

PRACTICAL
RADIO RANGE
DATA

T. "PRE" BALE DAL-AG

CONDENSED MILEAGE AND ALTITUDE CHART
SAVANNAH TO FORT WORTH

Savannah Alt 42'

26 Springfield

58-32 Sylvania

90-64-82 Shell Bluff

113-87-55-23 Augusta Alt 420'

Note: Augusta to Atlanta to Fort Worth
same as Charleston to Fort Worth

ATLANTA TO CINCINNATI VIA KNOXVILLE

Atlanta Alt 985'

46 Etowah River

83-37 Blue Ridge

131-85-48 Little Tennessee River

151-105-68-20 Knoxville Alt 972'

Knoxville Alt 972'

26 Norris

64-38 Williamsburg

103-77-39 Livingston

136-110-72-33 Richmond

162-136-98-59-26 Lexington

201-175-137-98-65-39 Talmouth

231-205-167-128-95-69-30 Cincinnati Alt 481'

Cincinnati Alt 481'

CONDENSED ITINERARY AND ALTITUDE CHART
ATLANTA TO CINCINNATI VIA CHATTANOOGA,
KNOXVILLE, LOUISVILLE

Atlanta Alt 985'
20 Super Fan Harbor
60-40 Adairville Harbor
83-63-23 Dalton
105-85-45-23 Chattanooga Alt 670'
158-138-98-75-53 Manchester Field Alt 1090'
192-172-138-109-87-34 Harpersboro
214-194-154-131-109-86-82 Nashville Alt 600'

Nashville Alt 600'
24 Gallatin Alt 357'
70-46- Smith's Cross Alt 637'
120-96-43-23 Clarkdale Alt 701'
157-137-88-68 Louisville Alt 546'
212-192-147-92-35 Warsaw Alt 485'
231-207-161-111-74-19 Union Fan Harbor
251-227-181-131-84-39-20 CC Alt 481'

CONDENSED ITINERARY AND ALTITUDE CHART
ATLANTA TO CINCINNATI VIA CHATTANOOGA,
KNOXVILLE, KNOXVILLE,
SMITHVILLE, KNOXVILLE, LOUISVILLE

Atlanta Alt 985'
20 Super Fan Harbor
60-40 Adairville Harbor
83-63-23 Dalton
105-85-45-23 Chattanooga Alt 670'
138-118-70-55-33 Dalton
173-153-113-90-68-35 Smoky Gap Intersectio
210-190-150-127-105-72-37 Knoxville Alt 97'

Knoxville Alt 972'
37 Smoky Gap Intersection
63-26- Greenville Alt 1640'
102-85-39-Smithville Alt 1054'
153-116-90-51 Nashville Alt 600'

Nashville Alt 600'
Nashville to Cincinnati same as Atlanta
to Cincinnati via Chattanooga, Nashville,
Louisville.

NAVIGATION NOTES

#40 - 1.50

10-11-12
13-14-15
16-17-18
19-20-21
22-23-24
25-26-27
28-29-30

APPROXIMATE "S" & "N" OF THE CENTER
OF THE CONTINENTAL PLATE

90° Longitude

- 1. For location of CROSS SECTION
- 2. APPROXIMATE BEARING FOR EACH POINT
- 3. LONG TO LONG ALTITUDE TO BEING
- ALTITUDE TO BEING
- 4. LONG TO LONGITUDE 770° E. AND
- 90° E. BEING AN ANGLE.

PLATE - 70 LAT - 14 20

CONDENSED ELEVATION AND DISTANCE CHART
CHARLESTON TO FORT MONROE

Charleston Altitude 40'
13 Summerville
37-39 Holly Hill
48-50-11 Farrier Field Alt. 267'
58-56-31-20 St Matthews
73-81-56-45-25 Columbia Alt 202'
122-120-85-74-34-29 Steedman
113-131-106-95-75-50-33 Aiken
163-151-126-115-95-70-41-20 Augusta Alt 4
170'
Augusta Alt 120'
27 Thomson
50-23 Crawfordville
62-35-12- Silcox Field Alt 654'
63-36-33-21 Madison
105-79-55-43-32 Covington
119-52-59-57-36-14 Site # 1
138-111-68-76-55-33-17 Atlanta Alt 985'
Atlanta Alt 985'
35 Carrollton
69-10 Tallapoosa Alt 1220'
67-29-19 Heflin
83-45-15-16 Jonistown Alt 530'
107-69-59-48-24 Pell City
136-93-69-69-53-29 Birmingham Alt 610'

CORRECTED TEMPERATURE AND ALTITUDE CORRECTION

CHANGING TO FORT WORTH DATA

Birmingham Alt 610'
 33 Toledo
 55-22 Tuscaloosa Alt 173'
 93-65-43 Gainesville Alt 174'
 114-131-55-46 Meridian Alt 310'
 147-154-132-69-43 Forrest Alt 512'
 230-157-175-132-80-43 Jackson Alt 300'

Jackson Alt 300'
 37 Vicksburg
 55-18 Tallulah Alt 85'
 76-39-21 Delhi
 108-71-53-38 Bayou Alt 71'
 122-104-87-66-30 Austin
 155-114-100-79-47-13 Arcadia Alt 343'
 181-141-125-106-75-39-24 Minden
 208-171-153-130-100-66-53-27 RM Alt 174'

Shreveport Alt 174'
 34 Marshall
 57-21 Longview
 87-51-34 Healds A It 520'
 113-77-51-26 Grand Saline
 134-60-77-47-21 White Point Alt 520'
 159-123-103-73-46-25 Forney
 182-116-125-95-69-48-23 Dallas Alt 475'

Dallas Alt 475'
 30 Fort Worth Alt 690'

EMERGENCY DATA HAYDEN POWER

ENGINE TEST: 45½" at 2500 RPM
 Do not test mag above 30"

MAXIMUM POWER FOR EXTENDED OPERATION

1000 HP at 2300 RPM
 MP for 1000 HP shown on Data Card 20
 (Section 5320-C of Operations Manual)
 Mixture "Take-Off and Climb" or richer
 NOTE: 1000 HP cannot be obtained at 2300
 RPM above 6900' (Density Altitude)

EMERGENCY POWER

1200 HP at 2900 RPM
 MP for 1200 HP is 45½" at S.L.
 Mixture "Take-Off and Climb" or richer

EXTREME EMERGENCY POWER

2500 RPM
 MP just under that at which deterioration
 occurs - with a reduction to 45½" or
 less as soon as possible.
 Mixture "Emergency Rich"

TURNS WHEN OPERATING ON ONE ENGINE

1. Should be shallow in either direction
 if power being used is relatively low.
2. Should be shallow and toward operation

DOUGLAS DC-3 CRUSA
EMERGENCY DATA MAXIMUM RANGE

EMERGENCY RANGE GAIN AIR
Use IAS of 117 MPH

Use:	1300 RPM @ 400 HP
	1475 RPM @ 450 HP
	1625 RPM @ 500 HP
	1800 RPM @ 550 HP
	1950 RPM @ 600 HP
	2000 RPM @ 625 HP
	Mixture "Cruise"

EXTREME EMERGENCY RANGE GAIN AIR
Use IAS of 117 MPH

Use minimum combination of RPM and HP at which 117 MPH and no deterioration occur with mixture at "Cruise". If deterioration occurs with a particular combination increase RPM and decrease HP rather than increasing IAS or richening mixture.

EMERGENCY RANGE OTHER THAN GAIN AIR

For Adverse Winds speed should be increased somewhat.

For Favorable Winds speed should be decreased slightly.

POWER CHART EXTRACTS

DC-3-203A

Standard

ALT	STD	Climb At 50HP	Cruise 50HP	Cruise 50 HP	Cruise 50 HP
0	59	289	27.0	27.2	27.4
1000	55	289	26.6	26.8	27.1
2000	52	289	26.3	26.5	26.8
3000	48	289	26.0	26.2	26.5
4000	45	274	25.7	25.9	26.2
5000	42	274	25.4	25.6	25.9
6000	38	274	25.1	25.3	25.6
7000	34	274	24.8	25.0	25.3
8000	30	26	24.5	24.7	25.0
9000	27	26	24.2	24.4	24.8
10000	23	26	23.9	24.1	24.5
11000	20	26	23.7	23.9	24.3
12000	16	26	23.5	23.7	24.0

Correction for Temp. If outside air is warmer than Std. add 0.3" for each 20°
 If outside air is colder than Std., subtract 0.3" for each 20°.

In Cruise Tables above 1" more manifold pressure than shown raises power to 50 HP
 1" less manifold pressure lowers power to 50 HP

~~LOCKED 100 RPM 5
 TRUE AIR SPEED~~

ALT	STD	50HP	50HP	50HP
0	59	152	155	158
1000	54	151	154	157
2000	50	149	153	156
3000	46	148	152	155
4000	42	146	150	153
5000	38	145	149	152
6000	34	143	147	150
7000	30	142	146	149
8000	26	141	145	148
9000	22	140	144	147
10000	18	139	143	146
11000	14	138	142	145
12000	10	137	141	144

~~NOTE: At 245 at 205 HP is 161 MPH
 " " 250 " " 169 "
 " " 275 " " 176 "~~

~~NOTE: Speeds at 237½ HP and 207½ HP may be obtained by interpolation~~

DOUGLAS DC-3-2202A
 TYPE III 1940

CONDENSED HP CHART
 LOCKHEED-ROB R975 E3

Alt.	514	500HP	550HP	600HP
0	170	173	177	181
1000	170	173	177	181
2000	170	173	177	181
3000	170	173	177	181
4000	170	173	177	181
5000	170	173	177	181
6000	170	173	177	181
7000	170	173	177	181
8000	170	173	177	181
9000	170	173	177	181
10000	170	173	177	181
11000	170	173	177	181
12000	170	173	177	181
13000	170	173	177	181

NOTE: Av. T.A.B. at 500 HP is 164 MPH
 " " " 550 HP " 173 MPH
 " " " 600 HP " 181 MPH

NOTE: Speeds at 500 and 575 HP MAY
 BE OBTAINED BY INTERPOLATION.

250 HP AT	1900 RPM	ALT	TEMP	MP	TAS
0	59	26.6	161		
1000	55	26.3	163		
2000	52	26.0	165		
3000	48	25.7	167		
4000	45	25.4	169		
5000	41	25.1	170		
6000	38	24.8	172		
7000	34	24.5	173		
8000	30	24.3	175		
9000	27	24.1	176		
10000	23	23.9	178		

Corr to 10' for above than 50' Temp. 3° per
 1000 ft. 1000' for other than 575 Temp. 5° per
 1000' for 1" more 10' plus 15 ft.
 Corr for 1" less 10' less 15 ft.

CONDENSED H.P. CHART

DOUGLAS DC-3 G202A

550 H.P. AT 1900 RPM

ALT	TEMP	MP	TAS
0	59 ^W	27.2	165
1000	55 ^W	26.8	167
2000	52 ^W	26.5	168
3000	48 ^W	26.2	169
4000	45 ^W	25.9	171
5000	41 ^W	25.6	172
6000	38 ^W	25.3	173
7000	34 ^W	25.0	174
8000	30 ^W	24.7	176
9000	27 ^W	24.4	177
10000	23 ^W	24.1	178

* to HP for other than Std temp, 3% per 1000 ft p.
 * to HP for other than Std temp 10 HP per 200 ft.
 * for 1" more HP plus 30 HP
 * for 1" less HP minus 30 HP

FAA DATA - 18 - Revised 4-3-61

CONDENSED TIMES AND DISTANCE CHART

Chart 1

CHARLESTON - LEXINGTON PORT TOWN

Course Airport to Airport

Stations	Westbound		Eastbound		Dist
	True	Mag	True	Mag	
CH-CE	303	304	243	244	93
CE-YD	239	239	99	60	70
SL-YD	300	300	152	152	113
YD-AD	275	275	76	95	130
SL-SE	308	308	88	88	139
SL-EL	234	239	54	49	164
SL-LR	290	284	90	84	86
JA-AD	277	270	97	90	207
CE-LE	273	264	91	84	200
CE-OL	277	268	97	88	182
CE-PT	287	278	87	78	30

Chart 2

ATLANTA - MCKEVILLE - LEXINGTON - CHARLESTON

Course Airport to Airport

Station	Westbound		Eastbound		Dist
	True	Mag	True	Mag	
AT-LE	9	8	180	180	15
LE-LR	350	350	170	170	14
LR-CC	2	2	182	182	9
AT-ATL	218	218	147	147	34
ATL-ATL	9	9	139	139	11
ATL-ATL	218	218	200	200	34

ALTA - ROUTE ALT 2

Alternate Route

Smith's Grove² Chattanooga² Nashville²
 Smith's Grove² Louisville² Cincinnati

Course Airport to Airport

Station	Northbound		Southbound		Dist.
	True	Mag	True	Mag	
100	338	334	158	155	110
101	300	297	130	117	32
102	324	321	144	141	50
103	21	17	201	197	66
104	21	19	201	199	69
105	49	49	229	229	94

Alternate Route

Atlanta² Emory Gap² Knoxville² Smithville²
 Nashville² Smith's Grove² Louisville²
 Cincinnati

Course Airport to Airport

Station	Northbound		Southbound		Dist.
	True	Mag	True	Mag	
100	338	335	158	154	110
101	308	304	28	26	64
102	97	96	273	273	35
103	274	272	94	92	102
104	201	200	101	98	48
105	21	17	201	197	66
106	21	19	201	199	69
107	49	49	229	229	94

Emory Gap Intersection

ALTA

T M T M

ALTA	333	335	154	153	110
ALTA	307	304	147	146	63
ALTA	18	20	198	198	64
ALTA	18	20	198	198	64
ALTA	343	345	143	145	142
ALTA	303	305	143	145	142
ALTA	348	350	148	150	147
ALTA	348	350	148	150	147

APPROVED COURSE FOR BIRM. CL. SURVEY

ALTERNATES ATLANTA

Alternates	Mileage	Heading	Range	Freq.
Alma	190	141	240	km.
Chattanooga	110	338	341	"
Jacksonville	270	143	344	"
Nashville	220	320	304	"
Spartanburg	170	57	245	"
Knoxville	180	9	257	"
Macon	80	127	385	"
Montgomery	140	229	270	"

	T	N	M	S	M	MILE
AG. VD	276	134	96	96		138
FD. JA	224	227	152	152		112
SH. JA	11	12	191	192		11.5
JA. OB	328	328	158	158		90
OB. BU	328	328	158	158		77
BU. W2	328	328	158	158		108
W2. MM	201	201	179	179		60

ALTIMETERS *Augusta*

Alternate	Mileage	Reading	Range	Freq.
Aims, Ga.,	188	191		342 kcs.
Spartanburg	100	2	248 & 234	"
Florence	148	69		239 "
Savannah	118	181		228 "
Jacksonville	818	172	244 & 234	"
Macon	100	242		385 "

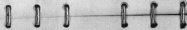
	Reading	Distance	Miles	Freq.	
GA - CA	10"	19"	10	2000	4
CA - 10000	200"	14"	8	1000	5
CA - 1000	300"	14"	7	1000	5
GA - 1000	250"	13"	7	1000	5
GA - 1000	210"	13"	7	1000	5
GA - 1000	200"	13"	7	1000	5
GA - 1000	200"	13"	7	1000	5
GA - 1000	200"	13"	7	1000	5
GA - 1000	200"	13"	7	1000	5
GA - 1000	200"	13"	7	1000	5

CG 10.3	312"	13"	1000 - 201	1000 - 219
109.9	Y	0		
KA - 100.3	200"	1	1000 - 201	1000 - 219

ALTERNATES

BIRMINGHAM

Alternates	Mileage	Heading	Range Freq.
Chattanooga	140	37	341 kcs.
Macon	215	Via MO	305 "
Montgomery	98	156	278 "
Mobile	220	197	240 "



REPLACEMENTS - 8-27-41

Alt.	Mileage	Heading	Range	Frequency
Chatt.	140	37	341	kcs.
Macon	215	Via MO	305	"
Montg.	98	156	278	"
Mobile	220	197	240	"

Route	Mileage	Mag. Reading	Range
Alma, Ga.	100	238	240
Jacksonville	310	195	244
Spartanburg	185	325	248
Florence	95	14	239
Savannah	95	227	233
Raleigh	315	81	250
Knocn	265	268	205

ALTERNATE-CHARLESTON

Alternate	Mileage	Mag. Reading	Range	Feet
Alma, Ga.,	100	238	240	300.
Jacksonville	310	195	244	"
Spartanburg	185	325	248	"
Florence	95	14	239	"
Savannah	95	227	233	"
Raleigh	315	81	250	"
Knocn	265	268	205	"

ALTERNATE COLUMBIA

Alternate	Mileage	Reading	Range	Freq.
	190	304	342	kon.
Alma, Ga.	250	189	344 &	236 "
Jacksonville	85	321	240 &	234 "
Spartanburg	70	79		235 "
Florence	133	182		233 "
Savannah	180			250 "
Raleigh	170	240		245 "
Macon				

WATERBURY	160	200	240	212	"
WATERBURY	180	241		242	"
WATERBURY	210	0		243	"
WATERBURY	240	281		244	"
WATERBURY	270	182		245	"
WATERBURY	280	180		241	"
WATERBURY	280	180		242	"
WATERBURY	240	180		243	"
WATERBURY	240	180		244	"
WATERBURY	240	180		245	"
WATERBURY	240	180		246	"
WATERBURY	240	180		247	"
WATERBURY	240	180		248	"
WATERBURY	240	180		249	"
WATERBURY	240	180		250	"
WATERBURY	240	180		251	"
WATERBURY	240	180		252	"
WATERBURY	240	180		253	"
WATERBURY	240	180		254	"
WATERBURY	240	180		255	"
WATERBURY	240	180		256	"
WATERBURY	240	180		257	"
WATERBURY	240	180		258	"
WATERBURY	240	180		259	"
WATERBURY	240	180		260	"
WATERBURY	240	180		261	"
WATERBURY	240	180		262	"
WATERBURY	240	180		263	"
WATERBURY	240	180		264	"
WATERBURY	240	180		265	"
WATERBURY	240	180		266	"
WATERBURY	240	180		267	"
WATERBURY	240	180		268	"
WATERBURY	240	180		269	"
WATERBURY	240	180		270	"
WATERBURY	240	180		271	"
WATERBURY	240	180		272	"
WATERBURY	240	180		273	"
WATERBURY	240	180		274	"
WATERBURY	240	180		275	"
WATERBURY	240	180		276	"
WATERBURY	240	180		277	"
WATERBURY	240	180		278	"
WATERBURY	240	180		279	"
WATERBURY	240	180		280	"
WATERBURY	240	180		281	"
WATERBURY	240	180		282	"
WATERBURY	240	180		283	"
WATERBURY	240	180		284	"
WATERBURY	240	180		285	"
WATERBURY	240	180		286	"
WATERBURY	240	180		287	"
WATERBURY	240	180		288	"
WATERBURY	240	180		289	"
WATERBURY	240	180		290	"
WATERBURY	240	180		291	"
WATERBURY	240	180		292	"
WATERBURY	240	180		293	"
WATERBURY	240	180		294	"
WATERBURY	240	180		295	"
WATERBURY	240	180		296	"
WATERBURY	240	180		297	"
WATERBURY	240	180		298	"
WATERBURY	240	180		299	"
WATERBURY	240	180		300	"

ALTERNATES FT. WORTH

Alternate	Mileage	Reading	Range Pres.
Big Spring, Tex.	268	253	336 mos.
Oklahoma City, Okla.	200	348	250 "
San Antonio, Tex.	250	187	224 "
Texarkana, Tex.	205	67	357 "
Vaco, Tex.	180	166	385 "
Abilene, Tex.	145	247	306 & 278v "
Ardmore, Okla.	110	357	262 "
Austin, Tex.	188	178	291 "
Vaco-Navasota, Tex.	104	130	278 "
Houston, Tex.	254	142	332 "
Amarillo, Tex.	240	274	248 "
Tulsa, Okla.	248	11	296 "

Wichita Falls, Tex.	700	710	710
Lawton, Okla.	55	291	291
Midland, Tex.	780	747	738
Fort Worth, Tex.	700	730	740
Dallas, Tex.	780	704	727 mos.

ALTERNATES MILEAGE READING RANGE PRES.

ALTERNATES

ALTERNATES

ALTERNATES

JACKSON

Alternate	Mileage	Heading	Range Freq.
Memphis	195	357	371 kcs.
Mobile	180	130	248 "
New Orleans	163	171	338 "
Greenwood, Miss.	88	337	281 "
Tylertown, Miss.	100	170	278 "

MEMPHIS	195	357	371
MOBILE	180	130	248
NEW ORLEANS	163	171	338
GREENWOOD	88	337	281
TYLERTOWN	100	170	278

MEMPHIS	195	357	371
MOBILE	180	130	248
NEW ORLEANS	163	171	338
GREENWOOD	88	337	281
TYLERTOWN	100	170	278

MEMPHIS MISSISSIPPI

ALTERNATE MERIDIAN

Alternate	Mileage	Reading	Range. Feet.
Memphis	200	334	371 hca.
Mobile	185	186	248 "
New Orleans	180	199	330 "
Greenwood, Miss	115	308	281 "
Tylertown, Miss	180	315	278 "

Memphis	200	334	371 hca.
Mobile	185	186	248 "
New Orleans	180	199	330 "
Greenwood, Miss	115	308	281 "
Tylertown, Miss	180	315	278 "

MEMPHIS MISSISSIPPI

ALTERNATES *SURVEY REPORT*

<u>Alternates</u>	<u>Mileage</u>	<u>Reading</u>	<u>Range Feet.</u>
Little Rock, Ark.	100	28	270 100
Texarkana, Tex.	70	240	329 "
Marion, Tex.	305	215	270 "
Houston, Tex.	228	196	222 "
Waco, Tex.	215	242	305 "

MIRAGE SCALE AS to RH

TC-Mirage 50
Var. E. E.

TC-Mirage 50
Var. S. E.

	AC	HI	TA	AN	PC	LE	RH
AC	0	17	47	82	107	132	134
HI	17	0	20	65	90	106	117
TA	47	20	0	35	60	75	87
AN	82	65	35	0	25	40	52
PC	107	90	60	25	0	15	27
LE	132	106	75	40	15	0	12
RH	134	117	87	52	27	12	0

88854
 78300-
 78300-
 78300-
 78300-
 78344-
 78344-
 78346-
 33347-
 15748-
 15849-
 50
 70751-
 52

UNIFORM SCALE 8H to 8M

TC-East- 224
Var. 4 E.

TC-West- 224
Var. 4 E.

	8H	8A	8U	8O	8Y	8M	100	100
8H	0	32	63	83	97	143	100	100
8A	32	0	21	51	65	111	140	140
8U	63	21	0	20	44	90	109	109
8O	83	51	20	0	14	60	65	100
8Y	97	65	44	14	0	44	47	70
8M	143	111	90	60	44	0	0	0

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MILEAGE SCALE HI to JA (Direct)

TC-East 442

Var. 5 K.

TC-East- 543

Var. 5 K.

	HI	RI	TU	AV	SE	PH	WO	EE	JA
HI	0	41	58	84	112	140	170	195	210
RI	41	0	14	48	71	107	129	154	177
TU	58	14	0	31	57	83	112	140	163
AV	84	48	31	0	26	62	84	109	132
SE	112	71	57	26	0	36	58	83	104
PH	140	107	83	62	36	0	22	47	70
WO	170	129	112	84	58	22	0	25	38
EE	195	154	140	109	83	47	25	0	23
JA	210	177	163	132	104	70	38	23	0

24	290	277	26	73	50	0
04	41	58	84	112	0	41
21	58	14	31	0	74	50
20	84	48	3	70	47	30
17	112	71	57	26	36	77
14	140	107	83	62	22	70
11	170	129	112	84	58	22

MILEAGE SCALE HI to JA (Direct)

0 170 2 72 200 380 5 120 2000 2 5

MILEAGE SCALE UM to JA

TC-East- 90
Var. 4 M.

TC-West- 870
Var. 4 M.

	UM	ME	PO	PE	JA
UM	0	24	43	61	85
ME	24	0	19	37	61
PO	43	19	0	18	48
PE	61	37	18	0	24
JA	85	61	48	24	0

100	100	100	100	100	100	100	100	100
101	101	101	101	101	101	101	101	101
102	102	102	102	102	102	102	102	102
103	103	103	103	103	103	103	103	103
104	104	104	104	104	104	104	104	104
105	105	105	105	105	105	105	105	105
106	106	106	106	106	106	106	106	106
107	107	107	107	107	107	107	107	107
108	108	108	108	108	108	108	108	108
109	109	109	109	109	109	109	109	109
110	110	110	110	110	110	110	110	110
111	111	111	111	111	111	111	111	111
112	112	112	112	112	112	112	112	112
113	113	113	113	113	113	113	113	113
114	114	114	114	114	114	114	114	114
115	115	115	115	115	115	115	115	115
116	116	116	116	116	116	116	116	116
117	117	117	117	117	117	117	117	117
118	118	118	118	118	118	118	118	118
119	119	119	119	119	119	119	119	119
120	120	120	120	120	120	120	120	120

TC-East- 90
Var. 4 M.

TC-West- 870
Var. 4 M.

MILEAGE SCALE UM to JA

170x6 472050 480 4 85M103538 0

MILEAGE SCALE JA to UO

TC-Inst-17

Ver. 3 E.

TC-Inst-277

Ver. 3 E.

	JA	KB	YB	TA	DK	RA	UO
JA	0	23	26	54	75	90	107
KB	23	0	15	31	52	67	84
YB	26	15	0	16	37	52	69
TA	54	31	16	0	21	36	53
DK	75	52	37	21	0	15	32
RA	90	67	52	36	15	0	17
UO	107	84	69	53	32	17	0

17	26	27	28	39	7
17	21	22	23	0	20
20	27	28	0	20	28
27	27	0	24	24	27
28	27	24	27	27	28

TC-Inst-17
Ver. 3 E.

TC-Inst-277
Ver. 3 E.

MILEAGE SCALE JA to UO

170 2 72020 790 6 08712324 4

MILEAGE SCALE KM to TY

TC- West- 74
Var. 8 K.

TC- West- 354
Var. 8 K.

	KM	JO	MA	LV	KI	TY
KM	0	21	35	50	66	78
JO	21	0	14	27	45	77
MA	35	14	0	23	31	63
LV	50	27	23	0	8	40
KI	66	45	31	8	0	32
TY	78	77	63	40	32	0

KM	78	77	63	40	32	0
KI	66	45	31	23	14	8
LV	50	27	23	14	8	0
MA	35	14	0	0	0	0
JO	21	0	0	0	0	0
TC	0	0	0	0	0	0

TC- West- 74
Var. 8 K.

TC- West- 354
Var. 8 K.

MILEAGE SCALE KM to TY

01 1752 23222 320 2 222222222 2

MILEAGE SCALE TY to DL

AC

AC - West- 104

Var. S E.

AC

AC - West- 204

Var. S E.

			TY	MM	CA	RR	FO	DL			
101	75					108	114	120	126	132	138
102	70		TY	MM	CA	RR	FO	DL	134	140	146
103	65	TY	0	23	30	35	40	45	50	55	60
104	60	MM	23	0	7	22	45	68	91	114	137
105	55	CA	30	7	0	25	38	61	84	107	130
106	50	RR	35	22	25	0	13	26	49	72	95
107	45	FO	40	45	38	13	0	23	46	69	92
108	40	DL	45	68	61	36	23	0	23	46	69

109	35					40	34	0			
110	30					0	0	20			
111	25					0	0	40			
112	20					0	0	60			
113	15					0	0	80			
114	10					0	0	100			
115	5					0	0	120			
116	0					0	0	140			

AC - West- 104
Var. S E.

AC - West- 204
Var. S E.

MILEAGE SCALE TY to DL

0 1702 07000 380 2 0000000000 0

TC-Route 27

Var. S E.

MILEAGE SCALE 27 to DL

TC-Route- 277

Var. S E.

2H	0	33	70	87	103	114	125	145	158	168
MA	33	0	35	52	68	79	100	113	123	147
GI	70	35	0	17	33	44	65	78	88	112
HW	87	52	17	0	16	27	48	61	71	95
MI	103	68	33	16	0	11	32	45	55	79
GS	114	79	44	27	11	0	21	34	44	68
WF	125	100	65	48	32	31	0	13	23	47
TE	145	113	78	61	45	34	13	0	10	34
FO	158	123	88	71	55	44	23	10	0	24
DL	168	147	112	95	79	68	47	34	24	0

2H	33	70	87	103	114	125	0
MA	0	35	52	68	79	100	33
GI	70	0	17	33	44	65	78
HW	87	52	0	16	27	48	61
MI	103	68	33	0	11	32	45
GS	114	79	44	27	0	21	34
WF	125	100	65	48	32	0	13
TE	145	113	78	61	45	34	0
FO	158	123	88	71	55	44	23
DL	168	147	112	95	79	68	47

TC-Route 277

TC-Route- 277

MILEAGE SCALE 27 TO DL

0110x2 972000 2074-4 0127102233

MIRAGE SCALE III to IV

TC - East - 07
Var. 10 E.

TC - West - 267
Var. 10 E.

	FV	MID	ML
FV	0.0	18.8	30.0
MID	18.8	0.0	16.8
ML	30.0	16.8	0.0

24 - 100 - 42

25 - 100 - 37

26 - 100 - 54

27	100	100	100	100	100	100	100	100	100
28	100	100	100	100	100	100	100	100	100
29	100	100	100	100	100	100	100	100	100
30	100	100	100	100	100	100	100	100	100
31	100	100	100	100	100	100	100	100	100
32	100	100	100	100	100	100	100	100	100
33	100	100	100	100	100	100	100	100	100
34	100	100	100	100	100	100	100	100	100
35	100	100	100	100	100	100	100	100	100
36	100	100	100	100	100	100	100	100	100
37	100	100	100	100	100	100	100	100	100
38	100	100	100	100	100	100	100	100	100
39	100	100	100	100	100	100	100	100	100
40	100	100	100	100	100	100	100	100	100
41	100	100	100	100	100	100	100	100	100
42	100	100	100	100	100	100	100	100	100
43	100	100	100	100	100	100	100	100	100
44	100	100	100	100	100	100	100	100	100
45	100	100	100	100	100	100	100	100	100
46	100	100	100	100	100	100	100	100	100
47	100	100	100	100	100	100	100	100	100
48	100	100	100	100	100	100	100	100	100
49	100	100	100	100	100	100	100	100	100
50	100	100	100	100	100	100	100	100	100

MIRAGE SCALE III to IV

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

MILAGE SCALE 40 to KI

IC-North-100
Var. A B

IC-South-100
Var. A B

	IC	KOS	IS.R	IC	MUR	76.M	KI
IC	0	28	46	64	101	133	151
KOS	28	0	20	38	75	108	125
IS.R	46	30	0	36	55	88	108
IC	64	58	38	0	17	48	67
MUR	101	75	55	17	0	31	50
76.M	133	108	88	48	31	0	19
KI	151	125	108	67	50	19	0

IC - 100 - 100
KOS - 100 - 100
IS.R - 100 - 100
IC - 100 - 100
MUR - 100 - 100
76.M - 100 - 100
KI - 100 - 100

IC - 100 - 100
KOS - 100 - 100
IS.R - 100 - 100
IC - 100 - 100
MUR - 100 - 100
76.M - 100 - 100
KI - 100 - 100

MILAGE SCALE 40 to KI

* MILEAGE SCALE KI to LI

TC-North-172

TC-South-172

Page 0

Page 0

	KI	KK	JL	JK	LO	KK	KY	LY
KI	0	30	35	67	91	123	124	124
KK	30	0	25	37	61	93	114	134
JL	35	25	0	12	36	68	89	109
JK	67	37	12	0	24	56	77	97
LO	91	61	36	24	0	32	53	73
KK	123	93	68	56	32	0	21	41
KY	124	114	89	77	53	21	0	20
LY	124	134	109	97	73	41	20	0

127
87

34

123
68

TC-North-172

0 1 2 3 4 5 6 7 8 9

MILEAGE GAIN IX to CC

TC-North-3
Var 0

TC-South-102
Var 0

	<u>IX</u>	<u>GY</u>	<u>FA</u>	<u>IR</u>	<u>CC</u>
IX	0	19	38	49	69
GY	19	0	19	30	50
FA	38	19	0	11	31
IR	49	30	11	0	20
CC	69	50	31	20	0

100-1000-1000 100-1000-1000

MILWAUKEE SCALE AG to CB

AG-North-335
Var 2.2

CB-South-155
Var 2.2

	AG	EM	CA	AD	DA	CB
AG	0	16	41	60	84	107
EM	16	0	25	44	68	89
CA	41	25	0	19	43	64
AD	60	44	19	0	24	47
DA	84	68	43	24	0	23
CB	107	89	64	47	23	0

AG	0	16	41	60	84	107
EM	16	0	25	44	68	89
CA	41	25	0	19	43	64
AD	60	44	19	0	24	47
DA	84	68	43	24	0	23
CB	107	89	64	47	23	0

AG	EM	CA	AD	DA	CB
----	----	----	----	----	----

AG
335

CB
155

MILWAUKEE SCALE

MILWAUKEE SCALE AG to CB

WILSON SCALE CH to SWI

NO-North-25
Top 1 E

NO-South-206
Top 1 E

	<u>CH</u>	<u>DAY</u>	<u>EG</u>	<u>SWI</u>
<u>CH</u>	0	29	51	65
<u>DAY</u>	29	0	22	26
<u>EG</u>	51	22	0	14
<u>SWI</u>	65	26	14	0

66	704	23	14	42	55	0
67	64	25	12	25	0	75
68	60	27	10	0	27	52
69	57	28	8	15	12	60
70	74	0	22	24	25	68
71	0	22	27	22	25	704
72	52	10	27	21	17	52

WILSON'S SCALE CH to SWI

0 175 2 272224 384 4 8888888 8

MILEAGE SCALE KSI to KI

MS-Cont-78
Var 1 E

MS-Cont-276
Var 1 E

	<u>KSI</u>	<u>KI</u>	<u>MI</u>	<u>KI</u>	<u>MI</u>
KSI	0	8	21	27	100
KI	8	0	15	29	100
MI	21	15	0	16	100
KI	27	29	16	0	100

MILEAGE SCALE KSI to KI

MS-Cont-78 Var 1 E MS-Cont-276 Var 1 E

WINDAGE SCALE KI to RA

FC - East-2E

Var E E

TC - East-2TB

Var E E

	<u>KI</u>	<u>KI</u>	<u>CR</u>	<u>SM</u>	<u>RA</u>
<u>KI</u>	0	30	61	101	153
<u>KI</u>	30	0	31	71	123
<u>CR</u>	61	31	0	40	92
<u>SM</u>	101	71	40	0	52
<u>RA</u>	153	123	92	52	0

<u>BT</u>	25	75	75	0
<u>BT</u>	75	25	0	75
<u>KI</u>	0	0	75	75
<u>BT</u>	0	0	25	25

BT KI BT BT

FC - 2 E
10-1967-14

TC - 2 E
10-1967-14

WINDAGE SCALE FOR 2E

0 175 2 492000 1000 2 08460000 2

WILSON SCALE CH to SA

TC-North-311

Var 3 K

TC-South-131

Var 3 K

	CR	SH	JA	LI	MD	MI
CD	0	22	30	28	27	112
RR	22	0	8	31	65	90
PA	30	8	0	23	17	82
MA	28	31	25	0	24	59
MD	27	65	27	34	0	25
MI	112	90	82	59	25	0

CD	122	122	25	22	0
RR	122	27	22	0	22
PA	27	21	0	22	22
MA	22	0	27	27	122
MD	0	22	21	122	122

CR	LI	MD	MI
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ANS K 1
TC-2000-1

TC-2000-1
TC-2000-1

WILSON SCALE CH to SA

0 170x2 932024 220 2 2000000000

MILWAUKEE SCALE RA to LV

TC-North-20

Jan 3 1

TC-South-200

Jan 3 1

	RA	RY	PO	SO	GL	PK	LV
RA	0	10	34	68	112	150	188
RY	10	0	34	68	102	180	140
PO	34	34	0	34	78	94	124
SO	68	68	34	0	44	68	90
GL	112	102	78	44	0	18	46
PK	150	180	94	68	18	0	38
LV	188	140	124	90	46	38	0

RY	10	34	68	102	180	140
PO	34	0	34	78	94	124
SO	68	34	0	44	68	90
GL	112	78	44	0	18	46
PK	150	94	68	18	0	38
LV	188	124	90	46	38	0

TC-North-20
Jan 3 1

TC-South-200
Jan 3 1

MILWAUKEE SCALE RA to LV

1752 47220 190 6 00000000 0

MIRAGE SCALE IV to WA CC

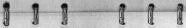
IV-North-42

Var 0

IV-South-222

Var 0

	IV	PS	NA	UN	CC	Notes
IV	0	31	54	71	91	Four Mirages
PS	31	0	25	40	60	Location 54 mi
NA	54	25	0	15	35	Var at CC var 0 mi
UN	71	40	15	0	20	CC located 15
CC	91	60	35	20	0	24 mi var 0 mi



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MIRAGE SCALE IV to WA CC

MILNER SCALE CS to CI

TC-Inst- 143
Var. I N.

TC-Inst- 323
Var. I N.

	CS	SU	SH	SL	SM	CI
CS	0	12	37	53	68	93
SU	12	0	20	41	56	81
SH	37	20	0	18	31	56
SL	53	41	18	0	15	40
SM	68	56	31	15	0	25
CI	93	81	56	40	25	0

61	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92
62	65	67	69	71	73	75	77	79	81	83	85	87	89	91	93
63	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94
64	67	69	71	73	75	77	79	81	83	85	87	89	91	93	95
65	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96
66	69	71	73	75	77	79	81	83	85	87	89	91	93	95	97
67	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98
68	71	73	75	77	79	81	83	85	87	89	91	93	95	97	99
69	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100
70	73	75	77	79	81	83	85	87	89	91	93	95	97	99	100

MILNER SCALE CS to CI

0 10 20 30 40 50 60 70 80 90 100

MILEAGE SCALE CI to YD

TC-East- 59

Var. 0

TC-West- 229

Var. 0

TC	CI	ST	AI	GR	AM
CI	0	29	30	58	70
ST	29	0	21	24	41
AI	50	21	0	5	30
GR	58	24	5	0	15
YD	70	41	30	15	0

REPRODUCED FROM THE ORIGINAL RECORDS OF THE NATIONAL ARCHIVES

MILEAGE SCALE VD to AG

TC-East- 80
Var. 0

TC-East- 875
Var. 0

	AG	CC	MA	GR	CH	TH	VD
AG	0	32	55	71	88	112	138
CC	32	0	23	39	56	70	106
MA	55	23	0	16	33	37	83
GR	71	39	16	0	17	41	67
CH	88	56	33	17	0	34	50
TH	112	70	37	41	34	0	26
VD	138	106	83	67	50	26	0

AG	36	47	60	70	87
CC	32	28	0	0	18
MA	50	27	0	0	30
GR	33	0	0	0	17
CH	0	22	20	20	10
TH	0	0	0	0	0

Var. 0
TC-East- 80

Var. 0
TC-East- 875

MILEAGE SCALE TO AG

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100