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Hq. AFWA, 16 Mar 1998

THIS PAGE IS UNCLASSIFIED
USER'S MANUAL FOR ESTIMATING TARGET ACQUISITION RANGE WHEN EMPLOYING TV SENSORS

BY
CAPT MICHAEL D. Abel
CAPT DENNIS P. REGAN
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LT KENNETH J. COMPTON
LT ROBERT M. COX

DECEMBER 1983

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USAF
ENVIRONMENTAL TECHNICAL APPLICATIONS CENTER
SCOTT AIR FORCE BASE, ILLINOIS 62225

84 04 30 092
### User's Manual for Estimating Target Acquisition Range When

TV sensors, visual contrast transmittance, inherent contrast, apparent contrast, threshold contrast, contrast transmittance charts, maximum target acquisition range.

A user's guide for estimating the maximum acquisition ground range from TV sensor to target by a manual method is presented. The guide includes background information on visual contrast transmittance, a sample maximum ground range sample worksheet, and directions on how to use it. This document also includes tables of reflectance values and many other aids needed to complete the worksheet. Finally, the technical note contains 360 pages of contrast transmittance charts plotted by ground range and flight altitude.

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### SUBJECT TERMS

apparent contrast, threshold contrast, contrast transmittance charts, maximum target acquisition range.

### ABSTRACT (Cont.)

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USAFETAC/DNE
INTRODUCTION

This technical note has been designed to provide AWS personnel with the capability to give environmental support to customers who use acquisition or tracking systems that employ TV sensors. The forecast techniques provided in this text should be used only if the TV-Tactical Decision Aid is not available. The manual method described herein can be used to estimate the maximum acquisition ground range from TV sensor to target. User inputs have been kept to a minimum and include only basic mission and forecast variables. The User's Guide section is preceded by a section on TV sensor background material which, hopefully, will provide the user with the necessary "feel" to use this publication with confidence.
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There are many kinds of electro-optical (E-O) sensors. They may be classed according to their electromagnetic wavelength sensitivities, i.e., TV (0.4 to 0.7 micrometers), near IR (0.8 to 2.0 micrometers), middle IR (2.0 to 5.0 micrometers), and far IR (5.0 to 13.0 micrometers). They may also be classed according to their method of operation, i.e., active (has its own radiation source), semi-active (senses emissions from an artificial source of radiation), or passive (senses radiation emitted by a natural source). Finally, they may be classed according to their function, i.e., target search, detection, lock-on, tracking, or evaluation. Our focus will be on passive TV sensors that may be used in multiple roles but will primarily be used for detection and/or lock-on.

The operational use and limitations of TV sensors are relatively easy to appreciate in contrast to infrared sensors. This is due to the fact that TV sensors respond to visible light in much the same way as our eyes (biological E-O sensors). However, given equal optics (light gathering device) the eye still has greater ability to distinguish the contrast or difference between an object and its background.

The question of interest to us is "At what distance can our TV sensor 'see' an object against its background?" Quantitatively, we assess whether or not a TV sensor can be used based on predictions of target/background contrast received at the sensor position. The problem involves both the specific scene and the visible image transmission (in terms of target/background contrast) through the atmosphere. Three important categories of visual contrast are: inherent contrast, apparent contrast, and threshold contrast.

Inherent contrast \( (C_o) \) is the visual contrast that exists between the object (in our case target) and its background at zero range. Its value ranges from 0 to 1. It is given in terms of the difference between the target and background luminances (brightness) divided by the larger of the two luminances.

For target scenes made visible solely by reflected light, target and background reflectances can be substituted for luminances. Thus, for passive TV sensors:

\[
C_o = \frac{|R_t - R_b|}{R_{\max}} \tag{1-1}
\]

where \( R_t \) is the target reflectance, \( R_b \) is the background reflectance, and \( R_{\max} \) is larger of \( R_t \) and \( R_b \).

The visual contrast we see at some distance from the object/background is called the apparent contrast \( (C_r) \). The atmosphere acts as a contrast-degrading medium causing \( C_r \) to decrease as the range increases. The deceivingly simple equation for apparent contrast:

\[
C_r = C_o \times T_c \tag{1-2}
\]

where \( C_o \) has been defined above and \( T_c \) is the contrast transmission (a very involved quantity).

The algorithms used to compute the TV contrast transmittance curves contained in the Appendix H were developed at the Rand Corporation. They were first used as part of the WETTA (Weather Effects on Tactical Target Acquisition) model. The "transmittance" is a complicated function of many environmental
factors including the relative positions of the sun, sensor, and target. Technically, the word transmittance refers to radiation removed by the extinction processes of scattering and absorption. During the transfer of visible contrast through the atmosphere, however, the primary degradation process is the scattering of light into the field of view. Nevertheless, we will still use the term "contrast transmittance."

The model computes contrast transmittance as a function of the range from the sensor to the target, the "sky-ground ratio parameter," and the atmospheric extinction coefficient for visible light. The extinction coefficient is calculated as a straightforward function of the reported visibility, using Koschmieder visibility theory. The sky-ground ratio is the ratio of the luminance of the horizontal sky to the inherent luminance of the target's background, with reference to a given viewing geometry. In practice, sky-ground ratio is seldom measured.

Sky-ground ratio is computed as an extremely complicated function of four variables: the background reflectance ($R_b$), sometimes called ground albedo; two angles (the dive angle and the elevation angle of the sun); and the visibility (from which the atmospheric extinction coefficient is estimated). Sky-ground ratio has the following general characteristics. It increases with decreasing albedo, or decreasing visibility, or decreasing sun angle. It is independent of sun angle under cloudy skies. It is nearly independent of sun azimuth angle, and it is largest when the dive angle is 10-30 degrees.

Finally, the last type of visual contrast concerning us is the threshold contrast ($C_{TA}$). It is that particular target-to-background apparent contrast at which 50 percent of observers will detect the target and 50 percent will not. For the human eye, the contrast threshold is approximately 0.02, and it is primarily a function of the size of the object seen in the field of view and the time spent looking at it. Each TV sensor will have its own threshold contrast which has been determined experimentally. A typical value of $C_{TA}$ is 0.2. This value of $C_{TA}$ along with $C_0$ is critical to our calculations of target acquisition range.

If we take equation 1-2 and replace apparent contrast ($C_T$) with threshold contrast ($C_{TA}$), then divide both sides by inherent contrast ($C_0$), we calculate a special value of contrast transmission ($T_c$), a value called threshold contrast transmittance ($C'$). This value is the simple ratio of $C_{TA}$ to $C_0$: $C' = C_{TA}/C_0$ (1-3)

If for instance, our inherent contrast ($C_0$) is 1 (a white on black target) the value of $C'$ and $C_{TA}$ are equal (say 0.2). However, if $C_0$ is 0.5, then $C'$ (0.4) is twice as large as $C_{TA}$ (0.2). By writing equation 1-2 in this ratio form we are able to make transmittance charts that are useful for all combinations of target/backgrounds and TV sensors.

The charts in Appendix H contain plotted isopleths of $C'$ (in tenths) given by range and altitude. By locating the appropriate $C'$ at the given flight altitude, one can easily estimate the maximum target acquisition range. This value is the maximum acquisition range because the threshold contrast (the smallest one detectable) was used to calculate $C'$. Furthermore, the range is only valid for the target/background specified. Different inherent contrasts and, consequently, different $C'$s would have to be calculated for other scenarios.
There are many assumptions, and thus limitations, in this method that the user of this publication should be aware of. First, the model assumes a two-layer atmosphere, the boundary of which is defined by the height of the surface mixing depth. Below this height the extinction coefficient is calculated from the surface visibility and is assumed constant through the layer. Above this height the extinction coefficient is set to a constant value representative of good visibility. Studies have shown that this type model is a good approximation to the real atmosphere in most, but not all, cases.

Secondly, basing extinction coefficient estimates on visibilities (visual range), probably the least objective of all observed or forecasted weather values, limits the accuracy of the model. Not only are visibilities difficult to forecast, there is no exact relationship between them and visual extinction coefficients. Furthermore, the model depends on two other forecast parameters: clouds and surface mixing depth. It goes without saying that the model results can be no better than the forecast values used in it.

Thirdly, the model gives acquisition ranges assuming there is a clear line-of-sight to the target. Of course, clouds will present a problem if they are located at or below flight level. Pilots usually know from experience how difficult it is to acquire a target in such a situation. Efforts to use probability of cloud-free-line-of-sight (CFLOS) estimates have not been too successful.

Fourthly, only some of the sensor and target features have been accounted for. Factors such as target contrast edge length and sensor scan line resolution can have important bearing on lock-on-range. Target features such as orientation and number of contrast edges, and shadows can also be important.

Finally, the calculations are concerned only with the hardware and environment, completely ignoring human factors. In reality, the pilot is in the loop using the TV sensor to detect a target. Many factors are involved in target recognition including target size, orientation, and background clutter. The acquisition range, computed using this publication, represents only that distance at which it is physically possible to first distinguish an object from its background. Therefore, the actual range at which acquisition is achieved is always less than the true maximum acquisition range. This feature makes verification of the forecasted maximum range nearly impossible. Only cases of underestimating the maximum range can be identified, and even then, the amount of error is not known.

Although the model is limited, this method of estimating maximum acquisition range was determined useful by AWS personnel who supported the PAVE SPIKE visual system during test and evaluation flights of the Low Level Laser Guided Bomb (LLLGB). The RAND WETTA model has also been used to support the TV-Maverick precision guided munitions system during various phases of development and deployment.

For further information on this subject see Cottrell, et al., (1979), Breitling (1982), Duff (1972), or Huschke (1976).
A worksheet (see sample, TV Sensor Target Acquisition Worksheet, on page 2-6) will be used to brief aircrews during mission planning. The instructions for completing this sample worksheet are given below. The sample worksheet has five sections described below in paragraphs A-E. Units may wish to modify this worksheet to meet their special needs.

A. MISSION DATA:

Mission ID: Self-explanatory.

Time on Target (Date/Time): Self-explanatory.

Fit Alt: _______(Ft AGL). Insert a flight altitude that is representative of the part of the mission during which the TV sensor will be used.

Target Location: Self-explanatory.

°Latitude: Self-explanatory.

°Longitude: Self-explanatory.

Sun Elevation: ______ (Degrees). Don't calculate this value for Bkn-Ovc cloud cover. The model always uses a value of 25 degrees for solar elevation angle in this situation. For Clr-Sct cloud cover, use Appendix A (identical to Appendix E of AWS/TR-79/002 and included in this user's manual for completeness) to find solar elevation angle for the location and time.

Target Type: Enter descriptions of the target (especially surface color and type) and its immediate background.

Target Reflectance ($R_t$): ______ See Appendix B for all values of $R_t$.

Background Type: Self-explanatory.

Background Reflectance ($R_b$): ______ Use Appendix B for all values of $R_b$ for Bkn-Ovc cloud cover and for Clr-Sct cloud cover with sun elevation above 35°. Use Appendix C for all values of $R_b$ in Clr-Sct cloud cover with sun elevation below 35°. For water use Appendix D.

B. SENSOR DATA FOR TV SYSTEM: Identify the type of TV sensor being used.

Threshold Illumination ($I_T$): ______ ft-candles. Threshold illumination will range from 0 to 100. Threshold values required in this section may be classified. These values will probably be available only from the customer.

Acquisition Threshold Contrast ($C_{TA}$): Acquisition threshold contrast will probably have a value near 0.2.

C. TARGET/BACKGROUND CONTRAST VALUES:

Inherent Contrast ($C_0$): Calculate using the target reflectance ($R_t$) and the background reflectance ($R_b$). For example, if $R_t = .10$ (a truck painted red) and $R_b = .30$ (concrete), then $C_0$ is equal to $10 \cdot 0.10 / 0.30 = 0.30$ or 0.67. The second calculation uses the inherent contrast ($C_0$) and the acquisition threshold contrast ($C_{TA}$) to find the threshold contrast transmittance ($C'$). For instance, if $C_{TA}$ is 0.20 and $C_0$ is 0.67, then $C'$ is equal to 0.20/0.67 or 0.30.
D. PHYSICAL VARIABLES FOR CONTRAST TRANSMISSION CHARTS: In this section, the user selects, for each of five physical variables, a category which corresponds to the contrast transmission chart headings. There are 360 possible category combinations. Use worksheet entries and the forecast to select the category combination which defines the single chart needed out of the 360 available.

Total Target Cloud Cover Category: _____ (Clr - Sct, or Bkn - Ovc) Self-explanatory.

Background Reflectance Category: _____ percent (0-14, 15-49, or 50-100). Choose a category based on the general scene reflectance and not just on immediate background under the target. See section A of the worksheet and appendices B, C, and D.

Solar Elevation Angle Category: _____ degrees (0-10, 11-30, 31-55, or 56-90). For the Bkn-Ovc cloud cover cases, the model has already selected the 11-30 degree category. For Clr-Sct cloud cover, select the category which includes the solar elevation angle from section A of the worksheet.

Surface Mixing Depth Category: _____ feet (below 50, 1500, 3000, or 6000). Select the nearest value based on the forecast. For example, if the forecast value is 4,000 feet, choose the 3,000 foot category.

Surface Visibility Category: _____ miles (1, 3, 5, 7, 10, or 15). Choose the surface visibility category based on the forecast visibility for the target area at the mission time. There will be a chart in the Appendix II headed with the five values specified above. To find the correct chart, use Tables 1-4 as follows. First, find the correct table based on the values for cloud and reflectance. All the page numbers for the Bkn-Ovc cloud cases are given in Table 1. Tables 2-4 have the page numbers for the Clr-Sct cases. Table 2 has page numbers for background reflectances of 0-14%. Tables 3 and 4 have page numbers for background reflectances of 15-49%, and 50-100%, respectively. The correct chart for the sample worksheet is Table 3. Once the correct table has been found, locate the row corresponding to the values of solar elevation and surface mixing depth specified on the form. Next, find the column corresponding to the visibility value. Finally, at the intersection of the column and row will be the contrast transmission chart page number in Appendix H. For the sample worksheet the chart page number is II-185. After locating the chart, find the position on the chart corresponding to the C' and flight altitude values given in sections A and C. From this point, drop vertically down to the X axis and read off the maximum acquisition ground range, which for the sample case is 7,500 feet. In some cases, interpolation between isopleths may be needed. Remember the isopleths of C' are given as tenths.

E. ADDITIONAL CALCULATIONS: This section includes calculations that may or may not be needed. If the time over target is within an hour of sunrise/sunset, the absolute amount of visible light illumination becomes important. If the forecasted available illumination (FC) does not exceed the TV sensor threshold illumination (I_T) then target acquisition is unlikely. The mission planners may want to change the time-over-target or cancel the mission. Furthermore, the maximum acquisition ground range computed in step D must be changed to zero. The best procedure is to complete sections A and B first. Then, if the time-over-target is within an hour of sunrise/sunset, go directly to section E. To see if there is enough light, first find the sky illumination (f_c, which is a function of solar elevation and cloud type/amount) by using Appendix E.

If time on target is within an hour of sunrise/sunset, find Illumination (f_c): _____ ft-candles (Appendix E).
Available Lumination (FC): \[ \text{___ ft-candles, FC} = R_{\text{max}} \times f_c \] Too little light if \( FC < L_T \). Light-GO \( ____ \) No-go ____.

Find the available lumination (FC) by multiplying illumination \( (f_c) \), which is about 962 foot-candles in the example, by the larger of the target/background reflectances \( (R_{\text{max}}) \), 0.3 in the example. If there is enough light, the value of FC will be larger than sensor threshold illumination \( (L_T) \).

Shadows at low sun elevation angles may also be a problem. To compute the maximum shadow acquisition range, find the shadow inherent contrast \( (C_0) \) using Appendix F (about 0.61) and recompute the threshold contrast transmission \( (C'') \) for the shadow using the same equation ratio described in section C \( (C'' \) is about 0.33 for the example). Use the same contrast transmittance chart found previously (section D) and the same technique to find the maximum shadow acquisition ground range which is about 6,500 feet in our example.

Max Shadow Acquisition Ground Range ____ ft

Finally, the factor found in Appendix G (a function of sun elevation) multiplied by the target height will give the target shadow length.

If Total Cloud Cover Clr-Sct then Target Shadow Length = Target Height ____ X (Appendix G) ____.
### TABLE 1. Chart Page Number Locator for all Bkn-Ovc Cases.

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### TABLE 2. Chart Page Number Locator for all Clr-Sct, 0-14 Percent Background Reflectance.

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### TABLE 3. Chart Page Number Locator for all Clr-Sct, 15-49 Percent Background Reflectance.

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<td>1500</td>
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### TABLE 4. Chart Page Number Locator for all Clr-Sct, 50-100 Percent Background Reflectance.

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<td>(             )</td>
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<tr>
<td></td>
<td>6000</td>
<td>284 285 286 287 288 289</td>
<td></td>
</tr>
<tr>
<td>Below 50</td>
<td>11-30</td>
<td>290 291 292 293 294 295</td>
<td></td>
</tr>
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<td>50-100</td>
<td>1500</td>
<td>296 297 298 299 300 301</td>
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<td>302 303 304 305 306 307</td>
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<td>6000</td>
<td>308 309 310 311 312 313</td>
<td></td>
</tr>
<tr>
<td>Below 50</td>
<td>31-55</td>
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<tr>
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<td>3000</td>
<td>326 327 328 329 330 331</td>
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<td>6000</td>
<td>332 333 334 335 336 337</td>
<td></td>
</tr>
<tr>
<td>Below 50</td>
<td>56-90</td>
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</tr>
<tr>
<td></td>
<td>6000</td>
<td>356 357 358 359 360 361</td>
<td></td>
</tr>
</tbody>
</table>
A. MISSION DATA

Mission ID: EXAMPLE-RUN  Time on Target (Date/Time): Jan 1 1984/1700  Flight Alt: 4,000 ft AGL
Target Location: Eglin AFB  Latitude: 30.52 N  Longitude: 86.52 W  Sun Elevation: 9.57 degrees
Target Type: Red Truck  Target Reflectance (R_t): 0.10  (See Appendix B)
Background Type: Concrete  Background Reflectance (R_b): 0.30  (See Appendix B, C, D)

B. SENSOR DATA FOR TV SYSTEM: TV-Maverick

Threshold Illumination (I_T): 80 ft-candles. Acquisition Threshold Contrast (C_TA): 0.20

C. TARGET/BACKGROUND CONTRAST VALUES

Inherent Contrast (C_o): 0.67  C_o = |R_t - R_b|/R_max (where R_max is the greater of R_t and R_b)
Threshold Contrast Transmittance (C'): 0.30  C' = C_TA/C_o

D. PHYSICAL VARIABLES FOR CONTRAST TRANSMISSION CHARTS

Total Cloud Cover over Target: Clr-Sct  (Clr - Sct, or Bkn - Ovc)
Background Reflectance Category: 15-49 percent (0-14, 15-49, or 50-100)
Solar Elevation Angle Category: 0-10 degrees (0-10, 11-30, 31-55, 56-90)
Surface Mixing Depth Category: 3,000 feet (below 50, 1500, 3000, or 6000)
Surface Visibility Category: 7 miles (1, 3, 5, 7, 10, or 15)

Go to corresponding chart in Appendix H using flight alt and C' find Max Acquisition Ground Range: 7,500 ft

E. ADDITIONAL CALCULATIONS

If time on target within 60 minutes of sunrise/sunset find Illumination (I_C): 962 ft-candles (Appendix E)
Available Illumination (FC): 289 ft-candles, FC = R_x X f_c. Too little light if FC < I_T Light-Go \checkmark  No-go

For Shadow calculation replace C_o with value in Appendix F, recompute C' and repeat Step D. Max Shadow Acq.G.R. 6,500 ft

If Total Cloud Cover Clr-Sct then Target Shadow Length = Target Height 10 ft X (Appendix G) 5.7 = 57 ft.
REFERENCES


Appendix A

COMPUTATION OF SOLAR ELEVATION ANGLE

A-1 Introduction. The following graphical method for computing solar elevation angle (degrees above horizon) is based on Table 169 and equation (1) of Table 170 of List (1966). Calculations consider mean solar time only.

A-2 Input Data. Data required to compute solar elevation angle (SA) are:

- Date (Greenwich Mean Time (GMT))
- Time (Greenwich Mean Time (GMT))
- Latitude (\(\phi\))
- Longitude

A-3 Procedure (use worksheet in paragraph A-5).

a. Enter Figure A-1 with date to find solar declination (\(\delta\)). Follow date down graph to curve. From intersection with curve, follow graph to left to solar declination. Record solar declination on worksheet.

b. Enter Figure A-2 with the time and longitude to find local hour angle (A).

(1) Enter Figure A-2a with the GMT time and follow to right to curve. This intersection relates GMT time to the Greenwich hour angle (read values at upper edge of figure). From intersection with curve, follow graph down to lower graph edge.

(2) Using the Greenwich hour angle and the longitude, enter Figure A-2b to find local hour angle (A). Follow the Greenwich hour angle down the graph to the curve representing the longitude. From the intersection with the curve, move left along the graph until the local hour angle is determined. Record local hour angle on worksheet.

c. Enter Figure A-3 with solar declination, local hour angle, and latitude to find solar elevation angle.

(1) Figure A-3a produces two values. The curve labeled \(\sin \delta\) is used with Figure A-3b while the curve labeled \(\cos \delta\) is used with Figure A-3c. Enter Figure A-3a from the left with solar declination and intersect the curve labeled \(\sin \delta\). Record value of \(\sin \delta\) (value at top of graph). With the same solar declination, intersect the curve labeled \(\cos \delta\). Record value of \(\cos \delta\) (value at bottom of graph).

(2) With the value of \(\sin \delta\) from Figure A-3a, enter Figure A-3b and move upward until the appropriate latitude curve is intersected (interpolate linearly if necessary). Record value of \(\sin \phi \sin \delta\).
(3) With the value of $\cos \delta$ from Figure A-3a, enter Figure A-3c and move downward until the appropriate latitude curve is intersected (interpolate linearly if necessary). Use the determined value of $\cos \phi \cos \delta$ and move to the right into Figure A-3d until the local hour angle is intersected. Record value of $\cos \phi \cos \delta \cos A$.

(4) Finally, using the value just determined and the result of Figure A-3b ($\sin \phi \sin \delta$), enter Figure A-3e to find solar elevation angle (SA). Record solar elevation angle (SA).

A-4 Comments. More accurate values of solar elevation angle can be calculated using the Air Almanac with List's Equation (1). The true local hour angle would be calculated in lieu of the mean local hour angle in order to achieve better accuracy. However, for the purpose intended in this text, the described technique is generally adequate. In most daylight cases, the calculation of solar elevation angle to later infer solar illumination is probably unnecessary since adequate illumination will be available for most TV systems. However, near sunrise and sunset, and under extremely heavy cloudiness calculations of solar elevation should be considered.

Figure A-1. Solar Declination as a Function of Data (Greenwich Mean Time).
Figure A-2. Local Hour Angle as a Function of Greenwich Mean Time and Longitude.
Figure A-3: Solar Elevation Angle as a Function of Solar Declination, Latitude, and Local Hour Angle.
Worksheet to Compute Solar Elevation Angle (SA).

**INPUT DATA**

Date (GMT) 
Time (GMT) 
Latitude (\(\phi\)) 
Longitude 

**PROCEDURE**

a. Enter Figure A-1 with GMT date to find solar declination.

Solar declination (\(\delta\)) ______ (degrees).

b. Enter Figure A-2 with GMT time and longitude to find local hour angle (A).

Local hour angle (A) ______ (degrees).

c. Enter Figure A-3 with solar declination (\(\delta\)), local hour angle (A) and latitude (\(\phi\)) to find solar elevation angle.

(1) From Figure A-3a,
\[
\sin \delta = \frac{0.4}{1}, \text{ and } \cos \delta = \frac{0.92}{1}.
\]

(2) From Figure A-3b,
\[
\sin \phi \sin \delta = 0.295.
\]

(3) From Figures A-3c and A-3d,
\[
\cos \phi \cos \delta \cos A = 0.58.
\]

(4) From Figure A-3e, the solar elevation angle (SA) = 61° (degrees).

**REFERENCES:**

AWS/TR-79/0C., ELECTRO-OPTICAL HANDBOOK, VOL I, WEATHER SUPPORT FOR PRECISION GUIDED MUNITIONS, MAY 1979, APPENDIX E.

LIST, R. J., ED., 1966: SMITHSONIAN METEOROLOGICAL TABLES, SIXTH REVISED EDITION, SMITHSONIAN INSTITUTION, WASHINGTON, DC.
## Appendix B

**Visible Wavelength Reflectance Values - High Sun**

(All \( R \) values, \( R_\lambda \) values for Clr-Sct cloud cover with sun elevation above 35 degrees, or all Bkn-Ovc cloud cases)

### Bare Soils

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<tr>
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<td>Wet Loam</td>
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<td>Dark, Dry</td>
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<tr>
<td>Dark, Wet</td>
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<tr>
<td>Dark, Dry (plowed)</td>
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</tr>
<tr>
<td>Light, Dry</td>
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</tr>
<tr>
<td>Light, Wet</td>
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<tr>
<td>Light, Dry (plowed)</td>
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</tr>
<tr>
<td>Light, Wet (plowed)</td>
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<td>Clay, Dry</td>
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<tr>
<td>Clay, Wet</td>
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<td>Red Soil/Earth</td>
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<tr>
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<td>White Sand</td>
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### Bare, Hard/Prepared Surfaces

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<td>Asphalt</td>
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### Vegetation

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<td>Rice</td>
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<td>ASBESTOS SHEETS</td>
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</tr>
<tr>
<td>STAINLESS STEEL</td>
<td>0.50</td>
</tr>
<tr>
<td>ALUMINUM</td>
<td>0.85</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SNOW</th>
<th>REFLECTANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRESH</td>
<td>0.85</td>
</tr>
<tr>
<td>DENSE</td>
<td>0.75</td>
</tr>
<tr>
<td>MOIST</td>
<td>0.65</td>
</tr>
<tr>
<td>OLD</td>
<td>0.55</td>
</tr>
<tr>
<td>MELTING</td>
<td>0.35</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ICE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>WHITE</td>
<td></td>
</tr>
<tr>
<td>GREY</td>
<td>0.75</td>
</tr>
<tr>
<td>SNOW &amp; ICF</td>
<td>0.60</td>
</tr>
<tr>
<td>DARK GLAZE</td>
<td>0.65</td>
</tr>
</tbody>
</table>

B-2
Appendix C

VISIBLE WAVELENGTH REFLECTANCE VALUES - LOW SUN

Visible Wavelength Reflectance Values ($R_b$) (Cir-Sct cloud cover with sun elevation below 35°)

<table>
<thead>
<tr>
<th>SURFACE</th>
<th>10</th>
<th>20</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dark Soil, Dry</td>
<td>.22</td>
<td>.16</td>
<td>.14</td>
</tr>
<tr>
<td>Dark Soil, Wet</td>
<td>.17</td>
<td>.11</td>
<td>.09</td>
</tr>
<tr>
<td>Light Soil, Dry</td>
<td>.34</td>
<td>.29</td>
<td>.21</td>
</tr>
<tr>
<td>Light Soil, Wet</td>
<td>.26</td>
<td>.21</td>
<td>.13</td>
</tr>
<tr>
<td>Sandy Soil, Dry</td>
<td>.34</td>
<td>.30</td>
<td>.27</td>
</tr>
<tr>
<td>Sandy Soil, Wet</td>
<td>.27</td>
<td>.23</td>
<td>.20</td>
</tr>
<tr>
<td>Vegetation (Average)</td>
<td>.25</td>
<td>.22</td>
<td>.19</td>
</tr>
<tr>
<td>Tall Grass, Growing</td>
<td>.28</td>
<td>.25</td>
<td>.22</td>
</tr>
</tbody>
</table>

At the time of publication, the change of visible wavelength reflectance with varying sun elevation angle was available for the limited number of surface types listed above. For surfaces not listed here, use $R_b$ values from Appendix B even though sun elevation angle is below 35°.
Appendix D

VISIBLE WAVELENGTH REFLECTANCE VALUES - WATER

Visible Wavelength Reflectance Values, for Water (Winds 2-10 mph at 10 meters, for higher winds decrease values slightly)

<table>
<thead>
<tr>
<th>SUN ELEVATION ANGLE (DEGREES)</th>
<th>CLOUD CLR - SCT</th>
<th>COVER BKN - OVC</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>.26</td>
<td>.14</td>
</tr>
<tr>
<td>10</td>
<td>.25</td>
<td>.14</td>
</tr>
<tr>
<td>15</td>
<td>.19</td>
<td>.11</td>
</tr>
<tr>
<td>20</td>
<td>.13</td>
<td>.09</td>
</tr>
<tr>
<td>30</td>
<td>.08</td>
<td>.07</td>
</tr>
<tr>
<td>40</td>
<td>.06</td>
<td>.07</td>
</tr>
<tr>
<td>50</td>
<td>.05</td>
<td>.06</td>
</tr>
<tr>
<td>60</td>
<td>.04</td>
<td>.06</td>
</tr>
<tr>
<td>70</td>
<td>.04</td>
<td>.06</td>
</tr>
</tbody>
</table>

REFERENCES for Appendices B, C, and D:

AWS/TR-79/002, ELECTRO-OPTICAL HANDBOOK, VOL 1, WEATHER SUPPORT FOR PRECISION GUIDED MUNITIONS, MAY 79, TABLE 8.

SYSTEMS AND APPLIED SCIENCES CORPORATION, INSOLATION MODEL USERS GUIDE (UNDATED), TABLE 2.

TECHNICAL REPORT EL-81-2, THERMAL MODELING OF TERRAIN SURFACE ELEMENTS, MARCH 1981, TABLE B1. (NIGHT VISION AND ELECTRO-OPTICS LABORATORY, FORT BELVOIR, VA).

RADIATION PROCESSES IN THE ATMOSPHERE, WMO-NO. 309, 1972, TABLES 2.1, 2.2, 2.3, 2.10, 2.15, Figures 2.1, 2.2
## Appendix E

### SOLAR ILLUMINATION VS. SOLAR ELEVATION AND CLOUD TYPE

<table>
<thead>
<tr>
<th>Solar Elevation (Degrees)</th>
<th>Clear Sky</th>
<th>SCT (Any Type)</th>
<th>Overcast</th>
<th>Cloud Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.00</td>
<td>0.01</td>
<td>0.02</td>
<td>0.03</td>
</tr>
<tr>
<td>1</td>
<td>0.04</td>
<td>0.05</td>
<td>0.06</td>
<td>0.07</td>
</tr>
<tr>
<td>2</td>
<td>0.08</td>
<td>0.09</td>
<td>0.10</td>
<td>0.11</td>
</tr>
<tr>
<td>3</td>
<td>0.12</td>
<td>0.13</td>
<td>0.14</td>
<td>0.15</td>
</tr>
<tr>
<td>4</td>
<td>0.16</td>
<td>0.17</td>
<td>0.18</td>
<td>0.19</td>
</tr>
</tbody>
</table>

**REFERENCE:** ANS/TS-79/002, ELECTRO-OPTICAL HANDBOOK, VOLUME I, WEATHER SUPPORT FOR PRECISION GUIDED MUNITIONS.
Appendix F

TARGET SHADOW INHERENT CONTRAST

RELATIVELY CLEAR ATMOSPHERE: VISIBILITIES $\geq$ 6.2 MILES (10 KM)

<table>
<thead>
<tr>
<th>ELEVATION</th>
<th>SOLAR REFLECTANCE ($R_b$)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.1</td>
</tr>
<tr>
<td>0°</td>
<td>.55</td>
</tr>
<tr>
<td>30°</td>
<td>.78</td>
</tr>
<tr>
<td>60°</td>
<td>.86</td>
</tr>
<tr>
<td>90°</td>
<td>.88</td>
</tr>
</tbody>
</table>

RELATIVELY TURBID ATMOSPHERE: VISIBILITIES < 6.2 MILES (10 KM)

<table>
<thead>
<tr>
<th>ELEVATION</th>
<th>SOLAR REFLECTANCE ($R_b$)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.1</td>
</tr>
<tr>
<td>0°</td>
<td>.16</td>
</tr>
<tr>
<td>30°</td>
<td>.50</td>
</tr>
<tr>
<td>60°</td>
<td>.65</td>
</tr>
<tr>
<td>90°</td>
<td>.68</td>
</tr>
</tbody>
</table>

Appendix G

TARGET SHADOW LENGTH FACTORS

<table>
<thead>
<tr>
<th>SOLAR ELEVATION ANGLE (SA), DEGREES</th>
<th>SHADOW LENGTH EQUALS TARGET HEIGHT TIMES*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 ........................................</td>
<td>57.3</td>
</tr>
<tr>
<td>2 ........................................</td>
<td>28.6</td>
</tr>
<tr>
<td>3 ........................................</td>
<td>19.1</td>
</tr>
<tr>
<td>4 ........................................</td>
<td>14.3</td>
</tr>
<tr>
<td>5 ........................................</td>
<td>11.4</td>
</tr>
<tr>
<td>6 ........................................</td>
<td>9.5</td>
</tr>
<tr>
<td>8 ........................................</td>
<td>7.1</td>
</tr>
<tr>
<td>10 .......................................</td>
<td>5.7</td>
</tr>
<tr>
<td>15 .......................................</td>
<td>3.7</td>
</tr>
<tr>
<td>20 .......................................</td>
<td>2.7</td>
</tr>
<tr>
<td>25 .......................................</td>
<td>2.1</td>
</tr>
<tr>
<td>30 .......................................</td>
<td>1.7</td>
</tr>
<tr>
<td>35 .......................................</td>
<td>1.4</td>
</tr>
<tr>
<td>40 .......................................</td>
<td>1.2</td>
</tr>
<tr>
<td>45 .......................................</td>
<td>1.0</td>
</tr>
<tr>
<td>50 .......................................</td>
<td>.8</td>
</tr>
<tr>
<td>60 .......................................</td>
<td>.6</td>
</tr>
<tr>
<td>70 .......................................</td>
<td>.4</td>
</tr>
<tr>
<td>80 .......................................</td>
<td>.2</td>
</tr>
<tr>
<td>85 .......................................</td>
<td>.1</td>
</tr>
<tr>
<td>90 .......................................</td>
<td>.0</td>
</tr>
</tbody>
</table>

* FACTOR = $\tan(90-SA)$
CLOUD COVER: BKN-OVC
BKGD. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 1 MILE (1.6 KM)
MIXING Lyr. DEPTH: BELOW 50 FEET

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC  
BKGND. REFLECTANCE: 00 TO 14 PERCENT  
SOLAR ELEV. ANGLE: SET @ 25 DEGREE  
SURFACE VISIBILITY: 3 MILES (4.8 KM)  
MIXING Lyr. DEPTH: BELOW 50 FEET

GROUND RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC
BKGD. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 5 MILES (8.0 KM)
MIXING Lyr. DEPTH: BELOW 50 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC  
BKGD. REFLECTANCE: 00 TO 14 PERCENT  
SOLAR ELEV. ANGLE: SET @ 25 DEGREE  
SURFACE VISIBILITY: 10 MILES (16.1 KM)  
MIXING Lyr. DEPTH: BELOW 50 FEET  

GROUND RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC
BKGD. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 15 MILES (24.1 KM)
MIXING LNR. DEPTH: BELOW 50 FEET
CLOUD COVER: BKN-OVC  
BKGND. REFLECTANCE: 00 TO 14 PERCENT  
SOLAR ELEV. ANGLE: SET @ 25 DEGREE  
SURFACE VISIBILITY: 1 MILE (1.6 KM)  
MIXING Lyr. DEPTH: 1500 FEET  

GROUND RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER:  BKN-OVC  BKGD. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE : SET @ 25 DEGREE
SURFACE VISIBILITY: 3 MILES (4.8 KM)
MIXING Lyr. DEPTH : 1500 FEET

HEIGHT AGL (K FEET)

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC  BKGN. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 7 MILES (11.3 KM)
MIXING Lyr. DEPTH: 1500 FEET

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC
BKGD. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 10 MILES (16.1 KM)
MIXING Lyr. DEPTH: 1500 FEET

GROUND RANGE (K FEET)

HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLoud cover: BKN-OVC  Background reflectance: 00 to 14 percent
Solar elevation angle: Set @ 25 degree
Surface visibility: 15 miles (24.1 km)
Mixing layer depth: 1500 feet

Contrast transmittance for visible wavelengths (in tenths)
CLOUD COVER: BKN-OVC  BKGD. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 3 MILES (4.8 KM)
MIXING Lyr. DEPTH: 3000 FEET
CLOUD COVER: BKN-OVC
BGND. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 5 MILES (8.0 KM)
MIXING Lyr. DEPTH: 3000 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC  BKGD. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE : SET @ 25 DEGREE
SURFACE VISIBILITY: 7 MILES (11.3 KM)
MIXING Lyr. DEPTH : 3000 FEET

HEIGHT AGL (K FEET)

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC  BKGD. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 10 MILES (16.1 KM)
MIXING Lyr. DEPTH: 3000 FEET
CLOUD COVER: BKN-OVC  
BKGN. REFLECTANCE: 00 TO 14 PERCENT  
SOLAR ELEV. ANGLE: SET @ 25 DEGREE  
SURFACE VISIBILITY: 15 MILES (24.1 KM)  
MIXING Lyr. DEPTH: 3000 FEET

GND RANGE (K FEET)  
HEIGHT AGL (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC  
BKGN. REFLECTANCE: 00 TO 14 PERCENT  
SOLAR ELEV. ANGLE: SET @ 25 DEGREE  
SURFACE VISIBILITY: 1 MILE (1.6 KM)  
MIXING Lyr. DEPTH: 6000 FEET
CLOUD COVER: BKN-OVC
BKGD. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 3 MILES (4.8 KM)
MIXING Lyr. DEPTH: 6000 FEET

HEIGHT AGL (K FEET)

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC
BKGND. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 5 MILES (8.0 KM)
MIXING Lyr. DEPTH: 6000 FEET
CLOUD COVER:  BKN-OVC  
BKGND. REFLECTANCE:  00 TO 14 PERCENT
SOLAR ELEV. ANGLE:  SET @ 25 DEGREE
SURFACE VISIBILITY:  7 MILES (11.3 KM)
MIXING Lyr. DEPTH:  6000 FEET

GROUND RANGE (K FEET)

HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC
BGND. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 10 MILES (16.1 KM)
MIXING Lyr. DEPTH: 6000 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC  BKGD. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 15 MILES (24.1 KM)
MIXING Lyr. DEPTH: 6000 FEET

GROUNd RANGE (k FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC  BKGD. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 1 MILE (1.6 KM)
MIXING LAYER DEPTH: BELOW 50 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC  BKGD. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 3 MILES (4.8 KM)
MIXING Lyr. DEPTH: BELOW 50 FEET

GROUND RANGE (K FEET)

HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC
BKGND. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 7 MILES (11.3 KM)
MIXING Lyr. DEPTH: BELOW 50 FEET

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC  BKGD. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE : SET @ 25 DEGREE
SURFACE VISIBILITY: 10 MILES (16.1 KM)
MIXING Lyr. DEPTH : BELOW 50 FEET

GROUND RANGE (K FEET)

HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC  
BGND. REFLECTANCE: 15 TO 49 PERCENT  
SOLAR ELEV. ANGLE: SET @ 25 DEGREE  
SURFACE VISIBILITY: 15 MILES (24.1 KM)  
MIXING Lyr. DEPTH: BELOW 50 FEET
CLOUD COVER: BKN-OVC  BKGD. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 1 MILE (1.6 KM)
MIXING Lyr. DEPTH: 1500 FEET

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC  BKGD. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 3 MILES (4.8 KM)
MIXING Lyr. DEPTH: 1500 FEET

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC
BKGD. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 5 MILES (8.0 KM)
MIXING Lyr. DEPTH: 1500 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC  
BKGND. REFLECTANCE: 15 TO 49 PERCENT  
SOLAR ELEV. ANGLE: SET @ 25 DEGREE  
SURFACE VISIBILITY: 7 MILES (11.3 KM)  
MIXING Lyr. DEPTH: 1500 FEET

HEIGHT AGL (K FEET)  
GROUND RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC  
BKGD. REFLECTANCE: 15 TO 49 PERCENT  
SOLAR ELEV. ANGLE: SET @ 25 DEGREE  
SURFACE VISIBILITY: 10 MILES (16.1 KM)  
MIXING Lyr. DEPTH: 1500 FEET

GROUNd RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC

BGND. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 15 MILES (24.1 KM)
MIXING Lyr. DEPTH: 1500 FEET

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC
BKGD. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 1 MILE (1.6 KM)
MIXING Lyr. DEPTH: 3000 FEET

GROUND RANGE (K FEET)

HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC  BKGD. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 3 MILES (4.8 KM)
MIXING Lyr. DEPTH: 3000 FEET

GROUND RANGE (K FEET)

HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC  
BKGNR. REFLECTANCE: 15 TO 49 PERCENT  
SOLAR ELEV. ANGLE: SET @ 25 DEGREE  
SURFACE VISIBILITY: 5 MILES (8.0 KM)  
MIXING Lyr. DEPTH: 3000 FEET  

GROUND RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC  BKGD. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 7 MILES (11.3 KM)
MIXING Lyr. DEPTH: 3000 FEET

HEIGHT AGL (K FEET)

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC
BKGN. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 10 MILES (16.1 KM)
MIXING Lyr. DEPTH: 3000 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC
BKGN. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 15 MILES (24.1 KM)
MIXING Lyr. DEPTH: 3000 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC
BKGD. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 1 MILES (1.6 KM)
MIXING Lyr. DEPTH: 6000 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC
BGND. REFLECTANCE: 15 TO 40 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 3 MILES (4.8 KM)
MIXING Lyr. DEPTH: 6000 FEET

GROUND RANGE (K FEET)
HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC  BKGD. REFLECTANCE: 15 TO 49 PERCENT  
SOLAR ELEV. ANGLE: SET @ 25 DEGREE  
SURFACE VISIBILITY: 5 MILES (8.0 KM)  
MIXING Lyr. DEPTH: 6000 FEET
CLOUD COVER: BKN-OVC  BKGN. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 10 MILES (16.1 KM)
MIXING Lyr. DEPTH: 8000 FEET

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC
BACKGROUND REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 15 MILES (24.1 KM)
MIXING Lyr. DEPTH: 6000 FEET

HEIGHT AGL (K FEET)

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
BGND. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 5 MILES (8.0 KM)
MIXING Lyr. DEPTH: BELOW 50 FEET

GROUND RANGE (K FEET)

HEIGHT AGL (K FEET)
CLOUD COVER: BKN-OVC  BKGD. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 7 MILES (11.3 KM)
MIXING Lyr. DEPTH: BELOW 50 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC
BGND. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 1 MILE (1.6 KM)
MIXING Lyr. DEPTH: 1500 FEET
CLOUD COVER: BKN-OVC
BKGD. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 10 MILES (16.1 KM)
MIXING Lyr. DEPTH: 1500 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC  
BKGN. REFLECTANCE: 50 TO 99 PERCENT  
SOLAR ELEV. ANGLE: SET @ 25 DEGREE  
SURFACE VISIBILITY: 1 MILE (1.6 KM)  
MIXING Lyr. DEPTH: 3000 FEET
CLOUD COVER: BKN-OVC  BKGN. REFLECTANCE: 50 TO 95 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 5 MILES (8.0 KM)
MIXING Lyr. DEPTH: 3000 FEET

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC  BKGD. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 7 MILES (11.3 KM)
MIXING Lyr. DEPTH: 3000 FEET

GROUND RANGE (K FEET)
HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC  
BKGD. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 10 MILES (16.1 KM)
MIXING Lyr. DEPTH: 3000 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC  BKGD. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 1 MILE (1.6 KM)
MIXING Lyr DEPTH: 6000 FEET

HEIGHT AGL (K FEET)

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC
BKGND. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 3 MILES (4.8 KM)
MIXING Lyr. DEPTH: 6000 FEET

GROUND RANGE (K FEET)
HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC
BGND. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 5 MILES (8.0 KM)
MIXING Lyr. DEPTH: 6000 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: BKN-OVC
BGND. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: SET @ 25 DEGREE
SURFACE VISIBILITY: 15 MILES (24.1 KM)
MIXING Lyr. DEPTH: 6000 FEET

GROUND RANGE (K FEET)

HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGN. REFLECTANCE: 00 TO 14 PERCENT  
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE  
SURFACE VISIBILITY: 1 MILE (1.6 KM)  
MIXING Lyr. DEPTH: BELOW 50 FEET  

GROUND RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
Cloud Cover: CLR-SCT
Background Reflectance: 00 to 14 Percent
Solar Elevation Angle: 0 to 10 Degree
Surface Visibility: 5 Miles (8.0 km)
Mixing Layer Depth: Below 50 Feet

Contrast Transmittance for Visible Wavelengths (in tenths)
CLOUD COVER: CLR-SCT

BGND. REFLECTANCE: 00 TO 14 PERCENT

SOLAR ELEV. ANGLE: 0 TO 10 DEGREE

SURFACE VISIBILITY: 10 MILES (16.1 KM)

MIXING Lyr. DEPTH: BELOW 50 FEET

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGD. REFLECTANCE: 00 TO 14 PERCENT  
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE  
SURFACE VISIBILITY: 3 MILES (4.8 KM)  
MIXING Lyr. DEPTH: 1500 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGD. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE
SURFACE VISIBILITY: 5 MILES (8.0 KM)
MIXING Lyr. DEPTH: 1500 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGN. REFLECTANCE: 00 TO 14 PERCENT  
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE  
SURFACE VISIBILITY: 7 MILES (11.3 KM)  
MIXING Lyr. DEPTH: 1500 FEET
CLOUD COVER: CLR-SCT  BKGD. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE
SURFACE VISIBILITY: 1 MILE (1.6 KM)
MIXING Lyr. DEPTH: 3000 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  BKND. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE
SURFACE VISIBILITY: 3 MILES (4.8 KM)
MIXING Lyr. DEPTH: 3000 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS- (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGD. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE
SURFACE VISIBILITY: 7 MILES (11.3 KM)
MIXING Lyr. DEPTH: 3000 FEET

GROUND RANGE (K FEET)
HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGD. REFLECTANCE: 00 TO 14 PERCENT  
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE  
SURFACE VISIBILITY: 10 MILES (16.1 KM)  
MIXING Lyr. DEPTH: 3000 FEET
CLOUD COVER: CLR-SCT.  BACKGROUND REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE
SURFACE VISIBILITY: 15 MILES (24.1 KM)
MIXING Lyr. DEPTH: 3000 FEET

HEIGHT AGL (K FEET)

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGD. REFLECTANCE: 00 TO 14 PERCENT  
SOLAR ELEV. ANGLE : 0 TO 10 DEGREE  
SURFACE VISIBILITY: 1 MILE (1.6 KM)  
MIXING Lyr. DEPTH : 6000 FEET

GROUND RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  BKGD. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE:  0 TO 10 DEGREE
SURFACE VISIBILITY: 3 MILES (4.8 KM)
MIXING Lyr. DEPTH:  6000 FEET

Contrast Transmittance for Visible Wavelengths (in tenths)
CLOUD COVER: CLR-SCT  
BKGD. REFLECTANCE: 00 TO 14 PERCENT  
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE  
SURFACE VISIBILITY: 5 MILES (8.0 KM)  
MIXING Lyr. DEPTH: 6000 FEET

GROUND RANGE (K FEET)  
HEIGHT AGL (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  BKGND. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE
SURFACE VISIBILITY: 7 MILES (11.3 KM)
MIXING Lyr. DEPTH: 6000 FEET

HEIGHT AGL (K FEET)

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGND. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE
SURFACE VISIBILITY: 10 MILES (16.1 KM)
MIXING Lyr. DEPTH: 6000 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISBILE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT

BGND. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE
SURFACE VISIBILITY: 15 MILES (24.1 KM)
MIXING LVR. DEPTH: 6000 FEET

GROUND RANGE (K FEET) CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)

HEIGHT AGL (K FEET)
BKGND. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE
SURFACE VISIBILITY: 1 MILE (1.6 KM)
MIXING Lyr. DEPTH: BELOW 50 FEET

CLOUD COVER:
CLR-SCT

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)

HEIGHT AGL (K FEET)
CLOUD COVER: CLR-SCT  
BGND. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE
SURFACE VISIBILITY: 7 MILES (11.3 KM)
MIXING Lyr. DEPTH: BELOW 50 FEET

GROUnD RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKND. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE
SURFACE VISIBILITY: 10 MILES (16.1 KM)
MIXING LWR. DEPTH: BELOW 50 FEET

GROUND RANGE (K FEET)

HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BACKGROUND REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE
SURFACE VISIBILITY: 15 MILES (24.1 KM)
MIXING Lyr. DEPTH: BELOW 50 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BGKND. REFLECTANCE: 00 TO 14 PERCENT  
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE  
SURFACE VISIBILITY: 1 MILE (1.6 KM)  
MIXING Lyr. DEPTH: 1500 FEET  

GROUND RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  BKGD. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE : 11 TO 30 DEGREE
SURFACE VISIBILITY: 3 MILES (4.8 KM)
MIXING Lyr. DEPTH : 1500 FEET

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKND. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE
SURFACE VISIBILITY: 5 MILES (8.0 KM)
MIXING Lyr. DEPTH: 1500 FEET
CLOUD COVER: CLR-SCT  BKGD. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE
SURFACE VISIBILITY: 7 MILES (11.3 KM)
MIXING Lyr. DEPTH: 1500 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT

BKGD. REFLECTANCE: 00 TO 14 PERCENT

SOLAR ELEV. ANGLE: 11 TO 30 DEGREE

SURFACE VISIBILITY: 10 MILES (16.1 KM)

MIXING Lyr. DEPTH: 1500 FEET

HEIGHT AGL (K FEET)

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BGKND. REFLECTANCE: 0% TO 14 PERCENT  
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE  
SURFACE VISIBILITY: 15 MILES (24.1 KM)  
MIXING Lyr. DEPTH: 1500 FEET

GROUND RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGND. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE
SURFACE VISIBILITY: 1 MILE (1.6 KM)
MIXING Lyr. DEPTH: 3000 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGND. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE
SURFACE VISIBILITY: 5 MILES (8.0 KM)
MIXING L YR. DEPTH: 3000 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  BKGD. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE
SURFACE VISIBILITY: 7 MILES (11.3 KM)
MIXING Lyr. DEPTH: 3000 FEET

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  BKGND. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE
SURFACE VISIBILITY: 1 MILE (1.6 KM)
MIXING Lyr. DEPTH: 6000 FEET

GROUND RANGE (K FEET)

HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGN. REFLECTANCE: 00 TO 14 PERCENT  
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE  
SURFACE VISIBILITY: 3 MILES (4.8 KM)  
MIXING Lyr. DEPTH: 6000 FEET

GROUND RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGD. REFLECTANCE: 00 TO 14 PERCENT  
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE  
SURFACE VISIBILITY: 5 MILES (8.0 KM)  
MIXING Lyr. DEPTH: 6000 FEET  

GROUND RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  BKGD. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE
SURFACE VISIBILITY: 7 MILES (11.3 KM)
MIXING Lyr. DEPTH: 6000 FEET

Contrast transmittance for visible wavelengths (in tenths)
CLOUD COVER: CLR-SCT

BKGND. REFLECTANCE: 00 TO 14 PERCENT

SOLAR ELEV. ANGLE: 11 TO 30 DEGREE

SURFACE VISIBILITY: 10 MILES (16.1 KM)

MIXING Lyr. DEPTH: 6000 FEET

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGD. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE
SURFACE VISIBILITY: 15 MILES (24.1 KM)
MIXING Lyr. DEPTH: 6000 FEET

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  BKGND. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE
SURFACE VISIBILITY: 1 MILE (1.6 KM)
MIXING Lyr. DEPTH: BELOW 50 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGN. REFLECTANCE: 00 TO 14 PERCENT  
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE  
SURFACE VISIBILITY: 3 MILES (4.8 KM)  
MIXING Lyr. DEPTH: BELOW 50 FEET

GROUND RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGND. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE
SURFACE VISIBILITY: 5 MILES (8.0 KM)
MIXING Lyr. DEPTH: BELOW 50 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGD. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE : 31 TO 55 DEGREE
SURFACE VISIBILITY: 10 MILES (16.1 KM)
MIXING Lyr. DEPTH: BELOW 50 FEET

GROUND RANGE (K FEET)

HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGD. REFLECTANCE: 00 TO 14 PERCENT  
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE  
SURFACE VISIBILITY: 15 MILES (24.1 KM)  
MIXING Lyr. DEPTH: BELOW 50 FEET

GROUND RANGE (K FEET)  
HEIGHT AGL (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGD. REFLECTANCE: 00 TO 14 PERCENT  
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE  
SURFACE VISIBILITY: 1 MILE (1.6 KM)  
MIXING LVR. DEPTH: 1500 FEET

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGND. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE
SURFACE VISIBILITY: 3 MILES (4.8 KM)
MIXING LVR. DEPTH: 1500 FEET

GROUND RANGE (K FEET)
HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BGND. REFLECTANCE: 00 TO 14 PERCENT 
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE 
SURFACE VISIBILITY: 7 MILES (11.3 KM) 
MIXING Lyr. DEPTH: 1500 FEET 

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGD. REFLECTANCE: 00 TO 14 PERCENT  
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE  
SURFACE VISIBILITY: 10 MILES (16.1 KM)  
MIXING Lyr. DEPTH: 1500 FEET

GROUND RANGE (K FEET)  
HEIGHT AGL (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  BKGD. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE : 31 TO 55 DEGREE
SURFACE VISIBILITY: 15 MILES (24.1 KM)
MIXING Lyr. DEPTH : 1500 FEET

GROUND RANGE (K FEET)
HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  BKGD. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE
SURFACE VISIBILITY: 1 MILE (1.6 KM)
MIXING Lyr. DEPTH: 3000 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGD. REFLECTANCE: 00 TO 14 PERCENT  
SOLAR ELEV. ANGLE : 31 TO 55 DEGREE  
SURFACE VISIBILITY: 5 MILES (8.0 KM)  
MIXING Lyr. DEPTH : 3000 FEET  

GROUND RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGND. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE
SURFACE VISIBILITY: 7 MILES (11.3 KM)
MIXING Lyr. DEPTH: 3000 FEET

GROUND RANGE (K FEET)  
HEIGHT AGL (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGND. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE
SURFACE VISIBILITY: 10 MILES (16.1 KM)
MIXING LVR. DEPTH: 3000 FEET

GROUND RANGE (K FEET)
HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN PERCENTS)
CLOUD COVER: CLR-SCT
BGND. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE : 31 TO 55 DEGREE
SURFACE VISIBILITY: 15 MILES (24.1 KM)
MIXING L.Y.R. DEPTH : 3000 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  BKGND. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE : 31 TO 55 DEGREE
SURFACE VISIBILITY: 1 MILE  (1.6 KM)
MIXING Lyr. DEPTH : 6000 FEET

HEIGHT AGL (K FEET)

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  BKGD. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE
SURFACE VISIBILITY: 3 MILES (4.8 KM)
MIXING Lyr. DEPTH: 6000 FEET

GROUND RANGE (K FEET)

HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGD. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE
SURFACE VISIBILITY: 7 MILES (11.3 KM)
MIXING Lyr. DEPTH: 6000 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGD. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE
SURFACE VISIBILITY: 10 MILES (16.1 KM)
MIXING Lyr. Depth: 6000 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGN. REFLECTANCE: 00 TO 14 PERCENT 
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE 
SURFACE VISIBILITY: 1 MILE (1.6 KM) 
MIXING Lyr. DEPTH: BELOW 50 FEET
CLOUD COVER: CLR-SCT
BACKGROUND REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE
SURFACE VISIBILITY: 5 MILES (8.0 KM)
MIXING LAYER DEPTH: BELOW 50 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BGKND. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE
SURFACE VISIBILITY: 10 MILES (16.1 KM)
MIXING Lyr. Depth: BELOW 50 FEET

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT

BGND. REFLECTANCE: 0% TO 14 PERCENT
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE
SURFACE VISIBILITY: 15 MILES (24.1 KM)
MIXING Lyr. DEPTH: BELOW 50 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)

HEIGHT AGL (K FEET)

22 20 18 16 14 12 10 8 6 4 2 0
0 5 10 15 20 25 30 35 40 45 50
CLOUD COVER: CLR-SCT
BKGD. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE
SURFACE VISIBILITY: 3 MILES (4.8 KM)
MIXING Lyr. DEPTH: 1500 FEET

GROUND RANGE (K FEET)
HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGD. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE
SURFACE VISIBILITY: 5 MILES (8.0 KM)
MIXING Lyr. DEPTH: 1500 FEET

GROUND RANGE (K FEET)

HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BGND. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE
SURFACE VISIBILITY: 10 MILES (16.1 KM)
MIXING Lyr. DEPTH: 1500 FEET

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGNDR. REFLECTANCE: 0.0 TO 0.14 PERCENT  
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE  
SURFACE VISIBILITY: 15 MILES (24.1 KM)  
MIXING Lyr. DEPTH: 1500 FEET

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGD. REFLECTANCE: 00 TO 14 PERCENT  
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE  
SURFACE VISIBILITY: 1 MILE (1.6 KM)  
MIXING Lyr. DEPTH: 3000 FEET  

GROUND RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
BKGND. REFLECTANCE: 0% TO 14 PERCENT
SOLAR ELEV. ANGLE: 55 TO 90 DEGREE
SURFACE VISIBILITY: 3 MILES (4.8 KM)
MIXING LVR. DEPTH:

CLOUD COVER:
CLR-SCT

GROUND RANGE [K FEET]
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)

HEIGHT AGL (K FEET)
CLOUD COVER: CLR-SCT

BGND. REFLECTANCE: 00 TO 14 PERCENT

SOLAR ELEV. ANGLE: 56 TO 90 DEGREE

SURFACE VISIBILITY: 5 MILES (8.0 KM)

MIXING Lyr. DEPTH: 3000 FEET

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLYUD COVER: CLR-SCT  
BKGD. REFLECTANCE: 00 TO 14 PERCENT  
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE  
SURFACE VISIBILITY: 7 MILES (11.3 KM)  
MIXING Lyr. DEPTH: 3000 FEET

GROUND RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BGNND. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE
SURFACE VISIBILITY: 15 MILES (24.1 KM)
MIXING Lvr. DEPTH: 3000 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGD. REFLECTANCE: 00 TO 14 PERCENT
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE
SURFACE VISIBILITY: 1 MILE (1.6 KM)
MIXING Lyr. DEPTH: 6000 FEET

HEIGHT AGL (K FEET)

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGND. REFLECTANCE: 00 TO 14 PERCENT  
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE  
SURFACE VISIBILITY: 5 MILES (8.0 KM)  
MIXING Lyr. DEPTH: 6000 FEET  

GROUND RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGN. REFLECTANCE: 00 TO 14 PERCENT  
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE  
SURFACE VISIBILITY: 7 MILES (11.3 KM)  
MIXING Lyr. DEPTH: 6000 FEET  

GROUND RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BACKGROUND REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE
SURFACE VISIBILITY: 1 MILE (1.6 KM)
MIXING Lyr. DEPTH: BELOW 50 FEET

GROUND RANGE (K FEET)
HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGND. REFLECTANCE: 15 TO 49 PERCENT  
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE  
SURFACE VISIBILITY: 3 MILES (4.8 KM)  
MIXING Lyr. DEPTH: BELOW 50 FEET  

GROUND RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGN. REFLECTANCE: 15 TO 49 PERCENT  
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE  
SURFACE VISIBILITY: 5 MILES (8.0 KM)  
MIXING Lyr. DEPTH: BELOW 50 FEET  

GROUND RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGND. REFLECTANCE: 15 TO 49 PERCENT  
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE  
SURFACE VISIBILITY: 7 MILES (11.3 KM)  
MIXING Lyr. DEPTH: BELOW 50 FEET

GROUND RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGND. REFLECTANCE: 15 TO 49 PERCENT  
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE  
SURFACE VISIBILITY: 10 MILES (16.1 KM)  
MIXING Lyr. DEPTH: BELOW 50 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGD. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE
SURFACE VISIBILITY: 15 MILES (24.1 KM)
MIXING Lyr. DEPTH: BELOW 50 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBlE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  BKGD. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE
SURFACE VISIBILITY: 1 MILE (1.6 KM)
MIXING Lyr. DEPTH: 1500 FEET

GROUND RANGE (K FEET)

HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGD. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE
SURFACE VISIBILITY: 3 MILES (4.8 KM)
mixing lyr. depth: 1500 FEET

Contrast transmittance for visible wavelengths (in tenths)
CLOUD COVER: CLR-SCT  BKGND. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE
SURFACE VISIBILITY: 5 MILES (8.0 KM)
MIXING Lyr. DEPTH: 1500 FEET

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BGND. REFLECTANCE: 15 TO 49 PERCENT  
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE  
SURFACE VISIBILITY: 7 MILES (11.3 KM)  
MIXING Lyr. DEPTH: 1500 FEET

HEIGHT AGL (K FEET)  
GROUND RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGD. REFLECTANCE: 15 TO 49 PERCENT  
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE  
SURFACE VISIBILITY: 10 MILES (16.1 KM)  
MIXING Lyr. DEPTH: 1500 FEET

GROUND RANGE (K FEET)  
HEIGHT AGL (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  BKGD. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE : 0 TO 10 DEGREE
SURFACE VISIBILITY: 15 MILES (24.1 KM)
MIXING Lyr. DEPTH : 1500 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGNDS. REFLECTANCE: 15 TO 49 PERCENT 
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE 
SURFACE VISIBILITY: 1 MILE (1.6 KM) 
MIXING Lyr. DEPTH: 3000 FEET 

HEIGHT AGL (K FEET) 

GROUND RANGE (K FEET) 

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  BKGD. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE
SURFACE VISIBILITY: 3 MILES (4.8 KM)
MIXING Lyr. DEPTH: 3000 FEET

HEIGHT AGL (K FEET)

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: GLR-SCT  
BKGD. REFLECTANCE: 15 TO 49 PERCENT  
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE  
SURFACE VISIBILITY: 5 MILES (8.0 KM)  
MIXING Lyr. DEPTH: 3000 FEET  

GROUND RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGN. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE
SURFACE VISIBILITY: 15 MILES (24.1 KM)
MIXING Lyr. DEPTH: 3000 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGND. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE
SURFACE VISIBILITY: 1 MILE (1.6 KM)
MIXING Lyr. DEPTH: 6000 FEET

GROUND RANGE (K FEET)
HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGD. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE
SURFACE VISIBILITY: 3 MILES (4.8 KM)
MIXING Lyr. DEPTH: 6000 FEET

HEIGHT AGL (K FEET)

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
BKGND. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE
SURFACE VISIBILITY: 5 MILES (8.0 KM)
MIXING Lyr. DEPTH:

CLOUD COVER: CLR-SCT

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)

HEIGHT AGL (K FEET)
CLOUD COVER: CLR-SCT  
BKGND. REFLECTANCE: 15 TO 49 PERCENT  
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE  
SURFACE VISIBILITY: 10 MILES (16.1 KM)  
MIXING Lyr. DEPTH: 6000 FEET
CLOUD COVER: CLR-SCT  BKGD. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE
SURFACE VISIBILITY: 15 MILES (24.1 KM)
MIXING Lyr. DEPTH: 6000 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGND. REFLECTANCE: 15 TO 49 PERCENT  
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE  
SURFACE VISIBILITY: 1 MILE (1.6 KM)  
MIXING Lyr. DEPTH: BELOW 50 FEET

GROUND RANGE (K FEET)  
HEIGHT AGL (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BGND. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE
SURFACE VISIBILITY: 3 MILES (4.8 KM)
MIXING LVR. DEPTH: BELOW 50 FEET

GROUND RANGE (K FEET)
HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGD. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE
SURFACE VISIBILITY: 7 MILES (11.3 KM)
MIXING LÝR. DEPTH: BELOW 50 FEET

HEIGHT AGL (K FEET)

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISBILE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGD. REFLECTANCE: 15 TO 49 PERCENT  
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE  
SURFACE VISIBILITY: 10 MILES (16.1 KM)  
MIXING Lyr. DEPTH: BELOW 50 FEET  

HEIGHT AGL (K FEET)  

GROUND RANGE (K FEET)  

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  BKGD. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE
SURFACE VISIBILITY: 1 MILE (1.6 KM)
MIXING Lyr. DEPTH: 1500 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGD. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE : 11 TO 30 DEGREE
SURFACE VISIBILITY: 3 MILES (4.8 KM)
MIXING Lyr. DEPTH : 1500 FEET

HEIGHT AGL (K FEET)

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
GROUND RANGE (K FEET)

MIXING LVR. DEPTH: 15000 FEET
SURFACE VISIBILITY: 5 MILES (8.0 KM)
SOLAR ELEV. ANGLE: 19 TO 30 DEGREE
CLOUD COVER: CLR-SCF
BKND. REFLECTANCE: 15 TO 49 PERCENT
CLOUD COVER: CLR-SCT  BKGD. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE
SURFACE VISIBILITY: 10 MILES (16.1 KM)
MIXING LVR. DEPTH: 1500 FEET

GROUND RANGE (K FEET)
HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGND. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE
SURFACE VISIBILITY: 15 MILES (24.1 KM)
MIXING Lyr. DEPTH: 1500 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGN. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE
SURFACE VISIBILITY: 1 MILE (1.6 KM)
MIXING Lyr. DEPTH: 3000 FEET

GROUND RANGE (K FEET)
HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BGND. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE
SURFACE VISIBILITY: 5 MILES (8.0 KM)
MIXING LYL. DEPTH: 3000 FEET

GROUND RANGE (K FEET)
HEIGHT AGL (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  BKGD. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE
SURFACE VISIBILITY: 7 MILES (11.3 KM) —
MIXING Lyr. DEPTH: 3000 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT

BACKGROUND REFLECTANCE: 15 TO 49 PERCENT

SOLAR ELEV. ANGLE: 11 TO 30 DEGREE

SURFACE VISIBILITY: 3 MILES (4.8 KM)

MIXING Lyr. DEPTH: 6000 FEET

HEIGHT AGL (K FEET)

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
SKGND. REFLECTANCE: 15 TO 49 PERCENT  
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE  
SURFACE VISIBILITY: 15 MILES (24.1 KM)  
MIXING LTR. DEPTH: 6000 FEET

HEIGHT AGL (K FEET)  
GROUND RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  BKID. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE : 31 TO 55 DEGREE
SURFACE VISIBILITY: 1 MILE (1.6 KM)
MIXING LYE. DEPTH : BELOW 50 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGND. REFLECTANCE: 15 TO 49 PERCENT  
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE  
SURFACE VISIBILITY: 3 MILES (4.8 KM)  
MIXING Lyr. DEPTH: BELOW 50 FEET  

GROUND RANGE (K FEET)  
HEIGHT AGL (K FEET)  

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGD. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE
SURFACE VISIBILITY: 5 MILES (8.0 KM)
MIXING Lyr. DEPTH: BELOW 50 FEET

HEIGHT AGL (K FEET)

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BACKGROUND REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE
SURFACE VISIBILITY: 7 MILES (11.3 KM)
MIXING Lyr. DEPTH: BELOW 50 FEET

GROUND RANGE (K FEET)
HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGND. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE 31 TO 55 DEGREE
SURFACE VISIBILITY: 10 MILES (16.1 KM)
MIXING Lyr. DEPTH: BELOW 50 FEET

GROUND RANGE (K FEET)

HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGD. REFLECTANCE: 15 TO 49 PERCENT  
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE  
SURFACE VISIBILITY: 1 MILE (1.6 KM)  
MIXING Lyr. DEPTH: 1500 FEET

GROUND RANGE (K FEET)  
HEIGHT AGL (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: GLR-SCT
BKGD. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE
SURFACE VISIBILITY: 5 MILES (8.0 KM)
MIXING LVR. DEPTH: 1500 FEET

GROUND RANGE (K FEET)
HEIGHT AGL (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGD. REFLECTANCE: 15 TO 49 PERCENT  
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE  
SURFACE VISIBILITY: 13 MILES (16.1 KM)  
MIXING Lyr. DEPTH: 1500 FEET

GROUNd RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGND. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE
SURFACE VISIBILITY: 1 MILE (1.6 KM)
MIXING Lyr. DEPTH: 3000 FEET

HEIGHT AGL (K FEET)

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGN. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE
SURFACE VISIBILITY: 3 MILES (4.8 KM)
MIXING Lyr. DEPTH: 3000 FEET

HEIGHT AGL (K FEET)

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGD. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE
SURFACE VISIBILITY: 5 MILES (8.0 KM)
MIXING Lyr. DEPTH: 3000 FEET

GROUNd RANGE (k FEET)

HEIGHT AGL (k FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  BKGD. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE : 31 TO 55 DEGREE
SURFACE VISIBILITY: 7 MILES (11.3 KM)
MIXING Lyr. DEPTH : 3000 FEET.

HEIGHT AGL (K FEET)

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  BKGD. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE
SURFACE VISIBILITY: 10 MILES (16.1 KM)
MIXING Lyr. DEPTH: 3000 FEET

HEIGHT AGL (K FEET)

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGD. REFLECTANCE: 15 TO 49 PERCENT  
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE  
SURFACE VISIBILITY: 15 MILES (24.1 KM)  
MIXING Lyr. DEPTH: 3000 FEET

GROUND RANGE (K FEET)  
HEIGHT AGL (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGMN. REFLECTANCE: 15 TO 49 PERCENT  
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE  
SURFACE VISIBILITY: 3 MILES (4.8 KM)  
MIXING Lyr. DEPTH: 6000 FEET

GROUND RANGE (K FEET)  
HEIGHT AGL (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGD. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE
SURFACE VISIBILITY: 5 MILES (8.0 KM)
MIXING Lyr. DEPTH: 6000 FEET

GROUND RANGE (K FEET)
HEIGHT AGL (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BGND. REFLECTANCE: 15 TO 49 PERCENT  
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE  
SURFACE VISIBILITY: 7 MILES (11.3 KM)  
MIXING Lyr. DEPTH: 6000 FEET  

GROUND RANGE (K FEET)  
HEIGHT AGL (K FEET)  

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  BKGD. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE
SURFACE VISIBILITY: 10 MILES (16.1 KM)
MIXING Lyr. DEPTH: 6000 FEET

GROUND RANGE (K FEET)
HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGD. REFLECTANCE: 15 TO 49 PERCENT  
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE  
SURFACE VISIBILITY: 15 MILES (24.1 KM)  
MIXING LHR. DEPTH: 6000 FEET  

GROUND RANGE (K FEET)  
HEIGHT AGL (K FEET)  

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BGND. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE
SURFACE VISIBILITY: 1 MILE (1.6 KM)
MIXING Lyr. DEPTH: BELOW 50 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGD. REFLECTANCE: 15 TO 49 PERCENT  
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE  
SURFACE VISIBILITY: 3 MILES (4.8 KM)  
MIXING Lyr. DEPTH: BELOW 50 FEET

HEIGHT AGL (K FEET)  
GROUND RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGN. REFLECTANCE: 15 TO 49 PERCENT  
SOLAR ELEV. ANGLE : 56 TO 90 DEGREE  
SURFACE VISIBILITY: 5 MILES (8.0 KM)  
MIXING Lyr. DEPTH : BELOW 50 FEET  

GROUND RANGE (K FEET)  
HEIGHT AGL (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  BKGD. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE : 56 TO 90 DEGREE
SURFACE VISIBILITY: 10 MILES (16.1 KM)
MIXING Lyr. DEPTH : BELOW 50 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BACKGND. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE
SURFACE VISIBILITY: 5 MILES (8.0 KM)
MIXING Lyr. DEPTH: 1500 FEET

GROUND RANGE (K FEET)

HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGD. REFLECTANCE: 15 TO 49 PERCENT  
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE  
SURFACE VISIBILITY: 10 MILES (16.1 KM)  
MIXING Lyr. DEPTH: 1500 FEET

GROUND RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGND. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE
SURFACE VISIBILITY: 3 MILES (4.8 KM)
MIXING Lyr. DEPTH: 3000 FEET

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGD. REFLECTANCE: 15 TO 49 PERCENT 
SOLAR ELEV. ANGLE : 56 TO 90 DEGREE 
SURFACE VISIBILITY: 5 MILES (8.0 KM) 
MIXING Lyr. DEPTH : 3000 FEET 

GROUND RANGE (K FEET) 
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BGND. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE
SURFACE VISIBILITY: 7 MILES (11.3 KM)
MIXING Lyr. DEPTH: 3000 FEET

HEIGHT AGL (K FEET)

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGD. REFLECTANCE: 15 TO 49 PERCENT  
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE  
SURFACE VISIBILITY: 10 MILES (16.1 KM)  
MIXING Lyr. DEPTH: 3000 FEET

HEIGHT AGL (K FEET)  
GROUnd RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGND. REFLECTANCE: 15 TO 49 PERCENT  
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE  
SURFACE VISIBILITY: 1 MILE (1.6 KM)  
MIXING Lyr. DEPTH: 6000 FEET  

GROUND RANGE (K FEET)  
HEIGHT AGL (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGD. REFLECTANCE: 15 TO 49 PERCENT
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE
SURFACE VISIBILITY: 5 MILES (8.0 KM)
MIXING Lyr. DEPTH: 6000 FEET

GROUND RANGE (K FEET)
HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGD. REFLECTANCE: 15 TO 49 PERCENT  
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE  
SURFACE VISIBILITY: 7 MILES (11.3 KM)  
MIXING LYR. DEPTH: 6000 FEET

Contrast transmittance for visible wavelengths (in tenths)
CLOUD COVER: CLR-SCT  BKGD. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE
SURFACE VISIBILITY: 1 MILE (1.6 KM)
MIXING Lyr. Depth: BELOW 50 FEET

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HEIGHT AGL (K FEET)

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BGND. REFLECTANCE: 50 TO 99 PERCENT  
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE  
SURFACE VISIBILITY: 3 MILES (4.8 KM)  
MIXING Lyr. DEPTH: BELOW 50 FEET  

HEIGHT AGL (K FEET)  
GROUND RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGND. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE
SURFACE VISIBILITY: 7 MILES (11.3 KM)
MIXING Lyr. DEPTH: BELOW 50 FEET

Contrast Transmittance for Visible Wavelengths (in Tenths)
CLOUD COVER: CLR-SCT
BACKGND. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE
SURFACE VISIBILITY: 10 MILES (16.1 KM)
MIXING Lyr. DEPTH: BELOW 50 FEET

GROUND RANGE (K FEET)

HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGD. REFLECTANCE: 50 TO 99 PERCENT  
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE  
SURFACE VISIBILITY: 15 MILES (24.1 KM)  
MIXING Lyr. DEPTH: BELOW 50 FEET

GROUND RANGE (K FEET)  
HEIGHT AGL (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGD. REFLECTANCE: 50 TO 99 PERCENT  
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE  
SURFACE VISIBILITY: 1 MILE (1.6 KM)  
MIXING Lyr. DEPTH: 1500 FEET

GROUNd RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGND. REFLECTANCE: 50 TO 99 PERCENT  
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE  
SURFACE VISIBILITY: 3 MILES (4.8 KM)  
MIXING Lyr. DEPTH: 1500 FEET  

GROUND RANGE (K FEET)  
HEIGHT AGL (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  BKGD. REFLECTANCE: .50 TO 99 PERCENT
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE
SURFACE VISIBILITY: 15 MILES (24.1 KM)
MIXING Lyr. DEPTH: 1500 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGD. REFLECTANCE: 50 TO 99 PERCENT  
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE  
SURFACE VISIBILITY: 1 MILE (1.6 KM)  
MIXING Lyr. DEPTH: 3000 FEET
CLOUD COVER: CLR-SCT  BKGD. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE : 0 TO 10 DEGREE
SURFACE VISIBILITY: 3 MILES (4.8 KM)
MIXING Lyr. DEPTH : 3000 FEET

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SET  
BKGN. REFLECTANCE: 50 TO 99 PERCENT  
SOLAR ELEV. ANGLE : 0 TO 10 DEGREE  
SURFACE VISIBILITY: 5 MILES (8.0 KM)  
MIXING Lyr. DEPTH : 3000 FEET  

GROUND RANGE (K FEET)  
HEIGHT AGL (K FEET)  

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGD. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE
SURFACE VISIBILITY: 7 MILES (11.3 KM)
MIXING Lyr. DEPTH: 3000 FEET

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  BKGD. REFLECTANCE: 50 TO 39 PERCENT
SOLAR ELEV. ANGLE : 0 TO 10 DEGREE
SURFACE VISIBILITY: 10 MILES (16.1 KM)
MIXING Lyr. DEPTH :  3000 FEET

GROUND RANGE (K FEET)

HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGD. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: 0 TO 10 DEGREE
SURFACE VISIBILITY: 1 MILE (1.6 KM)
MIXING Lyr. DEPTH: 6000 FEET

HEIGHT AGL (K FEET)

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BGND. REFLECTANCE: 50 to 99 percent  
SOLAR ELEV. ANGLE: 0 to 10 degree  
SURFACE VISIBILITY: 3 MILES (4.8 KM)  
MIXING Lyr. DEPTH: 6000 FEET

GROUnD RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGD. REFLECTANCE: 50 TO 99 PERCENT  
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE  
SURFACE VISIBILITY: 1 MILE (1.6 KM)  
MIXING Lyr. DEPTH: BELOW 50 FEET

GROUNd RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  BKGND. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE
SURFACE VISIBILITY: 3 MILES (4.8 KM)
MIXING L YR. DEPTH: BELOW 50 FEET

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGND. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE
SURFACE VISIBILITY: 7 MILES (11.3 KM)
MIXING Lyr. DEPTH: BELOW 50 FEET

GRAPHIC:
GROUND RANGE (K FEET)
HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGND. REFLECTANCE: 50 TO 99 PERCENT  
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE  
SURFACE VISIBILITY: 10 MILES (16.1 KM)  
MIXING Lyr. DEPTH: BELOW 50 FEET  

GROUND RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGD. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE
SURFACE VISIBILITY: 15 MILES (24.1 KM)
MIXING Lyr. DEPTH: BELOW 50 FEET

GROUND RANGE (K FEET)
HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  BKGD. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE
SURFACE VISIBILITY: 1 MILE (1.6 KM)
MIXING Lyr. DEPTH: 1500 FEET

HEIGHT AGL (K FEET)
GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BGND. REFLECTANCE: 50 TO 99 PERCENT  
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE  
SURFACE VISIBILITY: 3 MILES (4.8 KM)  
MIXING Lyr. DEPTH: 1500 FEET

GROUND RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BACKGROUND REFLECTANCE: 50 TO 99 PERCENT  
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE  
SURFACE VISIBILITY: 5 MILES (8.0 KM)  
MIXING Lyr. DEPTH: 1500 FEET

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGD. REFLECTANCE: 50 TO 95 PERCENT
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE
SURFACE VISIBILITY: 10 MILES (16.1 KM)
MIXING Lyr. DEPTH: 1500 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGND. REFLECTANCE: 50 TO 99 PERCENT  
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE  
SURFACE VISIBILITY: 1 MILE (1.6 KM)  
MIXING LYM. DEPTH: 3000 FEET

GROUND RANGE (K FEET)

HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGND. REFLECTANCE: 50 TO 99 PERCENT  
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE  
SURFACE VISIBILITY: 7 MILES (11.3 KM)  
MIXING Lyr. DEPTH: 3000 FEET  

GROUND RANGE (K FEET)  
HEIGHT AGL (K FEET)  

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGN. REFLECTANCE: 50 TO 99 PERCENT 
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE 
SURFACE VISIBILITY: 10 MILES (16.1 KM) 
MIXING LVR. DEPTH: 3000 FEET 

GROUND RANGE (K FEET) 
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGND. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE
SURFACE VISIBILITY: 1 MILE. (1.6 KM)
MIXING Lyr. DEPTH: 6000 FEET

HEIGHT AGL (K FEET)
GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGND. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE
SURFACE VISIBILITY: 3 MILES (4.8 KM)
MIXING Lyr. DEPTH: 6000 FEET

GROUND RANGE (K FEET)
HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGND. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE
SURFACE VISIBILITY: 5 MILES (8.0 KM)
MIXING Lyr. DEPTH: 6000 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  BKGD. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE
SURFACE VISIBILITY: 7 MILES (11.3 KM)
MIXING Lyr. DEPTH: 6000 FEET

GROUND RANGE (K FEET)
HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGN. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE
SURFACE VISIBILITY: 10 MILES (16.1 KM)
MIXING Lyr. DEPTH: 6000 FEET

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGD. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: 11 TO 30 DEGREE
SURFACE VISIBILITY: 15 MILES (24.1 KM)
MIXING Lyr. DEPTH: 6000 FEET

GROUND RANGE (K FEET)

HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BACKGND. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE
SURFACE VISIBILITY: 1 MILE (1.6 KM)
MIXING Lyr. DEPTH: BELOW 50 FEET

GROUND RANGE (K FEET)
HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLRD-SCT

BACKGROUND REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEVATION ANGLE: 31 TO 55 DEGREE
SURFACE VISIBILITY: 3 MILES (4.8 KM)
MIXING LAYER DEPTH: BELOW 50 FEET

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELTEHS (IN TENTHS)

HEIGHT AGL (K FEET)
CLOUD COVER: CLR-SCT  BKGD. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE
SURFACE VISIBILITY: 7 MILES (11.3 KM)
MIXING Lyr. DEPTH: BELOW 50 FEET

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGND. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE
SURFACE VISIBILITY: 10 MILES (16.1 KM)
MIXING Lyr. DEPTH: BELOW 50 FEET

HEIGHT AGL (K FEET)

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGD. REFLECTANCE: 50 TO 99 PERCENT  
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE  
SURFACE VISIBILITY: 15 MILES (24.1 KM)  
MIXING Lyr. DEPTH: BELOW 50 FEET  

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BACKGROUND REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: 31 TO 35 DEGREE
SURFACE VISIBILITY: 1 MILE (1.6 KM)
MIXING LAYER DEPTH: 1500 FEET

HEIGHT AGL (K FEET)

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGD. REFLECTANCE: 50 TO 99 PERCENT  
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE  
SURFACE VISIBILITY: 3 MILES (4.8 KM)  
MIXING Lyr. DEPTH: 1500 FEET
CLOUD COVER: CLR-SCT  BKND. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE
SURFACE VISIBILITY: 5 MILES (8.0 KM)
MIXING Lyr. DEPTH: 15000 FEET

HEIGHT AGL (K FEET)

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  BKGND. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE
SURFACE VISIBILITY: 7 MILES (11.3 KM)
MIXING Lyr. DEPTH: 1500 FEET

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGD. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE
SURFACE VISIBILITY: 10 MILES (16.1 KM)
MIXING LRY. DEPTH: 1500 FEET

GROUND RANGE (K FEET)

HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT

BACKGROUND REFLECTANCE: 50 TO 99 PERCENT

SOLAR ELEV. ANGLE: 31 TO 55 DEGREE

SURFACE VISIBILITY: 15 MILES (24.1 KM)

MIXING Lyr. DEPTH: 1500 FEET

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGD. REFLECTANCE: 50 TO 99 PERCENT  
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE  
SURFACE VISIBILITY: 1 MILE (1.6 KM)  
MIXING Lyr. DEPTH: 3000 FEET  

GROUND RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGD. REFLECTANCE: 50 TO 99 PERCENT  
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE  
SURFACE VISIBILITY: 3 MILES (4.8 KM)  
MIXING Lyr. DEPTH: 3000 FEET  

GROUND RANGE (K FEET)  
HEIGHT AGL (K FEET)  

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGND. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE
SURFACE VISIBILITY: 5 MILES (8.0 KM)
MIXING Lyr. DEPTH: 3000 FEET

GROUND RANGE (K FEET)
HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGD. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE
SURFACE VISIBILITY: 7 MILES (11.3 KM)
MIXING Lyr. DEPTH: 3000 FEET

HEIGHT AGL (K FEET)

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGD. REFLECTANCE: 50 TO 99 PERCENT  
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE  
SURFACE VISIBILITY: 10 MILES (16.1 KM)  
MIXING Lyr. DEPTH: 3000 FEET

GROUND RANGE (K FEET)

HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGN. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE
SURFACE VISIBILITY: 1 MILE (1.6 KM)
MIXING Lyr. DEPTH: 6000 FEET
CLOUD COVER: CLR-SCT
BKGND. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: 31 TO 55 DEGREE
SURFACE VISIBILITY: 5 MILES (8.0 KM)
MIXING Lyr. DEPTH: 6000 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)

HEIGHT AGL (K FEET)

GROUND RANGE (K FEET)

MIXING Lyr. DEPTH:

7 MILES (11.3 KM)

SOLAR ELEV. ANGLE:

3 TO 55 DEGREE

SURFACE VISIBILITY:

50 TO 99 PERCENT

BKGND. REFLECTANCE:

CLR-SCT

CLOUD COVER:
CLOUD COVER: CLR-SCT

BACKGROUND REFLECTANCE: 50 TO 99 PERCENT

SOLAR ELEV. ANGLE: 56 TO 90 DEGREE

SURFACE VISIBILITY: 1 MILE (1.6 KM)

MIXING Lyr. DEPTH: BELOW 50 FEET

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGND. REFLECTANCE: 50 TO 99 PERCENT  
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE  
SURFACE VISIBILITY: 7 MILES (11.3 KM)  
MIXING Lyr. DEPTH: BELOW 50 FEET

HEIGHT AGL (K FEET)

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGD. REFLECTANCE: 50 TO 99 PERCENT  
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE  
SURFACE VISIBILITY: 10 MILES (16.1 KM)  
MIXING Lyr. DEPTH: BELOW 59 FEET  

GROUND RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BACKGROUND REFLECTANCE: 50 TO 99 PERCENT  
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE  
SURFACE VISIBILITY: 15 MILES (24.1 KM)  
MIXING LAYER DEPTH: BELOW 50 FEET

GROUND RANGE (K FEET)  
HEIGHT AGL (K FEET)  

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGND. REFLECTANCE: 50 TO 99 PERCENT  
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE  
SURFACE VISIBILITY: 3 MILES (4.8 KM)  
MIXING Lyr. DEPTH: 1500 FEET

GROUND RANGE (K FEET)  
HEIGHT AGL (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  BKGD. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE
SURFACE VISIBILITY: 5 MILES (.80 KM)
MIXING Lyr. DEPTH: 1500 FEET

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGND. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE
SURFACE VISIBILITY: 7 MILES (11.3 KM)
MIXING Lyr. DEPTH: 1500 FEET

HEIGHT AGL (K FEET)

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGD. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE
SURFACE VISIBILITY: 15 MILES (24.1 KM)
MIXING LYL. DEPTH: 1500 FEET

GROUND RANGE (K FEET)

HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGD. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE
SURFACE VISIBILITY: 1 MILE (1.6 KM)
MIXING Lyr. DEPTH: 3000 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGD. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE
SURFACE VISIBILITY: 3 MILES (4.8 KM)
MIXING Lyr. DEPTH: 3000 FEET

GROUND RANGE (K FEET)
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGND. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE
SURFACE VISIBILITY: 7 MILES (11.3 KM)
MIXING Lyr. DEPTH: 3000 FEET

GROUND RANGE (K FEET)
HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT
BKGND. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE
SURFACE VISIBILITY: 10 MILES (16.1 KM)
MIXING Lyr. DEPTH: 3000 FEET

GROUND RANGE (K FEET)
HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGD. REFLECTANCE: 50 TO 99 PERCENT  
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE  
SURFACE VISIBILITY: 15 MILES (24.1 KM)  
MIXING Lyr. DEPTH: 3000 FEET  

GROUND RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BKGD. REFLECTANCE: 50 TO 99 PERCENT  
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE  
SURFACE VISIBILITY: 1 MILE (1.6 KM)  
MIXING Lyr. DEPTH: 6000 FEET

GROUND RANGE (K FEET)  
CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  

BKGND. REFLECTANCE: 50 TO 99 PERCENT  

SOLAR ELEV. ANGLE: 56 TO 90 DEGREE  

SURFACE VISIBILITY: 3 MILES (4.8 KM)  

MIXING Lyr. DEPTH: 6000 FEET

GROUND RANGE (K FEET)  

HEIGHT AGL (K FEET)  

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  BKGD. REFLECTANCE: 50 TO 99 PERCENT
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE
SURFACE VISIBILITY: 7 MILES (11.3 KM)
MIXING Lyr. DEPTH: 6000 FEET

GROUND RANGE (K FEET)

HEIGHT AGL (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
CLOUD COVER: CLR-SCT  
BACKGROUND REFLECTANCE: 50 TO 99 PERCENT  
SOLAR ELEV. ANGLE: 56 TO 90 DEGREE  
SURFACE VISIBILITY: 10 MILES (16.1 KM)  
MIXING Lyr. DEPTH: 6000 FEET

HEIGHT AGL (K FEET)

GROUND RANGE (K FEET)

CONTRAST TRANSMITTANCE FOR VISIBLE WAVELENGTHS (IN TENTHS)
SUPPLEMENTARY INFORMATION
NEW LIMITATION CHANGE

TO
DISTRIBUTION STATEMENT - C
Distribution authorized to U.S. Gov't agencies and their contractors

LIMITATION CODE: 2

FROM
DISTRIBUTION STATEMENT - B

LIMITATION CODE: 3

AUTHORITY

**REQUEST FOR LIMITED DOCUMENT**

**DTIC CONTROL NO.** 8071011

**USER CONTROL NO.** A687001

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**I. REQUEST AND JUSTIFICATION**

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<td>DISTRIBUTION LIMITED TO U.S. GOVT. AGENCIES ONLY; ADMINISTRATIVE/OPERATIONAL USE; 1 MAY 84. OTHER REQUESTS MUST BE REFERRED TO USAFETAC/DNE, SCOTT AFB, IL 62225.</td>
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**DATE REQUESTED**

MAR 11, 1998

**BIBLIOGRAPHIC INFORMATION**

The following data elements will be printed in this order: Report Title, Personal Authors, Report Date, Monitor Acronym/Number, Report Number, Contract Number and Corporate Author:

**USER’S MANUAL FOR ESTIMATING TARGET ACQUISITION RANGE WHEN EMPLOYING TV SENSORS.**


**REQUIRED FOR (Explain need in detail include applicable contracts) FOR RESEARCH AND ANALYSES SUPPORTING VISUAL TARGET DETECTION OF SYSTEMS.**

---

**II. REQUESTING ORGANIZATION AND GOVERNMENT SPONSOR IDENTIFICATION**

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<th>REQUESTING ORGANIZATION AND ADDRESS</th>
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<td>SYSTEM PLANNING CORP</td>
<td>MOON</td>
<td>MOON</td>
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**ATTN:** MGR TECH LIB P W MOON

**PO BOX 12314**

**ARLINGTON, VA 222190000**

**GOVERNMENT SPONSOR AND ADDRESS**

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**CONTRACT MONITOR AND TELEPHONE NUMBER**

| MS JESSICA H. HJACKSON |

**III. RELEASING AGENCY DECISION**

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<td>SCOTT AFB, IL 62225</td>
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**TYPED NAME AND TITLE**

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**DATE**

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MEMORANDUM FOR DTIC-OCD
ATTN: Mr. Bush

FROM: AFWA Scientific and Technical Information Officer (STINFO)
c/o AFCCC/DOL
859 Buchanan Street
Scott AFB IL 62225-5116

SUBJECT: Change of Distribution Statement on USAFETAC/TN-83/-004

1. We have received a request (DTIC Control #8071011) for a copy of USAFETAC/TN-83/-004 "User's Manual for Estimating Target Acquisition Range When Employing TV Sensors" for a DoD contractor. The technical note was originally limited in distribution to U.S government agencies only. In 1990, the Air Weather Service STINFO reviewed and delimited that technical note, making it "Cleared for Public Release." I can find no correspondence indicating we told you that before, so please update your records accordingly.

2. I have sent a paper copy of the delimited tech note directly to the contractor making the request. If you have any questions, I'm at DSN 576-4044.

JAMES S. PERKINS, DAF
AFWA STINFO

cc: DTIC-BCS with DTIC Fm 55

Completed
15 may 2000

ADB 582564

CHOOSE THE WEATHER FOR BATTLE