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***mixed numbers:***  
the hidden meanings of  
everyday digits



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# ***We're Surrounded***

Numbers pervade every aspect of our lives. We spend years studying them, learning arithmetic, geometry, calculus.

We rarely describe anything, make a decision, or even have a thought that is not influenced by numbers.

Any high school graduate has some familiarity with the kinds of calculations and logical dilemmas solved everyday with mathematics. We are, however, surrounded by numbers that we take for granted. These numbers also shape our lives, but their meanings and histories are not as clear as  $2+2=4$ .

These numbers assault us from every angle; we've grown so used to the majority of them that we don't even know what they represent. In these cases, familiarity has quelled our curiosity—can you explain the origin of your zip code or identify a false social security number?

Even the most simple investigation into questions like these provides new insight on the systems and tools by which we live our modern lives. Complexity is not something to be feared or avoided; on the contrary, as information and technology expand exponentially, complexity is a fact of life and should be embraced.

The following examples endeavor to provide not only answers to some overlooked questions, but to shed light on the design and function of many of our regular dealings with numbers.



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# *Interstate Highway Codes*

Highway travel was born in America in the early 1900s. As cities were connected, commerce, tourism, and communication all experienced a rapid increase. While the complexity of American infrastructure also increased, travel wasn't always as directions from Mapquest.



According to the Federal Highway Administration, by 1925, there were nearly 300 different high-volume, long-distance roadways, each with its own system of route names and symbols. Around this time the American Association of State Highway Officials requested that the Secretary of Agriculture investigate the creation of a standardized highway system.

Almost 30 years later, Eisenhower authorized the Federal Aid Highway Act, providing standards for the reclassification and building of roads and developing the following naming system:

**Two-digit numbers** specify major routes; odd for north-south roads and even for east-west roads. North-south roads are numbered consecutively starting in the west; east-west roads are numbered consecutively south to north. Names of major cross-country routes end in 5 or 0.

**Three-digit numbers** refer to routes serving major two-digit routes, reflected by the last two digits in their numbers. Loops and cross-city freeways begin with an even number, routes branching off a major highway begin with an odd number.



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# U.S. Postal Codes

Using the U.S. mail was a very different experience in the 1930s than it is today. As described by the U.S. Post Office's own history, railroad was still the primary means of transporting mail, and every item was resorted and redistributed at every stop; 10,000 trains crisscrossed the country delivering mail 24 hours a day.



For the next thirty years, the U.S. underwent many changes; the character, volume, and transportation of its mail followed suit.

By 1962, the railroads were in a state of decline, and business mail had increased to 80% of total mail volume (due in part to the emerging use of computers). A Post Office Advisory Board appointed by the President stated as a top priority the development of a coding system to lessen postal center burden and increase the service speed.

As a result, the Zoning Improvement Plan (ZIP) code system began on July 1, 1963.

The Metro System, from which the ZIP code was developed, was a plan to relieve large mail centers of volume by building up 85 mid-sized cities as mail centers themselves. These new centers, in turn, would be responsible for the distribution of mail to surrounding post offices.



*Mr Zip*

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Every address in the U.S. was assigned a 5-digit code when the program began, based on the following system:

- An initial digit representing general geographic region (ranging from 0 in the Northeast to 9 in the Far West).
- A second and third digit designating the address's location within the region's mail centers accessible to common transportation networks.
- Two final digits identifying the specific post office within the region or section.

In 1983, the Post Office expanded the original five-digit zip code to include a four-digit suffix, created the ZIP+4 nine-digit number that is the standard today. These four digits carry additional meaning and aid in the automation of the delivery process:

- The first two digits of the prefix denote a delivery sector within the original five-digit ZIP area— a few blocks, an apartment complex, a wall of post office boxes, a large office building.
- The final two digits of the prefix refer to a specific delivery segment within that sector— a floor in a building, houses on one side of the street, a subgroup of post office boxes.

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# ***Social Security Numbers***

We are often asked our Social Security numbers in official business as a means of identification: at school, when applying for a loan, for tax purposes. This number is useful in many cases because it is unique, and serves to reduce the confusion among names and other often coincidental information.

But what does it mean?

A social security number consists of nine digits, three "area numbers," two "group numbers," and

four "serial numbers."

When the Social Security Administration began issuing numbers to U.S. citizens, it based area numbers on the same method as the U.S. Postal ZIP codes (numbers increase from east to west) with a few exceptions: 000 has never been issued; 700 to 729, originally for Railroad workers, have been discontinued. The area number is code for the region of the address appearing on SS application forms.

Group numbers represent the order in which SSNs for an area are assigned. They are issued in following order: odd numbers 01 to 09, even numbers 10 to 98, even numbers, 02 to 08, and odd numbers 11 to 99. 00 group numbers are never assigned. Group numbers allow you to determine relative chronological order of cards from the same region.

Serial Numbers are assigned based on order as well. However, unlike group numbers, serial numbers are always assigned in a strictly increasing manner. 0000 is never assigned.





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# ***Currency Serial Numbers***

The U.S. Treasury takes great care to ensure not only that money is difficult to counterfeit, but maintains a standard appearance. The actual printing of money consists of many complex steps, most ensuring that each bill is identical. However, one crucial part of the process involves making each bill unique.



The serial number on US paper currency is applied separately from the portraits and symbols that characterize the bill. Printed in bright green ink when the uncut bills arrive at each Reserve Bank, this number represents the bill's unique identity.

A serial number consists of two prefix letters, eight numerals, and a one-letter suffix:

- The first letter of the prefix denotes the currency series.
- The second letter of the prefix indicates the Federal Reserve Bank at which the bill was produced.
- The eight digits represent the bill's sequential order within its group. The one-letter suffix is a further sequential counter within each Reserve Bank's bills in a series.
- The suffix letter advances when the 8-digit number reaches 99999999 (for example, xx99999999B is followed by



xx0000001C). The entire alphabet is used for this process except for the letter O.

- Bills with a star in the place of their suffix letter are replacements for bills that did not meet federal standards after the printing process and are subsequently destroyed.

Bills produced before 1996 were printed with the seal of their particular Reserve Bank; new bills feature a universal Federal Reserve Seal.

**Federal Reserve Bank Letter & Number Codes**

Boston	1	A	Chicago	7	G
New York	2	B	St. Louis	8	H
Philadelphia	3	C	Minneapolis	9	I
Cleveland	4	D	Kansas City	10	J
Richmond	5	E	Dallas	11	K
Atlanta	6	F	San Francisco	12	L

*This and other currency information can be found at the U.S. Bureau of Engraving & Printing's website: [www.moneyfactory.com](http://www.moneyfactory.com)*

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# Citizen's Band Jargon

*Well, we laid a strip for the Jersey Shore  
Prepared to cross the line  
I could see the bridge was lined with bears  
But I didn't have a doggone dime  
I says "Pigpen, this here's the  
Rubber Duck"  
"We just ain't a-gonna pay no toll"  
So we crashed the gate doin'  
ninety-eight  
I says "let them truckers roll, ten-  
four"*



"Convoy," Words and Music by C.W. McCall, Bill Fries, and Chip Davis

"Convoy" was a hit song in the 1970s due in part to its use of trucker's CB jargon. People have always sought methods of communication that will plug them in to others with whom they feel they have something in common. Though previously primarily used by truckers, CB radio use grew into somewhat of a fad in the mid-70s. Consider it a pre-internet chat room.

Along with the rise of the CB's popularity, the unique language employed by its users blossomed into the American vocabulary (hence the popularity of "Convoy," a number one single in 1976). It was at this point that phrases like "Breaker, Breaker" and "10-4, good buddy" became a part of many people's very non-CB conversations.

Much of CB (and trucker) slang is based on the Citizen's Band 10-code, a sort of short hand developed to encode common

## Select Citizen's Band 10-Code Phrasing

10-1	<i>"Receiving poorly"</i>
10-2	<i>"Receiving well"</i>
10-3	<i>"Stop transmitting"</i>
10-4	<i>"Message received"</i>
10-6	<i>"Busy, stand by"</i>
10-9	<i>"Repeat message"</i>
10-10	<i>"Transmission complete, standing by"</i>
10-11	<i>"You're talking too rapidly"</i>
10-12	<i>"Visitors present"</i>
10-17	<i>"Urgent business"</i>
10-20	<i>"Location"</i>
10-21	<i>"Call by telephone"</i>
10-22	<i>"Report in person"</i>
10-26	<i>"Disregard last transmission"</i>
10-30	<i>"This does not conform to FCC rules"</i>
10-35	<i>"Confidential information"</i>
10-38	<i>"Ambulance needed"</i>
10-42	<i>"Traffic accident at..."</i>
10-84	<i>"My phone number is..."</i>
10-91	<i>"Talk closer to microphone"</i>
10-99	<i>"Mission completed, all units secure"</i>
10-200	<i>"Police needed at..."</i>

transmissions in order and make communication more efficient (see above chart, gathered from <http://hotspotcb.com/cbshop/charts/10-code.html>). If I asked you "what's your ten-twenty?" you might respond "the homestead." If I heard you, I'd say "ten-four that." If signal interference made the transmission unintelligible, I may say "that's a ten-one, friend, can I get a ten-nine?"

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# ***AM/FM Call Numbers***

When we listen to the radio, we experience a constant barrage of the frequency and call letters of the station to which we're listening.



For the radio station, this means that we are likely to remember this information and will tune in whenever we can and also tell our friends. While they are primarily used by the general public as such, the true purpose of these numbers and letters is not just for the sake

of listener memory and advertising

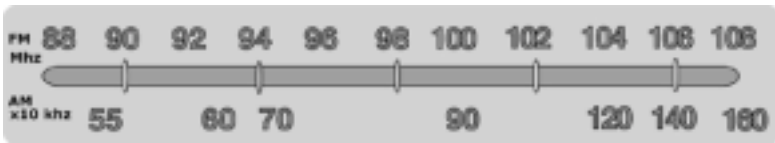
rates. In fact, the radio dial provides the average person considerable insight into the nature of signal transmission. Consumer radios provide the listener with a choice between two ranges of numbers, AM and FM. FM usually sounds better and has more commercially sophisticated programming. AM is less clear and usually deals primarily with talk programs. The cause of these differences are clear through a more in-depth comparison:

**AM** stands for amplitude modulation, and is measured in kilohertz (kHz). AM stations can be located, every 10 kHz, between 535 and 1705 kHz.

**FM** stands for frequency modulation, and is measured in megahertz (MHz). FM stations can be located between 88 and 108 MHz, but unlike AM, FM stations aren't restricted to whole number frequencies.

# AM & FM Stations in Austin

KNLE 88.1 Christian	KTSW 89.9 SWT campus	KQQQ 92.1 Tejano	KAMX 94.7 Mix	KJFK 98.9 Talk	KQBT-FM 104.3 R&B/Hip Hop
KMHF 88.5 Christian	KUT 90.5 Public	KBLK 92.5 Country	KKMJ 95.5 Easy listening	KASE 100.7 Country music	KFMK 105.9 Jammin' Oldies
KAZI 88.7 R&B	KOOP 91.7 Community	KLNC 93.3 Country	KHFI 96.7 Top 40	KROX 101 Alternative rock	KHLB 106.9 Country
KMFA 89.5 Classical	KVRX 91.7 UT campus	KLBJ 93.7 Rock	KVET 98.1 Country, Talk	KPEZ 102.3 Classic Rock	KTND 107.7 80's music



KLBJ 590 AM News, talk	KFIT 1060 Christian, Tejano	KVET 1300 News, talk	KELG 1440 Tejano	KQQA 1530 Tejano/Talk
KIXL 970 Christian talk	KWNX 1260 Talk, sports	KJCE 1370 News, Talk	KFON 1490 Sports	KTXZ 1560 Tejano

*As you can see, there are many more FM stations than AM stations, and there are several reasons for this. First of all, there is more advertising money in FM radio. Additionally, FM signals are not bound to the transmission constraints as AM stations, and like TV signals, do not suffer after dark.*

It's no coincidence "K" is at the beginning of every set of call letters in Austin. As stated in Thomas White's explanation of U.S. Call Letter Policies, the first letter of a station's call letters refers to the side of the Mississippi River the station is located, "K" for west, and "W" for east.

These standards were officially applied in 1923, based on classifications for radio stations on ships on either coast. Stations in either region with the opposite's first letter were allowed to retain their original call letters, and some of those still exist today.

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## ***For More Information...***

Some helpful sources in my search for these explanations were:



The U.S. Bureau of Engraving and Printing:  
<http://www.moneyfactory.com/>

The U.S. Postal Service History:  
[www.usps.com/history/](http://www.usps.com/history/)

The Social Security Administration:  
<http://www.ssa.gov/>

The Federal Highway Administration at the Department of Transportation:  
<http://www.fhwa.dot.gov/>

Cyber College AM/FM Module:  
<http://www.cybercollege.com/frtv/frtv017.htm>

Computer Professionals for Social Responsibility:  
<http://www.cpsr.org/>

Hot Spot CB Shop:  
<http://www.hotspotcbshop.com/>

German CB Museum:  
<http://www.cb-museum.de/>

The Currency Gallery:  
<http://www.currencygallery.org/>

PBS MoneyMoves:  
<http://www.pbs.org/moneymoves/>

Universal Map (map scans):  
<http://www.universalmmap.com/>

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