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THE ROSCOE MANUAL

Volume 1-2: A Simplified ROSCOE Input Scheme

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20. (Continued)

The ROSCOE documentation consists of a number of volumes, including user manuals (Volumes 1 through 3), systems code descriptions (Volumes 4, 20, and 21-1), code validation documents (Volumes 6 and 23), and phenomenology code descriptions (all others). This document has been written as an extension to the user manuals. It describes a simplified input scheme for running a subset of ROSCOE problems. It is intended for the user who only occasionally runs the code or would like to run a small problem.

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1 INTRODUCTION

In the last few years, ROSCOE (Radar and Optical Systems Code with Nuclear Effects) has been expanded to include simulations of satellite communications and optical surveillance systems in a nuclear environment. This expansion has led to considerably more complexity in the input requirements.

While the ROSCOE input scheme was devised to handle these problems (with no additional coding) and to allow the user complete flexibility in structuring scenarios with multiple sensors, objects, and bursts, it takes some time to learn how to use the system. For the user who only occasionally runs the code, or would like to run a small problem, a new input scheme has been built for running a subset of ROSCOE problems with a simple set of inputs.

The next section describes this new input scheme. Example input sets are shown for several different types of problems and the program outputs are briefly discussed. Section 3 describes how to access the new scheme, for both batch and interactive jobs. Finally, to make this paper useful as a reference guide, tables which describe the input options have been placed in Appendix A.

2 DESCRIPTION

The new ROSCOE input scheme consists of a data deck with a pre-selected set of input options, and a data preprocessor program which inserts user-specified values for the options into the data deck. The scheme, in general, does not sacrifice any of ROSCOE's input versatility, since a new data deck with a different set of options can be generated without writing new code.

2.1 LIMITATIONS

With the new scheme, as currently set up, the user can run nuclear burst phenomenology problems alone, or nuclear effects on radar surveillance and tracking of ballistic missiles, satellite communication, or optical surveillance and tracking, subject to these constraints:

- Up to five bursts are allowed, at altitudes up to 400 km -- positions, times, and burst properties are input.
- Only one radar can be simulated in a run -- radar characteristics and location are input.
- Only one object trajectory can be simulated in a run (although multiple objects can be spaced in time on the trajectory)--launch and impact points, impact time, and reentry angle are input.
- Only one satellite communication system can be simulated in a run (consisting of one ground transmitter, one ground receiver, and one set of satellite-borne equipment which receives and transmits) -- transmitter and receiver characteristics and locations are input.
- Only one optical sensor can be simulated in a run -- sensor characteristics and location are input.
- Run times can be no more than 900 seconds after the last burst.

2.2 INPUT VARIABLES

Input variables in the new scheme are of five types:

- General Inputs. Variables related to a reference location or time.
- Physics Inputs. Variables required to simulate a burst and print physics outputs.
- Radar Inputs. Variables required to simulate radar surveillance or tracking performance.
- Satcom Inputs. Variables required to simulate a satellite communication problem.
- Optics Inputs. Variables required to simulate optical sensor surveillance or tracking performance.

Table A.1 is a directory of input variables, divided into the five types described above with notes to indicate the options available. For each variable, the table gives its name, the number of values to be supplied (more than one if the variable is a vector), a definition of the variable including default units of measure, the default values that will be assumed if you do not input the variable, and whether a unit name is allowed for the variable. (Table A.2 shows the allowable unit names.) It is important to note the default units given. If you input values without unit names (for those variables allowing unit names), the default units are assumed. Note that the default values listed in Table A.2 are given in their customary units, which are not always the same as the internal default units.

To run a case, follow the instructions given in Table A.1, and input those variables you wish to change in the form: variable = value unit, variable = value unit, etc. End the input string with the command RUN following the last variable input. For vectors, the format may be: vector = value unit, value unit, etc., or vector(index) = value unit, value unit, etc. In the first case, the values are assigned to vector(1),

vector(2), etc.; in the second case, values are assigned to vector(index), vector(index + 1), etc. This free format is essentially compatible with the Fortran NAMELIST input scheme.

Note that positions can be specified by geographical coordinates (GEOGR), or by Cartesian (LOCXYZ) or range-azimuth-elevation (RADAR) coordinates relative to a reference location. The order of entry, orientation, and units for these specifications are given in Table A.3 and Fig. A.1.

2.3 EXAMPLE INPUT SETS

2.3.1 Physics Problem

To run a simple physics problem consisting of a single burst with the default characteristics and these assumptions:

- Burst time = 0 s
- Yield = 10 kT
- Altitude = 40 km
- Output every 20 s until 120 s after burst

input:

```
TSTØP = 120, ØTIME = 0, ØTINT = 20, BTIME1 = 0,  
BPØS1(3) = 40, YIELD1 = 10 KT, RUN
```

2.3.2 Radar Problem

To run a radar surveillance problem, where:

- There is a single burst with the above properties.
- The radar is at the center of a local Cartesian coordinate system (directly under the burst).
- The radar is of the type described by the default parameters.
- The object being viewed has a -30° reentry angle and is aimed at the radar.

- The object is at 100 km altitude at time = 0 when the burst occurs.
- Radar measurements are made once every second for 20 s.

input:

TSTØP = 20, BTIME1 = 0, BPØS1(3) = 40, YIELD1 = 10 KT,
 ØBTAG = ØBJECT-1, ØBTIM = 0, ØBPØS(2) = 173,
 100 KM, ØBVEL(3) = -30, RADAR = REFER, RUN

2.3.3 Satcom Problem

To run a satellite communication problem, where:

- The ground transmitter and receiver are together, directly beneath a satellite at synchronous altitude (the default condition)
- The default link inputs are assumed
- The default nuclear burst (1 MT at 200 km altitude) occurs 10 s after the first communication
- The burst is displaced 200 km horizontally from the line of sight
- Communication calculations are made every 20 s, from 0 s to 100 s

input:

TSTØP = 100, BTIME1 = 10, BPØS1(2) = 200, CTIME = 0,
 CTINT = 20, RUN

2.3.4 Optics Problem

To run an optical sensor surveillance problem, where:

- There is a single burst of 10 kt at 40 km altitude
- The sensor is at synchronous altitude
- The sensor is pointed at the burst

- The sensor is of the type described by the default parameters
- Sensor calculations are made at only one time (0 s)

input:

TSTOP = 1, BTIME1 = 0, BPOS1(3) = 40, YIELD1 = 10 KT,
 ØBTAG = REF-ØBJECT, ØTYPE = SURVEILLANCE, ØLØØK = 0,
 REFPT(1) = 40, ØPTICS = REFER, RUN

2.4 OUTPUTS

The outputs produced by the ROSCOE code using the new input scheme are described in this section. Two types of outputs may be produced:

(1) printer plots, and (2) tabular outputs.

2.4.1 Printer Plots

When a high-altitude (>90 km) burst is simulated, the code produces a series of printer plots at times specified by the ØTIME, ØTINT input variables. The plots consist of a picture of the fireball and beta tube region and contour plots of mass density, electron density, and striation fraction in the high-altitude grid.

The contour plots of mass density and electron density represent vertical cross sections through the burst point in the (magnetic) north-south direction, viewed looking eastward. The contour plots of the striation fraction are cross sections normal to the earth's magnetic field, viewed looking down the field lines.

The plots are produced as they are computed internally, and thus will appear before the tabular output described below.

In addition, contour plots of the relative radiance at the focal plane of the sensor can be generated when the optics code is used. These plots are generated when the optics calculation type, OCA1, is set to FOV.

2.4.2 Tabular Outputs

There are seven phenomenology lists, five radar lists, two satellite-communication lists, and three optics lists that may be output at the conclusion of the run, depending on the type of simulation performed.

The phenomenology lists include: burst parameters, common fireball parameters (fireball set 1), two additional low-altitude fireball parameter lists (fireball set 2 and fireball set 3), additional high-altitude fireball parameters (fireball set 4), contained debris region parameters, and beta tube parameters.

The radar lists include: trajectory output, track measurement errors, track filter output, and two lists of propagation errors.

The satcom lists include: propagation and probability-of-error data, and satellite position coordinates with respect to the ground-terminal positions.

The optics output lists include: angle and signal-strength measurements for an optical tracking sensor application, the radiance along each path treated within the field-of-view, and the data stream output produced by a scanning sensor.

Table 1 shows a small sample of each type of output. Some of the column headings are self-explanatory, while others require additional comment.

TABLE 1
ROSCOE TABULAR OUTPUTS

PHENOMENOLOGY OUTPUTS

BURST PARAMETERS											
TIME OF OUTPUT SEC	TOTAL ENERGY (ERGS)	FISSILE ENERGY (ERGS)	BURST ALTITUDE KM	BURST DENSITY (GM/CC)	SCALE HEIGHT KM	BURST PT. TEMP (DEG K)	INITIAL RADIUS KM	TIME TO REACH 3000K	TIME TO REACH 2000K		
1030.000	.4193E+23	.2092E+23	250.000	.5095E-13	37.579	39037.792	212.560	0.000	0.000		
1050.000	.4193E+23	.2092E+23	250.000	.5495E-12	67.922	13085.556	96.567	0.000	0.000		

NOTE: Columns 9 and 10: The outputs "time to reach 3000 K and 2000 K" are used only for low-altitude (<90 km) fireball chemistry calculations.

FIREBALL SET=1

TIME OF OUTPUT SEC	FIREBALL INDEX NUMBER	HORIZONTAL RADIUS KM	VERTICAL RADIUS KM	CENTED ALTITUDE KM	RISE RATE KM	EXPANSION RATE KM	FIREBALL DENSITY (GM/CC)	FIREBALL TEMP (DEG-K)	TIME SINCE BURST SEC
1030.000	1	280.583	269.073	421.580	1.671	0.000	.3021E-12	11213.966	10.000
1050.000	1	280.583	626.172	475.551	1.475	0.000	.3688E-13	8724.484	50.000

FIREBALL SET=2

TIME OF OUTPUT SEC	FIREBALL INDEX NUMBER	MINIMUM ALTITUDE KM	MAXIMUM ALTITUDE KM	TILT FROM VERTICAL DEG	AXIS ROTATION DEG	MCH VORTEX RADIUS KM	VORTEX RADIUS KM	VORTEX VOLUME (CM ³)	CHARACT. TYPE SEC
1030.000	1	164.278	680.601	.713	0.000	280.533	269.073	.0055E+23	0.000
1050.000	1	165.783	901.723	5.540	0.000	280.533	426.172	.1290E+24	0.000

NOTE: Column 6: Axis rotation is measured +CCW from North. Column 10: The characteristic time is the approximate time this fireball has merged with another (used only for low-altitude fireballs).

Table 1 (Continued)

FIREBALL SET=3

TIME OF OUTPUT SEC	FIREBALL INDEX NUMBER	X COORDINATE (CM)	Y COORDINATE (CM)	Z COORDINATE (CM)	OVAL OF CASSINI PARAMETER	OVAL ARM RADIUS KM	VERTICAL TEMP (DEG-K)	FIREBALL KIND	MERGE INDEX
95.000	1	.1150E+09	.4434E+09	.4210E+09	.050	0.000	497.913	1	0
96.000	1	.1150E+09	.4434E+09	.4210E+09	.031	0.000	434.253	1	0

NOTE: Column 6: The Oval of Cassini parameter describes the shape of a low-altitude fireball. A value of 1.0 or greater means the fireball has formed a torus. Columns 9 and 10: The fireball kind can take values from 1 to 5, where: 1 = spheroid, 2 = skewed spheroid, 3 = torus, 4 = inactive radiation-merged fireball, 5 = inactive hydromerged fireball.

FIREBALL SET=4

TIME OF OUTPUT SEC	FIREBALL INDEX NUMBER	X COORDINATE (CM)	Y COORDINATE (CM)	Z COORDINATE (CM)	GRID CELL INDEX (X=DIR.)	GRID CELL INDEX (Y=DIR.)	GRID CELL INDEX (Z=DIR.)	FIREBALL REL. PCS. IN CELL	FIREBALL KIND
1030.000	1	.8441E+08	.44491E+09	.5071E+09	3	3	8	.094	2
1050.000	1	.8524E+08	.44527E+09	.5071E+09	3	3	8	.094	2

NOTE: Columns 6 to 8: The grid cell indices refer to the grid cell in which the fireball center is located.

DEBRIS PARAMETERS

TIME OF OUTPUT SEC	FIREBALL INDEX NUMBER	DEBRIS INDEX NUMBER	TOTAL ENERGY (ERGS)	DEBRIS ALTITUDE KM	HORIZONTAL RADIUS KM	VERTICAL RADIUS KM	CEMIS DISTRIB. PARAMETER	EQUIVALENT SPM. RAD. KM	DEBRIS VOLUME (C-3)
95.000	1	1	.8156E+20	8.820	.053	.052	8.000	.052	.0641E+12
96.000	1	1	.8156E+20	8.820	.050	.050	8.000	.057	.2102E+13

NOTE: Column 8: The debris distribution parameter describes the rate of fall-off of the beta source strength from the tube boundary (see RANC IV).

Table 1 (Continued)

BETA TUBE PARAMETERS									
TIME OF OUTPUT SEC	FIBERALL INDEX NUMBER	RETATURE SHAPE	INITIAL DIP ANGLE DEG	KINK ANGLE FROM HORIZ DEG	KINK-BURST DISTANCE KM	M-S RADIUS AT 85KM KM	E-M RADIUS AT 85KM KM	M-S RADIUS AT 60KM KM	E-M RADIUS AT 60KM KM
1630.000	1	KINK	76.506	76.674	40.259	203.819	207.111	202.547	206.309
1650.000	1	KINK	76.506	77.821	88.328	201.169	205.439	199.915	204.644

NOTE: Column 3: The beta tube shape is either "STRAIGHT" or "KINK". Column 6: The kink-burst distance is the distance from the sub-burst point at 85 km to the center of the beta tube at 85 km.

RADAR CUTPUTS

TRAJECTORY OUTPUT

TYPE OF EVENT	TIME OF OUTPUT SEC	POSITION ALTITUDE M	DATA FOR RANGE M	OBJECT AT AZIMUTH DEG	SPECIFIED ELEVATION DEG	TIME VELOCITY M	SIGNAL TO NOISE (DB)	NUMBER OF TARGETS
SEARCH	1599.097	3296670.933	3236570.933	81.224	2.722	6226.094	19.879	1
VERIFY	1599.597	3296680.108	3226680.308	81.223	2.725	6226.259	20.575	1

NOTE: Column 1: The event type is either "SEARCH", "VERIFY", "TRACK IN" (for track initiation), or "TRACK". Columns 3 to 7: The position and velocity data given here are the actual values. Column 9: The number of targets can be zero if the target has been lost, one if a single target has been located, or more than one if multipath effects occur.

TRACK MEASUREMENT ERRORS

TIME OF OUTPUT SEC	PREDICTED RANGE M	PREDICTED AZIMUTH DEG	PREDICTED ELEVATION DEG	MEASURED RANGE M	MEASURED AZIMUTH DEG	MEASURED ELEVATION DEG	PREDICTED RANGE M	PREDICTED AZIMUTH DEG	PREDICTED ELEVATION DEG
1599.097	3296670.933	81.224	2.722	3296610.359	81.182	2.604	40.574	0.000	0.000
1599.597	3296680.108	81.223	2.725	3276211.211	81.142	2.604	130.403	0.000	0.000

NOTE: Columns 2 to 4 and 5 to 7: The predicted position is either equivalent to the actual position for search pulses or is the position predicted by the track filter once track has been initialized. The measured coordinates are those generated during the current look and include all refraction and radar measurement errors.

Table 1 (Continued)

TRACKING ERRORS														
TIME OF OUTPUT SEC	ERRORS IN POSITIONS	ERRORS IN VELOCITIES	APPARENT RANGE	TARGET AZIMUTH DEG	POSITION ELEVATION DEG	PERP TO V M	ALONG V M	DISPERSIVE LOSS	FARADAY ROTATION LOSS	FAILURE MODE	PERP TO V M	ALONG V M	CLCSS V M	CLCSS V M
1517.997	512.146	1508.945	-57.792	1718.544	6088.306	-2792.826	3193576.724	80.954	1.000	NO FAILURE	384.810	3187482.417	80.938	3.250
1517.997	112.680	913.407	1983.090	451.001	2202.409			1.000	1.000	NO FAILURE				3.280

NOTE: Columns 2 to 7 and 8 to 10: The errors in position and velocity are the difference between the filter prediction and actuals. The apparent target coordinates are the actual coordinates plus refraction and multi-path errors before radar measurement errors have been added.

PROPAGATION OUTPUT-1									
TIME OF OUTPUT SEC	ABSORPTION FROM ALL SOURCES	THRESHOLD ABSORPTION	NOISE PWR-FR	CLUTTER TO-NOISE RATIO (DB)	DISPERSIVE LOSS	FARADAY ROTATION LOSS	FAILURE MODE	CLUTTER TO-NOISE RATIO (DB)	DISPERSIVE LOSS
1509.497	0.000	7.209	.2445E-09	0.000	1.000	1.000	NO FAILURE	0.000	1.000
1509.597	0.000	7.563	.2445E-09	0.000	1.000	1.000	NO FAILURE	0.000	1.000

NOTE: Column 9: The failure mode flag can have the following messages:
 NO FAILURE S/N received is above threshold
 RANGE The radar is range (power) limited for this target
 ABSORPTION The absorption due to all sources has reduced the S/N below threshold
 ABS+NOISE The combination of absorption and fireball noise has reduced the S/N below threshold
 TOTAL The combination of absorption, noise, dispersion, and Faraday rotation has dropped the S/N below threshold
 LOW SIGNAL The combination of the above effects and refraction or clutter has dropped the S/N below threshold
 NO TARGET There are no targets within the range gate and 3 dB beamwidth

Table 1 (Continued)

PROPAGATION OUTPUT-2									
TIME OF OUTPUT SEC	BIAS RANGE M	REFRACTION AZIMUTH DEG	REFRACTION ELEVATION DEG	RANDOM RANGE M	REFRACTION AZIMUTH DEG	REFRACTION ELEVATION DEG			
1599.997	0.000	0.000	0.000	0.000	0.000	0.000			
1599.997	0.000	0.000	0.000	0.000	0.000	0.000			

COMMUNICATIONS OUTPUT-1									
TYPE OF OUTPUT	TIME OF OUTPUT SEC	UPLINK LOSS FACTOR	UPLINK SCINTY	DOWNLINK LOSS FACTOR	DOWNLINK SCINTY	PRCB, OF ERROR SATELLITE	PRCB, OF ERROR GROUND	PRCB, OF ERROR	
CCM-RECEIVED	1612.000	1.001	0.	1.605	0.	0.	0.	0.	
CCM-RECEIVED	1622.000	27.903	9526.6	60.143	10230.	0.25850E+03	.12247E+01	.12500E+01	

SATCOM OUTPUTS

COMMUNICATIONS OUTPUT-2									
TIME OF OUTPUT SEC	SATELLITE RANGE KM	COORD AZIMUTH DEG	COORD ELEVATION DEG	TRANSMIT ELEVATION DEG	SATELLITE RANGE KM	COORD AZIMUTH DEG	COORD ELEVATION DEG	RECEIVED ELEVATION DEG	
1612.000	1306.105	-86.892	74.592	77.716	1306.105	-86.892	74.592	77.716	
1622.000	1291.663	-86.922	77.716	77.716	1291.663	-86.922	77.716	77.716	

NOTE: Columns 3 to 6: The uplink and downlink loss factors are the losses due to absorption from all sources (dimensionless). The uplink and downlink scintillation values refer to the standard deviation in phase due to scintillation effects in radians.

Table 1 (Continued)

OPTICS OUTPUT

OPTICAL MEASUREMENTS									
TYPE OF OUTPUT	CENTRAL WAVELENGTH (MICRONS)	ACTUAL AZIMUTH (RADIAN)	MEASURED AZIMUTH (RADIAN)	MEASURED ELEVATION (RADIAN)	ESTIMATED AZIMUTH (RADIAN)	ESTIMATED ELEVATION (RADIAN)	SCATTERED RADIANCE AT SENSOR (M/UM ²)	IRRADIANCE AT SENSOR (M/UM ²)	SIGNAL-TO-NOISE (SN)
0.000	0.1957005	0.	0.	0.	0.	0.	0.	0.	0.

NOTE: Actual, measured, and estimated coordinates are measured in angular units relative to the sensor boresight.

INTEGRATED PATH DATA

TYPE OF OUTPUT	CENTRAL WAVELENGTH (MICRONS)	AZIMUTH (RADIAN)	ELEVATION (RADIAN)	INTEGRATED RADIANCE (M/UM ²)	INTEGRATED RADIANCE (M/UM ²)	INTEGRATED RADIANCE (M/UM ²)	INTEGRATED RADIANCE (M/UM ²)	INTEGRATED RADIANCE (M/UM ²)	INTEGRATED RADIANCE (M/UM ²)
0.000	0.1957005	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
0.000	0.1957005	0.0000005	0.0000005	0.0000005	0.0000005	0.0000005	0.0000005	0.0000005	0.0000005
0.000	0.1957005	0.0000100	0.0000100	0.0000100	0.0000100	0.0000100	0.0000100	0.0000100	0.0000100

NOTE: The radiance in Column 5 is the integrated radiance along the path (described by the azimuth and elevation off-boresight) due to all emission and scattering sources. The integrated radiance in Column 6 is just radiance integrated over all band intervals and the signal due to structure (Column 7) is the deviation in the integrated radiance due to striated (or structured) regions along the path.

OPTICAL SAMPLES

TYPE OF OUTPUT	CENTRAL WAVELENGTH (MICRONS)	AZIMUTH (RADIAN)	ELEVATION (RADIAN)	SCANNED RADIANCE (M/UM ²)	NORMALIZED RADIANCE (M/UM ²)	TARGET DETECTION FLAG
0.000000	0.1957005	0.0000000	0.0000000	0.0000000	0.0000000	0.0000
0.000010	0.1957005	0.0000005	0.0000005	0.0000005	0.0000005	0.0000
0.000020	0.1957005	0.0000100	0.0000100	0.0000100	0.0000100	0.0000
0.000030	0.1957005	0.0000150	0.0000150	0.0000150	0.0000150	0.0000

NOTE: The last four columns show the scanned signal output (irradiance at the detector), the normalized signal output (the irradiance normalized to the sensor NEFD), the final signal output (after all other processing such as differencing has been completed), and the target detection flag which signifies whether the final signal exceeds a preset threshold designating the point a "TARGET" versus a "BKGND" point.

3 ACCESSING THE INPUT SCHEME

3.1 BATCH JOBS

To access and use the new input scheme in the batch mode (i.e., by submitting a card input deck over the counter or through a remote terminal), use a deck setup such as that shown in Table A.4.

Note that an optional card may precede the data cards, directing the input program to print each default card changed, followed by the new card which replaces it.

3.2 INTERACTIVE JOBS

To access and use the new input scheme using the time-share system follow these steps (also shown in Table A.6). (First, you must have a procedure permfile containing a small CYBER control language "PRØC" and a set of control cards. A sample procedure permfile is shown in Table A.5)

- Step 1. Access your procedure file with the ATTACH statement.
- Step 2. Execute the ROSCOE time-share program by typing RØSCØTS.
- Step 3. Type your inputs, in response to the program's message "INPUTS?". The program then processes the inputs; that is, inserts them into the standard deck and checks for errors. If errors occur, the program prints them and asks you to input a revised list by again asking "INPUTS?". When no errors occur, terminate RØSCØTS by typing "RUN". The job file is then automatically placed in the input queue, and control returns to the INTERCOM system. You can check that your job has been accepted by typing a FIND, nnn command, where nnn is the first 1-5 characters of the job name (first parameter on your first control card).

APPENDIX A

USER REFERENCE TABLES

DIRLCTORY OF INPUT VARIABLES	NO.	02/04/80	10.56.10.	PAGE
INPUT VARIABLE	NO.		DEFAULT VALUES	UNIT-NAME ALLOWED
DESCRIPTION				

SIMPLIFIED MCSOCE INPUT LIST

A. GENERAL INPUTS

--THE DEFAULT VALUES ARE SET SO THAT THE CODE PROCESSES THE STOP EVENT FIRST AND THUS PROCESSES NO OUTPUT.
 --TO RUN A PHYSICS AND/OR RAFAF, SATCOM, OR OPTICS PROGRAM CHANGE THE EVENT TIMES DESCRIBED BELOW TO OCCUR BEFORE THE STOP TIME.

INPUT VARIABLE	NO.	SEC	YES
TSTOP	1	0.	NO
REFALT	1	0.	NO
REFLON	1	-79.33	NO
REFLAT	1	47.75	NO
EVNLST	1	1.	NO
ACELL	1	.02	NO
KREG	1	1.	NO
KVIS	1	1.	NO
MSM	1	1.	NO
OO	1	.01	NO
CLOUDS	1	ZEROS	NO

B. PHYSICS CODE INPUTS

--TO RUN A PHYSICS PROGRAM, INPUT THE BURST TIMES (BTIME1,BTIME2,ETC) TO OCCUR PRIOR TO TSTOP.
 --FOR EXAMPLE--BY INPUTTING BTIME1=0.,BTIME2=120.
 SET, THE CODE SIMULATES A SINGLE BURST FOR TIMES OUT TO 120 SEC AFTER BURST.

DICTIONARY OF INPUT VARIABLES
Table A.1 (Continued)

INPUT VARIABLE	NO.	DESCRIPTION	DEFAULT VALUES	UNIT-TYPE ALLOWED
ROPOS	4	K(PCSI(1-4)) = RADAR POSITION (ALFUS(1-3))=POSITION (COORDINATES) IN MM. COORD. THE --DELIM--LOCXYZ, ON RADAR) DISTANCE ARE IN MM. UNITS IN DEG.	0. 0. 0. LOCXYZ	NC NC NC NO
BORL	2	ECHE(1-2) = RADAR RESOLUTION (AZIMUTH CCW FROM EAST, AND ELEVATION IN DEG)	90. 25. 450. 2500.	NO YES YES YES
FREQ	1	FREQ = RADAR FREQUENCY (DEFAULT UNIT IS HZ)	1.5	CEG
ASDM	1	ASDM = RADAR RANGE OR 1-SW-1 TARGET (UNITS AVAILABLE AS UNIT-NAMES ARE MPCM, MPCM, MPCM, MPCM OR THE DEFAULT UNIT CMSCM)	1800.	CEG
SEAPW	1	SEAPW = MAXIMUM CEPWIDTH (DEFAULT UNIT IS RADIANS)	2.	CEG
RMAX	1	RMAX = MAXIMUM ELEVATION ANGLE (DEFAULT UNIT IS CM)	20.	DB
EMIN	1	EMIN = MINIMUM ELEVATION ANGLE (DEFAULT UNIT IS RADIANS)	15.	DB
S'OV	1	S'OV = S/N THRESHOLD FOR DETECTION AND VERIFICATION (DEFAULT UNIT IS PARTICLELENGTH)	2.5	DB
S'MIN	1	S'MIN = S/N THRESHOLD FOR TRACK (DEFAULT UNIT IS PARTICLELENGTH)	1.0	DB
BANDW	1	BANDW = BANDWIDTH (DEFAULT UNIT IS HZ)	.5	DB
BANDS	1	BANDS = SIGNAL BANDWIDTH (DEFAULT UNIT IS HZ)	500.	FT
BANDS	1	BANDS = SIGNAL BANDWIDTH (DEFAULT UNIT IS HZ)	.5	PRAD
FPC	1	FPC = PULSE COMPRESSION RATIO	8	PRAD
RGATE	1	RGATE = RADAR RANGE GATE FOR TRACK INITIATION (DEFAULT UNIT IS CM)	2400.	FT
TGATE	1	TGATE = RANGE GATE PARAMETER FOR TRACK (DEFAULT UNIT IS CP)	15.	PRAD
FERR	3	FERR(1-3) = FIXED PORTION OF RADAR RANGE MEASUREMENT ERRORS IN (SIGN*(1)+2)*ERR(1)+2*ERR(2)+2*ERR(3) (DEFAULT UNITS ARE CM/KM/RAD)	500. .5 .8	FT DB DB
SNERR	3	SNERR(1-3) = S/N DEPENDENT PORTION OF RADAR RANGE MEASUREMENT ERRORS IN IN MM COORD. (SIGN*(1)+2)*ERR(1)+2*ERR(2)+2*ERR(3) (DEFAULT UNITS ARE CM/KM/RAD)	500. 15. 15.	FT DB DB

3. OBJECT DATA

--AS MENTIONED IN SECTION C ABOVE, THE USER CAN INPUT EITHER OBJECT COORDINATES DIRECTLY (SUITABLE FOR FNO-ATM PROBLEMS) OR THE OBJECT TRAJECTORY (FOR EXC-ATM PROBLEMS). THE USER MUST SELECT EITHER OR THE OTHER (OBJECT COORDINATES OR TRAJECTORY DEFINITION). 1) TO ENTER OBJECT COORDINATES, SET DBREF=REFER AND CTAG=OBJECT (FOR AN OPTICS PROBLEM) AND ENTER OBJTAG=OBJECT (FOR AN OPTICS PROBLEM) AND ENTER OBJTAG=OBJECT (FOR AN OPTICS PROBLEM). 2) TO ENTER AN OBJECT TRAJECTORY, SET DBREF=ZERO AND ENTER OBJTAG=REFER AND CTAG=REFER. --NOTE THAT ONLY ONE OBJECT STATE OR ONE TRAJECTORY CAN BE ENTERED, BUT MULTIPLE OBJECTS (AGBU) EQUALLY SPACED IN TIME (TDEL) CAN BE SIMULATED WHEN USING THE TRAJECTORY INPUT OPTION.

DIRECTORY OF INPUT VARIABLES

Table A.1 (Continued)
INPUT NC.

VARIABLE	VALUES	DESCRIPTION	DEFAULT VALUES	UNIT-TYPE	ALLOEC
BETA	1	BETA = MV BALLISTIC COEFFICIENT (ALWAYS INPUT IN PSF)	1500.	PSF	YES
RCS	1	RCS = RADAR CROSS SECTION OF MV (DEFAULT UNIT IS CMSC)	1.0	MSC	YES
-STATE VECTOR INPUT					
OBREFER	1	OBREFER = FLAG TO DENSIFY OBJECT COORDINATES ARE BEING INPUT (SET = REFER, OTHERWISE FOR TRAJECTORY INPUT SET = ZEROS)	REFER		NO
OBTAG	1	OBTAG = FLAG TO DENSIFY A RADAR OR OPTICS OBJECT IS BEING INPUT (SET CLTAG=OBJECT-1 FOR RADAR, AND CBTAG=REF-OBJECT FOR OPTICS)	REF-OBJECT		NO
OBJM	1	OBJM = OBJECT TIME (DEFAULT UNIT IS SEC)	99999.	SEC	YES
OBPOS	4	OBPOS(1-4) = OBJECT POSITION (OBPOS(1-3)=POSITION COORD. OBPOS(4)=COORD TYPE--GEOGR,LOCXYZ, CH RADAR) (DISTANCES IN KM, ANGLES IN DEG)	0. 0. 50. 50. LOCATZ		NO NO NO NO NO
OBVEL	3	OBVEL(1-3) = OBJECT VELOCITY IN POLAR COORD (MAGNITUDE IN MP/S, PEACING COUNTERCLOCKWISE FROM LOCAL GEOGRAPHICAL EAST IN DEG, ELEVATION ABOVE LOCAL HORIZONTAL IN DEG)	7. -90. -45.		NO NO NO
-TRAJECTORY INPUT					
NOBJ	1	NOBJ = NUMBER OF OBJECTS ON THE TRAJECTORY	0.		NO
BOPOS	4	BOPOS(1-4) = LAUNCH (OR BOOSTER BURN-OUT) POSITION (BOPOS(1-3)= POSITION COORD, BOPOS(4)=CLCH, TYPE--GEOGR,LOCXYZ,CH RADAR) (DISTANCES IN KM, ANGLES IN DEG)	0. 105. 36. GEOGP		NO NO NO NO
TGPOS	4	TGPOS(1-4) = TARGET (OR IMPACT) POSITION (TGPOS(1-3)=TARGET COORD, TGPOS(4)=COORD TYPE--GEOGR,LOCXYZ, OR RADAR) (DISTANCES IN KM, ANGLES IN DEG)	0. 0. LOCATZ		NO NO NO
GAMA	1	GAMA = ENTRY ANGLE FOR TRAJECTORY SPECIFICATION (DEFAULT UNIT IS RADIAN)	20.	DEG	YES
TIMP	1	TIMP = IMPACT TIME FOR 1-ST MV (DEFAULT UNIT IS SEC)	2000.	SEC	YES
TOELT	1	TOELT = DELTA TIME BETWEEN MVS (DEFAULT UNIT IS SEC)	20.	SEC	YES

C. SATCOM CODE INPUTS

--TO RUN A SATCOM PROBLEM, INPUT THE FIRST SATCOM CALCULATION TIME (CTIME) TO OCCUR PRIOR TO THE PROBLEM STOP TIME (TSTOP).

1. RUN CONTROL

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CLSDESCRIPTION DEFAULT VALUES

 --SUSSEQUENT SATCOM CALCULATIONS ARE PERFORMED EVERY (CINT) SEC.

CTIME	1	CTIME = FIRST SAT-COM CALCULATION TIME (DEFAULT UNIT IS SEC)	99999.	SEC	YES
CINT	1	CINT = TIME STEP FOR SAT-COM CALCULATIONS (DEFAULT UNIT IS SEC)	30.	SEC	YES

2. PROCESSING DATA

--FOR A MORE DETAILED DESCRIPTION OF THESE INPUTS SEE THE RECCOM MANUAL VOL. 20.

CTYPE	1	CTYPE = SATCOM MODULATION TYPE (DSPA,CFSK, OR FSK)	CPSK	NO
REGEN	1	REGEN = FLAG FOR REGENERATION OF SIGNAL AT SATELLITE (YES OR NO)	YES	NO
COPT	1	COPT = FLAG FOR COHERENT FSK MODULATION (YES OR NO)	NO	NO
DETRM	1	DETRM = FLAG FOR FULLY DETERMINISTIC MODE CALCULATIONS (YES OR NO)	YES	NO
ORDER	1	ORDER = ORDER OF PHASE LOCKED LOOP (FIRST OR SECOND)	FIRST	NO

3. PLATFORM DATA

--RELATIVE COORDINATES CAN BE USED HERE TO ALIGN THE COMMUNICATIONS LINKS AND BURST REGIONS.

XPOS	4	XPOS(1-4) = TRANSMITTER POSITION (XPOS(1-3)=POSITION COORD, XPOS(4)=COORD TYPE--GEORG, LOCKY2, OR RADAR) (DISTANCES IN KM, ANGLES IN DEG)	0. 0. 0. LOCKY2	NO NO NC NC
RPOS	4	RPOS(1-4) = RECEIVER POSITION (RPOS(1-3)=POSITION COORD, RPOS(4)=COORD TYPE--GEORG, LOCKY2, OR RADAR) (DISTANCES IN KM, ANGLES IN DEG)	0. 0. 0. LOCKY2	NO NO NC NC
SPOS	4	SPOS(1-4) = SATELLITE POSITION (SPOS(1-3)=POSITION COORD, SPOS(4)=COORD TYPE--GEORG, LOCKY2, OR RADAR) (DISTANCES IN KM, ANGLES IN DEG)	0. 0. 0. 35767. LOCKY2	NO NO NC NC NC

4. LINK DATA

--FIRST ENTRY IN EACH CASE REFERS TO THE UPLINK, SECOND ENTRY TO THE DOWNLINK.

POWER	2	POWER(1-2) = TRANSMITTED POWER (UPLINK, DOWNLINK) (DEFAULT UNIT IS LRGS/SEC)	100. 20.	WATTS WATTS	YES YES
CFREQ	2	CFREQ(1-2) = SATCOM FREQUENCY (UPLINK, DOWNLINK) (DEFAULT UNIT IS MZ)	6000. 7400.	MHZ MHZ	YES YES
XGAIN	2	XGAIN(1-2) = TRANSMITTER GAIN (UPLINK, DOWNLINK) (DEFAULT UNIT IS RATIO (DIMENSIONLESS))	61. 33.2	DB DB	YES YES
RGAIN	2	RGAIN(1-2) = RECEIVER GAIN (UPLINK, DOWNLINK) (DEFAULT UNIT IS RATIO (DIMENSIONLESS))	16.8 61.	DB DB	YES YES

DIRECTORY OF INPUT VARIABLES		02/04/80		10.36.18.		PAGE 8	
Table A.1 (Continued)	INPUT VARIABLE	NO. OF VALUES	DESCRIPTION	DEFAULT VALUES	UNIT-NAME ALLOEED		
	BITP	2	BITP(1-2) = BIT PERIOD (UPLINK, LOCALINK) (DEFAULT UNIT IS SEC)	1.0E-8 1.0E-8	SEC SEC	YES	YES
	CBAND	2	CBAND(1-2) = IF FILTER BANDWIDTH (UPLINK, DOWNLINK) (DEFAULT UNIT IS HZ)	125. 125.	MHZ MHZ	YES	YES
	PBAND	2	PBAND(1-2) = PLL BANDWIDTH (UPLINK, DOWNLINK) (DEFAULT UNIT IS HZ)	125. 125.	MHZ MHZ	YES	YES
	CBEAM	2	CBEAM(1-2) = TRANSMITTER BEAMWIDTH (UPLINK, DOWNLINK) (DEFAULT UNIT IS RADIANS)	1.5 1.5	DEG DEG	YES	YES
	CSN	2	CSN(1-2) = SATCOM S/N THRESHOLD (UPLINK, DOWNLINK) (DEFAULT UNIT IS RATIO (DIMENSIONLESS))	15. 15.	DB DB	YES	YES

E. OPTICS CODE INPUTS

--TO RUN AN OPTICS PROBLEM THE USER MUST FIRST SET OPTICS=REFER

--TWO TYPES OF OPTICS PROBLEMS CAN BE SIMULATED--
 (1) A SURVEILLANCE PROBLEM WHERE THE SENSOR IS POINTED AT SOME REFERENCE LOCATION (UTYPE=SURVILLCE), OR
 (2) A BOOST TRACK PROBLEM WHERE A SENSOR LOCK IS CREATED INTERNALLY AT A SPECIFIED TIME (UTYPE=TRACK).
 --IN THE FIRST CASE, THE USER PROVIDES THE FIRST LOOK TIME(CLOCK) AND THE REFERENCE POINT(REFPT) FOR THE LOCK DIRECTION (OR TRACK THE BURST 1 FIREBALL (SEE SEASPT INPUT). IN THE SECOND CASE, THE USER INPUTS THE BOOSTER PCEEL AND THE BURST POSITION, (BCPOS).

IN EITHER CASE, THE USER MUST SET UP AN OPTICAL SENSOR

1. RUN CONTROL

--SUCCESSFUL OPTICS LOCKS ARE CREATED INTERNALLY EVERY (TIME) SECONDS.
 --OPTICS OUTPUTS ARE CONTROLLED BY THE (OFALC) PARAMETER (1) FOR (LOCAL=EVENTS), BOOST TRACK MEASUREMENTS ONLY ARE PRODUCED, AND
 (2) FOR (LOCAL=FOV), DATA STREAM OUTPUT AS THE DETECTOR SCANS THE FOV WILL ALSO BE PRODUCED.
 --THE BOOSTER MEASUREMENTS MAY BE USED TO INITIALIZE (OR ACC TO) A TRACK FILE BY SETTING (TFILL=REFER), AND THESE MEASUREMENTS MAY BE FITTED WITH RADAR DATA BY SETTING (SNLT=YES).

OPTICS 1 OPTICS = FLAG FOR INITIALIZING OPTICS CALCULATION (SET OPTICS=REFER ZEROS NO

DIRECTORY OF INPUT VARIABLES
Table A.1 (Continued)

INPUT VARIABLE	NO.	DESCRIPTION	DEFAULT VALUES	UNIT-NAME ALLOWED
OTYPE	1	OTYPE = OPTICS LOOK TYPE (TRACK OR SURVEILLANCE)	TRACK	NC
ODLOOK	1	CLOCK = TIME OF FIRST OPTICS LOOK (FOR OPTICS SURVEILLANCE) (DEFAULT UNIT IS SEC)	99999.	YES
FTIME	1	FTIME = FRAME TIME FOR OPTICS LOOKS (DEFAULT UNIT IS SEC)	10.	YES
OCALC	1	CCALC = OPTICS CALCULATION TYPE (POINTS OR FOV)	FOV	NO
OTFILE	1	OTFILE = OPTICS TRACK FILE FLAG (INPUT=REFER, FOR TRACK FILE; --ZROS=FOR NC TRACK FILE)	ZEROS	NO
SNST	1	SNST = SENSOR NETTING FLAG (YES OR NO)	NO	NO
SENSPT	1	SENSPT = TYPE OF TARGET SENSOR IS POINTED TOWARD. USL REF FOR A FIXED POINT (HEPT), FIREBALL TO TRACK THE FIREBALL OF BURST. NOTE-- THE USL MUST ALSO SET DBREFER=REFER AND CBTAG=REF-OBJECT-- SEE SECTION C-3 ABOVE.	REF	NO
REPPT	4	REPPT(1-4) = REFERENCE POINT FOR SENSOR POSITIONING (HEPT(1-3)=POSITION COORD, REFPT(4)=COORD. TYPE -- GEOR, LOCKY?, OR RADAR) (DISTANCES IN MM, ANGLES IN DEG)	0. -79.33 47.75 GEOGR	NO NO NO NO

2. SENSOR DATA

--THE SENSOR LOCATION CAN BE INPUT IN GEOGRAPHICAL COORDINATES (GEOR) OR RELATIVE TO THE REFERENCE LOCATION IN SECTION A. ABOVE.
--THERE ARE TWO WAVELENGTH BANDS ALLOWED AND THEY ARE BUILT IN SENSOR PROCESSING MODELS. THE FIRST TWO MODELS SHOULD BE USED IN SURVEILLANCE APPLICATIONS AND PROVIDE SLIGHTLY DIFFERENT OUTPUT. THE THIRD MODEL (SURVEIL-04) PROVIDES TRACK MEASUREMENT OUTPUT AND SHOULD BE USED WHEN (TFILE=REFER).

SNPOS	4	SNPOS(1-4) = OPTICAL SENSOR POSITION (SNPCS(1-3)=POSITION, COORD, SNPOS(4)=COORD. TYPE--GEOGR, LOCKY?, OR RADAR) (DISTANCES IN MM, ANGLES IN DEG)	35787. -79.33 47.75 GEOGR	NO NO NO NO
WLO	2	WLO(1-2) = LOW END OF SENSOR WAVELENGTH BAND --(TWO BANDS ALLOWED) (DEFAULT UNIT IS CM)	2.5L-6	YES
WHI	2	WHI(1-2) = HIGH END OF SENSOR WAVELENGTH BAND (DEFAULT UNIT IS CM)	2.6L-6	YES
DFERR	2	DFERR(1-2) = FIXED PORTION OF OPTICS RANGE MEASUREMENT ERRORS IN AE COORD (DEFAULT UNIT IS METER)	2.7E-6	YES
OSMER	2	OSMER(1-2) = STN DEPENDENT PORTION OF OPTICS RANGE MEASUREMENT ERRORS IN AE COORD (DEFAULT UNIT IS RADIANS)	.01	YES
OMOCL	1	OMOCL = OPTICAL SENSOR PROCESSING MODEL --(SURVEIL-01, SURVEIL-02, OR SURVEIL-04)	.01 1. SURVEIL-01	YES YES YES NO

3. BOOSTER DATA

--TWO BOOSTER STAGES ARE ALLOWED. NOTE THAT THE TIME COORRESP. TO THE INITIAL BOOSTER STATE IS SET INTERNALLY TO 0. SEC AND THE RV IMPACT TIME SPECIFIED IN THE

TRAJECTORY INPUTS (SEE SECTION C.3) WILL BE ADJUSTED ACCORDINGLY.

VARIABLE	INPUT NO.	DESCRIPTION	DEFAULT VALUES	UNIT-NAME	ALLOWED
FUEL	2	FULL(1-2) = FUEL TYPE (LIQUID OR SOLID)--NOTE--TWO STAGES ALLOWED	LIQUID	NO	
THRST	2	THRST(1-2) = BOOSTER STAGE THRUST (DEFAULT UNIT IS GM)	1100000.	LB	YES
WTI	2	WTI(1-2) = INITIAL STAGE WEIGHT (DEFAULT UNIT IS GM)	135000.	LB	YES
WTF	2	WTF(1-2) = FINAL STAGE WEIGHT (DEFAULT UNIT IS GM)	70000.	LB	YES
AN0Z	2	AN0Z(1-2) = NOZZLE EXIT AREA (DEFAULT UNIT IS CMSQ)	20000.	LB	YES
TSUMN	2	TSUMN(1-2) = STAGE BURN TIME (DEFAULT UNIT IS SEC)	35000.	LB	YES
REFA	2	REFA(1-2) = REFERENCE AREA FOR AERODYNAMIC DRAG CALCULATION (DEFAULT UNIT IS CMS ²)	8000.	INSQ	YES
CRN0	2	CRN0(1-2) = AXIAL FORCE COEFFICIENT AT M=0.5	3000.	INSC	YES
CRN1	2	CRN1(1-2) = AXIAL FORCE COEFFICIENT FOR M=1.0	2000.	SEC	YES
CRN3	2	CRN3(1-2) = AXIAL FORCE COEFFICIENT FOR M=3.0	0.	SEC	YES
			35.	FTSQ	YES
			.10	NO	NO
			.19	NO	NO
			.136	NO	NO
			.11	NO	NO
			.068	NO	NO

DESCRIPTION OF USER INPUT AND COMMAND FORMATS . . .
 Table A.1 (Concluded)

THE BASIC FORM FOR EACH INPUT LINE IS . . .
 I1,I2,I3,.....
 (ALL BLANKS ON THE LINE ARE IGNORED)
 WHERE THE I1, I2, ETC. ARE EITHER COMMANDS OR ITEMS OF THE FORM . . .

ITEM=LIST

WHERE ITEM IS ONE OF THE INPUT VARIABLES OR VECTOR ELEMENTS AND LIST IS A LIST OF ONE OR MORE VALUES TO BE INPUT, STARTING AT THE NAMED ELEMENT. THE VALUES NEED NOT INCLUDE DECIMAL POINTS FOR WHOLE NUMBERS AND MAY BE APPENDED WITH APPROPRIATE UNIT NAMES IF ALLOWED FOR THAT VARIABLE. VALUES ARE SEPARATED BY COMMAS.

THE RECOGNIZED COMMANDS ARE . . .

- ABORT CAUSES PROGRAM ABORT WITH NO OUTPUT FILE
 (TO AVOID SUBMITTING A BATCH JOB)
- CHANGELISTON TURNS ON SUBSTITUTION LIST OPTION (SHOWS HOW
 VALUES ARE USED IN ROSCOE INPUT DECK)
- CHANGELISTOFF TURNS CHANGELISTON OPTION OFF
- HELP TO PRODUCE THIS MENU AGAIN
- RUN TERMINATES EXECUTION AND PRODUCES OUTPUT FILE
 FOR ROSCOE EXECUTION. ALTERNATE FORMS ARE
 ENC OR END DATA

TABLE A.2

ALLOWABLE UNIT NAMES

<u>Category</u>	<u>Unit Name</u>	<u>Scaling Factor to Internal (Default) Units</u>
Frequency	MHZ	1,000,000
	KHZ	1,000
Time	HRS	1 (This may only be used for time-of-day inputs)
	SEC	1
Mass	KG	1,000
	GM	1
	LB	453.592
Ballistic Coeff.	PSF	0.4882405
	GM/CMSQ	1
Length	CM	1
	FT	30.48
	KM	100,000
	NMI or NM	185,325
	M	100
	KFT	30,480
Acceleration	G	980.665
Area	CMSQ	1
	MSQ	10,000
	INSQ	6.4516
	FTSQ	929.0304

TABLE A.2 (Cont'd.)

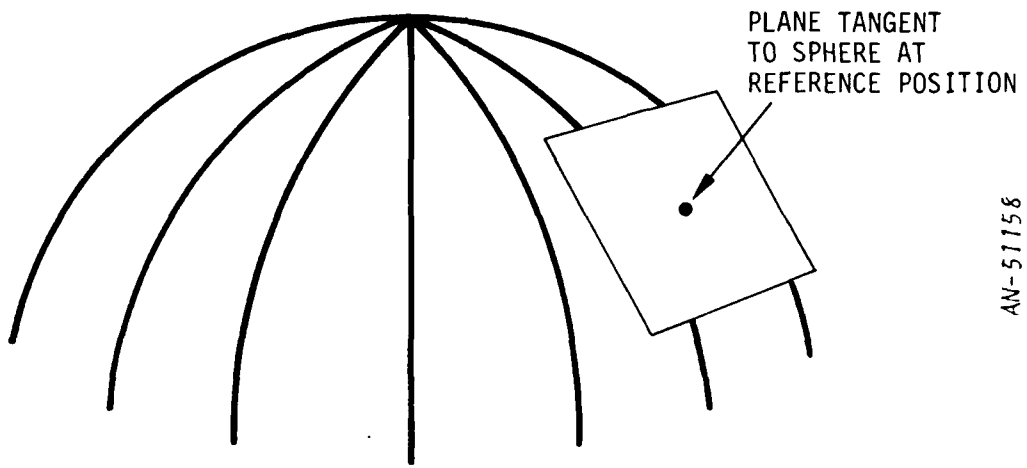
ALLOWABLE UNIT NAMES

<u>Category</u>	<u>Unit Name</u>	<u>Scaling Factor to Internal (Default) Units</u>
Yield	MT	1
	KT	0.001
Radar Range/Standard Target	CMSQCM	1
	KMSQM	10,000
	NMSQM	18532.5
	KFSQM	3048
Power	WATTS	10,000,000
Power Ratio	DB	$X \text{ dB} \rightarrow 10^{X/10}$
Angle	DEG	0.01745329252
	RAD	1
	MRAD	0.001

TABLE A.3

POSITION COORDINATE SPECIFICATIONS

GEOGR	Geographical Coordinates: <ul style="list-style-type: none">● Altitude (KM)● East longitude (DEG) (longitudes west of Greenwich input as negative)● North latitude (DEG) (south latitudes negative)
LOCXYZ	Local Tangent Plane Coordinates (see Fig. A.1): <ul style="list-style-type: none">● Geographic east (KM) (west input as negative)● Geographic north (KM) (south input as negative)● Distance above plane (KM)
RADAR	Local Radar Coordinates (see Fig. A.1); <ul style="list-style-type: none">● Slant range (KM)● Azimuth (DEG) (positive CCW from east)● Elevation (DEG) (positive above horizontal)



AN-51158

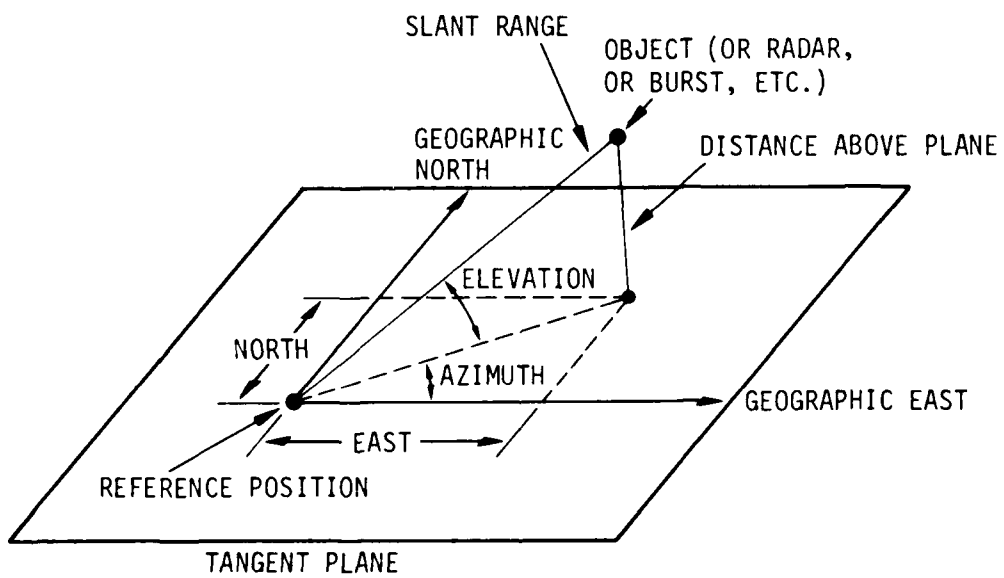


Figure A.1 Definition of Coordinates for Relative Coordinate Systems

TABLE A.4

SAMPLE CONTROL CARD DECK FOR AFWL/NOS/BE1

```

JOB CARD . . . . .
ACCOUNT CARD . . . . .
MAP(OFF)
ATTACH(XX1,OBINARY, ID=GRCXJJB, CY=1)
COPYBK(XX1,OBIN,240)
ATTACH(XX2,OBINARY, ID=GRCXJJB, CY=2)
COPYBF(XX2,OBIN)
RETURN(XX1,XX2)
REWIND(OBIN)
ATTACH(BCPYL,BCPYLRSCOE, ID=GRCXJJB, CY=3)
ATTACH(STRUCT,OSTRUCT, ID=GRCXJJB)
UPDATE(P=STRUCT,F,D,8,C=TAPL1,L=1)
BCPYL(TAPE1,OBIN,LFIL,.,REAL1,REWIND,ERRORS)
RETURN(TAPE1,TAPE4,BCPYL,OBIN)
ATTACH(SPINE,SPINERSCOE, ID=GRCXJJB, CY=2,MR=1)
ATTACH(TAG,DATA,IRSCOE, ID=GRCXJJB, CY=5)
SPIN(.,TAG,DATA,.,PATC,REWIND)
ATTACH(RLIBE,RLIBERSCOE, ID=GRCXJJB)
RETURN(TAPE1,TAPE2,TAPE3,TAPE4,TAPE5,TAPE6)
ATTACH(AMALGMB,AMALGMBRSCOE, ID=GRCXJJB)
AMALGMB.
RETURN(AMALGMB)
LQSET(LI=RLIBE,PRESET=ZERO,FILES=TAPL1)
LOAD(LFILE)
NOGO.
RETURN(LFILE)
RETURN(RLIBE)
ATTACH(TAPE3,NEWDATRSCOE, ID=GRCXJJB)
SENER.
7-8-9 CARD
*IDENT CHG
*COMPILE STRUCT
ANY MODS TO OSTRUCT FILE GO HERE . . . . .
7-8-9 CARD
CHANGELIST CN . . . . . (OPTIONAL)
SPINL DATA INPUTS . . . . .
. . . . .
. . . . .
RUN
7-8-9 CARD
6-7-8-9 CARD

```

TABLE A.5

SAMPLE PROCEDURE PERMFILE FOR INTERACTIVE USE

```

.PROC,ROSCOTS
COPYCR(ROSCOTS,DATEIR,2)
ATTACH(SPIKE,SPINEROSCOE, ID=GRCXJJB, CY=2, MR=1)
ATTACH(INTAB,DATEIRROSCOE, ID=GRCXJJB, CY=5)
SPIKE.
RETURN(SPIKE, INTAB, WAFILL)
ZAP(DATEIR, MW, IN)
COMMENT. FILE HAS BEEN BATCHED TO INPUT.
7-8-9 CARD
JOB CARD . . . . .
ACCOUNT CARD . . . . .
MAP(OFF)
ATTACH(XX1,OBINARY, ID=GRCXJJB, CY=1)
COPYBR(XX1,OBIN,240)
ATTACH(XX2,OBINARY, ID=GRCXJJB, CY=2)
COPYBR(XX2,OBIN)
RETURN(XX1,XX2)
REWIND(OBIN)
ATTACH(BCPYL,BCPYLROSCOE, ID=GRCXJJB, CY=3)
ATTACH(STRUCT,OSTRUCT, ID=GRCXJJB)
UPDATE(PE=STRUCT, F=O, B=C, TAPE1, L=1)
BCPYL(TAPE1,OBIN,LFILL, READ1,REWIND,ERRORS)
RETURN(TAPE1,TAPE4,BCPYL,OBIN)
COPYCR(INPUT,INDATA)
REWIND(INDATA)
ATTACH(RLIBE,RLIBEROSCOE, ID=GRCXJJB)
RETURN(TAPE1,TAPE2,TAPE3,TAPE4,TAPE5,TAPE6)
ATTACH(AMALGM8,AMALGM8ROSCOE, ID=GRCXJJB)
AMALGM8.
RETURN(AMALGM8)
LDSLT(LIB=RLIBE,PRESET=ZERO,FILES=TAPE1)
LOAD(LF FILE)
NOGO.
RETURN(LF FILE)
RETURN(RLIBE)
ATTACH(TAPE3,NEWDATEROSCOE, ID=GRCXJJB)
SENER.
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