Headmouse presents

Sir Lawn chalot

WHILE the foregoing drama is not necessarily an accurate record of what might have transpired in King Arthur's day, it's entirely possible that even then there were certain vexing details of personal equipment which made life more difficult for all concerned.

With which historical footnote, Headmouse, Approach's roving reporter girds his armor to present, as promised, the first of a series of "customer reports" on various items of personal and survival equipment. Armed with numerous "how come?" letters from you readers (Approach, Oct. 'S5) Headmouse sought out BuAer Safety, Survival and Rescue Section (AE-52) for answers regarding the first item of equipment-helmets.

Hard-hat History

First, some background information on helmets is in order, and the picture goes something like this: There was an H-1 helmet, which was a onepiece, outer shell design. It resembled a modified football headgear with earphones, and its shortcomings quickly indicated further improvement to be necessary. A scientifically designed H-2 one-piece helmet followed, but its development was discontinued when the two-piece helmet plus liner concept appeared to be a more promising answer.

This first two-piece helmet, the H-3, featured a "breakaway" shell, with a leather shear strap (later modified with a metal ball-hook) designed to permit the outer shell to carry away under high windblast forces. Quite a number of these were introduced to the fleet, and were later modified with fore and aft stabilizing straps connecting liner and shell, and solid, non-shear chinstrap. This stabilizing strap arrangement came about when thinking again turned to keeping the helmet attached to the liner, and this modification was permanently incorporated in the familiar H-4, which became the standard anti-buffet helmet. Until the recent appearance of the APH-5, the fleet was equipped with a sort of Duke's mixture of H-4s and H-3s having H-4 liners.

Meanwhile, work in helmet development continued with the MSA-N2 design, an immediate predecessor of the APH-5, being manufactured in very limited quantity. Another contract initiated work on an individually fitted helmet, designated the BBC- A further development is the BBC-X2 which is a joint effort of the Navy and Air Force. We'll speak more of this one later.

Complaint Department

For a comprehensive picture of the APH-5, Headmouse was taken to the Equipment Section's "chamber of horrors" of experimental equipment, where he fired away with the many questions and complaints received concerning this latest standard helmet. (Headmouse had scrounged the Safety Center's one APH-5 from the Aero-Department, and logged enough time in it to speak with some familiarity about it.)

First, the APH-5 is being purchased in quantity, and at the time of writing there have been some 5000 helmets manufactured (2500 under first contract, 2500 under second contract for 7500) and delivered at a cost of about $100 per copy.

Initially, the APH-5 was designed without a visor, and the incorporation of a visor required a cover plate in order that the helmet shell itself would not be weakened by the visor guide slot. (Headmouse poked at the

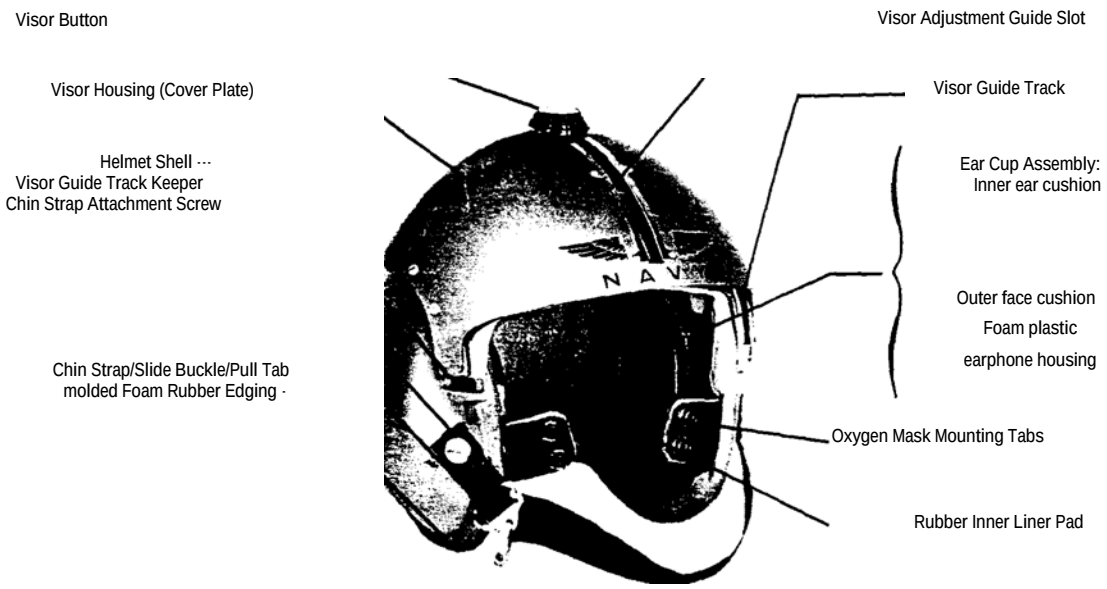
old slotted model and agreed that it was for the birds---hardheaded woodpeckers.) The final version was field tested for nearly a year by squadron pilots, during which time some 50 helmets had an average of 300 flight hours logged. From the comments

Protection vs. Comfort

The big factor in helmets, the protective quality, has been accomplished in the APH-5 with an improved shell (ridges were removed to prevent localizing of impact forces) and by an inner layer of polystyrene plastic

One thing to be remembered, Headmouse decided, is that the fit becomes more acceptable when the wearer realizes that stability is critically important to his protection, i.e. a snug fit, just short of uncomfortable tightness gives the optimum in both safety and comfort.

APH-5 Helmet



and suggestions thus obtained, several modifications were made and the helmet was put into production.

The APH-5 comes in two shell sizes, large and medium, which quickly proved somewhat inadequate for broad span heads. This deficiency was overcome by providing a thinner plastic earphone housing for us lop-eared types and by furnishing extension shim fittings which close-cropped pilots may insert as required.

energy absorption material which appears excellent. Six vari-sized sponge rubber pads are furnished with each helmet to provide individual fitting. The trick seems to be to try various combinations in order to get the best fit. (Headmouse thought he had a good initial fit, but after several hours, one or two pressure spots became somewhat uncomf-ortable. These were eliminated with insertion of a smaller pad in the appropriate area.)

Hot Subject

On the problem of heat, the equipment section people don't deny that the close fitting sponge rubber lining may produce more heat than the old cross-strap webbing of the H-3, -4. But they remind you that the new helmet offers contact all over your head, which condition is somewhat new to those of us who dislike wearing a Borsalino even in the winter. Headmouse recalled his initial introduction to the H-3 brain

bucket, which produced a pretty negative reaction, for about a month, after which it became just another item of gear.

There are consistent reports, however, that the sponge rubber collects perspiration in an unsatisfactory manner.

Regarding this problem, BuAer advises that heat tests of the helmet are being made and that there is also some promise of relief seen in improved, leather-covered liner pads which are being considered.

Visor Viewpoint

Now about the visor-most of you seem to regard it as quite an improvement, at least from the vision viewpoint, and the visor fit to the oxygen mask is pretty fair. (A modification being incorporated in production models provides a different angle of the oxygen fastener tabs on the helmet, which will make the mask hang more comfortably.)

A number of complaints on the visor button have been received -the binding problem was solved in later models by the use of a template for aligning the track before riveting, and by burnishing the visor track to reduce friction. Helmets produced under the second contract appear to be free of this binding. Headmouse was concerned over the possibility of the face curtain hitting the visor coverplate shoulder seems as if the coverplate might be more smoothly faired into the helmet to prevent possible curtain hanging.

The problem of the curtain dragging over the visor button seems of lesser importance. (Headmouse hopes to have time enough to get the visor down before yanking the curtain). The scraping of the button on the roundheaded rivets, which you may have experienced, is being corrected with substitution of flush eyelets. A reported tendency of the visor to "walk" back under high wind forces has been corrected with an additional spring in the button track, and the equally irritating tendency of the visor to slip out of the guide track has been corrected with the addition of an eye shield guide leaf spring on either side. Backfit kits are being shipped to holders of the earlier models.

Choose Your Filter

Headmouse found that the plastic visor, or filter lens, comes in several shades of "neutral gray" with marks on the inside of the lens to indicate the relative "darkness" or degree of visible light transmission afforded. (For example, in normal Navy sunglasses, about 85 percent of the visible light is blocked out.) Here's how you can choose your particular "shade":

In the first APH-5 contract, the marking of the lenses goes

"D"-10-20 % of visible light transmittance.

"XS"-Below 10 % of visible light transmittance.

In the second production contract the following marking is effective

"D"-10-20 % visible light transmission.

"XD1"-8-10 % (medium dark).

"XXD"-6-8% (dark).

"XXY"-Below 6 % (very dark).

These varying shades were made available for obvious reasons of mission and specific visual conditions, plus such factors as the demand by light pigmented (blond) pilots for darker lenses. The visor, which has held up in sled runs of over 600 mph, is regarded by a major optical authority as the best job of eye shield design they had seen.

Plug Troubles

In the first 1500 helmets manufactured, the plastic female communications plug on the side of the helmet obviously is poorly placed and subject to frequent breakage. This is remedied in later models with a lead-in which extends from beneath the edge of the helmet. For those who have the earlier types, BuAer hopes to have spare parts soon.

For those of you who have heard of the "Christmas tree" oxygen clip, BuAer tells Head

mouse that a number of the Hardman bayonet type adjustable fittings have been purchased for evaluation, and right now they look pretty good. This mask fastener may be quickly inserted in a slot receptacle on either side of the helmet for a comfortable fit and a quick disconnection. Headmouse liked this feature very much.

APH-5 vs. P-4

Because of the continuing interest in the respective qualities of various services' headgear, Headmouse chose to compare the Air Force standard P-4 helmet with the APH- Point for point, for weakness, the APH-5 seems to be considerably superior to the P4. First, on the basis of sheer protection, the APH-5 offers about the same superiority over the P-4 as over the old H-3; 4 jobs. While the P-4 has a beautifully finished outer shell, it has fewer cross straps than the H-4 in its suspension webbing, and has no energy absorption. material other than a wafer thin disc of sponge rubber.

Comfortwise, the P-4 has the advantage of limited head contact and provides air circulation space. Even so, with respect to weight, Headmouse weighed a small P-4, with earphones, and found it to be one ounce *heavier* than the large size APH-5 with earphones installed.

So much for that portion of the discussion, which can obviously become one of personal opinion versus individual likes and dislikes. Headmouse adds only that the helmet people at BuAer are very definite in pointing out that. the APH-5, like any such item, is but another step in improved protection-with no one step being offered as the final answer.

For the Future

Regarding that next step, Headmouse was interested to learn that the most promising helmet under development, the BBC-X2, will incorporate a new helmet shape plus a novel means of providing individually molded fits. Using an epoxy resin for the energy absorption material, non-technical personnel at the squadron level will be able to make individual head molds which will be placed in the new shell, covered with a thin, comfort layer of sponge rubber with an inner lining of chamois. The visor will retract between the outer shell and the energy absorption layer.

This development, you're reminded, does not conflict with the continuing work on pressure suit helmets, but is intended eventually to replace the APH-5 in the still well populated lower levels of air operations.

That's the picture on the helmet situation. Headmouse figures the APH-5 has drawbacks and deficiencies, but that the overall result is a considerable improvement over previous headgear. The one remaining question, that of "How and when can 1 get one?" is pretty much a matter of expeditious movement through the supply pipeline, and that phase of the problem is outside the function of BuAer.

Footnotes: A'=Should you .have trouble with the chinstrap screws becoming loose and backing out, try a dab .of rubber cement to make them seat firmly: We heard that - some folks were occasionally Dulling off their helmets at altitude be - ,-,--,,,cause of the best-we figure that •-could be pretty dangerous. Head ,.: mouse recommended that more ade- quate instructions for the fitting. =, care and maintenance of the APH- 5 6e provided with each helmet is On queries ' concerning use of -,,boom mikes with the APH-5. BuAer says that it is not presently eon` templating the provision of boom V mike attachments -for the helmet. :and indicated that those who re -quire them may adapt the present ' boom mike attachment to the new ;helmet.

One final item: In ease you may ,,lave been hesitant over expressing I'__= your personal sear problems, hel- and otherwise. BuAer invites the constructive criticism of its .customers- address Chief. Bureau

"of Aeronautics. (AE-52). Washing ton. D. C.

Ed **Note: (Watch for another "customer report., Of pilots' Per.** °*V sonal equipment* **appearing soon).**