

VZ-9A AVROCAR

Development sponsored by
The US Air Force
and
The US Army



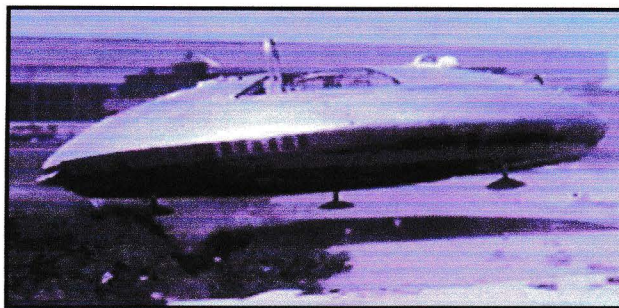
On February 11, 1953 *The Toronto Star* reported that a new flying saucer was being developed at the Avro-Canada plant in Malton, Ontario.

On 16 February the Minister for Defense Production informed the House of Commons, in Ottawa, that Avro-Canada was working on a 'mock-up model' of a flying saucer, capable of flying at 1500 miles per hour (2400 km/h) and climbing vertically.

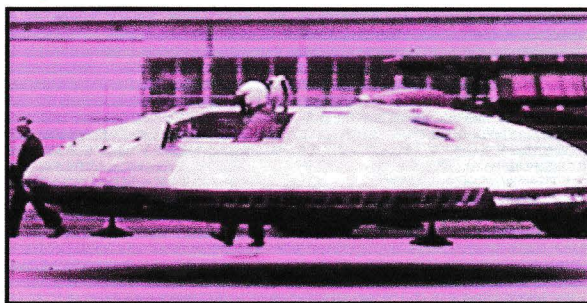
The President of Avro-Canada wrote in *AVRO NEWS* that the prototype being built was "...so revolutionary that it would make all other forms of supersonic aircraft obsolete".

But by 1960 it was being officially claimed that the project had been dropped. The 'prototype' of the Avro flying saucer is now in the U.S. Air Force Museum in Fort Eustis, Virginia.

A true flying saucer. A circular craft with a large central fan, that sucked in air from the upper side and expelled it at the edges of the disk. It flew well at low altitudes of five or six feet, but when it tried to rise further it became unstable. Never did more than hover at low altitude, and was abandoned after seven months because of stability problems.



The AVRO Canada VZ-9A AVRO car was , designed, built and tested just outside Toronto was unique in the annals of flight. Shaped like an obese discus, it was intended to use a novel flight mode called GETOL - Ground Effect Takeoff and Landing. The machine would lift into ground effect on a cushion of air expelled from a peripheral slot on its underside and directed by a sliding "focusing ring." The ring would then "focus" the cushion rearward, driving the flying saucer forward. The strange craft would thus taxi in ground effect until it had enough forward speed to climb out of ground effect and fly like a conventional airplane.



In actuality, the prototype never flew out of ground effect. To solve problems of stability in ground effect the designers came up with a pneumatic analogue control system using the huge vertical-axis lift fan as the sensing element. The obvious wobbliness of the ship in its original configuration completely disappeared thanks to this light, simple solution.

The Guardian

9-25-99

Canada's Avro 'Flying Saucer' - And German Disc Technology

By Julian Borger

In 1954, a memo was fired off to CIA department heads demanding intelligence on new 'saucer-like' flying machines being developed by Britain and Canada. So began the race to develop the most unlikely weapon of the Cold War.

It Came From Outer Toronto...

Avro Canada is best remembered for the ill-fated Arrow, the supersonic jet fighter shelved by Ottawa in 1959. Now, newly-released CIA documents shed new light on another of the

company's dreams - a flying saucer.

Washington -- The year was 1952 and the Cold War was at full chill. The House Un-American Activities Committee was looking for reds under beds, and UFO sightings were spreading like an epidemic across the United States. Even Air Force pilots reported being pursued by flying saucers. The sense of dread was turning to frenzy, and the CIA decided something had to be done.

In one of his many memos on the subject, H. Marshall Chadwell, deputy head of the agency's Office of Scientific Intelligence, declared that "something was going on that must have immediate attention." He and others in the CIA were concerned that the Soviet Union was developing a secret weapon based on the "flying discs" that the Nazis had been rumoured to have constructed in the last months of the Second World War.

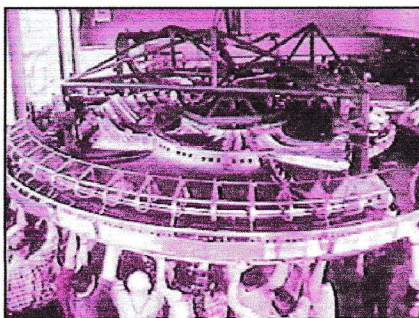
Recently released documents from the CIA archive are full of accounts by former German scientists of their desperate work to save the Fatherland with revolutionary circular aircraft supposedly capable of enormous speeds. But when the CIA set up a study group in 1952 to look into the phenomenon, it discovered something extraordinary far closer to home: In Canada, British engineers were in the process of building a flying saucer of their own.

It was called Project Y, a joint British-Canadian venture into the unknown that was, for much of the 1950s, perhaps the most secret aviation project in the West. Half a century on, the Project Y story remains a remarkable chapter in the history of aerial design, an idea that came tantalizingly close to breaking all the rules of the sky, before collapsing in bitter disappointment for lack of money and faith.

Back in the '50s, the news that British boffins were building a saucer set off alarm bells at the CIA. Was the United States being left behind by its staunchest allies in the race for a technological edge? And if Britain and Canada could build a flying saucer, then surely the Soviet Union wouldn't be far ahead.

Mr. Chadwell wanted answers. The sense of urgency is tangible in a memorandum he sent in June of 1954 to his department heads, demanding reports on "the use by any foreign power or nation of non-conventional types of air vehicles, such as or similar to the 'saucer like' planes presently under development by the Anglo/British Canadian efforts."

While CIA agents were dispatched to watch eastern skies for flying saucers, U.S. Air Force officers were visiting Malton, just outside Toronto, the research headquarters of Avro Canada, a subsidiary of the British aircraft firm A.V. Roe Ltd.



After the war, Malton was the place to be for hotshot aircraft designers fleeing Britain's doomed aviation industry. Among them was a supremely talented 31-year-old, John Frost, who had already earned a reputation for unorthodox design with the sleek de Havilland 108, a swallow-shaped research plane and arguably one of the most beautiful aircraft of all time.

Mr. Frost was brought to Avro Canada to work on the CF-100 fighter, an ugly pugnosed design he never really liked. He soon became obsessed with far more radical departures from orthodoxy. It is unclear whether he drew inspiration from the increasingly widespread popular legend of alien-piloted flying saucers skimming through the postwar skies or how much he relied on previous research.

He would have known about the "Coanda effect," named after a French Romanian inventor, Henri-Marie Coanda, who experimented with the first rudimentary jet engine as early as 1910. He found that a turbojet would not only provide thrust; by sucking in air, it could also create a vacuum above the wing and thereby produce extra lift.

There is plenty of evidence that, in the closing stages of the Second World War, the Nazis began to experiment with secret weapons built around the Coanda effect. Among the documents in the CIA's "X-File" archives is an interview given by a German aeronautical engineer, Georg Klein, who claimed to have worked on a flying saucer under the supervision of Luftwaffe designers Rudolf Schriever and Richard Miethe.

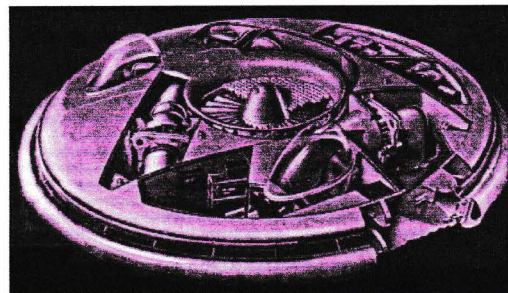
Another document from the archives is a 1950 article written by a German émigré in Chile, Eduard Ludwig. The article, submitted to a Chilean magazine but apparently never published, was titled "The mystery of 'flying discs' -- a contribution to its possible explanation." It recounted Dr. Ludwig's wartime work at a Junkers research facility, where he helped to develop a "one-piece metal wing" functioning as a "speedily rotating top" capable of vertical takeoff and high speeds.

"The experiments turned out to be extremely difficult and involved many casualties," Dr. Ludwig observed drily, clearly rueful that the spinning-top experiments had not come to fruition before the arrival of the Red Army.

He concluded: "The future will show whether the 'flying discs' are only the products of imagination or whether they are the results of a far-advanced German science which possibly, as well as the nearly finished atomic bombs, may have fallen into the hands of the Russians."

Some of the Luftwaffe's top engineers did, indeed, end up in Moscow, while a handful, such as Wernher von Braun and Dr. Miethe, were spirited away to the West. Dr. von Braun, of course, became the father of the U.S. space program. No one seems sure what became of Dr. Miethe.

In his own work at Malton, John Frost seemed to be groping his way. He was in search of the aeronautical holy grail of the age, the vertical takeoff and landing (VTOL) craft, but he began his research on a spade-shaped craft before settling in 1953 on a disc. The original concept called for a single flat turbojet to draw in air from above and force it out through nozzles around the edge of the craft. It would be kept aloft by a cushion of air and pulled upward by the Coanda effect.

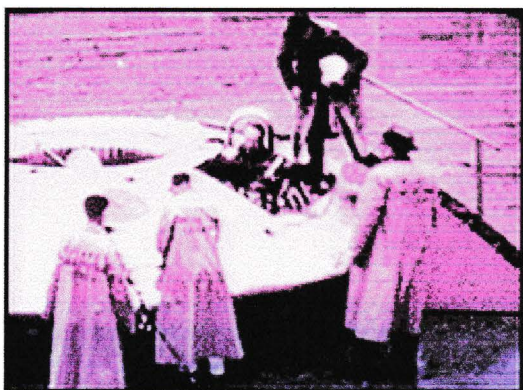


The early work was carried out in total secrecy; only a handful of Avro workers were

told what was going on. "It was so secret that when Frost would come to the welding shop, he would sketch the piece he wanted on some paper and, when we had finished, we had to put the sketch in a special garbage bag," Alex Raeburn, Avro's workshop superintendent at the time, recalls.

Verne Morse, the company photographer, was made privy to the secret only once it had begun to take shape. "There was a stupid rumour going around the plant that we were building a flying saucer, and everybody was laughing about it," he says. "Then one day I was called in by security, and I was told I needed clearance because we were building a flying saucer.

"My first impression was that this was ridiculous," but when he was taken past the guards, through Project Y's double doors, and saw the smooth metal disc taking shape, he was speechless. "It was a sense of 'Wow!' Just real awe."



But Project Y's first year was proving troublesome. The jet engine blew so hot it melted the steel structure of the craft, and its violent shaking would pop the rivets. When the U.S. Air Force officers arrived in September of 1953, the Canadian government, having spent \$400,000 on the project, was glad to hand over the reins to a bigger sponsor. A.V. Roe, having failed to squeeze funds out of the British government, also welcomed the Americans with open arms.

In 1955, Project Y became the U.S. Defence Department's weapon system 606A, and a white USAF star was painted on the prototype's fuselage. Millions were now being poured into the project, and the cult of secrecy deepened yet further.

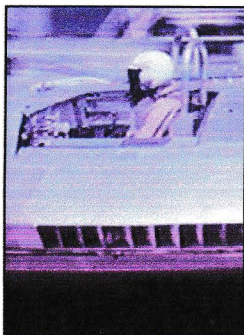
Mr. Raeburn recalls the day in 1959 that the U.S. Navy came to take the prototype away for wind-tunnel tests near Los Angeles. "We loaded it on a flatbed truck in the middle of the night. The police shut off all the traffic right down to Toronto harbour, and they put it on a U.S. tugboat. They even had one of our men sworn in to the U.S. Navy so he could go with it, along the Erie Canal, along the New York intercoastal waterway, and through the Panama Canal."



With the help of U.S. financing, Mr. Frost had redesigned the original concept, placing three small jet engines around a central fan that would suck in the air through a circular intake at the centre of the disc. The pilot would sit in a little oval cockpit to one side under a perspex bubble.

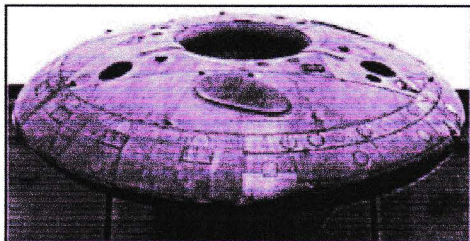
But the wind-tunnel tests suggested that secret weapon 606A had severe stability problems and was in constant danger of flipping over like a stiff pancake once the throttles were opened on its jets. Mr. Frost and his assistants tinkered away at the

problems for another year, but had still not mastered them by the winter of 1960 when Spud Potocki, a former Polish air force flier, took the prototype for its first flight.



Ernie Happe, another British engineer, was one of the few allowed to watch. "We were standing around it, and it was tethered with three cables to stop it flipping. It just went up a couple of feet off the ground, and Potocki was sitting in the cabin fiddling around with the controls, trying to make it do what it was supposed to."

Over the next few months, as Mr. Potocki attained a feel for the delicate controls, he was allowed to roam around the Avro compound, dodging in and out of hangars. Mr. Raeburn would often look out of his workshop window and see it floating by. "He would go up and down and hover over the concrete apron and look in the doors of the hangars. I remember the wind would suck the ice off the puddles and they would float around in the air like plates of glass."

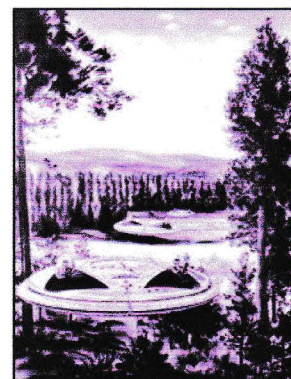


Avro's management was overjoyed to see its flying saucer take to the air. The publicity department began designing brochures to capitalize on the aircraft's boundless potential for the day when the shroud of secrecy would drop away. It was to be called the Avrocar, and it would spawn a string of civilian and military spinoffs. There would be an Avrowagon for the family of the future, an

Avroangel (an air ambulance that would zip to the scene of an accident and land on the spot) and an Avropelican for air-sea rescues and anti-submarine warfare.

Ken Palfrey, a draughtsman on the project, remembers Mr. Frost's far-reaching hopes. "He was planning to make one four times as big, to move troops in and out of battle, like helicopters do now."

The giant troop carriers would lurk under the enemy radar, drop their passengers and then zip into the stratosphere before the other side even spotted them. Mr. Happe recalls Mr. Frost excitedly visualizing the craft bouncing off the upper layers of the atmosphere, crossing continents in a single bound.



The reality was more mundane. The Avrocar hovered happily close to solid ground but became dangerously unstable at heights over 2.5 metres, however much Spud Potocki struggled with the controls. The USAF wanted to fit it with a tailplane to test whether that would correct the problem, but Mr. Frost, a design purist, refused to countenance the idea. "He wouldn't have it," Mr. Palfrey recalls. "When the Americans suggested that, it was about the only time I ever saw him angry."



Mr. Frost insisted he could fix the problems, but the U.S. military was rapidly losing interest. After spending \$7.5-million, the Defence Department pulled the plug at the end of

1961, killing the Avrocar. Mr. Frost left the country a bitter man. "He was completely fed up," Mr. Palfrey says. "It was a sad story. He was a fine guy. A gentleman."

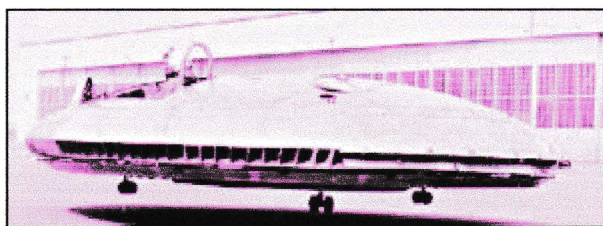
The designer ended up in Auckland, where he spent the rest of his days dreaming up gadgets for Air New Zealand, such as a hydraulic tail dock to allow engineers easy access to commercial planes. But it was small beer compared to the cosmic ambitions of Project Y, and the sense of betrayal was as keen as ever when he finally retired in May of 1979.

In his valedictory interviews, Mr. Frost told the local press that he had been robbed of credit for inventing the Hovercraft by Sir Christopher Cockerell. The irony was that, at Malton, Mr. Frost's eyes had been so set on the skies he failed to spot the Avrocar's ground-hugging potential under his nose. Within a few days of leaving his job, he died. He was 63.

The legend of Project Y lives on in the Web pages of committed ufologists. Some speculate that it had been a stunning success, and the litany of design errors and disappointments recalled by Avro veterans was merely a cover story. Others believe the project was merely a smokescreen for the Pentagon's "real" flying saucer project being masterminded in secret bases such as Roswell, perhaps by mysterious superannuated Nazis such as Dr Miethe.

As for secret weapon 606A, the prototype is gathering dust in a corner of a Maryland warehouse that serves as a storage facility for the National Air and Space Museum. Jack Walker, a veteran pilot who shows visitors around, cannot understand why anyone would want to see it, and warns me not to get too close lest I be abducted by aliens.

The burnished metal disc, about 15 metres across, is lying unsung and forlorn under the wing of a Second World War Black Widow fighter. The perspex bubble over the cabin has been removed, and its instrument panel is in a cardboard box somewhere else. But you can still see where the edges were charred in the effort to get John Frost's flawed vision off the ground.



Light years ahead of its time: the British prototype of the experimental plane known as Project Y was designed, in Canada to take off and land vertically

The Sunday Times

March 26 2000

Revealed - Britain's 1950s flying saucer

Jonathan Leake, Science Editor



*Saucerful of secrets:
the disc-shaped
AVRO plane was
intended to fly at
2,500mph*

It is the nearest the RAF got to a UFO. Recently discovered photographs taken at a secret laboratory in the 1950s reveal for the first time how close Britain came to developing a saucer-shaped stealth fighter after the second world war.

The pictures, taken at a research centre in Canada, show a revolutionary ultra-high-speed jet fighter designed by the British engineer John Frost. Aviation experts who studied the pictures last week said the jet incorporated some of the features on America's stealth fighter plane.

Work on the aircraft in the 1950s was code named Project Y. Frost and his team initially set out to build a disc-shaped machine with vertical takeoff, but ended with a sleek, arch-shaped aircraft.

"The pictures are a wonderful find," said David Windle, who has researched the history of Project Y. "It is technology that Britain just lost and it is a pity the project was abandoned. Who knows what would have happened if they had pursued it."

The photographs were taken at a laboratory in Malton, near Toronto, where Frost was working with Avro-Canada, a subsidiary of the British firm AVRO, to develop a jet fighter for the Canadian government. He wanted to create an aircraft which could fly at 2,500mph and take off and land on its tail.

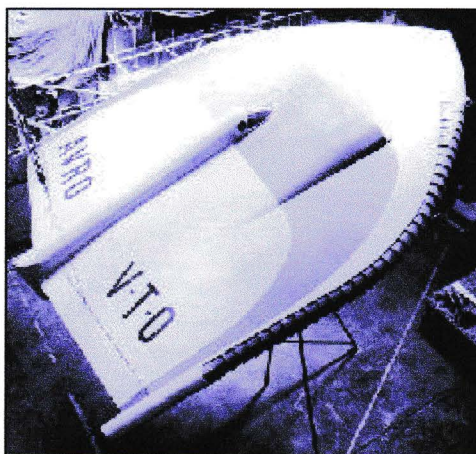
The existence of Project Y has been known about for years, but no pictures of the aircraft have ever been found. An aviation researcher accidentally discovered the photographs in a file at the Public Records Office in Kew.

An elongated saucer shape was used because of the revolutionary "radial flow" jets

designed to power it. The engines were designed to emit the exhaust gases from several small nozzles, increasing the thrust of the jet.

Aviation experts said last week that the prototype vehicle would have been almost invisible to radar because of its slim cross-section. It would also have been more likely to evade enemy missiles because of the lower heat output through the numerous jet outlets.

It is not known why the revolutionary jet never went into production, but the project was abandoned before the plane had its first test flight.



Reach for the sky: despite its sleek look, the AVRO never flew

Alex Raeburn, then assistant superintendent of manufacturing at AVRO, described the life of secrecy for those on the base. "The security was very tight," he says. "Armed guards were stationed on the doors and drawings were taken away as soon as we'd made the component. In fact, we never knew exactly what it was we were making."

Verne Morse, one of the team who worked on the secret project, said he was amazed any pictures had survived because of the total secrecy surrounding the project. He described how he saw a subsequent model designed by the team.

"When I saw it [the plane] for the first time I was stunned," he said. "I'd heard rumours we were working on a flying saucer, but I dismissed them. Now, here I was looking at it, and I was speechless."

In 1954, the Canadian government decided to end the development of the aircraft. The American air force took over the project and later a scaled-down version of the plane became an "air jeep", which was nicknamed the Avrocar.

Raeburn said he witnessed test pilot Spud Potocki flying the saucer-shaped craft. "I remember him flying up to the hangar windows and looking in like a humming bird might do. When he flew in cold weather the engines sucked pieces of ice off the puddles. They'd float around in the air, shining in the sunlight."

Professor Michael Graham, professor of aerodynamics at Imperial College, said: "In the 1950s there was a lot of interest in different aircraft shapes. This is built like a kind of flying wing. Its ability to hover is useful for landing in rough places."

While Frost worked on Project Y, American engineers were developing their own ultra-high-speed jets at desert bases in California and Nevada, which led to the development of spy planes such as the U2.

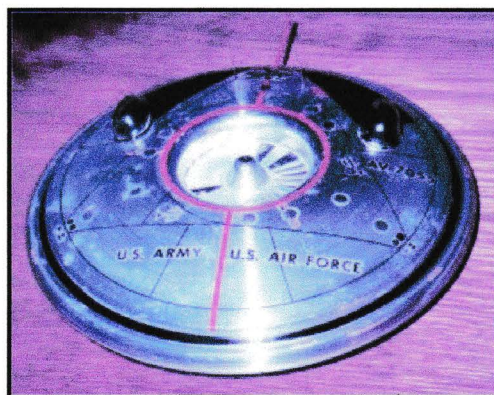
In 1961, however, despite the successful flights of the Avrocar, the American air force halted all funding for the company's researchers. There were no more British-designed flying saucers and Frost left AVRO and moved to New Zealand, where he died.

Last week Tony, his son, said: "Dad was a brilliant artist who was always designing things, but he combined that skill with being a very capable mathematician and great lateral thinker."

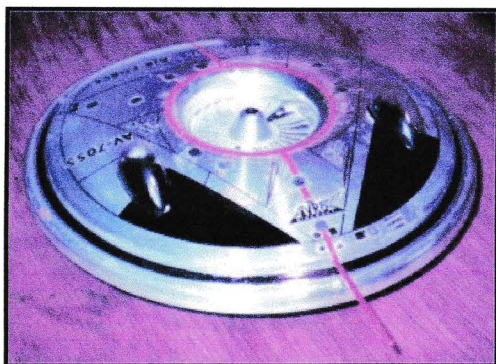


*Early concept of Avrocar?
Royal Canadian Airforce markings.*

'Front' at bottom of image.



**Original Model - Pictures courtesy of
the son of one of the designers**



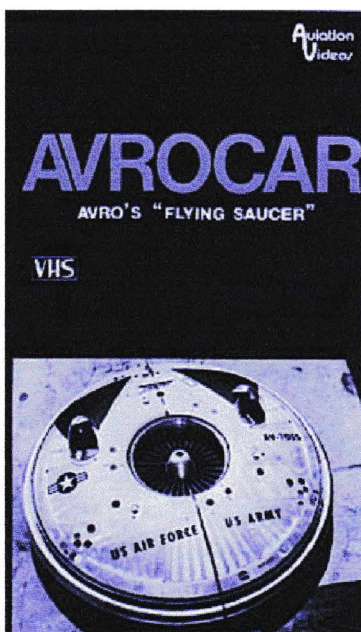
AVROCar Links

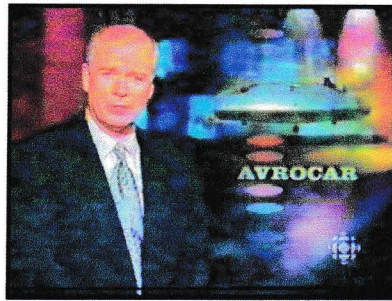
Look Magazine

Volume 19, JUNE 14, 1955

Article & Illustrations

Project Silver Bug





*The Canadian Broadcasting Corporation's 'The National' in May, 2000, broadcast a segment on Bill Zuk's attempts to repatriate a prototype of the AVROCar to Canada from the United States.
To view this clip, click image above.....*



*Picture by Scott Willey, (USAF ret.)
at
The Paul E. Garber Preservation, Restoration
and Storage Facility
of
The Smithsonian Institution's
National Air and Space Museum,
Washington, DC.*

**Site compiled by Errol Bruce-Knapp
UpDated June 21, 2000**