Big Picture
answer

to the

big problem?

Will the fighter-cockpit instrument
panel eventually be replaced by one
large screen? Karen Walker reports on a concept aimed at doing just that.

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rowning in data—starving for know-
ledge. According to McDonnell
Aircraft Company staff manager
Gene Adam, that is the big problem facing today's fighter pilot. But he believes that he has the answer to the big problem—the Big Picture.
Big Picture is a screen the size of a 19in domestic television which entirely replaces the aircraft's instrument panel. Because Big Picture is just a single screen—there are no dials, switches, gauges or structure—it is 100 per cent flexible. The pilot can summon the infor-mation he requires by tracing his finger along the touch-sensitive screen. Even-tually the screen might be voice-con-trolled, possibly even thought-controlled. Sounds like a far-off dream? Adam says that, given appropriate funding, Big Picture could become a reality within five years.
Adam has been designing fighter aircraft cockpits for years. The problem, he says, with the headup display (Hud) is that it is not really "headup", it is "head-forward". And Huds have a limited field of view—perhaps 20° to 30°. "What we need is a helmet-mounted display. McDonnell Douglas has built its own helmet-sight display which weighs 21b— lighter than the standard USAF helmet currently in use. The new helmet will be delivered to Wright-Patterson AFB in February next year for trials," says Adam.

Adam also wants to scrap the tradi-tional instruments and gauges. The fuel gauge, for instance, is simply an indicator
to the pilot of how much fuel he has remaining. Adam proposes a circle that shows the range his aircraft can fly with

the fuel available. The circle would expand and contract with speed and altitude vari-ations.

"The big problem today is lack of situ-ational awareness—knowing what's going on," says Adam. "CRTs are taking up more and more room in modern cockpits, and we are running out of CRT space. Secretaries have more space on their VDUs than fighter pilots have on their CRTs—and we are going to be faced with more problems because all the time we are getting more and more information to put on the CRTs.

"The pilot has to absorb a lot of infor-mation, then memorise it so that he can relate it to something else that he has to summon up separately. Because the wealth of information going on is so great, some people say 'show the pilot only what he needs to know'," explains Adam. "But I say that that is like putting a man in a room full of 36 snakes, but only showing him five of them. Then you expect him to cross the room safely. Like that man, the pilot needs more than snippets of informa-tion if he is to get through all the threats, deliver his weapons, and return safely."

"The point is that pilots are good deci-sion makers and good executors if they are given the right data and enough time. No computer around today can match the decision-making capabilities of a human being."
Adam believes that Big Picture can provide the pilot with all the information available, in a way that can be absorbed immediately. There is no separate radar display, and Big Picture will include posi-tions of enemy aircraft, friendly aircraft, SAM and AAA threats, and terrain, with

22

The pilot touches a missile area on the scree (represented by the balloon shape) and indica by voice command that he wants to avoid tha
area

all information displayed on the 300-400in2

screen. Current plans are fo
the whole screen to be touch-sensitive Adam is not worried about the technology needed to achieve this. It is the more advanced plans—for voice control and thought control—that Adam admits will be complicated to master, though curren research indicates that it is possible. But even developing only a touch-sensitive screen will not be without its problems. For one thing, Big Picture will need a breakthrough in low power, low bulk, flat-panel display technology. The performance of today's shadow-mask CRT displays in direct sunlight, which is usual inside a high-visibility fighter cockpit, still leaves much room for improvement. Adam says that today's pilot has grown up in the video age

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