WARM AIR 18 September 2021

Aviation Sports Club Gliding Newsletter

THIS WEEKEND: **No Flying this Week**

www.ascgliding.org Bank Acct 38-9014-0625483-000

Saturday	Instructing:
	Towing:
	Duty Pilot
Sunday	Instructing:
	Towing:
	Duty Pilot

MEMBERS NEWS

In Warm Air this Week;

- ***Club News***
- ***Airmanship***
- ***Video Corner – some links to some cool aviation videos.***
- **Our Avian compatriots part 12 Bird Anatomy. Jonathan Pote**
- ***New Roster***

  Thank you for the contributions from members

Club News

Okay folks get your Diaries out and note the following events and dates.

Club Captain Kishan wants, needs, request you note the following.

9th October

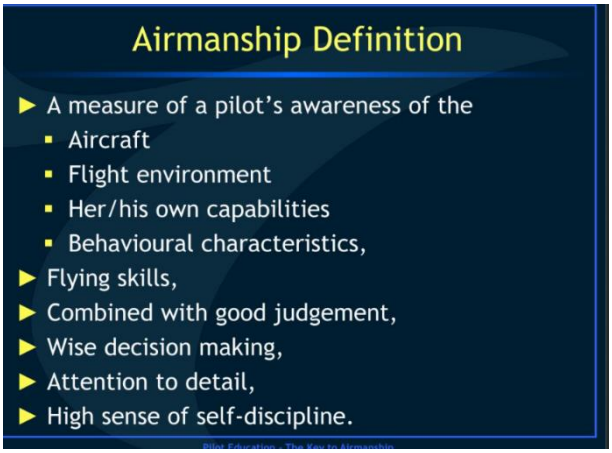
- **Annual General Meeting**
- **Start of Season Briefing**
- **Working Bee & BBQ**

Ok folks it is more than possible that we may have to postpone this event as we may still have some lockdown restrictions in place. However, we will monitor, and consider options closer to the time.

Labour Weekend, **Matamata** **Sat 23rd Oct 2021,**
We are intending to head to Matamata for the long weekend. This is just around the corner. The XC course is also being run at Matamata that weekend so if you want accommodation on in the bunkrooms I would book early.

Cross Country Course, Sat 23rd Oct 2021 - Wed 27th Oct 2021
For those planning on attending the XC course now is the time to register. Use either the Events tab on the GNZ homepage, or here:
https://msc.gliding.net.nz/events/msc-cross-country-coaching-course-oct-2021

Airmanship
*Airmanship covers a broad range of **desirable behaviors** and **abilities** in an aviator*



I thought as we get closer to our Soaring Season, our Start of Season Safety Briefing and the fact that for many of us we will not be current post-lockdown when we return to flying, that we should talk about examples of Airmanship. Often, we commentate and discuss the events of an incident or near miss, but we do not often talk about the proactive actions we have taken to make our flight or that of someone else's safe. What I would like to hear from You are actions you have you personally taken to demonstrate great airmanship.

Let me give you a couple of examples.

I had spent all morning rigging and preparing my glider, I was current and keen to soar. The wind had become quite strong and gusty and in fact had become a significant cross wind and had a bit of a quarter tail wind component added into it. A competent but junior pilot was up having a ball, the Tow Pilot was happy to launch, however I had a nagging doubt. I was on the flight line. Should I go, I was experienced, another pilot was up…hmm. However, my glider had a 15-knot cross wind limit, and I did not like the feel of that wind. The launch could result in dropping a wing, ground looping or getting out of position on take-off. This could be damaging to machines and people. I decided to "Scrub" the flight. I hitched the mighty 28 onto the car and drove back to the trailer and derigged. Disappointing yes, a bit of good-natured banter from others, but hey I made a good decision. I am actually really pleased I followed through not to fly and was disciplined not to push it. But there are a few other things in here to recognise, I had read the flight manual and knew the gliders limits, I recognised my capabilities and limits, and I was situationally aware of the environment and consideration and safety of others. There would be other days to fly.

Or the time I took the opportunity to sit in our old twin glider while it was parked on the flight line to get familiar with the controls, run through the pre-take off checks, while the instructor was briefing their student before its first sortie for the day. During a control check on the ailerons I found the left aileron was binding and jammed. Out I got and found the port aileron was moving laterally along the hinge line which resulted in the catching and jamming on the wing. It was not identified during a DI. So, the flight was scrubbed, and the aircraft grounded for repairs.

So, these actions appear simple and straightforward, but they contributed to Airmanship and safety. What I would like us to do is to share and acknowledge the actions we personally have taken to demonstrate Great Airmanship. So how about having a think what you have done over your flying career. It might have been something you saw and resolved during a DI, a maintenance issue, rigging, during a flight, the fact you simply said I will wait another day to fly. Drop us few sentences or a paragraph, please don't mention other people's names, and I will keep these anonymous. Now I don't care if it is about a glider, powered aircraft, private or commercial or whether you are still abinitio or an experienced pilot.

Let's share, learn and celebrate great airmanship. I look forward to your stories and replies.

Ian (Warm Air)

Tough Pilot Decision to SCRUB + Why Fly with a Helmet? - YouTube

[Airmanship - Pilot solutions - Aviation lessons for pilots - YouTube]

Video Corner

Follow Stefan Langer on this spectacular flight in a FES Glider. Beautiful Scenery.
[PROXIMITY FLYING with Electric Glider | Lake Como - YouTube]

[The TESLA of Aviation? New LAK17c FES glider review - YouTube]
Yes, and if you won Lotto this might be on your shopping list.

[This is Why We Fly - YouTube]

Spectacular scenery.

A really good article from Adam Woolley and Wings and Wheels about learning.

Personal Gliding Knowledge Base

By Adam Woolley

Falling in love with gliding may happen on your first flight, your first solo, once you've really started to grasp its beauty in all its incredible facets, the learning really starts to accelerate. One thing is for sure, once you do discover this, there's no going back. It's an inspiring sport, one of beauty, freedom, joy, and inspiration. Once this develops, your thirst for knowledge on all things gliding will grow exponentially, this is a good place to be. Knowledge is power, the more you know, the more you'll want to learn about it, this then becomes an insatiable thirst for more, and more will follow, thermalling up always. You can learn in so many ways, everyone is different. We can learn by reading textbooks, detailed explanations through lectures, webinars, or coaching, others learn from practice, others only from competitions and speaking with their peers after each day soaring. It doesn't matter in all reality, all one needs is the desire to learn, to acquire the knowledge, this is the recipe vital for your success – you're reading this and many of the other author's great articles weekly, so you're almost certainly already on the path!

Once you've gotten to the advanced level, learning becomes easier, as you can learn without instructors or coaches, you know what you're weak on, what you are interested in, perhaps even able to identify areas of 'what you don't know, you don't know', so you're able to delve deeper and open up another area of gliding that you hadn't thought of yet. So from this, you're no longer dependent on others to find success.

One thing for sure is that success is never straight ahead and easy, there are many twists and turns along the way. I found that my biggest learning in recent years came from my failures, the biggest one for me was losing my fear of failure. After I unlocked this critical part, I was able to learn more freely, without judgment from myself, my enjoyment factor increased too. However, with this attitude, you must also be ready to accept the failure, and be able to bounce back from it, which is imperative. Making mistakes is absolutely normal, we must however acknowledge it, learn from it, then work towards future improvement. It's clear to me that Ingo and Kawa both never made it to the top without persistence, learning from their own failures, their thirst for more knowledge, brutal hard work, and dedication.

If you're not at the top level yet, or indeed you are, then reading some key textbooks once a year will help motivate, trigger some key thoughts and help you along your path. Which ones do I recommend?

- THE SOARING ENGINE V1: RIDGE, THERMAL & MOUNTAIN SOARING
- COMPETING IN GLIDERS - WINNING WITH YOUR MIND
- **Cross-Country Soaring - Helmut Reichmann**

- ADVANCED SOARING MADE EASY

- ***What topic do you want to see in an upcoming newsletter? Email us*** *sales@wingsandsheels.com*

Adam Woolley was born into the gliding world, being the 3rd generation in his family. Going solo at 15, his thirst for efficiency in soaring flight & quest for a world championship title to his name has never wavered. One big passion is sharing his experiences & joy with other glider pilots all around the world. Adam is an airline pilot in Japan on the B767 & spends his off time chasing summer around the globe. He has now won 7 national Championships & represented Australia at 5 WGC's & 1 EGC.

Not part of this list? Join here: https://wingsandwheels.com/newsletter

---

Our Avian compatriots part 12 Bird Anatomy. Jonathan Pote

Introduction/Revision

Birds (Avians) evolved from theropod dinosaurs hundreds of millions ago, becoming able to fly due to their fore-limbs initially evolving for other reasons – to enhance temperature control, camouflage, food gathering, better escape and survival prospects and so on. Concomitantly, the progressively less useful bony tails disappeared, as did heavy jaws with teeth. Their whole skeletons became lighter (big bones becoming hollow with internal cross bracing to form girders). Pectoral (chest) muscles were now being used to flap wings rather than support body weight on the ground via the forelimbs and became enlarged to 15% of the total body weight. As well as the forelimb evolution, changes to improve respiratory efficiency and speed up digestion meant far more energy could be expended per unit time, flight being very energy intensive Once Avians had developed flight, water was no obstacle to further spread of a particular species while migration enhanced survivability if temperature or food supplies varied with the seasons. As 'ability to survive' drives evolution, so the ability to fly was sometimes lost in species that developed on islands, now safe from previous predators but encumbered by appendages of no use to food gathering or other survival criteria. Aotearoa has a great variety of flightless birds, but of course the Dodo (*Raphus cucullatus)* is the most famous worldwide. Happy on its island (Mauritius) for millions of years, within a hundred years of sailors first arriving in 1598 it was extinct, its vestigial wings being of no protection against the new predators.

The Dodo and its nemesis – '*Homo Sapiens Nautica'*

Flapping wings and flight

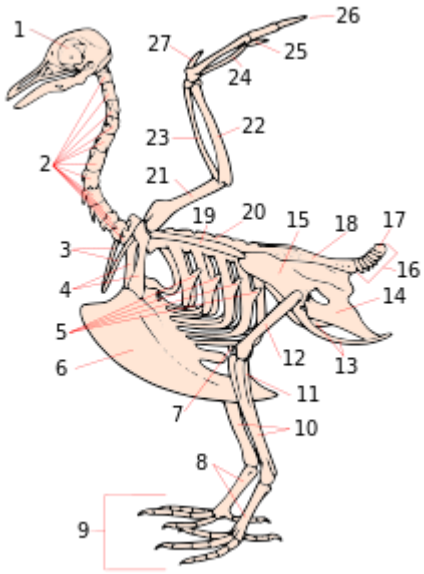
It seemed so simple to some human pioneers – just force two wings, each with considerable area, downwards and an upward force (= lift) will be generated. Angle the wing slightly to the horizontal and a force forward (= thrust) will result. Many 'inventors' tried this, and all failed. No-one could overcome the inevitable 'negative lift' of the obligatory upstroke and the only positive result was some amusing early movie film. Birds had succeeded over millennia because of variable geometry, both of their skeleton and individual feathers.

Restless Flycatcher (*Myiagra inquieta)*

The (Australian) bird above is shown at the end of the wing down stroke whilst at 'Maximum take-off power'. Note that the flight primary feathers are spread to maximize area, and have an angle of attack against the relative airflow similar to that of an aircraft. The tail is spread to partly enclose the higher pressure area below the wing (both down stroke and airspeed induced) and partly to deflect the relative airflow downwards, adding lift. The body is configured similar to man-made lifting body aircraft, whilst the wings have an airfoil shape to provide lift during forward motion.

On the upstroke, the primary feathers will partly rotate to reduce resistance vertically but still be angled to provide continuing thrust. At all times each primary feather has smooth airflow around it (un-stalled), each acting as an independent airfoil whilst smoothing the airflow the preceding primary much as the slot on a Tiger Moth. The appendicular (fore-limb/wing) skeleton also adjusts to reduce the effective area of the wing during upthrust, and thus the 'negative lift' resulting.

The Avian skeleton



The diagram above might not look like the skeleton of everyday birds, but this is not an ostrich or similar exotic species but actually of a pigeon, familiar to all of us. New Zealand has an endemic pigeon, the Kererū, and three introduced species are seen in surburbia. Below is a Kererū (*Hemiphaga novaeseelandiae*) in flight

Kererū

The Axial ('fuselage') skeleton

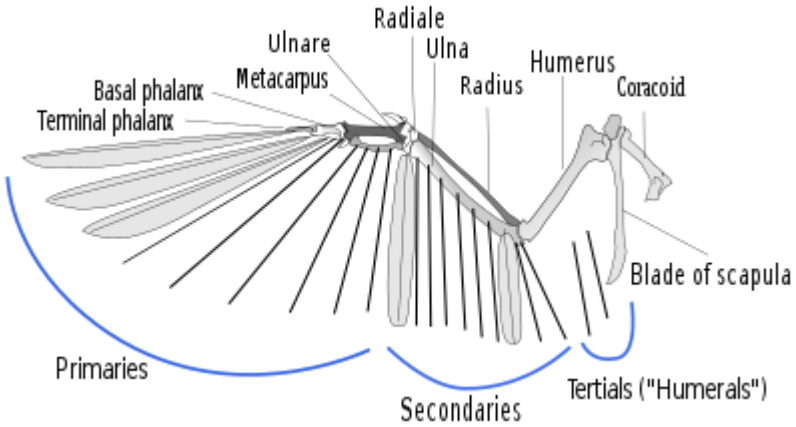
Looking at the skeleton, many features related to flight are evident. Note

- The prominent sternum ('Breastbone') to anchor the massive pectoral or flight muscles.
- The neck (comprising eight to twenty-five vertebrae, three times the number in our necks) has great flexibility. Whilst this is vital for catching food, in flight its flexibility is essential for trimming purposes as the wings and tail make their complex movements. A further vital flight function of the neck is 'head bobbing'. Essentially, a bird flies with a stabilized head on the same principle as an aircraft with an Artificial Horizon. This 'Opto-kinetic' capability enables the bird to 'fly the head' with the rest of the body following and contorting as needed to achieve the desired flight trajectory. A bird does NOT bank its head in a turn but keeps it horizontal unless there is a different reason to move it (see below)
- The skull is small – just 1% of the total body weight vs about 10% for humans, but even that 'bird brain' can do pretty well.

A Griffon Vulture, head level despite gentle bank to the left (John King image)

Appendicular (limb) skeleton. Bird Wings

Clearly the body part of greatest interest in birds is the wing. Note how similar the forelimb is to our human arm, with a humerus and the radius and ulna being very similar. The carpus/metacarpus ('wrist/hand') is however quite dissimilar as it carries the flight primary feathers.



Wing skeleton (typical garden bird species)

We primates have a complex carpus, five metacarpals and five digits beyond those, some two dozen separate bones in all. It is a very effective structure for the manual skills we can achieve but not for flight.

Feather planform

Rather than the complex mammalian hand/wrist/digit format, a bird merely has a fused carpus to which are attached the flight primary feathers. Each of these primary feathers is actually a partially independent airfoil. The secondary feathers, attached to what equates to our forearms, are less independent than the primaries and form fixed geometry wing section comparable to our glider wings inboard of the ailerons. The tertiary feathers/humerals, attached to the humerus, are analogous aerodynamically to the wing-root fillets fitted to some aircraft, more concerned with reducing interference drag than in providing lift. A multitude of smaller feathers complete the airfoil shape and plan outline of the wing. These small feathers are not significantly individually controllable (but moved as groups they can alter the chord/depth airfoil profile and wing area – and of course keep the bird warmer on a cold night). Note that the 'main spar' (Humerus plus radius and ulna) is right at the front of the airfoil, unlike our gliders that whose airfoils have a maximum thickness (and therefore the best place for the main spar) around 30% of chord.

The primary wing feathers have complex functions. Held together (by musculature at their roots) they act as a single paddle on the downstroke, creating the upward force of lift as well as a proportion diverted as thrust. In order not to negate that lift on the obligatory upstroke, the feather shaft rotates because the aerodynamic force on the greater area behind it and each feather becomes almost perpendicular to the line of flight. 'Negative lift' is thus minimized, and partly converted into more thrust. When gliding or soaring, the flight primaries separate into individual airfoils, their narrow tips minimizing the vortices generating induced drag. As one airfoil behind and (relative to the airflow) above the preceding, the configuration resembles that of the Beech Staggerwing and its reverse stagger to keep the high and low aerodynamic pressures apart.

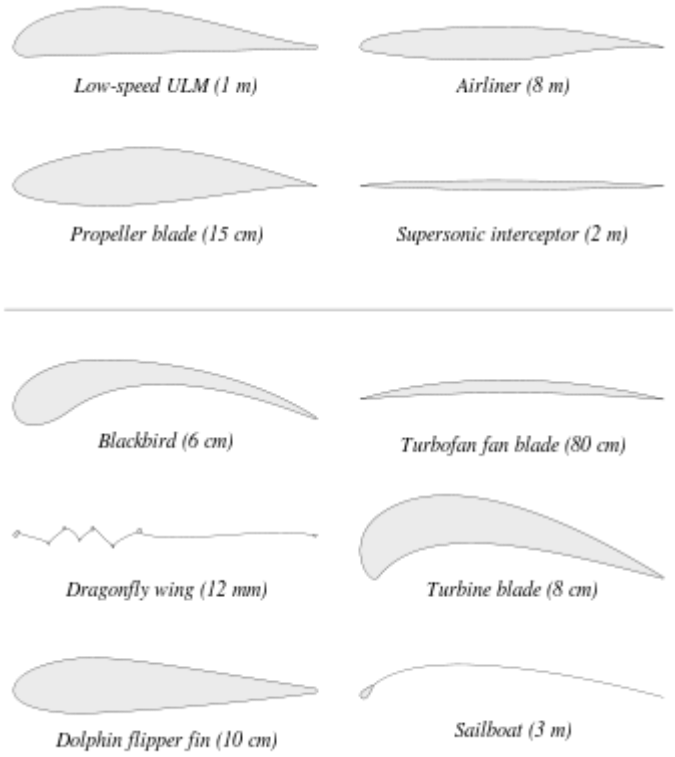
Beech 17 Staggerwing (1932)

A hawk's wing in gliding/soaring configuration

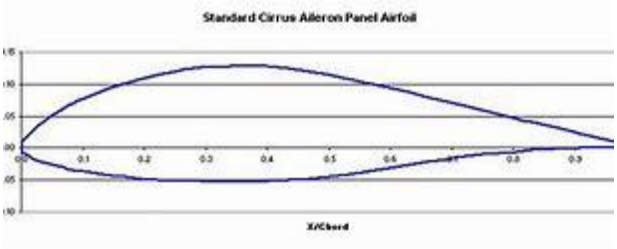
The half a dozen flight primaries are acting as separate airfoils, their small tips minimizing vortices. When spread thus, the high and low pressure areas of each primary do not interfact (Just as with staggered wings in a biplane, a Beech Staggerwing for example). The secondary flight feathers, in line with the airflow, are all held firmly in contact to produce an aerodynamic form similar to a glider wing inboard of the aileron. The many other small feathers towards the leading edge are almost a visual representation of the airflow over this wing, moving outwards initially due to transverse flow as well as rearwards (swept wing aircraft sometimes have fences to prevent this aerodynamic inefficiency).

Alula: The Alula (No 27 in the skeletal diagram) corresponds to the thumb of a mammalian hand. It consists of three to five feathers (+ small 'coverlets') forming a small semi-independent wing. If abducted (moved forwards away from the main wing planform) it acts as slat/slot by smoothing turbulent airflow over flight primaries behind/outboard of it thus reducing tip-stall speed.

Airfoils for different applications



Various airfoil shapes for different applications. The Blackbird airfoil, with a forward maximum depth, most closely resembles that of a yacht sail. There is no specific glider airfoil in the above group, but that of a Standard Cirrus is below.



Standard cirrus airfoil

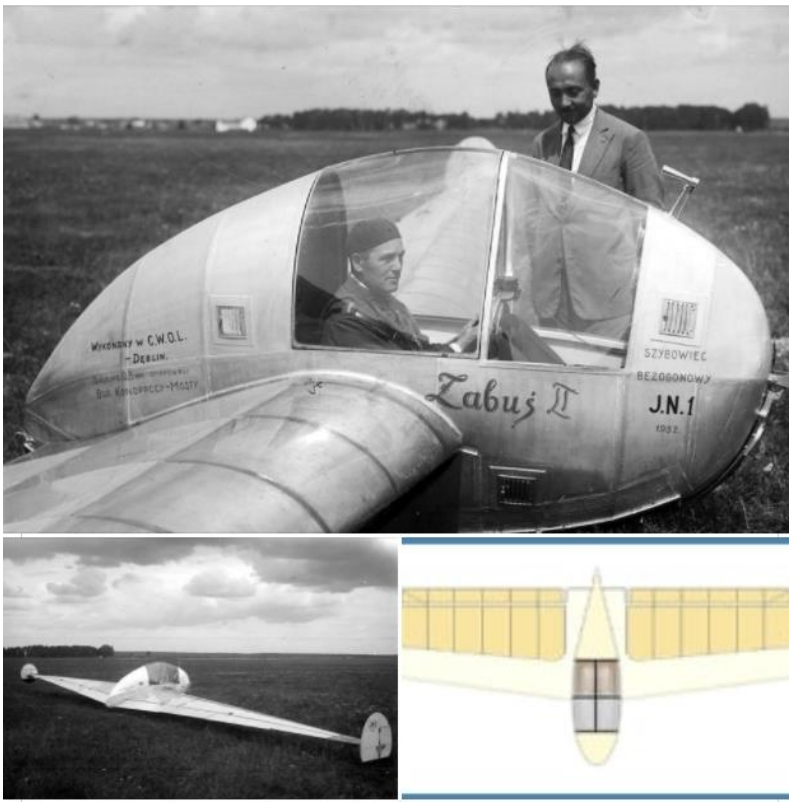
That covers the shape and structure of a typical bird. Next week I will cover how birds function aerodynamically with their variable geometry and variable centre of gravity.

Jonathan Pote jonathanpote47@gmail.com

Thanks, JP, for the supreme effort you put into these articles.

Did this thing fly? *Facebook*

So, thanks to several members and readers who did some detective work on this query.



Naleszkiewicz JN 1
The JN 1 first flew on 23 July, catapult-launched and flown by Franciszek Jach in Gummistart. It proved to be hard to control, being oversensitive in pitch both via elevator control and centre of gravity position. Car-towed flights follows but the control difficulties persisted and in the autumn the JN 1 was damaged in a crash. It was not repaired because of a mixture of funding problems, a lack of official interest and Naleszkiewicz's absence due to a new job in Warsaw.[1][2]
With its differentially operating rudders it may have the first glider fitted with air-brakes,[2] though of a very different type to the spoilers used a few years later on German sailplanes

New ROSTER

Ok hopefully as we reduce down through Lockdown, we will be back in the Air before long.

Month	Date	Duty Pilot	Instructor	Tow Pilot
	18	T PRENTICE	A FLETCHER	P EICHLER
	19	C BEST	P THORPE	R HEYNIKE
	25	E LEAL SCHWENKE	L PAGE	G CABRE
	26	R MCMILLAN	S WALLACE	F MCKENZIE

Duty Roster For Oct,Nov,Dec

Month	Date	Duty Pilot	Instructor	Tow Pilot	Comments
Oct	2	A MICHAEL	I WOODFIELD	P THORPE	
	3	R WHITBY	R BURNS	R CARSWELL	
	9	C DICKSON	A FLETCHER	D BELCHER	AGM / SOSB/ Working Bee??
	10	K JASICA	L PAGE	R HEYNIKE	
	16	J DICKSON	P THORPE	G CABRE	
	17	S HAY	S WALLACE	F MCKENZIE	
Labour W/E	23	K BHASHYAM	L PAGE	P THORPE	Matamata
	24	K PILLAI	R BURNS	R HEYNIKE	Matamata
	25	G LEYLAND	S WALLACE	D BELCHER	Matamata
	30	I O'KEEFE	I WOODFIELD	D BELCHER	
	31	M MORAN	R BURNS	G CABRE	
Nov	6	T O'ROURKE	A FLETCHER	F MCKENZIE	ATC
	7	R BAGCHI	P THORPE	R HEYNIKE	
	13	T PRENTICE	L PAGE	P THORPE	ATC

	14	C BEST	S WALLACE	R CARSWELL	ATC
	20	E LEAL SCHWENKE	I WOODFIELD	P EICHLER	ATC
	21	R MCMILLAN	R BURNS	G CABRE	ATC
	27	A MICHAEL	A FLETCHER	D BELCHER	
	28	R WHITBY	L PAGE	F MCKENZIE	
Dec	4	C DICKSON	S WALLACE	R CARSWELL	
	5	K JASICA	R BURNS	R HEYNIKE	
	11	J DICKSON	A FLETCHER	P EICHLER	
	12	S HAY	S WALLACE	G CABRE	
	18	K BHASHYAM	I WOODFIELD	D BELCHER	
	19	K PILLAI	P THORPE	F MCKENZIE	