

ACKNOWLEDGEMENTS

This collection is a compilation of stories written for the family and others over some years, mostly from memory. I have sought advice where possible from some of the participants, and from family members. My thanks to Bill Baggett, Pam Grierson, Wal Hume, the late Doug Harvey, John Lindner, Don Pollock, Bob St John, Libby Shade and Katharine Shade for their help in developing this publication.



Log, as distinct from logistic, transport.



It looks as though we will have our wires in a tangle shortly.

AMBLE THROUGH THE PREAMBLE

There have been a number of books written over the years detailing Australia's involvement in the Vietnam war. The most recent: *VIETNAM – The Complete Story of the Australian War*, Bruce Davies, Allen & Unwin, 2012 was published just before Remembrance Day 2012. I was rather taken aback when I sought the “*Complete Story*” provided about RAAF Transport Flight Vietnam (RTFV), of which I was a member during 1965. It is evident, if the paucity of information is any guide, that in Davies', or his editor's, opinion the RTFV operation contributed little or nothing to Australia's war. On the other hand, Davies' general introduction detailing the history of Vietnam and its wars is excellent, and would have been essential reading prior to deployment had it been available to us in 1964. I therefore came to the conclusion that it was time for an RTFV perspective and decided to detail some recollections of our operations. As it happens, my old colleague Don Pollock took the same view.

I was a relatively junior pilot in 1965 (Pilot Officer, promoted Flying Officer during the tour), and, as we all did, experienced some exciting and interesting times. Indeed, most of us recognised that the exposure to operations was not only crucial to our development as pilots, but also character forming provided we were honest enough to see our own weaknesses.

I would first like to set the scene as we, at the sharp end, experienced it. I reference some of Davies' observations as a method of focusing the story. Remember that my recollections commence at a time preceding the mass deployment of troops from Australia. Our Aussie Army compatriots were all members of the Australian Army Training Team Vietnam (AATTV), and it wasn't until mid-1965 that infantry and support troops arrived. They initially went to Bien Hoa Air Base, and among them were some RAAF engineering personnel who looked after the army observation aircraft.

On page 114 Davies mentions Colonel Serong¹ wanting to assume command over RTFV. Although this idea was rejected at high level, unfortunately there were other equally farcical Command and Control arrangements under

¹ Colonel FP (Ted) Serong was contingent commander of the Australian Army Component, Vietnam, July 1962-January 1965. Interestingly, on 27 July 1964, in a revision to the Directive to the Commander AATTV, he was placed under command COMUSMAVC. He was replaced by Colonel David Jackson (ref Davies).

which RTFV operated. *Department of Air Organisation Directive 5/64* stated: “In VIETNAM the Flight is to remain under national command which will be exercised through the Air Board” and “Operational Control of the Flight will be exercised by Commander United States Military Assistance Command VIETNAM (COMUSMACV) through the Commander Second Air Division USAF”. The first statement is a nonsense – how could the Air Board (actually the Deputy Chief of the Air Staff – DCAS) exercise command, especially given the communications limitations of those days, when nothing operational was delegated to the then Operational Command or to any subordinate organisation? The second statement led to the internal delegation within USAF of control being administered by (during my time) the 315th Air Commando Group under Colonel George L Hannah, USAF.

The late Wing Commander Doug Harvey DFC* AFC, the second CO of RTFV, in a letter to me of 25th January 1996, commented that the chain of command was “most stupid and impractical”. He, then a Squadron Leader, supposedly answered to the DCAS who had neither the day to day knowledge nor the staff to exercise command. Operational Command, HQ Richmond and 38 Squadron had no official links to the unit although trained aircrew and maintenance personnel were supplied from those sources – albeit RTFV had no say in the training requirements, and those units had little or no knowledge of the operation. But, legal and financial responsibilities were routed through RAAF Butterworth, so that, for example, the OC Butterworth (1 star) had oversight of the legal responsibilities of CO RTFV who in turn had disciplinary responsibilities for the RAAF personnel serving with No 161 Flight, the Army aviation unit at Bien Hoa. So when a charge against an RAAF airman was laid by an Army officer at Bien Hoa, and heard by Harvey at Vung Tau, it was sent to Butterworth for confirmation or otherwise.

The C2 arrangements also caused friction when an accounting officer sent from Butterworth to audit the unit's stores accounting spent most of his report criticising the fact that personal weapons in our accommodation were not locked away, completely ignoring the fact that we, with the possible addition of one White Mouse¹ (and towards the end of my tour, one Airfield Defence

1 White Mice was the nickname for the South Vietnamese National Police force, a function of their white uniforms and comparatively smaller size. Our usual man (ie, stationed at the Villa Anna) was the best shot with a Colt .45 auto that I saw. I watched in amazement one day on the range when he kept an empty coke can airborne above his head until he had expended a full magazine.

Guard), were responsible for our own defence. My weapons, in fact, were stored under my bed!¹ CO RTFV was also briefed that he had a “Diplomatic Responsibility” with General Westmoreland, whatever that meant, and the Americans had medical responsibility. In Vung Tau, we supposedly purchased our messing from the US Army, but in practice the quality in terms of food and location was so low that we preferred to use local sources. On detachment we messed with the US Forces, or purchased our own meals wherever we could.

The above mentioned Directive 5/64 stated “The Flight will operate in the short range transport role and may be employed on the following tasks:-

- (a) trooping,
- (b) supply transport,
- (c) supply dropping,
- (d) para dropping,
- (e) communications, and
- (f) medical evacuation.”

This was derived from a two man visit early in 1964, and I suspect that it is a straight lift from American advice. I’m not sure what is meant by “trooping” other than the obvious “carriage of troops”, and I doubt that Department of Air knew either; it is not an Australian term in my experience. However, in short order, and apparently without reference to Australia, combat assault and flare dropping were soon tasked. These activities were not trained for in Australia, and indeed would be likely to have been regarded by the RAAF hierarchy of those days as too great a threat to the asset. In my view this all reflects the fact that command was actually exercised by the 315th Air Commando Group, and the oft repeated statement that the Flight was under “National Command” (*Directive 5/64*) is nonsense. In practice, Harvey did what was required in the light of tasking orders, as did his predecessor and successor (SQNLDRs Sugden and Guthrie). I might add that Chris Sugden was remarkably innovative, albeit he broke many of the rules in the peacetime book, eg, developing a methodology for one-engine-out take-off.

As a matter of interest, the *Directive* also stated: “Where a member dies while

1 They consisted of an issue Colt .45 automatic M1911A1, a cut down (no stock) M2 .30 Carbine (my usual on-aircraft weapon), my custom made M1 .30 Carbine hunting rifle, a chrome plated Colt .38 detective special revolver, and two models of the M3 .45 Grease Gun (an early M3 and an M3A1).

on “special service” as defined in the Repatriation (Special Overseas Service) Act 1962, he is to be buried at the locality of death.” Fortunately, that aspect was not tested in my time, and of course, was not obeyed later.

The bulk of our operation was in support of US Special Forces (US SF), as the Australian Task Force didn't exist at the time, and the USAF didn't really have a suitable aircraft for our role, the C123 Fairchild Provider being just a bit too big for most of our airstrips. Of the four or five aircraft operating each day, two were on scheduled transport routes, albeit to very tight airfields in operational terms, for example, Hai Yen in the delta (1150 feet of rough, wet, PSP), and most of them were at US SF sites anyway. We developed, in my opinion, an extraordinarily close relationship with the SF Advisers, and given that we were the “heavy” transport for most of them – due to airfield limitations – we were often tasked when major resupply was needed, as in the case of siege. In fact, a number of people have argued that the subsequent take-over of the 144 US Army Caribou assets by the USAF on 1 January 1967 (not all in Vietnam) was said to have been influenced by the comparative efficiency of the RAAF operation compared to the US Army operation. However, the counter argument is that USAF was actually working towards a takeover before RTFV deployed, so we could not have influenced the outcome¹.

Following is an abbreviated list from my logbook (excluding the major headquarters at Nha Trang and Danang and those abbreviations I cannot now interpret) of the SF camps and centres I supported during my 1965 tour:

A Luoi, An Loc, An Khe, An Hiep, A Chau, Ba To, Ban Me Thout(City) and BMT(East), Bao Loc (Blao), Ben Tre, Can Tho New (Bin Thuy), Bac Lieu, Buon Brieng, Bong Son, Bu Dop, Buon Hai, Camau, Cao Lanh, Chudron, Cam Ranh Bay(old), Dong Ha, Duc Xuyen, Lien Khang, Dong Tre, Duong Dong, Dong Ba Thin, Dak To II, Cam Ly, Djamap (Bu Jamap), Gia Ngia, Gia Vuc, Ham Tan, Ha Thanh, Ha Tien, Hai Yen, Hue(Phu Bai) and Hue(Citadel), Kham Duc, Kannack, Kien Giang, Khe Sanh, Kon Tum, Long Xuyen, Long Thanh II, Lai Khe, Long Toan, Loc Ninh, Moc Hoa, Mang Buk, My Tho, Pleiku, Phan Thiet, Phouc Vinh, Phu Tuc, Plei Mrong, Plei Do Lim, Plateau G I , Plei Djereng, Plei

1 Davies doesn't believe that RTFV operations had any influence on the decision to transfer Caribou from US Army to USAF, because USAF had long mistrusted Army's desire to operate its own tactical airlift. However, according to Wikipedia, negotiations between the Army and Air Force Chiefs of Staff began in late 1965, culminating in the transfer of assets on 1 January 1967.

Me, Quang Ngai, Qui Nhon, Rach Gia, Soc Trang, Song Mao, Song Be, Tak Xa, Tam Ky, Tan Hiep, Tan Linh, Tay Ninh, Thap Chan, Thu Dau Mot, Tra Bong, Tra Vinh, Trung Lat, Tuy Hoa, Vinh Long, and Vinh Loi. Most aircrew would be able to extract a similar list.

Davies mentions (pages 107 and 248 et seq.) that many Army personnel are bitter about the honours and awards aspects of their deployment. It is fair to say that many RAAF people are none too pleased as well! Four aspects of the situation may be considered. Firstly, during the pre-departure briefing given at RAAF Richmond prior to the first deployment, it was clearly stated that we could not, indeed must not, accept foreign awards. Further, all recommendations would be taken into account when considering imperial awards. So it came as a surprise to me when, in my hearing in September 1965, the Air Attache Saigon, Group Captain W M Coombes, said to Doug Harvey who had enquired on behalf of the Colonel commanding Special Forces Nha Trang about the progress of his (the Colonel's) recommendations, "Oh, I file them in the WPB in accordance with Department of Air instructions." Consider, if you will, the on-ground situation. A crew, two Pilot Officers, a Corporal and an LAC (say) are tasked in I Corps (the north of the country) for a week. They fly up to 10 sorties a day for Special Forces completely out of contact with their own hierarchy – there were always difficulties in getting a phone call patched through the system. The only people who could judge their performance were the "clients". They return to Vung Tau somewhat buggered, and all they want to do is get outside a few beers and a good feed. There is no special mission report unless the aircraft or an individual is significantly damaged. Why should there be, and what could they say? But when the Special Forces hierarchy puts in a report, it gets binned! How then, could the "system" judge performance?

Secondly, we were awarded the General Service Medal 1962 on return to Australia. I wore that ribbon proudly for nearly a year during 1966, but the medal wasn't issued – things took a long time in those days. Out of the blue, an order arrived to say "Take it down; you're getting a different one". Although few people, even experts, seem to know that little piece of medallic history, I have been able to identify the two Royal Warrants concerned. However, and accepting the system's capacity to do what it wants, it still seems to me that having been awarded a medal, it shouldn't be withdrawn except in the case of military conviction.

Thirdly, both USAF and US Army were affronted by our refusal, and in some cases insisted strongly that awards be accepted. The consequence of that, if mentioned, could be severe. According to Harvey, a certain member was

awarded the Legion of Merit, a DFC and an Air Medal by USAF, complete with all the citations. He made the error of mentioning this in Canberra in 1966-7 (I'm not sure exactly when) and the awards and the citations were promptly confiscated. The medals were returned (as mementoes) after he retired, but the citations "couldn't be found" as I understand it. A number of others were told by senior officers of the US forces that they were to be awarded various medals, and some accepted the hardware, but couldn't accept the paperwork. So when Prime Minister Howard decided much later that such awards could be "approved" provided all the citations etc were available, most of us couldn't meet that requirement. There were similar problems arising from the unit citations that our superior organisations were awarded, but the official attitude to them was that the citation hadn't been offered Government to Government, and we weren't under "command", so they couldn't be accepted/worn. Our membership continues to regard the foregoing as completely unjust.

Finally, it is fair to say that a small redress was achieved a few years ago. A group of US ex-servicemen, mostly from the Air Commando Association, aware of the situation, set out to get US Congressional approval for the award of Air Medals to all unit aircrew. This was seen as a small way of saying thanks for your efforts, and of course the original paperwork for whatever might have been recommended for individuals was buried under the weight of ages. Congress sent the approval to the US President, who signed off in 2007, and with the Governor General's consent we were officially presented with the US Air Medal in April 2008 at a parade in Canberra. The ground crew should have been presented with a unit citation, but the intransigence of the Australian hierarchy continues to prevent that recognition.

In principle, RTFV had thirteen pilots, six loadmasters (as they were titled then) and some assistant loadmasters (not an aircrew mustering, they were either general hands or volunteers from among the technical musterings) for six aircraft (six crews plus the CO). Many of the pilots are mentioned by name in these musings, but as I didn't record the loadmaster for each trip, I should mention that for most of my missions I had the privilege of including one of Neil Boss, Bob Dexter, Keith "Aussie" Pratt, Trev Pratt, Bob St John or Ron Workman in the team. For a short while we had seven aircraft, but that was to accommodate the first major servicing, which was contracted out to Air Vietnam, and that aircraft disappeared for some months, to be followed immediately by the next due.

Length of posting varied early on in the deployment so that a stagger in personnel changeover was established. My tour was of eight months, during which I accumulated 643 flying-hours in 1043 operational sorties, calculated

using the abbreviated flying-hours methodology that was the basis of our contract with the US Army. It would have been recorded as just under 1000 hours using the peace-time recording system.

These notes reflect my experience, and things changed a lot during the course of the war. But RTFV, or so it seems to past members, rarely gets mentioned in accounts of Australian service in Vietnam, yet the aircrew members of that unit were among the few servicemen among all the Allies who operated over the length and breadth of the country. Chris Coulthard-Clark's official history *The RAAF in Vietnam* (Allen & Unwin) does, however, give a fair and accurate account of the involvement of all RAAF elements. By the time the Caribous were withdrawn, according to post war sources, the units (RTFV and 35 SQN) had completed: "81,000 sorties (totalling 44,000 hours) on combat support throughout South Vietnam, carrying 680,000 passengers and 46 million kilograms of cargo".¹ Hopefully, with exposure, these informal recollections of mine will trigger others from unit members.

Of course, the official view was that RTFV was committed to a "police action", called "special service" because there had been no declaration of war. Indeed, for the first half of its existence, RTFV members continued to pay tax, an anomaly only corrected when the Army became seriously involved in mid-1965. Nevertheless, in spite of the official definition, off I went to war, First Class, in an Alitalia DC8.



HMAS Sydney arrived in June.

1 Extract from Unit Plaque installed at the Australian War Memorial.



Barrie Brown shares an early morning joke with the Duty Pilot.

Photo: W Baggett



**Hurry up and wait! Tan Son Nhut tarmac.
Unknown, Geoff Lumsden, Mike Marsh, Trev Pratt**

IV CORPS

One went to war properly in those days. Alitalia, at the time, was one of the contractors to the government, flying migrants to Australia. But they had plenty of spare seats when bound for Europe, having little back-load, so they were used to deploy RAAF members to Vietnam, there being eleven in our party. I, of course, had the privilege of travelling First Class in the DC8. We overnighted in Singapore, where my suite at Raffles consisted of four rooms, and was so large that I got lost trying to find the bedroom in the dark after a “first night” in SE Asia. The next day we boarded an Air Vietnam Caravelle, travelling via the old Kuala Lumpur airport (where the dragchute was deployed for the landing), and so to Saigon to await the first Vung Tau bound Wallaby. I was soon introduced to the action, not least because the man I replaced, Don Jordan, marched out on the day after our arrival. There was some sense of continuity there, Don and I having completed our secondary schooling together.

Whilst not universally the case, operations in IV Corps (the designation of the military area encompassing the southernmost quarter of the country), tended, whether scheduled or unscheduled, to be centered on Tan Son Nhut (Saigon) airport (TSN). At the time, TSN was said to be the busiest airport in the world, and the operational problems were exacerbated by the fact that there was, for most aircraft anyway, only one runway. There was a short cross runway used mainly by light aircraft, but that conflicted with the helicopter operations as well as creating somewhat of a nightmare for the Air Traffic Controllers (ATC) in getting aircraft safely across the main runway. The ATC were a mixture of American and Vietnamese, but the Vietnamese were inexperienced in the traffic levels that TSN had during daylight hours, so it was not unusual for a sequence of events, initiated by one of the Vietnamese trainees, to have to be sorted out by an American instructor.

The American system of priorities was a mixture of instrument flight rules (IFR) and wartime necessity. For instance, tactical fighters, even though not on IFR flight plans, had absolute priority after aircraft in an emergency situation, but IFR aircraft had priority over those flying under visual flight rules (VFR), so unusual situations could develop. Usually, RTFV operations were conducted under the visual rules, but at certain times of the year, fog and low cloud would create havoc at TSN, and the only way one could get clearance to track inbound was to file an IFR plan, and accept a “slot” time for a radar approach (GCA) to the airport.

On one occasion, I, having been radar marshalled onto GCA final, somewhat below 1000 feet above ground level, in patchy cloud but not visual with the ground, was told by the controller: "Make left orbit at present height, 30 degrees bank, minimum fuel tactical jets behind." As I passed through the reciprocal direction to the runway, I glanced to the left, and there, a few feet away it seemed, were a pair of fighters heading down the GCA. I continued the turn, and broke out of the cloud shortly after to see them touching down on the runway just ahead. Separation was certainly not in accordance with instrument flight rules!

On another occasion, I was in the queue for take-off at TSN. The VFR departures were very widely spaced that day, because of the numbers of IFR (higher priority) arrivals. It was at the peak of the first phase of the American build-up, when combat troops and their supplies, as distinct from advisers, were being shipped into the country by any means possible. IFR aircraft, landing lights on from 100 miles out, were visible five miles apart on their landing approach as far as the eye could see. The traffic was so tightly spaced that there was little chance of even IFR, much less VFR aircraft getting a departure clearance. A large number of Air National Guard aircraft and crews had been pressed into service, including some quite elderly aircraft. On this occasion, a National Guard C124 Douglas Globemaster, being flown by a crew not familiar with local operations, was about three miles out on final approach when the crew called up (callsigns invented): "Saigon Tower, this is MAC 520943, runway visual, cancel IFR." The tower immediately responded: "Roger MAC943, go around, priority aircraft on departure, Weasel 56 clear immediate take-off, Dasher 22, line up behind the 105, MAC943 I say again go around, call departures." This aircraft had just flown in from Guam or some place east, and he still hadn't managed to get on to the ground before I departed maybe 45 minutes later.

I mentioned the crew structure in the preamble, and of course on most days there was, in effect, a spare crew. However, illness, R and R leave and other duties occupied the time of the spares. One of these jobs was that of Duty Pilot, a one-week commitment during which all sorts of oddities might eventuate. Having taken over the jeep from one's predecessor, it usually involved acting as transport between the airfield and the accommodation for the crews each day, filing flight plans, obtaining weather reports, recording notifications of friendly strikes and enemy groundfire, and dealing with such paperwork as the CO or his deputy required. Often enough there would be an aircraft coming out of a servicing or repair that needed an air test, and during one duty in October I flew air tests in two different aircraft (including a post-D airtest, which was quite extensive), the only times I flew Caribou solo.

On my first stint as Duty Pilot, during May, we had the problem of repairing the doubly broken aircraft at Hai Yen, the first problem for me being that of rescuing the crew. As it turned out, Doug Harvey decided to fly to where the crew had been dropped after being evacuated by helicopter, with me as his co-pilot. The next day, and for the rest of my week as Duty Pilot, the recovery team at Hai Yen had to be supported. The US Army was very cooperative, supplying not only spare parts and technicians, but also another wing after they had destroyed the one on the good side by dropping a crate of ammunition on it.

During that period in May, we were two aircraft short due to accidents, and, with the co-operative spirit to the fore, we traded crews and aircraft with the US Army Caribou company (the 57th Aviation Company) that shared the Vung Tau airfield with us. On the 14th of May, Geoff Lumsden and Barrie Brown temporarily joined the US Army and flew a day's missions for them, and then on the 17th of May, Bill Baggett and I were given Caribou 39744 to conduct some of our tasks.



The Duty Pilot supervises the loading of a “Rescue 8”.

63-9744

US Army Caribou 39744 was a CV-2B, maker's serial 196, accepted from De Havilland on 29 July 1964 (ie, it fitted between A4-195 and -199 of our roster). It had a somewhat higher basic weight than our aircraft, due to the more extensive armour plate in the cockpit, not to mention the weather radar and autopilot, but we simply operated it as though it was one of ours. We picked the aircraft up from the US lines nice and early, and I taxied it around to our lines. In spite of having been told it was ready for operations, our duty crew found quite a number of minor unserviceabilities, which they repaired. The extremely soft cushions and the armour plate (which interfered with the pilot's arms) made it much harder to handle than ours, and having discovered that applying the brakes simply pushed one back into the seat, I had to adjust the seating position considerably. I flew the morning missions with shuttles between Saigon and Tra Vinh, and Bill continued in the afternoon, finishing at Bac Lieu with no further duty requirements, so we were cleared to ferry the empty aircraft directly back to Vung Tau. There was no fuel available at Bac Lieu.

Conditions were such that Bill chose to operate low-level to the nearest point of the coastline, and then follow the coast around. After a while, it became apparent that our fuel remaining might leave us with very little in the way of reserves, so Bill decided to track direct for home. This took us over the Mekong delta, of course, where the main crop appeared to be rice, with paddy fields divided by levy banks perhaps 200 metres apart. We would pop over a bank, and drop down to just above the water so as to present ourselves as a target for the minimum amount of time. As we came over yet another levy bank, we saw a man with a water buffalo ploughing the paddy field, and as he became aware of our approach, I saw him reach down to grasp a rifle of some sort that was strapped to the side of the plough. I warned the loadmasters, who were riding as rear gunners at the tailgate, and as we passed over the man there was a rattle of fire from astern. I asked for a report. They said, well, we can't see the bloke due to the cloud of steam, but the buffalo is going well! Shortly after this we crossed the coast and set heading for Vung Tau.

We had perhaps 40 minutes of flight time to get home. After not very long, it became clear that the fuel situation would become critical. We had discovered during the day that the aircraft was less economical than ours, which we put down to having a higher basic weight, and possibly the engines weren't in quite as good a condition. We started to make adjustments to our operation to conserve fuel. In quite short order we had the engines manually leaned, as

low an RPM as we could achieve and still maintain airspeed, and we kept low for greatest endurance. As it turned out, by this time Vung Tau was the nearest airfield. Finally the Vung Tau coast came into view, we requested straight-in approach, and roared across the town to the airfield. We had both low-level warning lights on (ie, about 20 minutes of fuel left) about 20 minutes from home. Perhaps they were yet another item out of adjustment.

We gave the US Army back its aeroplane. I don't know what they thought about the extremely low quantity of fuel left in the tanks, and it was later suggested that we had returned it with unrepaired battle damage. I have since wondered what the strict legal position was, and whether the hierarchy of either military element was aware of our arrangements. Indeed, what would the situation have been if any one of us had seriously damaged the Army's property? As I understand it, this useful exchange of crew and hardware didn't occur again.

TAN HIEP

It is mid-afternoon on the 30th October 1965, I am operating the daily non-scheduled mission with Graeme Nicholson who is a relatively new boy on the block, and we are at Bien Hoa for about the fourth time that day. Graeme had flown the morning frag¹ as captain, I had completed three shuttles to Phuc Vinh, and it is now my partner's turn again. A jeep turns up as we park, message is: "Captain report to Ops, Tactical Emergency requirement". We have a quick conference, and he graciously accedes to my seniority in country (not in rank), so I resume command, so to speak, and head off to the Operations Room. There I am briefed on a firefight going on in the delta someplace, and the fact that there are a bunch of SVN army types who need to be on the other side of the river. Go to Place A, pick up a platoon as part of an airlift operation, and drop them at a certain camp, Place B. Go back, do it again. Do not, repeat, do not proceed to the north of the camp at Place B due AA fire and that is where the fight is, all operations are one way in from the south, opposite way out. There is no parking lot, you will unload on the runway, so do a 180² at the end of the landing roll, drop the ramp, send the lads off to their duty, and get out PDQ³.

1 "fragmentary order", meaning the daily programmed missions.

2 a 180 degree turn, ie a reversal of direction.

3 "pretty damn quick."