Birch Radio

SAMPLE PLACEMENT

AND RETURN STATISTICS

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It is important to note that the methodologies of BIRCH and Arbitron incorporate design differences with respect to the procedure that each service uses to generate sample households, select sample respondents, and execute the survey. For this reason, a straight comparison of any statistic other than Response Rate would yield a conclusion that reflects the design difference and not the performance difference between the samples.

What follows is a brief description of the design differences that exist between the services as well as an explanation of each of the sample placement and return elements. The description is presented in two parts:

Part I. Sample Placement and Return Counts
Part II. Calculations

These descriptions will allow the reader to better understand how the various statistics relate taking into consideration the design differences inherent in the comparison of two methodologies.

For the reader un-familiar with the basic design differences that exist between the methodologies, Appendix A has been presented to briefly highlight these differences.

No Answer/Busy: (Line C)

The no-answer statistic is unique to the BIRCH service. Rather than count all no-answer households as "non-households" BIRCH recognizes that, due to vacations, business travel and extenuating circumstances, no one may be home during the survey week to answer the telephone in a qualified telephone household. No Answers represent numbers within the designated sample to which repeated calls generated no results at identifying the unit. No Answers can be legitimate households, businesses or numbers which are not in service.

The number of No Answer/Busy telephone numbers is factored by BIRCH in the calculation of response rate to account for the fact that a proportion of no-answer numbers are actually telephone numbers which are not-in-service.
(See Part II -Calculations: Response Rate - Line O)

Total Contacts: (Line D)

The figures for total contacts represents the total number of telephone households in which the telephone was answered.
(See line D)

Birch derives its Total Contact number by adding total homes in which the telephone was answered to a factor equal to 30% of the No Answer/Busy rate.

Birch Total Contacts = Homes in which telephone was answered + (.3 X No Answer/Busy Rate)

Total contacts less language barrier households, refusals, terminations (in the case of BIRCH) or non-returned diaries and not qualified (in the case of Arbitron) is equal to in-tab. (See line G)

Total Homes in Which Arbitron Diaries Were Placed: (Line E)

This statistic is unique to Arbitron's service. It represents the total number of households which agree to participate in the service. (See line E)

Since Arbitron employes a technique in which all members of a selected household participate in the survey, called "household flooding", this statistic is helpful, when divided by the total number of individuals who were sent diaries, in determining the average number of persons per household in the sample. (See line K)

Arbitron does not report the total number of individual homes that returned at least one usable diary, therefore, it is impossible to compare the number of participating households in the BIRCH sample vs the Arbitron sample. As an estimate of the number of participating households in the Arbitron sample, the in-tab divided by the average-persons-per-home may be used. (See line P)

Total Individuals who were sent an Arbitron Diary: (Line F)

As with the "Total Homes in Which a Diary Was Placed" statistic described above, the "total individuals sent a diary" figure is unique to the Arbitron design.

This statistic reports the total number of diaries mailed to consenting households. (See line E for consenting households)

Total Individuals In-Tab: (Line G)

The "Total In-Tab" line represents, for both services, the number of interviews/diaries that were used in the tabulation of the report. Each in-tab represents a single individual.

Part II.
Performance Calculations

Performance calculations combine Sample Placement and Return Counts according to specified formulas that enable comparisons to be made. As previously mentioned, design differences between the two services make comparisons interesting but not actionable, except in the case of Response Rates.

Contact Rate: (Line H)

Because the BIRCH technique is Random Digit Dial, its Contact Rate will be lower than the Arbitron technique, which mixes RDD (to pick up unlisted telephone households) with a sample of known listed telephone households. The design difference causes BIRCH to achieve a higher proportion of business numbers, not-in-service, and no answers.

$$\text{Contact Rate} = \frac{\text{Total Contacts}}{\text{Residential Listings in Designated Sample}}$$

Agree Rate: (Line I)

The Agree Rate statistic relates only to the Arbitron technique as it reports the proportion of households which agree to keep diaries to the number of total households contacted.

$$\text{Agree Rate} = \frac{\text{Homes in Which Diaries Were Placed}}{\text{Total Contacts}}$$

Cooperation Rate: (Line J)

Both services utilize the same calculation for the determination of Completion Rate. This definition, acknowledged by the CASRO Completion Rates Task Force, is as follows:

CASRO Definition:

$$\text{Completion Rate} = \frac{\text{Number of Completed Interviews}}{\text{Number of Contacts}}$$

The Birch Cooperation Rate is identical in definition to the Arbitron Return Rate. That is, this statistic is an expression of the percentage of interviews that were in-tab as opposed to the number of persons contacted, in the case of BIRCH, or the number of diaries sent out, in the case of Arbitron.

BIRCH Definition:

$$\text{Cooperation Rate} = \frac{\text{Total Individuals In-Tab}}{\text{Total Contacts}}$$

Arbitron Definition:

$$\text{Cooperation Rate (Return Rate)} = \frac{\text{Total Individuals In-Tab}}{\text{Total Individuals Sent a Diary}}$$

Persons Per Home: (Line K)

Persons Per Home is a phenomenon of the household flooding or household clustering technique used by Arbitron. Since BIRCH interviews only one person per home, no calculation is necessary to monitor the average density of each household cluster.

$$\text{Arbitron Persons Per Home} = \frac{\text{Total Individuals Sent a Diary}}{\text{Total Homes in Which Diaries Were Placed}}$$

Return Rate : (Line L)

Return Rate is a third statistic which relates to the methodology used by Arbitron. This statistic describes the proportion of diaries that are returned when compared to the number of diaries that were originally sent out.

$$\text{Return Rate (Cooperation Rate)} = \frac{\text{Total Individuals In-Tab}}{\text{Total Individuals Sent a Diary}}$$

Estimated Persons in the Designated Sample: (Line M)

As an alternative method of calculating the Arbitron Response Rate, see section on Response Rates, it is necessary to "estimate-by-calculation" the number of persons in the designated sample. This estimate is made by applying the average number of diaries sent per home (Line K) against the Residential Listings in the Designated Sample (Line B)

Since the BIRCH calculation of Response Rates is based on single-person-per-household responses, it is not necessary to calculate an estimated number of persons per household.

$$\text{Estimated Persons in Designated Sample} = \text{Persons Per Home} \times \text{Residential Listings In Designated Sample}$$

"Hit Rate" : (Line N)

The term "Hit Rate" is used to describe the contact rate against the designated sample. This percentage reveals the number of "usable numbers" that were found in the original designated sample and is an expression of the efficiency of the frame with respect to producing "live households".

$$\text{Hit Rate} = \frac{\text{Residential Listings in Designated Sample}}{\text{Total Listings in Designated Sample}}$$

Response Rate: (Line 0)

Response Rate is the "bottom line" measure of the efficiency of the sample design and the execution of that design. It is the single measure that, when calculated according to the guidelines set forth by CASRO's Completion Rates Task Force, can be compared and measured against the performance of other designs and execution techniques.

In the words of the CASRO Completion Rates Task Force:

> *"The term Response Rate is a summary measure and should be used to designate the ratio of the number of interviews to the number of eligible units in the sample. The response rate is a measure of the result of all efforts, properly carried out, to execute a study. In determining a response rate, completion rates are used to evaluate the component steps. These component steps are then combined to form the response rate." (1)*

The "basic definition" as defined by the CASRO Task Force is as follows:

$$\text{Response Rates} = \frac{\text{Number of Completed Interviews with Reporting Units}}{\text{Number of Eligible Reporting Units in Sample}}$$

1) The BIRCH Response Rate Definition is as follows:

$$\text{Response Rates} = \frac{\text{Completed Interviews In-Tab}}{\text{Total Contacts} + (.3 \times \text{No-Answers})}$$

The number of No Answer/Busy telephone numbers is factored by BIRCH in the calculation of response rate. The proportion of No Answer/Busy telephone numbers which are assumed to be telephone households was researched by BIRCH in its 1982 study on the "Incidence of Qualified Telephone Households Within the No-Answer Statistic".

(1) CASRO SPECIAL REPORT - "On The Definition of Response Rates", Lester R. Frankel, Chairman

The BIRCH "No Answer" study found that 30% of all No Answer/Busy numbers were actually households that, for various reasons, could not be contacted. For this reason, BIRCH adds back into its response rate calculation 30% of the No Answer/Busy numbers to reflect the fact that 30% of the No Answer/busy households were actually qualified units for the sample. This technique effectively lowers the response rate to account for the fact that the design does not allow sample households to be contacted outside of the survey month.

2) The Arbitron Response Rate Definition is as follows:

a) Response Rates = Contact Rate X Agree Rate X Return Rate

OR

$$\text{b) Response Rates} = \frac{\text{Estimated Persons in Designated Sample}}{\text{Total Individuals In-Tab}}$$

While Arbitron uses the calculation defined in 2-a above, the second application is useful for the researcher to see the net effect of the combination of Contact, Agree and Return Rates as they relate to the CASRO definition. The Arbitron Response Rate Calculation assumes that the density of persons per household within the universe is the same as the density of persons within their sample households which were sent diaries.

Number of Households in Tab: (Line P)

The BIRCH sample choses one person randomly per household, therefore the BIRCH count for this statistic will be equal to its in-tab.

The "household flooding" technique used by Arbitron makes it necessary to calculate the estimated number of Households within the Sample In-Tab. This "estimate" is derived by dividing the Sample In-Tab (Line G) by the Average Persons Per Home (Line K).

This calculation assumes that the Arbitron In-Tab sample contains households which have the same distribution as the households which agreed to keep diaries. Also, this statistic assumes that there was a uniform response within household with all individuals in a household returning in-tab diaries. Since the later point is highly unlikely as response rates within household units varies, the Number of households in-tab estimate is an approximation.

Arbitron Number of Households in In-Tab Sample	=	In-Tab	/	Persons Per Home

Table 1

Sample Placement and Return Statistics
New Orleans, La. Metro Area
October/November/December 1984
****

		BIRCH	Arbitron
A.	Total Listings in Designated Sample ..... :	4,015	DNA
B.	Residential Listings in Designated Sample ..... :	2,448	1,876
C.	No Answer/Busy ..... :	664	DNA
D.	Total Contacts ..... :	2,249	1,829
E.	Total Homes in Which Arbitron Diaries Were Placed :	DNA	1,604
F.	Total Individuals Who Were Sent an Arbitron Diary ..... :	DNA	3,823
G.	Total Individuals In-Tab ..... :	1,497	1,575
H.	Contact Rate (D/B) ..... :	91.8 %	97.5 %
I.	Agree Rate (E/D) ..... :	DNA	87.7 %
J.	Cooperation Rate (see note 1).. :	66.6 %	41.2 %
K.	Persons Per Home (F/E) ..... :	DNA	2.38
L.	Return Rate (G/F) ..... :	DNA	41.2 %
M.	Estimated Persons in the Designated Sample (K*B) .. :	DNA	4,465
N.	"Hit Rate" (B/A) ..... :	61.0 %	DNA
O.	Response Rate (See note 2)..... :	61.1 %	35.2 %
P.	Number of households in sample .:	1,497	662 (G/K) (estimate)

Note 1:
BIRCH Co-Op Rate = G/D
Arbitron Co-Op Rate= G/F

Note 2:
BIRCH Response Rate = G/B
Arbitron Response Rate= (H*I*J) or (G/M)

DNA= Does Not Apply

Appendix A

An important precursor to the description of the origin of the services' counts is an explanation of the Sample Frame and Sample Selection procedures used by each service. The differences highlighted in this description constitute the basic design differences that exist between the services and will prove invaluable to the researcher in analyzing the sample performance characteristics highlighted in this paper.

While the frames used by the two services have a common beginning, the techniques used to select sample cause differences in performance statistics that make meaningful comparisons impossible, except in the case of Response Rate.

Sample Frame:

The sample frame is the starting point for a sample plan. Both services utilize a sample frame that is based on telephone households. It is the "universe" of households from which an actual "designated sample" will be drawn.

Birch utilizes the A. C. Nielsen Company's Total Telephone Frame. The pre-designated sample, consisting of potential telephone households, is drawn in daily replicates equal to 1/28 of the market objective divided by the historical hit rate in the market. Sample is drawn according to standard TTF procedures.

The Arbitron design draws a sample of listed telephone households from the MMAC data base and supplements this sample with a form of random digit dialing, called Expanded Sample Frame, to develop a designated sample of "potential" unlisted telephone households. The actual MMAC data base serves as the frame for Arbitron's listed telephone sample while a modified form of RDD is used to generate "potential" unlisted telephone households using the MMAC data base as a starting point. The Arbitron frame is, therefore, actually the sum of two separabe sub-frames which are mutually exclusive. The "Listed" Frame and the "Not-Listed" Frame are sampled at differential rates to produce the designated sample.

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October/November/December 1984
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P.	Number of households in sample .:	1,497	662 (G/K) (estimate)

Note 1:
BIRCH Co-Op Rate = G/D
Arbitron Co-Op Rate= G/F

Note 2:
BIRCH Response Rate = G/B
Arbitron Response Rate= (H*I*J) or (G/M)

DNA= Does Not Apply

The design difference that should be highlighted here is that Arbitron uses known listed telephone households within their designated sample. By dialing known listed telephone households, the Arbitron contact rate will be higher due to the efficiency of the sample. The Birch TTF technique will be less efficient with respect to developing high contact rates due to the randomness of the telephone numbers included in the sample. While Arbitron does not provide "Hit Rate" statistics, it is anticipated that the Arbitron "Hit Rate" (See line N) would be dramatically higher than the corresponding BIRCH statistic. This observation would be expected when comparing an RDD sample vs a partially listed sample such as that employed by Arbitron.

Sample Selection:

The first stage of sampling used by both services is the selection of a telephone household. The BIRCH design utilizes a second stage which requires the random selection within that household of a single member aged 12 or older. The Arbitron design calls for "household flooding" where the household serves as a sampling cluster which includes all people, aged 12 and older. Under the Arbitron design, fewer households are needed in the designated sample as all people within that household become eligible for the sample each receiving a diary in which to record their responses.

Result: The BIRCH design requires that a larger designated sample be drawn as only one member per household is selected to participate.

The Arbitron design allows for a smaller sample to be drawn as each member in the household is eligible to participate. On the average, between 2.3 and 2.6 persons per household participate in the Arbitron sample.

BIRCH and Arbitron, by design, draw sample geographically using historical response rates by county or sample unit so that each unit will be as near to proportionately represented in the final sample as possible. Disproportionate return upon analysis of the final sample is handled by both services utilizing a Sample Balancing scheme which compensates for age/sex/race/geography, in the case of Arbitron, and age/sex/race/geography by daypart probability of selection/ day of week, for Birch.

Appendix B

Appendix B contains a complete market analysis for the BIRCH Market of New Orleans, Louisiana for the Fall of 1984. Each interviewer's work has been classified as to type of contact for purposes of performance classification. The counts and resulting calculations reported for BIRCH and found in Table 1 originated from this Appendix B Table.

Columns B through I are the actual counts of contacts by disposition. Column A is the sum of columns B through I which amounts to the Total Numbers Dialed by each interviewer.

Column J is a sum of all contacts. Column K is a sum of all contacts minus non-residential numbers, such as businesses, that were encountered by the interviewers.

Column L(1) is the resultant CONTACT RATE as determined by:

-> (contacts - non residences) / Residential Listings IN Designated Sample

Column L(2) calculates "HIT RATE" by:

-> (Contacts - N.R.) / Total Listings in Des. Sample

Column M presents the CO-OPERATION RATE derived by:

-> (completed interviews) / (contacts - non residences)

Column N shows RESPONSE RATE which was calculated by:

-> (Completed Interviews) /
((contacts - non residences) + (.3 X No Answers))

Column O is the sum of all contacts less no-answers and is used for the purpose of calculating interviewer performance rates based on all possible types of contacts. This enables the BIRCH Supervisors to locate problems that any interviewer might have with certain kinds of contacts. These problems are brought to the attention of the BIRCH interviewer during the course of regular critiques.

An examination of columns P(1) through P(10) shows a consistency with respect to interviewer performance on a monthly basis.

SEE FOLLOWING TABLE - APPENDIX B

Appendix B

New Orleans, La.
Oct/Nov/Dec 1984
BIRCH Radio Sample Statistics

	B:I A	B	C	D	E	G
Interviewer:	# dialed	no answer	non-working	non-residence	language barrier	refusal
October:						
Larrieu	380	60	98	29	8	24
Robinson	639	135	87	24	12	64
Butler	394	77	101	42	6	31
Oct. Totals	1413	272	286	95	26	119
November:						
Larrieu	400	63	103	42	8	27
Robinson	608	98	84	21	11	75
Butler	324	53	71	41	3	15
Nov. Totals	1332	214	258	104	22	117
December:						
Larrieu	376	58	104	35	7	20
Robinson	571	74	61	51	25	57
Butler	323	46	82	26	7	7
Dec. Totals	1270	178	247	112	39	84
Oct/Nov/Dec	4015	664	791	311	87	320

Appendix B...continued
New Orleans, La.
Oct/Nov/Dec 1984
BIRCH Radio Sample Statistics
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H	*I*	D:I	J-D	K/ (K+(.3*B)	I/K	I/(K+(.3*B)
		J	K	L	M	N
early terminate	COMPLETED INTERVIEW	sum of contacts	contacts less N.R.	CONTACT RATE	CO-OP RATE	RESPONSE RATE
35	126	222	193	91.5%	65.3%	59.7%
65	252	417	393	90.7%	64.1%	58.1%
19	118	216	174	88.3%	67.8%	59.9%
119	496	855	760	90.3%	65.3%	58.9%
31	126	234	192	91.0%	65.6%	59.7%
67	252	426	405	93.2%	62.2%	58.0%
19	122	200	159	90.9%	76.7%	69.8%
117	500	860	756	92.2%	66.1%	61.0%
26	126	214	179	91.1%	70.4%	64.2%
51	252	436	385	94.5%	65.5%	61.9%
32	123	195	169	92.5%	72.8%	67.3%
109	501	845	733	93.2%	68.3%	63.7%
345	1497	2560	2249	91.9%	66.6%	61.1%

Appendix B...continued

New Orleans, La.
Oct/Nov/Dec 1984
BIRCH Radio Sample Statistics
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C:I O	A/O P(1)	B/O P(2)	C/O P(3)	D/O P(4)	E/O P(5)	G/O P(6)
Sum of C:I	# dialed % of O	no-ans. % of O	non-wk. % of O	non-res. % of O	lang. bar. % of O	refusal % of O
320	118.8%	18.8%	30.6%	9.1%	2.5%	7.5%
504	126.8%	26.8%	17.3%	4.8%	2.4%	12.7%
317	124.3%	24.3%	31.9%	13.2%	1.9%	9.8%
1141	123.8%	23.8%	25.1%	8.3%	2.3%	10.4%
337	118.7%	18.7%	30.6%	12.5%	2.4%	8.0%
510	119.2%	19.2%	16.5%	4.1%	2.2%	14.7%
271	119.6%	19.6%	26.2%	15.1%	1.1%	5.5%
1118	119.1%	19.1%	23.1%	9.3%	2.0%	10.5%
318	118.2%	18.2%	32.7%	11.0%	2.2%	6.3%
497	114.9%	14.9%	12.3%	10.3%	5.0%	11.5%
277	116.6%	16.6%	29.6%	9.4%	2.5%	2.5%
1092	116.3%	16.3%	22.6%	10.3%	3.6%	7.7%
3351	119.8%	19.8%	23.6%	9.3%	2.6%	9.5%

Appendix B...continued
New Orleans, La.
Oct/Nov/Dec 1984
BIRCH Radio Sample Statistics
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H/O P(7) early term. % of O	I/O P(8) completes % of O	J/O P(9) contacts % of O	K/O P(10) contacts less N.R. % of O	K/A L(2) HIT RATE
10.9%	39.4%	69.4%	60.3%	50.8
12.9%	50.0%	82.7%	78.0%	61.5
6.0%	37.2%	68.1%	54.9%	44.2
10.4%	43.5%	74.9%	66.6%	53.8
9.2%	37.4%	69.4%	57.0%	48.0
13.1%	49.4%	83.5%	79.4%	66.6
7.0%	45.0%	73.8%	58.7%	49.1
10.5%	44.7%	76.9%	67.6%	56.8
8.2%	39.6%	67.3%	56.3%	47.6
10.3%	50.7%	87.7%	77.5%	67.4
11.6%	44.4%	70.4%	61.0%	52.3
10.0%	45.9%	77.4%	67.1%	57.7
10.3%	44.7%	76.4%	67.1%	56.0

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