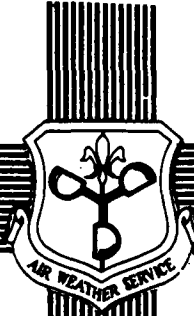


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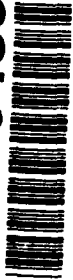
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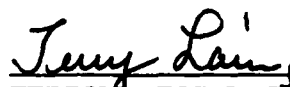
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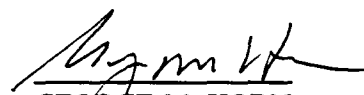
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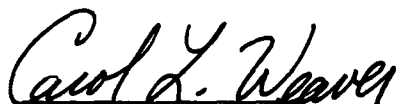
REVIEW AND APPROVAL STATEMENT

USAFETAC/TC-94/001, *Catalog of Air Force Weather Technical Publications, 1992-1993*, January 1994, has been reviewed and is approved for public release. There is no objection to unlimited distribution of this document to the public at large, or by the Defense Technical Information Center (DTIC) to the National Technical Information Service (NTIS).


TERRY LAING, Lt Col, USAF
Chief, Operations Division


GEORGE M. HORN
Editor

FOR THE COMMANDER


Carol L. Weaver, PhD
Chief Scientist
10 December 1993

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PREFACE

This technical catalog (TC) supplements (but does not supersede) AWS/TC-91/001, *Catalog of Air Weather Service Technical Documents 1941-1991*, December 1991. This catalog lists unclassified technical publications produced from January 1992 through December 1993 by HQ Air Weather Service and its three centers: the United States Air Force Environmental Technical Applications Center (USAFETAC), the Air Force Global Weather Central (AFGWC), and the Air Force Space Forecast Center (AFSFC). All the materials listed here are available from the AWS Technical Library (AWSTL), the Defense Technical Information Center (DTIC), or the National Technical Information Service (NTIS), depending on the materials requested and the requesting agency. Detailed availability information and ordering instructions are provided inside the catalog.

Listings for documents subject to "limited distribution" are indicated by the inclusion of their individual limited distribution statements (and "export control" warnings, when applicable). Consider these distribution statements before ordering such documents.

The catalog is aperiodically updated and reissued. Between updates, newly published materials and a list of publications in the publishing queue will be disseminated in an AWS "Technical Library Accessions" bulletin, or "TLA." TLAs may include other information on other publications of general interest to the Air Force weather community, as well as recent AWSTL accessions.

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Section 1

INTRODUCTION

1.1 How To Order From The Catalog.

• *Air Force weather units* (including Air National Guard, Air Force Reserve, and AFIT) order from the AWS Technical Library (AWSTL), 859 Buchanan St, Scott AFB IL 62225-5118. The AWSTL's DSN is 576-5023/2625/5061. Commercial, 618 5023/2625/5061. Fax: ext 3772. Order by report name, number, and AD-number, if available. Orders are filled from AWSTL stock whenever possible. If a paper copy is not available, the AWSTL will request a paper or microfiche copy from the Defense Technical Information Center (DTIC). Expect at least a 10-day delay for DTIC products.

• *Other Department of Defense (DoD) agencies* and bona fide defense contractors order from the Defense Technical Information Center (DTIC) by name and/or AD-number from: DTIC, Cameron Station, Alexandria VA 22314-6145, DSN 284-6847. For materials without an AD-number, contact the AWSTL.

• *Non-DoD agencies* may request materials that have been archived there from the National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, VA 22161, telephone (703) 487-4650.

1.2 DTIC/NTIS Cataloging and Numbering

System. All AWS technical publications are registered with the Defense Technical Information Center (DTIC) and entered into the DTIC database to facilitate a free exchange of technical data within the Department of Defense. DTIC registry allows any DoD researcher access to the documents registered there. Those AWS technical publications that have been "Approved for public release; distribution is unlimited" are forwarded by DTIC to the National Technical Information Service (NTIS), where they are made available to the general public.

1.3 How the Catalog is Updated. The TC is updated and republished aperiodically as necessary. Between published updates, an AWS "Technical Library Accessions" bulletin (or "TLA") distributed by the AWSTL lists newly published documents as well as those planned for publication but still in the editorial queue. The TLA may also list recent AWSTL accessions of general interest.

Section 2

AWS TECHNICAL PUBLICATIONS

2.1 AWS Technical Reports (TRs). AWS TRs are documents of general interest to the entire Air Force weather community. They are generally sponsored and/or produced by AWS/XT (Directorate of Technology) or AWS/DO (Directorate of Operations)..

AWS/TR-93/001 (AD-Pending) *New Techniques for Contrail Forecasting*, by Capt Jeffrey L. Peters, August 1993, 35pp. Documents the results of a study requested by the Strategic Air Command Deputy Chief of Staff for Operations (SAC/DO) to update previous contrail forecasting research done by Herbert Appleman for HQ Air Weather Service in 1953. Advancements in aircraft power plants, especially the development of bypass turbofan engines, made the new study necessary. This attempt to update and improve current contrail forecasting methods

was performed by the SAC Directorate of Weather (SAC/DOW). This report describes the development of new contrail forecast algorithms for several types of engines used in high-flying aircraft. It also provides contrail forecasting rules that correlate synoptic-scale upward vertical motion with contrail formation. The results indicate significant improvement in contrail forecasting accuracy over the Appleman technique now in use at the Air Force Global Weather Central.

2.2 AWS Forecaster Memos (FMs). AWS FMs are short publications that make Air Force weather forecasters quickly aware of new techniques or provide reviews of old ones.

AWS/FM-93/001 (AD-Pending) *The Basics of Weather Models*, by Dr W. Dale Meyer, March 1993, 15pp. Summarizes the history and fundamentals of modern numerical weather prediction models for operational weather forecasters. The information is intended to help forecasters understand the models' strengths and

weaknesses. It is published with the expectation that an increased understanding of the details of these complex mathematical models will help forecasters make better use of NWP model forecasts. This FM complements information in Chapter 7, AFP 105-56, *Meteorological Concepts*.

2.3 Interactive Training Packages (ITPs). Computer-based ITPs are produced by Detachment 5, HQ AWS, at Keesler AFB, MS, to satisfy Air Force weather units' needs for follow-on training. ITPs are produced in a variety of media, including combinations of computer graphics and text from diskette and CD-ROM drives, along with full-motion video and sound from interactive videodiscs.

AWS/ITP-93/001 (AD-Pending) *Weather Tutor I, Stability Basics*, August 1993. The first in a series of computer-based interactive training packages produced by AWS for use by Air Force weather units. Designed to run on the Air Weather Service Follow-On Training Multimedia Training System, it consists of text (instructions for running and using the computer program) and three 3 1/2-inch diskettes containing program software that generates high-resolution graphic images, anima-

tion, and text. This training package is in three parts: the first familiarizes students with the relationships between atmospheric variables. The second correlates these variables to atmospheric stability using the parcel theory and the Equation of State. The third and final part demonstrates the relationships of stability and moisture content with corresponding cloud scenes. An entry knowledge test is required before starting the lesson.

2.4 AWS Microcomputer Programs (PCs). AWS/SCC manages the AWS Small Computer Program and is approval authority for all software intended for distribution to weather units (except for tactical decision aids, which are managed by AWS/PMA, and AFDIS, which is managed by AFGWC/DOO). AWS/SCC maintains program source codes and sends distribution disks to the AWSTL for numbering (as PCs) and archival. Except as noted, order PCs by number and title from AWSTL, 859 Buchanan St, Scott AFB IL 62225-5118, DSN 576-5023/5061. Send source code requests to HQ AWS/SCC, 102 W Losey St, Scott AFB, IL 62225-5206. Revised PCs (those with new version numbers) are identified by double asterisks (**).

****PC-0036 Mark III EOTDA and Users Manual, Version 3.0.** NOTE: PC-0036 is for use only by AF weather units that support electrooptical weapons! Forward all requests for this program to HQ AWS/PMA, 102 W Losey St, Scott AFB IL 62225-5206. PC-0036 was produced by Phillips Laboratory to describe Mark III Electrooptical Tactical Decision Aids (EOTDAs) for microcomputers. Software supports three types of systems: infrared (IR), visible (TV, including low-light devices and night-vision goggles), and laser. Classified appendix must be stored and forwarded separately. Operating system: MS-DOS 3.0 or greater. Hardware: Z-248, other IBM-compatibles. Users manual and diskettes bear the following distribution limitations: *Distribution limited to DoD components only, critical technology, January 1993. Other requests for this document shall be referred to AWS/PMA, 102 W Losey St, Scott AFB IL 62225-5206. Warning: This document contains technical data whose export is restricted by the Arms Export Control Act (Title 22, U.S.C., Sec 2751, et seq.) Violations of these export laws are subject to severe criminal penalties. Disseminate in accordance with the provisions of AFR 80-34.*

****PC-0041 International Station Meteorological Climate Summary (ISMCS), Version 2.0.** A joint Navy/NOAA/USAFETAC project, on one CD-ROM disk. ISMCS includes summary data for 640 stations taken from Navy PC-SMOS, USAFETAC SOCS, and Navy Worldwide Airfield Summaries. User can print from disk and write selected data to an ASCII file for reformatting in a word processor. System requirements and start-up instructions are on the back of each disk.

****PC-0050 Electrooptical Climatology (EOCLIMO), Versions 2.0/2.1.** This interactive computer program allows user access to a comprehensive electrooptical climatological dataset for selected stations worldwide. The program produces graphs of EO-related conventional climatological data (ceilings, precipitation, and fog) as well as atmospheric transmittance climatology. EO data for the 8-12 micron band is computed by the LOWTRAN7 model using a standard geometry of 125-meter (410-foot) AGL sensor height and 4-km (2.16-NM) slant range with an assumed cloud-free line-of-sight. EOCLIMO requires an IBM-compatible computer with CGA or better graphics capability, and MS-DOS 3.2 or higher. The CGA version of this program will run on a Z-184 laptop, but the EGA version will *not*. Program output can be printed on any Epson-Compatible dot matrix printer. Datasets are compressed ("zipped") to conserve space. Instructions are provided for unzipping. Documentation for the program (unzipped) is on the program disk in the "EOCLIMOC.DOC" file. The technical information for the program is in the EOCLIM.TDF file. Datasets are by geographic region. More than one data disk may be required for your area of interest. Regional datasets are available for Africa (eight sets), the Persian Gulf (four sets), Central America and Mexico (four sets), Central and South America (one set), the Pacific (10 sets), and Europe (36 sets). EOCLIMO version 1.0 data files are NOT compatible with version 2.0/2.1 software. *Distribution limited to DoD components only, critical technology, 27 September 1991. Other requests shall be referred to A WSTL, FL4414, 859 Buchanan St, Scott AFB IL 62225-5118.*

PC-0051 *Marine Climatic Atlas of the World, Version 1.0.* This CD-ROM disk contains climatological information for user-specified areas. Data consists of summarized marine climatology elements for 1- and 5-degree latitude/longitude squares. Displays are as tables or isopleths. System requirements and start-up instructions are on the back cover of the box. This version allows users to write tables to an ASCII file on a hard drive. The file contains displayed headers as well as the data within the table to allow for loading tables into a word processor for reformatting.

PC-0052 *Skew-T/Hodograph Analysis and Research Program (SHARP), Version 1.0.* SHARP is similar to SKEW-T PRO (PC-0012B) but offers on-screen editing. SHARP, designed specifically for forecasting severe weather, presents wind profiles as hodographs. SHARP also calculates some new severe weather indices. Documentation is on the disk in the "README.1ST" file.

PC-0053 *Global Upper Air Climatic Atlas (GUACA), Version 1.0, April 1993.* This CD-ROM disk contains Volume I (period of record 1980-1987) and Volume II (period of record 1985-1991). System requirements and start-up instructions for this CD-ROM program are printed on the back cover of the box. This version lets users write tables to an ASCII file on the user's hard drive. The file contains displayed headers as well as the data within the table to allow loading tables into a word processor for reformatting.

PC-0054 *Air Force Global Weather Central Dial-In Program (AFDIS), Version 2.2.* The Air Force Global Weather Central Dial-In Subsystem (AFDIS) allows remote access to certain applications of AFGWC's Satellite Data Handling System. Instructions for using AFDIS are in AFGWC/TN-93/001, *AFDIS Software Users Manual*. *Note: Request AFDIS software from AFGWC/DOO, 106 Peacekeeper Dr S2N3, Offutt AFB NE 68113-4039, or call the AFGWC Global Duty Officer, DSN 271-2586.*

PC-0055 *Upper-Air Climatology (UACLIMO), Version 2.0.* UACLIMO produces climatology for enroute flight planning (legs or points). Data available includes mean monthly winds, temperature, and D-value for the Northern Hemisphere. Also available: wind factors and monthly contrail probabilities. Each data point corresponds to a 2.5 by 2.5 degree grid location. There are 12 data files, one for each month. UACLIMO displays vertical profiles of pressure, height, temperature, D-value, wind speed, wind direction, and wind factor from surface to 100 mb. The program interpolates data for aircraft altitude, then places the aircraft data relative to mandatory pressure levels. For points, sounding information is modified to display surface data (including elevation and altitude variation). Contrail formation probabilities are dependent on flight level and aircraft/engine type. Users can choose from four aircraft/engine types (U-2 non-bypass, B-52 and KC-135A non-bypass, low-bypass, and KC-135R high-bypass).

PC-0056 *NATIONWIDE Lightning Climatology, Version 1.0.* Program displays cloud-to-ground (CG) lightning strike climatology for the United States. The climatology was developed from a commercial database consisting of 5 years (1986-1990) of March-October CG lightning data obtained from GeoMet Data Services, Inc. Using AFGWC's Northern Hemisphere Whole-Mesh Polar Stereographic Reference Grid, each CG lightning observation was assigned to a grid box; the average hourly number of lightning strikes was calculated for each grid box by month. Summarized data is displayed for each of eight geographic regions. Graphs show diurnal variations of average hourly lightning strikes for any month or combination of months. Isopleth analyses give average hourly lightning strikes for any combination of months and hours. Tables give average hourly strikes by hour and month. Requires IBM-compatible (at least 286) PC with 640KB main memory, MS-DOS 3.2 or later, and EGA or better graphics; 3.8MB hard-disk space is required. It will *not* operate from floppy drives and it is *not* validated to run under Windows.

Section 3

USAFETAC TECHNICAL PUBLICATIONS

3.1 USAFETAC Technical Notes (TNs). USAFETAC TNs are written and published by USAFETAC members on widely diverse topics that range from regional climatology to SESS and from database quality control to the description of new algorithms.

Revised USAFETAC TNs

USAFETAC/TN-88/005 (AD-A263173) *Seasonal Snowfall Statistics for Selected Stations*, revised by SSgt Debra Runyon in January 1993, 36pp. A convenient reference to snowfall statistics at 63 selected stations worldwide. Revised data is for the 10-year period from 1980 to 1990. Total snowfall amounts for each season (defined as July of one year to June of the next) is provided, along with 24-hour snowfall extremes and dates. Seasonal means and standard deviations also given. All values in inches.

USAFETAC/TN-91/002 (AD-A260135) *SWANEA (Southwest Asia—Northeast Africa), A Climatological Study, Volume II—The Middle East Peninsula*, revised by TSgt Kenneth R. Gibson in September 1992, 263pp. This report (the second in a four-volume series) is a climatological study of the Middle East Peninsula, an area that includes the Red Sea Coastal Plains, the Arabian Desert, the Fertile Crescent, and the Persian Gulf Coastal Plains. It was revised to include additional information acquired during the conduct of the August 1990-March 1991 Persian Gulf War. After describing the general geography of land areas in the Middle East Peninsula, the study discusses major meteorological features of the entire study area. Each major subregion (based on "climatic commonality") is then broken into its own geography and general weather sections. Finally, each of the four so-called "seasons" in each of these subregions is discussed in detail.

New USAFETAC TNs

USAFETAC/TN-92/001 (AD-A253563), *Capabilities, Products, and Services of USAFETAC*, June 1992, 34pp. Describes the capabilities, products, and services of the USAF Environmental Technical Applications Center (USAFETAC), an agency that creates, maintains, and applies the Air Force's environmental climatological database. Describes USAFETAC products and services and tells how to request them. Describes the climatic database and USAFETAC computer assets. Discusses USAFETAC mission and organization. An appendix provides a history of USAFETAC and military climatology. *Note: Temporarily out of print but under revision.*

USAFETAC/TN-92/002 (AD-B162288) *USAFETAC's Cloud-Scene Generator (CLDGEN) Model*, by Capt John A. Rupp and Capt Anthony J. Warren, January 1992, 46pp. Describes the USAFETAC Cloud-Scene Generator (CLDGEN) computer simulation model. The CLDGEN model, which simulates cloud scenes at given locations and times, interfaces with software that tracks satellites in orbit. The model is intended for use in a wide range of cloud-free line-of-sight (CFLOS) applications. Report includes discussion of model theory and design, as well as the results of a validation study. *Distribution limited to U.S. Government agencies and their contractors, critical technology, 15 October 1991. Refer other requests to USAFETAC/SYT, Scott AFB IL 62225-5116.*

USAFETAC/TN-92/003 (AD-A248571) *Gulf War Weather*, by Kenneth R. Walters, Sr., Maj Kathleen M. Traxler, Michael T. Gilford, Capt Richard D. Arnold, TSgt Richard C. Bonam, TSgt Kenneth R. Gibson, March 1992, 245pp. A daily history of weather that affected United States military operations from 8 August 1990 through 31 March 1991 in the conduct of the Persian Gulf War. Illustrations include weather satellite imagery of the study area, which comprised Saudi Arabia, Kuwait, Iraq, and areas immediately adjoining. Separate chapters describe the weather during Operations DESERT SHIELD, DESERT STORM, and PROVIDE COMFORT. Appendices summarize mean monthly temperatures (including wet-bulb globe and wind-chill temperatures) for selected stations in the study area.

USAFETAC/TN-92/004 (AD-A259541) *South America South of the Amazon River—A Climatological Study*, by Michael T. Gilford, 1st Lt Michael J. Voitesak, MSgt Gregory Myles, TSgt Richard C. Bonam, Capt David L. Martens, August 1992, 715pp. A climatological study of South America south of the Amazon River. The study area includes Brazil south of the Amazon, Peru south of 5 degrees south and south of the Marañon River, and the countries of Argentina, Bolivia, Chile, Paraguay, and Uruguay. It also includes the Falkland (Malvinas) Islands. After describing general geography, the report discusses the major meteorological features of South America. Next, the geography and major climatic controls of each of four major subregions (West Central, Tropical, Subtropical, and Southern South America) are discussed. Finally, each of the four subregions is broken into "zones of climatic commonality." "Seasons," which vary in each of these zones, are defined and discussed in considerable detail.

USAFETAC/TN-92/005 (AD-A260139) *Climatological Probability of Cloud-Free Line-of-Sight*, by Capt Anthony J. Warren, December 1992, 31pp. This report describes how the climatological frequency distribution of cloud-cover is obtained and used to compute the

climatological probability of cloud-free line-of-sight, or CFLOS. The probabilities can be estimated for an instantaneous point in time or for a specified time window (i.e., the probability of a continuous CFLOS for a time period of t minutes). The procedures outlined in the report are used by the USAFETAC CPCFLOS computer program. An appendix describes the Burger Aerial Algorithm.

USAFETAC/TN-92/006 (AD-A260152) *Climate and Weather of the Horn of Africa—Executive Summary*, by Kenneth R. Walters, Sr., and Capt Richard D. Arnold, Dec 92, 36pp. Provides a brief executive summary of annual weather and climatology for the region generally known as the "Horn of Africa," an area that comprises Somalia, Yemen, Djibouti, Ethiopia, Sudan, and Kenya.

USAFETAC/TN-93/001 (AD-A259841) *Somalia Upper-Air Climatic Atlas*, January 1993, 243pp. An atlas of tabular upper-air statistics for Somalia. Statistics are provided in three regional sets: Northern Somalia, Central Somalia, and Southern Somalia. Tables provide upper-air data (D-value, temperature, dew point, wind speed and direction) at levels from the surface to 10 millibars for specified 2.5 by 2.5 degree latitude/longitude grid points.

USAFETAC/TN-93/002 (AD-A263083) *Climate and Weather of Yugoslavia—Executive Summary*, by Capt Richard D. Arnold and Kenneth R. Walters, Sr., January 1993, 38pp. Provides a brief executive summary of annual weather and climatology for the region formerly known as Yugoslavia which, in 1992, was restructured politically into the countries of Slovenia, Croatia, Bosnia-Herzegovina, and Serbia.

USAFETAC/TN-93/003 (AD-A266850) *TAFVER II Users Manual*, by Capt Christopher A. Donahue, May 1993, 31pp. TAFVER II is an automated quality control program designed to provide headquarters staff (at HQ USAF/XOW, HQ Air Weather Service, and the Major Command Directorates of Weather) a tool they can use to measure the quality of weather forecasting support

provided by the Air Force weather community. The TAFVER II program, run by USAFETAC at Scott AFB, IL, verifies all Terminal Aerodrome Forecasts (TAFs) issued by Air Force weather forecasters, providing there are corresponding observations against which to verify them. TAFVER II accommodates customer-tailored output by incorporating command-unique category thresholds. This technical note tells users how the TAFVER II program verifies weather forecasts and explains the output statistics. Appendices provide major command verification categories and USAFETAC's weather station information databases.

USAFETAC/TN-93/004 (AD-A269511) *Eastern Europe, A Climatological Study*, by Maj Kathleen Traxler, et al., July 1993, 385pp. A climatological study of Eastern Europe, a region that comprises

Poland, the Czech Republic, Slovakia, Hungary, Romania, the former Yugoslavia, Albania, Greece, Latvia, Lithuania, Estonia, Belarus, Moldova, Ukraine, Azerbaijan, Armenia, Georgia, and Turkey west of the Sea of Marmara; also, Russia, Kazakhstan, Uzbekistan, and Turkmenistan west of 60° E, including Novaya Zemlya. For this study, the entire region is divided into eight "zones of climatic commonality." After describing the general geography of Eastern Europe, the study discusses major meteorological features of the entire region. Geography and the major climatic controls for each of the eight "climatic commonality zones" are then described. Finally, each season is defined and discussed in considerable detail, to include typical weather, clouds, visibility, winds, precipitation, temperature, and weather hazards.

3.2 USAFETAC Project Reports (PRs). PRs are normally prepared to document the results of a specific USAFETAC project for a specific USAFETAC customer, but they are often of interest to other readers, as well.

USAFETAC/PR-92/001 (AD-A254182) *Wind-Speed Periodicity Study for Shemya AFB, Alaska*, by Capt Christopher A. Donahue, April 1992, 20pp. Describes results of a time-series analysis that attempts to identify high frequency periodicities (fluctuations with periods of less than 1 hour) in wind speed at Shemya AFB, Alaska. Peaks in the power spectra at low frequencies were filtered out, and the remaining peaks were tested for significance. None of the peaks in the spectra at high frequencies were found to be significantly different from white noise.

USAFETAC/PR-92/002 (AD-A269339) *DTED (Digital Terrain Elevation Data) Study*, by Capt Donald R. Johnson, June 1992, 27pp. Terrain height errors have significant effects on studies sensitive to atmospheric quantity and structure, such as USAFETAC's atmospheric profiles (point analyses). A recent study concluded that the primary source of degradation in atmospheric profile quality was caused by the coarse grid spacing of the eighth-mesh data used in the Air Force Global Weather Central (AFGWC) Atmospheric Slant Path Analysis Model (ASPAM). This report documents a study that determines the feasibility of incorporating the Defense Mapping Agency (DMA) high density Digital Terrain Elevation Data (DTED) into the AFGWC atmospheric profile model. The report also describes a procedure, developed by USAFETAC, to make the dataset smaller and save computer storage space.

USAFETAC/PR-92/003 (AD-A254410) *SAC Contrail Formation Study*, by Capt Brian M. Bjornson, May 1992, 48pp. This report documents the results of a study that compares the Appleman contrail forecasting method used at the Air Force Global Weather Central (AFGWC) with the SAC method using pilot report (PIREP) data collected by SAC/DOW between March 1990 and July 1991. The study resulted in development of two

other contrail forecasting techniques. The first (ETACFCST) was developed using discriminant analysis schemes to obtain "best fit" curves of contrail formation as a function of altitude and temperature, or altitude, temperature, and vertical motion. Statistics showed ETACFCST to be better than either the Appleman or SAC contrail prediction curves. But another technique developed near the end of the study incorporated aircraft engine type as a factor for the first time. The new engine-specific contrail forecasting technique is recommended as a replacement for the Appleman method used at AFGWC.

USAFETAC/PR-92/004 (AD-A258065) *Cloud Model Database Comparison Study*, by Capt Kirk D. Poore, August 1992, 55pp. This report documents the results of a study that examines and compares the Air Force Global Weather Central's (AFGWC's) climatological cloud model databases: Real-Time Nephanalysis (RTNEPH) and Three-Dimensional Nephanalysis (3DNEPH). The study investigated their characteristics, determined the length of a climatologically sound period of record (POR), found a year with "typical" cloud cover for use as a baseline in future studies, and weighted the advantages and disadvantages of Multipurpose Simulator (MPS) databases derived from the RTNEPH and 3DNEPH. The older 3DNEPH cloud model, first used in the 1980's, produced worldwide, layered cloud analyses on a 25-NM grid. RTNEPH replaced 3DNEPH at the beginning of 1984.

USAFETAC/PR-92/005 (AD-A260288) *ASPAM (Atmospheric Slant Path Analysis Model) Statistical Paired Differences Study for Sample Size Determination*, by Capt Thomas H. Elio, Mr Charles R. Coffin, and Maj Lauraleen O'Connor, November 1992, 42pp. Describes methodology and results of a pilot study intended to determine the required sample size for a statistically significant seasonal study of the differences

between ground truth (represented by upper-air soundings) and (1) ASPAM optimum interpolation vertical profiles (OIVPs) and (2) alternate vertical profiles. This study builds on earlier ASPAM studies, incorporating lessons learned and user feedback. It found that a sample size of 50 observations was enough to determine if the differences between ground truth (upper-air soundings) and ASPAM vertical profiles were significant at the customer's confidence level.

USAFETAC/PR-92/006 (AD-A260152) *LIGHTPC Accuracy Study*, by Capt Matthew C. Peterson, December 1992, 49pp. This report documents the results of a USAFETAC study of the accuracy of LIGHTPC and ICE PC small computer programs, both of which were used to compute astronomical data such as sunrise, sunset, moonrise, and moonset. It presents error distributions for programs at and above 60° N. The LIGHTPC program solves fundamental astronomical equations to produce sunrise and sunset times; the ICE program allows accesses to an ephemeris calculated to high precision. The LIGHTPC program is less accurate than ICE in predicting sunrise and sunset times at all latitudes above 60° N. The report discusses weaknesses of the LIGHTPC program and errors in the ICE program. A technique for using LIGHTPC to correct ICE to produce better twilight end times than by using ICE alone is provided.

USAFETAC/PR-92/007 (AD-A261381) *BitHit/Solar Activity Correlation Study*, by Capt Mary L. Hart, December 1992, 36pp. This report documents a study of statistical correlations between Global Positioning System (GPS) satellite anomalies ("bit hits") and the state of the actual space environment from 1 October 1984 through 31 March 1991. The study compared distributions of space environmental data with GPS anomalies to determine the correlations (if any) of GPS anomaly occurrences with space environment variables such as global geomagnetic index and proton/electron counts. Using stepwise linear regression and discriminant analysis, correlations

were found to be very low. Regression equations were found to predict the probability of satellite anomalies only slightly better than random chance.

USAFETAC/PR-93/001 (AD-A269401) *Thunderstorm Forecast Study for Eglin AFB, FL*, by Capt Daniel Cornell, March 1993, 48pp. This report describes the evaluation of an empirical technique (WINNDEX) for predicting air-mass thunderstorms at Eglin AFB, FL. Results showed that the WINNDEX objective forecast technique had a Heidke skill score of .18 in predicting thunderstorm activity on the Eglin Range complex. A discriminant analysis model was developed that improved this skill to .32 in predicting the occurrence of thunderstorms during four 3-hour periods beginning at 1200Z. The study demonstrated the utility of USAFETAC's lightning database in developing and verifying a thunderstorm forecast model for remote locations.

USAFETAC/PR-93/002 (AD-Pending) *An Analysis of Cloud-Cover Reporting in the 1977 Surface Observation Database*, by 1st Lt James G. Saccomando, Jr., September 1993, 14pp. The study examines the surface weather observation database to determine cloud-cover report quality, coverage, and frequency around the world during 1977. The results of the analysis are plotted on global maps.

USAFETAC/PR-93/003 (AD-Pending) *Worldwide Frequency of Temperatures at Selected Altitudes*, by 1st Lt James G. Saccomando, Jr., September 1993, 10pp. This report describes how USAFETAC determined and plotted the frequency of occurrence of temperatures less than or equal to specified values at selected altitudes worldwide. High-Resolution Analysis System (HIRAS) temperatures and D-values were used. A SAS program gleaned the required data from the 1985 to 1991 HIRAS tapes and calculated temperatures at the specified altitudes. Another SAS program computed percent occurrence frequencies. Contours of probability are plotted by month on world maps.

USAFETAC/PR-93/004 (AD-269403) "Cloudiest Year" Study—An Analysis of the 3DNEPH and RTNEPH Databases, by Billy D. Bainter, April 1993, 25pp. Describes techniques used to analyze total cloud cover values from the USAF Environmental Technical Applications Center's Nephanalysis databases: 3DNEPH and RTNEPH. Object of the study was to determine if total global cloud cover differed significantly on a year-to-year basis. Contoured global maps in an appendix show the results.

USAFETAC/PR-93/005 (AD-Pending) Optimum Heights for Balloon-Borne Radar, by Michael F. Squires, November 1993, 18pp. The Air Defense Initiative is considering the use of balloon-borne radar transmitters. Tethering these balloons at an optimum height based on the effects of atmospheric refraction maximizes target detection efficiency. This report provides information for determining those optimum tethering heights. The

data is provided on one 5 1/4-inch diskette (included) as tables of radar detection data stratified by transmitter and target heights. Tables are accessible through a user-friendly interactive PC program that displays the data. Instructions for access to and interpretation of the tables included. Report summarizes assumptions, data, and methods used to create tables.

USAFETAC/PR-93/006 (AD-Pending) RAOB Quality Control Comparison Study, by Capt David J. Speltz, November 1993, 30pp. Compares the upper-air quality control (QC) and data correction methods used by the Air Force Global Weather Central (AFGWC) and the National Meteorological Center (NMC). AFGWC uses the New Upper-Air Validator (NUAV), while NMC uses the Complex QC procedure for rawinsonde heights and temperatures (CQCHT). The study identifies advantages, disadvantages, and added value of both correction schemes.

3.3 Station Climatic Summaries (SCSs). SCSs are published as data summaries (DSs). These regional collections of climatic briefs and operational climatic data summaries (OCDSs) are issued for each of the seven major geographical areas shown below. This series is continually under revision--when enough new material has been accumulated, a revised version is assembled and published. For convenience, all the current publications in this series are listed here.

USAFETAC/DS-93/031 (AD-A269567)
North America, Volume 1--The Contiguous United States (424pp.); Volume 2--Alaska, Canada, and Greenland (239pp.), February 1993. This two-volume set (bound together) supersedes DS--88/031 (AD-A176735).

USAFETAC/DS-90/032 (AD-A259542)
Latin America, June 1990, 541pp. To be reissued during 1994 in three volumes.

USAFETAC/DS-89/033 (AD-A204331)
Europe, January 1989, 480pp.

USAFETAC/DS-87/034 (AD-A178414)
Africa, March 1987, 226pp.

USAFETAC/DS-89/035 (AD-A222708)
Asia, July 1989, 654pp.

USAFETAC/DS-90/037 (AD-A229298)
USSR, Mongolia, and China, August 1990, 439pp.

USAFETAC/DS-90/038 (AD-A229376)
Antarctica, Australia, and Oceania
August 1990, 89pp.

3.4 Standard Climatic Packages (SCPs). A USAFETAC Standard Climatic Package normally consists of a Surface Observation Climatic Summary (SOCS), a wind-stratified climatic summary (WSCC), and a temperature/dew-point change summary (T/TD). After a new or revised SCP has been produced and sent to the primary customer, copies become available (on 3 1/2-inch diskette or microfiche) from the AWSTL. Order SOCS by station name and DS-number; order WSCC and T/TD by station name and ET-number. Note that most of the SCP components listed here are updates of products listed in AWS/TC-91/001, Section 5. For operational purposes, users should always select the latest product, as shown by the DS- or ET-number. Air Force weather units order *new and revised* SCPs from USAFETAC/DO IAW AFI 115-118 and USAFETAC/TN-92/001 (Revised). NA = Not available.

STATION	WMO IDENT	SOCS DS #	WSCC ET #	T/TD ET #
ANSBACH AHP	DL107550	92/284	01362	01361
BANJA LUKA	YG132420	NA	01426	NA
BARKSDALE AFB	USLA722485	92/290	01373	01374
BELGRADE	YG132720	NA	01422	NA
BERGSTROM AFB	USTX722545	92/281	01355	01356
BITBURG AB	DL106100	92/270	01328	01329
BOISE	USID726810	91/244	01278	01279
CAMP CASEY	KO471066	91/249	01292	01293
CAMP HUMPHREYS	KO471270	91/248	01290	01291
CANNON AFB	USNM722686	92/279	01351	01352
CASTLE AFB	USCA724810	91/253	01300	01301
COLEMAN AAF	DL107295	91/258	01308	01309
COLUMBUS AFB	USMS723306	91/264	01320	01321
DOBBINS AFB	USGA722270	93/214	01420	01421
DOVER AFB	USDE724088	92/280	01353	01354
DUGWAY PROVING GROUNDS	USUT690110	90/228	01254	01255
DUKE FIELD/EGLIN AUX	USFL722246	91/252	01298	01299
EGLIN AFB	USFL722210	93/211	01405	01406
ELLSWORTH AFB	USSD726625	91/257	01306	01307
ELMENDORF AFB	USAK702720	93/210	01403	01404
FAIRBANKS	USAK702610	91/250	01294	01295
F.E. WARREN AFB	USWY725640	93/201	01396	01395
FT BRAGG/SIMMONS AAF	USNC746930	92/267	01326	01327
FT DEVENS AIN	USMA744905	91/254	01302	01303

STATION	WMO IDENT	SOCS DS #	WSCC ET #	T/TD ET #
FT EUSTIS/FELKER AAF	USVA723087	92/282	01357	01358
FT HUACHUCA	USAZ722730	93/204	01396	01397
FT HOOD AAF	USTX722570	92/275	01344	01345
FT LEONARD WOOD/FORNEY AAF	USMO724457	92/272	01336	01337
FT LEWIS/GRAY AAF	USWA742070	93/205	01165	01031
FT ORD/FRITZSCHE AAF	USCA724916	92/286	01363	01364
FT POLK/POLK AAF	USLA722390	93/203	01392	01393
FT RICHARDSON	USAK702700	92/289	01371	01372
FT RILEY/MARSHALL AAF	USKS724550	91/256	01304	01305
FT SILL/POST AAF	USOK723550	92/285	01365	01366
FT STEWART/WRIGHT AAF	USGA722090	86/053	01377	01378
FULDA AAF	DL105445	91/259	01310	01311
HANAU AAF	DL106420	92/274	01340	01341
HOLLOMAN AFB	USNM747320	92/277	01347	01348
HOWARD AFB	PN788060	93/202	01386	01387
HURLBURT FLD	USFL747770	93/207	01390	01391
ILLESHEIM AIN	DL107520	91/260	01312	01313
KEESLER AFB	USMS747686	93/218	01427	01428
KLAMATH FALLS	USOR725895	91/246	01286	01287
KUNSAN AB	KO471410	91/262	01316	01317
LAUGHLIN AFB	USTX722615	92/288	01369	01370
LUKE AFB	USAZ722785	91/261	01314	01315
MACDILL AFB	USFL747880	91/265	01322	01323
MATHER AFB	USCA724835	92/268	01330	01331
MCCLELLAN AFB	USCA724836	91/263	01318	01319
MCCONNELL AFB	USKS724505	92/273	01338	01339
MILDENHALL RAF	UK035773	88/204	01382	01383
MINOT AFB	USND742070	93/206	01388	01389
MISAWA AB	JP475800	93/208	01407	01400
MOODY AFB	USGA747810	92/271	01334	01016
MUIR AAF	USPA725144	92/293	01204	01381
MYRTLE BEACH AFB	USSC747910	92/269	01332	01333

STATION	WMO #	SOCS DS #	WSCC ET #	TTD ET #
NELLIS AFB	USNV723865	92/283	01359	01360
PETERSON AFB	USCO724660	90/206	01231	01232
PORTLAND	USOR726980	91/247	01288	01289
RICHARDS-GEBAUR AFB	USMO724466	91/241	01276	01277
ROBERT GRAY AAF	USTX722576	92/276	01342	01343
ROBINS AFB	USGA722175	92/278	01349	01350
SARAJEVO	YG133530	NA	01424	NA
SCOTT AFB	USIL724338	92/278	01401	01402
SHEPPARD AFB	USTX723510	93/220	01430	01431
SKOPJE	YG135860	NA	01423	NA
SPLIT	YG133330	NA	01426	NA
TUCSON IAP	USAZ722749	91/243	01282	01283
TYNDALL AFB	USFL747750	92/287	01367	01368
UPPER HEYFORD RAF	UK036553	89/206	01346	01153
VANCE AFB	USOK723535	92/291	01375	01376
WENDOVER AFB	USUT725810	91/242	01280	01281
WIESBADEN AB	DL106330	93/215	01411	01412
WILLIAMS AFB	USAZ722786	91/266	01324	01325
WHITEMAN AFB	USMO724467	92/294	01384	01385
WHITE SANDS "C" SITE	USNM722690	93/212	01409	01408
WRIGHT-PATTERSON AFB	USOH745700	91/245	01284	01285

35 Climatic Database Users Handbooks (UHs). These handbooks provide potential users of USAFETAC's climatic databases (all of which are stored at USAFETAC's Operating Location A in Asheville, NC) with descriptions of those databases and information on how to obtain and use them. USAFETAC/TN-86/003 is a directory of all the databases stored at OL-A. For convenience, all the current users handbooks are listed here without regard for publication date.

USAFETAC/UH-86/001 (AD-B108863) *RTNEPH, USAFETAC Climatic Database Users Handbook No. 1*, September 1986. Describes the Real-Time Nephanalysis database.

USAFETAC/UH-86/002 (AD-B108864) *Surface Temperature Analysis, USAFETAC Climatic Database Users Handbook No. 2*, 1986. Describes the eighth-mesh surface temperature analysis database.

USAFETAC/UH-86/003 (AD-B106038) *SESS, USAFETAC Climatic Database Users Handbook No. 3*, August 1986. Describes the Space Environmental Support System (SESS) Climatic Database.

USAFETAC/UH-86/004 (AD-B108865) *DATSAV2 Surface, USAFETAC Climatic Database Users Handbook No. 4*, November 1986. Current reprint incorporates February 1987 errata and November 1988 Change 1.

USAFETAC/UH-88/005 (AD-A233023) *HIRAS, USAFETAC Climatic Database Users Handbook No. 5*, Revised February 1991. Describes the High Resolution Analysis System (HIRAS) Climatic Database.

USAFETAC/UH-93/001 (AD-A269402) *AWSMSC (Air Weather Service Master Station Catalog) USAFETAC Climatic Database Users Handbook No. 6*, March 1993.

3.6 Subject Bibliographies (SBs). The following SBs provide comprehensive literature citations on specific subjects. They are the printed results of detailed computer searches through a number of online computer databases available to the AWSTL staff. Although SBs are prepared for individual requesters, titles are provided here to serve as references in determining topics for new search requests. Once an SB has been provided to the original requester, it is not generally available for further distribution. SB users should note and observe individual distribution limitation and destruction notices printed on the covers. Request new SBs by sending a completed AWS Form 9 to: AWSTL (FL4414), 859 Buchanan St, Scott AFB IL 62225-5118.

AWSTL/SB-92/001 *Ball Lightning*, 17 Jan 92, 12pp, 29 citations.

AWSTL/SB-92/002 *Turbulence in the Stratosphere*, 21 Jan 92, 24pp, 47 citations.

AWSTL/SB-92/003 *Update of Measured Effect of Weather on Military Operations*, 6 Feb 92, 7pp, 11 citations.

AWSTL/SB-92/004 *Climatology and Wind Statistics Articles by Orvel Smith*, 12pp, 24 citations.

AWSTL/SB-92/005 *Meteorological Software for Small Computers*, 10 Feb 92, 27pp, 43 citations.

AWSTL/SB-92/006 *Early Warning Radars: Environmental Sensitivities*, 13 Feb 92, 9pp, 17 citations.

AWSTL/SB-92/007 *Vertical Winds in the Boundary Layer over Flat Terrain*, 25 Feb 92, 47pp, 62 citations.

AWSTL/SB-92/008 *Data Compression*, 26 Feb 92, 64pp, 97 citations.

AWSTL/SB-92/009 *Spatial Variability of Daily Weather Data*, 3 Mar 92, 103pp, 145 citations.

AWSTL/SB-92/010 *Effects of a Volcanic Eruption*, 13 Mar 92, 280pp, 616 citations.

AWSTL/SB-92/011 *Interpolation of Data to Grid Points*, 17 Mar 92, 78pp, 128 citations.

AWSTL/SB-92/012 *Periodicity of Wind Gusts*, 25 Mar 92, 41pp, 69 citations.

AWSTL/SB-92/013 *Update of Best Start Date for Climatological Records*, 27 Mar 92, 10pp, 13 citations.

AWSTL/SB-92/014 *Motor Vehicle Accidents and Weather*, 30 Mar 92, 29pp, 43 citations.

AWSTL/SB-92/015 *Hurricanes, Typhoons, Tropical Cyclones and Tropical Storms: Update*, 24 Apr 92, 258pp, 465 citations.

AWSTL/SB-92/016 *Ice Crystals in High Clouds*, 30 Apr 92, 134pp, 220 citations.

AWSTL/SB-92/017 *C. Varotsos on Atmospheric Ozone*, 1 May 92, 3pp, 4 citations.

AWSTL/SB-92/018 *Mesoscale Structure of Extratropical Cyclones*, 7 May 92, 80pp, 136 citations.

AWSTL/SB-92/019 *The PSU NCAR Mesoscale Model (MM4)*, 7 May 92, 39pp, 62 citations.

AWSTL/SB-92/020 *Atmospheric Effects on Microwave Landing Systems*, 15 May 92, 25pp, 44 citations.

AWSTL/SB-92/021 *Cloud Forecasting*, 18 May 92, 52pp, 82 citations.

AWSTL/SB-92/022 *Effects of Lee Trough and Surface Winds on Kansas Weather*, 22 May 92, 46pp, 74 citations.

AWSTL/SB-92/023 *Radioactive Fallout in Polar Regions*, 3 Jun 92, 26pp, 47 citations.

AWSTL/SB-92/024 *Weather Modification*, 12 Jun 92, 248pp, 463 citations..

AWSTL/SB-92/025 *Refractivity Structure Constant*, 16 Jun 92, 70pp, 114 citations.

AWSTL/SB-92/026 *Properties of Subvisual or thin Cirrus: Update 3*, 48pp, 14 Jul 92, 68 citations.

AWSTL/SB-92/027 *Visibility In Clouds: Update*, 20 Jul 92. 29pp, 45 citations.

AWSTL/SB-92/028 *Liquid Water Content of Clouds*, 10 August 92, 268pp, 480 citations.

AWSTL/SB-92/029 *Low-Level Wind Shear Hazard*, 27 August 82, 453pp, 756 citations.

AWSTL/SB-92/030 *The Downburst, Micro-burst and Macroburst: 2nd Update*, 28 August 92, 140pp, 226 citations.

AWSTL/SB-92/031 *Attenuation by Clouds of Satellite Communications*, 4 September 92, 654pp, 369 citations.

AWSTL/SB-92/032 *Weather Modification and Tropical Cyclone Research in Western Europe*, 25 September 92, 11pp, 18 citations..

AWSTL/SB-92/033 *Weather Modification by Flight Operations*, 28 September 92, 13pp, 19 citations.

AWSTL/SB-92/034 *Remote Sensing Research in Western Europe*, 29 September 92, 110pp, 181 citations.

AWSTL/SB-92/035 *Numerical Weather Models in Western Europe*, 30 September 92, 71pp, 105 citations.

AWSTL/SB-92/036 *Severe Weather Forecasting Techniques*, 13 October 1992, 223pp, 382 citations.

AWSTL/SB-92/037 *Meteorology and Climatology of Southeast Asia: Update*, 13 October 1992, 107pp, 213 citations.

AWSTL/SB-92/038 *Evolution and Forecasting of Nocturnal Inversions*, 30 October 1992, 68pp, 128 citations.

AWSTL/SB-92/039 *Mesoscale Convective Systems: Update*, 30 October 1992, 37pp, 70 citations.

AWSTL/SB-92/040 *Fractals and Cloud-Scene Modeling*, 9 November 1992, 88pp, 161 citations.

AWSTL/SB-92/041 *El Niño - Southern Oscillation: 3rd Update*, 11 December 1992, 279pp, 502 citations.

AWSTL/SB-92/042 *Atmospheric Short Waves*, 23 December 1992, 359pp, 616 citations.

AWSTL/SB-93/001 *Forecasting Fog and Stratus: 2nd Update*, 5 January 1993, 48pp, 86 citations.

AWSTL/SB-93/002 *Precipitation Regimes of the American Southwest*, 28 Jan 93, 42pp, 76 citations.

AWSTL/SB-93/003 *Microwave Remote Sensing of Water Vapor*, 9 Feb 93, 195pp, 331 citations.

AWSTL/SB-93/003 *Microwave Remote Sensing of Water Vapor: Appendix*, 9 Feb 93, 3pp, 4 citations.

AWSTL/SB-93/004 *Microwave Sensing of the Atmosphere from Satellites: Update*, 12 Feb 93, 71pp, 114 citations.

AWSTL/SB-93/005 *Meteorology and Climatology of Tunisia*, 15 Mar 93, 73pp, 177 citations.

AWSTL/SB-93/006 *Cloud-Free Line-of-Sight: 3rd Update*, 7 Apr 93, 15pp, 22 citations.

AWSTL/SB-93/007 *Bengali Flooding*, 7 Apr 93, 58pp, 116 citations.

AWSTL/SB-93/008 *Interpolation of Data to Grid Points: Update*, 23 Apr 93, 140pp, 245 citations.

AWSTL/SB-93/009 *Regional Climatology of Northern Pakistan*, 27 Apr 93, 38pp, 80 citations.

AWSTL/SB-93/010 *Cloud Tops over Indonesia*, 4 May 93, 12pp, 18 citations.

AWSTL/SB-93/011 *Arctic Haze and Atmospheric Pollution*, 7 May 93, 25pp, 31 citations.

AWSTL/SB-93/012 *Meteorology and Climatology of Algeria*, 7 May 93, 47pp, 103 citations.

AWSTL/SB-93/013 *Aircraft Icing: Update*, 13 May 93, 80pp, 133 citations.

AWSTL/SB-93/014 *Hurricane Induced Tornadoes*, 17 May 93, 30pp, 60 citations.

AWSTL/SB-93/015 *Climatology and Operational Planning*, 4 Jun 93, 29pp, 53 citations.

AWSTL/SB-93/016 *METSAT Training*, 18 Jun 93, 9pp, 15 citations.

AWSTL/SB-93/017 *Some Stability Indices in Europe*, 10 Jun 93, 10pp, 18 citations.

AWSTL/SB-93/018 *Psychrometric Computations*, 21 Jun 93, 18pp, 37 citations.

AWSTL/SB-93/019 *Snow Forecasting Techniques: 2nd Update*, 24 Jun 93, 18pp, 29 citations.

AWSTL/SB-93/020 *Freezing Precipitation: Update*, 24 Jun 93, 8pp, 12 citations.

AWSTL/SB-93/021 *Forecasting Fog and Stratus: 3rd Update*, 25 Jun 93, 28pp, 32 citations.

AWSTL/SB-93/022 *Meteorology and Climatology of Nigeria*, 16 Jul 93, 132pp, 326 citations.

AWSTL/SB-93/023 *Atmospheric Short Waves: Update*, 23 Jul 93, 185pp, 304 citations.

AWSTL/SB-93/024 *Cold Air Funnels*, 26 Jul 93, 8pp, 5 citations.

AWSTL/SB-93/025 *Cost/Benefit Analyses of Weather Services*, 27 Jul 93, 63pp, 105 citations.

AWSTL/SB-93/026 *Meteorology and Climatology of Morocco*, 28 Jul 93, 120pp, 303 citations.

AWSTL/SB-93/027 *Saharan Dust*, 2 Aug 93, 115pp, 219 citations.

AWSTL/SB-93/028 *Meteorology and Climatology of Mauritania*, 3 Aug 93, 89pp, 176 citations.

AWSTL/SB-93/029 *Meteorology and Climatology of Mali and Niger*, 5 Aug 93, 69pp, 129 citations.

AWSTL/SB-93/030 *Meteorology and Climatology of the West African Sahel*, 6 Aug 93, 112pp, 251 citations.

AWSTL/SB-93/031 *Drought in the Western Sahel*, 10 Aug 93, 141pp, 286 citations.

AWSTL/SB-93/032 *Meteorology and Climatology of the Maghreb*, 18 Aug 93, 55pp, 144 citations.

AWSTL/SB-93/033 *Meteorology and Climatology of Northwest Africa*, 19 Aug 93, 60pp, 134 citations.

AWSTL/SB-93/034 *Hail Forecasting*, 26 Aug 93, 94pp, 182 citations.

AWSTL/SB-93/035 *Hydrometeors at Flight Altitude*, 30 Aug 93, 53pp, 78 citations.

AWSTL/SB-93/036 *Mountain Weather Forecasting*, 7 Sep 93, 228pp, 458 citations.

AWSTL/SB-93/037 *The Summer Monsoon of the Southwestern United States: Update*, 9 Sep 93, 14 citations.

AWSTL/SB-93/038 *Operation PLUMBBOB*, 10 Sep 93, 24 citations.

AWSTL/SB-93/039 *Effects of a Volcanic Eruption: Update*, 29 Sep 93, 26pp, 34 citations.

AWSTL/SB-93/040 *The Downburst, Microburst, and Macrobust: 3rd Update*, 30 Sep 93, 69pp, 94 citations.

AWSTL/SB-93/041 *Low-level Wind Shear hazard: Update*, 30 Sep 93, 91pp, 129 citations.

AWSTL/SB-93/042-1 *Tropical Weather Forecasting Part 1: AWSTL Holdings*, 29 Oct 93, 399pp, 712 citations.

AWSTL/SB-93/042-2 *Tropical Weather Forecasting Part 2: Not Held by AWSTL*, 29 Oct 93, 142pp, 260 citations.

AWSTL/SB-93/043 *Weather Services in India and Pakistan*, 3 Nov 93, 45pp, 51 citations.

AWSTL/SB-93/044 *Low-Level Wind Forecasting: 2nd Update*, 9 Nov 93, 165pp, 281 citations.

AWSTL/SB-93/045 *Toxic Gas Dispersion Models: 2nd Update*, 18 Nov 93, 120pp, 173 citations.

AWSTL/SB-93/046 *Lake Effect Snow Storms: Update*, 23 Nov 93, 34pp, 47 citations, 432 citations.

Section 4

AFGWC TECHNICAL NOTES

AFGWC/TN--92/001 (AD-A257985) *Computer Models Used by AFGWC and NMC for Weather Analysis and Forecasting*, by TSgt Richard J. Conklin, August 1992, 77pp. Describes the numerical analysis and forecast models most widely used by U.S. Air Force meteorologists. These models are: the Air Force Global Weather Central (AFGWC) Global Spectral Model (GSM); the AFGWC Real-Time Nephanalysis (RTNEPH); the AFGWC High Resolution Analysis (HIRAS) model; the AFGWC Five-Layer cloud forecast model (5-LAYER); the National Meteorological Center (NMC) Nested Grid Model (NGM); and the NMC Aviation/Medium Range Forecast (AVN/MRF) model. Report also describes model grids and tells how the grids are built. Strengths and weaknesses of the models are discussed, along with AFGWC and NMC production cycles.

AFGWC/TN-93/001 (AD-Pending) *AFGWC Dial-In Subsystem (AFDIS) Software Users Manual, Version 2.2*, by Sterling Software, October 1993, 145pp. Describes AFGWC'S Dial-In Subsystem (AFDIS) software (PC-0054—see Section 2.4) that allows remote access to certain applications of AFGWC's Satellite Data Handling System (SDHS). It provides users step-by-step instructions for installing and using the software required for access to SDHS. AFDIS software is *not* provided with the users manual; to request a copy of the software, call or write AFGWC/DOO, 106 Peacekeeper Drive, Offutt AFB NE 86113-4039, DSN 271-5985.

Section 5

AFSFC TECHNICAL DOCUMENTS

None published from 1992 to date.

SUBJECT INDEX

AFDIS Software Users Manual	4-1
Appleman Technique	2-1, 3-4
Atmospheric Slant Path Analysis Model (ASPAM)	
Sample size determination	3-4
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 Det 1, 7WS, HQ USEUCOM ECJ3-OD-WE, Unit 30400 Box 1000, APO AE 09128-5000 1
 Det 2, 7WS, Unit 20200, APO AE 09165-9816 1
 OL-A, Det 2, 7 WS, CMR 438, APO AE 09111-5000 1
 Det 3, 7WS, Unit 29231, APO AE 09102-3737 1
 OL-A, Det 3, 7 WS, Unit 29719 Box 363, APO AE 09028-5000 1
 Det 6, 7WS, Cmr 453, APO AE 09146-0979 1
 Det 7, 7WS, Unit 28130, APO AE 09114-5000 1
 OL-A, Det 7, 7WS, Unit 28216, APO AE 09173-5000 1
 Det 8, 7WS, Unit 25202, APO AE 09079-5000 1
 Det 10, 7WS, Unit 26410, APO AE 09182-0006 1
 OL-A, Det 10, 7WS, CMR 54, Unit 31020, APO AE 09250- 5000 1
 OL-B, Det 10, 7WS, APO AE 09031-5000 1
 Det 13, 7WS, Cmr 416, Box S, APO AE 09140-9998 1
 Det 26, 7WS, Unit 29632, APO AE 09096-5000 1

 104 Weather Flight, Bldg 929, Ft Meade, MD 20755-5430 1
 105 Weather Flight, Tennessee Air National Guard, PO Box 17267, Nashville, TN 32717-0267 1
 107 Weather Flight, Selfridge ANGB, MI 48045-5024 1
 110 Weather Flight, 10800 Natural Bridge Rd, Bridgeton, MO 63044-2371 1
 111 Weather Flight, Ellington ANGB, TX 77034-5586 1
 113 Weather Flight, IN ANG, Hulman Fld, Terre Haute, IN 47803-5000 1
 116 Weather Flight, WA ANG, Bldg 304, McChord AFB, WA 98433-5000 1
 199 Weather Flight, McGuire AFB NJ 08641-6004 1
 120 Weather Flight, Buckley ANGB, CO 80011-9599 1
 121 Weather Flight, Stop 28, Andrews AFB, MD 20331-6539 1
 122 Weather Flight, New Orleans NAS, LA 70143-0200 1

123 Weather Flight, Portland IAP, OR 97218-2797	1
125 Weather Flight, PO Box 580340, Tulsa AFS, OK 74158-0340	1
126 Weather Flight, WI ANG, 350 E College, Milwaukee, WI 53207-6298	1
127 Weather Flight, Forbes Fld, Topeka, KS 66619-5000	1
130 Weather Flight, Yeager Apt, Charleston, WV 25311-5000	1
131 Weather Flight, Barnes Map, Westfield, MA 01085-1385	1
140 Weather Flight, Willow Grove NAS, PA 19090-5105	1
146 Weather Flight, GTR Pittsburg ANG AN, PA 15231-0459	1
154 Weather Flight, Camp Robinson, North Little Rock, AR 72118-2200	1
156 Weather Flight, 5225 Morris Fld Dr., Charlotte, NC 28208-5797	1
159 Weather Flight, c/o HQ FLANG, State Arsenal, St Augustine, FL 32085-1008	1
163 Weather Flight, Ft Wayne MAP, IN 46809-5000	1
164 Weather Flight, Rickenbacker ANGB, OH 43217-5007	1
165 Weather Flight, Standiford Fld, Louisville, KY 40213-2678	1
181 Weather Flight, 8150 W Jefferson Blv, Dallas, TX 75211-9570	1
182 Weather Flight, Kelly AFB TX 78241-7001	1
195 Weather Flight, 4146 Naval Air Rd., Port Huenene, CA 93041-4001	1
199 Weather Flight, 1102 Wright Ave, Hickam AFB, HI 96853-5200	1
200 Weather Flight, 5680 Beulah Rd., Sandston, VA 23150-6109	1
201 Weather Flight, Suffolk County ANGB, NY 11978-1294	1
202 Weather Flight, Otis ANGB, MA 02542-5028	1
203 Weather Flight, Ft Indiantown GAP, Annville, PA 17003-5002	1
204 Weather Flight, McGuire AFB, NJ 08641-6004	1
207 Weather Flight, 3558 N. Michigan Rd., Shelbyville, IN 46176-4914	1
208 Weather Flight, 206 Airport DE, St Paul, MN 55107-4098	1
209 Weather Flight, PO Box 5218, Austin, TX 78763-5218	1
210 Weather Flight, 1280 South Tower Drive, Ontario ANGS CA 91761-7627	1
COMNAVOCEANCOM, Code N312, Stennis Space Ctr, MS 39529-5000	2
COMNAVOCEANCOM (Capt Brown, Code N332), Stennis Space Ctr, MS 39529-5001	1
NAVOCEANO (Bernie Rau), Code N25778, Bldg 8100, Rm 203D, Stennis Space Ctr, MS 39522-5001	2
NAVOCEANO (Tony Ortolano), Code 9220, Stennis Space Ctr, MS 39529-5001	1
NAVOCEANO (CWO4 Shoemaker), Code N2513, 1002 Balch Blvd, Stennis Space Ctr, MS 39522-5001	1
Maury Oceanographic Library, Naval Oceanography Office, Stennis Space Ctr, MS 39522-5001	1
Naval Research Laboratory, Monterey, CA 93943-5006	1
Naval Research Laboratory, Code 4323, Washington, DC 20375	1
Naval Research Laboratory (Dr Riley), Code 4180, Washington, DC 20375	1
Naval Postgraduate School, Chmn, Dept of Meteorology, Code 63, Monterey, CA 93943-5000	1
Naval Eastern Oceanography Ctr (Clim Section), U117 McCady Bldg, Norfolk NAS, Norfolk, VA 23511-5000	1
Naval Western Oceanography Ctr, Box 113, Attn: Tech Library, Pearl Harbor, HI 96860-7000	1
Commanding Officer, Naval Polar Oceanography Center, 4301 Suitland Road, FOB #4, Washington, DC 20395-5108	1
Commanding Officer, Naval Oceanography Command Ctr, PSC 819, Box 13, FPO AE, 09645-3200	1
NAVOCEANCOMDET, Federal Building, Asheville, NC 28801-2696	1
NAVOCEANCOMDET, Patuxent River NAS, MD 20670-5103	1
NAVOCEANCOMFAC, NAS North Island, San Diego, CA 92135-5130	1
Naval Air Warfare Center-Weapons Division, Geophysical Sciences Branch, Code 3254, Attn: Mr. Roger Helvey, Point Mugu, CA 93042-5001	1
WSO, H & HS Marine Station Wea, MCAS Tustin CA 92710-5000	1
Army Training and Doctrine Command, ATDO-IW (ATTN: SWO), Ft Monroe VA 23651-5000	1
75th RGR (Attn: SWO), Ft Benning, GA 31905-5000	1
CDR USASOC, Attn: AOIN-ST, Ft Bragg, NC 28307-5200	1
JSOC/Weather, P.O. Box 70239, Ft Bragg, NC 28307-5000	1
Armed Forces Medical Intelligence Ctr, Info Svcs Div, Bldg 1607, Ft Detrick, Frederick, MD 21702-5004	1
Army Research Lab Battlefield Environment Dir, ATTN: AMSRL-BE-W, White Sands Missile Range, NM 88002-5501	1

USA TECOM, ATTN: AMSTE-TC-AA (MacBlain), White Sands Missile Range, NM 88002-5504	1
USA TECOM, ATTN: AMSTE-TC-AM (WS), White Sands Missile Range, NM 88002-5501	1
USA TECOM, ATTN: AMSTE-TC-AM CAB, Aberdeen Proving Ground, MD 21005-5001	1
USA TECOM, ATTN: AMSTE-TC-AM (RE) Met Team, Redstone Arsenal, AL 35898-8052	1
USA TECOM, ATTN: AMSTE-TC-AM(BE), c/o NVESD, Ft Belvoir VA 22060-5677	1
USA TECOM, ATTN: AMSEL-RD-NV-VMD (MET), Ft Belvoir VA 22060-5677	1
Director, USA-CETEC, ATTN: GL-AE (Whitmarsh), Fort Belvoir, VA 22060-5546	1
USAIC/SWO, Attn: ATSI-CDW, Ft Huachuca, AZ 85613-6000	1
PL/TSMML, Research Library, Hanscom AFB, MA 01731-5000	1
USAF Rome Lab Tech Lib, FL2810, Corridor W., Ste 262, RL/SUL, Doc Lib, 26 Electronics Parkway , Bldg 106, Griffiss AFB, NY 13441-4514	1
Technical Library, Dugway Proving Ground, Dugway, UT 84022-5000	1
NOAA Central Library, 1314 East-West Highway, Ste 2000, Silver Spring MD 20910	1
NOAA/MASC Library MC5, 325 Broadway, Boulder, CO 80303-3328	2
NOAA/NESDIS (Attn: Nancy Everson, E/RA22), World Weather Bldg, Rm 703, Washington, DC 20233	1
NGDC, NOAA, Mail Code E/GC4, 325 Broadway, Boulder, CO 80333-3328	1
NWS W/OSD, Bldg SSM C-2 East-West Hwy, Silver Spring, MD 20910	1
NWS Training Center, 617 Hardesty, Kansas City, MO 64124	1
NWS W/OM21(Attn: Leroy Spayd), 1325 East-West Highway, Rm 13208, Silver Spring MD 20910	1
NIST Pubs Production, Rm A635, Admin Bldg, Gaithersburg, MD 20899	1
NCDC Library (D542X2), Federal Building, Asheville, NC 28801-2723	1
Cape Canaveral Forecast Facility/ROCC, Bldg 81900, Cape Canaveral AFS FL 32925-6537	1
94 SG/WE (Barton) Bldg 737, Dobbins AFB GA 30069-5000	1
Det 3/DOXW, 1900 East Flamingo, Ste 266 PO Box 19070, Las Vegas NV 89119-5116	1
Westover Base Weather Station, Bldg 7091, Rm 123, Westover AFB MA 01022-5000	1
Weather Readiness Training Center (WRTC), PB Box 465, Rte 1, Camp Blanding, Starke FL 32091-9703	1
193 SOG/DOW, Bldg 19-101, Rm 108 AASF #1, Indiantown Gap, Annville PA 17003-5005	1
USAFA/DFP, Attn: Capt Steve Carr, Colorado Springs, CO 80840-5701	1
USAFA Dept of Economics & Geography, Colorado Spings, CO 80840-5701	1
USAFA/CWOSW, Air Field Dr., Bldg 9206, USAF Academy, CO 80840-5000	1
8 TDCS/DA, Tinker AFB, OK 73145-6503	1
2854ABG/SSL, Tinker AFB, OK 73145-5000	1
99MAS/DOV, Attn: Lt Col Anderson, Andrews AFB, MD 20331-5000	1
Capt Paul Bellaire, 6001 East Pima St, #79, Tucson AZ 85712	1
1CC/AZSB-GTFD(AH-64CSM-ATTAC), Ft Campbell, KY 42223-5000	1
HQ 5th U.S. Army, AFKB-OP (SWO), Ft Sam Houston, TX 78234-7001	1
USCINCPAC (J37), Box 13, Camp H.M. Smith, HI 96861-5025	1
DTIC-FDAC, Cameron Station, Alexandria, VA 22304-6145	2
AUL/LSE, Maxwell AFB AL 36112-5564	1
AWSTL, Scott AFB, IL 62225-5438	100