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EA-6B MISSION PLANNING PROGRAM

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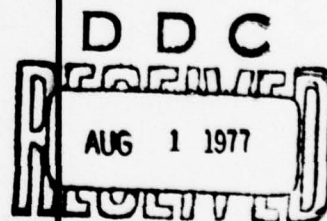
Carl Alan Beaudet

June 1977

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EA-6B Mission Planning Program

by

Carl Alan Beaudet
Lieutenant, United States Navy
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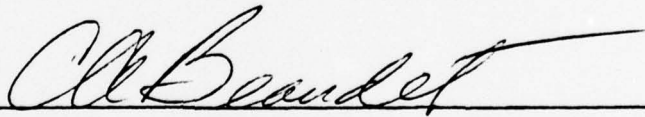
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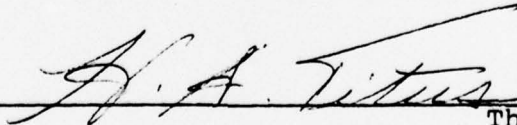
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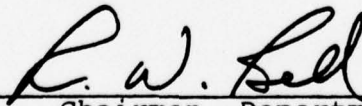
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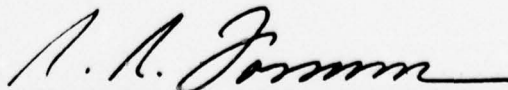
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ABSTRACT

The EA-6B Mission Planning Program is designed for use by aircrewmen deployed on board aircraft carriers. It is an interactive computer program for automated sorting, retrieval, display, and plotting of information. All decision making is done by the aircrewman. The desired goals of this program are increased mission planning efficiency and effectiveness through automation of the clerical tasks of the planning process.

TABLE OF CONTENTS

I.	INTRODUCTION -----	7
II.	DESIGN CONSIDERATIONS -----	9
III.	SYSTEM DESCRIPTION -----	13
IV.	DETAILED PLANNING SESSION -----	15
	A. INTRODUCTION -----	15
	B. ESCORT MISSION -----	15
	C. STANDOFF MISSION -----	19
	D. MODIFIED ESCORT MISSION -----	22
V.	PROPOSALS FOR PROGRAM EXPANSION -----	24
	COMPUTER PROGRAM -----	29
	LIST OF REFERENCES -----	49
	INITIAL DISTRIBUTION LIST -----	50

LIST OF FIGURES

1.	EOB listing with EA-6B parameters -----	26
2.	Escort mission, terminal threat envelopes displayed -----	26
3.	Escort mission, all emitter envelopes displayed -----	26
4.	Escort mission, EW/ACQ emitter envelopes displayed -----	26
5.	Standoff mission, terminal threat envelopes displayed -----	27
6.	Standoff mission, EW/ACQ emitter envelopes, normal and jammed, are displayed -----	27
7.	Modified escort mission, terminal threat envelopes displayed -----	27
8.	Navigation solution, modified escort mission ---	27
9.	Time scenario, escort mission -----	27
10.	Time scenario, modified escort mission -----	27
11.	Jamming parameters, standoff mission -----	28
12.	Weapon platform listing of EA-6B parameters ----	28

I. INTRODUCTION

The process of planning the electronic warfare support for an air strike is complex and time consuming. There are sophisticated methods for data collection, analysis, and storage, and the effective employment of today's weapon systems depends on such data. However, no automated interface has been developed to assist the Electronic Warfare Officer in his efforts to correlate the two. It's all done by hand.

The mission planning process reveals a pattern common to many technical problem solving efforts. The majority of one's time is spent gathering information and setting up the problem to be solved. Very little time is devoted directly to solving it. The data and information needed for EA-6B mission planning must be retrieved, by hand, from numerous source documents such as Kilting lists, TACMANUALs, computer printouts of the Electronic Order of Battle (EOB), radar handbooks, etc. Much of the information contained in these documents is non-essential to the immediate problem of mission planning, and only adds to the time required for sorting and retrieval. Data lists must be made for later reference in flight, and charts must be marked showing the EOB, route of flight, and emitter detection envelopes. Only when all this preliminary work is complete can the scenario

be subjectively analyzed by the planner, and jammer positioning optimized. Some calculations of jamming effectiveness may be performed, but these are so cumbersome and time consuming that an operator can seldom afford to make more than one or two such calculations, just to obtain a "feel" for the situation. The inefficiency is apparent, and under some circumstances, unaffordable.

II. DESIGN CONSIDERATIONS

The primary objective was to automate as much of the planning process as possible, and allow the operator to devote more of his time to solving the problem of asset optimization. Speed and simplicity were the foundation for design considerations. The following is a description of the rationale used, and the decisions made which led to the final system design.

Sorting, plotting, and calculating can be most effectively accomplished by a computer. Making decisions, or choosing between options is a relatively simple task for a human. Therefore, the software system is not a completely hands off, optimization routine. Rather, it is a series of steps requiring decisions from the planner at various points, indicating in which direction to proceed. The decision points arise whenever it is more efficient for the planner to perform some portion of the planning process rather than generating a computer code to do the same thing. All probable situations have been included in the system design.

To minimize cost, the system is intended to utilize equipment and facilities currently on board aircraft carriers. Access to the ship's main computer at arbitrarily random times is not considered practical. Therefore, the system is designed for a small, peripheral type, general purpose computer. All Pacific Fleet carriers have been funded for

the WANG 2200 system, which is such a computer. The WANG system has:

- 1) Central processor of moderate capacity - 32K
- 2) Auxiliary storage of three 250K floppy disks
- 3) Video display
- 4) Typewriter for hard copy output
- 5) X-Y plotter capable of accommodating aeronautical charts.

Naval Ocean Systems Command has developed an interface between the WANG computer and the ship's main computer for fast transfer of information, with no apparent interruption of the main computer's functions.

The ship's computer contains the EOB for areas of the world in which the Navy has responsibility. The information contained in other reference documents is not presently in computer files, and the EA-6B TACMANUAL lists 13 separate publications for reference during mission planning. Therefore, an Emitter Parameter Library file was developed containing information retrieved from these various sources and stored in the floppy disk for reference. The library is an array containing EA-6B pertinent information on each type radar listed in the ship's EOB. When site locations are retrieved from the EOB in the main computer, the site type is retrieved also. The listing routine matches site types retrieved with the corresponding type in the Emitter Library and builds a "working" EOB. The parameters listed when the EOB is printed out are:

- 1) Site number
- 2) Latitude and longitude
- 3) Threat type, e.g. Low Blow or Tall King
- 4) Emitter function, e.g. Fire Control or Early Warning
- 5) Frequency band and frequency range of emitter
- 6) PRF range
- 7) Automatic and manual jamming codes against the emitter
- 8) Percent of frequency band of the emitter
- 9) Pertinent remarks, e.g. "HOJ against noise", or "SA-2, DLJ beacon at ____MHZ".

The listing would be used by the operator to determine computer lists to generate for the mission, site locations to be programmed, and any preemptive jamming assignments to be made. The information included in the Emitter Library is arbitrary, and items can be added or deleted to suit the preferences of the squadron or community. Computer space may be at a premium, so the intent here is to include information of primary importance for quick reaction planning. No in-depth information on how the various codes were generated is presented.

This first generation program produces a "Flat Earth" solution. This was necessary to keep solution time to a minimum. Geographical features are not presently stored in the ship's computer, and an algorithm will have to be

devised to accommodate this problem. One approach will be discussed in the proposals for system expansion. At present, it would require a great deal of time and inputs from the operator to include terrain features, which is at cross purpose with the guidelines of speed and simplicity. All conflicts concerning whether or not to automate a certain phase of the mission planning process were resolved within this framework.

III. SYSTEM DESCRIPTION

A computer simulation was accomplished utilizing:

- 1) IBM 360/67 general purpose computer
- 2) Tektronix 4012 graphics terminal (30/12 system)
- 3) Tektronix 4610 hard copy unit.

FORTRAN language was used in the simulation and conversion to BASIC language used on the WANG 2200 is relatively straightforward due to the similarities of the two languages.

The system that has been designed assists the operator as follows: The operator initiates the planning process by choosing one of three basic mission profiles; escort, modified escort, or standoff. Next, either a route of flight for the strike group is entered, if it has already been chosen, or just the latitude and longitude of the target may be entered, allowing the operator to choose and enter a route later. The system produces a printout of the area's EOB. Next, the EOB, detection envelopes of the various emitters, and the route of flight are visually presented to the operator. This is a key point in the planning process, for once the visual presentation is available, the optimum route is often apparent at a glance. A large X-Y plotter appropriately marks the operator's chart with this presentation, if and when desired. If the operator wishes to consider a number of alternatives, each may be plotted on a transparent overlay, several of which may be presented to

the strike leader or staff for final decision. Then hard copies of the complete navigation solution and the Time Scenario of the route are printed. The Time Scenario is a minute-by-minute listing of the sites within detection range of the strike group and/or EA-6B. It contains all necessary information to react as quickly as possible to an onboard jamming system malfunction which would cause operation in a degraded mode.

The operator may consider as many combinations of routes and mission profiles as he desires. The point to remember is that this is not an optimization routine. The aircrewman must make all the decisions. The success of his planning efforts will depend on how he uses his training, experience, and imagination, which is no different from the way things have always been. Hopefully he will have the chance to be considerably more effective by utilizing a system which performs most of the clerical tasks of mission planning for him.

IV. DETAILED PLANNING SESSION

A. INTRODUCTION

The following is a description of all aspects of system assistance available in a complete planning session. The assumption made is that the strike aircraft route of flight to and from the target has already been designated. The operator's task is to pick the most appropriate EA-6B mission profile, and optimize his assets accordingly.

B. ESCORT MISSION

Upon initiating the program, the operator can select any of the mission profiles for consideration. This example assumes consideration of the Escort mission profile first. The system then asks the operator to enter the strike aircraft route of flight to and from the target, including turnpoints, speeds on each leg of the route, and the magnetic variation of the area. At this point the system takes the given L/L's of the route, determines the maximum and minimum of each, and adds and subtracts 120 NM to the maximum and minimum, respectively. This sets the geographical limits of search in the EOB to be obtained from the ship's main computer. The system then accesses the current listing of the EOB. It searches through the EOB and retrieves all sites that fall within the geographical limits of the maximum and minimum latitudes and longitudes previously calculated.

It retrieves the site L/L and the site type (Fansong, Barlock, etc.). All these sites are stored in an array (list) in the peripheral machine, and matched with the appropriate parameters in the Emitter Parameter Library, as described in Design Considerations.

The "working" EOB now contains all sites listed in the ship's EOB within the geographical limits set. The operator is asked if he wants to add any additional sites to the EOB that may be a result of recent intelligence (VQ, returning strike a/c, RA-5C missions, etc.). He also has the option to build his own complete EOB, ignoring the ship's listing entirely. This would be useful in exercises against friendly EOB's such as U.S. coastlines, EW ranges at Fallon and Pinecastle, etc.

When the "working" EOB is complete, the system asks if the operator wishes a printout of the EOB. If a listing is desired, the operator can be selective by choosing to list all emitters, just EW/Acq type emitters, or just Terminal Threat types. The information presented comes from the "working" EOB and the Emitter Parameter Library. The listing contains information pertinent to EA-6B operators (see Fig. 1).

The next step in the process is to display the EOB and route of flight to the operator. He can display the route of flight and radar detection envelopes of all emitters, EW/Acq types only, or terminal threat types only. Once the desired combinations are entered, the sites, route of flight,

and detection envelopes are displayed (see Figs. 2,3,4), and the margin is scaled with appropriate L/L. The L/L convention used is + for N and E, - for S and W. The operator may choose to have this presentation drawn on his aeronautical chart, or on a transparent overlay. The display and chart can be studied for terrain features, appropriateness of route, etc.

The next choice offered the operator is 'Do you wish a Navigation solution?' for the route currently being considered. It is necessary to have the NAV solution if a time scenario (discussed in System Description) is desired also. Several items calculated in the NAV solution, such as speeds, headings, times, etc., are used in determining present position of the EA-6B as it proceeds around the route. If the operator doesn't want the NAV solution, he is then asked if he wishes to consider a different route, or a different mission profile. If he does want the solution, it is displayed for him, and a hard copy is produced (see Fig. 8).

Next, the system asks "Do you want a listing of the Time Scenario?" If desired, the system proceeds as follows:

- 1) It asks operator to indicate emitters of interest by type (all, EW/Acq only, Terminal Threat only) and by frequency band.
- 2) It calculates present position (p/p) of the EA-6B beginning at the first point of the route.

- 3) It filters the "working" EOB for the proper type and frequency bands, calculates the range from p/p to each emitter having passed the filter, checks that distance against the "threat" range for that emitter listed in the Emitter Parameter Library. If the distance is within "threat" range, the important inflight parameters are displayed.
- 4) After all sites are checked, time is incremented by a minute, and a new p/p is calculated using headings and speeds obtained from the NAV solution.
- 5) There are detailed routines in this portion to check if the p/p increment goes around a turnpoint and if heading speed changes occur, or if the end of the route is reached.
- 6) The process iterates around the entire route, minute by minute.
- 7) The parameters printed out for the operator (see Fig. 9) in hard copy form are:
 - a) Time
 - b) Present Position
 - c) Emitter Type
 - d) "Working" EOB Number
 - e) Range and Bearing to the emitter
 - f) Automatic and Degraded jamming modes to use
 - g) Relative percent of frequency band of the emitter.

The entire purpose of producing this scenario is to provide the operator with all information necessary to devote a minimum of "inflight" time searching, analyzing, and reacting to known sites, allowing more time to concentrate on the unknown or unexpected emitters. The information will allow him to handle system degradations with as little confusion and consternation as possible. This program does not attempt to solve the problem of having fewer assets than number of sites in range. Here, again, the operator must decide relative priorities using information available such as ranges to the various sites (just entering or about to exit an envelope), type emitters (AAA vs SAM, or SA-2 vs SA-6), and choose his asset deployment scheme accordingly. If the route is too saturated, perhaps a case can be made for an alternative route.

After the Time Scenario is complete, the system offers the operator the options to consider a different strike route, or a different mission profile. If he wishes to consider a new strike route, he enters it and the system returns to the Display portion of the program. This example will retain the same strike route and next, consider the Standoff mission profile.

C. STANDOFF MISSION

A standoff mission is hereby defined as using an EA-6B to primarily jam EW/Acq type radars as the strike group proceeds to and from the target. The "raid" can usually be

divided into three phases; ingress, over the target, and egress. The standoff objective is to optimize jamming against EW/Acq emitters during ingress and egress. While the strike aircraft are over the target there is little in the way of effective jamming that can be accomplished (from a standoff orbit) against narrow beam fire control and missile control radars. Therefore, the operator usually attempts to optimize his track or orbit to cover the first and last phases of the strike.

The program offers the operator a chance to view the EOB and various standoff stations. Often a single orbit for each phase (ingress and egress) is the optimum jamming position. Standoff jamming positioning is dictated by strike aircraft location. Therefore the system takes as inputs for the standoff solution, the strike aircraft route (in this example it has already been entered and need not be done so again), and the latitude and longitude of a standoff jamming point. Standoff jamming orbits are usually short enough in length with respect to distances to target emitters that jamming effectiveness will not vary significantly from one point in the orbit to another. Therefore, the midpoint of an orbit will suffice for most cases.

Next the system displays the strike aircraft route, the EOB sites and their detection envelopes, and the standoff point for the EA-6B. The display may be filtered by the operator, as before, by type emitter groupings. Additionally,

detection envelopes depressed by jamming may be displayed. The operator can assess the effectiveness of this jamming orbit for various strike group locations around the route. Several different standoff points may be considered before the operator decides on the optimum position(s). As an example, perhaps a stationary orbit is optimum for the first 15 minutes of the strike. Then the EA-6B must transit to an orbit some distance away, say 100 NM, for optimum positioning to cover the egress. The operator can display the first orbit, the last orbit, and as many points between the two as desired. He would then have a visual indication of how his jamming effectiveness will be affected during the transit phase, and where the strike group is most vulnerable to EW/Acq emitters during the strike (see Figs. 5,6).

As with the Escort mission discussed earlier, the operator would receive a hardcopy printout of:

- 1) Strike group navigation solution
- 2) List of jamming parameters for use in flight
(see Fig. 11)
- 3) Chart appropriately marked with the EOB, route of flight, and emitter detection envelopes.

Operator judgment will play a large part in determining the success and speed at which optimum positioning of the stand-off EA-6B is accomplished. He must vary the parameters, consider the options, and then make the decision. The system will not do it for him. It does provide enough speed

and ease of computation to allow the operator the luxury of considering many alternatives before making his selection, something seldom affordable with current planning procedures.

D. MODIFIED ESCORT

The Modified Escort mission profile is one in which the jamming aircraft directly accompanies the strike group on it's route until such time as the group must penetrate AAA or SAM weapon envelopes. At such time, the EA-6B parallels the strike group just outside the weapon envelopes. Timing and positioning of the EA-6B is critical if any measurable success is to be achieved against fire control and missile control radars.

If the operator wishes to plan for this profile, he proceeds as mentioned in the previous sections. He may enter the strike group route and the EA-6B route, or just the strike group route, or neither. In this example, the strike group route has been entered previously. The operator has the option of viewing the EOB and strike route before entering the modified escort route for the EA-6B. He also has available the NAV solution for the strike group, with the times at various turnpoints on the route. He may use this information to coordinate the timing and positioning of the EA-6B, consistent with the strike group route. Once this route has been entered, the Modified Escort route is added to the visual presentation (see Fig. 7). If this

route is acceptable to the operator, he may have his chart marked with that route. He receives a printout of the EA-6B navigation solution, and a Time Scenario for the mission, if desired (see Figs. 8,10). The Time Scenario considers threats to both the strike group and the EA-6B, and lists the emitters "in range" accordingly. At the end of this sequence, the operator can alter the strike route, change the EA-6B route, change mission profiles again, or terminate the planning process.

V. PROPOSALS FOR PROGRAM EXPANSION

- 1) The data base (Emitter Parameter Library) could be expanded to include EA-6B information grouped by weapon platforms such as ships, aircraft, and missile threat (ASM, SSM, and AAM). This information is easily compiled and requires no additional computer calculations. Current auxiliary storage space is sufficient. A simple call for information on a particular ship or aircraft would produce a printout similar to the EOB listing available in the current program (see Fig. 12).
- 2) Terrain consideration is one of the most important aspects of EW mission planning. The U.S. Geological Survey has developed a procedure to store geographical features in computer format that may prove adaptable to this planning program. The approach would be to store the terrain features of various areas of the world on cassette tapes and load the particular area of interest into the computer when planning a mission. The amount of computer space and complexity of application may prove to be beyond the capabilities of a mini computer, but that should be investigated.
- 3) If a refresh graphics display is available (the Tektronix is a storage tube, i.e. once the picture is drawn, it cannot be altered without redrawing the entire presentation), it

may be possible to present a dynamic visual display of jamming effectiveness as a mission proceeds from beginning to end. The current program presents "snapshots" of the situation at various points selected by the planner.

4) A current proposal for the ICAP II version of the EA-6B is to load a complete mission plan into the aircraft with a cassette tape. The intent is to go through the complete mission planning procedure in the Ready Room, compile all necessary data, enter it on a cassette tape, then take it to the aircraft and load it. The entire known scenario would then be stored in the aircraft's computer, lists would be automatically activated and deactivated, pre-programmed jamming assignments made, etc. Practially all the information required for such an effort is available in its current status. There would be a necessity to develop a language interface between the WANG and the aircraft computer.

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SITE	NAME	NTH	SAND	RNGE	LIST	FLO	FTH	PRF1	PRF2	PRF3	PRF4	PRF5	PRF6	PRF7	PRF8	PRF9	PRF10	PRF11	PRF12	PRF13	PRF14	PRF15	PRF16	PRF17	PRF18	PRF19	PRF20	PRF21	PRF22	PRF23	PRF24	PRF25	PRF26	PRF27	PRF28	PRF29	PRF30	PRF31	PRF32	PRF33	PRF34	PRF35	PRF36	PRF37	PRF38	PRF39	PRF40	PRF41	PRF42	PRF43	PRF44	PRF45	PRF46	PRF47	PRF48	PRF49	PRF50	PRF51	PRF52	PRF53	PRF54	PRF55	PRF56	PRF57	PRF58	PRF59	PRF60	PRF61	PRF62	PRF63	PRF64	PRF65	PRF66	PRF67	PRF68	PRF69	PRF70	PRF71	PRF72	PRF73	PRF74	PRF75	PRF76	PRF77	PRF78	PRF79	PRF80	PRF81	PRF82	PRF83	PRF84	PRF85	PRF86	PRF87	PRF88	PRF89	PRF90	PRF91	PRF92	PRF93	PRF94	PRF95	PRF96	PRF97	PRF98	PRF99	PRF100	PRF101	PRF102	PRF103	PRF104	PRF105	PRF106	PRF107	PRF108	PRF109	PRF110	PRF111	PRF112	PRF113	PRF114	PRF115	PRF116	PRF117	PRF118	PRF119	PRF120	PRF121	PRF122	PRF123	PRF124	PRF125	PRF126	PRF127	PRF128	PRF129	PRF130	PRF131	PRF132	PRF133	PRF134	PRF135	PRF136	PRF137	PRF138	PRF139	PRF140	PRF141	PRF142	PRF143	PRF144	PRF145	PRF146	PRF147	PRF148	PRF149	PRF150	PRF151	PRF152	PRF153	PRF154	PRF155	PRF156	PRF157	PRF158	PRF159	PRF160	PRF161	PRF162	PRF163	PRF164	PRF165	PRF166	PRF167	PRF168	PRF169	PRF170	PRF171	PRF172	PRF173	PRF174	PRF175	PRF176	PRF177	PRF178	PRF179	PRF180	PRF181	PRF182	PRF183	PRF184	PRF185	PRF186	PRF187	PRF188	PRF189	PRF190	PRF191	PRF192	PRF193	PRF194	PRF195	PRF196	PRF197	PRF198	PRF199	PRF200	PRF201	PRF202	PRF203	PRF204	PRF205	PRF206	PRF207	PRF208	PRF209	PRF210	PRF211	PRF212	PRF213	PRF214	PRF215	PRF216	PRF217	PRF218	PRF219	PRF220	PRF221	PRF222	PRF223	PRF224	PRF225	PRF226	PRF227	PRF228	PRF229	PRF230	PRF231	PRF232	PRF233	PRF234	PRF235	PRF236	PRF237	PRF238	PRF239	PRF240	PRF241	PRF242	PRF243	PRF244	PRF245	PRF246	PRF247	PRF248	PRF249	PRF250	PRF251	PRF252	PRF253	PRF254	PRF255	PRF256	PRF257	PRF258	PRF259	PRF260	PRF261	PRF262	PRF263	PRF264	PRF265	PRF266	PRF267	PRF268	PRF269	PRF270	PRF271	PRF272	PRF273	PRF274	PRF275	PRF276	PRF277	PRF278	PRF279	PRF280	PRF281	PRF282	PRF283	PRF284	PRF285	PRF286	PRF287	PRF288	PRF289	PRF290	PRF291	PRF292	PRF293	PRF294	PRF295	PRF296	PRF297	PRF298	PRF299	PRF300	PRF301	PRF302	PRF303	PRF304	PRF305	PRF306	PRF307	PRF308	PRF309	PRF310	PRF311	PRF312	PRF313	PRF314	PRF315	PRF316	PRF317	PRF318	PRF319	PRF320	PRF321	PRF322	PRF323	PRF324	PRF325	PRF326	PRF327	PRF328	PRF329	PRF330	PRF331	PRF332	PRF333	PRF334	PRF335	PRF336	PRF337	PRF338	PRF339	PRF340	PRF341	PRF342	PRF343	PRF344	PRF345	PRF346	PRF347	PRF348	PRF349	PRF350	PRF351	PRF352	PRF353	PRF354	PRF355	PRF356	PRF357	PRF358	PRF359	PRF360	PRF361	PRF362	PRF363	PRF364	PRF365	PRF366	PRF367	PRF368	PRF369	PRF370	PRF371	PRF372	PRF373	PRF374	PRF375	PRF376	PRF377	PRF378	PRF379	PRF380	PRF381	PRF382	PRF383	PRF384	PRF385	PRF386	PRF387	PRF388	PRF389	PRF390	PRF391	PRF392	PRF393	PRF394	PRF395	PRF396	PRF397	PRF398	PRF399	PRF400	PRF401	PRF402	PRF403	PRF404	PRF405	PRF406	PRF407	PRF408	PRF409	PRF410	PRF411	PRF412	PRF413	PRF414	PRF415	PRF416	PRF417	PRF418	PRF419	PRF420	PRF421	PRF422	PRF423	PRF424	PRF425	PRF426	PRF427	PRF428	PRF429	PRF430	PRF431	PRF432	PRF433	PRF434	PRF435	PRF436	PRF437	PRF438	PRF439	PRF440	PRF441	PRF442	PRF443	PRF444	PRF445	PRF446	PRF447	PRF448	PRF449	PRF450	PRF451	PRF452	PRF453	PRF454	PRF455	PRF456	PRF457	PRF458	PRF459	PRF460	PRF461	PRF462	PRF463	PRF464	PRF465	PRF466	PRF467	PRF468	PRF469	PRF470	PRF471	PRF472	PRF473	PRF474	PRF475	PRF476	PRF477	PRF478	PRF479	PRF480	PRF481	PRF482	PRF483	PRF484	PRF485	PRF486	PRF487	PRF488	PRF489	PRF490	PRF491	PRF492	PRF493	PRF494	PRF495	PRF496	PRF497	PRF498	PRF499	PRF500	PRF501	PRF502	PRF503	PRF504	PRF505	PRF506	PRF507	PRF508	PRF509	PRF510	PRF511	PRF512	PRF513	PRF514	PRF515	PRF516	PRF517	PRF518	PRF519	PRF520	PRF521	PRF522	PRF523	PRF524	PRF525	PRF526	PRF527	PRF528	PRF529	PRF530	PRF531	PRF532	PRF533	PRF534	PRF535	PRF536	PRF537	PRF538	PRF539	PRF540	PRF541	PRF542	PRF543	PRF544	PRF545	PRF546	PRF547	PRF548	PRF549	PRF550	PRF551	PRF552	PRF553	PRF554	PRF555	PRF556	PRF557	PRF558	PRF559	PRF560	PRF561	PRF562	PRF563	PRF564	PRF565	PRF566	PRF567	PRF568	PRF569	PRF570	PRF571	PRF572	PRF573	PRF574	PRF575	PRF576	PRF577	PRF578	PRF579	PRF580	PRF581	PRF582	PRF583	PRF584	PRF585	PRF586	PRF587	PRF588	PRF589	PRF590	PRF591	PRF592	PRF593	PRF594	PRF595	PRF596	PRF597	PRF598	PRF599	PRF600	PRF601	PRF602	PRF603	PRF604	PRF605	PRF606	PRF607	PRF608	PRF609	PRF610	PRF611	PRF612	PRF613	PRF614	PRF615	PRF616	PRF617	PRF618	PRF619	PRF620	PRF621	PRF622	PRF623	PRF624	PRF625	PRF626	PRF627	PRF628	PRF629	PRF630	PRF631	PRF632	PRF633	PRF634	PRF635	PRF636	PRF637	PRF638	PRF639	PRF640	PRF641	PRF642	PRF643	PRF644	PRF645	PRF646	PRF647	PRF648	PRF649	PRF650	PRF651	PRF652	PRF653	PRF654	PRF655	PRF656	PRF657	PRF658	PRF659	PRF660	PRF661	PRF662	PRF663	PRF664	PRF665	PRF666	PRF667	PRF668	PRF669	PRF670	PRF671	PRF672	PRF673	PRF674	PRF675	PRF676	PRF677	PRF678	PRF679	PRF680	PRF681	PRF682	PRF683	PRF684	PRF685	PRF686	PRF687	PRF688	PRF689	PRF690	PRF691	PRF692	PRF693	PRF694	PRF695	PRF696	PRF697	PRF698	PRF699	PRF700	PRF701	PRF702	PRF703	PRF704	PRF705	PRF706	PRF707	PRF708	PRF709	PRF710	PRF711	PRF712	PRF713	PRF714	PRF715	PRF716	PRF717	PRF718	PRF719	PRF720	PRF721	PRF722	PRF723	PRF724	PRF725	PRF726	PRF727	PRF728	PRF729	PRF730	PRF731	PRF732	PRF733	PRF734	PRF735	PRF736	PRF737	PRF738	PRF739	PRF740	PRF741	PRF742	PRF743	PRF744	PRF745	PRF746	PRF747	PRF748	PRF749	PRF750	PRF751	PRF752	PRF753	PRF754	PRF755	PRF756	PRF757	PRF758	PRF759	PRF760	PRF761	PRF762	PRF763	PRF764	PRF765	PRF766	PRF767	PRF768	PRF769	PRF770	PRF771	PRF772	PRF773	PRF774	PRF775	PRF776	PRF777	PRF778	PRF779	PRF780	PRF781	PRF782	PRF783	PRF784	PRF785	PRF786	PRF787	PRF788	PRF789	PRF790	PRF791	PRF792	PRF793	PRF794	PRF795	PRF796	PRF797	PRF798	PRF799	PRF800	PRF801	PRF802	PRF803	PRF804	PRF805	PRF806	PRF807	PRF808	PRF809	PRF810	PRF811	PRF812	PRF813	PRF814	PRF815	PRF816	PRF817	PRF818	PRF819	PRF820	PRF821	PRF822	PRF823	PRF824	PRF825	PRF826	PRF827	PRF828	PRF829	PRF830	PRF831	PRF832	PRF833	PRF834	PRF835	PRF836	PRF837	PRF838	PRF839	PRF840	PRF841	PRF842	PRF843	PRF844	PRF845	PRF846	PRF847	PRF848	PRF849	PRF850	PRF851	PRF852	PRF853	PRF854	PRF855	PRF856	PRF857	PRF858	PRF859	PRF860	PRF861	PRF862	PRF863	PRF864	PRF865	PRF866	PRF867	PRF868	PRF869	PRF870	PRF871	PRF872	PRF873	PRF874	PRF875	PRF876	PRF877	PRF878	PRF879	PRF880	PRF881	PRF882	PRF883	PRF884	PRF885	PRF886	PRF887	PRF888	PRF889	PRF890	PRF891	PRF892	PRF893	PRF894	PRF895	PRF896	PRF897	PRF898	PRF899	PRF900	PRF901	PRF902	PRF903	PRF904	PRF905	PRF906	PRF907	PRF908	PRF909	PRF910	PRF911	PRF912	PRF913	PRF914	PRF915	PRF916	PRF917	PRF918	PRF919	PRF920	PRF921	PRF922	PRF923	PRF924	PRF925	PRF926	PRF927	PRF928	PRF929	PRF930	PRF931	PRF932	PRF933	PRF934	PRF935	PRF936	PRF937	PRF938	PRF939	PRF940	PRF941	PRF942	PRF943	PRF944	PRF945	PRF946	PRF947	PRF948	PRF949	PRF950	PRF951	PRF952	PRF953	PRF954	PRF955	PRF956	PRF957	PRF958	PRF959	PRF960	PRF961	PRF962	PRF963	PRF964	PRF965	PRF966	PRF967	PRF968	PRF969	PRF970	PRF971	PRF972	PRF973	PRF974	PRF975	PRF976	PRF977	PRF978	PRF979	PRF980	PRF981	PRF982	PRF983	PRF984	PRF985	PRF986	PRF987	PRF988	PRF989	PRF990	PRF991	PRF992	PRF993	PRF994	PRF995	PRF996	PRF997	PRF998	PRF999	PRF1000	PRF1001	PRF1002	PRF1003	PRF1004	PRF1005	PRF1006	PRF1007	PRF1008	PRF1009	PRF1010	PRF1011	PRF1012	PRF1013	PRF1014	PRF1015	PRF1016	PRF1017	PRF1018	PRF1019	PRF1020	PRF1021	PRF1022	PRF1023	PRF1024	PRF1025	PRF1026	PRF1027	PRF1028	PRF1029	PRF1030	PRF1031	PRF1032	PRF1033	PRF1034	PRF1035	PRF1036	PRF1037	PRF1038	PRF1039	PRF1040	PRF1041	PRF1042	PRF1043	PRF1044	PRF1045	PRF1046	PRF1047	PRF1048	PRF1049	PRF1050	PRF1051	PRF1052	PRF1053	PRF1054	PRF1055	PRF1056	PRF1057	PRF1058	PRF1059	PRF1060	PRF1061	PRF1062	PRF1063	PRF1064	PRF1065	PRF1066	PRF1067	PRF1068	PRF1069	PRF1070	PRF1071	PRF1072	PRF1073	PRF1074	PRF1075	PRF1076	PRF1077	PRF1078	PRF1079	PRF1080	PRF1081	PRF1082	PRF1083	PRF1084	PRF1085	PRF1086	PRF1087	PRF1088	PRF1089	PRF1090	PRF1091	PRF1092	PRF1093	PRF1094	PRF1095	PRF1096	PRF1097	PRF1098	PRF1099	PRF1100	PRF1101	PRF1102	PRF1103	PRF1104	PRF1105	PRF1106	PRF1107	PRF1108	PRF1109	PRF1110	PRF1111	PRF1112	PRF1113	PRF1114	PRF1115	PRF1116	PRF1117	PRF1118	PRF1119	PRF1120	PRF1121	PRF1122	PRF1123	PRF1124	PRF1125	PRF1126	PRF1127	PRF1128	PRF1129	PRF1130	PRF1131	PRF1132	PRF1133	PRF1134	PRF1135	PRF1136	PRF1137	PRF1138	PRF1139	PRF1140	PRF1141	PRF1142	PRF1143	PRF1144	PRF1145	PRF1146	PRF1147	PRF1148	PRF1149	PRF1150	PRF1151	PRF1152	PRF1153	PRF1154	PRF1155	PRF1156	PRF1157	PRF1158	PRF1159	PRF1160	PRF1161	PRF1162	PRF1163	PRF1164	PRF1165	PRF1166	PRF1167	PRF1168	PRF1169	PRF1170	PRF1171	PRF1172	PRF1173	PRF1174	PRF1175	PRF1176	PRF1177	PRF1178	PRF1179	PRF1180	PRF1181	PRF1182	PRF1183	PRF1184	PRF1185	PRF1186	PRF1187	PRF1188	PRF1189	PRF1190	PRF1191	PRF1192	PRF1193	PRF1194	PRF1195	PRF1196	PRF1197	PRF1198	PRF1199	PRF1200	PRF1201	PRF1202	PRF1203	PRF1204	PRF1205	PRF1206	PRF1207	PRF1208	PRF1209	PRF1210	PRF1211	PRF1212	PRF1213	PRF1214	PRF1215	PRF1
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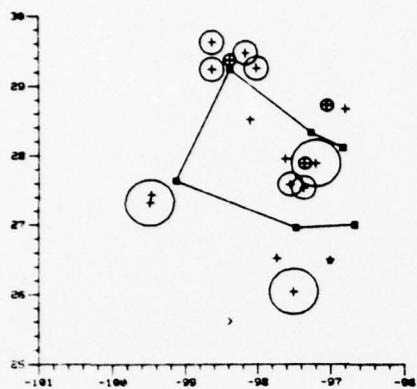


FIGURE - 4. SHOWS STRIKE GROUP ROUTE, STANDOFF JAMMER POSITION, AND TERMINAL THREAT Emitter ENVELOPES (NOT DEPRESSSED BY JAMMING).

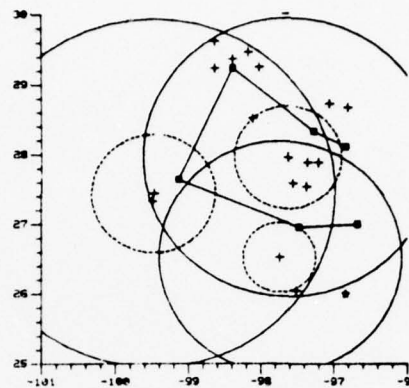


FIGURE - 5. SHOWS STRIKE GROUP ROUTE, STANDOFF JAMMER POSITION, Emitter ENVELOPES (UNJAMMED (SOLID LINES) AND JAMMED (DASHED LINES)).

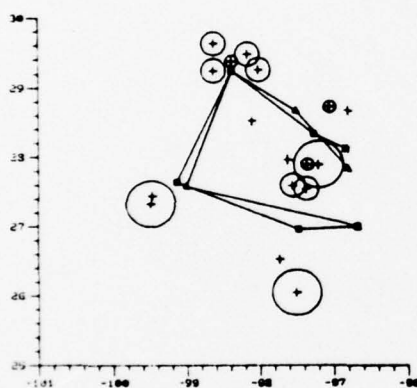


FIGURE - 6. SHOWS STRIKE GROUP ROUTE, EA-6B ROUTE, AND TERMINAL THREAT Emitter ENVELOPES (NOT JAMMED).

Strike Group Navigation Solution

Leg	Dist	Time	TR	MR	FA	TCIT	TCID	to Turnpt	L/L
1	13.0	7	67	234	300	7.1	43.0	25.80	-47.25
2	45.8	14	205	257	420	21.2	111.2	27.34	-49.00
3	10.1	13	22	14	430	14.1	243.1	29.35	-49.01
4	30.6	10	133	120	430	22.3	342.1	29.36	-47.16
5	26.4	3	119	111	180	17.5	352.1	29.07	-47.50

Mod Escort Navigation Solution

Leg	Dist	Time	TR	MR	JAS	TCIT	TCID	to Turnpt	L/L
1	129.7	19	286	278	430	19.5	104.7	27.35	-49.00
2	105.2	13	19	10	430	11.7	234.4	29.15	-48.47
3	38.3	7	127	110	430	19.7	253.2	29.40	-47.30
4	62.3	9	143	135	430	26.5	362.5	29.10	-46.15

FIGURE - 6. THIS IS A LISTING OF THE STRIKE GROUP AND EA-6B JAVEL SOLUTIONS FOR A MODIFIED ESCORT MISSION.

TIME	PRES POS	TYPE	EOB	RNGE	SRG	AUTO	DEGR	PRCT
0	27 00 -06 40	TALL KING	2	63	244	FT7	UFT	40
		SPURST B	6	77	319	FT4	UFT	28
1	26 59 -06 46	TALL KING	2	58	246	FT7	UFT	40
		SPURST AC	4	146	281	FT8	UFT	46
		SPURST B	6	74	388	FT4	UFT	28
2	26 59 -06 50	TALL KING	2	54	230	FT7	UFT	40
		SPURST AC	4	141	281	FT8	UFT	46
		SPURST B	6	71	388	FT4	UFT	28
3	26 59 -06 50	TALL KING	2	49	236	FT7	UFT	40
		SPURST AC	4	138	280	FT8	UFT	46
		SPURST B	6	68	330	FT4	UFT	28
4	26 59 -27 04	TALL KING	2	44	233	FT7	UFT	40
		SPURST AC	4	131	282	FT8	UFT	46
		SPURST B	6	66	334	FT4	UFT	28
5	26 58 -27 10	TALL KING	2	40	229	FT7	UFT	40
		SPURST AC	4	128	283	FT8	UFT	46
		SPURST B	6	64	338	FT4	UFT	28
6	26 58 -27 10	TALL KING	2	36	224	FT7	UFT	40
		SPURST AC	4	121	284	FT8	UFT	46
		SPURST B	6	62	343	FT4	UFT	28
7	26 58 -27 22	TALL KING	2	32	217	FT7	UFT	40
		SPURST AC	4	116	286	FT8	UFT	46
		SPURST B	6	60	347	FT4	UFT	28

FIGURE - 8. THIS IS A PORTION OF THE TIME SCENARIO FOR AN ESCORT MISSION SHOWING PARAMETERS NECESSARY TO ANTICIPATE ALL KNOWN SITES, AND TO REACT TO SYSTEM MALFUNCTIONS CAUSING DEGRADED MODE OPERATION WITH A MINIMUM OF CALCULATION. THE SITES ARE ONLY LISTED IF THE STRIKE GROUP IS WITHIN THE DESIGNATED DETECTION RANGE.

TIME	PRES POS	TYPE	EOB	RNGE	SRG	AUTO	DEGR	PRCT
0	27 00 -06 24	TALL KING	2	78	246	FT7	UFT	40
		SPURST B	6	87	318	FT4	UFT	28
1	27 00 -06 31	TALL KING	2	81	249	FT7	UFT	40
		SPURST AC	4	170	279	FT8	UFT	46
		SPURST B	6	90	380	FT4	UFT	28
2	27 03 -06 25	TALL KING	2	84	249	FT7	UFT	40
		SPURST AC	4	173	278	FT8	UFT	46
		SPURST B	6	98	380	FT4	UFT	28
3	27 04 -06 28	TALL KING	2	86	249	FT7	UFT	40
		SPURST AC	4	178	278	FT8	UFT	46
		SPURST B	6	93	387	FT4	UFT	28
4	27 04 -06 28	TALL KING	2	87	250	FT7	UFT	40
		SPURST AC	4	178	278	FT8	UFT	46
		SPURST B	6	94	386	FT4	UFT	28
5	27 04 -06 19	TALL KING	2	88	250	FT7	UFT	40
		SPURST AC	4	178	278	FT8	UFT	46
		SPURST B	6	94	386	FT4	UFT	28
6	27 05 -06 18	TALL KING	2	90	250	FT7	UFT	40
		SPURST AC	4	177	278	FT8	UFT	46
		SPURST B	6	94	386	FT4	UFT	28
7	27 05 -06 17	TALL KING	2	89	250	FT7	UFT	40
		SPURST AC	4	177	278	FT8	UFT	46
		SPURST B	6	94	386	FT4	UFT	28

FIGURE - 10. THIS IS A PORTION OF THE TIME SCENARIO PRINTOUT FOR A MODIFIED ESCORT MISSION. ANGLES ARE FROM THE "00 TO VARIOUS SITES. SITES ARE LISTED IF EITHER THE STRIKE GROUP OR THE ESCORT ARE WITHIN THE DESIGNATED DETECTION RANGE.

BEST AVAILABLE COPY

STANDOFF L/L 25 00 -96 50	TYPE	EOB	RNGE	DRG	AUTO	DEGR	PRCT
	FANSONG B-F	1	36	275	T960	WSS	44
	TALL KING	2	58	304	FT7	WFT	40
	SPHST AC	4	165	302	FT2	WFT	46
	LOW BLOW	5	103	338	T900	WSS	83
	SPHST B	6	125	340	FT4	WFT	28
	FIREWHEEL	7	117	346	T483	SS1	18
	BRK-BGBAR B	10	165	336	FT3	WFT	21
	TALL KING	11	161	1	FT7	WFT	40
	FIRECAN	12	164	356	T377	SS3	32
	LOW BLOW	14	221	341	T900	WSS	83
	WHIFF	15	219	338	FT3	SS2	27
	LOW BLOW	16	238	336	T900	WSS	83
	LOW BLOW	17	222	332	T900	WSS	83

FIGURE - 11 JAMMING PARAMETERS FOR A STANDOFF MISSION FROM ORBIT POINT INDICATED.

KASHIN DLG

ARMAMENT: SAM 20 x SA-N-15 (2 TWIN)

GUNS 4 x 50MM (TWIN MOUNT)

ASW 2 x RBU- 1000
2 x RBU- 2000
4 x 10 IN. TORPEDOES

A/C 1 x HORMONE

ELECTRONICS:

EMITTER	FUNC	BAND	LIST	RNGE	FLO	FHI	PRF1	PRF1	PRF2	PRF2	AUTO	DEGR	PRCT	REMARKS
BIG BOY	EW	1	4	100	25	50	100	110	----	----	S123	WSS	12	PRIMARY AIR SCH
BAD NEWS	EW	4	2	50	100	200	250	269	----	----	FT20	WFT	23	NONE
POPCORN	FC	7	15	22	2000	2100	1000	1010	----	----	T321	WSS	44	AAA, E-O ALSO
DON-2	NAV	9	12	8	4000	4400	8800	8900	9300	9400	FTC3	NFT2	67	NONE
FOOLYA	MC	8	30	45	6000	7000	1800	1850	----	----	T456	NSS	97	SA-N-15, DLJ

FIGURE - 12 TYPICAL PRINTOUT OF EA-6B PERTINENT INFORMATION BY WEAPON PLATFORM.

MA 100010
MA 100020
MA 100030
MA 100040

THIS IS THE MAIN PROGRAM FOR EA-6B MISSION PLANNING.
FOR TEST PURPOSES, ENTER FILEDEF 4 DSK BEFORE EACH
EXECUTION.

www

DIMENSION	X(10)	Y(10)	SX(20)	SY(20)	ST(20)	CL(9)	SPD(9)	TL(9)
INTH(9)	WH(9)	I(AS(9))	T(120)	SR(30)	TT(9)	NT(5)	TYP(30,15)	NB(8)
D2D2(30)	IZ(30)	D4(30)	D5(30)	D6(30)	D7(30)	D8(30)	D9(30)	
33D10(30)	D11(30)	D12(30)	D13(30)	D14(30)	IN(30,3)	TRG(30)		
49)	YME(9)	XME(9)	M(AS(9))	SPDM(9)	PJ(30)	B(3C)	GJR(30)	PR(30)
53QI)	FLM(9)	DTM(9)	NTHM(9)	MHM(9)				
EQUVALENCE	(IZ,TYP(1,3))							
CATA	TN(1,1)	TN(1,2)	TN(1,3)	KNFR,	ST A,	'		
CATA	TN(2,1)	TN(2,2)	TN(2,3)	KNFR,	ST B,	'C,'		
CATA	TN(3,1)	TN(3,2)	TN(3,3)	SPNR,	ST A,	'C,'		
CATA	TN(4,1)	TN(4,2)	TN(4,3)	SPNR,	ST A,	'C,'		
CATA	TN(5,1)	TN(5,2)	TN(5,3)	TALL,	KIN,	'G,'		
CATA	TN(6,1)	TN(6,2)	TN(6,3)	BIGB,	AR-M,	'ESH,'		
CATA	TN(7,1)	TN(7,2)	TN(7,3)	SQUA,	TEFE,	'		
CATA	TN(8,1)	TN(8,2)	TN(8,3)	BIGM,	ESH,	'D,'		
CATA	TN(9,1)	TN(9,2)	TN(9,3)	FLAT,	FAC,	'E,'		
CATA	TN(10,1)	TN(10,2)	TN(10,3)	BRLK,	-RGP,	'AR B,'		
CATA	TN(11,1)	TN(11,2)	TN(11,3)	WHIF,	F,	'		
CATA	TN(12,1)	TN(12,2)	TN(12,3)	FIRE,	CAN,	'		
CATA	TN(13,1)	TN(13,2)	TN(13,3)	FIRE,	WHEE,	'L,'		
CATA	TN(14,1)	TN(14,2)	TN(14,3)	FANS,	ONG,	'B-F,'		
CATA	TN(15,1)	TN(15,2)	TN(15,3)	FANS,	CNG,	'C-E,'		
CATA	TN(16,1)	TN(16,2)	TN(16,3)	PAT,	HAND,	'		
CATA	TN(17,1)	TN(17,2)	TN(17,3)	SA-6,	2*	'		
CATA	TN(18,1)	TN(18,2)	TN(18,3)	FLAP,	WHEE,	'L,'		
CATA	TN(19,1)	TN(19,2)	TN(19,3)	LOW,	BLOW,	'		
CATA	TN(20,1)	TN(20,2)	TN(20,3)	STPA,	IT F,	'LUSH,'		
CATA	TN(21,1)	TN(21,2)	TN(21,3)	SRZO,	-2,	'		
CATA	TN(22,1)	TN(22,2)	TN(22,3)	TACA,	N A3,	'12A,'		
CATA	TN(23,1)	TN(23,2)	TN(23,3)	LUNG,	TAL,	'K,'		
CATA	TN(24,1)	TN(24,2)	TN(24,3)	ROCK,	-STC,	'N CK,'		
CATA	TN(25,1)	TN(25,2)	TN(25,3)	SPON,	GE,	'CK,'		
CATA	TN(26,1)	TN(26,2)	TN(26,3)	SA-2,	2*	'		
CATA	TN(27,1)	TN(27,2)	TN(27,3)	SA-6,	2*	'		
CATA	TN(28,1)	TN(28,2)	TN(28,3)	PORK,	TRQU,	'GH,'		
CATA	TN(29,1)	TN(29,2)	TN(29,3)	BWRX,	-12,	'		
CATA	TN(30,1)	TN(30,2)	TN(30,3)	MOON,	BEAM,	'		
CATA	D2/10*	EW, 3*	FC, 3*	MC,	SEKR,	'FC, 2*	'MC,	'IFF,'
HF,	BCN,	DL,	SURV,	WX,	HE /			
I Z/3#1	2,2,4,4,	5*7, 8, 8, 3*9,	100., 80., 90., 3*5,	2*20., 30., 10., 5.				
TRG/3#1	20., 150., 2*100., 75., 100., 80., 90., 3*5,	2*20., 30., 10., 5.						

```

1,2*10.,2*100.,3*40.,30.,15.,80.,65.,50./
DATA D5/3*6.,2*8.,9.,NONE.,9.,10.,5*11.,15.,16.,C42.,1MAI00460
18,17.,15.,9.,NONE.,9.,12.,13.,C45.,C47.,3*NONE./,1MAI00470
DATA D6/70.,80.,50.,180.,190.,600.,780.,640.,800.,2650,MAI00480
1,2620.,2710.,2690.,4200.,4360.,8710.,9380.,8725.,MAI00490
24210.,600.,700.,600.,2500.,2800.,6150.,9000.,9200.,MAI00510
3,1500./,MAI00520
DATA D7/80.,90.,60.,190.,200.,650.,810.,690.,850.,2680,MAI00530
1,2640.,2750.,2720.,2759.,4250.,4380.,8800.,9410.,8775.,4MAI00540
2280.,610.,800.,2700.,650.,2700.,3000.,2*.,9200.,9400.,1950./,MAI00550
DATA D8/50.,75.,60.,120.,100.,300.,450.,250.,350.,420.,MAI00560
1,2000.,2500.,1800.,1000.,800.,5005.,1800.,6380.,1.2G.,308MAI00570
20,PAKET,200.,400.,300.,280.,SYNCR,11J.,400.,40.,710./,MAI00580
DATA D9/80.,100.,90.,180.,200.,310.,460.,275.,355.,430,MAI00590
1,2050.,2520.,1900.,1050.,850.,5015.,1900.,6390.,+-50.,40MAI00600
200.,NT.,400.,480.,500.,320.,WITH,200.,500.,50.,720./,MAI00610
DATA D11/4*.,240.,4*.,860.,3*.,2100.,1700.,5*.,R.,4*,MAI00620
1,TWS,4*.,/200.,4*.,840.,3*.,2000.,1600.,5*.,RADA,MAI00630
14,DATA D10/4*.,/FT3.,FT4.,FT2.,FT7.,FT2.,SPT3.,SPT2.,FT5.,FT3,MAI00640
DATA D12/2*FT3.,T483.,T959.,T902.,DFT8.,T709.,T888.,T900.,T3MAI00650
1,FT3.,T377.,T483.,4*SS3.,4*SS2.,FT4.,SS3./,MAI00660
285.,FT5.,3*SS3.,2*WSS.,2*WFT.,SS2.,SS3.,SS1.,2*WSS.,SS5.,MAI00680
DATA D13/6*WFT.,9*WSS.,WFT.,2*WSS.,/SS1.,WFT.,2*WSS.,/MAI00690
1SS1.,WFT.,9*WSS.,WFT.,2*WSS.,/SS1.,WFT.,2*WSS.,/MAI00700
DATA D14/30.,33.,36.,65.,48.,27.,83.,12.,70.,75.,30.,40.,45MAI00710
12.,18.,44.,86.,77.,78./,MAI00720
2,30.,40.,86.,77.,78./,MAI00730
CC 3 I=1,30,MAI00740
TYP(I,2)=D2(I),MAI00750
TYP(I,4)=D4(I),MAI00760
TYP(I,5)=D5(I),MAI00770
TYP(I,6)=D6(I),MAI00780
TYP(I,7)=D7(I),MAI00790
TYP(I,8)=D8(I),MAI00800
TYP(I,9)=D9(I),MAI00810
TYP(I,10)=D10(I),MAI00820
TYP(I,11)=D11(I),MAI00830
TYP(I,12)=D12(I),MAI00840
TYP(I,13)=D13(I),MAI00850
TYP(I,14)=D14(I),MAI00860
3 CCNTINUE,MAI00870
CC 310 I=1,30,MAI00880
READ(4,311)(TRMKS(I,J),J=1,9),MAI00890
FCRMAT(9A4),MAI00900
311 CCNTINUE,MAI00910
310 DATA PJ/10*20.,10*50.,10*10./,MAI00920
DATA B/30*20./,MAI00930

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DATA GJR/30*10./
 DATA PR/30*100./
 DATA GAIN/30*36./

MAI00940
 MAI00950
 MAI00960

```

YMAX=0.
PI=3.14159
CS=9.
CMFLG=1.
XMAX=0.
YMIN=300.
XMIN=300.
INTEGER VAR,ST
WRITE(6,1)
1 FORMAT(' FOR ALL QUESTIONS: ENTER 1 FOR YES, 0 FOR NO')
299 WRITE(6,299)
300 FORMAT(1X,' DO YOU WISH TO CONSIDER A PARTICULAR MSN PROFILE AT THIS TIME?')
12=MOD(ESCORT, 3=STANDOFF)
READ(5,2)MSN
IF(MSN.EQ.0)GO TO 99
WRITE(6,300)
300 FORMAT(1X,' WHICH MSN DO YOU WISH TO CONSIDER (FIRST)? 1=ESCORT, 12=MOD(ESCORT, 3=STANDOFF)')
99 WRITE(6,101)
101 FORMAT(' DO YOU HAVE A STRIKE ROUTE TO ENTER AT THIS TIME?')
2 READ(5,2)LRTE
IF(LRTE.EQ.1)GO TO 113
N=2
WRITE(6,103)
103 FORMAT(' THEN ENTER APPROX START PT LAT/LONG, THEN TGT LAT/LONG')
4 READ(5,4)(Y(I),X(I),I=1,N)
4 FORMAT(7F2)
CALL LL(X,Y,2)
GO TO 42
113 WRITE(6,115)
115 FORMAT(' ENTER NUMBER OF TURNPTS')
6 READ(4,6)N,K
6 FORMAT(I2)
M=N-1
WRITE(6,13)
13 FORMAT(' ENTER LAT, THEN LONG OF EACH TURNPT IN ORDER.')
40 READ(4,4)(Y(I),X(I),I=1,N)
CALL LL(X,Y,N)
WRITE(6,40)
40 FORMAT(' ENTER MAG VAR TO NEAREST DEGREE, + FOR W, - E, EX:-12=12E')

```

MAI00970
 MAI00980
 MAI00990
 MAI01000
 MAI01010
 MAI01020
 MAI01030
 MAI01040
 MAI01050
 MAI01060
 MAI01070
 MAI01080
 MAI01090
 MAI01100
 MAI01110
 MAI01120
 MAI01130
 MAI01140
 MAI01150
 MAI01160
 MAI01170
 MAI01180
 MAI01190
 MAI01200
 MAI01210
 MAI01220
 MAI01230
 MAI01240
 MAI01250
 MAI01260
 MAI01270
 MAI01280
 MAI01290
 MAI01300
 MAI01310
 MAI01320
 MAI01330
 MAI01340
 MAI01350
 MAI01360
 MAI01370
 MAI01380

```

41 READ (4,41) VAR
   FCFORMAT(13)
   WRITE(6,17)
17 FCFORMAT(1) ENTER TAS FOR EACH LEG IN ORDER.')
   DC 20 I=1,M
   SPD(I)=ITAS(I)/60.
20 CONTINUE
42 CALL MAX(X,N,FR)
   CALL MAX(Y,N,TP)
   CALL MIN(X,N,FL)
   CALL MIN(Y,N,BOT)
   TCP=TOP+2.
   BCT=BOT-2.
   FR=FR+2.
   FL=FL-2.
16 READ(4,16)(SY(I),SX(I),ST(I),I=1,K)
   FCFORMAT(27,2,13)
   CALL LL(SX,SY,K)
   IF(LRTE.EQ.0) GO TO 44
   IF(MSN-2)44,400,298
400 WRITE(6,401)

```

MAI01390
 MAI01400
 MAI01410
 MAI01420
 MAI01430
 MAI01440
 MAI01450
 MAI01460
 MAI01470
 MAI01480
 MAI01490
 MAI01500
 MAI01510
 MAI01520
 MAI01530
 MAI01540
 MAI01550
 MAI01560
 MAI01570
 MAI01580
 MAI01590
 MAI01600

```

401 FCFORMAT(1X,/) DO YOU HAVE A MOD ESCORT ROUTE TO ENTER NOW?')
   READ(5,2)MERTE
   IF(MERTE.EQ.0)GO TO 44
   WRITE(6,402)
402 FCFORMAT(1X,/) ENTER NUMBER OF TURNPTS IN MOD ESCORT ROUTE')
   READ(4,2)MEN
   WRITE(6,403)
403 FCFORMAT(1X,/) ENTER LAT, THEN ENTER LONG OF EACH POINT IN ORDER')
   READ(4,4)(YME(I),XME(I),I=1,MEN)
   CALL LL(XME,YME,MEN)
   MEN=MEN-1
   WRITE(6,404)
404 FCFORMAT(1X,/) ENTER TAS FOR EACH LEG, IN ORDER')
   READ(4,41)(MTAS(I),I=1,MEN)
   DC 405 I=1,MEN
405 SPDM(I)=MTAS(I)/60.
   GO TO 44
298 WRITE(6,301)

```

MAI01610
 MAI01620
 MAI01630
 MAI01640
 MAI01650
 MAI01660
 MAI01670
 MAI01680
 MAI01690
 MAI01700
 MAI01710
 MAI01720
 MAI01730
 MAI01740
 MAI01750
 MAI01760
 MAI01770
 MAI01780

```

301 FCFORMAT(1X,/) DO YOU HAVE A STANDOFF POINT TO CONSIDER YET?')
   READ(5,2) LSO

```

MAI01790
 MAI01800

```

327 IF(LSQ.EQ.0)GO TO 44
328 WRITE(6,302)
329 FORMAT(1X,7' ENTER LAT, THEN LONG OF STANDOFF POINT')
330 READ(5,4)STOX,STOX
331 CALL LL(STOX,STOX,1)
44 WRITE(5,56)
MAI01810
MAI01820
MAI01830
MAI01840
MAI01850
MAI01860

56 FORMAT(' DO YOU WISH TO USE SHIPS F.O.B. ?')
57 READ(5,2)L
58 IF(L.EQ.0)GO TO 55
59 WRITE(6,51)
51 FORMAT(' OPERATOR WISH TO ENTER SITES IN ADDITION TO OR INSTEAD OF
1 FROM THE SHIPS F.O.B. ?')
52 READ(5,2)L
53 IF(L.EQ.0)GO TO 57
54 WRITE(6,52)
55 FORMAT(' ENTER TOTAL NUMBER OF SITES OPERATOR IS ENTERING, USE 2
1 DIGITS, F.G. 04, OR 07, OR 13')
56 READ(5,6)J
57 NL=K+J
58 K1=K+1
59 WRITE(6,53)
510 FORMAT(' ENTER LAT, THEN LONG OF EACH SITE IN ORDER')
511 READ(5,4)(SY(I),SX(I),I=K1,NL)
512 WRITE(6,54)
513 FORMAT(' ENTER SITE TYPE ACCORDING TO EMITTER LIST NUMBER IN SAME
1 ORDER AS YOU ENTERED THE SITES')
514 READ(5,4)(ST(I),I=K1,NL)
515 K=NL
516 WRITE(6,58)
517 FORMAT(' DO YOU WISH A LISTING OF THE F.O.B. ?')
518 READ(5,2)L
519 IF(L.EQ.0)GO TO 35
520 CALL RLL(SX,SY,K)
521 WRITE(6,70)
522 FORMAT(' CHOOSE TYPE EMITTERS TO LIST: 1=ALL; 2=EW/ACQ ONLY; 3=TERM
1 THREAT ONLY')
523 READ(5,2)L
524 WRITE(6,59)
525 FORMAT(1X,7' SITE',1X,7' NAME',1X,7' MSN',1X,7' BAND',1X,7' RANGE',
1,1X,7' FLCT',1X,7' FHI',1X,7' PRF1',1X,7' PRF2',1X,7' PRF',
2,1X,7' AUTO',1X,7' DEGR',1X,7' PRCT',1X,7' REMARKS')
526 IF(L-2)71,72,73
527 DO 74 I=1,K
528 WRITE(6,75)I,(TN(ST(I),J),J=1,3),TYP(ST(I),2),IZ(ST(I)),TRG(ST(I))
1, (TYP(ST(I),JN),JN=5,14),(TRMKS(ST(I),J1),J1=1,9),SY(I),SX(I))
MAI01870
MAI01880
MAI01890
MAI01900
MAI01910
MAI01920
MAI01930
MAI01940
MAI01950
MAI01960
MAI01970
MAI01980
MAI01990
MAI02000
MAI02010
MAI02020
MAI02030
MAI02040
MAI02050
MAI02060
MAI02070
MAI02080
MAI02090
MAI02100
MAI02110
MAI02120
MAI02130
MAI02140
MAI02150
MAI02160
MAI02170
MAI02180
MAI02190
MAI02200
MAI02210
MAI02220
MAI02230
MAI02240
MAI02250

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```

75 FORMAT(IX,I3,2X,3A4,IX,A4,3X,I1,2X,F4.0,10(IX,A4),1X,9A4,/5X,F7.2,
12X,F7.2)
74 CCNTINUE
CALL LL(SX,SY,K)
GO TO 35
72 DO 76 I=1,K
IF(ST(I).GT.10)GO TO 76
WRITE(6,75)I,(TN(ST(I),J),J=1,3),TYP(ST(I),2),IZ(ST(I)),TRG(ST(I))
1,(TYP(ST(I),JN),JN=5,14),(TRKS(ST(I),J1),J1=1,9),SY(I),SX(I)
76 CCNTINUE
CALL LL(SX,SY,K)
GO TO 35
73 DO 77 I=1,K
IF(ST(I).LE.10)GO TO 77
WRITE(6,75)I,(TN(ST(I),J),J=1,3),TYP(ST(I),2),IZ(ST(I)),TRG(ST(I))
1,(TYP(ST(I),JN),JN=5,14),(TRKS(ST(I),J1),J1=1,9),SY(I),SX(I)
77 CCNTINUE
CALL LL(SX,SY,K)
GO TO 35

```

```

35 WRITE(6,32)
32 FORMAT(IX,/, DO YOU WISH TO DISPLAY EOB & RTE?')
IF(J.EQ.0)GO TO 34
WRITE(6,31)
31 FORMAT(, AFTER DISPLAY PRESENTED, ENTER ANY SINGLE CHARACTER TO COM
INTINUE)
WRITE(6,63)
63 FORMAT(, DO YOU WISH TO DISPLAY FOR THREAT ENVELOPES ALSO?')
READ(5,2)DISP
IF(DISP.EQ.0) GO TO 66
WRITE(6,61)
61 FORMAT(, TO DISPLAY WEAPON/RADAR ENVELOPES, ENTER APPROPRIATE NUMB
1ER: 1=ALL EMITTERS, 2=EW/ACQ ONLY, 3= TERMINAL THREAT ONLY')
READ(5,2)LEMIT
IF(MSN.NE.3)GO TO 66
WRITE(6,60)
600 FORMAT(IX,/, DO YOU WANT TO SEE ENVELOPES DEPRESSED BY JAMMING?')
66 READ(5,2)JAM
CALL MAX(X,N,XMAX)
XMAX=XMAX+.2
CALL MAX(Y,N,YMAX)
YMAX=YMAX+.2
CALL MTN(X,N,XMIN)

```

```

CALL MIN (SX,K,XMIN)
XMIN=XMIN-2
CALL MIN (Y,N,YMIN)
CALL MIN (SY,K,YMIN)
YMIN=YMIN-2
CALL SCALE(XMAX,XMIN,YMAX,YMIN)
50 CALL INIT
CALL LINE (0)
CALL SLIMX(150,850)
CALL SLIMY(050,700)
CALL XFERM(2)
CALL YFERM(2)
CALL DLIIMX(XMIN,XMAX)
CALL DLIIMY(YMIN,YMAX)
CALL NPTS (K)
CALL SYMBL (8)
CALL SIZES (1.)
CALL PLOT (SX,SY)
CALL NPTS (N)
CALL SYMBL (4)
IF(LRTE.EQ.0)GO TO 45
CALL LINE(1)
GO TO 46
45 CALL LINE (0)
46 CALL CPLOT (X,Y)
IF(MSN-2)47,420,380
420 CALL NPTS(MEN)
CALL SYMBL(3)
CALL CPLOT(XME,YME)
GO TO 47
380 CALL NPTS(1)
CALL LINE(0)
CALL SYMBL(5)
CALL CPLOT(STOX,STOY)
CALL LINE(1)
47 IF (LDISP.EQ.0)GO TO 36
81 IF (LEMIT-2)81,82,83
DO 80 I=1,K
XD= SX(I)
YC= SY(I)
RAD=TRG(ST(I))/60.
IF (TRG(ST(I)).GE.100.)GO TO 90
IF (TRG(ST(I)).GE.50.)GO TO 100
J=31
GO TO 110
90 J=51
GO TO 110
100 J=41

```

```

MAI02710
MAI02720
MAI02730
MAI02740
MAI02750
MAI02760
MAI02770
MAI02780
MAI02790
MAI02800
MAI02810
MAI02820
MAI02830
MAI02840
MAI02850
MAI02860
MAI02870
MAI02880
MAI02890
MAI02900
MAI02910
MAI02920
MAI02930
MAI02940
MAI02950
MAI02960
MAI02970
MAI02980
MAI02990
MAI03000
MAI03010
MAI03020
MAI03030
MAI03040
MAI03050
MAI03060
MAI03070
MAI03080
MAI03090
MAI03100
MAI03110
MAI03120
MAI03130
MAI03140
MAI03150
MAI03160
MAI03170
MAI03180

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```

110 CALL CIRCLE(XO,YO,RAD,J)
   IF(MSN.NE.3)GO TO 80
   IF(JAM.EQ.0)GO TO 80
   CALL DIST(XO,YO,STOX,STOY,RJ)
   RAD=BTHRU(PJ(ST(I)),B(ST(I)),GJR(ST(I)),CS,RJ,GAIN(ST(I)
1),CMFLG)
   J=41
   LINE(121)
   CALL CIRCLE(XO,YO,RAD,J)
   CALL LINE(1)
80 CONTINUE
   GO TO 36
82 DO 84 I=1,K
   IF(ST(I).GT.10)GO TO 84
   XO=SX(I)
   YO=SY(I)
   RAD=TRG(ST(I))/60.
   IF (TRG(ST(I)).GE.100.)GO TO 85
   J=41
   GO TO 86
85 J=51
86 CALL CIRCLE(XO,YO,RAD,J)
   IF(MSN.NE.3)GO TO 84
   IF(JAM.EQ.0)GO TO 84
   CALL DIST(XO,YO,STOX,STOY,RJ)
   RAD=BTHRU(PJ(ST(I)),B(ST(I)),GJR(ST(I)),CS,RJ,GAIN(ST(I)
1),CMFLG)
   J=41
   LINE(121)
   CALL CIRCLE(XO,YO,RAD,J)
   CALL LINE(1)
84 CONTINUE
   GO TO 36
83 DO 88 I=1,K
   IF(ST(I).LE.10).OR.(ST(I).GT.20))GO TO 88
   XO=SX(I)
   YO=SY(I)
   RAD=TRG(ST(I))/60.
   J=31
   CALL CIRCLE(XO,YO,RAD,J)
   IF(MSN.NE.3)GO TO 88
   IF (JAM.EQ.0)GO TO 88
   CALL DIST(XO,YO,STOX,STOY,RJ)
   RAD=BTHRU(PJ(ST(I)),B(ST(I)),GJR(ST(I)),CS,RJ,GAIN(ST(I)
1),CMFLG)
   J=41
   LINE(121)
   CALL CIRCLE(XO,YO,RAD,J)

```

```

MAI0319J
MAI03200
MAI03210
MAI03220
MAI03230
MAI03240
MAI03250
MAI03260
MAI0327J
MAI03280
MAI03290
MAI0330J
MAI03310
MAI03320
MAI03330
MAI03340
MAI0335J
MAI03360
MAI03370
MAI0338J
MAI03390
MAI03400
MAI03410
MAI03420
MAI03430
MAI03440
MAI03450
MAI0346J
MAI03470
MAI03480
MAI0349J
MAI03500
MAI03510
MAI03520
MAI03530
MAI03540
MAI03550
MAI03560
MAI0357J
MAI03580
MAI03590
MAI0360J
MAI03610
MAI03620
MAI03630
MAI03640
MAI0365J
MAI03660

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MAI03670
MAI03680
MAI03690
MAI03700

CALL LINE(1)
88 CONTINUE
36 CALL PAUSE
CALL FIN

MAI03710
MAI03720
MAI03730
MAI03740
MAI03750
MAI03760
MAI03770
MAI03780
MAI03790
MAI03800
MAI03810
MAI03820
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MAI03880
MAI03890
MAI03900
MAI03910
MAI03920
MAI03930
MAI03940
MAI03950
MAI03960
MAI03970
MAI03980
MAI03990
MAI04000
MAI04010
MAI04020

```

34 IF(LRTE.EQ.0)GO TO 331
   IF (MSN.EQ.0)GO TO 322
   CALL TD(X,Y,M,SPD,TL,TT,DL,DT)
   CALL HDG(X,Y,M,VAR,NTH,MH,PI)
   WRITE(6,21)
21  FORMAT('WANT NAV SOLN? ITS NECESS. FOR TIME SCENARIC')
   READ(5,21) L
   IF(L.EQ.0)GO TO 331
   WRITE(6,500)
500  FORMAT(1X, '// STRIKE GROUP NAVIGATION SOLUTION')
   WRITE(6,23)
23  FORMAT(1X, '// LEG',3X,'DIST',2X,'TIME',3X,'TH',3X,'MH',2X,'TAS',3X,
1, 'TOT',3X,'TOTD',6X,'TC TURNPT L/L')
   CALL RLL(X,Y,N)
   DO 25 I=1,M
25  WRITE(6,24) I,DL(I),TL(I),NTH(I),MH(I),ITAS(I),TT(I),DT(I), Y(I+1),
1 X(I+1)
24  FORMAT(12,4X,F5.1,3X,F3.0,2X,I3,2X,I3,2X,I3,2X,F4.1,3X,F5.1,2X,F7.
12,2X,F7.2)
25  CONTINUE
   CALL LL(X,Y,N)
   IF(MSN-2)93,450,330
450  CALL TD(XME,YME,MEM,SPDM,TLM,TTM,DLM,DTM)
   CALL HDG(XME,YME,MEM,VAR,NTHM,MHM,PI)
   CALL RLL(XME,YME,MEN)
   WRITE(6,451)
451  FORMAT(1X, '// MOD ESCORT NAVIGATION SOLUTION')
   DO 452 I=1, MEM
   WRITE(6,24) I,OLM(I),TLM(I),NTHM(I),MHM(I),MTAS(I),TTM(I),DTM(I),YM
1E(I+1),XME(I+1)
452  CONTINUE

```

MAI04030
MAI04040
MAI04050
MAI04060
MAI04070
MAI04080

```

93  WRITE(6,92)
92  FORMAT(1X, '// DO YOU WISH A TIME SCENARIO?')
   READ(5,21) L
   IF(L.EQ.0)GO TO 331
   WRITE(6,121)
121  FORMAT('ENTER NUMBER OF DIFFERENT BANDS INTERESTED IN')

```

```

122 READ(5,2)NUMBND
WRITE(6,122)
123 FORMAT(1)ENTER THE BAND NO.S ONE AT A TIME, NO COMBOS LIKE 5/6')
124 READ(5,2)(NB(I),I=1,NUMBND)
WRITE(6,123)
125 FORMAT(1)INDICATE TYPE EMITTERS INTERESTED IN FOR THE BANDS YOU HAVE
126 FIVE SELECTED: 1=ALL, 2=EW/ACQ ONLY, 3=TERM THREAT ONLY,)
127 READ(5,2)NTYP
128 PRINT OUT HEADINGS FOR TIME SCENARIO
129 WRITE(6,124)
130 FORMAT(1X,10 TIME',5X,PRES POS',8X,'TYPE',6X,'EOB',2X,'RNGE',2X,
131 1,'BRG',2X,'AUTO',2X,'DEGR',2X,'PRCT',)
132 SET IF(1)INITIAL CONDITIONS FOR TIME SOLUTION
133 IF(MSN.EQ.2)GO TO 700
134 TIME=0.
135 PPX=X(1)
136 PPY=Y(1)
137 CALL RLL(PPX,PPY,1)
138 WRITE(6,125)TIME,PPY,PPX
139 FORMAT(1X,F4.0,2X,F7.2,1X,F7.2)
140 CALL LL(PPX,PPY,1)
141 CALL PPS(PPX,PPY,1)
142 1YSTK)
143 NOW PROCEED AROUND THE ROUTE 1 MIN AT A STEP
144 I=1
145 TIME=TIME+1./60.
146 DINC=SPD(I)/60.
147 IF(1)GO TO 126
148 IF(1)GO TO 126
149 IF(1)GO TO 126
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402 IF(1)GO TO 126
403 IF(1)GO TO 126
404 IF(1)GO TO 126
405 IF(1)GO TO 126
406 IF(1)GO TO 12
```

```

126 CALL RADN(I,NTH,H)
PPX=PPX+DINC*COS(H)
PPY=PPY+DINC*SIN(H)
128 CALL RLL(PPX,PPY,I)
WRITE(6,125)TIME,PPY,PPX
CALL LL(PPX,PPY,I)
CALL PPS(PPX,PPY,SY,ST,K,NB,NUMBND,NTYP,TYP,IZ,TN,TRG,MSN,XSTK,
1YSTK)
IF(TIME-GE.TT(M))GO TO 331
GO TO 129
PAGE
SKIP003
700 TIME=0.
PPX=XME(I)
PPY=YME(I)
XSTK=X(I)
YSTK=Y(I)
CALL RLL(PPX,PPY,I)
WRITE(6,125)TIME,PPY,PPX
CALL LL(PPX,PPY,I)
CALL PPS(PPX,PPY,SY,ST,K,NB,NUMBND,NTYP,TYP,IZ,TN,TRG,MSN,XSTK,
1YSTK)
I=1
J=1
725 TIME=TIME+1./60.
DINC=SPD(I)/60.
DINC=SPDM(I)/60.
IF(TT(I)-GT.TIME)GO TO 726
PARTIM=TIME-TT(I)
I=I+1
IF(I.EQ.N)GO TO 727
XSTK=X(I)
YSTK=Y(I)
CALL RADN(I,NTH,H)
XSTK=XSTK+PARTIM*SPD(I)/60.*COS(H)
YSTK=YSTK+PARTIM*SPD(I)/60.*SIN(H)
GO TO 728
727 XSTK=X(N)
YSTK=Y(N)
GO TO 728
726 CALL RADN(I,NTH,H)
XSTK=XSTK+DINC*COS(H)
YSTK=YSTK+DINC*SIN(H)
728 IF(TT(J)-GT.TIME)GO TO 736
PARTIM=TIME-TT(J)
J=J+1
IF(J.EQ.MEN)GO TO 737
PPX=XME(J)

```

MAI04570
MAI04580
MAI04590
MAI04600
MAI04610
MAI04620
MAI04630
MAI04640
MAI04650
MAI04660

MAI04670
MAI04680
MAI04690
MAI04700
MAI04710
MAI04720
MAI04730
MAI04740
MAI04750
MAI04760
MAI04770
MAI04780
MAI04790
MAI04800
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MAI04910
MAI04920
MAI04930
MAI04940
MAI04950
MAI04960
MAI04970
MAI04980
MAI04990
MAI05000
MAI05010
MAI05020

```

PPY=YME(J)
CALL RADN(J,NTHM,H)
PPX=PPX+PARTIM*SPDM(J)/60.*COS(H)
PPY=PPY+PARTIM*SPDM(J)/60.*SIN(H)
GO TO 738
737 PPX=XME(MEN)
PPY=YME(MEN)
GO TO 738
736 CALL RADN(J,NTHM,H)
PPX=PPX+DINCM*COS(H)
PPY=PPY+DINCM*SIN(H)
735 CALL RLL(PPX,PPY,1)
WRITE(6,125)TIME,PPY,PPX
CALL PPS(PPX,PPY,SY,ST,K,NB,NUMBND,NTYP,TYP,IZ,TN,TRG,MSN,XSTK,
1YSTK)
IF(TIME.GT.1TM(MEM)) GO TO 331
GO TO 729

```

MAI05030
MAI05040
MAI05050
MAI05060
MAI05070
MAI05080
MAI05090
MAI05100
MAI05110
MAI05120
MAI05130
MAI05140
MAI05150
MAI05160
MAI05170
MAI05180
MAI05190

```

330 WRITE(6,315)
315 FORMAT(1X,/, DO YOU WANT A PRINTOUT OF JAMMING PARAMETERS FOR THIS
1STANDOFF POINT?,)
READ(5,2)LGOTO 331
IF(L.EQ.0)GO TO 331
WRITE(6,121)
READ(5,2)NUMBND
WRITE(6,122)
READ(5,2)(NB(I),I=1,NUMBND)
WRITE(6,123)
READ(5,2)NTYP
WRITE(6,316)
316 FORMAT(1X,/, STANDOFF L/L',12X,'TYPE',6X,'EOB ',2X,'RNGE',2X,'BRGMAI05320
1',2X,'AUTO',2X,'DEGR',2X,'PRCT',)
CALL RLL(STOX,STOY,1)
WRITE(6,317)STOX,STOY
317 FORMAT(1X,F7.2,1X,F7.2)
CALL LL(STOX,STOY,1)
CALL PPS(STOX,STOY,SY,ST,K,NB,NUMBND,NTYP,TYP,IZ,TN,TRG,MSN,XSTK,
1K,YSTK)

```

MAI05200
MAI05210
MAI05220
MAI05230
MAI05240
MAI05250
MAI05260
MAI05270
MAI05280
MAI05290
MAI05300
MAI05310
MAI05320
MAI05330
MAI05340
MAI05350
MAI05360
MAI05370
MAI05380
MAI05390

```

331 WRITE(6,329)
329 FORMAT(1X,/, ARE YOU THROUGH PLANNING?,)
READ(5,2)LGOTO 33
IF(L.EQ.1)GO TO 33

```

MAI05400
MAI05410
MAI05420
MAI05430

MAI05440
MAI05450
MAI05460
MAI05470
MAI05480
MAI05490

```

324 WRITE(6,324)
    FORMAT(1X,/, 'WANT TO CONSIDER A (DIFFERENT) MISSION PROFILE?')
    READ(5,2) L
    IF (L.EQ.0) GO TO 91
    WRITE(6,300)
    READ(5,2) MSN

```

MAI05500
MAI05510
MAI05520
MAI05530
MAI05540
MAI05550
MAI05560
MAI05570
MAI05580
MAI05590
MAI05600
MAI05610
MAI05620
MAI05630
MAI05640
MAI05650

```

91 WRITE(6,26)
26 FORMAT(1X,/, 'DO YOU WISH TO CONSIDER (ANOTHER) STRIKE ROUTE?')
    READ(5,2) LAGAIN
    IF (LAGAIN.EQ.0) GO TO 322
    WRITE(6,115)
    READ(4,2) N
    M=N-1
    WRITE(6,13)
    READ(4,4) (Y(I),X(I),I=1,N)
    CALL LL(X,Y,N)
    WRITE(6,17)
    READ(4,4) (ITAS(I),I=1,M)
    DO 28 I=1,M
28 SPD(I)=ITAS(I)/6J.
    LRT=1
322 IF (MSN-2) 35,400,318

```

MAI05660
MAI05670
MAI05680
MAI05690
MAI05700
MAI05710
MAI05720
MAI05730

```

318 WRITE(6,319)
319 FORMAT(1X,/, 'WANT TO CONSIDER ANOTHER STANDOFF POINT?')
    READ(5,2) LSO
    IF (LSO.EQ.0) GO TO 331
    WRITE(6,302)
    READ(5,4) STOX,STOY
    CALL LL(STOX,STOY,1)
    GO TO 35

```

MAI05740
MAI05750

```

33 STOP
    END

```



```

C C      DXX=(SX(1)-XSTK)*SDF
        DYY=SY(1)-YSTK
        DSS=(SQRT(DXX**2+DYY**2))*60.
        IF(DSS.GT.TRG(IC))GO TO 100
        WENT BACK TO 100; ANOTHER SITE! BECAUSE ITS NOT IN RANGE.
        BUT IF IT IS IN RANGE, CONTINUE BELOW. CALC BEARING, PRINT OUT EVRYTH
    111 BRG=ATAN(DY/DX)
        IF(CX.GE.O)GO TO 60
        PRG=(1.5*PI-BRG)*DG
        GO TO 80
    60 PRG=(PI/2.-BRG)*DG
    80 NBRG=BRG+.5
        IF(NBRG.GE.O)GO TO 40
        NBRG=NBRG+360
        GC TO 89
    40 IF(NBRG.LT.360)GC TO 89
        NBRG=NBRG-360
    89 WRITE(6,90)(TN(IC,J),J=1,3),I,DS,NBRG,TYP(IC,12),TYP(IC,13),TYP(IC,14)
    90 FCRMAT(21X,3A4,3X,I2,3X,F4.0,3X,I3,2X,A4,2X,A4,2X,A4)
    100 CONTINUE
        RETURN
END
PPS00490
PPS00500
PPS00510
PPS00520
PPS00530
PPS00540
PPS00550
PPS00560
PPS00570
PPS00580
PPS00590
PPS00600
PPS00610
PPS00620
PPS00630
PPS00640
PPS00650
PPS00660
PPS00670
PPS00680
PPS00690
PPS00700
PPS00710

```

```

C THIS SUBROUTINE TAKES THE MAX AND MIN OF THE X AND Y COORDINATES,
C CHOOSES THE LARGER OF THE TWO SPREADS AND ADJUSTS THE OTHER
C ACCORDINGLY SO THAT THE PLOT ON THE GRAPH IS ALWAYS SQUARE AND
C THE DISTANCE SCALE IN THE ORZ. IS THE SAME AS IN THE VERT.
      SUBROUTINE SCALE(XMAX,XMIN,YMAX,YMIN)
      DX=ABS(XMAX-XMIN)
      DY=ABS(YMAX-YMIN)
      IF(CX.GE.DY)GO TO 10
      XMP=XMIN+DX/2.
      XMIN=XMP-DY/2.
      XMAX=XMP+DY/2.
      GC TO 20
10  YMP=YMIN+DY/2.
      YMIN=YMP-DX/2.
      YMAX=YMP+DX/2.
20  RETURN
      END
SCA00010
SCA00020
SCA00030
SCA00040
SCA00050
SCA00060
SCA00070
SCA00080
SCA00090
SCA00100
SCA00110
SCA00120
SCA00130
SCA00140
SCA00150
SCA00160
SCA00170

```

```

C THIS SUBROUTINE COMPUTES THE TIME AND DISTANCE AROUND A PARTICULAR
C ROUTE. COMPUTES BOTH TOTAL AND INDIVIDUAL LEG VALUES.
C PARAMETERS PASSED ARE: LONG AND LAT OF TRNPTS, NUMBER OF PTS,
C SPEED (NAUT MILES/MIN) FOR EACH LEG, TIME/LEG, TOTAL TIME, DIST/LEG
C AND TOTAL DISTANCE.
      SUBROUTINE TD(X,Y,M,SPD,TL,TT,DL,DT)
      DIMENSION X(1),Y(1),SPD(1),TL(1),DL(1),DT(1),TT(1)
      T=0.
      D=0.
      DO 10 I=1,M
      C MUST CALCULATE A SCALE DOWN FACTOR SCF, LAT, NE, LONG IN DIST
      SCF=1.0294-.0023*ABS((Y(I+1)+Y(I))/2.)-.0001*((Y(I+1)+Y(I))/2.))**2
      DX=(X(I+1)-X(I))*SCF
      DY=Y(I+1)-Y(I)
      DL(I)=SQRT(DX**2+DY**2)
      D=D+DL(I)
      DT(I)=D
      TL(I)=DL(I)/SPD(I)
      TT(I)=T
      T=TT(I)+T
10  CCNTINUE
      RETURN
      END
TD 00010
TD 00020
TD 00030
TD 00040
TD 00050
TD 00060
TD 00070
TD 00080
TD 00090
TD 00100
TD 00110
TD 00120
TD 00130
TD 00140
TD 00150
TD 00160
TD 00170
TD 00180
TD 00190
TD 00200
TD 00210
TD 00220
TD 00230
TD 00240

```

```

C THIS SUBRTN CONVERTS TRUE HEADINGS FROM DEGREES TO RADIAN FOR USE
C COMPUTING THE DISTANCE INCREMENT OF LAT/LONG IN THE TIME SCENARIO.
C SPECIFICALLY: SIN AND COS FUNCTIONS REQUIRE RADIAN.
  SLBROUTINE RADN(I,NTH,H)
  DIMENSION NTH(1)
  X=2.*3.14159/360.
  IF(NTH(1).GE.0).AND.(NTH(1).LE.90))GO TO 10
  F=(450-NTH(1))*X
  GC TO 20
  10 H=(90-NTH(1))*X
  20 RETURN
  END

```

```

INRAD000010
RAD000020
RAD000030
RAD000040
RAD000050
RAD000060
RAD000070
RAD000080
RAD000090
RAD000100
RAD000110
RAD000120

```

```

C THIS SUBRTN COMPUTES TRUE HDG AND MAG HDG FOR A ROUTE OF FLIGHT.
C PARAMETER PASSED ARE: X AND Y COORDS OF TURNPTS,
C NUMBER OF TRNPTS, MAGNETIC VARIATION, DUMMY LISTS FOR TH AND MH,
C AND VALUE CF PI.
  SLBROUTINE HDG (X,Y,M,VAR,NTH,MH,PI)
  DIMENSION X(1),Y(1),NTH(1),MH(1)
  INTEGER VAR
  DG=180./PI
  DO 10 I=1,M
  C MUST CALC A SCALE DOWN FACTOR SDF, SINCE LAT.NE. LONG IN DIST
  SDF=1./0.294-.0023*ABS((Y(I+1)+Y(I))/2.)-.0001*((Y(I+1)+Y(I))/2.))**2
  DX=(X(I+1)-X(I))*SDF
  DY=Y(I+1)-Y(I)
  TH=ATAN(DY/DX)
  IF(CX.GE.0.)GO TO 60
  TH=(1.5*PI-TH)*DG
  GC TO 80
  60 TH=(PI/2.-TH)*DG
  80 NTH(I)=(TH+.5)
  MH(I)=NTH(I)+VAR
  MC=MH(I)
  IF(MD.GE.0.)GO TO 40
  MH(I)=MH(I)+360
  GC TO 10
  40 IF (MD.LT.360)GO TO 10
  10 MH(I)=MH(I)-360
  CONTINUE
  RETURN
  END

```

```

HDG000010
HDG000020
HDG000030
HDG000040
HDG000050
HDG000060
HDG000070
HDG000080
HDG000090
HDG000100
HDG000110
HDG000120
HDG000130
HDG000140
HDG000150
HDG000160
HDG000170
HDG000180
HDG000190
HDG000200
HDG000210
HDG000220
HDG000230
HDG000240
HDG000250
HDG000260
HDG000270
HDG000280
HDG000290

```

```

C THIS ROUTINE CONVERTS DEGREES AND MINUTES TO DEGREES AND TENTHS OF
C DEGREES.
SUBROUTINE LL(X,Y,N)
DIMENSION X(1),Y(1)
DO 10 I=1,N
NX=X(I)
RX=X(I)-NX
X(I)=NX+RX
NY=Y(I)
RY=Y(I)-NY
Y(I)=NY+RY
10 CONTINUE
RETURN
END
LL 00010
LL 00020
LL 00030
LL 00040
LL 00050
LL 00060
LL 00070
LL 00080
LL 00090
LL 00100
LL 00110
LL 00120
LL 00130
LL 00140
LL 00150
LL 00160

```

```

C THIS ROUTINE RE-CONVERTS LATITUDES AND LONGITUDES FROM DEGREES AND
C TENTHS OF DEG. TO DEGREES AND MINUTES FOR PRINTOUT.
SUBROUTINE RLL(X,Y,N)
DIMENSION X(1),Y(1)
DO 10 I=1,N
NX=X(I)
RX=X(I)-NX
X(I)=NX+RX
NY=Y(I)
RY=Y(I)-NY
Y(I)=NY+RY
10 CONTINUE
RETURN
END
RLL00010
RLL00020
RLL00030
RLL00040
RLL00050
RLL00060
RLL00070
RLL00080
RLL00090
RLL00100
RLL00110
RLL00120
RLL00130
RLL00140
RLL00150
RLL00160

```

```

MAX000010
MAX000020
MAX000030
MAX000040
MAX000050
MAX000060
MAX000070
MAX000080
MAX000090
MAX000100
MAX000110
MAX000120
MAX000130
MAX000140

```

```

C THIS ROUTINE SEARCHES FOR THE MAX VALUE OF THE LIST PASSED TO,
C AND RETURNS THIS VALUE TO THE MAIN PROGRAM. IT IS USED TO
C OBTAIN THE MAX LAT AND LONG FOR USE IN ADJUSTING THE SCALE
C DURING THE PLOTTING SEQUENCE.
C PARAMETERS PASSED ARE: ARRAY OF LATITUDES OR LONGITUDES, NUMBER
C OF ITEMS IN THE ARRAY, DUMMY VALUE OF MAX WITH TRUE MAXIMUM TO BE
C RETURNED.
      SUBROUTINE MAX(X,N,XMAX)
      DIMENSION X(1)
      XMAX=X(1)
      DO 10 I=1,N
      10 XMAX=AMAX1(XMAX,X(I))
      RETURN
      END

```

```

MIN000010
MIN000020
MIN000030
MIN000040
MIN000050
MIN000060
MIN000070
MIN000080
MIN000090
MIN000100
MIN000110
MIN000120
MIN000130

```

```

C THIS SUBROUTINE SEARCHES LIST PASSED FOR THE MIN VALUE AND
C RETURNS IT TO THE MAIN PROGRAM. USED TO SET LIMITS IN SCALING
C DURING THE PLOTTING ROUTINE.
C PARAMETERS PASSED ARE: ARRAY OF LATITUDES OR LONGITUDES,
C NUMBER OF ITEMS IN THE ARRAY, DUMMY VALUE OF MIN WITH THE REAL
C VALUE OF MIN TO BE RETURNED TO THE MAIN PROGRAM.
      SUBROUTINE MIN(X,N,XMIN)
      DIMENSION X(1)
      XMIN=X(1)
      DO 10 I=1,N
      10 XMIN=AMIN1(XMIN,X(I))
      RETURN
      END

```

C THIS ROUTINE CALCULATES THE DISTANCE FROM A STANDOFF POINT TO EACH
C EMITTER OF INTEREST, WHEN PRINTING PARAMETERS FOR A STANDOFF MSN.

```

SLBROUTINE DIST(XO,YO,STOX,STOY,FJ)
SCF=1.0294-.0023*ABS((YO+STOY)/2.)-.0001*((YC+STOY)/2.)*2
DX=(XO-STOX)*SDF
DY=YO-STOY
RJ=SQRT(DX**2+DY**2)
RETURN
END

```

DIS00010
DIS00020
DIS00030
DIS00040
DIS00050
DIS00060
DIS00070

C THIS FUNCTION CALCULATES THE BURNTHRU RANGE FOR JAMMING FROM A STANDOFF
C POINT TO ANY EMITTER OF INTEREST. USED IN PLOTTING DEPRESSED JAMMING
C ENVELOPES IN THE DISPLAY PORTION OF THE PROGRAM.

```

FUNCTION BTHRU(PJ,B,GJR,PR,CS,RJ,GAIN,CMFLG)
RJ=RJ*1852.
PR=PR*1000.
BTHRU=((PR*GAIN**2*CMFLG*CS*RJ**2)/(12.56637062*PJ
1*B*(10.**(GJR/10.)))*.25)/1852.
RETURN
END

```

BTH00010
BTH00020
BTH00030
BTH00040
BTH00050
BTH00060
BTH00070

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