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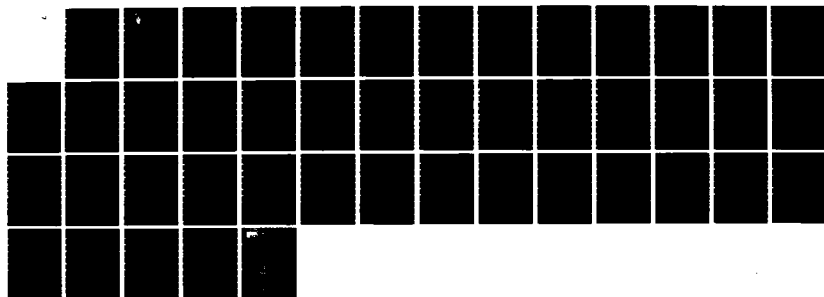
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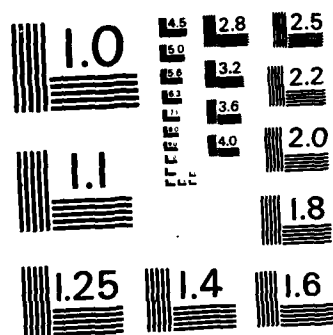
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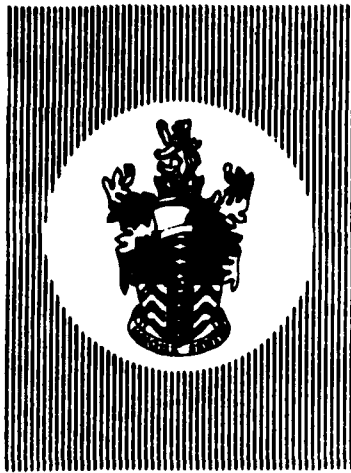
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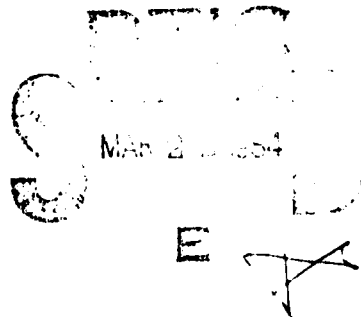
ROYAL SIGNALS AND RADAR ESTABLISHMENT,
MALVERN

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RSRE SPEECH DATA BASE RECORDINGS (1983) PART I
SPECIFICATION OF VOCABULARY AND RECORDING
PROCEDURE

Authors: J Deacon, R K Moore, R L Pratt,
M J Russell and M J Tomlinson

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PROCUREMENT EXECUTIVE, MINISTRY OF DEFENCE
RSRE
Malvern, Worcestershire.

December 1983

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ROYAL SIGNALS AND RADAR ESTABLISHMENT

Report 83010

Title: RSRE SPEECH DATA BASE RECORDINGS (1983) PART I
SPECIFICATION OF VOCABULARY AND RECORDING PROCEDURE

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Date: December 1983

SUMMARY

This is the first of a series of reports which describe a database of speech recordings currently being made at RSRE by the Automatic Speech Recognition Section (T46) and Acoustics Section (T47). The vocabulary which forms the basis of the database can be conveniently divided into two parts. The first part is an anglicised version of the Diagnostic Rhyme Test (DRT) Form IV. This will be used in T47 for the assessment of speech communications equipment by subjective intelligibility tests, and in T46 for the evaluation of automatic speech recognition systems. In addition, T46 will exploit the minimally contrastive pairs of rhyming words in the DRT in research which is directed towards the development of advanced speech recognition algorithms. The second part of the vocabulary consists of the ten digits, the twenty-six letters of the alphabet and the sixty most frequent words in telephone conversational speech.

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RSRE SPEECH DATA BASE RECORDINGS (1983)

PART I

SPECIFICATION OF VOCABULARY AND RECORDING PROCEDURE

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Introduction

This is the first of a series of reports which describe a database of speech recordings currently being made at RSRE by the Automatic Speech Recognition Section (T46) and Acoustics Section (T47). The vocabulary which forms the basis of the database can be conveniently divided into two parts. The first part is an anglicised version of the Diagnostic Rhyme Test (DRT) Form IV [1]. This will be used in T47 for the assesment of speech communications equipment by subjective intelligibility tests, and in T46 for the evaluation of automatic speech recognition systems. In addition, T46 will exploit the minimally contrastive pairs of rhyming words in the DRT in research which is directed towards the developement of advanced speech recognition algorithms. The second part of the vocabulary consists of the ten digits, the twenty-six letters of the alphabet and the sixty most frequent words in telephone conversational speech.

Anglicised Version of DRT

In order to ensure that the material rhymes unambiguously when used with British talkers, it was necessary to make changes to the Diagnostic Rhyme Test Form IV of Voiers [1]. The modified list, which will be referred to as the anglicised DRT, is given in appendix I. The changes which have been made are summarised in appendix IV. In each case where a word has been changed, the table shows the original rhyming word-pair from [1] and the rhyming word-pair which replaces it in the anglicised list. The complete original list from [1] is given in appendix III for reference.

Additional Words

In order to increase the usefulness of the database for the evaluation of automatic speech recognition equipment and the developement of new algorithms, it was decided to supplement the anglicised DRT list with a further 96 words. This supplementary list consists of the ten digits 0 - 9, the twenty-six letters of the alphabet A - Z and the sixty most common words in telephone conversational speech [2]. In addition to their obvious relevance in their own right, these words can be combined with other words from the database to produce syntactically correct sentences. The complete list of additional words is given in appendix II.

Assuming the statistics given in [2], it is estimated that the ninety-six words of appendix II account for approximately 70% of the words of telephone conversational speech (excluding proper nouns, exclamations and interjections).

Recording Equipment

All database recordings are made digitally on video cassette using a Sony PCM-F1 Pulse Code Modulation system (14 bit resolution) and Sony SL-FLUB video cassette recorder (PAL). This results in high quality recordings with wide dynamic range, minimal distortion and flat frequency response. In addition, distribution of the database will be facilitated since multi-generation digital-to-digital tape copy can be performed with no deterioration in quality.

Presentation of Word-Lists to Speakers

Sixteen different random orderings of the vocabulary are used for recordings. Each random ordering is divided into two complementary parts, such that each part contains one word from every rhyming word-pair of the anglicised DRT, and half of the additional words. The sixteen random orderings are presented in appendix V.

Word-lists are presented automatically to the speaker using a system built around the BBC microcomputer (Model B). This is a powerful, self-contained microcomputer system with high-resolution colour graphics. The computer is based on a 2MHz 6502A microprocessor with 16K ROM BASIC, 16K ROM operating system and 32K RAM.

Such a system has several advantages. Words are displayed one at a time on a Visual Display Unit (VDU), so that list-effects are minimised. Rate of speaking can also be easily controlled.

A complete listing of the computer program which is used to present the word lists is available from the authors.

Presentation of Word-Lists to Listeners

In the case of subjective intelligibility testing of communications equipment, a corresponding program has been written, using the BBC microcomputer, which administers the listening phase of the experiment. Whilst a subject listens to a word-list via the channel under test, the appropriate word-pair is displayed on a VDU and the subject responds by pressing one of two buttons (mounted on a hand held unit) corresponding to the word he thinks he heard. The computer automatically logs the response and checks to see if the correct word was selected. At the end of the test an overall score is displayed in addition to individual scores for each of the six attributes in the DRT (see [1]).

REFERENCES

1. W D Voiers "Diagnostic Evaluation of Speech Intelligibility", Benchmark Papers in Acoustics, Vol 11: Speech Intelligibility and Speaker Recognition (M Hawley ed.) Dowden, Hutchinson and Ross, Stroudsburg (1977), 374-387
2. N R French, C W Carter Jr., W Koenig Jr. "The Words and Sounds of Telephone Conversations", Bell System Technical Journal, Vol 9, 1930, 290-324..

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APPENDIX I

Anglicised Diagnostic Rhyme Test Words

BEAN	PEAN	VEAL	FEEL	ZOO	SUE	DO	TOO
GIN	CHIN	DINT	TINT	VOLE	FOAL	GOAT	COAT
ZED	SAID	DENSE	TENSE	VAULT	FAULT	DAUNT	TAUNT
VAN	FAN	GAD	CAD	JOCK	CHOCK	BOND	POND
MEAT	BEAT	NEED	DEED	MOOT	BOOT	NOOZE	DOOZE
MITT	BIT	NIP	DIP	MOAN	BONE	NOTE	NOTE
MEND	BEND	NECK	DECK	MAUL	BALL	GNAW	DAW
MAD	BAD	NAB	DAB	MOM	BOMB	KNOCK	DOCK
VEE	BEE	SHEET	CHEAT	FOO	POOH	SHOES	CHOOSE
VILL	BILL	THICK	TICK	THOSE	DOZE	THOUGH	DOUGH
THEN	DEN	FENCE	PENCE	THORN	TORN	SHORE	CHORE
THAN	DAN	SHAD	CHAD	VON	BONN	VOX	BOX
ZEE	THEE	CHEEP	KEEP	JUICE	GOOSE	CHEW	COO
JILT	GUILT	SING	THING	JOE	GO	SOAP	THOPE
JEST	GUEST	CHAIR	CARE	JAWS	GAUZE	SAW	THAW
JAB	GAB	SANK	THANK	JOSH	GOSH	CHOP	COP
WEED	REED	PEAK	TEAK	MOON	NOON	POOT	TOOT
BID	DID	FIN	THIN	BOAT	NOTE	FOKE	THOKE
MET	NET	PENT	TENT	FOUGHT	THOUGHT	BORE	DOOR
BANK	DANK	FAD	THAD	WOD	ROD	POT	TOT
YIELD	WIELD	KEY	TEA	KOOP	POOP	YOU	RUE
HIT	FIT	GID	DID	GHOST	BOAST	SHOW	SO
KEG	PEG	YEN	WREN	YAWL	WALL	CAUGHT	TAUGHT
GAT	BAT	SHAG	SAG	HOP	FOP	GOT	DOT

APPENDIX II

List of Additional Words

(Alphabet, digits and 60 most frequent words from telephone speech)

'A'	'B'	'C'	'D'	'E'	'F'	'G'	'H'
'I'	'J'	'K'	'L'	'M'	'N'	'O'	'P'
'Q'	'R'	'S'	'T'	'U'	'V'	'W'	'X'
'Y'	'Z'	ONE	TWO	THREE	FOUR	FIVE	SIX
SEVEN	EIGHT	NINE	ZERO	I	YOU	THE	A
ON	TO	THAT	IT	IS	AND	GET	WILL
OF	IN	HE	WE	THEY	SEE	HAVE	FOR
KNOW	DON'T	DO	ARE	WANT	GO	TELL	WITH
ME	HIM	ABOUT	AT	THINK	THIS	DAY	THING
SAY	CAN	CALL	WOULD	THEM	WAS	NOW	FROM
WHAT	MORNING	AN	JUST	OVER	BE	OR	TAKE
AM	COME	MAKE	GIVE	VERY	SEND	AS	RIGHT

APPENDIX III

Diagnostic Rhyme Test Words from [1]

(* Indicates that a word-pair has been changed in the anglicised list)

BEAN	PEAN	VEAL	FEEL	ZOO	SUE	DUNE	TUNE*
GIN	CHIN	DINT	TINT	VOLE	FOAL	GOAT	COAT
ZED	SAID	DENSE	TENSE	VAULT	FAULT	DAUNT	TAUNT
VAST	FAST*	GAFF	CALF*	JOCK	CHOCK	BOND	POND
MEAT	BEAT	NEED	DEED	MOOT	BOOT	NEWS	DUES*
MITT	BIT	NIP	DIP	MOAN	BONE	NOTE	DOTE
MEND	BEND	NECK	DECK	MOSS	BOSS*	GNAW	DAW
MAD	BAD	NAB	DAB	MOM	BOMB	KNOCK	DOCK
VEE	BEE	SHEET	CHEAT	FOO	POOH	SHOES	CHOOSE
VILL	BILL	THICK	TICK	THOSE	DOZE	THOUGH	DOUGH
THEN	DEN	FENCE	PENCE	THONG	TONG*	SHAW	CHAW*
THAN	DAN	SHAD	CHAD	VON	BON*	VOX	BOX
ZEE	THEE	CHEEP	KEEP	JUICE	GOOSE	CHEW	COO
JILT	GUILT	SING	THING	JOE	GO	SOLE	THOLE*
JEST	GUEST	CHAIR	CARE	JAWS	GAUZE	SAW	THAW
JAB	GAB	SANK	THANK	JOSH	GOSH	CHOP	COP
WEED	REED	PEAK	TEAK	MOON	NOON	FOOL	TOOL*
BID	DID	FIN	THIN	BOWL	DOLE*	FOE	THO*
MET	NET	PENT	TENT	FOUGHT	THOUGHT	BONG	DONG*
BANK	DANK	FAD	THAD	WAD	ROD*	POT	TOT
YIELD	WIELD	KEY	TEA	COOP	POOP*	YOU	RUE
HIT	FIT	GILL	DILL*	GHOST	BOAST	SHOW	SO
KEG	PEG	YEN	WREN	YAWL	WALL	CAUGHT	TAUGHT
GAT	BAT	SHAG	SAG	HOP	FOP	GOT	DOT

APPENDIX IV

Changes made to the DRT Form IV of Voiers [1] in order to ensure that the material rhymes unambiguously when spoken by British speakers.

WORD-PAIR IN ANGLICISED LIST

DO - TOO
VAN - FAN
GAD - CAD
NOOZE - DOOZE
MAUL - BALL
THORN - TORN
SHORE - CHORE
VON - BONN
SOAP - THOPE
POOT - TOOT
BOAT - DOTE
FOKE - THOKE
BORE - DOOR
WOD - ROD
KOOP - POOP
GID - DID

WORD-PAIR IN ORIGINAL LIST

DUNE - TUNE
VAST - FAST
GAFF - CALF
NEWS - DUES
MOSS - BOSS
THONG - TONG
SHAW - CHAW
VON - BON
SOLE - THOLE
FOOL - TOOL
BOWL - DOLE
FOE - THO
BONG - DONG
WAD - ROD
COOP - POOP
GILL - DILL

APPENDIX V

The following 32 pages contain complete listings of the sixteen random orderings of the vocabulary used in the RSRE speech data base recordings.

LIST 1 PART 1

vault	mad	bill	guest
moon	wield	vole	maul
than	guilt	met	poop
chock	bone	thorn	jab
bid	peg	pean	bomb
those	jaws	bank	fit
sue	meat	von	go
fought	gat	zed	moot
vee	gosh	boat	wall
chin	bend	foo	thee
wod	ghost	fan	bit
then	goose	reed	fop
taunt	dab	thick	chair
toot	key	coat	daw
chad	sing	tent	you
bond	note	chore	thank
thin	yen	veal	knock
dough	thaw	thad	gid
do	deed	box	soap
door	sag	tense	dooze
cheat	chop	thoke	caught
dint	neck	choose	cheep
tot	so	gad	nip
pence	chew	peak	got

'u'	know	can	'r'
I	him	three	is
over	'z'	on	morning
'f'	eight	very	'm'
they	come	'j'	in
think	'a'	want	was
'x'	are	call	's'
a	about	six	will
take	one	it	an
'g'	nine	right	'p'
for	make	'k'	he
thing	'd'	with	now

LIST 1 PART 2

daunt	nab	tick	care
poot	tea	goat	gnaw
shad	thing	pent	rue
pond	dote	shore	sank
fin	wren	feel	dock
though	saw	fad	did
too	need	vox	thope
bore	shag	dense	nooze
sheet	cop	foke	taught
tint	deck	shoes	keep
pot	show	cad	dip
fence	coo	teak	dot
fault	bad	vill	jest
noon	yield	foal	ball
dan	jilt	net	koop
jock	moan	torn	gab
did	keg	bean	mom
doze	gauze	dank	hit
zoo	beat	bonn	joe
thought	bat	said	boot
bee	josh	dote	yawl
gin	mend	pooh	zee
rod	boast	van	mitt
den	juice	weed	hop

'w'	do	would	't'
the	at	five	get
or	two	that	just
'h'	zero	as	'o'
have	give	'l'	we
day	'c'	tell	from
'v'	don't	say	'q'
you	me	four	and
be	'y'	to	what
'e'	seven	send	'n'
see	am	'i'	of
this	'b'	go	them

LIST 2 PART 1

chock	mad	vee	jest
noon	hit	foal	mom
dan	thee	met	poop
vault	bone	bonn	jab
weed	peg	gin	maul
those	josh	dank	wield
zoo	mitt	thorn	joe
wod	bat	zed	moot
vill	jaws	dote	hop
bean	mend	foo	guilt
fought	boast	van	beat
den	juice	did	wall
bond	dab	cheat	care
poot	did	goat	dock
shad	cheep	tent	you
taunt	note	vox	thank
teak	yen	tint	daw
dough	cop	fad	key
too	dip	chore	thope
tot	shag	tense	dooze
tick	thaw	foke	dot
feel	deck	choose	sing
door	show	cad	need
fence	coo	fin	caught

four	know	me	'q'
you	say	'v'	is
send	'z'	seven	morning
'e'	to	be	'm'
want	come	'a'	of
think	'i'	see	was
five	are	at	't'
the	would	'w'	will
as	one	zero	an
'h'	that	or	'p'
with	make	'd'	we
thing	'l'	have	now

LIST 2 PART 2

pond	nab	sheet	chair
toot	gid	coat	knock
chad	keep	pent	rue
daunt	dote	box	sank
peak	wren	dint	gnaw
though	chop	thad	tea
do	nip	shore	soap
pot	sag	dense	nooze
thick	saw	thoke	got
veal	neck	shoes	thing
bore	so	gad	deed
pence	chew	thin	taught
jock	bad	bee	guest
moon	fit	vole	bomb
than	zee	net	koop
fault	moan	von	gab
reed	keg	chin	ball
doze	gosh	bank	yield
sue	bit	torn	go
rod	gat	said	boot
bill	gauze	boat	fop
pean	bend	pooh	jilt
thought	ghost	fan	meat
then	goose	bid	yawl

six	do	about	's'
a	call	'x'	get
right	two	nine	just
'g'	it	take	'o'
tell	give	'c'	he
day	'k'	for	from
three	don't	him	'r'
I	can	'u'	and
very	'y'	eight	what
'f'	on	over	'n'
go	am	'b'	in
this	'j'	they	them

LIST 3 PART 1

van	bone	den	guilt
reed	yawl	chock	mad
those	guest	did	yield
sue	mom	than	go
met	fit	vault	moot
bonn	gab	boat	keg
pean	maul	pooh	gosh
dank	ghost	chin	meat
thorn	juice	rod	gat
said	mitt	vee	gauze
noon	fop	foai	bend
bill	thee	thought	poop
cad	note	fence	sing
peak	taught	bond	dab
dough	chair	fin	tea
do	dock	chad	soap
tent	gid	taunt	dooze
vox	sank	thoke	wren
veal	daw	shoes	chop
fad	so	dint	deed
chore	coo	pot	sag
dense	dip	cheat	saw
poot	got	goat	neck
thick	cheep	bore	you

'y'	and	morning	'j'
ei	over	'f'	want
a	'n'	in	say
'b	they	think	four
know	was	'q'	on
him	'v'	I	very
two	get	an	'k'
nine	take	'g'	with
give	'o'	he	would
'c'	for	thing	five
are	now	't'	it
about	'w'	a	right

LIST 3 PART 2

gad	dote	pence	thing
teak	caught	pond	nab
though	care	thin	key
too	knock	shad	thope
pent	did	daunt	nooze
box	thank	foke	yen
feel	gnaw	choose	cop
thad	show	tint	need
shore	chew	tot	shag
tense	nip	sheet	thaw
toot	dot	coat	deck
tick	keep	door	rue
fan	moan	then	jilt
weed	wall	jock	bad
doze	jest	bid	wield
zoo	bomb	dan	joe
net	hit	fault	boot
von	jab	dote	peg
bean	ball	foo	josn
bank	boast	gin	beat
torn	goose	woa	bat
zed	bit	bee	jaws
moon	hop	voie	mend
vill	zee	fought	koop

one	will	just	'l'
zero	or	'h'	tell
make	'p'	we	call
'd'	have	day	six
do	from	's'	that
at	'x'	the	as
'z'	is	what	'i'
seven	be	'e'	go
come	'm'	of	can
'a'	see	this	three
don't	them	'r'	to
me	'u'	you	send

LIST 4 PART 1

veal	note	choose	thing
tot	yen	cad	need
dough	coo	fin	got
daunt	nab	cheat	soap
toot	gid	tense	gnaw
shad	keep	foke	you
pond	neck	shore	sank
teak	show	dint	dock
pence	saw	thad	tea
do	dip	box	care
bore	shag	coat	nooze
tick	chop	pent	taught
pean	bone	foo	jilt
wod	peg	van	beat
those	juice	did	fop
fault	bad	vee	go
moon	fit	zed	ball
dan	zee	dote	poop
jock	bend	torn	gab
weed	boast	chin	mom
then	gauze	bank	yield
sue	mitt	von	jest
thought	bat	vole	boot
vill	gosh	net	yawl

'c'	get	thing	'l'
with	an	'x'	do
at	'p'	the	call
five	he	take	one
zero	now	'h'	that
as	't'	have	make
'b'	and	think	'i'
want	morning	'u'	don't
me	'm'	you	can
four	in	over	'z'
seven	was	'e'	to
send	'q'	see	come

LIST 4 PART 2

bean	moan	pooh	guilt
rod	keg	fan	meat
doze	goose	bid	hop
vault	mad	bee	joe
noon	hit	said	maui
than	thee	boat	koop
chock	mend	thorn	jab
reed	ghost	gin	bomb
den	jaws	dank	wield
zoo	bit	bonn	guest
fought	gat	foal	moot
bill	josh	met	wall
feel	dote	shoes	sing
pot	wren	gad	deed
though	chew	thin	dot
taunt	dab	sheet	thope
poot	did	dense	daw
chad	cheep	thoke	rue
bond	deck	chore	thank
peak	so	tint	knock
fence	thaw	fad	key
too	nip	vox	chair
door	sag	goat	dooze
thick	cop	tent	caught

'a'	is	this	'j'
go	what	'v'	know
him	'n'	I	say
three	of	be	'y'
eight	them	'f'	on
very	'r'	they	am
'd'	will	day	'k'
tell	just	'w'	are
about	'o'	a	would
six	we	or	two
nine	from	'g'	it
right	's'	for	give

LIST 5 PART 1

fault	mend	those	goose
bid	yield	van	ball
den	go	moon	hit
jock	mad	thorn	guest
dote	poop	pean	mom
than	jaws	met	ghost
gin	meat	bonn	gab
thought	keg	sue	mitt
bee	gosh	bank	wall
vole	boot	vill	zee
rod	bat	said	moan
foo	jilt	reed	fop
daunt	deck	dough	chew
thin	tea	cad	gnaw
fence	soap	toot	did
pond	dab	chore	chair
foke	you	veal	dock
chad	thaw	tent	so
tint	deed	vox	sank
bore	wren	do	dip
sheet	chop	thad	caught
coat	nooze	tick	keep
pot	shag	dense	dote
choose	thing	peak	got

'v'	of	them	'f'
on	me	three	don't
be	'r'	is	think
'i'	seven	very	'z'
see	morning	'n'	I
say	'a'	want	am
'w'	we	from	'g'
it	at	six	do
or	's'	will	thing
'l'	zero	right	one
have	an	'o'	a
would	'd'	with	give

LIST 5 PART 2

taunt	neck	though	coo
fin	key	gad	daw
pence	thope	poot	gid
bond	nab	shore	care
thoke	rue	feel	knock
shad	saw	pent	show
dint	need	box	thank
door	yen	too	nip
cheat	cop	fad	taught
goat	dooze	thick	cheep
tot	sag	tense	note
shoes	sing	teak	dot
vault	bend	doze	juice
did	wield	fan	maul
then	joe	noon	fit
chock	bad	torn	jest
boat	koop	bean	bomb
dan	gauze	net	boast
chin	beat	von	jab
fought	peg	zoo	bit
vee	josh	dank	yawl
foal	moot	bill	thee
wod	gat	zed	bone
pooh	guilt	weed	hop

'x'	he	now	'h'
that	about	five	are
take	't'	get	day
'k'	nine	as	two
for	just	'p'	the
call	'c'	tell	make
'u'	in	was	'e'
to	him	four	know
over	'q'	and	this
'j'	eight	send	'y'
they	what	'm'	you
can	'b'	go	come

LIST 6 PART 1

said	moot	than	gosh
did	ghost	pean	mend
foo	gab	rod	hit
fault	beat	then	goose
bank	fop	vole	maul
bee	guest	moon	bat
gin	moan	thorn	thee
net	koop	chock	bit
doze	jaws	weed	peg
fan	mom	vill	go
thought	wield	zoo	mad
von	guilt	dote	wall
dense	dooze	chad	chop
fin	so	veal	deck
choose	sank	pot	did
daunt	need	pence	chew
thad	got	coat	daw
sheet	chair	toot	snag
tint	dote	chore	cheep
pent	rue	bond	nip
though	thaw	teak	yen
gad	dock	tick	soap
bore	key	too	dab
box	sing	foke	caught

'r'	I	am	four
to	them	'v'	seven
what	'f'	don't	very
'j'	and	over	'b'
of	this	'y'	want
can	'n'	they	him
's'	a	give	five
that	from	'w'	zero
just	'g'	do	right
'k'	get	take	'c'
we	day	two	with
call	'o'	for	about

LIST 6 PART 2

tense	nooze	shad	cop
thin	show	feel	neck
shoes	thank	tot	gid
taunt	deed	fence	coo
fad	dot	goat	gnaw
cheat	care	poot	sag
dint	note	shore	keep
tent	you	pond	dip
dough	saw	peak	wren
cad	knock	thick	thope
door	tea	do	nab
vox	thing	thoke	taught
zea	boot	dan	josh
bid	boast	bean	bend
pooh	jab	wod	fit
vault	meat	den	juice
dank	hop	foal	ball
vee	jest	noon	gat
chin	bone	torn	zee
met	poop	jock	mitt
those	gauze	reed	keg
van	bomb	bill	joe
fought	yield	sue	bad
bonn	jilt	boat	yawl

't'	the	make	six
it	now	'x'	nine
an	'h'	are	as
'l'	will	or	'd'
he	thing	one	tell
would	'p'	have	at
'q'	you	come	three
on	was	'u'	eight
morning	'e'	know	send
'i'	is	be	'a'
in	think	'z'	go
say	'm'	see	me

LIST 7 PART 1

sue	ball	then	thee
bank	hop	vole	moot
thorn	jest	reed	gat
chin	moan	foo	gauze
met	wield	jock	mitt
doze	goose	fought	peg
fan	mom	vill	joe
noon	wall	pean	bad
von	guilt	dote	poop
said	beat	than	josh
did	boast	vault	mend
bee	gab	wod	hit
do	gnaw	pence	cheep
tnad	dot	coat	dooze
chore	care	peak	sag
dint	dote	choose	saw
tent	key	pond	dip
though	chew	door	yen
gad	dock	tick	thope
poot	caught	veal	nab
box	sing	foke	you
dense	need	chad	cop
fin	show	taunt	deck
sheet	sank	tot	did

'f'	see	what	'b'
know	very	'i'	is
think	'u'	in	me
'z'	want	say	'n'
I	be	'q'	seven
come	four	on	was
'g'	have	just	'c'
are	right	'l'	will
thing	'x'	he	at
one	with	would	'o'
a	or	't'	-er-
make	five	it	now

LIST 7 PART 2

too	daw	fence	keep
fad	got	goat	nooze
shore	chair	teak	shag
tint	note	shoes	thaw
pent	tea	bond	nip
dough	coo	bore	wren
cad	knock	thick	soap
toot	taught	feel	dab
vox	thing	thoke	rue
tense	deed	shad	chop
thin	so	daunt	neck
cheat	thank	pot	gid
zoo	maul	den	zee
dank	fop	foal	boot
torn	guest	weed	bat
gin	bone	poch	jaws
net	yield	chock	bit
those	juice	thought	keg
van	bomb	bill	go
moon	yawl	bean	mad
bonn	jilt	boat	koop
zed	meat	dan	gosh
bid	ghost	fault	bend
vee	jab	rod	fit

'h'	for	an	'd'
do	as	'k'	get
day	'w'	we	about
two	tell	call	'p'
the	take	's'	nine
give	six	that	from
'e'	they	morning	'a'
don't	send	'j'	and
this	'v'	of	him
'y'	go	can	'm'
you	over	'r'	eight
am	three	to	them

LIST 8 PART 1

van	bone	pooh	jest
rod	fit	pean	mad
doze	goose	met	fop
vault	meat	dan	go
noon	peg	chin	maui
vee	gab	dote	koop
jock	bit	thorn	thee
dank	ghost	said	mom
bill	jaws	weed	gat
sue	mend	von	guilt
fought	yield	vole	moot
den	gosh	bid	yawl
cad	note	shoes	care
pot	gid	veal	dab
though	chew	tent	got
taunt	deed	shad	soap
poot	yen	dint	daw
cheat	sank	foke	rue
pond	nip	chore	cheep
fad	so	dense	dock
thick	thaw	teak	sag
do	deck	box	sing
door	tea	coat	dooze
fence	chop	thin	taught

'y'	and	this	'q'
go	can	'v'	seven
come	'n'	I	morning
three	on	be	'b'
don't	was	'f'	of
very	'j'	see	me
two	get	day	't'
tell	call	'w'	zero
make	'o'	a	an
six	it	or	'c'
do	now	'g'	we
right	'k'	have	at

LIST 8 PART 2

gad	dote	choose	chair
tot	did	feel	nab
dough	coo	pent	dot
daunt	need	chad	thope
toot	wren	tint	gnaw
sheet	thank	thoke	you
bond	dip	shore	keep
thad	show	tense	knock
tick	saw	peak	shag
too	neck	vox	thing
bore	key	goat	nooze
pence	cop	fin	caught
fan	moan	foo	guest
wod	hit	bean	baa
those	juice	net	hop
fault	beat	than	joe
moon	keg	gin	ball
bee	jab	boat	poop
chock	mitt	torn	zee
bank	boast	zed	bomb
vill	gauze	reed	bat
zoo	bend	bonn	jilt
thought	wield	foal	boot
then	josh	did	wall

one	will	thing	's'
with	would	'x'	nine
give	'p'	the	just
five	that	take	'd'
are	from	'h'	he
as	'l'	for	about
'z'	is	think	'r'
want	say	'u'	eight
am	'm'	you	what
four	to	over	'a'
know	them	'e'	in
send	'i'	they	him

LIST 9 PART 1

gad
peak
choose
dint
tent
though
veal
fad
shore
tense
fin
box
fan
reed
foo
chin
met
doze
pean
dank
torn
zed
did
von

nooze
taught
care
dote
dot
thank
gnaw
rue
thing
dock
show
cheep
boot
yaw
jest
moan
hop
jab
ball
koop
jilt
mom
boast
thee

fence
goat
tot
chad
daunt
toot
tick
bond
thoke
cheat
do
bore
den
foal
wod
than
fault
moon
vill
chock
boat
vee
sue
thought

chop
nab
tea
coo
dip
wren
thope
need
sag
thaw
neck
gid
gosh
bad
yield
juice
mitt
keg
joe
beat
gat
jaws
bend
fit

one
nine
give
'c'
are
about
'z'
eight
am
'l'
know
him

the
take
'h'
for
thing
'x'
you
over
'e'
they
think
'u'

an
'k'
we
would
's'
it
morning
'j'
of
say
'r'
on

five
get
right
'p'
with
from
four
and
very
'm'
want
them

LIST 9 PART 2

van	moot	then	josh
weed	wall	vole	mad
pooh	guest	rod	wield
gin	bone	dan	goose
net	fop	vault	bit
those	gab	noon	peg
bean	maul	bill	go
bank	poop	jock	meat
thorn	guilt	dote	bat
said	bomb	bee	gauze
bid	ghost	zoo	mend
bonn	zee	fought	hit
cad	dooze	pence	cop
teak	caught	coat	dab
shoes	chair	pot	key
tint	note	shad	cnew
pent	got	taunt	nip
dough	sank	poot	yen
feel	daw	thick	soap
thad	you	pond	deed
chore	sing	foke	snag
dense	knock	sheet	saw
thin	so	too	deck
vox	keep	door	did

'y'	I	what	three
seven	be	'i'	is
come	'f'	in	send
'a'	see	can	'n'
don't	this	'q'	go
me	'v'	to	was
two	a	just	six
zero	or	'l'	will
make	'g'	he	as
'd'	have	call	'o'
do	day	't'	tell
at	'w'	that	now

LIST 10 PART 1

veal	nab	tick	chop
thoke	taught	dense	deed
snad	thing	pot	so
do	neck	sheet	sank
thin	got	taunt	dooze
pence	keep	fad	did
goat	daw	shoes	care
teak	shag	bond	note
shore	coo	pent	tea
tint	dock	though	thaw
poot	yen	gad	dip
box	thope	bore	rue
pean	bad	vill	gosh
boat	yawl	said	meat
dan	jilt	rod	ghost
sue	bend	bee	gab
bid	fop	vault	moot
then	zee	dank	hit
foal	maul	pooh	jest
weed	bat	chock	bone
torn	juice	net	yield
gin	mom	doze	jaws
noon	peg	fan	mitt
von	joe	thought	koop

'c'	do	would	five
will	take	'g'	we
about	two	that	right
'o'	have	day	's'
zero	make	'l'	with
from	'x'	the	just
'b'	don't	say	four
is	over	'f'	of
him	'y'	to	very
'n'	see	this	'r'
seven	come	'i'	want
them	'u'	you	what

LIST 10 PART 2

bean	mad	bill	josh
dote	wall	zed	beat
than	guilt	wod	boast
zoo	mend	vee	jab
did	hop	fault	boot
den	thee	bank	fit
voie	ball	foo	guest
reed	gat	jock	moan
thorn	goose	met	wield
chin	bomb	those	gauze
moon	keg	van	bit
bonn	go	fought	poop
feel	dab	thick	cop
foke	caught	tense	need
chad	sing	tot	show
too	deck	cheat	thank
fin	dot	daunt	nooze
fence	cheep	thad	gid
coat	gnaw	choose	chair
peak	sag	pond	dote
chore	chew	tent	key
dint	knock	dough	saw
toot	wren	cad	nip
vox	soap	door	you

'a'	know	can	three
and	be	'e'	in
me	'z'	on	send
'm'	they	think	'q'
eight	am	'j'	go
was	'v'	I	morning
'd'	are	call	six
get	or	'h'	he
at	one	it	as
'p'	for	thing	't'
nine	give	'k'	tell
now	'w'	a	an

LIST 11 PART 1

zoo	bone	bonn	guest
reed	fit	vault	moot
doze	gosh	met	yield
van	maul	pooh	joe
wod	peg	gin	bad
torn	goose	boat	hop
pean	mitt	than	jaws
moon	ghost	said	beat
vill	jab	fought	poop
chock	mend	bee	guilt
dank	yawi	foal	mom
den	zee	bid	bat
too	note	vox	chair
peak	gid	taunt	dooze
though	chop	tent	tea
cad	daw	shoes	thope
tot	yen	tint	nab
shore	chew	thoke	dot
veal	dip	chad	thaw
toot	so	dense	need
tick	thank	door	you
bond	deck	sheet	sing
fad	taught	goat	dock
fence	keep	thin	shag

'e'	and	send	'r'
eight	can	'y'	they
this	'n'	want	what
'a'	on	come	'u'
I	was	three	in
him	'j'	know	over
'h'	get	as	's'
nine	call	two	for
day	'o'	with	just
'd'	it	make	'x'
a	now	six	he
about	'k'	are	take

LIST 11 PART 2

do	dote	box	care
teak	did	daunt	nooze
dough	cop	pent	key
gad	gnaw	choose	soap
pot	wren	dint	dab
chore	coo	foke	got
feel	nip	shad	saw
poot	show	tense	deed
thick	sank	bore	rue
pond	neck	cheat	thing
thad	caught	coat	knock
pence	cheep	fin	sag
sue	moan	von	jest
weed	hit	fault	boot
those	josh	net	wield
fan	ball	foo	go
rod	keg	chin	mad
thorn	juice	dote	fop
bean	bit	dan	gauze
noon	boast	zed	meat
bill	gab	thought	koop
jock	bend	vee	jilt
bank	wail	vole	bomb
then	thee	did	gat

'g'	will	right	't'
zero	would	one	have
thing	'p'	tell	an
'c'	that	give	'w'
the	from	five	we
at	'l'	do	or
'f'	is	very	'q'
seven	say	'z'	see
think	'm'	go	morning
'b'	to	am	'v'
you	them	four	of
me	'i'	don't	be

LIST 12 PART 1

van	mom	vee	gauze
moon	fit	vole	bad
bonn	zee	fought	poop
said	bone	dan	gosh
weed	yawl	gin	bend
those	gab	rod	wield
sue	mitt	then	go
dank	fop	fault	moot
bill	guest	dote	bat
pean	maul	pooh	guilt
met	ghost	cnock	beat
thorn	goose	did	keg
cad	dock	cheat	saw
toot	gid	coat	nab
vox	keep	door	you
dense	note	shad	chop
teak	taught	tint	neck
dough	sank	pot	key
do	dip	pence	soap
fad	got	daunt	dooze
thick	chair	foke	shag
veal	daw	shoes	sing
tent	so	bond	need
chore	chew	fin	wren

'y'	want	me	'v'
I	can	'q'	and
come	three	seven	be
'f'	to	morning	'n'
know	very	'a'	see
think	'j'	in	was
two	with	at	'w'
a	call	't'	get
make	six	zero	or
'g'	that	an	'o'
are	right	'd'	have
thing	'k'	he	now

LIST 12 PART 2

gad	knock	sheet	thaw
poot	did	goat	dab
box	cheep	bore	rue
tense	dote	chad	cop
peak	caught	dint	deck
though	thank	tot	tea
too	nip	fence	thope
thad	dot	taunt	nooze
tick	care	thoke	sag
feel	gnaw	choose	thing
pent	show	pond	deed
shore	coo	thin	yen
fan	bomb	bee	jaws
noon	hit	foal	mad
von	thee	thought	koop
zed	moan	than	josh
reed	wall	chin	mend
doze	jab	wod	yield
zoo	bit	den	joe
bank	hop	vault	boot
vill	jest	boat	gat
bean	ball	foo	jilt
net	boast	jock	meat
torn	juice	bid	peg

one	tell	about	'x'
the	would	's'	will
give	five	nine	take
'h'	it	just	'p'
do	as	'c'	for
day	'l'	we	from
'z'	go	him	'u'
you	say	'r'	is
am	four	eight	over
'e'	on	what	'm'
don't	send	'b'	they
this	'i'	of	them

LIST 13 PART 1

vole	mend	von	guilt
reed	yawl	sue	bone
den	josh	bid	wield
fan	boot	those	jest
rod	fit	fault	bad
foo	joe	met	fop
pean	maul	than	juice
boat	peg	chin	beat
torn	gab	moon	ghost
jock	mitt	bee	jaws
dank	poop	zed	bomb
vill	thee	thought	gat
coat	deck	box	sing
peak	taught	do	note
fence	cop	thin	key
gad	nooze	dough	care
pot	gid	daunt	nab
choose	thope	tent	got
veal	daw	chad	coo
thoke	yen	dint	need
shore	sank	toot	so
pond	dip	sheet	thaw
fad	you	tense	knock
tick	cheep	bore	sag

'm'	of	very	'j'
eight	over	'z'	you
was	'q'	want	can
'b'	see	am	'e'
and	morning	four	to
me	'u'	know	this
'p'	we	right	'k'
nine	take	one	the
now	't'	with	call
'c'	have	give	'h'
get	an	five	that
at	'x'	are	day

LIST 13 PART 2

goat	neck	vox	thing
teak	caught	too	dote
pence	chop	fin	tea
cad	dooze	though	chair
tot	did	taunt	dab
shoes	soap	pent	dot
feel	gnaw	shad	chew
foke	wren	tint	deed
chore	thank	poot	show
bond	nip	cheat	saw
thad	rue	dense	dock
thick	keep	door	shag
foal	bend	bonn	jilt
weed	wall	zoo	moan
then	gosh	did	yield
van	moot	doze	guest
wod	hit	vault	mad
pooh	go	net	hop
bean	ball	dan	goose
dote	keg	gin	meat
thorn	jab	noon	boast
chock	bit	vee	gauze
bank	koop	said	mom
bill	zee	fought	bat

'o'	he	as	'l'
zero	or	two	a
from	's'	tell	would
'd'	for	make	'g'
will	just	six	it
about	'w'	do	thing
'n'	in	send	'i'
seven	be	'y'	I
them	'r'	go	say
'a'	they	come	'f'
is	what	three	on
him	'v'	don't	think

LIST 14 PART 1

veal	knock	shoes	sing
foke	wren	gad	need
box	chew	fin	so
daunt	dab	cheat	cop
toot	gid	tense	gnaw
chad	cheep	pot	rue
coat	neck	shore	thank
peak	dot	dint	note
fence	thaw	fad	tea
too	nip	though	chair
door	sag	bond	dooze
thick	soap	tent	caught
pean	bomb	pooh	guilt
dote	keg	fan	beat
von	goose	did	ghost
fault	mad	vee	josh
moon	fit	zed	ball
than	thee	rod	koop
vole	bend	torn	jab
reed	hop	chin	bone
den	jaws	dank	yield
zoo	bit	doze	guest
fought	gat	chock	moot
bill	go	met	wall

'c'	tell	day	'k'
get	just	'w'	do
at	five	the	would
'o'	we	take	two
zero	as	'h'	that
from	's'	have	give
'b'	go	this	'j'
and	what	'v'	don't
me	four	you	say
'n'	of	over	'y'
seven	send	'e'	to
them	'r'	see	am

LIST 14 PART 2

bean	mom	foo	jilt
boat	peg	van	meat
bonn	juice	bid	boast
vault	bad	bee	gosh
noon	hit	said	maui
dan	zee	wod	poop
foal	mend	thorn	gab
weed	fop	gin	moan
then	gauze	bank	wield
sue	mitt	those	jest
thought	bat	jock	boot
vili	joe	net	yawl
feel	dock	choose	thing
thoke	yen	cad	deed
vox	coo	thin	show
taunt	nab	sheet	chop
poot	did	dense	daw
shad	keep	tot	you
goat	deck	chore	sank
teak	got	tint	dote
pence	saw	thad	key
do	dip	dough	care
bore	shag	pond	nooze
tick	thope	pent	taught

'a'	want	think	'i'
is	morning	'u'	know
him	three	I	can
'm'	in	be	'z'
eight	very	'f'	on
was	'q'	they	come
'd'	with	thing	'l'
will	an	'x'	are
about	six	a	call
'p'	he	or	one
nine	right	'g'	it
now	't'	for	make

LIST 15

PART 1

do	dote	fence	keep
fin	shag	bond	dooze
dough	care	peak	did
daunt	knock	choose	thope
tent	key	gad	gnaw
box	coo	thoke	wren
dint	dab	chore	chop
poot	so	veal	dip
chad	saw	pot	rue
dense	need	tick	sank
bore	got	goat	deck
cheat	thing	thad	taught
sue	moan	den	zee
did	bat	chock	moot
those	jest	reed	hit
fault	bomb	foo	joe
met	wield	fan	ball
von	juice	boat	keg
chin	mad	thorn	gosh
noon	ghost	pean	mitt
than	gauze	rod	koop
said	beat	vill	gab
thought	fop	foal	mend
vee	jilt	bank	yawl

'g'
that
thing
'k'
a
would
'f'
to
think
'j'
I
say

will
make
'p'
do
now
two
is
come
'm'
don't
was
'y'

an
'w'
he
take
's'
for
morning
'v'
in
over
'r'
they

'd'
with
at
six
nine
right
'a'
want
me
three
eight
very

LIST 15 PART 2

zoo	bone	then	thee
bid	gat	jock	boot
doze	guest	weed	fit
vault	mom	pooh	go
net	yield	van	maul
bonn	goose	dote	peg
gin	bad	torn	josh
moon	boast	bean	bit
dan	jaws	wod	poop
zed	meat	bill	jap
fought	hop	vole	bend
bee	guilt	dank	wall
too	note	pence	cheep
thin	sag	pond	nooze
though	chair	teak	gid
taunt	dock	shoes	soap
pent	tea	cad	daw
vox	chew	foke	yen
tint	nab	shore	cop
toot	show	feel	nip
shad	thaw	tot	you
tense	deed	thick	thank
door	dot	coat	neck
sheet	sing	fad	caught

'e'	and	what	'b'
on	am	'u'	go
this	'n'	of	him
'i'	know	be	four
you	them	'q'	seven
can	'z'	see	send
'h'	get	just	'c'
it	give	'x'	tell
day	'o'	we	about
'l'	are	or	five
the	from	't'	zero
call	one	have	as

LIST 16 PART 1

sue	meat	den	gab
did	wall	chock	boot
vee	jest	bank	fit
vole	mom	foo	thee
net	bat	fault	bone
bonn	goose	weed	peg
chin	ball	doze	josh
noon	wield	van	bit
torn	go	wod	koop
zed	mad	vill	jaws
boat	fop	bean	bend
than	guilt	thought	ghost
do	deed	fence	sank
fin	caught	bond	nooze
cheat	care	thad	gid
coat	dock	choose	cheep
pent	shag	daunt	note
vox	chew	teak	yen
dint	gnaw	though	cop
poot	key	cad	nip
shore	soap	tot	rue
tense	dab	tick	thaw
thoke	got	feel	neck
chad	sing	bore	so

'f'	seven	morning	'z'
to	be	'n'	go
think	'a'	of	come
'i'	they	them	four
you	him	'r'	don't
can	'v'	is	send
'g'	zero	an	one
that	or	'o'	tell
thing	'd'	we	make
'l'	for	from	five
the	about	's'	do
call	'w'	will	as

LIST 16 PART 2

too	need	pence	thank
thin	taught	pond	dooze
sheet	chair	fad	did
goat	knock	shoes	keep
tent	sag	taunt	dote
box	coo	peak	wren
tint	daw	dough	chop
toot	tea	gad	dip
chore	thope	pot	you
dense	nab	thick	saw
foke	dot	veal	deck
shad	thing	door	show
zoo	beat	then	jab
bid	yawl	jock	moot
bee	guest	dank	hit
foal	bomb	pooh	zee
met	gat	vault	moan
von	juice	reed	keg
gin	maui	those	gosh
moon	yield	fan	mitt
thorn	joe	rod	poop
said	bad	bill	gauze
dote	hop	pean	mend
dan	jilt	fought	boast

'h'	nine	just	two
it	take	'p'	with
day	'c'	he	give
'k'	have	now	six
a	at	't'	are
would	'x'	get	right
'e'	eight	what	'y'
on	over	'm'	want
this	'b'	in	am
'j'	see	was	three
I	me	'q'	know
say	'u'	and	very

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<p>Abstract This is the first of a series of reports which describe a database of speech recordings currently being made at RSRE by the Automatic Speech Recognition Section (T46) and Acoustics Section (T47). The vocabulary which forms the basis of the database can be conveniently divided into two parts. The first part is an anglicised version of the Diagnostic Rhyme Test (DRT) Form IV 1. This will be used in T47 for the assessment of speech communications equipment by subjective intelligibility tests, and in T46 for the evaluation of automatic speech recognition systems. In addition, T46 will exploit the minimally contrastive pairs of rhyming words in the DRT in research which is directed towards the development of advanced speech recognition algorithms. The second part of the vocabulary consists of the ten digits, the twenty-six letters of the alphabet and the sixty most frequent words in telephone conversational speech.</p>				

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