

```
options ps=60 ls=100 nonumber nodate;  
DATA onerep;  
INPUT Plot Entry Name$ Block TSW;  
datalines;
```

101	8	31	1	9.25
102	45	126	1	9.43
103	90	MF183	1	10.30
104	9	34	1	9.02
105	27	89	1	10.97
106	28	90	1	10.52
107	89	Ross	1	9.86
108	42	121	1	10.56
109	18	68	1	10.39
110	14	57	1	10.97
111	41	118	1	10.32
112	91	Starlight	1	10.44
113	31	96	2	11.58
114	3	15	2	9.95
115	90	MF183	2	9.24
116	36	105	2	10.27
117	44	125	2	9.34
118	30	95	2	11.01
119	5	27	2	10.05
120	13	47	2	9.84
121	7	30	2	8.81
122	91	Starlight	2	9.40
123	11	39	2	10.98
124	89	Ross	2	9.18
125	24	77	3	10.35
126	34	102	3	11.01
127	50	149	3	9.39
128	49	143	3	9.30
129	4	23	3	10.31
130	89	Ross	3	10.32
131	20	71	3	10.86
132	2	12	3	9.86
133	35	104	3	8.29
134	19	70	3	10.54
135	90	MF183	3	10.27
136	91	Starlight	3	10.50
137	47	135	4	11.15
138	32	100	4	9.63
139	16	61	4	10.35
140	22	74	4	10.40
141	89	Ross	4	10.06
142	48	141	4	9.91
143	40	113	4	10.88
144	90	MF183	4	10.02
145	15	58	4	9.84
146	23	75	4	11.34
147	1	9	4	10.72
148	91	Starlight	4	10.61
149	6	28	5	9.60
150	12	44	5	10.53
151	89	Ross	5	9.48
152	43	123	5	10.27
153	39	111	5	10.85

154	29	92	5	10.64
155	38	110	5	10.76
156	37	109	5	10.73
157	91	Starlight	5	9.92
158	10	35	5	10.05
159	21	72	5	10.29
160	90	MF183	5	10.40
161	91	Starlight	6	10.15
162	89	Ross	6	10.44
163	25	85	6	10.85
164	46	132	6	9.52
165	90	MF183	6	10.14
166	26	87	6	10.73
167	33	101	6	9.24
168	17	66	6	8.79

;

```

PROC GLM data=onerep;
TITLE 'Fixed genotype model using GLM';
CLASS block entry;
MODEL TSW=block entry/solution;
RANDOM block/test;
OUTPUT OUT=resplots R=resTSW P=predTSW;
RUN;

```

```

PROC PLOT data=resplots;
TITLE 'Augmented Design Residual Plot';
PLOT resTSW*predTSW=entry;
RUN;

```

```

PROC MIXED data=onerep;
TITLE 'Mixed Model Augmented Design - new entries fixed';
CLASS block entry;
MODEL TSW=entry/solution;
RANDOM block/solution;
LSMEANS entry/pdiff adjust=tukey;
LSMEANS entry/pdiff=CONTROLU('91') adjust=dunnett;
ods output lsmeans=TSWadj diffs=TSWpdiff;

```

```

PROC MIXED data=onerep;
TITLE 'Reduced model without blocks';
CLASS entry;
MODEL TSW=entry;
RUN;

```

```

DATA PROB;
/*calculate chi-square as difference between -2 Res Log Likelihood for the
full and reduced models and insert into chiprob function*/
/*divide by two to test that variance among blocks is >0*/
chiprob=(1-probchi(6.7, 1))/2;
RUN;

```

```

PROC PRINT;
RUN;

```

```
/*prepare the dataset to run a mixed model analysis with new entries random*/
```

```
DATA arcdbd;  
set onerep;  
if(entry>50) then new=0;  
else new=1;  
if(new) then entryc=999;  
else entryc=entry;  
RUN;
```

```
PROC GLM data=arcdbd;  
TITLE 'ANOVA for mixed model using GLM';  
CLASS block entry entryc;  
MODEL TSW=block entryc entry*new/solution;  
RANDOM block/test;  
LSMEANS entryc/stderr;  
RUN;
```

```
PROC MIXED data=arcdbd;  
TITLE 'Mixed Model Augmented Design - new entries random';  
CLASS block entry entryc;  
MODEL TSW=entryc/solution;  
RANDOM block entry*new/solution;  
LSMEANS entryc;  
ods output solutionr=eblups;  
RUN;
```

```
QUIT;
```