling card billed calls. Instead of the customer hanging-up and redialing when detecting a keying error (before the card system detects the keyed error), the caller can simply dial * to back up to a pre-established point and then redial the segment.

6.5 Other Codes: N11 Service Access Codes

N11 Service Access Codes have been declared national resources in the United States and are assigned by the FCC (See TABLE 3 in the Appendix for N11 Codes).

6.5 Other Codes: N00 Easily Recognized Codes

N00 codes are classified as Easily Recognized Codes. Their uses are assigned by INC (See TABLE 4 in the Appendix for N00 Codes).

6.6 Other Codes: Carrier Identification Codes (CIC)

CICs are 4-digit codes used mainly by carriers to route long-distance calls to a customer's carrier of choice for 1+ and 0+ calls. In the United States, NANPA assigns CICs following the Carrier Identification Code (CIC) Assignment Guidelines (ATIS-0300050) developed by the INC.

6.7 Other Codes: Carrier Access Codes (CAC)

In order to select a carrier on a per-call basis, customers may choose to dial an access code that also contains a Carrier Identification Code (CIC) to reach an IXC. The format of this code is 101XXXX, where the XXXX is the CIC.

CARRIER ACCESS CODE FORMAT	USE OF CODE
101XXXX	Carrier Access Code (CAC), Feature Group “D”
950XXXX	Carrier Access Code (CAC), Feature Group “B”

6.8 Other Codes: Abbreviated Dialing Codes

FCC documents have attempted to define the term “Abbreviated Dialing Codes” and have equated N11 Codes to Abbreviated Dialing Codes. Any code can be made to function as an Abbreviated Dialing Code by the use of switch translations. Some N11 Codes may be translated to a NANP telephone number and thus function as an Abbreviated Dialing Code. In another switch, the same N11 Code may translate to a specific trunk group and thus not function as an Abbreviated Dialing Code. This functionality is at the discretion of each service provider in setting up switch translation.

6.9 **Other Codes: Additional Numbering Needs for CMRS Providers and Other Nomadic Services Providers**

The wireless telecom industry and other nomadic services providers also have other numbering requirements, separate from the number associated with the customer. Most of these requirements are necessitated by wireless roaming and access to emergency services via dialing 9-1-1 (See TABLE 5 in the Appendix).

7.0 References

1) “The international public telecommunication numbering plan,” Recommendation E.164, International Telecommunication Union, February 2005.
2) “The Communications Act of 1934 as amended by the Telecom Act of 1996.”
3) “NPA Allocation Plan & Assignment Guidelines,” ATIS-0300055 (INC), July 2004.
4) “Central Office Code (NXX) Assignment Guidelines,” ATIS-0300051 (INC), June 2005.
5) “Notation for national and international telephone numbers, e-mail addresses and Web addresses,” Recommendation E.123, International Telecommunication Union, February 2001.
6) “Uniform Dialing Plan,” ATIS-0300059 (INC), July 1998.
7) “Carrier Identification Code (CIC) Assignment Guidelines” ATIS-0300050 (INC), May 2005.
8) “Notes on the Networks,” SR-2275 Issue 04, Telcordia Technologies, October 2000.

8.0 Acronyms

AT&T	American Telephone and Telegraph
ATIS	Alliance for Telecommunications Industry Solutions
CAC	Carrier Access Code
CDMA	Code Division Multiple Access
CIC	Carrier Identification Code
CMRS	Commercial Mobile Radio Services
CO Code	Central Office Code
DDD	Direct Distance Dialing
FCC	Federal Communications Commission
GSM	Global System for Mobile communications
IDDD	International Direct Distance Dialing
INC	Industry Numbering Committee
ITU	International Telecommunication Union
IXC	Interexchange Carrier
NANC	North American Numbering Council
NANP	North American Numbering Plan
NANPA	North American Numbering Plan Administrator
NPA	Numbering Plan Area (Area Code)
PIN	Personal Identification Number
PSTN	Public Switched Telephone Network
RAO	Revenue Accounting Office
TDMA	Time Division Multiple Access
UMTS	Universal Mobile Telecommunications System
USITA	United States Independent Telephone Association (now called United States Telecom Association)
VSC	Vertical Service Code

9.0 Appendix

TABLE 1: STRUCTURE OF THE ITU REC. E.164 NUMBER FIELDS

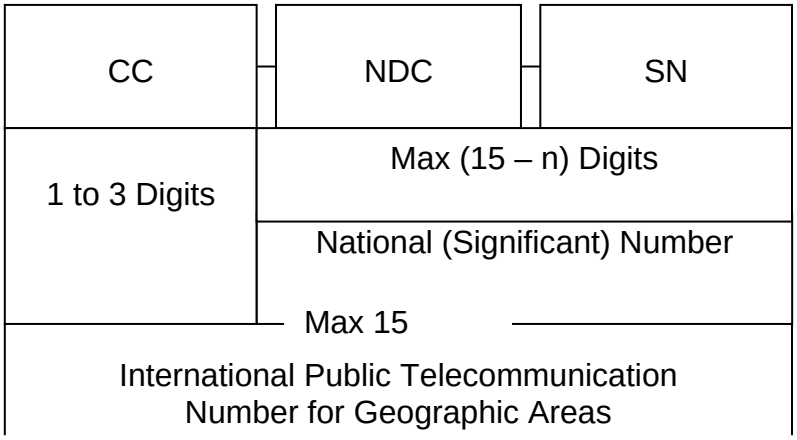

TABLE 2: UNITED STATES NATIONAL DIALING PLAN ITU REC. E.164 COMPLIANCE

CC = 1
NDC = Area Code = NXX Format
SN = CO Code plus Line Number = NXX-XXXX format
n = 1 digit (the number of digits in a country code can be from 1-3; U.S. is assigned 1 digit)

TABLE 3: UNITED STATES N11 SERVICE ACCESS CODES

N11 Code	Assigned Use
211	Community Information
311	Non-emergency access to government
411*	Directory Assistance
511	Traffic or Travel Information
611*	Telco Repair Service
711	Telecommunications Relay Service
811	Pipeline and Utility Safety
911	Emergency
* Commonly accepted use but not yet officially assigned by the FCC	

TABLE 4: N00 NPA CODES

N00 NPA Code	Assigned Use
200	Future
300	Future
400	Future
500	Personal Communications Services
600	Assigned to Canada
700	IXC Services
800	Toll Free Number Access[4]
900	Premium Services

[4] See www.nanpa.com for complete listing of toll free NPA assignments.

TABLE 5: ADDITIONAL NUMBERING NEEDS OF CMRS SERVICE PROVIDERS AND/OR OTHER NOMADIC SERVICES PROVIDERS

ACRONYM	MEANING	FORMAT	COMMENTS
ESRD	Emergency Services Routing Digit	10 digit NANP # (NPA-NXX-XXXX) or 10 digit non-dialable numbers	Identifies the cell site and sector from which a CMRS E9-1-1 call originates.
ESQK	Emergency Services Query Key /	10 digit NANP # (NPA-NXX-XXXX) or 10 digit non-dialable numbers	Used by non-CMRS nomadic services providers to identify and delivery specific call data to the appropriate PSAP. The ESQK also is used to look up location information associated with an emergency call instance.
ESRK	Emergency Services Routing Key	10 digit NANP # (NPA-NXX-XXXX) or 10 digit non-diable numbers	In addition to identifying the cell site and sector from which a CMRS E9-1-1 call originates, also identifies and delivers specific call data to the appropriate PSAP
MSRN	Mobile Station Routing Number	NPA-NXX-XXXX	A number dynamically assigned on a per call basis by the serving wireless service provider to a CMRS roaming subscriber for incoming call setup purposes. This is used for signaling in GSM/UMTS technology.
TLDN	Temporary Local Directory Number	NPA-NXX-XXXX	A number dynamically assigned on a per call basis by the serving wireless service provider to a CMRS roaming subscriber for incoming call setup purposes. This is used for signaling in CDMA/TDMA/AMPS technology.

TABLE 6: UNITED STATES DIALING PLAN

QUANTITY OF DIGITS DIALED	FORMAT	CALL TYPE	COMMENTS
None	Seizure (off hook)	Hot Line, Warm Line	Automatic connection to predetermined location
One Digit	0	Operator	Connection to LEC Operator
Two Digits	00	Operator	Connection to IXC Operator
Three Digits	N11 *XX	Services Vertical Services	Connection Activation of service, acknowledgment tone is returned to customer and dial tone is returned.
Four/Five Digits	11XX 11XXX *XXX	Vertical Service from Dial Pulse phone Vertical Services	Activation of service, acknowledgment tone is returned to customer and dial tone is returned. Expansion of *XX
Seven Digits	NXX-XXXX	Local Call	Call Completion
Ten Digits	NXX-NXX-XXXX	Local Call, where 10 digit local calls are required.	Call Completion
Eleven Digits	1 NXX-NXX-XXXX 0 NXX-NXX-XXXX	SSSP Call to another NANP location PPCS Call to another NANP location	Call Completion Call Completion Note: These call types are routed differently dependent upon Intra-LATA or Inter-LATA jurisdictions.
More than Eleven Digits	01 + CC + CC + Number 011 + CC + CC + Number CC= Country Code and City Code	International PPCS Call International SSSP Call	Call Completion Call Completion Note: These calls can be from 12 to 15 digits plus the Access Code.