run 5

THE JOURNAL OF STRATEGIC STUDIES GROUP

Issue 1

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DETAILS INSIDE

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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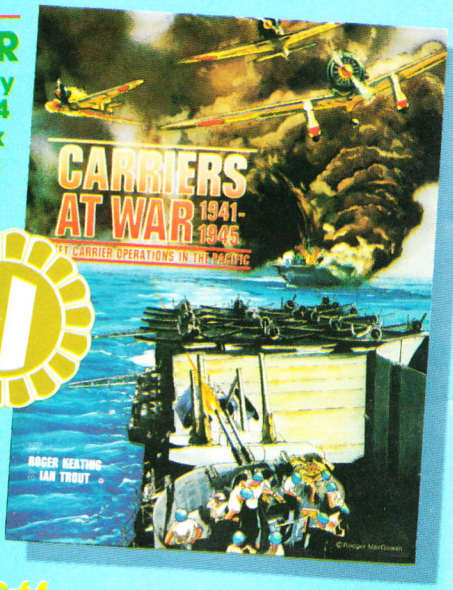

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Your Computer.

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Strategy & Tactics Magazine.

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Commodore's POWER/PLAY.

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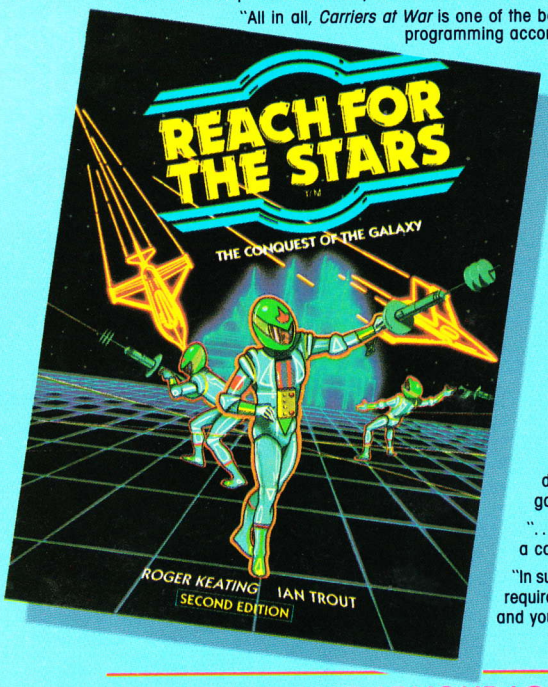

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Your Computer.

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January 1986

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American and Canadian subscribers should place their order (in US funds) withour American Office. Everyone else should contact ourAustralian Office.

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.

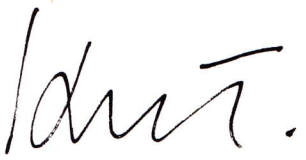
There's as much in the game as you care to take out of it. The same applies with our new *Europe Ablaze*, which we hope you have purchased by now.

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 contraints, 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

Continued on page 22

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 0FF
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 0FF
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
```

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  #!20
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  #!38
0317 B1 28         51 CRT1     lda  (SL),Y
0319 C8            52          iny
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  #!01
032A B1 28         71 CRT2     lda  (SL),Y
032C 88            72          dey
032D 91 28         73          sta  (SL),Y
032F C8            74          iny
0330 C8            75          iny
0331 C4 01         76          cpy  POS2
0333 90 F5         77          blt  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  #!24
0343 F0 07         93          beq  CRTN
0345               94 ;
0345 A9 0A         95 CRT3     lda#!10
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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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 personel 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 guarrantee 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.

JAPANESE ORDER OF BATLE

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

AMERICAN ORDER OF BATLE

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

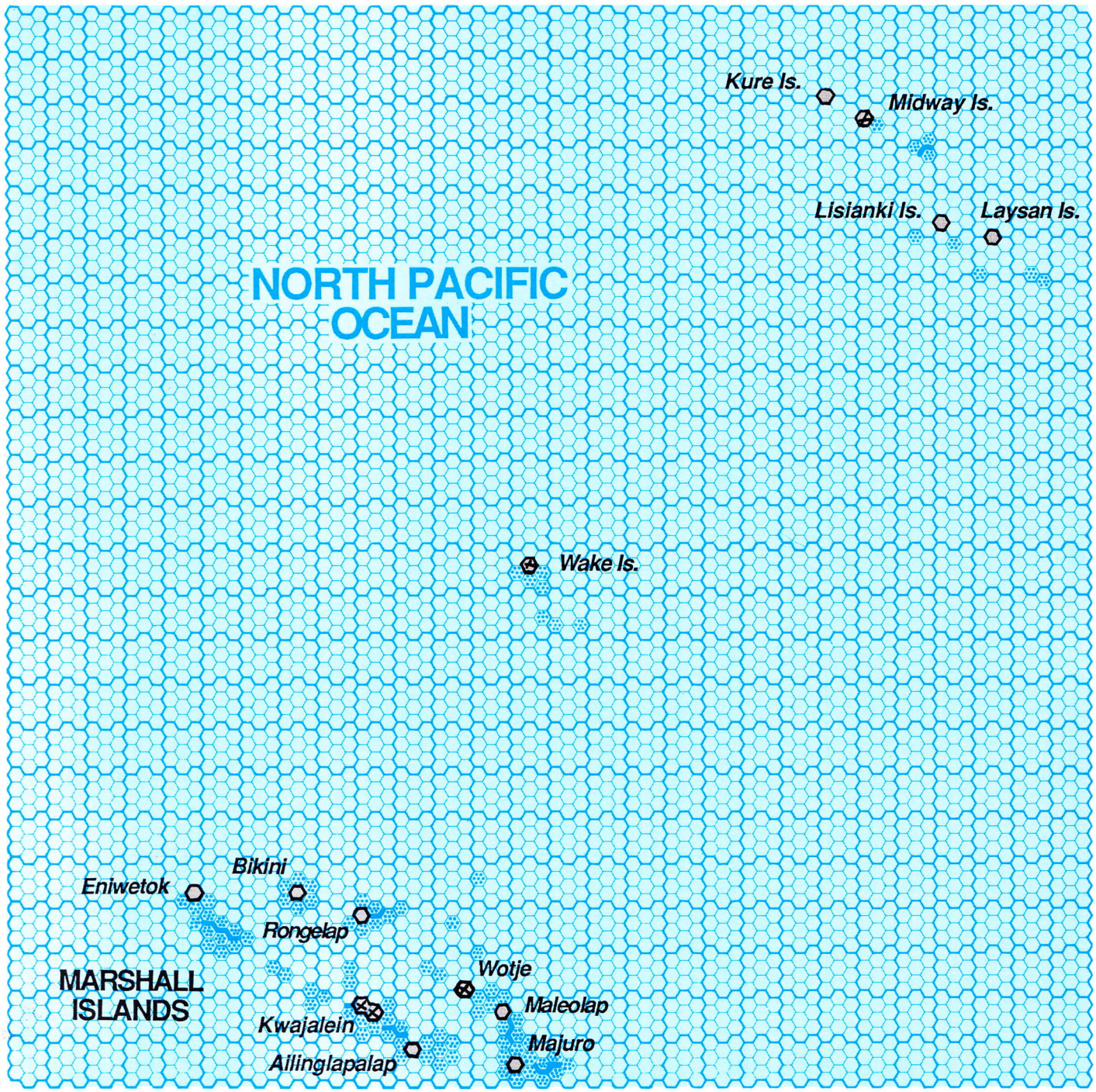
Saratoga - 13 F4F-3, 43 SBD-3,
- 11 TBD-1
Lexington - 21 F2A-3, 33 SBD-3,
- 15 TBD-1
Enterprise - *18 F4F-3, 35 SBD-3,*
- *14 TBD-1*
San Fran. - *18 SBD-3*

LAND BASED AIR

Theatre 0

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

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	1	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	N	Y	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]	CV1925	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
VULNERABILTY	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
VULNERABILTY	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		

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		NE,E SE

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 - 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	-	-
AMCHOR POINT 2	Y/N	-	-

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
AIRSTRIP 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 - Kajioka.

Allies

Theatre 0 - Devereux, Task Force 0 - Fletcher.

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 ISLAND 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
VULNERABILTY	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 pre-requisite 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 *Blitzkreig*, 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 oportunity 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, iniative, altitude, speed and, above all, fighting spirit. *Luftwaffe* morale, especially amongst the fighter arm, plummetted.

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 *Luftfotte* 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 sufficent 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 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.

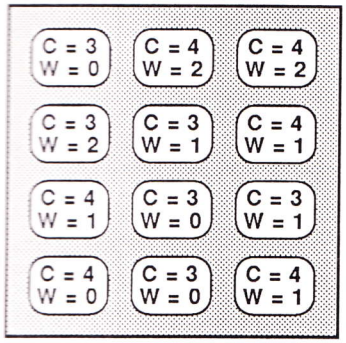
THE BLITZ - Plane Types (0)

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
MANOEUVERABILITY	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
MANOEUVERABILITY	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
MANOEUVERABILITY	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



THE BLITZ - Doctrine

		AXIS	ALLIES
MISSIONS	0-15	4	0
POPULATION	0-7	7	0
INDUSTRY	0-7	5	5
COMMUNICATIONS	0-7	1	4
PORT FACILITIES	0-7	4	7
AIRFIELDS	0-7	2	3
RADAR	0-7	2	0
SHIPPING	0-7	3	6
SUPREME COMMANDER	0-7	4	5
C-IN-C	0-7	2	5
GROUND ECM	0-7	0	2
ORDNANCE EFFECT	0-3	2	0
AA FIRE CONTROL	0-3	2	1

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	KGr126	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	74,76-7,111	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	78-9,82,112	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 Lindsy	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

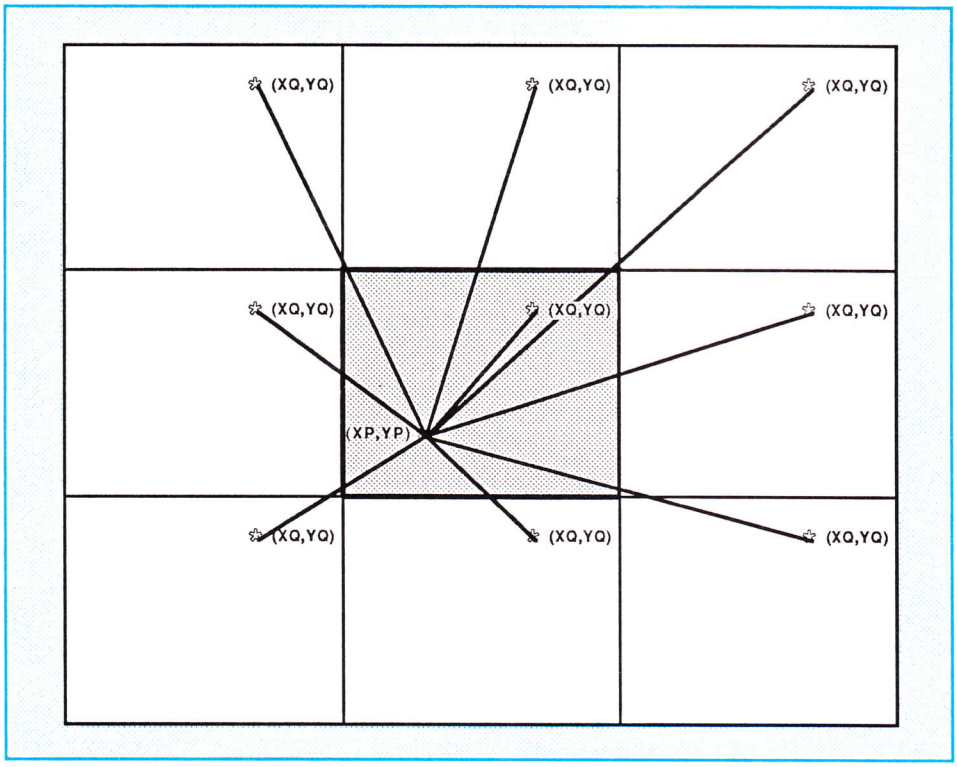
DATE	1-31	7
MONTH	1-12	9
YEAR	0-63	40
LENGTH	1-31	10
DAWN	3-10	6
DUSK	15-22	19
MOON	0-27	11
FORECAST	0-3	1

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.

(1) (2)

(4) (3)

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 57l 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 rapscallion 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 numbers[1] 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	Ryuho
(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
	DD100	Tokitsukaze
	DD101	Urakaze
	DD102	Yukikaze
DD 1941A	DD103	Akigumo
	DD104	Akishimo
	DD105	Asashimo
	DD106	Fujinami
	DD107	Hamanami
	DD108	Hayanami
	DD109	Hayashimo
	DD111	Kazegumo
	DD114	Kiyonami
	DD115	Kiyoshimo
	DD116	Makigumo
	DD117	Makinami
	DD119	Naganami
	DD120	Okinami
	DD121	Onami
	DD123	Suzunami
	DD125	Takanami
	DD126	Tamanami
	DD130	Yugumo
DD 1941B	DD131	Akizuki
	DD132	Fuyutsuki
	DD133	Hanatsuki
	DD134	Harutsuki
	DD135	Hatsutsuki
	DD139	Natsuzuki
	DD140	Niizuki
	DD142	Shimotsuki
	DD143	Suzutsuki
	DD144	Teruzuki
	DD145	Wakatsuki
	DD146	Yoizuki
DD 1942	DD147	Shimakaze
DD 1944A	DD148	Hinoki
	DD149	Kaede
	DD150	Kashi
	DD151	Kaya
	DD152	Keyaki
	DD153	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.

	DD154 Kuwa
	DD155 Maki
	DD156 Matsu
	DD157 Momi
	DD158 Momo
	DD159 Nara
	DD160 Sakura
	DD161 Sugi
	DD162 Take
	DD163 Tsubaki
	DD164 Ume
	DD165 Yanagi
DD 1944B	DD166 Azusa
	DD167 Enoki
	DD168 Hagi
	DD169 Hatsuyume
	DD170 Hatsuzakura
	DD171 Hishi
	DD172 Kaba
	DD173 Kaki
	DD174 Katsura
	DD175 Kusunoki
	DD176 Kuzu
	DD177 Nashi
	DD178 Nire
	DD179 Odake
	DD180 Sakaki
	DD181 Shii
	DD182 Sumire
	DD183 Tachibana
	DD184 Tochi
	DD185 Tsuta
	DD186 Wakazakura
	DD187 Yadake
	DD188 Yaezakura

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	Belleau Wood
(34,4)CVE1939	CVE26	Sangamon
	CVE27	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 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 LIGHT CRUISERS

CL 1920	CL 4	Omaha
	CL 5	Milwaukee
	CL 6	Cincinatti
	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	Indiannapolis
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	Witchita
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
	DD416 Walke
	DD417 Morris
	DD418 Roe
	DD419 Wainwright
	DD420 Buck
DD 1939	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
	DD453 Bristol
	DD454 Ellison
	DD455 Hambleton
	DD456 Rodman
	DD457 Emmons
	DD458 Macomb
	DD459 Laffey
	DD460 Woodworth
	DD461 Forrest
	DD462 Fitch
	DD463 Corry
	DD464 Hobson
	DD483 Aaron Ward
	DD484 Buchanan
	DD485 Duncan
	DD486 Lansdowne
	DD487 Lardner
	DD488 McCalla
	DD489 Mervine
	DD490 Quick
	DD491 Farenholt
	DD492 Bailey
	DD493 Carmick
	DD494 Doyle
	DD495 Endicott
	DD496 McCook
	DD497 Frankford
	DD598 Bancroft
	DD599 Barton
	DD600 Boyle
	DD601 Champlin
	DD602 Meade
	DD603 Murphy
	DD604 Parker
	DD605 Caldwell
	DD606 Coghlan
	DD607 Frazier
	DD608 Gansevoort
	DD609 Gillespie
	DD610 Hobby
	DD611 Kalk
	DD612 Kendrick
	DD613 Laub
	DD614 Mackenzie
	DD615 McLanahan
	DD616 Nields
	DD617 Ordronaux
	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
	DD465 Saufley
	DD466 Waller
	DD467 Strong
	DD468 Taylor
	DD469 De Haven
	DD470 Bache
	DD471 Beale
	DD472 Guest
	DD473 Bennett
	DD474 Fullam
	DD475 Hudson
	DD476 Hutchins
	DD477 Pringle
	DD478 Stanly
	DD479 Stevens
	DD480 Halford
	DD481 Leutze
	DD482 Watson
	DD498 Philip
	DD499 Renshaw
	DD500 Ringgold
	DD501 Schroeder
	DD502 Sigsbee
	DD507 Conway
	DD508 Cony
	DD509 Converse
	DD510 Eaton
	DD511 Foote
	DD512 Spence
	DD513 Terry
	DD514 Thatcher
	DD515 Anthony
	DD518 Brownson
	DD519 Daly
	DD520 Isherwood
	DD521 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 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 SUBMARINES

(2,6)SS 1918
SS130 S-25 to SS146 S-41

(2,6)SS 1923
SS153 S-42 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 Hallibut
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 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
VULNERABILTY	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
VULNERABILTY	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
VULNERABILTY	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
VULNERABILTY	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
VULNERABILTY	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

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
VULNERABILTY	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
VULNERABILTY	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
VULNERABILTY	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
VULNERABILTY	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
VULNERABILTY	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

a. The Lexington was sunk before she had a chance to be fitted with the revised AA battery.

b. The bracketed figures refer to the South Dakota (BB 57). She was fitted out as a Force Flagship.

c. 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
VULNERABILTY	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
VULNERABILTY	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
VULNERABILTY	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 accomodate 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 Phildelphia 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, seige 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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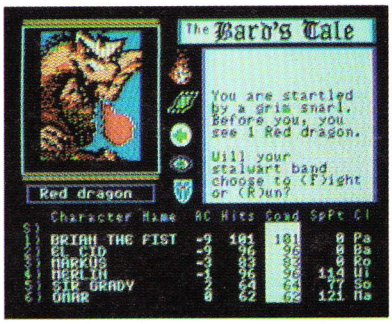

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