

William C. Ford
STATION 4
PO Box 6124
STN Forces
Cold Lake, AB
T9M 2C5
(780) 594-3797

1 AMS Anniversary Helmet Display of Vintage Jet Age Flight Helmets
of the Royal Canadian Air Force and Canadian Armed
Forces 1954 thru Present Day

Background History:

With the rapid development of jet aircraft for military use, it was quickly realised that pilots needed better forms of physical protection to withstand the demands placed on the human body. The bygone days of the old leather flying helmet, goggles and silk scarf were quickly coming to a close.

At the close of World War II with the introduction of Jet aircraft and the ever increasing determination to push the speed barrier up to, and exceeding Mach 1 there was an urgent requirement for the rapid introduction of better forms of pilot protective equipment. With the increase in aircraft speeds and higher altitudes being achieved better forms of protection had to be developed to physically, internally and externally ensure the pilots survival in this ever-increasing hostile environment.

Since the United States, Britain and Canada were leading the way into the jet age development, it was natural that this medical research information would be shared. General Textile Mills Company of New York was the leading company for jet pilot survival equipment for the United States Air Force, so it was only natural that Canada investigate, develop and adopt their equipment and standards where possible. Thus began the long and close association between the RCAF, Canadian Armed Forces and Gentex Corporation. This association has lasted well over the past 50 years.

The First Standard Issue Air Force Hard Shell Helmet:

The first hard shell flight helmet was produced by the General Textile Mills Company and was called the P-1. This issue of helmet was issued during the Korean Conflict for all United States jet fighter aircraft and was also procured in mass by all NATO countries and other countries friendly to the United States.

The "P" series helmet shells were constructed of multy layers of fibreglass cloth reinforced with epoxy resin. The MS22001 oxygen mask used was similar to the World War II US Army Air Corps standard issue mask called the A-13A and was redesignated by the USAF in 1950.

This standard white helmet the P-1 coupled with the American issue B-8 goggles and the above MS22001 oxygen mask were standard issue to our lead in pilots of the RCAF Jet Age. Such outstanding early jet pilots were W/C Duke Warren (DFC) and S/Ldr Syd Burrows (AFC) to name but just a few.

Note: For this display, a P-1 helmet is not available at this time.

Top Row 1 - left to right:

Helmet #1



The H4-1 was first issued in 1954 by General Textile Mills Inc of New York, NY, USA. To complete this issue an inner cloth helmet liner housed the communication cord & earphones. This inner helmet was secured to the outer hard shell surface, as housed as well the electronic earphones. This issue was completed with the standard MS22001 oxygen mask with microphone. To complete the pilot, they were issued with the standard US issue B-8 goggles (to see the bandit in the sun). This helmet would be worn by the RCAF pilots of F-86 Sabre and CF-100 AVRO "Canuck" of the day.

Helmet #2



The H4-1 hard shell with inner cloth helmet and full electronic, MS22001 oxygen mask assembly with the MC-3A oxygen connector and B-8 goggles.

Note: This helmet has been painted and marked to denote 434 Fighter Sqn during the hey days of Canada's commitment to NATO, ie F-86 Sabre. 'Tom', call number 31, would have worn this helmet in 2(F) Wing in France during 1954.

Helmet #3



The 2nd Canadian issue model of H4-1 helmet featured a better mounting system for the new visor assembly to the H4-1 hard shell. This was carried out by the addition of an aluminium centre slide bar. A new tinted visor with elastic straps with pull-the-dot fastener as with the previous H4. This new visor feature allowed the pilot the freedom of movement of only using one hand to operate the visor assembly instead of having to use two hands to put on and off the old goggles that were used in the past. A cloth inner helmet liner housed the communication cord & earphones and mounted the MS22001 oxygen mask with MC-3A connector.

This helmet would be worn during the final days of the F-86 and during the hey days of the CF-100 Clunk. One drawback of this visor assembly was that during ejection the high winds and speeds reached would cause the visor to snap over the top of the helmet and or break away causing injuries to the head, neck & face of the pilot.

Helmet #4



The 3rd Canadian issue model of the H4-1 Hard-shell, inner cloth liner helmet, MS22001 oxygen mask, MC-3A connector, MKII Pate Quick Acting Suspension. This H4-1 helmet featured a newly developed visor assembly that was hard mounted to the helmet outer protective shell. The new hinge assembly was very limited as it only allowed for two (2) positions, fully up or fully down and could only be locked in one of those two positions. This was the standard issue helmet & mask assembly for the RCAF pilot of the day flying the CF-100 Clunk, CF-104 Starfighters or the CF101 Voodoo aircraft in the early 1960's.

The aim of the MKII Pate Quick Acting Suspension assembly was that of a more efficient mask fitting, application of and removal of the MS22001 mask to the face. A more comfortable and safer mask fit could be achieved during flying operations, rapid single-handed adjustment for increasing mask tension to maintain the breathing pressures required for emergency descent from 50,000 ft. Some additional features were no appreciable increase in weight, no added restrictions to visibility or mobility to the pilot during operation of the mask. A further 3 variations in mask positions were achievable with only single hand operation. The assembly could be positioned either in standby on chest, normal with the straps adjusted to prevent outboard leakage and finally "emergency" with straps adjusted to hold mask pressures up to 50,000 ft equivalent.

Helmet #5



This RCAF helmet when officially introduced was called the Aircrew Flying Helmet DH 41-2. It was first introduced in the very early 1970's with the introduction of fast movers, ie: CF-104 Starfighter and CF-101 Voodoo aircraft and the abilities to achieve speeds greater than just mach 1 or 2. It was designed and manufactured by the newly renamed GenTex Corporation.

The DH 41-2 helmet was designed for use by personnel of the Royal Canadian Air Force in high performance aircraft. It incorporates the famous GenTex sound attenuation capability with both comfort and helmet retention. Under extreme loads experienced during ejections this helmet inner liner systems had an added feature of break links in the chinstraps, allowing the helmet to be pulled free of the wearer's head to aid in the prevention of neck and head injury. Communications systems could be adapted to user requirements.

The basic shell construction was made from an epoxy impregnated fibreglass cloth laminate material finished with white epoxy paint. Because of the exclusive GenTex 'inner helmet' design, the common practice of using sizing pads was virtually eliminated. A very effective slow recovery energy-absorbing material manufactured by GenTex was used instead of an inner crushable liner.

The neutral pivot-type visor has a cloth cover to protect it from scratches when not in use. Snap fasteners are incorporated for adapting the "Pate" type oxygen retention means.

The features of the newly developed DH 41-2 helmet were as follows: retained during high-speed bailout, provision for both better vision and facial protection. Also sound attenuation protection of the wearer's head during in-flight buffeting, ejection's, manual bailouts and crash landings.

In addition, this helmet provided for a more stable carrier for the oxygen mask, microphone, earphones and visor; providing face protection from sun radiation, fire during emergencies, cold, wind and rain in survival situations.

The helmet featured the MS22001 mask with the RCAF first MKI pate suspension assembly, which was the first with the standard MC-3A connector. Of note this helmet was worn by "F/Lt Lyle Kettles", one of the RCAF's first pilots instructors for the CF-104 Starfighter at CFB Cold Lake, Alberta with 6OTU. Lyle's tactical call sign was "GAR".

Helmet #6



This helmet is a repeat of the DH 41-2 but for display purposes has a new improved RCAF MKII pade installed on the MS22001 mask.

Helmet #7



This helmet is called the DH 411 single visor helmet configuration used by pilots of transport aircraft, helicopter aircraft, and by tech crewman, pilots and other personnel. This model of the GenTex helmet offered a unique close-fitting design very similar to an armour/tanker's helmet. The fibreglass outer shell of the 411 helmets came with the optional feature of both dark and clear visors housed in a hard protective cover in order to provide better protection of the visors and reduce scratches. These visor could be raised or lowered by unscrewing the metal knob in the centre and could be locked in any position along the centre track assembly.

Middle Row 2 Left to Right

DH41-2/411 General History

The Canadian Armed Forces in 1979 officially adopted GenTex's new model of jet pilot helmet due to the problems reported following accidents and complaints from the users. Some of these were: on ejection the visor assembly would snap off, fracture or shatter, causing facial or eye injuries. Further, since the visor was not covered, it was easily damaged or scratched.

This new issue to the Canadian Forces Jet Pilots of the day was called the Gentex DH 41-2 Dual Visor Helmet Assembly. This new helmet design when properly fitted could be retained during high-speed bailouts. It provided for much better vision and facial protection, sound attenuation

and protection for the wearer's head during in-flight buffeting, ejection's, manual bailouts and crash landings. The design distributes the impact forces over the entire head via the webbing outer shell suspension system, thus absorbing the forces and resulting in a minimum amount of impact reaching the wearer's head.

In service use, the helmet assembly was assembled either to the type DH 41-2 Jet Crew, or the 411 type Helicopter/transport configurations. These generally consist of the following:

DH 41-2 Assembly consists of the following: two individually controlled visors, one clear and one tinted, and used with a microphone equipped oxygen mask.

Type 411 Assembly consisted of the following: a single visor housing into which one of three tinted visors could be installed and a boom microphone installed on the outer surface of one ear cup.

Helmet #8

Canadian Armed Forces 1979 DH 41-2 Dual Visor Helmet



Description: As per above, but this helmet has had the 421 Sqn markings applied to the visor cover assembly. Of note is the pilot's rank and name. In the European theatre, Canada was depicted in weekly Stars & Stripes newspaper comic strip of a clean steely-eyed fighter pilot, this was S/Ldr Dan Cooper. 421 Sqn members carried on the fine tradition and had the new issue of their helmets painted with Squadron markings and named to denote the Canadian Armed Forces and its new rank structure. Of note as shown on this visor assembly there was a real Major Dan Cooper on Squadron strength at the time that this comic strip was running showing a fictitious Canadian Starfighter pilot. At this time 421 Squadron were flying the CF-104 Starfighter aircraft in their new reconnaissance/ground strike role as Canada gave up its NATO Nuclear Strike Role with its state of the art nuclear tipped missiles being replaced with photo pods and dumb iron bombs.

Helmet #9



Canadian Armed Forces
1979 DH 41-2 Dual Visor Helmet

This helmet along with the MKII paint and MS22001 mask was the standard issue to our CF-101 Voodoo aircrew members. It was common practice for squadrons to apply their own unit markings with “call signs” or members names. This helmet is marked as per 409 Squadron “Nighthawks” based at Comox British Columbia with Maj. Drew Foulds name as he wore it while on squadron strength in the late 1980's. In this case if the light were turned off, this helmet would reveal the “Nighthawk” head & markings in the dark through the use of orange & red reflective tape!

Helmet #10



A standard issue Canadian Armed Forces DH 41-2 with MKII paint suspension with a visor cover painted and marked as per 416 “Lynx” Sqn, based at CFB Chatham, NB. At the time 416 Squadron was flying the McDonnell CF-101 Voodoo aircraft with 2 air-to-air unguided missile carrying a nuclear warhead called the ‘Genie’ and/or lightweight Falcon (AIM-4D) air-to-air missiles used to engage enemy fighter aircraft in the all weather fighter Interceptor NORAD Role.

In total Canada’s commitment to NORAD was 3 Squadrons of CF-101 Voodoo’s serving with 425 “Alouette” Sqn, at Bagotville PQ, 416 Sqn at Chatham NB and 409 Sqn at Comox BC. The Canadian Armed Forces commitment to North American Air Defence Command (NORAD) and to safeguard against hostile Soviet aircraft attacking North America was three fighter squadrons maintaining

2 fully crewed and armed McDonnell CF101 Voodoo aircraft on alert, 7 days a week, 365 days a year, at CFB Comox, CFB Chatham NB and BFC Bagotville, PQ, for over 20 years.

Helmet #11



The final issue of the DH 41-2 helmet series featured a dual visor helmet that was issued in the early 1980's and the only new features was a newer liner assembly with contour ear cups with a newly designed oxygen mask retention assembly. These contour ear cups were not very popular, as they were hard to fit to the flyer head and constantly required adjustment due to hot spots being felt on the wears head. The mask retention assembly had to be custom fitted to the member face and was not easily reused once fitted, as the straps were cut and sewn together.

Canadian Armed Forces 2nd issue of the DH 411 single visor configuration with a push button lock knob. This second issue of the DH 411 single visor helmet had a number of improved features. The visor was available in 3 styles: clear, tinted and gradient tinted versions, providing better protection for the wearer from sun, glare, dust, wind blast, foreign particles and flash fires.

The most important feature was a vastly improved visor with a controlled push button locked sliding knob, running on the corrugated housing track, or by turning button locks, friction locking on the button slide. To complete this issue, a boom microphone was installed on the outer surface of either ear cup.

Helmet #12



A standard Canadian Forces issue DH 411 single visor helmet modified and issued to the Para Rescue Personnel. The standard issue Para Rescue Crewman's helmet featured the modification of the boom microphone moved to the right-hand ear cup as the parachute static line was fed over the left shoulder. The replacement of the clear visor with the graduated tinted visor and the painting of the shell and visor cover in "international orange" was the standard issue of the RCAF Para Rescue personnel.

This helmet displayed was worn only once in 1994 at the annual Para Rescue SAREX held at 19 Wing Comox. That year was the 50th Anniversary of the formation of the Para Rescue trade. To mark this occasion, 50 SAR technicians (CAF) and ex (RCAF) Para Rescue men conducted a 50-man "mass jump" from a C-130 "Herk", CC-115 De Havilland "Buffalo" and a CH-113 Labrador Helicopter. Following this jump, all 50 members who took part in this historic jump signed the helmet to mark the occasion.

Helmet #13



A standard Canadian Forces issue DH 411 single visor helmet that was standard issue to all (10 TAG) tactical helicopter aircrew. This helmet featured a khaki paint colour with dull khaki liner assembly. 400, 401, 403, 408, 427 and 438 squadrons flying the Twin Huey, Kiowa, and Jet Ranger helicopters would have worn this issue of helmet.

Bottom Row 3 Left to Right

Canadian Armed Force
Aircrew Flying Helmet Model 190A

Basic Description:

The GenTex 190/190A helmet was first introduced in 1985 to Canada's lead in pilots for the McDonnell/Douglas CF-18 Hornet aircraft. The outer shell is made of fibreglass fabric moulded with epoxy resin. A form edge roll around the periphery, covered with soft leather, provided comfort. The outside surface of the shell is finished with polyurethane paint, colour lustreless grey.

The helmet is designed to be retained during high-speed ejections. It provides visual and facial protection, sound attenuation and protection for the wearer's head during in-flight buffeting, ejections, egress and crash landings. It is a contact helmet incorporating a polystyrene liner positioned inside the shell for impact protection and an integrated chin and nape strap for retention.

In addition, the helmet fulfils the following functions: provides a stable carrier for oxygen mask, microphone, earphones, telecommunication cords and visors.

Helmet #14



Canadian Armed Forces
Aircrew Flying Helmet 1986
Dual Hard Visor Assembly with British PQ Oxygen Mast

This first issue GenTex model 190 was with a hard visor assembly; first issued to Canadian Forces fighter pilots on operations with the CF-18 Hornet aircraft. This helmet was first issued with the British lightweight PQ mask.

There were a number of problems with this first issue 190/190A helmet. The visor assembly was found to be labour intensive, heavy on the wearer's head and neck. During high speed/"G" the shell was found to be too flexible and the mask had a number of major problems. The least of which was the retention cables. The cables and the retention blocks were hard to do and undo while wearing gloves.

Helmet #15



Canadian Armed Forces
1990's GenTex 190C

This helmet was designed, acquired and used by the Canadian Forces Search and Rescue technicians for search and rescue operations. This helmet has been modified with a downsized microphone boom mic as well as retains an MBU-12/P pressure breathing/pressure demand oxygen mask.

MBU-12/P Oxygen Mask. The MBU-12/P mask is a pressure breather/pressure demand oxygen mask. It has been especially designed for use in new generation high performance aircraft and provided for increased head mobility, better downward vision, and greater mask stability during aircraft combat manoeuvres (ACM).

The MBU-12/P oxygen mask assembly features a silicone rubber face seal integrally bonded to a high strength polysulfone plastic hard shell. The inherent rigidity of the integral face seal/hard shell allows adjustment to provide superior sealing during pressure breathing.

This assembly also consists of an inhalation/exhalation combination valve, a microphone, a suspension system and an oxygen delivery tube complete with a three-prong bayonet connector or an MC3M connector.

Helmet #16



Canadian Armed Forces
1980's GenTex Model 190A

This helmet was first introduced in the mid-1980's. It was a new and improved model 190 with a great method of improvement both to the basic materials and a better means to mount a new and improved MBU-12/P mask. Further, the visor assembly was vastly reduced in weight by the removal of the cover guides, slides and knobs.

The assembly consisted of the following major components: outer shell, energy absorbing liner, thermoplastic liner, Snap-On visor assembly, integration nape-chin strap assembly, ear cup, universal pile liner and fitting pads. This helmet features the leather visor cover featuring 410 Tactical Fighter Squadron flying the Macdonnell Douglas CF-18 Hornet based at CFB Cold Lake in Alberta. The tactical call sign is "Wild Bill". This is my own call sign used from my Search and Rescue days on the East Coast.

Helmet # 17



Canadian Forces
Mick

Gentex Model 190C Para Rescue with clip on Boom

Helmet #18



Canadian Forces

Gentex Model 190 A with AR5 NBCW Hood

Helmets # 19 & 20

Canadian Armed Forces
GenTex SPH-SCF 1993



The SPH-SCF is a lightweight helmet assembly providing head protection, noise reduction and communication enhancement for helicopter personnel. The SPH-SCF helmet assembly features a dual visor system with a mounted platform for night vision goggle (NVG) attachment. The helmet assembly consists of a helmet shell; an energy absorbing liner and a preformed thermoplastic liner, a yoke-style retention assembly with adjustable chin and nape strap; and a communications assembly featuring a quick-disconnect, boom-mounted microphone and sound attenuating ear cups.

The helmet shell is available in four different sizes and is constructed using a newly developed nylon, graphite and fibreglass cloth composition with black rubber edge beading. Two cross straps and a chafing pad, located inside the shell at each ear cup area, improved the ear cup to head tension and prevent ear cup chafing on the helmet shell.



The SPH-SCF helmet dual visor assembly featured a neutral visor, a clear visor and a mount for NVG attachment. The visor control knob is usually located along the left of the visor housing and can be locked in a down position at one of the three separate settings the ANVIS-6 NVG mount onto and is locked in place by the housing mounting plate.

In addition, the SPH-SCF helmet can be modified for the installation of the MBU-12/P oxygen mask, integration of the ANVIS-6 NVG electrical cable, night vision lip flashlight, NBC visor used with the AC and DC respirator and installation of the tempest communication system for the CH-146 Griffon.

Helmet # 21



Canadian Forces
Gentex 190C Combat Edge with MBU 20 mask.

Visor cover is from Capt Patrick Belanger 439 Squadron Aircraft
Engineering Officer

