

run 5



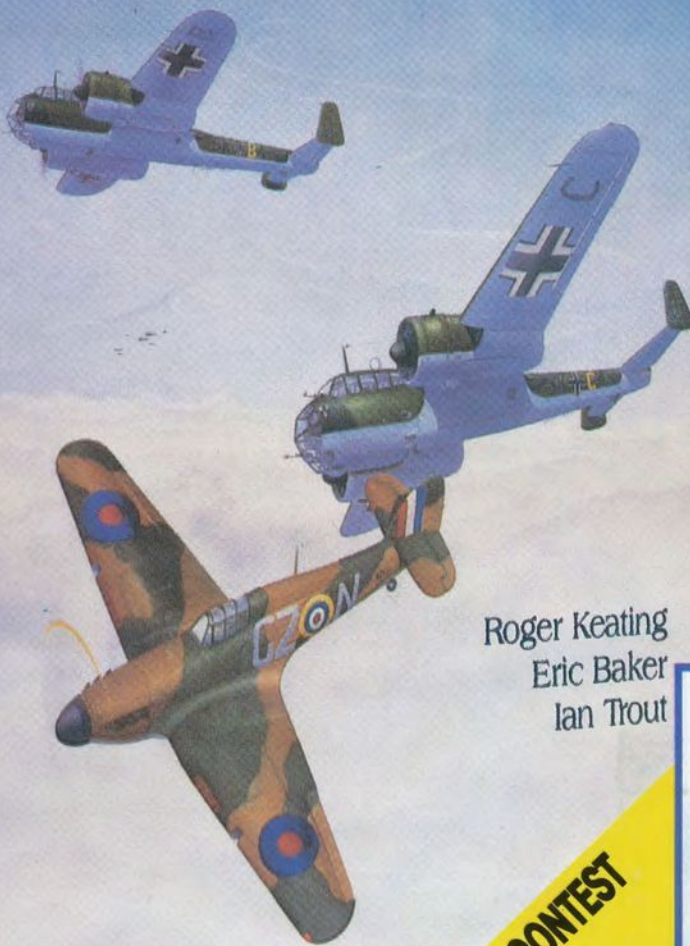
THE JOURNAL OF STRATEGIC STUDIES GROUP

Issue 1

AUST \$4.00/US \$4.00

EUROPE ABLAZE

The Air War Over England and Germany 1939-1945



Roger Keating
Eric Baker
Ian Trout

Featured in this Issue

- ★ The Blitz – an 8 day scenario for *Europe Ablaze*
- ★ Wake Island Relief – a scenario for *Carriers at War*
- ★ Programming & Game Design – an article by Roger Keating
- ★ Part 1 of a detailed analysis of warships in a *Carriers at War* format.

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DETAILS INSIDE

EUROPE ABLAZE

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"Besides its historical accuracy, *Carriers at War* is the best-playing simulation of naval warfare I have seen on either tabletop or video monitor."

"*Carriers at War* is the best game available on World War II carrier operations. It is, perhaps, the best wargame of 1984 on any topic."

"In actual play, the computer is no more predictable than a human counterpart. It is capable of undertaking daring and risky manoeuvres, or it might play conservatively. You can never be sure."

"...it's an excellent game — playable, enjoyable and tense. Kudos to SSG, and I hope they continue producing products of this high level for others to try to emulate."

"The combination of excellent detail and an innovative, easy-to-learn game system makes *Carriers at War* one of the most attractive products currently available on the market."

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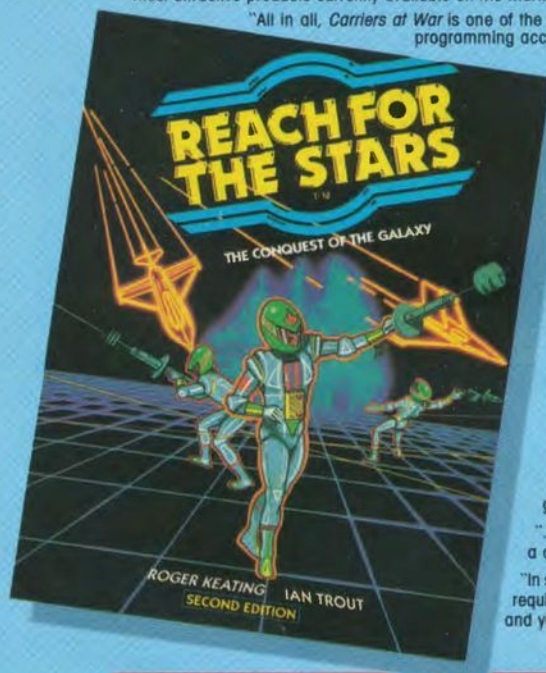
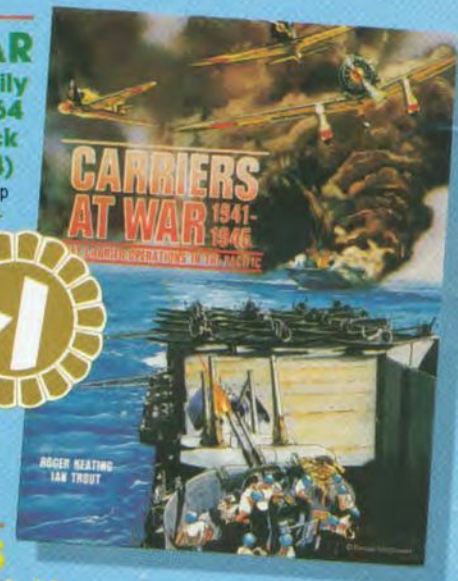
"This is an interstellar strategy game ... but that's like calling the Apple a 'nice computer'. It leaves a good deal out. Think of it this way: If *Wizardry* is a fantasy game and *Zaxxon* is an arcade game, then *Reach for the Stars* is a strategy game ... In short, the game itself is beautifully designed. More than that, the 'engineering' of the thing is lovely. You can do just about anything you want to with the system, from adding various hazards to the game universe, to stopping a game in the middle and saving it on disc."

"*Reach for the Stars* is a stimulating program."

"*RFTS* is, after a little playing, a very user friendly game ... (It) offers features to be found in no other space game. Its great artificial intelligence and careful design could only be expected after Roger Keating's many successful designs for SSI and Ian Trout's long hours of work in development. My only hope is that *RFTS* is soon followed by more games of the same quality."

"... once mastered this might be the only game you'll ever want to buy for your C-64. Indeed, it would be worth buying a computer to play it. Definitely one of my most favourite games and a classic."

"In summarizing, *RFTS* is an excellent game. It is fast and intelligent, and the game mechanics are simple but the strategy required is quite devious. Add to this the natural strengths of a game employing four people in subtle but all out competition and you have a winner."



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January 1986

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EDITORIAL

This appears to be all the space remaining, which probably isn't such a bad thing since it's less space to waste . . .

We waited about a year before deciding to go ahead and produce our magazine. The main reason being the need to know just whether our approach to strategy game design was going to prove popular in a market used to other ways of getting the job done. So far, so good.

One of the most satisfying aspects of designing *Carriers at War* was the knowledge that, provided we did a good enough job in developing mechanics to simulate carrier operations, our customers would have a tool to enable them to recreate pretty well any naval/air situation.

There's as much in the game as you care to take out of it. The same applies with our new *Europe Ablaze*, which we hope you have purchased by now.

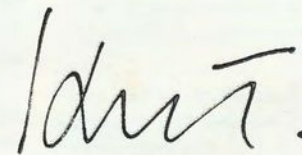
RUN 5 is, for the moment, a unique magazine. We (that's Roger, and I) get a real kick out of being able to support our products in the creative manner this

magazine, and our programs, allow. It's a far cheaper, friendlier, and more versatile format than scenario disks (which would have to cost around \$15 a pop) as well as providing an opportunity for those of you who care to contribute a scenario, article, letter or whatever. Just make your submissions legible, please!

You're not restricted to our products but please be aware it'll probably be a couple of dozen years or so before we find room to print anything on straight arcade games and the like. Careful, sensible reviews of any strategy games will be most welcome.

At present we intend to publish on a quarterly schedule, leastways until we can gauge our impact (if any) on the marketplace.

Whatever, I'll have more to say in Issue 2.



PROGRAMMING AND GAME DESIGN

By Roger Keating and his Computer

When Ian and I started SSG about three years ago we had to re-think many of our old ideas and learn to cope with this new environment. Until then my main job had been associated with programming and I spent little time thinking about the historicity of a topic or even the relevance of the factors I was introducing into the game. When asked at one time what type of unit I was portraying in *Southern Command* (a title I did for SSI in 1982), I had to express ignorance and answer that "it seemed to fit into the game".

The task of programming a game in machine language left little time for such things as the human interface or structuring the game so that it would be easy to write a tutorial to introduce a new person to it. Writing rules for a game presented an insurmountable obstacle and I was always unhappy with results. (The difficulties encountered in persuading Roger to write this article were almost insurmountable too... Ed.)

Ian had to learn about computers and come to terms with the endless stream of memory constraints, design restrictions, interface problems and last, but not least, at the end of all this a computer opponent had to be there to provide a worthwhile contest. In *Reach for the Stars* we learnt to live with each other, Ian got some idea of the bounds of the computer and I had started to come to terms with the massive interface problem that had *bugged* me during my previous games.

The Design Kit arrived with *Carriers at War* as a way in which Ian could enter the relevant data into the game leaving me free to program the modules which would drive the game. The hardest task in the game was to develop a routine to move the task groups around the map in an environment that could be changed with a keystroke.

The menu system answered most of the complaints about the human interface and when we released the game we both felt that we had tackled most of the questions we had set ourselves at the completion of *Reach for the Stars*.

Europe Ablaze allowed us to refine the process of design and we now feel that the future, particularly with the new machines coming up, looks bright. In writing this article, I intend to concentrate on the one element of computer game design that causes the most pain but without which these games could not exist - machine language.

After *Operation Apocalypse*, a 96K BASIC program which I did for SSI, it became obvious to me that machine language was needed to solve several problems. The code had to take up less space so that more modules could be in the machine at one time. If, for example, the movement routines and the combat routines could not exist together, then the computer would move without any understanding of the combat environment about it. Chaining could only be used when independent parts of the program were being addressed. For the intelligence to *bite*, a massive amount of data had to be thrust through the accumulator in a small amount of time to allow the machine to come up with a reasonable choice for a particular action. BASIC is extremely hard to debug and it would take months to check the program. It became imperative that the computer play all active positions in the game so it could check much of the program itself.

Programming in machine language (or more correctly, assembly language) can be compared to running against a brick wall and learning to like it. Each arithmetic calculation has to be tailored to the module in which it is to be used. Any generalized routines would slow the game down and thus be unacceptable.

Ian quickly found that I expected divisions to be in powers of 2 and any discussion of decimal points was ruled out at a very early stage.

Much of the programming in a game involves the shifting of data from one place to another, even screen displays, etc. The routine on the facing page (for the Apple II family) will split the text screen and is a good example of the type of project that should be tackled to get used to the skills that will be required in a computer game.

As an example of a routine that has been written for speed, look at the listing on this page. The routine finds the distance between hex (XP, YP) and hex (XQ, YQ) and returns the result in D. To go through this code and understand it will give you a good idea of the tasks ahead in the programming of any game.

Another piece of information that is invaluable is the direction finding routine to get from XP,YP to XQ,YQ which can be tagged on to the distance routine so that a call to \$300 and to \$360 will give you both the

DISTANCE ROUTINE

```

0300          1      org $300
0300          2      obj $300
0300          3      ;distance routine
0300          4      ;
0350          5      XP  = $350
0351          6      YP  = $351
0352          7      XQ  = $352
0353          8      YQ  = $353
0354          9      D   = $354
0300         10     ;
0300         11     DIST:
0300 AD 50 03 12     lda XP
0303 38      13     sec
0304 ED 52 03 14     sbc XQ
0307 B0 05 15     bcs DIST1
0309 49 FF 16     xor OFF
030B AA      17     tax
030C E8      18     inx
030D 8A      19     txa
030E 8D 54 03 20    DIST1 sta D
0311         21     ;
0311 A8      22     tay
0312 C8      23     iny
0313 AD 50 03 24     lda XP
0316 4A      25     lsr
0317 90 23 26     bcc DIST4
0319         27     ;
0319 AD 53 03 28     lda YQ
031C 38      29     sec
031D ED 51 03 30     sbc YP
0320 B0 06 31     bcs DIST3
0322 88      32     dey
0323         33     ;
0323 49 FF 34     DIST2 xor OFF
0325 AA      35     tax
0326 E8      36     inx
0327 8A      37     txa
0328 8C 4B 03 38    DIST3 sty XI
032B 4E 4B 03 39     lsr XI
032F 38      40     sec
032F ED 4B 03 41     sbc XI
0332 90 07 42     bcc DISTX
0334 18      43     clc
0335 6D 54 03 44     adc D
0338 8D 54 03 45     sta D
033B 60      46     DISTX rts
033C         47     ;
033C AD 53 03 48    DIST4 lda YQ
033F 38      49     sec
0340 ED 51 03 50     sbc YP
0343 90 DE 51     bcc DIST2
0345 F0 E1 52     beq DIST3
0347 88      53     dey
0348 4C 28 03 54     jmp DIST3
034B         55     ;
034B         56     ;scratch variable
034B 00      57     XI hex 00
034C         58     ;
034C         59     end

```

Continued on page 22

PAGE SPLITTING PROGRAM

```

0300      1      org $300
0300      2      obj $300
0300      3      ;
0300      4      ;PAGE SPLITTING PROGRAM
0300      5      ;
0300      6      ;CODE CAN BE RELOCATED WITHOUT
0300      7      ;CHANGE
0300      8      ;
0300      9      ;TWO SCRATCH VALUES
0300     10      ;
00D5     11      CNT    epz $D5
0300     12      ;
0300     13      ;LOW AND HIGH ADDRESS OF THE LEFT
0300     14      ;MOST BYTE IN THE LINE
0300     15      ;
0028     16      SL     epz $28
0029     17      SH     epz $29
0300     18      ;
0000     19      POS1   epz $0
0001     20      POS2   epz $1
0002     21      LINE   epz $2
0300     22      ;
0300     23      ;CALCULATES THE LEFT MOST BYTE
0300     24      ;AND STORES RESULT IN $28,$29
0300     25      ;
FBC1     26      BCALC  equ $FBC1
0300     27      ;
0300     28      ;DELAY USED TO SLOW SPLIT
0300     29      ;
FCA8     30      WAIT   equ $FCA8
0300     31      ;
0300     32      ;MAIN PROGRAM STARTS HERE
0300     33      ;
0300 A9 14     34      SPLIT  lda #120
0302 85 D5     35          sta CNT
0304 A9 00     36          lda 00
0306 85 02     37          sta LINE
0308          38      ;
0308 A9 14     39          lda 14
030A 85 00     40          sta POS1
030C A9 13     41          lda 13
030E 85 01     42          sta POS2
0310          43      ;
0310          44      ;CALCULATE THE START ADDRESS
0310          45      ;OF THE LINE
0310          46      ;
0310 A5 02     47      CRT0   lda LINE
0312 20 C1 FB  48          jsr BCALC
0315          49      ;
0315 A0 26     50          ldy #138
0317 B1 28     51      CRT1   lda (SL),Y
0319 C8        52          lny
031A 91 28     53          sta (SL),Y
031C 88        54          dey
031D 88        55          dey
031E C4 00     56          cpy POS1
0320 B0 F5     57          bge CRT1
0322          58      ;
0322          59      ;PLACE BLANK IN CENTRE

```

```

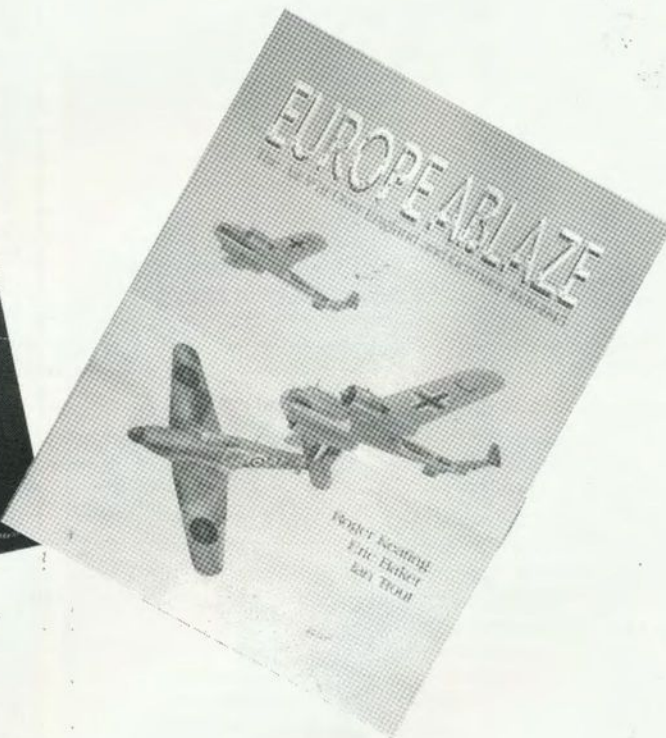
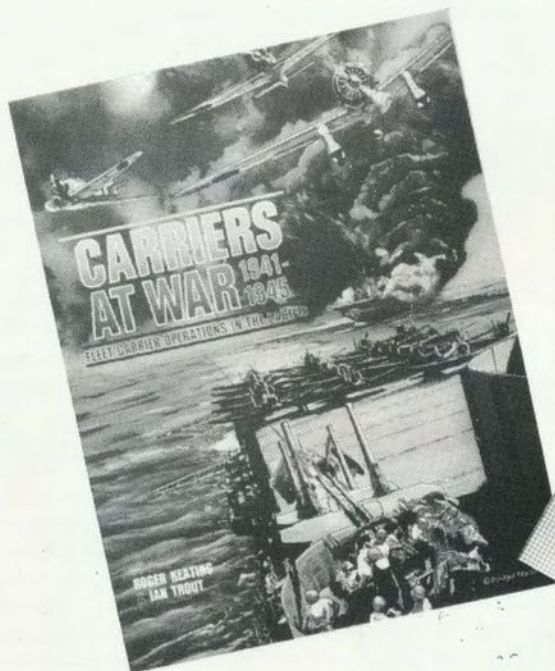
0322          60      ;
0322 A4 00     61          ldy POS1
0324 A9 A0     62          lda 0A0
0326 91 28     63          sta (SL),Y
0328          64      ;
0328          65      ;NOW MOVE BYTES 00 TO 19 ACROSS
0328          66      ;ONE PLACE TO THE LEFT
0328          67      ;START WITH 01 MOVED TO 00
0328          68      ;AND END WITH 19 MOVED TO 18
0328          69      ;
0328 A0 01     70          ldy #101
032A B1 28     71      CRT2   lda (SL),Y
032C 88        72          dey
032D 91 28     73          sta (SL),Y
032F C8        74          lny
0330 C8        75          lny
0331 C4 01     76          cpy POS2
0333 90 F5     77          bit CRT2
0335 F0 F3     78          beq CRT2
0337          79      ;
0337          80      ;PLACE BLANK IN CENTRE
0337          81      ;
0337 A4 01     82          ldy POS2
0339 A9 A0     83          lda 0A0
033B 91 28     84          sta (SL),Y
033D          85      ;
033D E6 02     86          inc LINE
033F A5 02     87          lda LINE
0341          88      ;
0341          89      ;HAS LINE 24 BEEN REACHED
0341          90      ;IF SO THEN DECREMENT CNT
0341          91      ;
0341 C9 18     92          cmp #124
0343 F0 07     93          beq CRTN
0345          94      ;
0345 A9 0A     95      CRT3   lda #110
0347 20 A8 FC  96          jsr WAIT
034A F0 C4     97          beq CRT0
034C          98      ;
034C          99      ;REPEAT AGAIN
034C          100     ;
034C E6 00     101     CRTN   inc POS1
034E C6 01     102          dec POS2
0350          103     ;
0350          104     ;DECREMENT CNT AND IF 00
0350          105     ;(REPEATED 20 TIMES)
0350          106     ;END PROGRAM
0350          107     ;
0350 A9 00     108          lda 00
0352 85 02     109          sta LINE
0354 C6 D5     110          dec CNT
0356          111     ;
0356          112     ;BRANCH IF NOT EQUAL BACK TO
0356          113     ;START. NOTE THAT A JUMP IS
0356          114     ;NOT USED SO THAT THE CODE CAN
0356          115     ;BE RELOCATED
0356          116     ;
0356 D0 ED     117          bne CRT3
0358 60        118          rts
0359          119     ;
0359          120     end

```

Turn your creative talent to cash with our

SCENARIO DESIGN COMPETITION

Two prizes of \$500 each are to be awarded for the best *Carriers at War* and *Europe Ablaze* scenarios submitted to us by June 30th, 1986.



There is no restriction as to subject matter, size or anything else. All we require is that you submit your entry (or entries) on a floppy disk together with a typed (or very clearly written) briefing for the scenario.

The judging panel will include Roger Keating and Ian Trout, their decision will be final and, as always with this kind of thing, no correspondence will be entered into... leastways about our choice of winners.

The winning scenarios will be published in Issue 3 of *RUN 5*.

All entries become the property of Strategic Studies Group Pty Ltd. However, a payment of \$100 will be made to the author of any scenario selected for publication. This payment is not in addition to the prizes described above.

Please be sure you include your name and address in a legible form.

All submissions must be sent to -

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Drummoyne. 2047
AUSTRALIA.

Overseas entrants are well advised to wrap the floppy disk in aluminium foil as a precaution against magnetic erasure.

RELIEF OF WAKE ISLAND

A CARRIERS AT WAR SCENARIO

BY JACK GREENE JR & IAN TROUT

In the early months of the War in the Pacific, the United States had precious few opportunities to engage Japanese naval forces on anything like equal terms. Their best chance came just two weeks after the attack on Pearl Harbour when a Japanese amphibious force attempting to capture Wake Is. was beaten off with heavy casualties. That the relief attempt failed is history. It could have been different...

THE SITUATION

On December 7th, 1941, the Japanese Fast Carrier Striking Force dealt what appeared at the time to be a devastating blow to United States Naval Forces in the Pacific.

Hindsight has clearly demonstrated how little effect the loss of those seven battleships was to have upon the course of a war dominated by naval air power, and in particular carrier-borne naval air power.

In the immediate aftermath of Pearl Harbour, however, there were few senior navy men on either side who foresaw the shape of the war so suddenly thrust upon them. Pre-war battle plans, more or less, envisaged forcing

a climactic battleship duel under advantageous circumstances. Without battleships, the plans were useless.

Admiral Husband E. Kimmel, facing a certain and inglorious end to his meritorious career, conceived and planned a manageable and promising operation to reinforce the isolated Wake Island outpost and, hopefully, in the eyes of the world, redeem both his Service and himself.

On December 11th, Wake Island's ad-hoc force of 500 marines and other service personnel beat off an amphibious invasion, sinking two destroyers and a small troop transport in the process. It was the first check the Japanese had received and

provided the United States with a splendid opportunity to engage Japanese naval forces close to home.

Kimmel's plan went awry from the first. Administrative confusion, caused both by the Pearl Harbour debacle and the appointment of Admiral Chester W. Nimitz as a replacement for Kimmel, delayed the expedition. The choice of Rear Admiral Frank Jack Fletcher to command the operation no doubt added to the indecision. To this date, Fletcher had had no carrier experience. Rear Admiral Aubrey W. Fitch, aboard *Saratoga*, would have been more suitable.

Whatever the reasons, the Wake Island relief force did not get into position in time to contest the second invasion attempt. In the early hours of December 23rd, Major Devereux's gallant band surrendered to the Japanese.

THE SCENARIO

It is interesting to speculate on what may have happened had the US operation been less tardy. The Japanese forces detailed to capture Wake were, considering the Island's proximity to Hawaii, somewhat on the lean side. In direct contrast to the American operation, however, Japanese plans were executed resolutely and briskly. The opportunity was lost.

This scenario postulates the early arrival of the American Task Groups. The opening day is December 19th which sees Rear Admiral Kajioka's invasion force to the north of Kwajalein en route to Wake. Rear Admiral Abe's Second Carrier Division, comprising

Soryu and *Hiryu*, is scheduled to arrive on the north edge of the map on the 20th. The two American fast carrier groups, built around *Lexington* and *Saratoga*, also arrive on the 20th, but from the east edge.

In the space of the next three days, you can decide for yourself how fortunate, or otherwise, were the contenders that they got away with the historical result.

Wake Island is not a long scenario. Somewhere between 1 and 2 hours will be more than enough to reach a decision.

SOME VARIATIONS

As with any hypothetical situation, there are always plenty of 'what-ifs' to colour the confrontation. Make use of any of the following that interest you. Better still; get a friend to vary your disk to make for real suspense: The data necessary to implement these variations can be found on page 11.

1. Point of Entry.

The Japanese carrier task force (TG1) can enter from any point on the north or western map edges. (It's not a bad idea to keep clear of Midway; the Catalinas there will probably spot you.)

All American task groups can enter from any point on the eastern map edge.

2. Time of Entry.

The Japanese carrier group is scheduled to arrive on day 1. It can arrive at any time between days 1 and 3.

All American task groups are scheduled to arrive on day 1. They can arrive at any time between days 1 and 5. Historically, they would have made a day 4 arrival.

3. Additional Forces.

As a covering force for the Wake Island relief operation, *Enterprise* was deployed just to the west of Johnson Island. Adding this task group to the American forces should guarantee an Allied victory. Her point of entry can be varied to any hex on the eastern map edge and time of arrival can be between days 2 and 5.

4. Miscellaneous.

A proposal was put forward prior to the outbreak of war to convert the heavy cruiser *San Francisco* into a cruiser carrier. Her air complement would have been 18 Dauntless scouts. Armament would have been nine 6" guns, eight 5" DP's and some light AA.

Delete CA 38 from TG 1 and replace her with the *Quincy* (CA 39). The new *San Francisco* (CF

1) operates as an independent task group escorted by a couple of destroyers. Ideally, this group should be given a cover mission to get the most out of the scout planes.

SOME NOTES

1. Reinforcements

Most of the naval forces, and all of the carrier commands, in this scenario begin the game as reinforcements. Remember that you will have no control over these groups until they enter the map.

2. Creating the Weather.

You will note there is no display in the data provided showing the distribution of cloud and squalls for this scenario, only the weather forecasts for each of the 12 sectors.

Enter these via Menu 14 then go to Menu 13. The Weather Report is blank, as it should be; i.e. there are no weather elements on the strategic map.

Type (RET) five times to get the weather routines up and running, then save the result as the Weather Report. It's a good idea to complete Menu 10 (Scenario Length) before creating the weather. As you can see, this is a much more effective way of creating weather.

AMERICAN ORDER OF BATTLE

NAVAL FORCES

TASK FORCE 0 (Fletcher)

Task Group 1

1 CV - Saratoga
3 CA - Astoria CA 34
- Minneapolis ** (CA 36)
- San Francisco (CA 38)

7 DD

Task Group 2

1 AO - Neches
1 DD - Ralph Talbot* (DD390)

Task Group 3

1 CV - Lexington*
3 CA - Chicago (CA 29)
- Portland (CA 33)
- Indiannapolis (CA 35)

7 DD

Task Group 4

1 AO - Neosho
1 DD - Drayton* (DD366)

Task Group 5

1 AP - Tangier*

Task Group 6 (Optional)

1 CV - Enterprise*
3 CA - Salt Lake City (CA 25)
- Northampton (CA 26)
- Chester (CA 27)

7 DD

Task Group 7 (Optional)

1 CF - San Francisco*
2 DD

AIR FORCES

NAVAL AIR

Task Force 0

Saratoga - 13 F4F-3, 43 SBD-3,
- 11 TBD-1
Lexington - 21 F2A-3, 33 SBD-3,
- 15 TBD-1
Enterprise - 18 F4F-3, 35 SBD-3,
- 14 TBD-1
San Fran. - 18 SBD-3

LAND BASED AIR

Theatre 0

Wake Is. - 3 F4F-3
Midway - 12 PBV-4

JAPANESE ORDER OF BATTLE

NAVAL FORCES

TASK FORCE 0 (Abe)

Task Group 1

2 CV - Soryu**, Hiryu
2 CA - Chikuma (CA 17)
- Tone (CA 18)

2 DD

TASK FORCE 1 (Kajioka)

Task Group 2

3 CL - Tatsuta (CL 1)
- Tenryu (CL 2)
- Yubari** (CL 14)

6 DD

2 APB

3 AP

Task Group 3

4 CA - Furutaka (CA 1)
- Kako (CA 2)
- Aoba* (CA 3)
- Kinugasa (CA 4)

3 DD

AIR FORCES

NAVAL AIR

Task Force 0

Soryu - 16 Zero, 16 Val,
- 18 Kate
Hiryu - 16 Zero, 16 Val,
- 18 Kate
Seaplanes - 10 Pete

Task Force 1

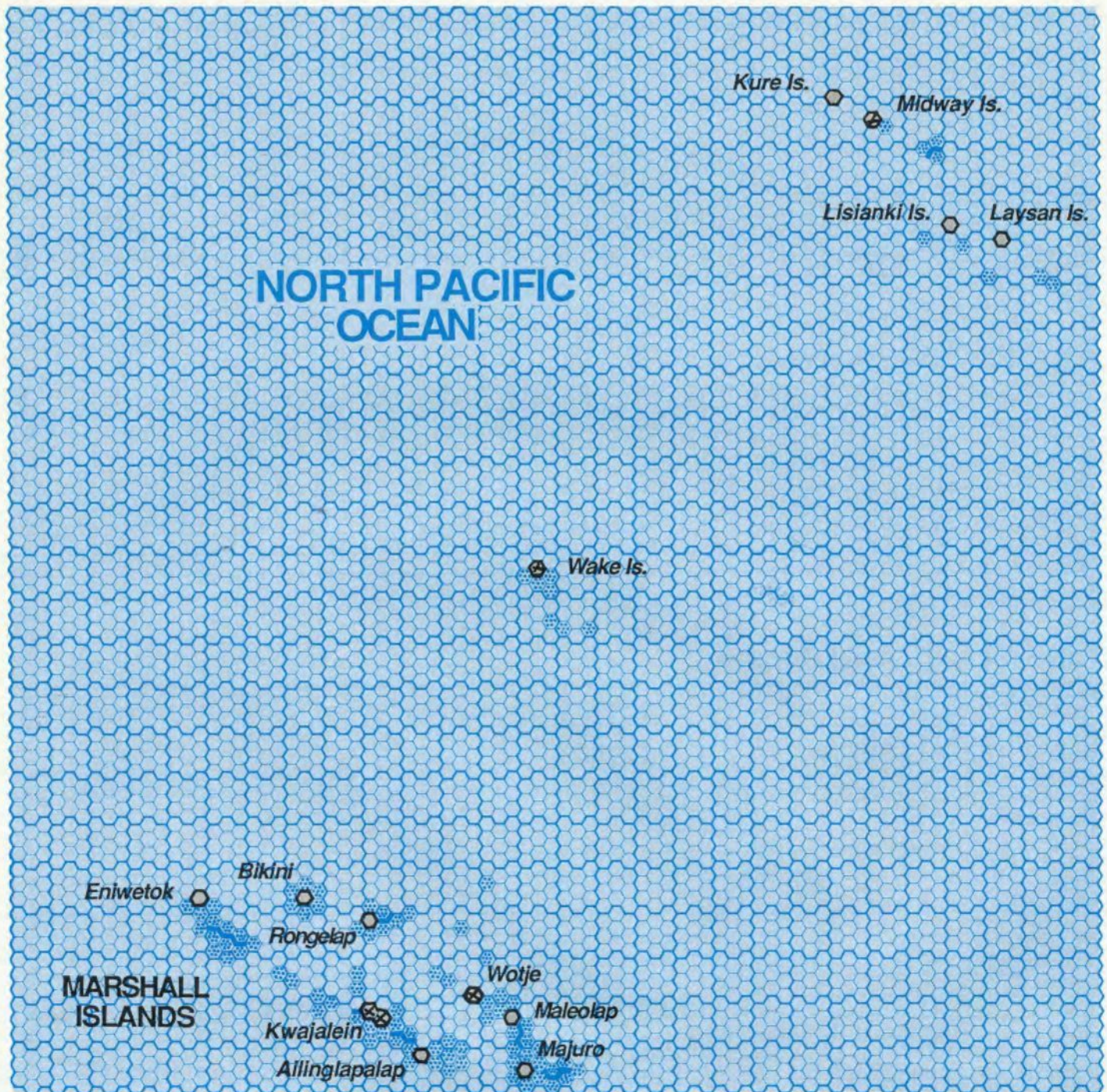
Seaplanes - 4 Pete, 4 Dave

LAND BASED AIR

Theatre 0

Roi - 14 Zero, 18 Betty
Namur - 18 Betty
Wotje - 15 Mavis

WAKE ISLAND - Map



SCENARIO 8

*Relief of Wake Is.
19-25 Dec, 1941*

US BASES - Wake Island, Midway

IJN BASES - Kwajalein (Roi and Namur), Wotje

WAKE ISLAND - Plane Types

PLANE NUMBER	0-63	1	2	3	4	5	6	7	8	9	10	11	12
PLANE TYPE	[8]	F2A-3	F4F-3	SBD-3	TBD-1	PBY-4	ZERO	VAL	KATE	BETTY	DAVE	PETE	MAVIS
ROLE	0-2	0	0	1	1	2	0	1	2	1	2	2	2
CREW	0-5	0	0	1	2	4	0	1	2	4	1	1	5
RANGE (n,e,t)	0-31	3,5,6	6,6,7	7,8,11	3,6,7	15,19,24	7,8,10	6,7,9	8,10,11	12,16,18	5,5,6	3,3,4	16,25,27
ALTIT. (h,m,l)	0-3	2,3,3	3,3,2	1,3,3	0,2,3	0,3,3	2,3,3	3,3,2	1,3,3	1,3,3	0,3,3	2,3,3	2,3,3
CRUIS. SPEED	0-15	7	6	7	6	5	9	8	7	9	5	7	6
BOMB LOAD	0-63	1	0	4	4	7	0	3	6	6	1	1	8
CHAR. (f,v,m,p)	0-7	4,3,5,3	4,4,6,3	2,4,4,1	1,3,3,0	2,2,0,0	4,2,7,3	2,2,5,1	1,2,3,0	2,1,1,1	2,1,3,0	2,2,5,0	3,3,0,0
ALLIED	Y/N	Y	Y	Y	Y	Y	N	N	N	N	N	N	N
CARRIER	Y/N	Y	Y	Y	Y	N	Y	Y	Y	N	N	N	N
SEAPLANE	Y/N	N	N	N	N	Y	N	N	N	N	Y	Y	Y
TORPEDO	Y/N	N	N	N	Y	N	N	N	Y	Y	N	N	Y
NIGHT	Y/N	N	N	N	N	Y	N	N	N	N	N	N	Y
ANTI-SUB	Y/N	N	N	N	N	N	N	N	N	N	N	N	N

WAKE ISLAND - Squadrons

SQUADRON NUMBER	1-126	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
PLANE TYPE	1-63	1	3	3	4	2	3	3	4	2	5	6	7	8	6	7	8	10	10	11	11	11	11	9	6	9	12
# OF AIRCRAFT	1-63	21	18	15	15	13	22	21	11	3	12	16	16	18	16	16	18	2	2	2	2	5	5	18	14	18	15
EXHAUSTION	0-7	7	7	7	7	7	7	7	7	3	6	5	5	5	5	5	5	7	7	7	7	6	6	5	7	5	6
EXPERIENCE	0-3	2	2	2	2	3	2	2	2	3	1	3	3	3	3	3	3	2	2	2	2	3	3	2	2	2	2
ADMIN	0-3	1	1	1	1	1	1	1	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	2
RECON OPS	Y/N	N	N	Y	N	N	N	Y	N	N	Y	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	N	N	N	Y
NIGHT OPS	Y/N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y
CARRIER OPS	Y/N	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N

WAKE ISLAND - Ship Classes

SHIP CLASS #	0-63	1	2	3	4	5	6	7	8	9	10	11	12
CLASS NAME	[8]	CV 1925	CA 1929B	CA 1931	CA 1933	DD 1934	DD 1935A	DD 1935B	DD 1936A	AO 1920	AO 1939	AP LARGE	CV 1935
ALLIED	Y/N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
SEAPLANE	Y/N	N	N	N	N	N	N	N	N	N	N	N	N
SHIP TYPE	0-4	0	1	1	1	2	2	2	2	4	4	4	0
MAX. SPEED	0-45	33	33	33	33	37	37	37	39	11	18	17	34
DISPLACEMENT	0-31	17	5	5	5	1	1	1	1	2	3	5	8
HEAVY AA	0-31	0	8	8	8	5	0	5	4	4	5	2	12
LIGHT AA	0-31	6	0	1	1	1	2	1	1	0	0	4	4
ARMOUR	0-15	6	3	2	5	0	0	0	0	0	0	0	2
PRIMARY GUNS	0-15	0	9	9	9	0	0	0	0	0	0	0	0
SEC. GUNS	0-15	0	0	0	0	3	4	3	2	2	1	1	6
TORP. TUBES	0-15	0	0	0	0	8	8	12	15	0	0	0	0
VULNERABILITY	0-7	1	3	3	3	3	4	3	3	0	1	1	2
ANTI-SUB	0-7	0	0	0	0	1	0	1	2	0	0	0	0
TORP. LOADS	0-3	0	0	0	0	1	1	1	1	0	0	0	0

SHIP CLASS #	0-63	13	14	15	16	17	18	19	20	21	22	23	24
CLASS NAME	[8]	CV 1937	CA 1925	CA 1926	CA 1937	CL 1918	CL 1923A	DD 1922B	DD 1925	DD 1938	APB FAST	AP SMALL	AP MED
ALLIED	Y/N	N	N	N	N	N	N	N	N	N	N	N	N
SEAPLANE	Y/N	N	Y	Y	Y	N	N	N	N	N	N	N	N
SHIP TYPE	0-4	0	1	1	1	2	2	2	2	2	2	4	4
MAX. SPEED	0-45	34	33	33	35	33	36	37	37	35	18	10	14
DISPLACEMENT	0-31	9	4	4	6	2	2	1	1	1	0	1	2
HEAVY AA	0-31	12	4	4	8	1	1	3	2	6	0	0	0
LIGHT AA	0-31	4	2	2	2	1	1	1	2	1	1	0	1
ARMOUR	0-15	2	1	1	6	2	2	0	0	0	0	0	0
PRIMARY GUNS	0-15	0	6	6	8	0	0	0	0	0	0	0	0
SEC. GUNS	0-15	6	0	2	4	4	6	2	1	3	1	0	0
TORP. TUBES	0-15	0	8	8	12	6	4	4	6	8	0	0	0
VULNERABILITY	0-7	2	3	3	5	1	2	2	3	5	2	1	1
ANTI-SUB	0-7	0	0	0	0	0	0	2	4	2	1	0	0
TORP. LOADS	0-3	0	2	2	2	2	2	1	1	2	0	0	0

WAKE ISLAND - Allied Task Groups

TASK GROUP #	1-23	1	2	3	4	5
FLAGSHIP	[-]	CA 36	DD390	LEXINGTON	DD366	AP 1
TOTAL SHIPS	[-]	11	2	11	2	1
OBJECTIVE	1-23	1	0	5	0	1
MISSION	0-7	0	6	0	6	5
HEADING	0-7	6	6	5	5	6
ENDURANCE	0-31	16	31	22	31	30
TF NUMBER	0-3	0	0	0	0	0
TF ADMIN	0-3	0	0	2	0	0
REINFORCEMENT	0-9	1	1	1	1	1
TF COMMAND	Y/N	Y	N	N	N	N
START AREA	Y[x,y]	83,27	83,25	83,34	83,25	83,34
SEARCH PATTERN	Y/N	SW,W NW		SW,W NW		

WAKE ISLAND - Carriers

CARRIER NUMBER	1-31	1	2	3	4
CARRIER NAME	[11]	LEXINGTON	SARATOGA	SORYU	HIRYU
AIR CAPACITY	1-127	90	90	71	73
SHIP CLASS #	1-63	1	1	12	13
TASK GROUP	1-23	3	1	1	1
ASSIGNED SQDS	[5]	1,2,3,4	5,6,7,8	11,12,13	14,15,16
SPOT NUMBER	0-31	6	6	6	6
DAMAGE STATUS	0-15	15	15	15	15
RADAR	0-7	1	1	0	0
DAMAGE CONTROL	0-3	0	0	1	1
AA ACCURACY	0-3	1	1	2	2

WAKE ISLAND - Bases

BASE NUMBER	1-23	1	2	3	4	5
NAME	[11]	WAKE ISLAND	MIDWAY	ROI	NAMUR	WOTJE
LOCATION	[x,y]	40,37	66,7	27,66	28,67	35,65
ASSIGNED SQDS	[10]	9	10	23,24	25	26
HEAVY AA	0-31	1	0	2	2	0
LIGHT AA	0-31	4	2	5	5	1
SPOT NUMBER	0-15	3	2	5	5	2
DAMAGE STATUS	0-15	10	15	15	15	15
AIRSTRIPE TYPE	0-7	1	0	2	2	0
RADAR	0-7	0	0	0	0	0
AA ACCURACY	0-3	2	0	1	1	0
DAMAGE CONTROL	0-3	1	0	0	0	0
THEATRE	0-1	0	0	0	0	0
ALLIED	Y/N	Y	Y	N	N	N
FIGHTER FAC.	Y/N	Y	N	Y	Y	N
BOMBER FAC.	Y/N	N	N	Y	Y	N
PORT FACILITIES	Y/N	Y	Y	Y	Y	Y
SEARCH PATTERN	Y/N		S,SW W,NW			N,NE E

WAKE ISLAND - Weather

MAP SECTOR	[12]	1	2	3	4	5	6	7	8	9	10	11	12
CONDITION	0-3	0	0	0	0	0	0	0	0	1	1	1	1
DIRECTION	0-7	3	3	3	3	2	2	2	2	2	2	2	2
RELIABILITY	0-1	1	1	1	1	1	1	1	1	1	1	1	1

WAKE ISLAND - Length

START HOUR	0-23	22
DAY	1-31	19
MONTH	1-12	12
YEAR	0-55	41
DAWN	3-10	6
DUSK	15-22	17
END HOUR	0-23	20
END DAY	1-9	6
FORECAST	0-3	1

3. Entering Names.

Complete the Scenario Name routine using the following information.

Axis

Theatre 0 - Inouye, Task Force 0 - Abe, Task Force 1 - Kajioaka.

Allies

Theatre 0 - Devereux, Task Force 0 - Fletcher.

Axis Task Groups

1	2	3
SORYU	CL 14	CA 3
6	14	7
1	1	0
0	5	3
4	1	1
24	28	20
0	1	1
3	1	2
1	0	0
Y	Y	N
33,0	25,55	28,56
E,SE S		NEE SE

WAKE ISLAND - Brief

NATIONALITY		AXIS	ALLIES
MORALE	0-3	2	2
PASSIVE ASW	0-3	0	1
FIRE CONTROL	0-3	2	1
INVASION MULT.	0-3	1	1
RADAR TECH.	0-3	0	0
AERIAL TORPEDOS	0-3	3	1
SURF. TORPEDOS	0-3	3	2
SUB TORPEDOS	0-3	3	0
ABORT DIRECTION	0-7	6	3
SURPRISED	Y/N	N	N
PARA-FRAGS	Y/N	N	N
CLEAR POINTS	Y/N	Y	Y
COASTWATCHER 1	Y/N	14,59	-
COASTWATCHER 2	Y/N	38,67	-
COASTWATCHER 3	Y/N	-	-
COASTWATCHER 4	Y/N	-	-
ANCHOR POINT 1	Y/N	-	-
ANCHOR POINT 2	Y/N	-	-

4. Clearing Map Points.

This is just a reminder that you must type (Y) on the <CLEAR MAP POINTS> line. Otherwise, every coastwatcher and anchor point will end up in hex location 0,0. This applies even if a side has no coastwatchers or anchor points at all!

5. Optional Task Groups.

The best way of storing the data necessary for the optional variants is to first build up the basic scenario data base. Save this effort on a save-game disk as the Wake Is. Relief scenario.

Now select another save location and save the data again, this time calling it Wake Is. Variant. Go back to the creation routines and enter all of the optional data. Once this is done, save into the Wake Is. Variant location.

6. Spot Numbers on US CV's.

The early model Wildcat and Dauntless aircraft carried aboard American CV's at this time did not have folding wings. This reduced the number that could be spotted at any one time by about 15 percent.

WAKE ISLAND - Other Ships

SHIP NUMBER	1-215	1	2	3	4	5	6	7	8	9	10
PENNANT NUMBER	[5]	CA 29	CA 33	CA 35	CA 34	CA 36	CA 38	DD 349	DD 350	DD 351	DD 352
SHIP CLASS #	1-63	2	3	3	4	4	4	5	5	5	5
DAMAGE STATUS	0-15	15	15	15	15	15	15	15	15	15	15
CARGO	0-7	0	0	0	0	0	0	0	0	0	0
RADAR	0-7	0	0	0	0	0	0	0	0	0	0
DAMAGE CONTROL	0-3	1	1	1	1	1	1	1	1	1	1
AA ACCURACY	0-3	1	1	1	1	1	1	1	1	1	1
TASK GROUP	1-23	3	3	3	1	1	1	3	3	3	3
ASS. SUB PATROL	Y/N	-	-	-	-	-	-	-	-	-	-
SUB DEPTH	0-7	-	-	-	-	-	-	-	-	-	-
SUB SPEED	0-7	-	-	-	-	-	-	-	-	-	-
SEAPLANE SQD	[1]	-	-	-	-	-	-	-	-	-	-

SHIP NUMBER	1-215	11	12	13	14	15	16	17	18	19	20
PENNANT NUMBER	[5]	DD 353	DD 355	DD 357	DD 360	DD 366	DD 387	DD 388	DD 389	DD 390	DD 391
SHIP CLASS #	1-63	5	5	6	6	7	8	8	8	8	8
DAMAGE STATUS	0-15	15	15	15	15	15	15	15	15	15	15
CARGO	0-7	0	0	0	0	0	0	0	0	0	0
RADAR	0-7	0	0	0	0	0	0	0	0	0	0
DAMAGE CONTROL	0-3	1	1	1	1	1	1	1	1	1	1
AA ACCURACY	0-3	1	1	1	1	1	1	1	1	1	1
TASK GROUP	1-23	3	3	1	3	4	1	1	1	2	1
ASS. SUB PATROL	Y/N	-	-	-	-	-	-	-	-	-	-
SUB DEPTH	0-7	-	-	-	-	-	-	-	-	-	-
SUB SPEED	0-7	-	-	-	-	-	-	-	-	-	-
SEAPLANE SQD	[1]	-	-	-	-	-	-	-	-	-	-

SHIP NUMBER	1-215	21	22	23	24	25	26	27	28	29	30
PENNANT NUMBER	[5]	DD 392	DD 393	AO 1	AO 2	AP 1	CA 1	CA 2	CA 3	CA 4	CA 17
SHIP CLASS #	1-63	8	8	9	10	11	14	14	15	15	16
DAMAGE STATUS	0-15	15	15	15	15	15	15	15	15	15	15
CARGO	0-7	0	0	0	0	10	0	0	0	0	0
RADAR	0-7	0	0	0	0	0	0	0	0	0	0
DAMAGE CONTROL	0-3	1	1	0	0	0	2	2	2	2	2
AA ACCURACY	0-3	1	1	0	1	0	1	1	1	1	1
TASK GROUP	1-23	1	1	2	4	5	3	3	3	3	1
ASS. SUB PATROL	Y/N	-	-	-	-	-	-	-	-	-	-
SUB DEPTH	0-7	-	-	-	-	-	-	-	-	-	-
SUB SPEED	0-7	-	-	-	-	-	-	-	-	-	-
SEAPLANE SQD	[1]	-	-	-	-	-	17	19	20	18	21

SHIP NUMBER	1-215	31	32	33	34	35	36	37	38	39	40
PENNANT NUMBER	[5]	CA 18	CL 1	CL 2	CL 14	DD 15	DD 21	DD 22	DD 24	DD 28	DD 29
SHIP CLASS #	1-63	16	17	17	18	19	19	19	20	20	20
DAMAGE STATUS	0-15	15	15	15	15	15	15	15	15	15	15
CARGO	0-7	0	0	0	0	0	0	0	0	0	0
RADAR	0-7	0	0	0	0	0	0	0	0	0	0
DAMAGE CONTROL	0-3	2	2	2	2	2	2	2	2	2	2
AA ACCURACY	0-3	1	1	1	1	1	1	1	1	1	1
TASK GROUP	1-23	1	2	2	2	2	2	2	3	2	2
ASS. SUB PATROL	Y/N	-	-	-	-	-	-	-	-	-	-
SUB DEPTH	0-7	-	-	-	-	-	-	-	-	-	-
SUB SPEED	0-7	-	-	-	-	-	-	-	-	-	-
SEAPLANE SQD	[1]	22	-	-	-	-	-	-	-	-	-

SHIP NUMBER	1-215	41	42	43	44	45	46	47	48	49	50
PENNANT NUMBER	[5]	DD 32	DD 33	DD 34	DD 99	DD 101	APB 1	APB 2	AP 1	AP 2	AP 3
SHIP CLASS #	1-63	20	20	20	21	21	22	22	23	24	24
DAMAGE STATUS	0-15	15	15	15	15	15	15	15	15	15	15
CARGO	0-7	0	0	0	0	0	2	2	4	7	6
RADAR	0-7	0	0	0	0	0	0	0	0	0	0
DAMAGE CONTROL	0-3	2	2	2	2	2	1	1	0	0	0
AA ACCURACY	0-3	1	1	1	1	1	0	0	0	0	0
TASK GROUP	1-23	3	2	3	1	1	2	2	2	2	2
ASS. SUB PATROL	Y/N	-	-	-	-	-	-	-	-	-	-
SUB DEPTH	0-7	-	-	-	-	-	-	-	-	-	-
SUB SPEED	0-7	-	-	-	-	-	-	-	-	-	-
SEAPLANE SQD	[1]	-	-	-	-	-	-	-	-	-	-

WAKE ISLANDS VARIATIONS

Ship Classes

SHIP CLASS #	0-63	25	26	27	28
CLASS NAME	[8]	CV 1936	CF 1938	CA 1929A	DD 1936B
ALLIED	Y/N	Y	Y	Y	Y
SEAPLANE	Y/N	N	N	N	N
SHIP TYPE	0-4	0	0	1	2
MAX. SPEED	0-45	33	32	33	39
DISPLACEMENT	0-31	10	4	5	1
HEAVY AA	0-31	8	8	8	4
LIGHT AA	0-31	5	2	1	1
ARMOUR	0-15	4	4	3	0
PRIMARY GUNS	0-15	0	0	10	0
SEC. GUNS	0-15	4	9	0	2
TORP. TUBES	0-15	0	0	0	15
VULNERABILITY	0-7	1	2	2	2
ANTI-SUB	0-7	0	0	0	2
TORP. LOADS	0-3	0	0	0	1

Squadrons

SQUADRON NUMBER	1-126	27	28	29	30	31
PLANE TYPE	1-63	2	3	3	4	3
# OF AIRCRAFT	1-63	18	19	16	14	18
EXHAUSTION	0-7	7	7	7	7	7
EXPERIENCE	0-3	2	2	2	2	2
ADMIN	0-3	1	1	1	1	1
RECON OPS	Y/N	N	N	Y	N	Y
NIGHT OPS	Y/N	N	N	N	N	N
CARRIER OPS	Y/N	Y	Y	Y	Y	Y

Task Groups

TASK GROUP #	1-23	6	7
FLAGSHIP	[-]	ENTERPRISE	SAN FRAN.
TOTAL SHIPS	[-]	11	3
OBJECTIVE	1-23	1	1
MISSION	0-7	0	3
HEADING	0-7	6	6
ENDURANCE	0-31	20	23
TF NUMBER	0-3	0	0
TF ADMIN	0-3	1	1
REINFORCEMENT	0-9	2	1
TF COMMAND	Y/N	N	N
START AREA	Y[x,y]	83,33	83,27
SEARCH PATTERN	Y/N	SW,W NW	SW,W NW

Carriers

CARRIER NUMBER	1-31	5	6
CARRIER NAME	[11]	ENTERPRISE	SAN FRAN.
AIR CAPACITY	1-127	96	24
SHIP CLASS #	1-63	25	26
TASK GROUP	1-23	6	7
ASSIGNED SQDS	[5]	27-30	31
SPOT NUMBER	0-31	6a	2
DAMAGE STATUS	0-15	15	15
RADAR	0-7	1	1
DAMAGE CONTROL	0-3	0	0
AA ACCURACY	0-3	1	1

Other Ships

SHIP NUMBER	1-215	51	52	53	54	55	56	57	58	59	60	61	62	63
PENNANT #	[5]	CA 25	CA 26	CA 27	CA 39	DD 356	DD 367	DD 368	DD 378	DD 379	DD 384	DD 385	DD 380	DD382
SHIP CLASS	1-63	27	2	2	4	6	7	7	7	7	7	7	28	28
DAM. STAT.	0-15	15	15	15	15	15	15	15	15	15	15	15	15	15
CARGO	0-7	0	0	0	0	0	0	0	0	0	0	0	0	0
RADAR	0-7	0	0	0	0	0	0	0	0	0	0	0	0	0
DAM. CONT.	0-3	1	1	1	1	1	1	1	1	1	1	1	1	1
AA ACCURACY	0-3	1	1	1	1	1	1	1	1	1	1	1	1	1
TASK GROUP	1-23	6	6	6	1	6	6	6	6	6	6	6	7	7
SUB PATROL	Y/N	-	-	-	-	-	-	-	-	-	-	-	-	-
SUB DEPTH	0-7	-	-	-	-	-	-	-	-	-	-	-	-	-
SUB SPEED	0-7	-	-	-	-	-	-	-	-	-	-	-	-	-
SEAPLANE	[1]	-	-	-	-	-	-	-	-	-	-	-	-	-

COMING UP IN OUR NEXT ISSUE...

JAPAN SWEEPS SOUTH

From Kota Baru to Sunda Strait
December 1941 - March 1942

Japan Sweeps South is a series of short, loosely connected scenarios recreating the whirlwind campaign directed against Commonwealth and Dutch possessions in South East Asia. A common data base is used from which forces are selected as required. A wide range of optional forces, both land and air, are included to allow you to examine the numerous 'what ifs' which characterized this period.

For Those of Us Who Have to Play and Run...
TRY THESE SHORT VERSIONS OF THE
EUROPE ABLAZE
SCENARIOS

*All of the historical scenarios which accompany **Europe Ablaze** are in excess of 20 days in length. This makes for an average of about 5 hours to complete a scenario.*

For many of us, there is not always that much time available.

These three short versions of the historical scenarios are intended to rectify this problem. They can be played through to a conclusion in a comfortable couple of hours.

The small amount of data editing which needs to be done to activate these scenarios appears herewith.

Finally, you will need to prepare a save-game disk.

SHORT VERSION No. 1
THEIR FINEST HOUR
 13-17 Aug, 1940

Select the following menus and make the listed alterations.

MENU 5 (Weather)

C = 4 W = 3	C = 4 W = 2	C = 3 W = 1
C = 4 W = 2	C = 4 W = 3	C = 4 W = 2
C = 3 W = 2	C = 3 W = 3	C = 4 W = 3
C = 5 W = 4	C = 4 W = 3	C = 5 W = 4

MENU 9 (Time)
 Date = 13
 Length = 4
 Moon = 13

MENU 11 (Score)
 Threshold Values (Axis)
 Luftflotte 5 = 20
 Luftflotte 2 = 80
 Luftflotte 3 = 80
 Threshold Values (Allies)
 10 Group = 20
 11 Group = 50
 12/13 Group = 20
 Coastal Cmd = 0
 Bomber Cmd = 0

SHORT VERSION No. 2
ENEMY COAST AHEAD
 23-29 Jul, 1943

Select the following menus and make the listed alterations.

MENU 9 (Time)
 Length = 6

MENU 11 (Score)
 Threshold Values (Axis)
 Luftflotte 3 = 80
 Reichsvert. = 70
 Threshold Values (Allies)
 Bomber Cmd = 240
 8th Air Force = 160
 Fighter Cmd 3 = 70

SHORT VERSION No. 3
PIERCING THE REICH
 3-8 Feb, 1944

Select the following menus and make the listed alterations.

MENU 9 (Time)
 Length = 5

MENU 11 (Score)
 Threshold Values (Axis)
 Luftflotte 3 = 60
 Reichsvert. = 100
 Threshold Values (Allies)
 Bomber Cmd = 200
 8th Air Force = 580
 2nd Tac A. F. = 100

THE BLITZ

A EUROPE ABLAZE SCENARIO

BY IAN TROUT

By the end of August, 1940, the Luftwaffe had plainly failed in its plan to reduce the RAF to impotence in preparation for a September invasion of the British Isles. Something needed to be done to get the program back on schedule.

It was hoped, and expected, that a terror-bombing campaign directed against major population centres would unnerve and or paralyse the British Government into submission.

The assault began on September 7th...

THE SITUATION

As early as July 12th, 1940, the German High Command had determined that complete air superiority would be a necessary prerequisite for a successful cross-channel invasion of England.

To this end, the original two-fold plan envisioned the destruction of Fighter Command within four days and complete mastery of the air within four weeks.

By August 19th, after six days of heavy fighting, the *Luftwaffe* had lost some 550 aircraft without appreciably achieving any part of their plan. Fighter Command's operational strength stood at 630 single engined fighters, much the same as it had been at the end of July.

A second period of intensive fighting followed. Between August 23rd - 31st a further 336 German aircraft were destroyed. Again, little progress was made toward the expected mastery of British airspace. Indeed, a strong case could be made that Fighter Command was in a better position now than it had been at the beginning of the month.

Notwithstanding these reverses the German Air Force Staff, blinded perhaps by the prevailing spirit of *Blitzkrieg*, endeavoured to formulate a new plan to effect their goals. At no time did they seriously come to terms with the fact that both their tactics and equipment were inadequate to deal with the enemy.

The German medium bomber force of Dornier

17s, Heinkel 111s and Junkers 88s did not have the speed to evade such high performance fighters as the Hurricane and Spitfire and this, coupled with their feeble armament, made them easy prey.

The Bf 110 escort fighter proved incapable of providing cover for the bombers. In fact, its dismal showing against RAF fighters compelled the use of a single engined escort for these types as well, further stretching the fighter resources of the *Luftwaffe*.

Put simply, the *Luftwaffe* did not have enough single engine fighters to achieve a decisive result against Fighter Command. Furthermore, the limited endurance of the Bf 109E restricted air cover to the regions south of London. The bulk of British industrial capacity lay in the midlands.

On the night of August 25th, a force of Wellingtons from RAF Bomber Command struck at targets in and around Berlin. Little real damage was done but it appears this action was the spur behind Hitler's directive to the *Luftwaffe*, dated September 2nd, to commence attacks by day and by night on the populations and defences of the larger cities, particularly London.

It is unlikely that this strategy would have been adopted had the previous plans met with even a small measure of success. The change of plan was, in part, a tacit admission of failure by the *Luftwaffe* High Command. There is little doubt, however, that a lingering hope remained that Fighter Command might finally be exhausted and that victory could be snatched at the last moment.

On the afternoon of September 7th, a force of 372 medium bombers, accompanied by a large escort of single and twin engined fighters, struck at the London dockyards causing large fires and considerable damage. In the evening, 255 medium bombers followed up the daylight raid and, using the still burning fires as target markers, added to the destruction.

This pattern was repeated over the succeeding days and nights. The cost, however, was again prohibitive. In the first eight days of the offensive, 200 bombers and 100 fighters did not return.

As is ever the case when things go wrong, arguments over correct operating procedure split the *Luftwaffe*. Accusations and counter-accusations between the fighter and bomber arms forced Goering's direct intervention in the dispute. Dismayed by their inability to defend themselves against British fighters, the bomber arm demanded a close escort. The fighter arm argued for a freelance approach to escort duties, thereby giving themselves an opportunity to engage Fighter Command on an equal footing, albeit at the risk of exposing the vulnerable bombers.

Goering decided on a conservative approach and tied the fighter *gruppen* to a rigid doctrine of tight escort. In consequence, the RAF could usually count on the advantages of surprise, initiative, altitude, speed and, above all, fighting spirit. *Luftwaffe* morale, especially amongst the fighter arm, plummeted.

By the end of September, German losses were out of all proportion with the results achieved.

The tactics changed again.

THE SCENARIO

The *Luftwaffe* has somewhat reorganized its forces since August 10th. The bulk of the fighter *gruppen* attached to *Luftflotte 3* have been transferred to *Luftflotte 2*. Approximately half of the medium bombers assigned to *Luftflotte 5* have also joined *Luftflotte 2*.

Luftflotte 2 is operating by day. *Luftflotte 3* is operating by night.

The best results will be achieved by round the clock strikes against London. As the German player(s), make sure you allocate sufficient fighters to sweeps to maintain continuous fighter protection.

Large missions are best scheduled for the afternoon. Early morning fog at this time of year is almost certain to force a delayed take-off of some squadrons. Furthermore, if you've stirred up the Allied fighters in the morning with raids, harassments and sweeps, then it's possible they may be getting just a bit tired by the time your missions strike. Be careful to leave enough daylight for your aircraft to return to base before nightfall. Squadrons untrained for night operations are very vulnerable to accident when landing at night.

As a useful rule of thumb, don't use bomber squadrons unless they have at least 70% of their total aircraft in an operational condition. Even more importantly, don't fly in bad weather. Restrict your major operations to target areas identified as having good weather. The computer will automatically stand down any non-fighter squadron which does not receive an assignment. Fresh crews bomb much better than tired crews.

The Allied player(s) are faced with much the same problems they have in the *Their Finest Hour* scenario. The cream of the RAF's fighter pilots have been transferred to 11 Group and this area will bear the brunt of the attack. Don't be afraid to commit all your fighters when directing 11 Group; the computer knows when you've run out of reserves and will do its best to help you out.

Conversely, if you're playing 12/13 Groups and the computer controls 11 Group, keep an eye on enemy activity over south east England and when the action hots up, pitch in and help.

You can expect about 30% of the German bombing effort to come at night. You don't have many night-fighters so there's not much you can do about it. Keep in mind that the German target locating beams are pretty well neutralized by electronic counter-measures and that the German night raids are most likely to be ineffective.

There's not much Bomber or Coastal Command can do. If you get any points at all while controlling these commands, you can give yourself a pat on the back.

SOME VARIATIONS

There has probably been more historical speculation over what could have happened in this campaign than any other in the entire second world war. The list included with this scenario is by no means exhaustive, but it does provide some idea of the potential you have to experiment with history.

1. Bigger Bombs.

The quality of high explosive used by the *Luftwaffe* was excellent. However, they suffered from a chronic shortage of 1,000 kg (1 ton) bombs. Twenty 50 kg bombs just don't pack the same punch as a single big one. Enter Menu 12 (Doctrine) and alter the the Axis Ordnance Effect rating to 3 to reflect a greater availability.

2. Better Bomber Armament.

The German medium bombers used in the battle were designed to rely on speed rather than firepower to defend themselves from enemy fighter attack. By 1940, however, fighter design had advanced to the point where any modern fighter could easily out-perform the bombers of the day.

Enter Menu 14 (Plane Creation) and modify the German medium bombers (NUM's 22-24) as follows. To each, increase firepower by 2 and reduce payload by 1.

3. Drop Tanks.

At this period of the war, the use of jettisonable fuel tanks to increase a fighter's endurance was still in the experimental stage. Assume this technology had been available to the *Luftwaffe*.

Enter Menu 14 (Plane Creation) and increase the fuel capacity of the Bf 109E (NUM 18) to 28. Be warned that this modification makes a

big difference to the outcome of the game.

4. British Radar and GCI.

A major part of the British success in the Battle of Britain can be attributed to the sophisticated (for the time) relationship between the radar locating stations and Ground Controlled Interception procedures. To examine how great an effect these had on the outcome of the battle, we can make a few alterations to the data to reduce their contribution to the conflict.

Enter Menu 18 (Radar Station Creation) and reduce the reliability rating to 0. Enter Menu 14 (Plane Creation) and reduce the radar rating of British fighters (NUM's 1-3) to 3.

5. Full Campaign.

Early in October, bad weather called a halt to operations. The Battle of Britain was lost to the *Luftwaffe* and while night attacks and anti-shipping patrols were to continue for some time, large-scale daylight operations were abandoned.

In this variant, we'll give the *Luftwaffe* some more punch and extend the length of time available.

Use the *Wever's Plan* variant from Chapter 4 in the Design Manual. Enter Menu 9 (Time) and increase the length of the scenario to 24 days. Enter Menu 11 (Score) and change the threshold values as follows.

Allies - 10 Group (20), 11 Group (120), 12/13 Groups (20), Coastal Command (0), Bomber Command (0).

Axis - *Luftflotte 5* (0), *Luftflotte 2* (700), *Luftflotte 3* (80).

If you use the drop tank capable Bf 109Es in this variant, increase *Luftflotte 2's* threshold to 850.

SOME NOTES

Use the *Their Finest Hour* scenario as the template to build this scenario. If you're not sure what this means, read chapters 4 and 5 in the design Manual and try your hand at creating the scenario variation example given there.

Don't clear the map. There is also no need to clear the other data. Many of the data bases require few, if any, alterations. Read the DATA NOTES on page 15 for a description of which data bases must be altered.

Note that full data base information is provided for those who prefer to re-enter everything or would like an opportunity to examine the information on the printed page.

THE BLITZ - Plane Types (0)

PLANE NUMBER	1-37	1	2	3	4	5	6	7	8	9	10
PLANE TYPE	[11]	Hurricane 2	Spitfire IA	Gladiator	Defiant I	Blenheim IF	Battle	Anson I	Hudson II	Blen. IVB	Wellington
ROLE	0-3	0	0	0	0	0	2	2	2	2	2
CREW SIZE	0-7	1	1	1	1	3	3	3	4	3	5
FUEL CAPACITY	1-255	35	27	28	27	61	57	56	138	71	153
PAYLOAD	0-63	0	0	0	0	0	4	1	6	5	16
SERVICE CEILING	11-41	36	32	33	30	27	25	19	27	22	18
MAXIMUM SPEED	1-41	16	18	13	15	14	13	11	13	13	12
OPTIMUM ALTITUDE	1-31	18	15	15	17	15	15	10	15	12	16
CRUISING SPEED	1-31	10	11	11	13	11	10	8	10	11	10
CLIMB RATE	1-15	14	13	11	10	7	6	5	8	8	6
FIREPOWER	0-7	4	4	3	2	3	1	1	2	2	3
MANOEUVRABILITY	0-7	6	6	7	4	3	3	2	3	3	2
VULNERABILITY	0-7	3	4	2	4	3	3	3	4	3	4
RADAR	0-7	6	6	6	0	0	0	0	0	0	0
REPLACEMENT RATE	0-7	5	5	0	1	1	1	1	0	3	3
ECM	0-7	0	0	0	0	0	0	0	0	0	0
ALLIED	Y/N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
NIGHT	Y/N	N	N	Y	Y	Y	N	N	N	Y	Y

PLANE NUMBER	1-37	11	12	13	14	15	16	17	18	19
PLANE TYPE	[11]	Whitley IV	Hampden I	Stanraer	Sunderland	London II	Beaufort	Spitfire PR	Bf 109E	Bf 110C
ROLE	0-3	2	2	2	2	2	2	3	0	1
CREW SIZE	0-7	5	4	6	7	6	4	1	1	3
FUEL CAPACITY	1-255	104	149	120	189	129	107	49	18	48
PAYLOAD	0-63	24	14	4	17	7	6	0	0	4
SERVICE CEILING	11-41	26	23	19	18	20	17	32	34	33
MAXIMUM SPEED	1-41	12	13	8	11	8	13	20	18	17
OPTIMUM ALTITUDE	1-31	16	16	6	5	3	6	15	12	20
CRUISING SPEED	1-31	11	8	5	7	7	9	15	14	11
CLIMB RATE	1-15	5	4	6	4	6	7	14	15	10
FIREPOWER	0-7	2	3	2	5	2	3	0	5	5
MANOEUVRABILITY	0-7	2	2	0	0	0	3	7	5	3
VULNERABILITY	0-7	3	3	3	4	2	2	4	4	3
RADAR	0-7	0	0	0	0	0	0	0	3	3
REPLACEMENT RATE	0-7	1	0	0	1	0	1	0	4	2
ECM	0-7	0	0	0	0	0	0	0	0	0
ALLIED	Y/N	Y	Y	Y	Y	Y	Y	Y	N	N
NIGHT	Y/N	Y	Y	Y	Y	Y	N	N	N	N

PLANE NUMBER	1-37	20	21	22	23	24	25	26	27	28
PLANE TYPE	[11]	Bf 110D	Ju 87B	Ju 88A	Do 17Z	He 111H	He 115B	Fw 200C	Bf 109D	Ju 88C
ROLE	0-3	1	2	2	2	2	2	2	0	0
CREW SIZE	0-7	3	2	4	4	5	3	5	1	3
FUEL CAPACITY	1-255	68	27	85	69	83	148	131	19	67
PAYLOAD	0-63	3	4	27	8	24	9	10	0	0
SERVICE CEILING	11-41	33	27	30	23	26	17	22	29	30
MAXIMUM SPEED	1-41	16	12	14	13	13	9	11	16	15
OPTIMUM ALTITUDE	1-31	11	11	11	11	11	3	14	12	18
CRUISING SPEED	1-31	10	8	4	3	2	9	10	13	12
CLIMB RATE	1-15	3	1	2	2	3	3	5	13	5
FIREPOWER	0-7	3	4	3	3	2	1	4	4	4
MANOEUVRABILITY	0-7	3	2	4	3	3	3	2	5	3
VULNERABILITY	0-7	3	3	3	4	2	2	2	3	4
RADAR	0-7	0	0	0	0	0	0	0	3	0
REPLACEMENT RATE	0-7	0	2	4	0	5	0	0	0	1
ECM	0-7	0	0	0	0	0	0	0	0	0
ALLIED	Y/N	N	N	N	N	N	N	N	N	N
NIGHT	Y/N	Y	N	N	N	N	N	N	N	Y

THE BLITZ - Weather

C = 3 W = 0	C = 4 W = 2	C = 4 W = 2
C = 3 W = 2	C = 3 W = 1	C = 4 W = 1
C = 4 W = 1	C = 3 W = 0	C = 3 W = 1
C = 4 W = 0	C = 3 W = 0	C = 4 W = 1

THE BLITZ - Doctrine

	AXIS	ALLIES
MISSIONS	0-15	4
POPULATION	0-7	7
INDUSTRY	0-7	5
COMMUNICATIONS	0-7	1
PORT FACILITIES	0-7	4
AIRFIELDS	0-7	2
RADAR	0-7	2
SHIPPING	0-7	3
SUPREME COMMANDER	0-7	4
C-IN-C	0-7	2
GROUND ECM	0-7	0
ORDNANCE EFFECT	0-3	2
AA FIRE CONTROL	0-3	2

DATA NOTES

It is not actually necessary to <CLEAR ALL DATA> when creating this scenario. Much of the information in it is unchanged from the **Their Finest Hour** scenario. The bracketed number after each data heading informs you of the number of entries in that data base which need to be changed. Data bases without a bracketed number must be entered in their entirety.

THE BLITZ - Squadrons (Allies-73; Axis-All)

SQD NUMBER	1-255	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
SQD I.D.	[6]	1	3	17	19	23	25	29	32	41	43	46	54	56	64	65
PLANE TYPE	1-37	1	1	1	2	5	5	5	1	2	2	1	2	1	2	2
OFFICIAL EST.	1-31	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
INITIAL EST.	1-31	14	14	16	14	15	15	13	14	12	12	13	13	12	15	14
# VET	1-31	3	2	3	2	4	4	4	0	2	2	3	0	1	3	0
# EXP	1-31	14	12	14	10	8	10	8	10	13	15	11	6	10	10	8
FATIGUE	0-7	5	6	6	6	7	6	7	6	6	5	6	7	7	5	6
NIGHT OPS	Y/N	N	N	N	N	Y	Y	Y	N	N	N	N	N	N	N	N
RECON OPS	Y/N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
NAVAL OPS	Y/N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
PATHFINDER	Y/N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

SQD NUMBER	1-255	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
SQD I.D.	[6]	66	72	73	74	79	85	87pt	92	111	141pt	145	151	152	213	219
PLANE TYPE	1-37	2	2	1	2	1	1	1	2	1	4	1	1	2	1	5
OFFICIAL EST.	1-31	16	16	16	16	16	16	8	16	16	8	16	16	16	16	16
INITIAL EST.	1-31	14	13	14	15	12	15	8	15	12	8	12	12	14	14	16
# VET	1-31	2	2	3	0	2	3	0	1	3	0	0	1	2	1	3
# EXP	1-31	10	11	11	10	11	10	8	10	10	8	10	10	12	11	10
FATIGUE	0-7	7	5	6	6	5	5	6	7	6	7	7	7	6	6	7
NIGHT OPS	Y/N	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	Y
RECON OPS	Y/N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
NAVAL OPS	Y/N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
PATHFINDER	Y/N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

SQD NUMBER	1-255	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
SQD I.D.	[6]	222	229	232	234	238	242	245	247	249	253	257	264	266	302POL	310 CZ
PLANE TYPE	1-37	2	1	1	2	1	1	1	3	1	1	1	4	2	1	1
OFFICIAL EST.	1-31	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
INITIAL EST.	1-31	14	14	14	14	16	13	12	5	15	14	13	14	14	16	15
# VET	1-31	2	1	1	1	0	2	1	1	2	3	3	1	2	0	2
# EXP	1-31	12	11	11	10	10	8	9	4	11	10	10	10	13	10	10
FATIGUE	0-7	5	7	7	6	6	7	6	7	5	5	5	7	6	7	6
NIGHT OPS	Y/N	N	N	N	N	N	N	N	N	N	N	N	Y	N	N	N
RECON OPS	Y/N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
NAVAL OPS	Y/N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
PATHFINDER	Y/N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

SQD NUMBER	1-255	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
SQD I.D.	[6]	501	504	600	601	602	603	604	605	607	609	610	611	615	616	FIU
PLANE TYPE	1-37	1	1	5	1	2	2	5	1	1	2	2	2	1	2	5
OFFICIAL EST.	1-31	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
INITIAL EST.	1-31	12	16	13	12	12	16	14	14	12	16	14	16	13	13	12
# VET	1-31	2	2	1	2	2	2	0	0	0	2	0	0	0	0	1
# EXP	1-31	12	10	10	12	12	10	12	13	12	6	6	8	7	11	11
FATIGUE	0-7	5	6	6	6	6	6	7	7	6	6	6	6	7	7	7
NIGHT OPS	Y/N	N	N	Y	N	N	N	Y	N	N	N	N	N	N	N	Y
RECON OPS	Y/N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
NAVAL OPS	Y/N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
PATHFINDER	Y/N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

SQD NUMBER	1-255	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
SQD I.D.	[6]	53	500	254	612	48	321	206	235	279	1 PRU	107	110	82	15	21
PLANE TYPE	1-37	5	7	9	7	8	7	8	5	8	17	9	9	9	9	9
OFFICIAL EST.	1-31	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
INITIAL EST.	1-31	16	15	15	16	16	15	16	16	15	12	16	16	16	16	14
# VET	1-31	1	1	0	1	0	0	0	0	0	4	1	0	0	2	0
# EXP	1-31	13	13	14	12	15	13	16	14	14	8	15	16	14	13	11
FATIGUE	0-7	6	6	6	6	7	7	7	7	6	7	7	7	7	7	7
NIGHT OPS	Y/N	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Y
RECON OPS	Y/N	N	Y	N	Y	Y	Y	Y	N	Y	Y	N	N	N	N	N
NAVAL OPS	Y/N	N	Y	Y	Y	Y	Y	Y	N	Y	N	N	N	N	N	N
PATHFINDER	Y/N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

SQD NUMBER	1-255	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
SQD I.D.	[6]	40	101	99	149	38	115	9	57	37	75 NZ	214	51	10	58	77
PLANE TYPE	1-37	9	9	10	10	10	10	10	10	10	10	10	11	11	11	11
OFFICIAL EST.	1-31	16	16	16	16	16	16	16	16	16	16	16	24	16	16	16
INITIAL EST.	1-31	16	16	16	16	16	15	16	15	15	15	14	24	16	15	16
# VET	1-31	3	4	2	3	1	0	2	2	0	0	1	4	0	0	0
# EXP	1-31	13	11	14	12	13	13	14	12	15	15	13	19	16	15	16
FATIGUE	0-7	7	7	7	7	6	7	7	7	7	6	7	7	7	6	7
NIGHT OPS	Y/N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
RECON OPS	Y/N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N
NAVAL OPS	Y/N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
PATHFINDER	Y/N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

THE BLITZ - Squadrons (cont.)

SQD NUMBER	1-255	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105
SQD I.D.	[6]	102	78	61	144	49	83	44	50	106	210	300POL	301POL	103	150	18
PLANE TYPE	1-37	11	11	12	12	12	12	12	12	12	14	6	6	6	6	9
OFFICIAL EST.	1-31	24	16	16	24	24	24	16	24	24	12	16	16	16	16	16
INITIAL EST.	1-31	23	16	15	22	23	23	16	24	23	10	9	10	7	7	16
# VET	1-31	0	3	0	0	1	0	0	0	0	1	3	2	2	1	0
# EXP	1-31	22	13	13	20	21	23	16	22	22	6	7	7	4	6	14
FATIGUE	0-7	7	7	7	6	6	7	7	6	7	7	6	5	3	4	7
NIGHT OPS	Y/N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	Y
RECON OPS	Y/N	N	N	N	N	N	N	Y	N	N	Y	N	N	N	N	Y
NAVAL OPS	Y/N	N	N	N	N	N	N	N	N	N	Y	N	N	Y	Y	N
PATHFINDER	Y/N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

SQD NUMBER	1-255	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
SQD I.D.	[6]	12	142	105	114	139	218	311 CZ	217	88	226	223	224	240	42	269
PLANE TYPE	1-37	6	6	9	9	9	9	10	7	6	6	8	8	15	16	8
OFFICIAL EST.	1-31	16	16	16	16	16	16	16	16	16	16	16	16	12	16	16
INITIAL EST.	1-31	5	6	15	16	16	16	16	16	9	11	16	16	8	14	14
# VET	1-31	1	2	0	2	2	1	2	0	0	0	0	1	0	1	1
# EXP	1-31	5	4	14	13	11	14	13	15	6	8	16	15	7	11	12
FATIGUE	0-7	3	3	7	6	6	7	7	7	7	7	7	6	7	6	7
NIGHT OPS	Y/N	N	N	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N
RECON OPS	Y/N	N	N	N	N	N	N	N	Y	N	N	Y	Y	Y	N	Y
NAVAL OPS	Y/N	Y	Y	N	N	N	N	N	Y	N	N	Y	Y	Y	Y	Y
PATHFINDER	Y/N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

SQD NUMBER	1-255	121	122	123	124	125	126	127	128	130	131	132	133	134	135	136
SQD I.D.	[6]	236	502	220	608	10 OZ	209	228	230	1/KG1	2/KG1	3/KG1	1/KG76	2/KG76	3/KG76	1/KG2
PLANE TYPE	1-37	9	7	8	8	14	13	14	14	24	24	22	23	22	23	23
OFFICIAL EST.	1-31	16	16	16	16	12	12	12	12	30	30	30	30	30	30	30
INITIAL EST.	1-31	14	16	14	15	7	10	10	9	30	30	9	26	27	30	30
# VET	1-31	1	1	0	1	1	0	0	0	3	6	3	4	7	4	3
# EXP	1-31	12	14	12	14	6	8	9	9	20	15	12	17	19	16	19
FATIGUE	0-7	7	6	7	6	7	7	6	7	6	6	0	7	5	7	5
NIGHT OPS	Y/N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N
RECON OPS	Y/N	N	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N
NAVAL OPS	Y/N	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N
PATHFINDER	Y/N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

SQD NUMBER	1-255	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151
SQD I.D.	[6]	2/KG2	3/KG2	1/KG3	2/KG3	3/KG3	bF/122	1/KG53	2/KG53	3/KG53	aF/22	2/SG1	4S/LG1	EGr210	2K/LG2	2/SG2
PLANE TYPE	1-37	23	23	23	23	23	24	24	24	24	19	21	21	19	23	21
OFFICIAL EST.	1-31	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
INITIAL EST.	1-31	30	30	30	30	28	24	23	29	24	18	30	30	26	30	30
# VET	1-31	6	5	7	6	5	4	6	5	5	5	2	3	4	4	3
# EXP	1-31	16	18	19	20	16	12	19	11	19	17	12	13	17	19	16
FATIGUE	0-7	7	6	6	7	5	7	6	7	6	6	7	6	6	5	6
NIGHT OPS	Y/N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N
RECON OPS	Y/N	N	N	N	N	N	Y	N	N	N	Y	N	N	N	N	N
NAVAL OPS	Y/N	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	N	Y
PATHFINDER	Y/N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

SQD NUMBER	1-255	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166
SQD I.D.	[6]	3/KG4	aF/122	1/KG4	2/KG4	b/NJG2	e/Lehr	1/JG51	2/JG51	3/JG51	2/JG53	KGri26	1/ZG26	2/ZG26	3/ZG26	1/JG77
PLANE TYPE	1-37	22	22	24	24	20	27	18	18	18	18	24	19	19	19	18
OFFICIAL EST.	1-31	30	30	30	30	10	30	30	30	30	30	30	30	30	30	30
INITIAL EST.	1-31	30	21	30	30	9	18	30	27	30	30	30	30	27	26	30
# VET	1-31	2	2	2	3	0	0	7	8	3	7	6	7	4	6	8
# EXP	1-31	12	11	17	11	6	8	16	13	11	12	16	20	18	18	20
FATIGUE	0-7	7	6	6	6	7	7	7	7	7	7	7	7	6	6	6
NIGHT OPS	Y/N	N	N	N	N	Y	N	N	N	N	N	Y	N	N	N	N
RECON OPS	Y/N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N
NAVAL OPS	Y/N	N	Y	N	N	N	N	N	N	N	N	Y	N	N	N	N
PATHFINDER	Y/N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

SQD NUMBER	1-255	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181
SQD I.D.	[6]	2/ZG76	3/ZG76	1/ZG2	2/ZG2	1/JG3	2/JG3	3/JG3	a/NJG2	1/JG54	2/JG54	3/JG54	2/JG52	1/JG26	2/JG26	3/JG26
PLANE TYPE	1-37	19	19	19	19	18	18	18	20	18	18	18	18	18	18	18
OFFICIAL EST.	1-31	30	30	30	30	30	30	30	10	30	30	30	30	30	30	30
INITIAL EST.	1-31	27	21	21	28	26	24	25	9	28	30	29	28	27	30	29
# VET	1-31	8	6	4	2	3	7	8	2	5	3	3	3	8	4	7
# EXP	1-31	16	16	11	16	20	16	12	5	15	18	16	16	13	20	16
FATIGUE	0-7	6	7	6	6	6	6	5	7	6	5	7	6	7	7	7
NIGHT OPS	Y/N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N
RECON OPS	Y/N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
NAVAL OPS	Y/N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
PATHFINDER	Y/N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

THE BLITZ - Squadrons (cont.)

SQD NUMBER	1-255	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196
SQD I.D.	[6]	3/JG53	1/JG27	2/JG27	3/JG27	3/JG52	1/KG26	3/KG26	1/KG30	3/KG30	1/KG77	2/KG77	3/KG77	1/JG52	KGr806	5Z/LG1
PLANE TYPE	1-37	18	18	18	18	18	24	24	22	22	22	22	22	18	22	19
OFFICIAL EST.	1-31	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
INITIAL EST.	1-31	30	30	30	30	30	28	29	11	30	30	30	30	23	27	23
# VET	1-31	8	5	8	7	5	3	6	4	4	2	6	2	16	6	6
# EXP	1-31	11	18	12	19	17	15	14	12	19	14	20	15	4	12	16
FATIGUE	0-7	6	6	7	6	7	7	5	0	7	7	7	7	6	5	7
NIGHT OPS	Y/N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N
RECON OPS	Y/N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
NAVAL OPS	Y/N	N	N	N	N	N	Y	Y	Y	Y	N	N	N	N	N	N
PATHFINDER	Y/N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

SQD NUMBER	1-255	197	198	199	200	201	202	203	204	205	206	207	208	209	210
SQD I.D.	[6]	1/KG51	2/KG51	3/KG51	1/KG54	2/KG54	1/KG55	2/KG55	3/KG55	aF/123	1K/LG1	2K/LG1	3K/LG1	1/KG27	2/KG27
PLANE TYPE	1-37	22	22	22	22	22	24	24	24	24	22	22	22	24	24
OFFICIAL EST.	1-31	30	30	30	30	30	30	30	30	30	30	30	30	30	30
INITIAL EST.	1-31	30	30	30	30	26	27	30	25	20	27	30	30	30	30
# VET	1-31	5	5	6	4	5	6	4	2	3	2	3	5	3	5
# EXP	1-31	11	16	17	17	15	17	13	15	16	11	19	17	12	11
FATIGUE	0-7	6	6	7	5	6	7	7	5	6	7	6	6	7	6
NIGHT OPS	Y/N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
RECON OPS	Y/N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N
NAVAL OPS	Y/N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N
PATHFINDER	Y/N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

SQD NUMBER	1-255	211	212	213	214	215	216	217	218	219	220	221	222	223	224
SQD I.D.	[6]	3/KG27	1/JG2	2/JG2	3/JG2	KGr606	aF/31	KGr100	bF/121	1/KG40	KFG106	1/SG3	1/JG53	aF/121	KFG506
PLANE TYPE	1-37	24	18	18	18	23	19	24	22	26	25	21	18	24	25
OFFICIAL EST.	1-31	30	30	30	30	30	30	30	30	30	30	30	30	30	30
INITIAL EST.	1-31	20	29	22	30	30	27	28	23	10	28	30	30	20	24
# VET	1-31	2	8	3	6	2	3	5	4	5	2	3	6	2	4
# EXP	1-31	15	11	11	19	7	15	15	11	8	13	14	14	16	11
FATIGUE	0-7	6	7	6N	7	6	6	6	7	7	6	7	5	7	7
NIGHT OPS	Y/N	Y	N	Y	N	Y	N	Y	N	N	Y	N	N	Y	Y
RECON OPS	Y/N	N	N	N	N	N	Y	N	Y	Y	Y	N	N	Y	Y
NAVAL OPS	Y/N	N	N	N	N	N	N	N	Y	Y	Y	Y	N	Y	Y
PATHFINDER	Y/N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N

SQD NUMBER	1-255	225	226	227	228	229	230	231	232	233	234	248	249	250	251
SQD I.D.	[6]	bF/22	2/JG77	c/NJG1	a/NJG1	a/Lehr	b/NJG1	b/Lehr	c/NJG2	c/Lehr	d/Lehr	1/RCAF	303POL	141pt	87pt
PLANE TYPE	1-37	23	18	28	20	27	20	27	28	27	27	1	1	4	1
OFFICIAL EST.	1-31	30	30	10	10	30	10	30	10	30	30	16	16	8	8
INITIAL EST.	1-31	18	30	9	9	18	9	16	9	20	20	16	16	8	8
# VET	1-31	2	7	0	1	0	1	0	0	1	1	2	2	0	0
# EXP	1-31	20	15	6	7	4	6	5	5	6	5	10	11	8	8
FATIGUE	0-7	7	6	7	7	7	7	7	7	7	7	6	6	7	7
NIGHT OPS	Y/N	N	N	Y	Y	N	Y	N	Y	N	N	N	N	Y	Y
RECON OPS	Y/N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N
NAVAL OPS	Y/N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N
PATHFINDER	Y/N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

THE BLITZ - Radar Stations (0)

RADAR STATION No.	1-63	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
I.D. CODE	[1]	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L
LOCATION	[x,y]	10,22	10,22	11,26	11,26	16,28	16,28	21,27	21,27	23,26	23,26	23,23	23,23	24,21	24,21	21,17	21,17
MIN. DETECTION ALT	1-15	4	1	4	1	4	1	4	1	4	1	4	1	4	1	4	1
MAX. DETECTION ALT	1-41	41	10	41	10	41	10	41	10	41	10	41	10	41	10	41	10
RANGE	1-8	6	3	6	3	6	3	6	3	6	3	6	3	6	3	6	3
RELIABILITY	0-3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
DAMAGE STATUS	0-15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
DAMAGE CONTROL	0-3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
360 SCAN	Y/N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
ALLIED	Y/N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

RADAR STATION No.	1-63	17	18	19	20	21	22	23	24	40	41	42	43	44	45	46
I.D. CODE-	[1]	H	L	H	L	H	L	H	L	W	W	W	W	W	W	W
LOCATION	[x,y]	20,14	20,14	18,10	18,10	18,6	18,6	18,3	18,3	38,9	39,12	39,16	36,19	36,23	33,25	33,29
MIN. DETECTION ALT	1-15	4	1	4	1	4	1	4	1	1	1	1	1	1	1	1
MAX. DETECTION ALT	1-41	41	10	41	10	41	10	41	10	41	41	41	41	41	41	41
RANGE	1-8	6	3	6	3	6	3	6	3	4	4	4	4	4	4	4
RELIABILITY	0-3	2	2	2	2	2	2	2	2	0	0	0	0	0	0	0
DAMAGE STATUS	0-15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
DAMAGE CONTROL	0-3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
360 SCAN	Y/N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	Y
ALLIED	Y/N	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N

THE BLITZ - Airfields (Allies-29; Axis-All)

AIRFIELD NUMBER	1-127	1	2	3	4	5	6	7	8	9	10
NAME	[11]	Pembrey	Cheriton	Pembroke	St Eval 1	St Eval 2	Mt Batten	Roborough	Filton	Warmwell	M. Wallop
LOCATION	[x,y]	11,22	10,22	10,22	10,26	10,26	11,26	12,27	15,24	15,26	16,25
ASSIGNED SQDS	[4]	23	65,66	126-128	35	113	125	29,38	22,251	13,28	34,52,55
THEATRE	1-5	1	4	4	1	4	4	1	1	1	1
DAMAGE STATUS	0-15	15	15	15	15	15	15	15	15	9	15
DAMAGE CONTROL	0-3	2	1	1	2	1	1	1	2	1	2
SEALED	Y/N	Y	N	N	Y	N	N	N	Y	N	Y
ALLIED	Y/N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

AIRFIELD NUMBER	1-127	11	12	13	14	15	16	17	18	19	20
NAME	[11]	Tangmere	Kenley	Binbrook	Detling	Manston	Hornchurch	Biggin Hill	Northolt	Oakington	Northweald
LOCATION	[x,y]	18,27	19,25	21,17	22,26	23,26	21,24	20,25	19,23	20,23	21,23
ASSIGNED SQDS	[4]	10,49,50,60	16,17,24,40	106,107	61,62	-	9,31,48,51	20,46,250	47,248-49	4,76-7,111	11,39
THEATRE	1-5	2	2	5	4	2	2	2	1	5	2
DAMAGE STATUS	0-15	15	8	15	6	4	10	6	15	15	9
DAMAGE CONTROL	0-3	2	2	1	1	1	2	2	2	1	2
SEALED	Y/N	Y	Y	N	N	N	Y	Y	Y	N	Y
ALLIED	Y/N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

AIRFIELD NUMBER	1-127	21	22	23	24	25	26	27	28	29	30
NAME	[11]	Debden	Wattisham	Stradishall	Honnington	Coltishall	Martlesham	Watton	Marham	Duxford	Newton
LOCATION	[x,y]	21,22	22,23	22,23	22,22	24,21	23,22	23,21	22,21	20,22	18,19
ASSIGNED SQDS	[4]	3,18	71,72	86	8-9,82,112	36,59	6,41	73,108-10	80-1,84-5	4,45	103-4
THEATRE	1-5	2	5	5	5	3	2	5	5	3	5
DAMAGE STATUS	0-15	11	15	15	15	15	15	15	15	11	15
DAMAGE CONTROL	0-3	2	2	1	1	2	1	1	1	2	1
SEALED	Y/N	Y	Y	N	N	Y	N	N	N	Y	N
ALLIED	Y/N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

AIRFIELD NUMBER	1-127	31	32	33	34	35	36	37	38	39	40
NAME	[11]	Wittering	Leeming	Bircham	Waddington	Hemswell	Digby	Kton Lindsay	Ch. Fenton	Ringway	Dishforth
LOCATION	[x,y]	19,20	23,20	23,20	20,19	20,18	20,18	19,17	18,16	17,17	19,15
ASSIGNED SQDS	[4]	5,32,43	70,88,91,105	67-69	97,101-2	93-96	7,27,57	19,42	21,44	14	87,89,92
THEATRE	1-5	3	5	4	5	5	3	3	3	3	5
DAMAGE STATUS	0-15	15	15	15	15	15	15	15	15	15	15
DAMAGE CONTROL	0-3	2	1	1	1	1	2	2	2	1	1
SEALED	Y/N	Y	N	N	N	N	Y	Y	Y	N	N
ALLIED	Y/N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

AIRFIELD NUMBER	1-127	41	42	43	44	45	46	47	48	49	50
NAME	[11]	Leconfield	Driffield	Thornaby	Catterick	Acklington	Drem	Turnhouse	Leuchars	Dyce 2	Dyce 1
LOCATION	[x,y]	20,15	20,16	20,14	18,14	19,11	17,9	15,8	17,7	19,4	19,4
ASSIGNED SQDS	[4]	-	90,98-9	123-4	12,30	8,54,56	53,58	15,25	116-7	63-4	26
THEATRE	1-5	3	5	4	3	3	3	3	4	4	3
DAMAGE STATUS	0-15	15	15	15	15	15	15	15	15	15	15
DAMAGE CONTROL	0-3	1	1	1	2	1	1	2	1	1	1
SEALED	Y/N	N	N	N	Y	N	N	Y	N	N	N
ALLIED	Y/N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

AIRFIELD NUMBER	1-127	51	52	53	54	55	56	57	58	59	65
NAME	[11]	Lossimouth	Bog O Mayne	Wick 2	Wick 1	Oban	Wig Bay	Aldergr 2	Aldergr 1	Sydenham	Montdidier
LOCATION	[x,y]	18,3	19,3	16,1	16,1	13,7	12,11	10,12	10,12	10,13	24,32
ASSIGNED SQDS	[4]	75	83	119-20	2,33	100	118	121-2	37	114-5	130-132
THEATRE	1-5	4	4	4	3	4	4	4	3	5	2
DAMAGE STATUS	0-15	15	15	15	15	15	15	15	15	15	15
DAMAGE CONTROL	0-3	0	0	1	2	1	1	1	1	0	2
SEALED	Y/N	N	N	N	Y	N	N	N	N	N	N
ALLIED	Y/N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N

AIRFIELD NUMBER	1-127	66	67	68	69	70	71	72	73	74	75
NAME	[11]	Beauvais	Cormeilles	Cambrai	Antwerp	Lille	Calais	St Omer	Amsterdam	Eindhoven	Wissant
LOCATION	[x,y]	24,33	21,33	26,30	29,26	26,28	24,28	25,28	30,23	31,25	25,27
ASSIGNED SQDS	[4]	133-134	135	136-138	139-142	143-146	147-149	150-151	152-153	154-157	158-161
THEATRE	1-5	2	2	2	2	2	2	2	2	2	2
DAMAGE STATUS	0-15	15	15	15	15	15	15	15	15	15	15
DAMAGE CONTROL	0-3	2	2	2	2	2	2	2	2	2	2
SEALED	Y/N	N	N	N	N	N	N	N	N	N	N
ALLIED	Y/N	N	N	N	N	N	N	N	N	N	N

THE BLITZ - Airfields (cont.)

AIRFIELD NUMBER	1-127	76	77	78	79	80	81	82	83	84
NAME	[11]	Arques	Abbeville	Guyancourt	Desvres	Guines	Marquise	Etaples	Brussels	Laon
LOCATION	[x,y]	22,31	23,30	20,34	24,29	24,28	24,29	24,28	29,26	26,32
ASSIGNED SQDS	[4]	162-165	166-168	169-170	171-174	175-178	179-182	183-186	187-190	191-194
THEATRE	1-5	2	2	2	2	2	2	2	2	2
DAMAGE STATUS	0-15	15	15	15	15	15	15	15	15	15
DAMAGE CONTROL	0-3	2	2	2	2	2	2	2	2	2
SEALED	Y/N	N	N	N	N	N	N	N	N	N
ALLIED	Y/N	N	N	N	N	N	N	N	N	N

AIRFIELD NUMBER	1-127	85	86	87	88	89	90	91	92	93
NAME	[11]	Caen	Orly	Evreux	Chartres	Orleans	Tours	Le Harve	Cherbourg	Vannes
LOCATION	[x,y]	19,33	24,35	22,34	22,35	23,35	21,35	21,32	16,31	13,35
ASSIGNED SQDS	[4]	195-196	197-199	200-201	202-205	206-208	209-211	212-214	215-216	217-218
THEATRE	1-5	3	3	3	3	3	3	3	3	3
DAMAGE STATUS	0-15	15	15	15	15	15	15	15	15	15
DAMAGE CONTROL	0-3	2	2	2	2	2	2	2	2	2
SEALED	Y/N	N	N	N	N	N	N	N	N	N
ALLIED	Y/N	N	N	N	N	N	N	N	N	N

AIRFIELD NUMBER	1-127	94	95	96	97	98	99	100	101	102
NAME	[11]	Brest	Aalberg	Stavanger	Sola	Kiel	Hamburg	Emden	Essen	Cologne
LOCATION	[x,y]	9,33	41,8	34,1	34,2	41,15	41,19	36,20	36,26	35,28
ASSIGNED SQDS	[4]	219-222	223	224-225	226	227	228-229	230-231	232-233	234
THEATRE	1-5	3	1	1	1	2	2	2	2	2
DAMAGE STATUS	0-15	15	15	15	15	15	15	15	15	15
DAMAGE CONTROL	0-3	2	2	2	2	1	1	1	1	1
SEALED	Y/N	N	N	N	N	Y	Y	Y	Y	Y
ALLIED	Y/N	N	N	N	N	N	N	N	N	N

THE BLITZ - Shipping Lanes (0)

SEA LANE NUMBER	1-63	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
I.D. CODE	[1]	N	N	N	N	N	N	N	N	N	T	T	T	T	T	T	D
LOCATION	[x,y]	21,10	21,11	21,12	20,13	21,13	21,14	21,15	22,16	23,16	24,24	24,25	23,24	22,25	23,25	24,26	24,27
SHIPPING DENSITY	0-7	2	3	4	5	4	4	5	4	3	3	4	5	7	5	3	3
ALLIED	Y/N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

SEA LANE NUMBER	1-63	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
I.D. CODE	[1]	D	D	C	C	C	C	C	C	C	C	C	C	C	C	C	C
LOCATION	[x,y]	23,27	22,28	21,28	20,28	19,28	18,28	17,28	17,27	16,29	16,27	15,28	15,27	14,28	13,28	12,28	11,27
SHIPPING DENSITY	0-7	3	2	2	3	2	3	3	5	3	5	3	4	3	3	4	5
ALLIED	Y/N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

SEA LANE NUMBER	1-63	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
I.D. CODE	[1]	C	C	C	C	C	B	B	B	B	B	B	I	I	I	S	S
LOCATION	[x,y]	10,28	9,28	8,28	7,28	6,29	14,24	13,24	12,24	12,23	11,23	10,24	14,17	13,16	12,16	39,3	40,4
SHIPPING DENSITY	0-7	3	4	3	3	2	6	5	5	4	4	3	7	6	5	4	3
ALLIED	Y/N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N

SEA LANE NUMBER	1-63	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
I.D. CODE	[1]	K	K	K	N	N	N	N	N	N	N	N	N	S	S	S
LOCATION	[x,y]	41,12	41,13	41,14	37,16	38,17	39,17	38,18	35,17	35,18	35,19	34,19	33,18	38,4	38,5	37,5
SHIPPING DENSITY	0-7	5	6	7	2	3	4	4	2	3	4	3	2	2	3	2
ALLIED	Y/N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

THE BLITZ - Flak Units (7)

FLAK UNIT NUMBER	1-63	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
I.D. CODE	[1]	N	N	N	N	M	M	M	M	M	M	M	M	M	M	M	S	S	S	S
LOCATION	[x,y]	18,0	15,8	19,12	20,14	20,16	18,16	15,17	16,18	18,18	16,19	17,19	17,20	18,21	18,19	16,22	15,24	11,26	15,26	16,26
NUMBER OF AA GUNS	0-255	20	20	27	17	19	10	26	10	12	4	18	32	22	3	18	8	18	9	4
ALLIED	Y/N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

FLAK UNIT NUMBER	1-63	20	21	22	23	24	25	26	27	34	35	36	37	38	39	40	41	42	43	44
I.D. CODE	[1]	S	S	E	E	E	E	E	E	C	C	C	C	C	C	C	C	C	A	A
LOCATION	[x,y]	16,26	17,26	19,24	20,24	21,25	21,24	23,23	23,26	9,35	9,33	14,35	16,31	21,32	22,31	24,29	24,28	30,24	19,33	23,30
NUMBER OF AA GUNS	0-255	20	20	22	76	35	22	8	20	16	22	12	46	24	36	60	54	36	16	16
ALLIED	Y/N	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N

FLAK UNIT NUMBER	1-63	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
I.D. CODE	[1]	A	A	A	A	A	A	I	I	I	I	I	I	I	I	I	I	I	I	I
LOCATION	[x,y]	25,27	29,26	40,23	41,8	34,2	34,1	41,15	41,19	38,19	36,20	36,26	37,26	35,27	35,28	37,31	38,31	38,32	38,33	40,35
NUMBER OF AA GUNS	0-255	16	16	16	8	16	16	40	16	24	24	30	30	30	30	30	30	30	30	30
ALLIED	Y/N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

THE BLITZ - Centres (8)

CENTRE NUMBER	1-63	1	2	3	4	5	6	7	8	9
CENTRE NAME	[11]	Falmouth	Plymouth	Exeter	Swansea	Cardiff	Gloucester	Bristol	Yeovil	Portland
LOCATION	[x,y]	9,27	11,26	12,26	12,22	13,23	16,22	15,24	15,25	15,26
POPULATION	0-3	0	1	1	1	2	1	1	0	1
INDUSTRY	0-3	0	1	1	1	2	2	1	1	0
PORT FACILITIES	0-3	1	2	0	1	2	0	1	0	2
COMMUNICATIONS	0-3	0	1	1	1	1	1	1	0	0
ALLIED	Y/N	Y	Y	Y	Y	Y	Y	Y	Y	Y

CENTRE NUMBER	1-63	10	11	12	13	14	15	16	17	18
CENTRE NAME	[11]	Southampton	Portsmouth	Brighton	Dover	Kingston	London	Langley	Ipswich	Norwich
LOCATION	[x,y]	16,26	17,26	20,27	23,26	19,24	20,24	20,23	22,23	23,21
POPULATION	0-3	2	2	1	1	2	3	1	2	2
INDUSTRY	0-3	2	1	1	0	2	3	2	1	1
PORT FACILITIES	0-3	2	2	1	1	0	3	0	0	0
COMMUNICATIONS	0-3	1	1	0	0	2	3	1	1	1
ALLIED	Y/N	Y	Y	Y	Y	Y	Y	Y	Y	Y

CENTRE NUMBER	1-63	19	20	21	22	23	24	25	26	27
CENTRE NAME	[11]	Leicester	Coventry	Birmingham	Wolverh'ton	Sheffield	Nottingham	Derby	Stoke	Manchester
LOCATION	[x,y]	19,20	18,21	17,20	16,20	18,18	18,19	17,19	16,19	16,18
POPULATION	0-3	2	2	3	1	1	2	2	2	3
INDUSTRY	0-3	2	3	3	3	2	2	2	2	3
PORT FACILITIES	0-3	0	0	0	0	0	0	0	0	0
COMMUNICATIONS	0-3	1	1	2	1	1	1	1	1	2
ALLIED	Y/N	Y	Y	Y	Y	Y	Y	Y	Y	Y

CENTRE NUMBER	1-63	28	29	30	31	32	33	34	35	36
CENTRE NAME	[11]	Liverpool	Bolton	Blackpool	Bradford	Leeds	Hull	Sunderland	Newcastle	Belfast
LOCATION	[x,y]	15,17	16,17	16,16	17,16	18,16	20,16	19,13	19,12	10,12
POPULATION	0-3	3	1	2	2	3	2	2	2	2
INDUSTRY	0-3	3	1	2	2	3	2	2	3	1
PORT FACILITIES	0-3	3	0	2	0	0	2	2	2	2
COMMUNICATIONS	0-3	2	2	1	1	3	1	1	1	1
ALLIED	Y/N	Y	Y	Y	Y	Y	Y	Y	Y	Y

CENTRE NUMBER	1-63	37	38	39	40	41	42	43	44	45
CENTRE NAME	[11]	Glasgow	Edinburgh	Scapa Flow	Hamburg	Kristiansnd.	Kiel	Bremerhaven	Emden	Dortmund
LOCATION	[x,y]	14,8	16,8	18,0	41,19	38,3	41,15	38,19	36,20	37,26
POPULATION	0-3	2	2	0	2	0	2	2	1	2
INDUSTRY	0-3	2	1	0	2	0	1	1	1	2
PORT FACILITIES	0-3	0	1	2	2	1	2	2	2	0
COMMUNICATIONS	0-3	1	2	0	2	1	2	2	1	2
ALLIED	Y/N	Y	Y	Y	N	N	N	N	N	N

CENTRE NUMBER	1-63	46	47	48	49	50	51	52	53	54
CENTRE NAME	[11]	Essen	Dusseldorf	Cologne	Mainz	Frankfurt	Darmstadt	Mannheim	Stuttgart	Rotterdam
LOCATION	[x,y]	36,26	11,26	12,26	37,31	38,31	38,32	38,33	40,35	30,24
POPULATION	0-3	2	2	2	2	2	1	2	2	0
INDUSTRY	0-3	2	2	2	1	3	1	1	2	0
PORT FACILITIES	0-3	0	0	0	0	0	0	0	0	3
COMMUNICATIONS	0-3	2	2	2	2	2	1	1	1	1
ALLIED	Y/N	N	N	N	N	N	N	N	N	N

CENTRE NUMBER	1-63	55	56	57	58	59	60	61	62	63
CENTRE NAME	[11]	Calais	Boulogne	Dieppe	Le Harve	Paris	Cherbourg	St. Malo	Brest	L'Orient
LOCATION	[x,y]	24,28	24,29	22,31	21,32	24,34	16,31	14,35	9,33	9,35
POPULATION	0-3	0	0	0	0	0	0	0	0	0
INDUSTRY	0-3	0	0	0	0	0	0	0	0	0
PORT FACILITIES	0-3	3	2	3	3	0	1	1	2	2
COMMUNICATIONS	0-3	0	0	1	1	1	1	1	1	1
ALLIED	Y/N	N	N	N	N	N	N	N	N	N

THE BLITZ - Allied Commands

	NAME	CURSOR	THRSH.	PRIOR.
C-IN-C	NEWELL	1	N.A.	N.A.
COM #1	10 GROUP	1	10	6
COM #2	11 GROUP	1	50	5
COM #3	12/13 GROUP	1	10	6
COM #4	COASTAL CMD	1	0	5
COM #5	BOMBER CMD	1	0	5

THE BLITZ - Axis Commands

	NAME	CURSOR	THRSH.	PRIOR.
C-IN-C	GOERING	3	N.A.	N.A.
COM #1	LUFTFLOT 5	3	0	2
COM #2	LUFTFLOT 2	3	230	4
COM #3	LUFTFLOT 3	3	30	3
COM #4	-	-	-	-
COM #5	-	-	-	-

Start Times

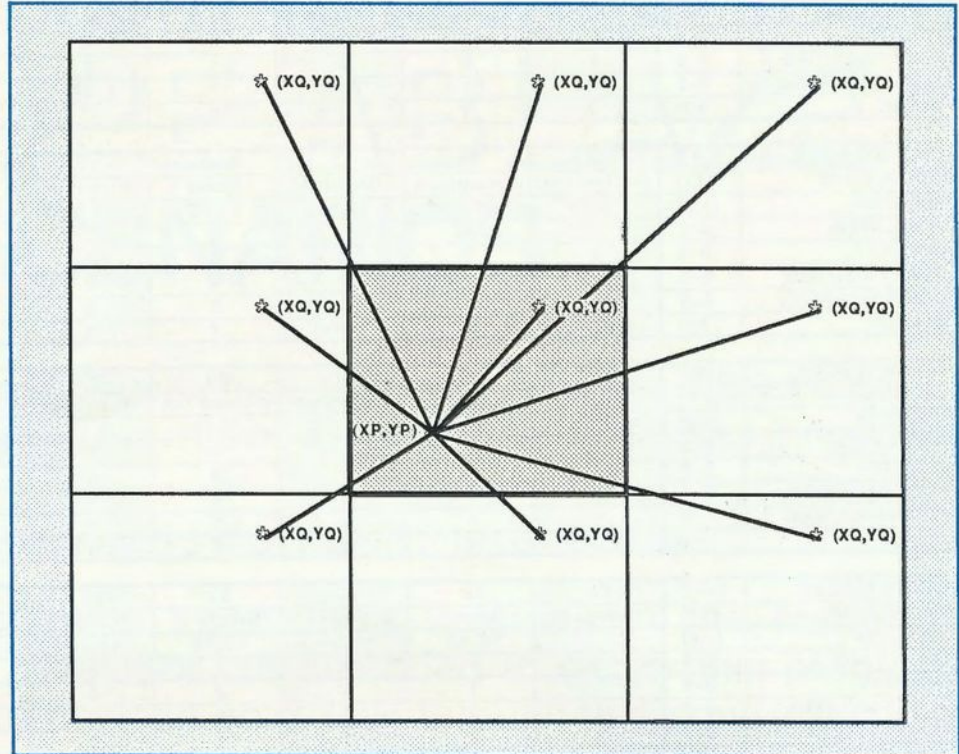
DATE	1-31	7
MONTH	1-12	9
YEAR	0-63	40
LENGTH	1-31	10
DAWN	3-10	6
DUSK	15-22	19
MOON	0-27	11
FORECAST	0-3	1

distance and the direction (D at \$354 and DIR at \$355). When using DIR, 1 is up, 4 is down, counting clockwise.

In *Reach for the Stars* with its dreaded wrap-around universe, these calculations were performed by first arranging 8 maps around the original (in a noughts and crosses fashion) and performing the above calculations 9 times as shown in the accompanying sketch.

By selecting the least distance, and using the direction given by it, travel could easily be achieved via wrap-around.

This column is intended as a regular event in Run 5 and if you would like to participate I would appreciate your writing to me with your views or questions.



DIRECTION FINDING ROUTINE

```

0360      1      org $360
0360      2      obj $360
0360      3      ;
0360      4      ;DIRECTION FROM (XP,YP) TO (XQ,YQ)
0360      5      ;RETURNS DIR (1 TO 6)
0360      6      ;
0350      7      XP      = $350
0351      8      YP      = $351
0352      9      XQ      = $352
0353     10      YQ      = $353
0355     11      DIR     = $355
0356     12      SCR     = $356
0360     13      ;
0360     14      DIRECT:
0360 A0 01     15      ldy 01
0362 AD 50 03 16      lda XP
0365 38       17      sec
0366 ED 52 03 18      sbc XQ
0369 F0 08     19      beq DIR1
036B A0 00     20      ldy 00
036D C9 80     21      cmp 80
036F B0 02     22      bge DIR1
0371 A0 02     23      ldy 02
0373 8C 56 03 24 DIR1 sty SCR
0376      25      ;
0376 A0 03     26      ldy 03
0378 AD 51 03 27      lda YP

```

```

037B 38       28      sec
037C ED 53 03 29      sbc YQ
037F D0 0A     30      bne DIR2
0381 AD 50 03 31      lda XP
0384 4A       32      lsr
0385 90 0C     33      bcc DIR3
0387 A0 09     34      ldy 09
0389 D0 08     35      bne DIR3
038B      36      ;
038B A0 00     37 DIR2 ldy 00
038D C9 80     38      cmp 80
038F B0 02     39      bge DIR3
0391 A0 06     40      ldy 06
0393      41      ;
0393 98       42 DIR3 tya
0394 18       43      clc
0395 6D 56 03 44      adc SCR
0398 A8       45      tay
0399 B9 A0 03 46      lda DIRXY,Y
039C 8D 55 03 47      sta DIR
039F 60       48      rts
03A0      49      ;
03A0 03 04 05 50 DIRXY hex030405030005
03A3 03 00 05
03A6 02 01 06 51      hex020106020006
03A9 02 00 06
03AC      52      ;
03AC      53      end

```

AS CLEAR AS MUD

(Somebody Done a Mistake)

For one reason or another there are some mistakes in the documentation for our games. The following errata should help to clear things up.

REACH FOR THE STARS PLAYER'S MANUAL

(p. 4) The formula for calculating RP production was omitted from the bottom of the left-hand column. It is given below.

$$RPs = POP*2 + \frac{IND*SOC}{16}$$

(p. 5) The starship icons were omitted from the section on Player Identification. They are reproduced below.

PLAYER ONE



PLAYER TWO



PLAYER THREE



PLAYER FOUR



When more than one player's icon collides in a star system, an asterix identifies the contenders.



CARRIERS AT WAR PLAYER'S MANUAL

(p. 10) In the Coral Sea scenario, there are 7 A-24s based at Townsville.

(p. 11) Variation (a) for the Midway scenario has a mistake in it. The *Hiyo* was not in service at this time. The light carrier accompanying the *Junyo* was the *Ryujo*. The *Carriers at War* ship specification article appearing elsewhere in this issue lists the data necessary to create this ship. A suggested air complement is 9 A6M2, 18 D1A1, 6 B5N2.

(p. 13) In the Philippine Sea scenario, all Japanese task groups become available on the 18th June; not the 17th June. The data on the disk is correct.

DESIGN MANUAL

(p. 3) In the Plane Class Create section the **Crew** variable was omitted. It appears, of course, on the disk itself. Crew values range from 0-5. 0=1 man crew, 1=2 man crew, 2=3 man crew, 3=4-5 man crew, 4=6-8 man crew, 5=9+ crew members.

(p. 7) The print utility is Menu 5, not Menu 10. The review utility is Menu 4, not Menu 11.

(p. 10) The last paragraph in the left-hand column should be ignored.

EUROPE ABLAZE

PLAYER'S MANUAL

(p. 3) Para 3, left column. Negative scores are not displayed above the menu window. Negative scores appear as 0.

(p. 5) Late in the game's development we decided to make the Combat Display (Menu 10) an optional feature. The mechanism for turning it on/off appears in Menu 9. Contrary to the statement in the last paragraph, Menu 9 is never bypassed.

(p.6) Flak unit A43 is not the one illustrated in Fig 1; flak unit 571 is shown.

(p. 8) Fog-prone weather boxes are shown in white. Storm weather boxes are shown in inverse. Storm and fog weather boxes are a combination of both symbols.

(p. 9) Commodore owners using black and white monitors will no doubt appreciate this little bit of information. On your menu card there is no mention of the need to type Cntl(B) to enter the black and white mode. The little rascal who forgot it has been soundly chastised. Type Cntl(B) as soon as Menu A has appeared. The colour displays in Menu 8 will now appear as words (and should make more sense).

(p.17) No. 32 squadron, as illustrated in Fig 19, flies Hurricanes and not Spitfires as written in the text.

(p.18) The *Briefing* category in the squadron report menu was omitted. It should be number (e) while the *Stood Down* category becomes number (f). The *Briefing* category includes all squadrons who have been given an assignment and have not as yet become airborne. Also included in this category are squadrons in the landing pattern routine. They are *debriefing*. These latter type are distinguished by a *landing* indicator in the examine squadron menu.

DESIGN MANUAL

(p.9) In the Time Create section the **Forecast** variable was omitted. It appears, of course, on the disk itself. Forecast values range from 0-3. 0=clearing, 1=stable, 2=building up, 3=unstable.

(p.16) At the time of preparing the Design Manual, it was not possible to determine the thresholds for the 4 commands in the *15th Air Force* scenario. They are given below.

Axis - Luftflotte 1 (0), Luftflotte 2 (30).

Allies - 15 Air Force (1050), 12 Air Force (240).

(p.17) The Ground Radar table in Appendix C lists the minimum detection altitude for Axis radars in '43-'45 as 5. The value should read 1.

In the next issue of Run 5, we'll be running a question and answer forum in this space. We would welcome any queries from readers who would like some clarification on any aspect of our games.

CARRIERS AT WAR

TECHNICAL DATA ON SHIP CLASSES

PART ONE - Japanese Warships in Service (1939-45) US Warships in Service (1939-42)

*One of the hardest tasks in designing a scenario for **Carriers at War** is obtaining technical information on ship classes. This feature is intended to make that job a little bit easier.*

Complete design specifications, in *Carriers at War* format, is provided for each ship class together with the names and pennant numbers¹ of every ship in each class.

All United States warships launched prior to December 31st, 1942 and all Japanese warships are included in part 1.

Part 2 (which appears in our second issue) will contain the specifications for United States warships from 1943-1945 as well as Commonwealth warships for the period 1939-1945. Finally, part 3 (in issue 3) will provide the specifications for French, Dutch, Italian and German warships for the same period as well as including some specifications for support vessels (e.g. oilers, transports, tenders) for all nationalities.

To make use of the information, locate the required ship from the listing and note the ship class to which it belongs. Now find this ship class from the appropriate table and enter these values either directly into your computer or (recommended) onto a blank design sheet.

Note that pennant numbers for CV's are included even though there is enough space in the carrier creation routine to enter most names in full.

The ship listings also include the specialized data needed to create carriers and submarines. This information appears to the right of the ship class name in the following format. For carriers, air capacity and spot number are read as follows - (A,S). For submarines, depth and speed are read as follows - (D,S).

It's best to illustrate the procedure with an example. Let's say we're designing a scenario

to recreate the Allied amphibious operations against the island of Leyte in the Philippine Group. Among others we need the specs for the battleship *New Jersey*. Consult the US ship listings (under battleships) and you'll find the pennant number of the *New Jersey* is BB62 and the ship class is BB 1942. Locate BB 1942 in the ship class listings and enter the data there onto a blank design sheet.

If you were after the US Submarine *Gato*, you'd look in the ship listings and find that its pennant number is SS212, its diving depth and submerged speed ratings are 6 and 5 respectively and it belongs to ship class SS 1941.

Throughout the war, armament, especially AA armament, evolved rapidly as the reality of naval vulnerability to air attack became apparent. For those ships commissioned pre-war, the armament ratings are those applicable at the outbreak of hostilities. Later arrivals have been given armament ratings as at the time they entered service.

As a useful rule of thumb, the size of AA batteries on United States and Japanese warships doubled between Pearl Harbour and the end of 1942, and doubled again in each succeeding year.

The remaining information necessary to complete ship and task group creation is dependent upon the scenario. The historical scenarios are the best guide for the appropriate ratings.

1. Japanese warships were not issued pennant numbers as such. For convenience (and to fit the often long Japanese names into the 5 characters allowed), Japanese warships have been given pennant numbers based on the chronological order of their ship classes and their alphabetical listing within them.

JAPANESE AIRCRAFT CARRIERS

(90,7)CV 1921	CV 1	Kaga
(90,7)CV 1925	CV 2	Akagi
(71,6)CV 1935	CV 3	Soryu
(73,6)CV 1937	CV 4	Hiryu
(84,7)CV 1939	CV 5	Shokaku
	CV 6	Zuikaku
(53,5)CV 1941	CV 7	Hiyo
	CV 8	Junyo
(60,7)CV 1943A	CV 9	Taiho
(65,6)CV 1943B	CV 10	Amagi
	CV 11	Katsuragi
	CV 12	Unryu
(75,8)CV 1944	CV 13	Shinano
(24,3)CVL1921	CVL 1	Hosho
(48,4)CVL1931	CVL 2	Ryujo
(30,4)CVL1935	CVL 3	Shoho
	CVL 4	Zuiho
(31,5)CVE1933	CVE 1	Ryuyo
(27,3)CVE1939	CVE 2	Chuyo
	CVE 3	Taiyo
	CVE 4	Unyo
(24,3)CVE1941	CVE 5	Kaiyo
(33,4)CVE1942	CVE 6	Shinyo
(30,5)CVE1943	CVE 7	Chitose
	CVE 8	Chiyoda

JAPANESE BATTLESHIPS

BB 1914	BB 1	Fuso
	BB 2	Yamashiro
BB 1916	BB 3	Hyuga
	BB 4	Ise
BB 1919	BB 5	Mutsu
	BB 6	Nagato
BB 1940	BB 7	Musashi
	BB 8	Yamato
BC 1912	BC 1	Haruna
	BC 2	Hiei
	BC 3	Kirishima
	BC 4	Kongo

JAPANESE SEAPLANE TENDERS

(24,1)CAV1936 CAV 1 Chitose
CAV 2 Chiyoda
(24,1)CAV1938 CAV 3 Mizuho
(25,1)CAV1939 CAV 4 Nisshin
(12,1)AV 1936 AV 1 Kamikawa Maru
AV 2 Kimikawa Maru

JAPANESE HEAVY CRUISERS

CA 1925 CA 1 Furutaka
CA 2 Kako
CA 1926 CA 3 Aoba
CA 4 Kinugasa
CA 1927 CA 5 Ashigara
CA 6 Haguro
CA 7 Myoko
CA 8 Nachi
CA 1930 CA 9 Atago
CA 10 Chokai
CA 11 Maya
CA 12 Takao
CA 1934 CA 13 Kumano
CA 14 Mikuma
CA 15 Mogami
CA 16 Suzuya
CA 1937 CA 17 Chikuma
CA 18 Tone

JAPANESE LIGHT CRUISERS

CL 1918 CL 1 Tatsuta
CL 2 Tenryu
CL 1919 CL 3 Kiso
CL 4 Kitakami
CL 5 Kuma
CL 6 Oi
CL 7 Tama
CL 1921 CL 8 Abukuma
CL 9 Isuzu
CL 10 Kinu
CL 11 Nagara
CL 12 Natori
CL 13 Yura
CL 1923A CL 14 Yubari
CL 1923B CL 15 Jintsu
CL 16 Naka
CL 17 Sendai
CL 1939 CL 18 Kashii
CL 19 Kashima
CL 20 Katori
CL 1941 CL 21 Agano
CL 22 Noshiro
CL 23 Sakawa
CL 24 Yahagi
CL 1942 CL 25 Oyodo

JAPANESE DESTROYERS

DD 1919 DD 1 Akikaze
DD 2 Hokaze
DD 3 Minekaze
DD 4 Numakaze
DD 5 Okikaze
DD 6 Shiokaze
DD 7 Tachikaze
DD 8 Yukaze
DD 1922A DD 9 Karukaya
DD 10 Kuretake
DD 11 Sanae
DD 12 Sawarabi
DD 13 Wakatake
DD 1922B DD 14 Asakaze
DD 15 Asanagi
DD 16 Harukaze
DD 17 Hatakaze
DD 18 Hayate
DD 19 Kamikaze
DD 20 Matsukaze
DD 21 Oite
DD 22 Yunagi
DD 1925 DD 23 Fumizuki
DD 24 Kikuzuki
DD 25 Kisaragi
DD 26 Mikazuki
DD 27 Minazuki
DD 28 Mochizuki
DD 29 Mutsuki
DD 30 Nagatsuki
DD 31 Satsuki
DD 32 Uzuki
DD 33 Yayoi
DD 34 Yuzuki
DD 1927 DD 35 Akebono
DD 36 Amagiri
DD 37 Asagiri
DD 38 Ayanami
DD 39 Fubuki
DD 40 Hatsuyuki
DD 41 Isonami
DD 42 Miyuki
DD 43 Murakumo
DD 44 Oboro
DD 45 Sagiri
DD 46 Sazanami
DD 47 Shikinami
DD 48 Shinonome
DD 49 Shirakumo
DD 50 Shirayuki
DD 51 Uranami
DD 52 Ushio
DD 53 Usugumo
DD 54 Yugiri
DD 1931 DD 55 Akatsuki
DD 56 Hibiki
DD 57 Ikazuchi
DD 58 Inazuma
DD 1932 DD 59 Ariake
DD 60 Hatsuharu
DD 61 Hatsushimo
DD 62 Nenohi
DD 63 Wakaba
DD 64 Yugure
DD 1935 DD 65 Harusame
DD 66 Kawakaze
DD 67 Murasame
DD 68 Samidare

DD 69 Shigure
DD 70 Shiratsuyu
DD 71 Suzukaze
DD 72 Umikaze
DD 73 Yamakaze
DD 74 Yudachi
DD 1936 DD 75 Arare
DD 76 Arashio
DD 77 Asagumo
DD 78 Asashio
DD 79 Kasumi
DD 80 Michishio
DD 81 Minegumo
DD 82 Natsugumo
DD 83 Ooshio
DD 84 Yamagumo
DD 1938 DD 85 Amatsukaze
DD 86 Arashi
DD 87 Hagikaze
DD 88 Hamakaze
DD 89 Hatsukaze
DD 90 Hayashio
DD 91 Isokaze
DD 92 Kagero
DD 93 Kuroshio
DD 94 Maikaze
DD 95 Natsushio
DD 96 Nowake
DD 97 Oyashio
DD 98 Shiranuhi
DD 99 Tanikaze
DD 100 Tokitsukaze
DD 101 Urakaze
DD 102 Yukikaze
DD 1941A DD 103 Akigumo
DD 104 Akishimo
DD 105 Asashimo
DD 106 Fujinami
DD 107 Hamanami
DD 108 Hayanami
DD 109 Hayashimo
DD 110 Kazegumo
DD 111 Kiyonami
DD 112 Kiyoshimo
DD 113 Makigumo
DD 114 Makinami
DD 115 Naganami
DD 116 Okinami
DD 117 Onami
DD 118 Suzunami
DD 119 Takanami
DD 120 Tamanami
DD 121 Yugumo
DD 1941B DD 122 Akizuki
DD 123 Fuyutsuki
DD 124 Hanatsuki
DD 125 Harutsuki
DD 126 Hatsutsuki
DD 127 Natsuzuki
DD 128 Niizuki
DD 129 Shimotsuki
DD 130 Suzutsuki
DD 131 Teruzuki
DD 132 Wakatsuki
DD 133 Yoizuki
DD 134 Shimakaze
DD 1942 DD 135 Hinoki
DD 136 Kaede
DD 137 Kashi
DD 138 Kaya
DD 139 Keyaki
DD 140 Kiri

Note that only United States warships launched prior to December 31st, 1942 are included in these listings. Consult part 2, which will appear in our second issue, for those ships launched after this date.

UNITED STATES BATTLESHIPS

BB 1911	BB 33	Arkansas
BB 1912	BB 34	New York
	BB 35	Texas
BB 1914	BB 36	Nevada
	BB 37	Oklahoma
BB 1915	BB 38	Pennsylvania
	BB 39	Arizona
BB 1917	BB 40	New Mexico
	BB 41	Mississippi
	BB 42	Idaho
BB 1919	BB 43	Tennessee
	BB 44	California
BB 1920	BB 45	Colorado
	BB 46	Maryland
	BB 48	West Virginia
BB 1940	BB 55	North Carolina
	BB 56	Washington
BB 1941	BB 57	South Dakota
	BB 58	Indiana
	BB 59	Massachusetts
	BB 60	Alabama
BB 1942	BB 61	Iowa
	BB 62	New Jersey

UNITED STATES AIRCRAFT CARRIERS

(90,7)CV 1925	CV 2	Lexington
	CV 3	Saratoga
(86,5)CV 1933	CV 4	Ranger
(96,8)CV 1936	CV 5	Yorktown
	CV 6	Enterprise
	CV 8	Hornet
(84,6)CV 1939	CV 7	Wasp
(98,9)CV 1942	CV 9	Essex
	CV 16	Lexington
	CV 17	Bunker Hill
(45,5)CVL1942	CVL22	Independence
	CVL23	Princeton
	CVL24	Be'leau Wood
(34,4)CVE1939	CVE26	Sangamon
	CVE 27	Suwanee
	CVE28	Chenango
	CVE29	Santee
(21,3)CVE1940	CVE 1	Long Island
	CVE30	Charger
(21,3)CVE1941	CVE 9	Bogue
	CVE11	Card
	CVE12	Copahee
	CVE13	Core
	CVE16	Nassau
	CVE18	Altamaha
	CVE20	Barnes
	CVE21	Block Island
	CVE23	Breton
	CVE25	Croatan
	CVE31	Prince William

UNITED STATES LIGHT CRUISERS

CL 1920	CL 4	Omaha
	CL 5	Milwaukee
	CL 6	Cincinnati
	CL 7	Raleigh
	CL 8	Detroit
	CL 9	Richmond
	CL 10	Concord
	CL 11	Trenton
	CL 12	Marblehead
	CL 13	Memphis
CL 1936	CL 40	Brooklyn
	CL 41	Philadelphia
	CL 42	Savannah
	CL 43	Nashville
	CL 44	Phoenix
	CL 47	Boise
	CL 48	Honolulu
	CL 49	St Louis
	CL 50	Helena
CL 1941	CL 55	Cleveland
	CL 56	Columbia
	CL 57	Montpelier
	CL 58	Denver
	CL 60	Santa Fe
	CL 62	Birmingham
	CL 63	Mobile
CLA1941	CLA51	Atlanta
	CLA52	Juneau
	CLA53	San Diego
	CLA54	San Juan
	CLA95	Oakland
	CLA96	Reno

JAPANESE SUBMARINES

(4,3)SS 1924	I1 - I4
(2,3)SS 1925	I153-5, I158
(2,3)SS 1926	I122-4
(2,4)SS 1927	I161-2, I164
(2,3)SS 1928	I156-7, I159-60, I163
(3,3)SS 1931	I165-7
(4,3)SS 1932	I5
(3,3)SS 1933	I168-73
(4,3)SS 1934A	RO33-4
(4,3)SS 1934B	I6
(5,3)SS 1935	I7-8
(3,3)SS 1936	I174-5
(5,3)SS 1939A	I9-11
(5,3)SS 1939B	I15-39
(4,3)SS 1941A	RO100-117
(4,3)SS 1941B	I176-85
(4,3)SS 1942A	RO35-50, RO55
(5,3)SS 1942B	I40-45
(5,2)SS 1943A	I54, I56, I58
(5,3)SS 1943B	I46 - I48

UNITED STATES HEAVY CRUISERS

CA 1929A	CA 24	Pensacola
	CA 25	Salt Lake City
CA 1929B	CA 26	Northampton
	CA 27	Chester
	CA 28	Louisville
	CA 29	Chicago
	CA 30	Houston
	CA 31	Augusta
CA 1931	CA 33	Portland
	CA 35	Indianapolis
CA 1933	CA 32	New Orleans
	CA 34	Astoria
	CA 36	Minneapolis
	CA 37	Tuscaloosa
	CA 38	San Francisco
	CA 39	Quincy
	CA 44	Vincennes
CA 1937	CA 45	Wichita
CA 1942	CA 68	Baltimore
	CA 69	Boston

UNITED STATES DESTROYERS

DD 1934 DD348 Farragut
DD349 Dewey
DD350 Hull
DD351 McDonough
DD352 Worden
DD353 Dale
DD354 Monaghan
DD355 Aylwin
DD 1935A DD356 Porter
DD357 Selfridge
DD358 McDougal
DD359 Winslow
DD360 Phelps
DD361 Clark
DD362 Moffat
DD363 Balch
DD 1935B DD364 Mahan
DD365 Cummings
DD366 Drayton
DD367 Lamson
DD368 Flusser
DD369 Reid
DD370 Case
DD371 Conyngham
DD372 Cassin
DD373 Shaw
DD374 Tucker
DD375 Downes
DD376 Cushing
DD377 Perkins
DD378 Smith
DD379 Preston
DD384 Dunlap
DD385 Fanning
DD 1936A DD386 Bagley
DD387 Blue
DD388 Helm
DD389 Mugford
DD390 Ralph Talbot
DD391 Henley
DD392 Patterson
DD393 Jarvis
DD 1936B DD380 Gridley
DD382 Craven
DD400 McCall
DD401 Maury
DD 1937 DD381 Somers
DD383 Warrington
DD394 Sampson
DD395 Davis
DD396 Jouett
DD 1938A DD397 Benham
DD398 Ellet
DD399 Lang
DD402 Mayrant
DD403 Trippe
DD404 Rhind
DD405 Rowan
DD406 Stack
DD407 Sterret
DD408 Wilson
DD 1938B DD409 Sims
DD410 Hughes
DD411 Anderson
DD412 Hammann
DD413 Mustin
DD414 Russell
DD415 O'Brien

DD 1939 DD416 Walke
DD417 Morris
DD418 Roe
DD419 Wainwright
DD420 Buck
DD421 Benson
DD422 Mayo
DD423 Gleaves
DD424 Niblack
DD425 Madison
DD426 Lansdale
DD427 Hilary P Jones
DD428 Charles F Hughes
DD429 Livermore
DD430 Eberle
DD431 Plunkett
DD432 Kearney
DD433 Gwin
DD434 Meredith
DD435 Grayson
DD436 Monssen
DD437 Woolsey
DD438 Ludlow
DD439 Edison
DD440 Ericsson
DD441 Wilkes
DD442 Nicholson
DD443 Swanson
DD444 Ingraham
DD445 Bristol
DD446 Radford
DD447 Jenkins
DD448 La Vallette
DD449 Nicholas
DD450 O'Bannon
DD451 Chevalier
DD452 Saufley
DD453 Waller
DD454 Taylor
DD455 Hambleton
DD456 Rodman
DD457 Emmons
DD458 Macomb
DD459 Laffey
DD460 Woodworth
DD461 Forrest
DD462 Fitch
DD463 Corry
DD464 Hobson
DD465 Strong
DD466 Waller
DD467 Taylor
DD468 De Haven
DD469 Bache
DD470 Beale
DD471 Guest
DD472 Bennett
DD473 Fullam
DD474 Hudson
DD475 Hutchins
DD476 Pringle
DD477 Stanly
DD478 Stevens
DD479 Halford
DD480 Leutze
DD481 Watson
DD482 Philip
DD483 Renshaw
DD484 Ringgold
DD485 Schroeder
DD486 Sigsbee
DD487 Conway
DD488 Cony
DD489 Converse
DD490 Eaton
DD491 Foote
DD492 Spence
DD493 Terry
DD494 Thatcher
DD495 Anthony
DD496 Brownson
DD497 Daly
DD498 Isherwood
DD499 Kimberly
DD500 Mackenzie
DD501 McLanahan
DD502 Nields
DD503 Ordranax
DD504 Davison
DD505 Edwards
DD506 Glennon
DD507 Jeffers
DD508 Maddox
DD509 Nelson
DD510 Baldwin
DD511 Harding
DD512 Satterlee
DD513 Thompson
DD514 Welles
DD515 Cowie
DD516 Knight
DD517 Doran
DD518 Earle
DD519 Butler
DD520 Gherardi
DD521 Herndon
DD522 Shubrick
DD523 Beatty
DD524 Tillman
DD525 Stevenson
DD526 Stockton
DD527 Thorn
DD528 Turner
DD 1942 DD445 Fletcher
DD446 Radford
DD447 Jenkins
DD448 La Vallette
DD449 Nicholas
DD450 O'Bannon
DD451 Chevalier
DD452 Saufley
DD453 Waller
DD454 Taylor
DD455 Hambleton
DD456 Rodman
DD457 Emmons
DD458 Macomb
DD459 Laffey
DD460 Woodworth
DD461 Forrest
DD462 Fitch
DD463 Corry
DD464 Hobson
DD465 Strong
DD466 Waller
DD467 Taylor
DD468 De Haven
DD469 Bache
DD470 Beale
DD471 Guest
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DD473 Fullam
DD474 Hudson
DD475 Hutchins
DD476 Pringle
DD477 Stanly
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DD479 Halford
DD480 Leutze
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DD482 Philip
DD483 Renshaw
DD484 Ringgold
DD485 Schroeder
DD486 Sigsbee
DD487 Conway
DD488 Cony
DD489 Converse
DD490 Eaton
DD491 Foote
DD492 Spence
DD493 Terry
DD494 Thatcher
DD495 Anthony
DD496 Brownson
DD497 Daly
DD498 Isherwood
DD499 Kimberly

DD614 Mackenzie
DD615 McLanahan
DD616 Nields
DD617 Ordranax
DD618 Davison
DD619 Edwards
DD620 Glennon
DD621 Jeffers
DD622 Maddox
DD623 Nelson
DD624 Baldwin
DD625 Harding
DD626 Satterlee
DD627 Thompson
DD628 Welles
DD632 Cowie
DD633 Knight
DD634 Doran
DD635 Earle
DD636 Butler
DD637 Gherardi
DD638 Herndon
DD639 Shubrick
DD640 Beatty
DD641 Tillman
DD645 Stevenson
DD646 Stockton
DD647 Thorn
DD648 Turner
DD 1942 DD445 Fletcher
DD446 Radford
DD447 Jenkins
DD448 La Vallette
DD449 Nicholas
DD450 O'Bannon
DD451 Chevalier
DD452 Saufley
DD453 Waller
DD454 Taylor
DD455 Hambleton
DD456 Rodman
DD457 Emmons
DD458 Macomb
DD459 Laffey
DD460 Woodworth
DD461 Forrest
DD462 Fitch
DD463 Corry
DD464 Hobson
DD465 Strong
DD466 Waller
DD467 Taylor
DD468 De Haven
DD469 Bache
DD470 Beale
DD471 Guest
DD472 Bennett
DD473 Fullam
DD474 Hudson
DD475 Hutchins
DD476 Pringle
DD477 Stanly
DD478 Stevens
DD479 Halford
DD480 Leutze
DD481 Watson
DD482 Philip
DD483 Renshaw
DD484 Ringgold
DD485 Schroeder
DD486 Sigsbee
DD487 Conway
DD488 Cony
DD489 Converse
DD490 Eaton
DD491 Foote
DD492 Spence
DD493 Terry
DD494 Thatcher
DD495 Anthony
DD496 Brownson
DD497 Daly
DD498 Isherwood
DD499 Kimberly

DD526 Abner Read
 DD527 Ammen
 DD528 Mullany
 DD529 Bush
 DD530 Trathen
 DD531 Hazelwood
 DD532 Heermann
 DD533 Hoel
 DD544 Boyd
 DD545 Bradford
 DD550 Capps
 DD551 David W Taylor
 DD552 Evans
 DD553 John D Henley
 DD554 Franks
 DD569 Aulick
 DD570 Chas Ausburne
 DD571 Claxton
 DD572 Dyson
 DD573 Harrison
 DD574 John Rodgers
 DD575 McKee
 DD576 Murray
 DD577 Sproston
 DD578 Wickes
 DD579 William Porter
 DD580 Young
 DD581 Charrette
 DD582 Connor
 DD583 Hall
 DD587 Bell
 DD588 Burns
 DD589 Izard

UNITED STATES SUBMARINES

(2,6)SS 1918 SS130 S-25
 to to
 SS146 S-41
 (2,6)SS 1923 SS153 S-42
 to to
 SS158 S-47
 (3,3)SS 1929 SS167 Narwhal
 SS168 Nautilus
 (4,3)SS 1933 SS170 Cachalot
 SS171 Cuttlefish
 (4,3)SS 1935 SS172 Porpoise
 SS173 Pike
 SS174 Shark
 SS175 Tarpon
 SS176 Perch
 SS177 Pickerel
 SS178 Permit
 SS179 Plunger
 SS180 Pollack
 SS181 Pompano
 (4,4)SS 1937 SS182 Salmon
 SS183 Seal
 SS184 Skipjack
 SS185 Snapper
 SS186 Stingray
 SS187 Sturgeon
 (5,4)SS 1938 SS188 Sargo
 SS189 Saury
 SS190 Spearfish
 SS191 Sculpin
 SS192 Squalus
 SS193 Swordfish
 SS194 Seadragon
 SS195 Sealion
 SS196 Searaven
 SS197 Seawolf
 (5,4)SS 1939 SS198 Tambor
 SS199 Tautog
 SS200 Thresher
 SS201 Triton
 SS202 Trout
 SS203 Tuna
 SS206 Gar
 SS207 Grampus
 SS208 Grayback
 SS209 Grayling
 SS210 Grenadier
 SS211 Gudgeon
 (6,5)SS 1941 SS212 Gato

SS213 Greenling
 SS214 Grouper
 SS215 Growler
 SS216 Grunnion
 SS217 Guardfish
 SS218 Albacore
 SS219 Amberjack
 SS220 Barb
 SS221 Blackfish
 SS228 Drum
 SS229 Flying Fish
 SS230 Finback
 SS231 Haddock
 SS232 Halibut
 SS233 Herring
 SS234 Kingfish
 SS235 Shad
 SS236 Silversides
 SS237 Trigger
 SS238 Wahoo
 SS239 Whale
 SS253 Tautog
 SS254 Thresher
 SS255 Triton
 SS256 Trout
 SS257 Tuna
 SS258 Gar
 SS259 Grampus
 SS260 Grayback
 SS209 Grayling
 SS261 Grenadier
 SS262 Gudgeon
 SS263 Gato
 SS265 Greenling
 SS266 Grouper
 SS267 Grunnion
 SS268 Guardfish
 SS269 Albacore
 SS275 Amberjack
 SS276 Barb
 SS277 Blackfish
 SS278 Drum
 SS279 Flying Fish
 SS280 Finback
 SS281 Haddock
 SS282 Halibut
 SS283 Herring
 SS284 Kingfish
 SS285 Shad
 SS286 Silversides
 SS287 Trigger
 SS288 Wahoo
 SS290 Whale

UNITED STATES DESTROYER ESCORTS

DE 1942 DE 5 Evarts
 DE 6 Wyffels
 DE 13 Brennan
 DE 14 Doherty
 DE 15 Austin
 DE 16 Edgar G Chase
 DE 17 Edward C Daly
 DE 18 Gilmore
 DE 19 Burden Hastings
 DE 20 Le Hardy
 DE 21 Harold C Thomas
 DE 22 Wileman

UNITED STATES SHIP CLASSES (CONTINUED FROM FACING PAGE)

NUMBER IN CLASS	#	17	6	2	2	10	6	10	12	53	x
SHIP CLASS NAME	[8]	SS 1918	SS 1923	SS 1929	SS 1933	SS 1935	SS 1937	SS 1938	SS 1939	SS 1941	PT misc
ALLIED	Y/N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SEAPLANE	Y/N	N	N	N	N	N	N	N	N	N	N
SHIP TYPE	0-4	3	3	3	3	3	3	3	3	3	2
MAXIMUM SPEED	0-45	15	15	17	17	19	21	21	20	21	39
DISPLACEMENT	0-31	0	0	2	1	1	1	1	1	1	0
HEAVY AA	0-31	0	0	0	1	0	0	0	0	0	0
LIGHT AA	0-31	0	0	1	1	1	1	1	1	1	1
ARMOUR	0-15	0	0	0	0	0	0	0	0	0	0
PRIMARY GUNS	0-15	0	0	0	0	0	0	0	0	0	0
SECONDARY GUNS	0-15	1	1	2	0	1	1	1	1	1	0
TORPEDO TUBES	0-15	4	4	10	6	8	8	8	8	10	4
VULNERABILITY	0-7	0	1	3	2	3	3	4	4	5	2
ANTI-SUBMARINE	0-7	0	0	0	0	0	0	0	0	0	2
TORPEDO LOADS	0-3	2	2	3	3	3	3	2	2	2	1

UNITED STATES SHIP CLASSES - A CARRIERS AT WAR DESIGN FEATURE

NUMBER IN CLASS	#	2	1	3	1	24	9	4	2	11	1
SHIP CLASS NAME	[8]	CV 1925	CV 1933	CV 1936	CV 1939	CV 1942	CVL1942	CVE1939	CVE1940	CVE1942	BB 1911
ALLIED	Y/N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SEAPLANE	Y/N	N	N	N	N	N	N	N	N	N	N
SHIP TYPE	0-4	0	0	0	0	0	0	0	0	0	1
MAXIMUM SPEED	0-45	33	30	33	30	33	32	18	17	17	21
DISPLACEMENT	0-31	17	6	10	6	14	6	10	6	5	10
HEAVY AA	0-31	8[0] a	0	8	8	12	0	2	0	2	4
LIGHT AA	0-31	6	2	5	2	14	12	4	2	2	0
ARMOUR	0-15	6	2	4	0	4	0	0	0	0	11
PRIMARY GUNS	0-15	0	0	0	0	0	0	0	0	0	12
SECONDARY GUNS	0-15	4[0] a	4	4	4	6	0	1	1	1	8
TORPEDO TUBES	0-15	0	0	0	0	0	0	0	0	0	0
VULNERABILITY	0-7	1	1	1	1	2	2	1	0	1	3
ANTI-SUBMARINE	0-7	0	0	0	0	0	0	0	0	0	0
TORPEDO LOADS	0-3	0	0	0	0	0	0	0	0	0	0

NUMBER IN CLASS	#	2	2	2	3	2	3	2	4	4	2
SHIP CLASS NAME	[8]	BB 1912	BB 1914	BB 1915	BB 1917	BB 1919	BB 1920	BB 1940	BB 1941	BB 1942	CA 1929A
ALLIED	Y/N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SEAPLANE	Y/N	N	N	N	N	N	N	N	N	N	N
SHIP TYPE	0-4	1	1	1	1	1	1	1	1	1	1
MAXIMUM SPEED	0-45	21	21	21	22	21	21	28	28	33	33
DISPLACEMENT	0-31	11	12	13	13	13	15	18	18	23	5
HEAVY AA	0-31	4	16	16	12	12	8	20	16[20] b	20	8
LIGHT AA	0-31	2	10	4	5	0	4	4	12[14] b	28	1
ARMOUR	0-15	12	14	14	14	14	15	12	12	12	3
PRIMARY GUNS	0-15	10	10	12	12	12	8	9	9	9	10
SECONDARY GUNS	0-15	3	8	8	6	6	5	4	10[8] b	10	0
TORPEDO TUBES	0-15	0	0	0	0	0	0	0	0	0	0
VULNERABILITY	0-7	3	4	4	4	5	5	6	6	7	2
ANTI-SUBMARINE	0-7	0	0	0	0	0	0	0	0	0	0
TORPEDO LOADS	0-3	0	0	0	0	0	0	0	0	0	0

NUMBER IN CLASS	#	6	2	7	1	18	10	9	28	6	8
SHIP CLASS NAME	[8]	CA 1929B	CA 1931	CA 1933	CA 1937	CA 1942	CL 1920	CL 1936	CL 1941	CLA 1941	DD 1934
ALLIED	Y/N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SEAPLANE	Y/N	N	N	N	N	N	N	N	N	N	N
SHIP TYPE	0-4	1	1	1	1	1	2	2	2	2	2
MAXIMUM SPEED	0-45	33	33	33	33	33	34	33	33	33	37
DISPLACEMENT	0-31	5	5	5	5	7	3	5	6	3	1
HEAVY AA	0-31	8	8	8	8	12	4	8	12	16	5
LIGHT AA	0-31	0	1	1	1	15	1	1	9	8	1
ARMOUR	0-15	3	2	5	6	6	0	5	5	4	0
PRIMARY GUNS	0-15	9	9	9	9	9	0	0	0	0	0
SECONDARY GUNS	0-15	0	0	0	4	6	12	15	15	8	3
TORPEDO TUBES	0-15	0	0	0	0	0	6	0	0	8	12
VULNERABILITY	0-7	3	3	3	4	6	2	4	5	4	3
ANTI-SUBMARINE	0-7	0	0	0	0	0	0	0	0	0	1
TORPEDO LOADS	0-3	0	0	0	0	0	2	0	0	1	1

NUMBER IN CLASS	#	8	18	8	4	5	10	12	96	176	66
SHIP CLASS NAME	[8]	DD 1935A	DD 1935B	DD 1936A	DD 1936B	DD 1937	DD 1938A	DD 1938B	DD 1939	DD 1942	DE 1942
ALLIED	Y/N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SEAPLANE	Y/N	N	N	N	N	N	N	N	N	N	N
SHIP TYPE	0-4	2	2	2	2	2	2	2	2	2	2
MAXIMUM SPEED	0-45	37	37	39	39	39	39	35	35	35	20
DISPLACEMENT	0-31	1	1	1	1	1	1	1	1	1	1
HEAVY AA	0-31	8	5	4	4	4	4	5	5	5	2
LIGHT AA	0-31	2	1	1	1	1	1	1	1	4	2
ARMOUR	0-15	0	0	0	0	0	0	0	0	1	0
PRIMARY GUNS	0-15	0	0	0	0	0	0	0	0	0	0
SECONDARY GUNS	0-15	4	3	2	2	2	2	3	3	2	0
TORPEDO TUBES	0-15	8	12	15	15	15	15	8	10	10	0
VULNERABILITY	0-7	4	3	3	2	3	3	3	4	6	3
ANTI-SUBMARINE	0-7	0	1	2	2	2	1	2	1	3	5
TORPEDO LOADS	0-3	1	1	1	1	1	1	1	1	1	0

JAPANESE SHIP CLASSES - A CARRIERS AT WAR DESIGN FEATURE

NUMBER IN CLASS	#	1	1	1	1	2	2	1	3	1	1
SHIP CLASS NAME	[8]	CV 1921	CV 1925	CV 1935	CV 1937	CV 1939	CV 1941	CV 1943A	CV 1943B	CV 1944	CVL1921
ALLIED	Y/N	N	N	N	N	N	N	N	N	N	N
SEAPLANE	Y/N	N	N	N	N	N	N	N	N	N	N
SHIP TYPE	0-4	0	0	0	0	0	0	0	0	0	0
MAXIMUM SPEED	0-45	28	31	34	34	34	26	26	34	27	25
DISPLACEMENT	0-31	17	17	8	9	12	11	11	8	29	4
HEAVY AA	0-31	16	12	12	12	16	12	12	12	28	0
LIGHT AA	0-31	3	4	4	4	5	3	5	11	18	4
ARMOUR	0-15	11	10	2	2	9	0	0	4	8	0
PRIMARY GUNS	0-15	0	0	0	0	0	0	0	0	0	0
SECONDARY GUNS	0-15	14	6	6	6	8	6	6	6	8	0
TORPEDO TUBES	0-15	0	0	0	0	0	0	0	0	0	0
VULNERABILITY	0-7	0	1	2	2	2	1	0	1	3	0
ANTI-SUBMARINE	0-7	0	0	0	0	0	0	0	0	0	0
TORPEDO LOADS	0-3	0	0	0	0	0	0	0	0	0	0

NUMBER IN CLASS	#	1	2	1	3	1	1	2	2	1	1
SHIP CLASS NAME	[8]	CVL1931	CVL1935	CVE1933	CVE1939	CVE1941	CVE1942	CVE1943	CAV1936	CAV1938	CAV1939
ALLIED	Y/N	N	N	N	N	N	N	N	N	N	N
SEAPLANE	Y/N	N	N	N	N	N	N	N	Y	Y	Y
SHIP TYPE	0-4	0	0	0	0	0	0	0	0	0	0
MAXIMUM SPEED	0-45	29	28	27	21	24	22	29	29	22	28
DISPLACEMENT	0-31	4	6	6	8	7	8	5	5	5	5
HEAVY AA	0-31	8	8	8	8	8	8	8	4	6	6
LIGHT AA	0-31	4	1	5	1	3	4	4	2	2	3
ARMOUR	0-15	1	0	0	0	0	0	0	0	0	0
PRIMARY GUNS	0-15	0	0	0	0	0	0	0	0	0	0
SECONDARY GUNS	0-15	0	4	4	4	4	4	4	2	3	3
TORPEDO TUBES	0-15	0	0	0	0	0	0	0	0	0	0
VULNERABILITY	0-7	1	1	1	0	1	2	0	2	2	2
ANTI-SUBMARINE	0-7	0	0	0	0	0	0	0	0	0	0
TORPEDO LOADS	0-3	0	0	0	0	0	0	0	0	0	0

NUMBER IN CLASS	#	2	2	2	2	2	4	2	2	4	4
SHIP CLASS NAME	[8]	AV 1936	BB 1914	BB 1916	BB 1919	BB 1940	BC 1912	CA 1925	CA 1926	CA 1927	CA 1930
ALLIED	Y/N	N	N	N	N	N	N	N	N	N	N
SEAPLANE	Y/N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SHIP TYPE	0-4	0	1	1	1	1	1	1	1	1	1
MAXIMUM SPEED	0-45	16	25	25	25	27	30	33	33	34	34
DISPLACEMENT	0-31	5	16	16	17	29	15	4	4	6	6
HEAVY AA	0-31	2	8	8	8	12	8[4] c	4	4	8	8
LIGHT AA	0-31	1	2	3	3	4	3	2	2	1	2
ARMOUR	0-15	0	12	12	11	15	8	1	1	4	5
PRIMARY GUNS	0-15	0	12	12	8	9	8	6	6	10	10
SECONDARY GUNS	0-15	1	14	15	9	12	14	0	2	4	4
TORPEDO TUBES	0-15	0	0	0	0	0	0	8	8	8	15
VULNERABILITY	0-7	0	3	3	2	5	4	3	3	4	4
ANTI-SUBMARINE	0-7	0	0	0	0	0	0	0	0	0	0
TORPEDO LOADS	0-3	0	0	0	0	0	0	2	2	3	2

NUMBER IN CLASS	#	4	2	2	5	6	1	3	3	4	1
SHIP CLASS NAME	[8]	CA 1934	CA 1937	CL 1918	CL 1919	CL 1921	CL 1923A	CL 1923B	CL 1939	CL 1941	CL 1942
ALLIED	Y/N	N	N	N	N	N	N	N	N	N	N
SEAPLANE	Y/N	Y	Y	N	N	N	N	N	N	N	Y
SHIP TYPE	0-4	1	1	2	2	2	2	2	2	2	2
MAXIMUM SPEED	0-45	35	35	33	36	36	36	35	18	35	36
DISPLACEMENT	0-31	6	6	2	2	2	2	3	3	3	5
HEAVY AA	0-31	8	8	1	1	1	1	1	2	2	4
LIGHT AA	0-31	2	2	1	1	1	1	1	1	7	2
ARMOUR	0-15	6	6	2	3	3	2	3	1	1	1
PRIMARY GUNS	0-15	10	8	0	0	0	0	0	0	0	0
SECONDARY GUNS	0-15	4	4	4	4	4	6	4	3	6	6
TORPEDO TUBES	0-15	12	12	6	8	8	4	8	4	8	0
VULNERABILITY	0-7	3	5	1	2	3	2	3	2	3	4
ANTI-SUBMARINE	0-7	0	0	0	0	0	0	0	0	2	0
TORPEDO LOADS	0-3	2	2	2	2	2	2	2	1	2	0

JAPANESE SHIP CLASSES (CONT.)

NUMBER IN CLASS	#	8	5	9	12	20	4
SHIP CLASS NAME	[8]	DD 1919	DD 1922A	DD 1922B	DD 1925	DD 1927	DD 1931
ALLIED	Y/N	N	N	N	N	N	N
SEAPLANE	Y/N	N	N	N	N	N	N
SHIP TYPE	0-4	2	2	2	2	2	2
MAXIMUM SPEED	0-45	39	36	37	37	34	34
DISPLACEMENT	0-31	1	0	1	1	1	1
HEAVY AA	0-31	0	0	3	2	6	4
LIGHT AA	0-31	1	1	1	2	1	2
ARMOUR	0-15	0	0	0	0	0	0
PRIMARY GUNS	0-15	0	0	0	0	0	0
SECONDARY GUNS	0-15	2	1	2	1	3	2
TORPEDO TUBES	0-15	6	4	4	6	9	9
VULNERABILITY	0-7	1	1	2	3	3	3
ANTI-SUBMARINE	0-7	1	3	2	4	2	3
TORPEDO LOADS	0-3	2	1	1	1	1	2

KEY TO SHIP CLASS NOTES

- The Lexington was sunk before she had a chance to be fitted with the revised AA battery.
- The bracketed figures refer to the South Dakota (BB 57). She was fitted out as a Force Flagship.
- The bracketed figure refers to the Hiei (BC 2).

NUMBER IN CLASS	#	6	10	10	18	19	12	1	18	23	4
SHIP CLASS NAME	[8]	DD 1932	DD 1935	DD 1936	DD 1938	DD 1941A	DD 1941B	DD 1942	DD 1944A	DD 1944B	SS 1924
ALLIED	Y/N	N	N	N	N	N	N	N	N	N	N
SEAPLANE	Y/N	N	N	N	N	N	N	N	N	N	N
SHIP TYPE	0-4	2	2	2	2	2	2	2	2	2	3
MAXIMUM SPEED	0-45	33	35	35	35	35	33	40	28	28	18
DISPLACEMENT	0-31	1	1	1	1	1	2	1	1	1	1
HEAVY AA	0-31	5	5	6	6	6	4	6	3	3	0
LIGHT AA	0-31	1	1	1	1	1	1	1	3	3	1
ARMOUR	0-15	0	0	0	0	0	0	0	0	0	0
PRIMARY GUNS	0-15	0	0	0	0	0	0	0	0	0	0
SECONDARY GUNS	0-15	3	3	3	3	3	4	3	0	0	1
TORPEDO TUBES	0-15	6	8	8	8	8	4	15	4	4	6
VULNERABILITY	0-7	4	4	4	5	5	5	4	3	3	2
ANTI-SUBMARINE	0-7	2	2	2	2	4	4	2	2	4	0
TORPEDO LOADS	0-3	2	2	2	2	2	2	1	1	1	3

NUMBER IN CLASS	#	4	3	3	5	3	1	6	2	1	2
SHIP CLASS NAME	[8]	SS 1925	SS 1926	SS 1927	SS 1928	SS 1931	SS 1932	SS 1933	SS 1934A	SS 1934B	SS 1935
ALLIED	Y/N	N	N	N	N	N	N	N	N	N	N
SEAPLANE	Y/N	N	N	N	N	N	N	N	N	N	N
SHIP TYPE	0-4	3	3	3	3	3	3	3	3	3	3
MAXIMUM SPEED	0-45	20	15	20	20	21	18	23	19	20	23
DISPLACEMENT	0-31	1	1	1	1	1	1	1	0	1	1
HEAVY AA	0-31	0	0	0	0	1	0	1	1	1	0
LIGHT AA	0-31	0	0	1	1	1	1	1	1	1	1
ARMOUR	0-15	0	0	0	0	0	0	0	0	0	0
PRIMARY GUNS	0-15	0	0	0	0	0	0	0	0	0	0
SECONDARY GUNS	0-15	1	1	1	1	0	1	0	0	0	2
TORPEDO TUBES	0-15	8	4	6	8	6	6	6	4	6	6
VULNERABILITY	0-7	2	2	3	3	3	3	4	3	3	3
ANTI-SUBMARINE	0-7	0	0	0	0	0	0	0	0	0	0
TORPEDO LOADS	0-3	2	3	2	2	2	3	2	3	3	3

NUMBER IN CLASS	#	2	3	21	18	10	17	6	3	3	x
SHIP CLASS NAME	[8]	SS 1936	SS 1939A	SS 1939B	SS 1941A	SS 1941B	SS 1942A	SS 1942B	SS 1943A	SS 1943B	PG misc
ALLIED	Y/N	N	N	N	N	N	N	N	N	N	N
SEAPLANE	Y/N	N	N	N	N	N	N	N	N	N	N
SHIP TYPE	0-4	3	3	3	3	3	3	3	3	3	2
MAXIMUM SPEED	0-45	23	24	24	14	23	20	24	18	24	20
DISPLACEMENT	0-31	1	2	1	0	1	1	1	1	1	0
HEAVY AA	0-31	0	0	0	0	0	1	0	0	0	0
LIGHT AA	0-31	1	1	1	1	1	1	1	1	1	2
ARMOUR	0-15	0	0	0	0	0	0	0	0	0	0
PRIMARY GUNS	0-15	0	0	0	0	0	0	0	0	0	0
SECONDARY GUNS	0-15	1	1	1	0	1	0	1	1	1	1
TORPEDO TUBES	0-15	6	6	6	4	6	4	6	6	8	2
VULNERABILITY	0-7	4	5	5	4	5	5	5	4	4	2
ANTI-SUBMARINE	0-7	0	0	0	0	0	0	0	0	0	1
TORPEDO LOADS	0-3	2	3	3	2	2	3	3	3	3	1

Road to Appomattox

Some early thoughts on our upcoming American Civil War Game

The design of a comprehensive American Civil War game has been buzzing around in our heads almost since Roger and I first went to work together some three years ago.

Hopefully, we've now developed the skills necessary to tackle what's going to be our most demanding project to date. In the next few months we'll certainly find out!

The game will begin with the fall of Fort Sumter in 1861 and continue through to the eventual(?) demise of the Confederacy in 1865 or whenever it may be.

To provide a manageable framework for the military operations, we intend to construct the political and economic environment of the time. Ultimately, there will be several levels of player participation. Building on a chain of command concept that can accommodate human and computer contenders in any combination (as we experimented with in *Europe Ablaze*), the roles offered will include President, field army and department commands of various sizes.

We'll be using a hex-grid at 25 miles per hexagon to depict the region from Philadelphia in the north to Tampa in the south and from the east coast to Little Rock, Arkansas. Time scale will probably be 1 day per turn with an interphase every month for economic manipulation.

Up to three bytes of memory will be allocated to each hex allowing all of the following factors to be accounted for.

- * which state the hex is located in.
- * the predominant type of terrain in the hex (mountain, swamp, wooded, cultivated).
- * the communications resources present (road and rail facilities and their extent).
- * rivers (navigable and otherwise).

Assigned to a separate data base will be the major navigable rivers such as the Mississippi. Also in separate data bases will be approximately 150 cities and towns each organized to account for a wide range of political, economic and demographic factors.

Military units will be represented at the divisional, corps and army level.

The unit of recruitment will be the regiment for infantry and cavalry, the battery for artillery and these will be assigned either to the field army units just mentioned or to city, depot or fortification garrisons. As the design stands at the moment, field army units will have the following characteristics.

Divisions - up to 12 regiments of infantry (12,000 men) or 8 regiments (8,000 men) of cavalry; up to 3 batteries (12-18 guns) of artillery; an experience rating; a fatigue rating; a supply status.

Corps - provision to control up to 4 divisions of the same type; up to 7 batteries of artillery.

Armies - provision to control up to 4 units which can be any combination of divisions, siege trains, corps or other armies.

There will be approximately 80 commanders in the game. Each commander will be rated for rank (2-5 star), availability date, experience, ability, political *clout*, and popularity. These ratings will change as events dictate throughout the course of the game.

Each active army and corps will have a commander assigned to it while divisions will only require a commander when on an independent assignment.

It looks as though there will be no major problems associated with the relationships between human and computer commanders; in fact it's probable that all 80 commanders will be able to have human or computer direction. (Fitting 80-odd players around a keyboard might be a small problem!).

We intend to provide three mechanisms for determining the initial ratings of the Commanders; historical values, random values and player-generated values.

Like our previous historical games, *Road to Appomattox* will include a design kit although you won't be able to alter the map or centre location.

You will be able to re-evaluate State political and economic factors (even to the point, for example, of including Maryland in the Confederacy), alter the importance of cities and towns, affect foreign policies; in general you can expect to be able to change pretty well everything except basic geographic reality.

In addition to the full campaign scenario recreating the entire war, there will be several mini-campaigns of 1-6 months duration.

The design kit will also have the facilities to create mini-campaigns so that all the major confrontations can be simulated. *Run 5* will regularly publish scenarios of this type.

As far as combat resolution goes, we hope to be able to provide an abstracted tactical combat display. Where a commander is actually present at a battle, he will have access to an order menu to activate his troops on a stylized deployment display. Junior commanders, of course, will not have the same capability to influence the outcome of a battle as senior commanders.

Also included in the game will be a careful treatment of naval and riverine forces. Since each hex on the map will know at all times what State it's in, its proximity to friendly and enemy forces, the presence of fortifications, etc., forces travelling along river hex-sides will have their speed determined accordingly.

The economic and political systems are yet to be developed in more than a rudimentary way. More information on these next issue.

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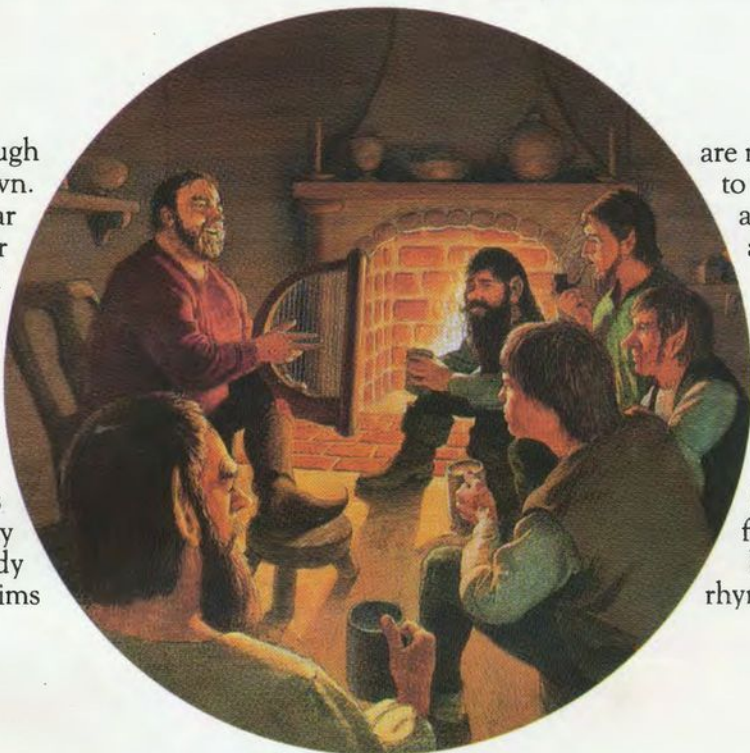
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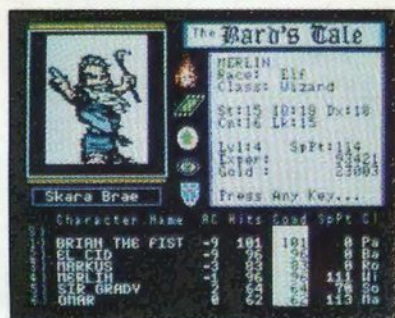
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