TELEPHONE WORDS

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Introduction

Problem 1642, "Telephone Synonyms", in the Journal of Recreational Mathematics 21:2, pp. 156-8, 1989, concerned the relationship between words and US telephone numbers. The letters Q and Z are omitted, then the digits 2 to 9 are assigned respectively to ABC,DEF,GHI,JKL,MNO,PRS, TUV and WXY. Thus DOC is dialled as 364. Note that neither of the digits 0 or 1 is permitted. The problem was restricted to 7-letter words because of the structure of the telephone numbering system. Victor Feser gave some interesting answers, and this article expands upon those. The acceptability of words such as hyphenated words, acronyms and names is a somewhat personal matter, so I present a number of examples, allowing the reader to discard those he dislikes. I am indebted to Susan Thorpe for words marked *. Words found by Feser are marked with ~.

The problem says "Telephone synonyms are words that are spelled differently but are dialled identically on a [US] telephone." Thus the word "synonym" is being used for words of usually different meaning that, upon translation, result in the same number. I would prefer to say "words which translate to the same set of digits when dialled: for short, telephone homonyms". A homonym is the "same name", like 6666, "used to denote different things" like MOON and NOON. But let this not spoil the game!

Longest Words Translating Into Strictly Ascending or Descending Digits

There are only eight digits (2 to 9), so eight is the maximum length of word possible. "Strictly" means a following digit is more or less than (not equal to) the preceding one. The longest I found were:

Ascending BEIKOST 2345678; ADHORT, BLJOUX; ADIOS, ADOPT, AELST
Descending SOLEA, SOLFA, SOLIDA, TRIFA, TROIC, TROKE, UNKID, UNLID, UNLIE, USNEA, USNIC, VOKIE, VOLGA, VOLGE, WOKIE, WROKE, YOKIE

Words Containing the Strings 23456789 or 98765432 After Translation

None were found, although BEIKOSTY would qualify if it were valid.

Longest Words Consisting of the Same Digit Repeated After Translation

digit 2 BACABA; ABABA, ABACA, BACCA

digit 3 DEED

digit 4 HIGH

IGIGI; GI

digit 5 KXX

digit 6 MONO

MOON~; M

digit 7 FPS

digit 8 TUT

digit 9 XXX

Longest Words

COMBINATION

NONCOMMUNICATING (15).

Longest Words

PRESS-REFLEXION

PRESSED, DRESS

PERPLEXEDLY, DRESS

Words Using Or

In numerical

ANESTHYL, BR

DIGOTYLS, DILL

ENTHALPY, DO

HAYLOFTS, HE

GUNLAYER, GU

KEYPUNCH, LI

LYTERIAN, NE

PHLICTEN, P

STEAMILY, ST
Longest Words Containing Runs of the Same Digit After Translation

<table>
<thead>
<tr>
<th>Digit</th>
<th>Words</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>MACCABAW, MACCABAÉAN, CACCBABIS (6 in row)</td>
</tr>
<tr>
<td>3</td>
<td>FIDDLE-DEE-DEE (7); BEEFEED, BALEFEEDER, FIDDLE-DEE-DEE, UNDEEDED (6)</td>
</tr>
<tr>
<td>4</td>
<td>HIGH-HIGHISH (9); GIGGING, HIGHISH, MALPIGHINEAE, THIGGIT, WHIGGIS (5)</td>
</tr>
<tr>
<td>5</td>
<td>FOLKLORE, KILLJOY, MILKLESS, WHELKLKE, YOLKLESS (3)</td>
</tr>
<tr>
<td>6</td>
<td>CACODAEMONONOMANIA, HOMONOMIAL, PNEUMONOMONOMANIA, PNEUMONOMONOMIALIASIS (7)</td>
</tr>
<tr>
<td>7</td>
<td>AIRS PRAY, CROSSPRODUCT (4)</td>
</tr>
<tr>
<td>8</td>
<td>GUTTUROPALATAL, STUTTER (4)</td>
</tr>
<tr>
<td>9</td>
<td>ASPHYXY, CYWYDD (3)</td>
</tr>
</tbody>
</table>

Longest Words Containing Solely Even Digits After Translation

<table>
<thead>
<tr>
<th>Words</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMBINATION BUTTON, MONOCOCONTAMINATING, MONOCOCONTAMINATION (17); NONCOMMUNICATING, NONCOMMUNICATION, NONCONTAMINATION (16). Borgmann noted &quot;non-communicating&quot; in Language on Vacation. For less obviously hyphenated words, I offer THANATOGNOMONIC and UNCOMMUNICATING (15).</td>
</tr>
</tbody>
</table>

Longest Words Containing Solely Odd Digits After Translation

<table>
<thead>
<tr>
<th>Words</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRESS-REFLEXES, WELL-EXPRESSED (13); SLEEPLESSNESS (12); DERE-PRESSED, DERE-PRESSES, EXPRESSLESS, PRESS-REFLEX, PREFERREDDLY, PERPLEXEDLY, REDRESSLESS, SELF-SEEKERS, SLEEPLESSLY (11). Borgmann noted well-expressed.</td>
</tr>
</tbody>
</table>

Words Using One Each of the 8 Digits After Translation

| In numerical order, these are ADROITLY, CLIENTRY, BLOWIEST, ANESTHYL, BROWLIFT, CRYOLITE, BUNGERLY, CYPENTIL, EARTHOWL, DICTYOLS, DILATORY, PILATORY, DICTYOLS, DIPLOVAX, FLUSHBOX, ENTHALFY, DOYVALIS, FOXTAILS, EPICOTYL, DYSTOIA, GALEWORT, HAYLOFTS, HECTORLY, GEOLATRY, IDOLATRY, INTERLAY, GRUNWALD, GUNLAYER, GUNWALES, HRYTENAL, LAUWINES, LAUWIEST, LAWNIEST, LAWNIET, LEGATORY, KEYPUNCH, LIPOCYTE, KNITWEAR, LOPHEAVY, Kyanites, LYNCHETS, LYTERIAN, NEURALGY, OVALWISE, SCOLYTID, PENALITY, PENTYLIC, PHLYCTEN, PLAYTIME, PLOWGATE, PLUMEGAY, SODALITY, STAYHOLE, STEAMILY, STIBENYL, SULFAGYN, TALEYSIM, TANKWISE, TENSIBLY, |
THENARLY, UNBIRDLY, UNCLERGY, UNFAIRLY, UNEASILY, TWANGLER,
TWANGLES, TWANKIES, TYROIDAL, WATERLOG, WETROCK, WRECKGUN,
WRENTAIL.

Outstanding are the three pairs of numerical homonyms: DILATORY and
FILATORY 34526879, GEOLATRY and IDOLATRY 43652879, and TWANGLER
and TWANGLES 89264537. There are no words beginning with J,M,R,V,X,
or Y, but after translation, numbers starting with each of the digits 2
to 9 appear. Feser mentions just STEAMILY.

Largest Sets of Words With Same Numerical Equivalent

4-letter words:
7663 POME, POND, PONE, POOF, ROME, ROND, RONE, POOD, POOF,
SNOD, SOME, SOND, SONE (14)
7667 POTS, POUR, POUS, RNVRS, ROTS, ROUP, ROUS, SMUR, SNUF, SNUR,
SOTS, SOUP, SOUR, SOUS (14)
Also of interest are the numerical palindromes:
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All of interest are the numerical palindromes:
2222 AAAA, AABA, AABB, ABAC, ACCA, BABA, BABB, BACA, BCAA,
CABA, CACA, CACC (13)
7667 POMP, POMS, PONS, POOP, POOR, ROMP, RONS, ROOP, ROOS, SNOP,
SONS, SOOP, SOOR (13)
2662 AMMA, ANNA, ANOA, ANOC, BOMA, BOMB, BONA, BOOB, COMA, COMB,
CONA, COOB (12)
The most difficult were words starting with 8 or 9, for which I found
only sets of eight; next most difficult were words starting with 3 or 6,
for which I found only sets of size 10.

5-letter words:
22737 ACRES, BARD, BARE, BARES, BARFS, BASER, BASES, CAFER,
CAPES, CARDS, CARER, CARES, CASER, CASES (14)
22737 AMMER, ANMDP, BONDS, BONER, BONES, BOOES, BOOER, COMER,
COMES, CONER, CONES, CONFR, COOER, COofs (14)
26737 AMPER, ANREP, ANSER, BORDS, BORER, BORES, BOser, COPER,
COPES, CORDS, CORER, CORES, CORFS, COSES (14)
72837 PATER, PATES, PAVER, PAVES, RATER, RATES, RAVER, RAVES,
SATER, SATES, SAUER, SAVER, SAVES, SCUDS
Of interest are the following sets of nine based on five different digits:
52637 JAMES, JANES, KAMES, KANES, LAMER, LAMES, LANES, LANER,
LANES
54837 JIVES, KHUDES, KITER, KITLES, KIVER, LITER, LITES, LIVER,
LIVES 64537 MIKER, MIKES, MILDS, MILER, MILES, NILES, OGLER, OGLES, OILER
The most difficult were words starting with 8, for which I found only
sets of seven; next most difficult were words starting with 3 or 9, for
which I found only sets of size eight; for words of length 5 or 6 I
found only sets of size nine.

6-letter words:
727437 PAPIER, PARGES, PARES, PASHER, RAPHES, RAPIDS, RAPIER,
RASHER, RASHES, SAPIDS, SARGES, SASHES, SCRES (13)
LY, TWANGLER, CK, WRECKGUN,
DILATORY and TWANGLER
with J,M,R,V,X,
of the digits 2
ROOD, ROOF,
SNUP, SNUR,
IACA, BCAA,
ROOS, SNOP,
COMA, COMB,
which I found
g with 3 or 6,
CAPER,
COMER,
COPER,
RAPIER,
RAPIER,

7-letter words:
287437 BURGER, BURIER, BURIES, BUSHER, BUSHES, BUSIER, BUSIES,
CUPIDS, CURIIES, CSHES (10)
727733 PARRED, PARSED, PARSEE, PASSED, PASSEE, RAPPEE, RAPPEE,
RAPPED, SAPPED, SASSSED (10)
728467 PATHOS, PATINS, PATIOS, PAVINS, PAVIOR, RATIOS, RAVINS,
SATINS, SAVIN, SAVIOR (10)
The following set consists of six different digits:
628437 MATHER, MATHES, MATIER, MATIES, MAuger, MAVIES, NATHER,
NAuger, NAVIES (9)
I found no sets of any size for words starting with the digits 8 or 9.
Words starting 5 were next most difficult: I found sets of seven of these.
For words starting 3 or 4 I found sets of eight.

Other Amusements
Unfortunately, PRIME 77463 is not, and neither are SQUARE (ends in 3,
beside having the invalid Q) nor CUBE 2823. On the other hand, EVEN
3836 and ODD 633 both work. We may surely rely upon some reader to
find other mathematical terms which render examples of themselves upon
translation. There are, however, other entertainments such as BAD EGG*
223344, HIGH NOON* 44446666, and OW! 69.

Parochial Concerns
The United Kingdom did once have letters on the dials of telephones,
but that was long ago. The system was not the same as in the United
States, so even if we had letters today, it would still be impossible to
dial 800-SEX-LINE with any certainty—indeed the 800 numbers do not
normally operate internationally!