AVIATION ENGLISH TEACHING

FORUM

20 and 21 March 1987

Paris, Orly

organised by
Joan Bellec and Fiona Robertson
Centre de Linguistique Appliquee
University de Franche Comte
Besangon
France

Language Standardisation in Aviation was the theme for the Third Aviation English Forum. This theme proved very fruitful, affecting as many aspects as there are departments in aviation transport and manufacturing industry. Enough food for thought and discussion was produced to fill a week, and two days seemed all too short. Certainly more questions were asked than answered. However, the Forum provided an opportunity to meet colleagues from different countries and different professions within the aviation world. An attempt to share common problems is the first step to working towards solutions.

Aviation Companies and organisations tend to be quite large, and all those who care about the language used may meet rarely if at all. We were very pleased to see many who had come to the other Forums and delighted to welcome others from France Europe and even further afield.

Now that the impetus of the opening of the trade barriers in Europe in 1992 is gathering strength, the task of those involved in improving the quality of international communication must be seen to be of increasing importance. We hope that the Forum held in March 1987 made some contribution towards better communication.

We wish to thank Air Inter for their kind help and the English department at ENAC Toulouse for their assistance and encouragement.

Fiona Robertson and Joan Bellec

LANGUAGE STANDARDISATION IN AVIATION

Aviation English Teaching Forum, 20 and 21 March 1987

PROGRAMME

FRIDAY at Air Inter Head Office (Siege Social), 1st Floor.

9.00-9.30	Registration
9.30-10.00	Opening, Captain Delaloy, Flight Crew Training Centre Manager, Air Inter Introduction and practical details, Fiona Robertson and Joan Bellec, C.L.A.
10.00-10.30	Defining terms of reference (In groups)
	A CLOSE LOOK AT RADIOTELEPHONY PHRASEOLOGY (plus discussion sessions on topics connected with the general theme)
10.30-11.15	The Bad Old Days. P. Domogala, Regional Vice President Europe West, I.F.A.T.C.A.
11.15-11.30	Coffee break
11.30-12.00	How the first CAP413 was put together. J.A. Williams, Head of Air Traffic Control Training, National Air Traffic Services, West Drayton.
12.00-12.30	Group exchange: Who are we? What do we do?
12.30-14.00	BUFFET LUNCH
14.00-14.30	Users' Input to RT Phraseology In IFATCA and IFALPA. E.G.H Green, G.A.T.C.O.
14.30-14.45	RT in Everyday Use. P. Mignon, Pilot, Air France
14.45-15.45	Group discussions

15.45-16.15 Variation In Cognitive Processing and Variations In Language Use. P. Falzon, I.N.R.I.A.

16.15-16.45 Conclusions Drawn from EGATS Forum on Radiotelephony. G. Gillett, Vice-President, Eurocontrol Guild.

16.45-17.30 Open discussion

(between 14.00 and 16.00 visits to the Flight Training Centre and Simulator Building will be organised for those who wish)

17.30 Cocktail offered by AIR INTER

****

Explanation of acronyms

ATA - International Air Transport Association CAA - Civil Aviation Authority (UK)
CLA - Centre de Linguistique Appliqee (Universite de Besancon)
DGAC - Direction Generale de l'Aviation Civile (France)
EGATS - Eurocontrol Guild of Air Traffic Services
FAA - Federal Aviation Authority (USA)
ICAO - International Civil Aviation Organisation, known in French as OACI.
IFATCA - International Federation of Air Traffic Controllers Associations
IFALPA - International Federation of Airline Pilots Associations
INRIA - Institut National de Recherche en Informatique et en Automatique
RT - Radiotelephony

SATURDAY at ENAC Examinations building from 9.00

9.30 Simplified English presentation by D.Pinna (GIFAS) followed by discussion session

11.15-11.30 Coffee break

11.30-12.30 Naming of Aircraft Components. C. Barthe (Aerospatiale)

12.30-14.00 Lunch

14.00-14.45 Presentations of English Courses in Institutes and Schools

Choice of workshops and presentations.

EITHER

14.45 Cabin English Workshop Part I: Language Use in Cabin Announcements, J. Bellec Centre de Linguistique Appliquee, University de Besancon

15.45 Cabin English Workshop Part II: Training for Announcements, J.Bellec

OR

14.45 Learner Independence as a Strategy for the In-service Training of Air Traffic Control Officers J. Mell, Ecole Nationale de l'Aviation Civile, and M. Thomas, ATC Training Centre, Roissy.

15.45 A Workshop on Classroom Teaching for Pilots and Controllers

FOLLOWED BY

16.45-17.15 Final Plenary Session

THE THIRD INTERNATIONAL AVIATION ENGLISH TEACHING FORUM

20-21 MARCH, 1987, PARIS-ORLY - FRANCE

THE BAD OLD DAYS

By Philippe DOMOGALA
IFATCA Regional Vice President Europe West

What I will attempt to tell you today is how Radio first affected Aeroplanes and Aviation, why we use Radio-Telephony (R/T in short) today, why we use certain codes, where they all come from, why we use English on the R/T, how things evolved to become standardized ... or are they really standardized?

Any form of Communication's imperfect.
You have the speaker who wants to say something.
The "receiver" who wants to hear something else
and each use "codes" like words, intonation and body language to pass on their messages ...

In first radio communications using Morse you could forget intonation and body language so the "words" were important and needed to be standardized. It has been, still is a hell of a job ...

In the beginning, to communicate we used signals, ... SMOKE signals (you know the Indians, Walt Disney, etc...) then semaphores, then lighthouses, then Radio ...

In Aviation we were lucky because when ORVILLE WRIGHT first flew in 1903 Marconi had already started to use wireless communication since 1896 ... When one realizes that the first 2-seater aeroplane came only in 1908 and that the first commercial flight (using a 3-seater) was in 1913, one realizes that radio had already proved itself before it was needed for Aviation.

Radio was first developed for TRAINS (U.S. Railroad) and mostly for Maritime vessels ...

The first attempt to place Radio Equipment on board an aircraft was in 1910 both in France (in Trappers using a Farman) and in the U.S.A. (Mr. Curdy in a Curtiss) but as no official record was kept, it is difficult to say who was first. The first photograph existing of a Radio Equipment on board an aircraft
dates from 1912 : (Fig. 1)

> It shows a Curtiss bi-plane in New-York (Oct. 1912) The pilot holds the controls aeroplane. The radio operator has his right hand on the antenna reel (trailed antenna behind the aeroplane) his left hand holding the Morse key strapped to his knee. The transmitter is behind the seat and the A lamps on his feet are used to regulate the power of the winddriven generator that can be seen above the Pilot. (A very high voltage was necessary to "spark" the transmitter").

You can immediately see the size and complexity of the operations, and the penalty on the performances of the aircraft due to the wind generator, the trailed antenna and the extra weight.

In 1910, 10 European countries met and tried to reach an Agreement on Standardization ... They failed.
The only thing existing was a code of conduct, defined in Berlin in 1906 which stated:
"There should be a Mandatory exchange of Messages regardless of system used"
"Stations are not allowed to disturb each other"
"Priority must be given to emergency signals".

Just before the First World War, Radio Equipment was so heavy and difficult to operate (see photo) that very few aircraft were equipped. (Fig. 4).

The communication form used then was mostly ground signals, pyrotechnic flares and colored rockets. From that time remained the Famous VFR Signals that all pilots should know.

The first standardization rules governing radio were established in London in 1912, when the first International Radiotelegraphic. Convention (the forerunner of Int'l Telegraphic Union or I.T.U.) defined a few things.

RADIO TELEGRAPHY : should be done in Morse code using the international coding (several codes were used then) and using a code made of 3 letters starting with the letter "Q" for "question": 45 of these "Q Codes" were established.(Fig. 6).

RADIO TELEPHONY : (like the Telegraphy in clear words) should be done in the language of the country of destination, and when addressing a mobile station, in the language of the country of registration of the ship or aeroplane. Regulations were in French, established official language for telecommunications (still is in the postal service today by the way ...).

But these first regulations were in fact more destined for ships than aeroplanes. As I said earlier, prior to W.W. 1 very few aircraft carried radio. In fact in 1914, Britain had only 2 aircraft equipped with radio and France 5.

The first equipment suitable for military aeroplanes was only available in Europe in 1918 with headphones sewed on the helmet and a Morse key big enough to be operated with fur gloves ... made in U.S.A.

The Germans, during W.W. 1 used a lot of colored rackets to inform both aircraft from the ground, and for aeroplanes to inform the ground. Aircraft were carrying pistols and a set of colored flares. For the anecdote, German aeroplanes carried flare pistols in their cockpits until 1943. The FOCKE-WULF 190 fighter for instance was so equipped.

Civil Aviation as such started in 1919.
Marconi, the then world leader in radio, marketed its first R/T equipment the Ad-1 that year, and these were fitted on DH 16's (ex-military aircraft converted for civil operations) on the LONDON-PARIS route ...
Range was very limited (20 km) and initially only one ground station existed
(CRICKLEWOOD, near London) but in 1920 the station moved to CROYDON, 2 more stations, one in LYMPNE and the other in PULHAM, opened to provide effective direction finding.

The use of radio telephony was a big problem in a noisy open cockpit environment. Marconi had developed during the war a sound-proof helmet and this was used, but the microphone was hanging around the neck ...

The other big event for Civil Aviation took place during the VERSAILLES Peace Treaty of 1919 where the Allies of W.W. 1 created [illegible]

The rest of the world in fact copied the CINA Regulations until 19A5. South America and the USA included. The USA tried to form a similar body for the Caribbean, USA and Canada but it was in fact a copy of CINA, merely translating into English the CINA Regulations that were in French.

Initially CINA work was not very encouraging: This is the first agreed preamble: (Fig. 7).

> "Every aircraft in cloud, fog, mist or other condition of bad visibility shall proceed with caution, having careful regard to the circumstances"

But later CINA did a far better job: it set up 8 ANNEXES (A to H) out of which Annex "D" was the "Rules of the Air" introducing the first form of standardization in radio communications.

Annex D, contained the basis for each radio operator in Aviation:

1. the language to be used in R/T is the language of the state overflown.
2. transmission shall start with "Allo" and end by "Termine"
3. station called name before station calling ...
4. use of I.T.U. defined Q Codes when no language comparability existed
5. official documents, regulations shall be in French.

These basic regulations remained in force in Europe until 1947.

When these regulations were published, around 1921, still very few aircraft used radio (still judged too heavy) and for separation the basic rules were applied.

> "Look around before taking off"
> "follow landmarks like rivers, roads and railway tracks by at least 300 m to the right of it..."
> "to cross a landmark do it as fast as possible and at right angles... "circle the airfield before landing".

A few signals could be displayed on the ground to inform the pilot of various things (the famous VFR ground signals) and the aircraft could rock its wings in front of people on the ground which meant

> "I want to land"

Some more audacious pilots tried to improve the system by adding a barrel roll for "I have tires problems" and a full looping for "I would like to use the other runway" but the Association of Airline Passengers of that time objected strongly the idea and we were stuck with rocking wings ...

3 Things modified the system completely:

The first one was the air collision that took place in 1922 between a Daimler Airways DH18 from London to Paris and a Farman Goliath of Grand Express Aeriens on the route Paris to London, near BEAUVAIS, all 7 occupants were killed.

The second one was that due to the constant fog in the winter of 1921 above London a lot of flights had to be cancelled or aircraft landed on alternate aerodromes or sometimes returned where they came from because of that fog.

The third one was the development of the radio tube (valve, lamp) which reduced considerably the size, the weight and the fiability of radio equipment. (Fig. 8).

2 letter-codes for radio telegraphy and R/T were also established (OK for: we are in agreement is still used today).

n the U.S.A., aviation relied on rotating light beacons (after having briefly tried bonfires, where airlines used to pay farmers to ight hay bushes at regular intervals) until 1926, where airlines set up the first RADIO-RANGE BEACONS (left and right signals and developed their own communication network in R/T.

CINA in Europe put a regulation that aircraft of more than 5 seats flying more than 150 km over land or 25 km over sea must be equipped with R/T, and that aircraft of more than 10 seats had to have a telegraphist on board using Morse.

n Europe, radio stations started to flourish everywhere (CROYDON, OOSTENDE, CAP GRIZ-NEZ, ABBEVILLE, PARIS, etc... all in the same frequency: All over Europe telephony was on 900 m and telegraphy on 1500 m. The range of these stations being around 100 km and the number of aircraft flying being so low made sure nobody was disturbing anybody else.

Ground controllers gave to aircraft only information, never instructions. They gave weather informations, QDM's, etc... in ALL LANGUAGES!

Pilots had to be multilingual and when overflying 4 countries, speak the 4 languages... KLM pilots did speak French, English and German in addition to their own language. British pilots all spoke French (difficult to imagine today, I know) .

This is an example of R/T exchange on a flight London to Paris in 1927. (Fig. 9) .

The USA were dragging behind. The first control tower equipped with R/T was Cleveland in 1931, replacing lightguns and flags But still very few aircraft were R/T equipped: in 1930 a US Law was passed to encourage large aircraft to carry 2-way radio by paying a premium to the airlines that would do so.

n the USA, the airlines themselves were running the system, but procedures were not standardized between airlines and no R/T phraseology existed. Pilots were also not too happy about the rule to report their position at "frequent intervals". There were no beacons to do so, so they used landmarks like trees and farms of which nobody else knew where they were.
The equipment was 50 Watts transmitters with no pre-amplication, so the pilots had to shout to make the signal readable ...

Only around 1935 did things in the USA change when 4 major U.S. Airlines developed jointly the first 3 Air Traffic Control Centres (NEWARK, CLEVELAND and CHICAGO) setting up standards and common rules (one that remained still today's "first come, first served...") and assigning altitudes and routes to aircraft (the first instructions to aircraft ...). When all this was fully operational a year later, in 1936, the U.S. Federal Bureau of Commerce took over the facilities and created the Federal Civil Aeronautic Administration ... precursor of the FAA.

n the 1930's in Europe, telegraphy replaced R/T especially for long range communications. With the new "Tube" transmitters range on telegraphy was over 200 km and the use of Q codes alleviated the language problem. Aircraft were growing bigger, so the transportation of a telegraphist was no longer a problem and it relieved considerably the work of the pilots. (Fig. 11).

n 1938, the ITU Conference of CAIRO devised R/T procedures and increased the number of Q codes to 140.
Transmission in Q codes in telegraphy was by now extremely fast and prevented confusions. This is an example of telegraphy exchange: (Fig. 12).

As early as 1939 VHF was used by, among others, SPITFIRES of the Royal Air Force (R.A.F.) to communicate directly with the ground radar stations above the UK channel. They used abbreviated R/T from a manual called "Fighter Command Day-brievity Code" (ANGEL for instance was "Altitude" and "ANGEL 15" meant "I am at 15.000 feet; MATRASS meant "I am on top o clouds" BANDITS 6 O'CLOCK meant "enemy fighters behind you ..." etc...). (Fig. 13).

The US Airforce equipped its aircraft with 2 radio sets, one for long range communications, using longwares called "Liaison Set' and a short range ; short;wave set called "Command Set" the latter only used for airplane-to-airplane communications .

The German LUFTWAFFE also used VHF R/T to direct their fighter to their targets using powerful sets. So powerful that the British were able, before a raid, to determine the Air/Ground Frequency in use that day by the Germans, and later wher sending their bombers the British were effectively jamming that frequency. The Germans had to find a counter measure and developed later a system allowing the multiplication of frequencies using close separation quartzes. This was the basis of ou multi-channel frequency system today.

In 1943, the USA, which had had civil aviation still going on at full speed during the war, started to introduce the first RADIO RANGE BEACONS that were R/T capable, with the ground controller physically located in the beacon. This was the basis o our V.O.R. system and led to the Beacon-to-Beacon Air Traffic Control System as we know it today.

The war also brought drastic changes in the aviation procedures, mainly due to the Americans.

The US Air Force started to use long range R/T with HF across the Atlantic.
Americans are pragmatic people and had soon realized the potential of R/T as opposed to telegraphy (Morse).
The transmission speeds speak for themselves. (Fig. 14).
They used huge antennas (like the Rhombic antenna of Bronsville (Tennessee), a triangular antenna mounted on 300 fee pylons with a range right through Europe. The US used this to guide aircraft across the Atlantic using Direction Finders.

The phraseology used was typically American: the method of Identification Friend or Foe consisted of asking the pilot (or the controller) to sing a song (popular or a children verse) to make sure that they were both Americans before transmitting o following QDM's. The Germans were using counter-measures to divert aircraft over the Atlantic to have them run out of fue above sea. For large groups of aircraft crossing the Atlantic (and later the Pacific) sometimes over 200 aircraft in one go special procedures applied where 2 Indians (mainly SIOUX or APACHE's) were used. One was on the ground and the other or the leading aircraft conversing on R/T in their own language so that nobody (and certainly not the Germans or the Japanese knew where they were or where they were heading to.

The Americans found the ITU R/T procedures too slow, and developed their own during the war.

To illustrate this I have taken the history of the spelling alphabet in R/T.
The first standardization attempt of spelling letters in R/T dates from 1930
where ITU developed a code using cities.
A = Amsterdam
B = Baltimore
etc.
choosing diplomatically 1 city per important state on each continent.

But some of the names used were very difficult to pronounce by some nationalities, so ITU) in its Madrid Conference in 1932 refined its original list using other words K (KIMBERLEY) became KILOGRAM and Z = (ZULULAND) became ZURICH.

The system was also modified later due to political influences. H was HANNOVER but with NAZI Germany becoming aggressive, pressure was exercised to have Hannover replaced by another city, so H became HAVANA.

This system lasted until 1945. As I told you earlier the US Air Force had already made up their own code during the war, made of shorter words, more suitable for R/T and military operation: A = AFFIRM, B = BAKER, C = CAST, D = DOG, etc... and in 1945 all these abbreviations were used by the Allied Troups in Western Europe.

A-Affirm; B-Baker; C-Cast, D-Dog, E-Easy, F-FoX;
G-George; H-Hypo; I-Inter; J-Jig; K-King; L-Love;
M-Mike; N-Negat; O-Option; P-Prep; Q-Queen;
R-Roger; S-Sail; T-Tare, U-Unit; V-Victor; W-William;
X-X-Ray; Y-Yoke Z-Zed,

So, just before the end of the war in December 1944, the Americans decided to call-up an International Civil Aviation Conference in Chicago, in a move to impose their procedures to the rest of the world. This succeeded and 6 months later the Provisional ICAO (PICAO) was set up charged to prepare the real ICAO and to define International Civil Aviation Procedures. They copied the CINA administrative scheme, the basic difference was that the working procedures were U.S. Little resistance from other European states occurred, and this is not surprising if one remembers that the U.S.A. were the master winner of the War and were the only Allied Force which had kept full civil aviation operation during the war, and also that 90 % of the civil aircraft flying in 1945 were U.S. built.

Again history is repeating itself. Following World War 1, CINA was put up by the winning party and France imposed its views following World War 2 the Americans did the same.

In March 1947, PICAO became ICAO and the U.S. procedures were slightly modified to meet the need of the rest of the world To come back to our alphabet spelling example, the 1st ICAO alphabet set up in 1947 largely took over the U.S.> one with some slight modifications to prevent misunderstandings.

A-Abel; B-Baker; C-Charley; D-Dog; E-Easy;
F-Fox; G-George; H-How; I-Item;J-Jig; K-King;
L-Love; M-Mike; N-Nan; O-Oboe; P-Peter; Q-Queen;
R-Roger (!); S-Sugar; T-Tare; U-Uncle; V-Victor;
W-William; X-X-Ray; Y-Yoke; Z-Zebra.

A (AFFIRM), N = (NEGAT) were replaced by ABEL and NAN. R (ROGER) was planned to be replaced as well but. the U.S.A opposed for God knows what reason. (People representing their state in ICAO had not always the Adequate Aviation R/T background needed to make the decisions in that time).

But some words were still very difficult to pronounce for some nationalities like 0 = OBOE and T = TARE, etc... and again, like ITU had to do in 1932, ICAO had to revise its copy and come up in 1954 with the alphabet as we know it today, using English words made of Latin roots.

For the sake of the anecdote, one can remark that Q for QUEBEC and Z for ZULU were back from the first original alphabet ir 1930.

n 1948 civil aviation in Europe was reorganizing, the Americans occupying Western Germany and being present in most o Western Europe used R/T in English between their aircraft and the ground stations, and tried to force European airlines to do the same.

But W/T was still superior, especially over long distances, codes were used, precise, fast and the first coding machines were becoming available, so W/T had the preference of the Europeans, who had also some 15 languages to cope with. If the Chicago Convention of 1944 did not mention R/T except to refer to ITU Cairo Convention it was clear that English R/T was ir he mind of the Americans and when ICAO in 1950 designed its Annex 10 (Communications). (Fig. 16).

f it retained the original 1st Recommendation of ITU (see illustration) it immediately added that "Pending the development of a New Language for aviation, English should be used ... or made available" ... That was it .... A working group of ICAO called ILA International Language for Aviation) was set up but it soon became clear that unless we created something like ESPERANTO that nobody wanted) it was a doomed task so finally they agreed to make ILA "based on the English language" and "created' in fact took over) words like CLEAR, ROGER, WILCO, etc...

The big blow to W/T came on the North Atlantic route, where the major American Airlines created jointly NARTEL (North Atlantic Radio Telephony Committee) with R/T VHF stations all around the Atlantic (see map). (Fig. 17). ICAO under the pressure of the Europeans increased their Q codes to 248, covering each and every possible message, but the battle was lost The surplus of war aeroplanes (DC3, DC4, DC6's) were all American and acceptance of US procedures was only a matter o ime.

A few events in 1953 buried the European chances for telegraphy all together. First the European Airlines started to joir NARTEL, then the second bath of VHF frequencies (from the 30 channels plan) was implemented in Europe, and some new aircraft (the Convair 340) were only equipped with R/T (HF + VHF). The main disadvantage t.o R/T over long distances was, fo he pilots t.o maintain a constant, listening watch on a busy frequency full of static. This last, disadvantage disappeared ir December 1953 with the arrival ot" SELCAL equipment (Selective Calling) the same equipment as we know it today.

n 1954 the first, commercial jet aircraft, the COMET, in a different move was equipped with a radio operator position with elegraphy (see photo). (Fig.18). But by 1956 everybody knew that telegraphy was condemned. The DC-7 arrived with no place for a radio operator in its cockpit and the airlines were in fact supporting this move to have the pilots taking over the communications in an increase-profit-idea (one staff less to pay and one passenger more on board). However, the standardizations of procedures on a worldwide basis were far from established.
Airlines, especially U.S. ones, were still operating their own radio stations (in R/T) around the world for their own aircraft. Zones of influence, like South America, West Africa and Indochina still used telegraphy and when R/T was used it was in Spanish or ir French.

An interesting anecdote on what happened in BANGKOK in 1955-56 when AEROSIAM, the employer of the official telegraphy station decided to switch to R/T. Firstly the radio operators and controllers did not speak English and had to be trained ... they asked for more money which ended up in disputes ... delaying the program. By 1957 only a few Thai operators used English or R/T but with such an accent that the Scandinavian and Dutch pilots (the principal users of the local airspace then) were unable

But the next big events which helped the Americans was the failure of the COMET as a world airliner and the arrival in 1959 o he BOEING 707. The 707 was only equipped for R/T, done by pilots and the crew of all airlines operating that jet aircraft were rained in the USA on US procedures. The DC8 arrived one year later equipped with transistor radio equipment (10 % of the weight of conventional equipment + no maintenance). The last Aviation Telegraphy ended up in 1962 when the last South American station closed down, replaced by HF.

R/T won and English was the language used. Standardization tried to make everybody understand each other but it was and i still is difficult.

History shows no how politics have influenced the system. From the beginning.

An anecdote from 1906, 80 years ago ... In the first Maritime Radio Conference in Berlin that year, an international distress cal n Morse had to be chosen. Everybody used then CQD (CQ for "attention all stations", and "D" for "Danger") only the Germans used S.O.E. (Telefunken code). Since the conference was in Berlin, to please the Germans - S.O.E. - was chosen. But as the etter E was not so distingable in Morse, it was later decided, for symmetric reasons to use SOS (3 dashes - 3 dots - 3 dashes).

Bad Habits also disrupted the system.

We still use today Good Morning and Good-bye in almost every transmission despite the desperate insistence of ICAO to eliminate this "Polite Jargon" as they call it. But we did not invent it. In 1900 operators of Marine Telegraphy invented their own code, starting their messages with GA or GM (for Good Morning and Good Afternoon) instead of the mandatory letters and ended their transmission by TK.OM (for thank you old man), OM became the signature of "veteran certified operator".

Regional Influences: Procedures still vary from state to state.
Most countries are using their own language for R/T in addition to English with emphasis on their own language. Large countries like USSR are using Metric System (an ICAO Recommendation by the way) and different Navigation Equipment etc... But even between English speaking natives using the same system problems do occur.

I have a nice anecdote, a conversation between a British pilot and an American controller, taken in DAYTON, Ohio some 3 years ago.
You know British pilots use QFE on landing.
In bad R/T this becomes "FE".
Our British aircraft approached DAYTON, where one of the local operators
Federal Express's Mystere 20's had for registration N + 3 numbers + FE as callsign.
So the R/T went like this:

British a/c:	"DAYTON do you have FE" ?
APP:`	"FE? He is on Tower 119,7 ..."
British a/c:	"1197, thanks ... Eh ... is that not a bit too high ?"
APP:	"What do you mean "?
British a/c:	"I mean the FE, is a bit high no ? You must have made a mistake"
APP:	"Stand-by ... Negative the FE landed 5 minutes ago" ... and this this went on for a few more minutes.

CONCLUSION

Well ... we have now travelled through 80 years of radio communications. As you saw, nothing came easy and there were reasons behind all that we are doing and speaking when using R/T today.

What can we recall from this presentation:

We learned today :
- that radio was made for the railroad and the Navy, for aeroplanes.
- fortunately the Germans lost WW1 otherwise all the Rules of the Air would have been in German
- if the first ICAO Conference would have been held in Paris instead of Chicago we would all be speaking French today ... maybe even on the R/T above U.S.A.

On a more serious note, automated machines could have taken over a great part of routine telecommunications using Telegraphed Morse Q coded info... Data link between ground and aircraft that could have pass route clearances, weather info's, etc... and positions reports, speed, requested PL's, the other way (from aircraft to ground).

All this could have been done automatically with technology available in 1956. ICAO FANS (Future Air Navigation Systems) is now thinking about bringing such a system back, using satellites and Mode? S transponders. A similar thing hut. hundreds o ime more expensive and most of all ... built. by American companies .

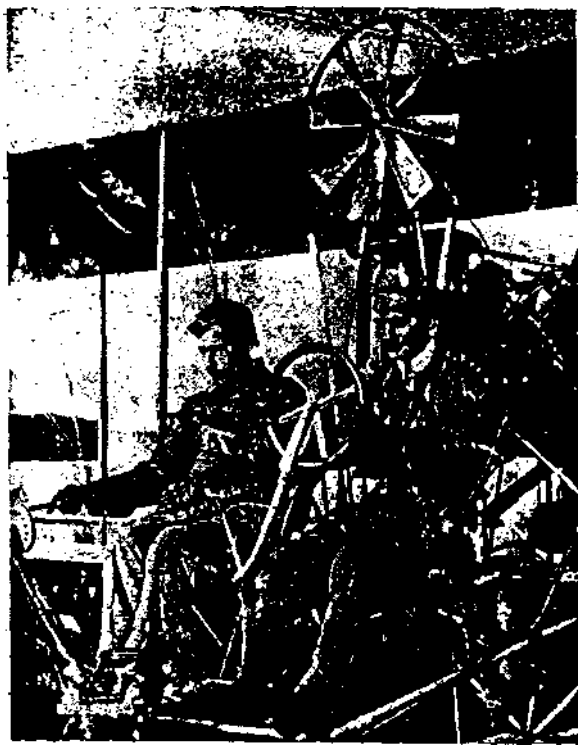
ACKNOWLEDGEMENTS

When researching this present I discovered that very little material existed on Aviation Radio Telephony especially in Europe. am therefore very grateful to the few individuals who, by their anecdotes and memory helped me to put this together.

They are:

Hary COLE and Roy RODWELL of the MARCONI Company, London.
"Doc" RAMAY, ex US Air Corps controller in 1930's, Harlington USA.
H.E. MOESHART, ex Holland Air Traffic Controller in 1930's, Bunde, Nederland.
Rene FRAJ, ex Gonio (D.F.) Controller in 1950's in Indochina, Africa, France, Aspet, France
Glen NASH, ex Boeing Air Transport Company Controller in 1920's, later Lighthouses Service, Scottsdale, Az, USA (now 80 years old).
J. FONTAINE, I.T.U. Archives, Geneva
and the fantastic book (unfortunately only in Dutch) by Klaas Houtkoper, ex-wireless operator by KLM about radio adventures with KLM DC2's, DC6's and super constellations in the 40's and 50's. "Het Onsterfelijk Alfabet" Heerlen 1981 SBN 90.64.0085.

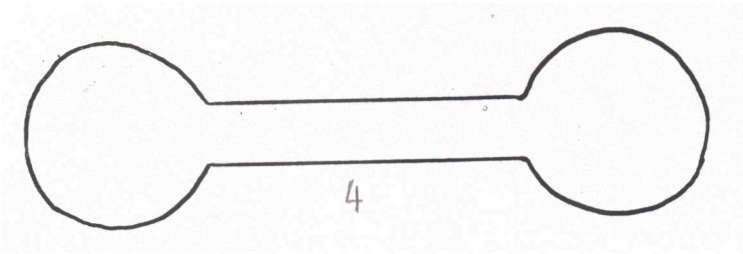
LIST OF ILLUSTRATIONS

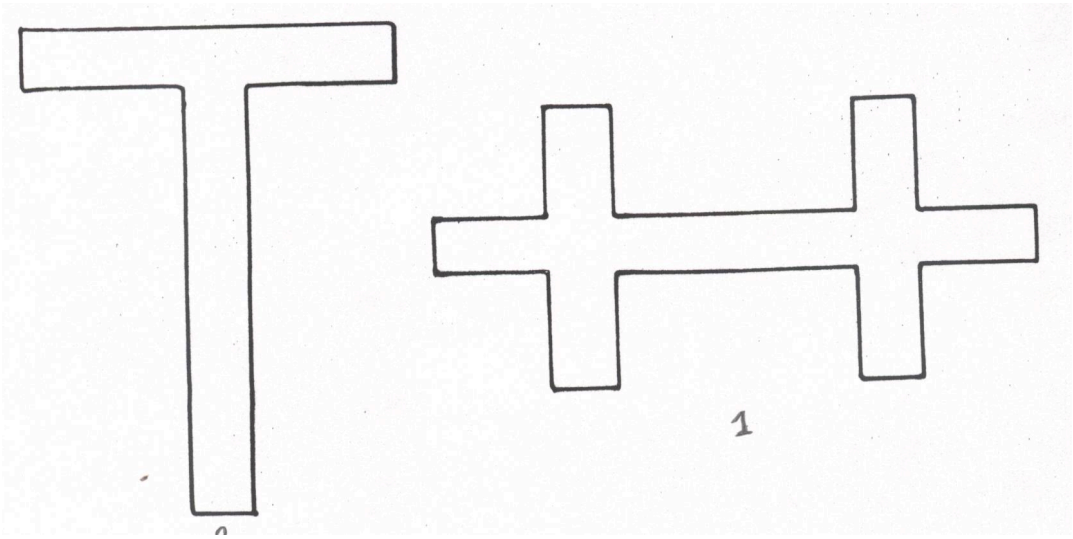


Courtesy E. J. Simson

Figure 1. Good photographs of early aviation radio equipment are extremely scarce, and those of the U. S. "firsts" are. not obtainable. This is probably the earliest extant photograph showing a complete experimental aviation radio installation.- It was taken at Hammondsport, N. Y., in October 1912. At the controls of the Curtiss biplane is Larry Lesh; at his right is E. J. Simon, right hand on the antenna reel of his radiotelegraph transmitter, left hand on the key strapped to his knee. The radio apparatus is not visible: the tubes at his feet are a bank of electric lights connected to the wind-driven generator, to balance power output. The fan at the upper wing drives the electric generator, said to have been the first installation in this country.

5





5 (Green)

6 (Red)

7 (Green)

8 (Red)

9 (White)

VFR SIGNALS

BERNE
BUREAU INTERNATIONAL DE L'UNION TÉLÉGRAPHIQUE
1912

CONVENTION RADIOTÉLÉGRAPHIQUE

INTERNATIONALE

LONDRES 1912

Liste des abréviations à employer dans les transmissions radiotélégraphiques.

Abréviation	Question	Réponse ou avis
	2	3
— • — • — — • — (C Q)	. . . . .	Signal de recherche employé par une station qui désire entrer en correspondance.
— • — • (T R)	. . . . .	Signal annonçant l'envoi d'indications concernant une station de bord (article XXVIII).
— — • • — — (!)	. . . . .	Signal indiquant qu'une station va émettre avec une grande puissance.
P R B	Désirez-vous communiquer avec ma station à l'aide du Code international de signaux?	Je désire communiquer avec votre station à l'aide du Code international de signaux.
Q R A	Quel est le nom de votre station?	Ici la station . . . .
Q R B	A quelle distance vous trouvez-vous de ma station?	La distance entre nos stations est de . . . . milles nautiques.
Q R C	Quel est votre vrai relèvement?	Mon vrai relèvement est de . . . . degrés.
Q R D	Où allez-vous?	Je vais à . . . .
Q R F	D'où venez-vous?	Je viens de . . .
Q R G	A quelle compagnie ou ligne de navigation appartenez-vous?	J'appartiens à . . . .
Q R H	Quelle est votre longueur d'onde?	Ma longueur d'onde est de . . . . mètres
Q R J	Combien de mots avez-vous à transmettre?	J'ai . . . mots à transmettre.
Q R K	Comment recevez-vous?	Je reçois bien
Q R L	Recevez-vous mal? Dois-je transmettre 20 fois: • • • — • pour permettre le réglage de vos appareils?	Je reçois mal. Transmettez 20 fois: • • • — • pour que je puisse régler mes appareils

FLYING BY RADIO

Aided by Wireless, Aircraft will soon Fly in Safety through all Weathers

By Captain F. L. Barnard

"Hullo Croydon, LO calling. Please give me 12 o'clock weather reports for Lympne and St. Inglevert. Over."

"Hullo LO, Croydon answering, understand London to Paris. Is this correct please?"

"One minute, please. (Minute elapses.) *Hullo LO, Croydon calling. 12 o'clock Lympne. Visibility less than 50 yards. Cloud on surface. 10/10ths."*

"No wind.
"12 o'clock St. Inglevert; 1,000 yds; 225 feet; 10/10ths; heavy rain; S.S.W. 6."
(S.S.W. 6 means Wind S.S.W. at 6 m.p.h.).
"Hullo Croydon. LO answering. I have your weather reports quite O.K. Thank you. Switching off."

"Hullo Croydon. LO calling. Position required. Over."

"Hullo LO. Croydon answering. Please run your generator for half a minute."

"Hullo Croydon. Switching off."
"Hullo Pulham. Croydon calling. Your bearing, please."
"Hullo Croydon. Pulham answering. My bearing one nine O (190°)*second class."*

"Hullo Pulham: Croydon answering. Understand your bearing one nine O second class. Mine 111 first class".
"Hullo Lympne. Croydon calling. Your bearing, please."
"Hullo Croydon. Lympne answering. My bearing 293 first class."
"Hullo Lympne. Croydon answering. Understand 293 first class."

"Hullo LO. Croydon calling. At 12.29 (time the machine asked for position) *your position was 3¼ miles south of Ashford, second class."*
"Hullo Croydon. LO answering. Understand my position 3¼ miles south of Ashford second class. Thank you. Switching off."

"Hullo Croydon. LO calling. Changing course to one three two."

"Hullo Abbeville. Imperial LO vous appelle. Voulez-vous me donner le temps d'Abbeville, Poix et de Beauvais, s'il vous plait?"

"Hullo Le Bourget. Imperial LO vous appelle. Je passe Beaumont, et je remoyte mon antenne."
"Hullo LO. Le Bourget vous répond. Je comprends que vous passez Beaumont et vous remontez votre antenne."
"Hullo Le Bourget. LO vous répond. Vous avez très bien compris. Merci beaucoup. Terminé."

W/T COMMUNICATIONS

1 PS de G-ABCD QAM PS ?

2 GCD QAM PS 1000 QBA 10KM QBE 300M 10/10
QAN SW 15K/H QFE 1003 MB

3 PS GCD QGA ?

4 GCD QGP Z QFM 600M

5 GCD QGP 1 QGA

Translation :

1 PARIS from G-ABCD request the weather of Le Bourget .

2 G-CD from PARIS weather observation 1000h. visibility 10 km.
cloud base 300m 10/10th (8/8) wind south-west 15km/h
pressure on ground 1003 Milibars.

3 PARIS G-CD request permission to land using SBA ?
(Standard Beam approach beacon) 1930's ILS

4 G-CD your are number 2., keep circling at 60Om (2000ft)

5 G-CD you are nr 1 .clear to land.

SPEED

CONTROL TOWER SIGNALING LAMP

4 WORDS PER MINUTE

MORSE SINGLE KEY

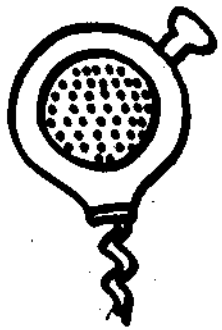
25-40 WORDS P. MIN

MORSE DOUBLE KEY

40-80 WORDS P. MIN

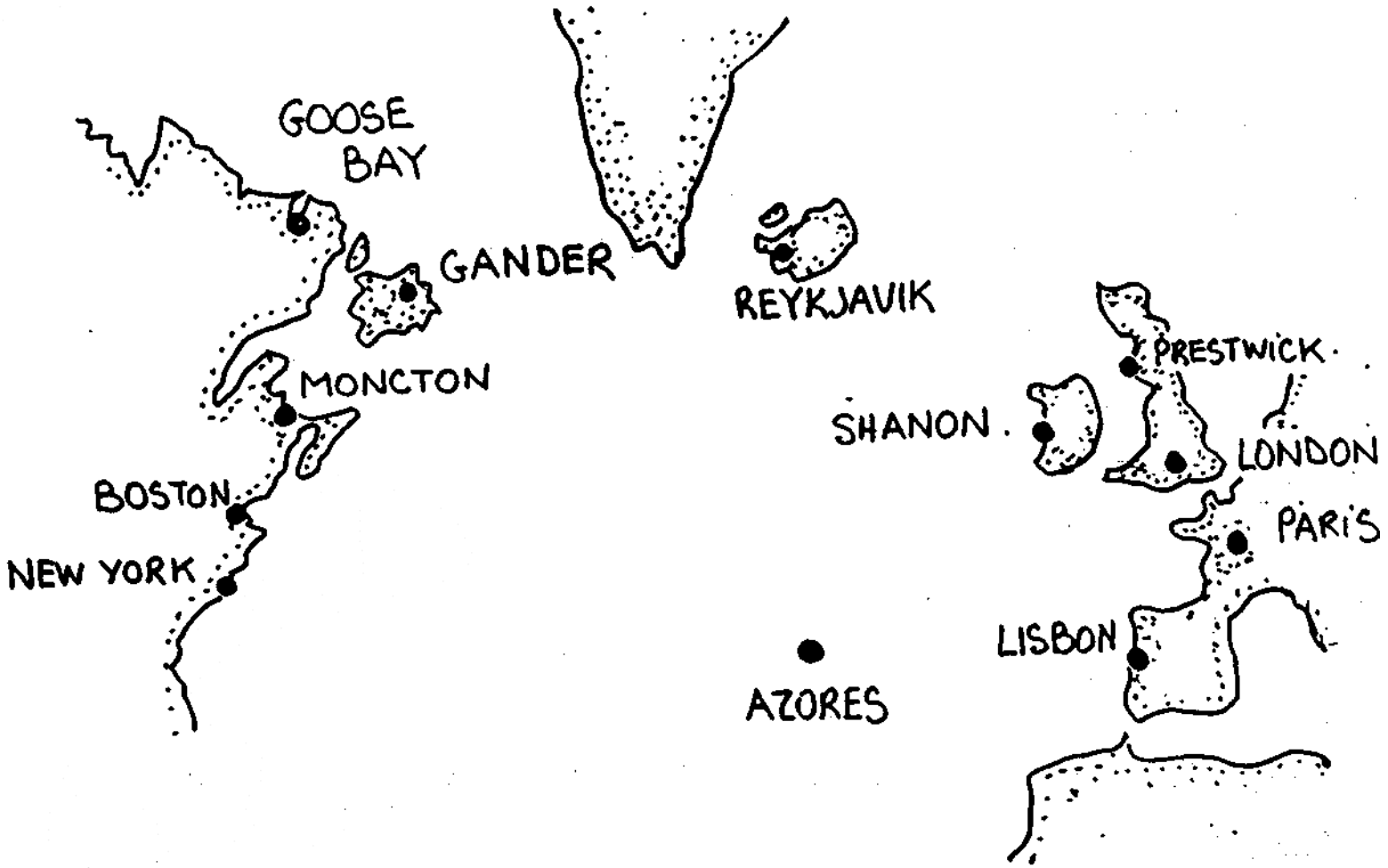
SLOW : 100
NORMAL : 160

MAXIMUM: > 400 WORDS P. MIN.



VOICE R/T

NARTEL


GOOSE BAY
GANDER
REYKJAVIK
MONCTON
PRESTWICK
SHANON
LONDON
BOSTON
PARIS
NEW YORK
LISBON
AZORES

Presentation to the Third Aviation English Teaching Forum.
"Language Standardisation in Aviation".
Paris Orly March 20 and 21 1987.

"How the first CAP 413 was put together"

During the early 1970's, Radiotelephony Phraseology was scattered amoung various International Civil Aviation Organisation ICAO) documents. There were examples of pilot and controller messages in different documents but rarely were a complete series of messages listed or both sides of the exchange given. Even when examples existed, there were alternatives quoted which could be misleading. The United Kingdom had adopted similar arrangements, so parts of Annex]0 formed the basis o CAP 46 - Radiotelephony Procedure, whilst relevant sections of Annex 11 and PANS RAC were repeated in the Manual of Ai Traffic Control but only from the Air Traffic Controllers' side. There was no single document which contains phraseology from each users viewpoint. There had been an increasing number of occasions during the day to day operations of airlines and private flying where ambiguity or misunderstanding of phraseology had resulted in the unexpected happening. This was highlighted in the missed approach procedure where 'overshoot' and 'go-around' had different interpretations on either side o the Atlantic.

The problem of standardisation had been discussed at the European Air Navigation Planning Group (EANPG) meetings and was also under consideration by the Air Navigation Commission of ICAO. The whole subject of radiotelephony was also being actively studied by IATA (International Air Transport Association) and IFALPA (International Federation of Airline Pilots Associations), the latter body being assisted with contributions from IFATCA (International Federation of Air Traffic Contro Associations).

Until ICAO had completed its work, the EANPG drew its member states attention to the problems of radiotelephony standardisation and recommended that "European States take all necessary action to ensure that ambiguities in, or lack o provisions covering the use of RTF are resolved to the extent possible...."
t was in this climate that the UK set up a Radiotelephony Phraseology Working Group to look at the problem of phraseology standardisation and to determine how to educate all users of phraseology in the correct procedures.

The Civil Aviation Authority (CAA) was set up in 1972 to be responsible for the economic and safety regulation of British Civi Aviation and, jointly with the Ministry of Defence, for the operation of the National Air Traffic Services.
t has departments responsible for all major aspects of flying; Aircraft Operations; Flight Crew Licensing; General Aviation Telecommunications and Air Traffic Control through the National Air Traffic Services which comprises both Civil and Military Controllers; it also has contacts with the major National Aviation bodies through its regulatory functions and advisory activities.

n setting up the Working Group, each CAA department was invited to send a representative if they considered that the subjec
of Radiotelephony Phraseology was relevant to their terms of reference. At the inaugural meeting of this group, I was given a
remit to produce a comprehensive document covering Radiotelephony Procedures incorporating examples of both pilot and
controller phraseology. It was to be applicable to all RTF users and would contain not only phraseology but also an explanation
of when and why the phraseology was to be used. It was to cover the initial flier who was just starting to take lessons; the
mature commercial pilot with years of experience and also the aviation enthusiast who visited airfields and wished to acquire
some background to the calls he heard on his airband radio.

A small subgroup, under my Chairmanship, was formed to determine the contents and details that the book should cover. In
addition to those actively involved in Phraseology, this group included the editors of those official manuals which contained RTF
Phraseology so that any changes proposed could be implemented simultaneously. The content and scope of each chapter was
determined by the group but the writing of the whole document was contracted out to the instructor responsible for RTF
nstruction at the College of Air Traffic Control at Hurn. The author was asked to cover each topic as fully as possible so that as
far as possible nothing was omitted. Where it was available ICAO phraseology was to be used; if none existed then current UK
practice was to be incorporated. Where alternatives existed in ICAO they were referred to the subgroup for a ruling as to which
was to be included.

Ambiguous messages were eliminated, eg "Go ahead" as a response was replaced by "pass your message". Areas where
misunderstanding had arisen, particularly in the airfield environment, were closely considered. Frequently an Air Traffic
Controller had to pass instructions to aircraft on the ground relating to routes or levels which the pilot would have to comply with
after the aircraft was airborne. The inclusion of the phrase "After take off turn ...../climb to .....
had been misunderstood as giving permission to take off. It was recommended that such phrases containing executive
nstructions should be restricted to occasions when action was required and not as part of a general message. The use of the
word 'cleared' was reduced in usage and where possible replaced by an action verb, eg, 'climb', 'descend', 'report', 'taxi', 'join'.

On completion the initial manuscript was reviewed and edited by the subgroup and then submitted to the main Working Group
for approval. Following further minor revisions the draft document was circulated to National Aviation organisations and users
for comment. (ADA - Aerodrome Owners Association; AOPA - Aircraft Owners and Pilots Association; BA - British Airways
BALPA - British Air Line
Pilots Association; GAPAN - Guild of Air Pilots and Air Navigators; GATCO -Guild of Air Traffic Control Officers; JACOLA - Join
Airports Committee of Local Authorities; MOD - Ministry of Defence (Air Force Department); PFA -Popular Flying Association)
Following comments from these organisations a. further revision was made and the final version was sent to the CAA Printing
and Publication Section to be published.

t was necessary to produce an attractive book which would appeal to the general public, it had to be compact and to retail at a price of £1 or less. It also had to be easily carried in a light aircraft. The finished document was produced in paperback format t cost £1 and the text employed different type faces to indicate pilot or ground messages. An attractive cover was designed which broke with the CAA House Style, to make the book more attractive to the general public. It was published on 1 September 1978 to coincide with the SBAC show at Farnborough and sold 5,000 copies in five months. In total, 33,000 copies of the first edition were printed.

To coincide with the publication of CAP 143, the CAA and Military documents containing Radiotelephony Phraseology were amended so that they would reflect the changes made. The new Phraseology was publicised in Information Circulars and the Aviation Press and was also one of the features highlighted on the CAA stand at Farnborough, all of which gave a wide exposure to the existence of the document and the standardisation introduced.

The publication of CAP 413 was the result of close co-operation between users of . radiotelephony, both professional and amateur. Representatives from Air Traffic Control, Aircrew Licensing, Airline Operations, General Aviation, Military and Telecommunications worked together to compile a book that contained standard Phraseology which could be used and understood by both airborne and ground based users. It was the first time in the UK, that all Phraseology was listed in one document. The complete book formed one of the working papers for the ICAO

Radiotelephony Phraseology study.

A second edition was subsequently published in 1984 which incorporates the results from that ICAO study.

Head of ATC Training

London Air Traffic Control Centre

1987

USER'S INPUT TO R.T. PHRASEOLOGY IN IFATCA AND IFALPA

E.G.H. GREEN (G.A.T.C.O.)

How the ICAO working group produced the new phraseologies:

Example: incident on final approach to New York. British airline told at 5/6 miles out to "go around", (illustration 1 because aircraft on 13L burst a tyre, British pilot misunderstood the "go around" instruction and turned left, unaware of the downwind leg.
This illustrates why there is concern for the need for standardisation.

IFATCA and IFALPA became aware of this sort of ambiguity of meaning between "go around" and "overshoot" through their Member Associations. At that stage, IFALPA had permanent observer status within ICAO, while IFATCA did not have any direct entry. However, the technical committees of the two organisations had a system of exchange and participation in the other's work. They became aware of the non-standard RT being used, and decided to try together to make sense of the phraseology This work really started as a result of the Tenerife accident when there was a clear indication that RT phraseology may have been a contributory factor. Representations had already been made by IFALPA, but Tenerife was the trigger for ICAO to set up a working group, including IFATCA, IFALPA, AOPA, IATA and some of the major states that had language interests, like France, UK, USSR, Italy, Spain, Canada, USA. Most of the organisations involved were represented by people with day-to-day experience of RT.

Working group act as advisers to ICAO, so any decisions made in the group could be overriden by the Air Navigation Commission, a permanent body of ICAO. While other types of technical documents pass unhindered through the Commission when it came to RT phraseology, everyone considered themselves an expert.

Principles of operation for the working group:standardisation considered absolutely essential.

- no duplicate meanings countenanced eg. eliminate "clear" due to double meaning, except for landing and take-off
- experts advised that two syllable words were beneficial, so there was an attempt to make any new words have two syllables eg. "locate"
- because ICAO has 4 official languages, the committee also took into consideration that translations into the 4 languages also had to be unambiguous

First tackled Aerodrome phraseology. A lot of group discussion as to how members thought phraseologies should be used, and this started to have an effect on ideas about procedures. Changes:

- one of the big changes was the use of "vacate" but it has been successfully been incorporated, and avoids many confusing uses of "clear".
- "Affirm" introduced to avoid misunderstandings between "affirmative" and "negative" particularly when the first part was blocked out
- "line up and wait" more readily pronounced and distinguished than "line up and hold" by speakers of Far Eastern languages who could confuse "line up and roll"

Problematic points:

"go around" versus "overshoot" caused division in the working group, "go around" won.
group would have happily dispensed with "Pan, Pan" message as pilots invariably lapse into plain language to explain the

holding point 24, check before crossing runway 13"? Pilots firmly did not want to cross ANY runway unless specifically cleared to do so, while controllers did not want extra exchanges on radio. ICAO decided on "Taxy to holding point 24"

- European/US usage:

illustration 4) "when ready"/"at pilot's discretion" but procedure involved was different. In USA "descent at pilot's discretion" means they may leave the top of descent when they are ready but also implies that they may level out on the descent to regain speed; and the inverse similarly "climb at pilot's discretion"

radar contact" in UK means controller has a recognisable blip on the screen. In USA it means"you are identified and you do not need to make any further position reports until I ask you to do so". Therefore, "radar contact" was dropped.

- Conditional clearances caused huge problems and outcome is finally a compromise
- readback of clearances. USA wanted to get rid of all readbacks. Group retained readbacks but failed to say whether callsign should come at beginning or end.
- "go ahead" has been retained and is potentially dangerous due to confusion with "go straight ahead"

There remains the problem mentioned before that everyone seems to be instant experts on RT phraseology, and there is already a large volume of correspondence from individual states with their own ideas on the subject.

The working group did what they sincerely believed to be their best to improve the recommended phraseology. It is certainly better now, but there is no guarantee that it is perfect.

(notes by F.A.R.)

'OVERSHOOT' or 'GO AROUND'

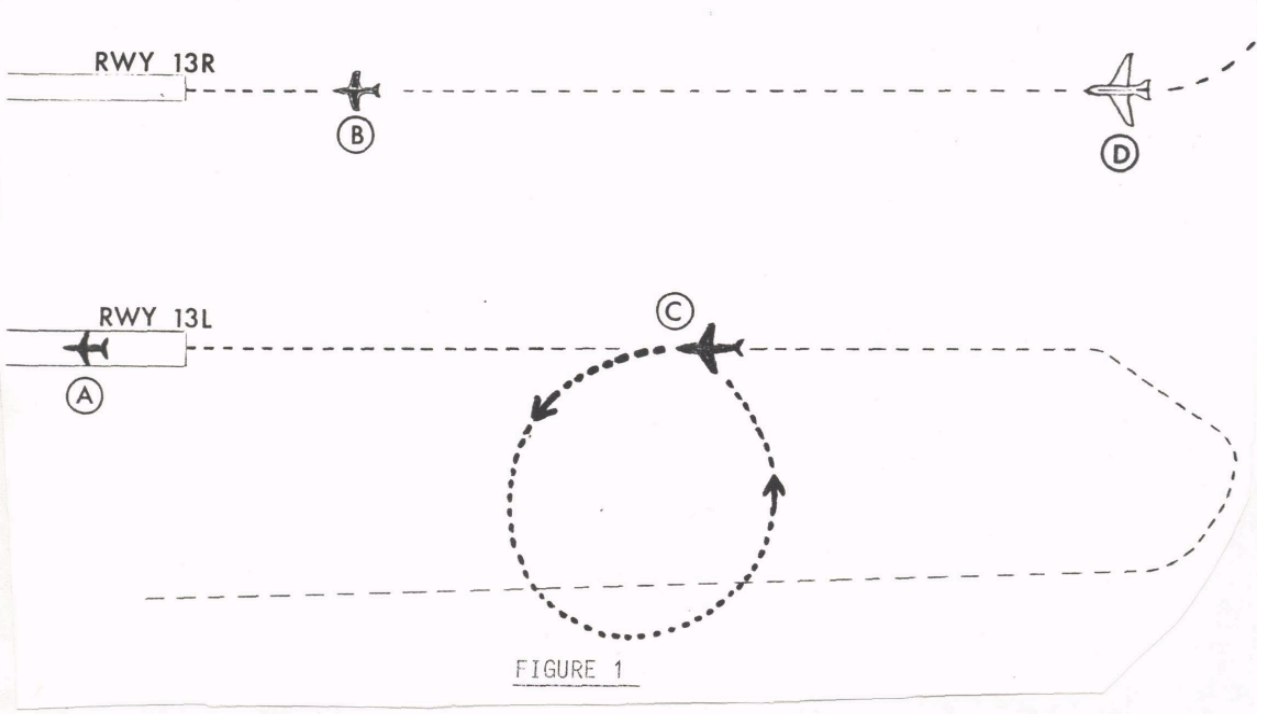


FIGURE 1

'FINAL' or 'LONG FINAL' ?

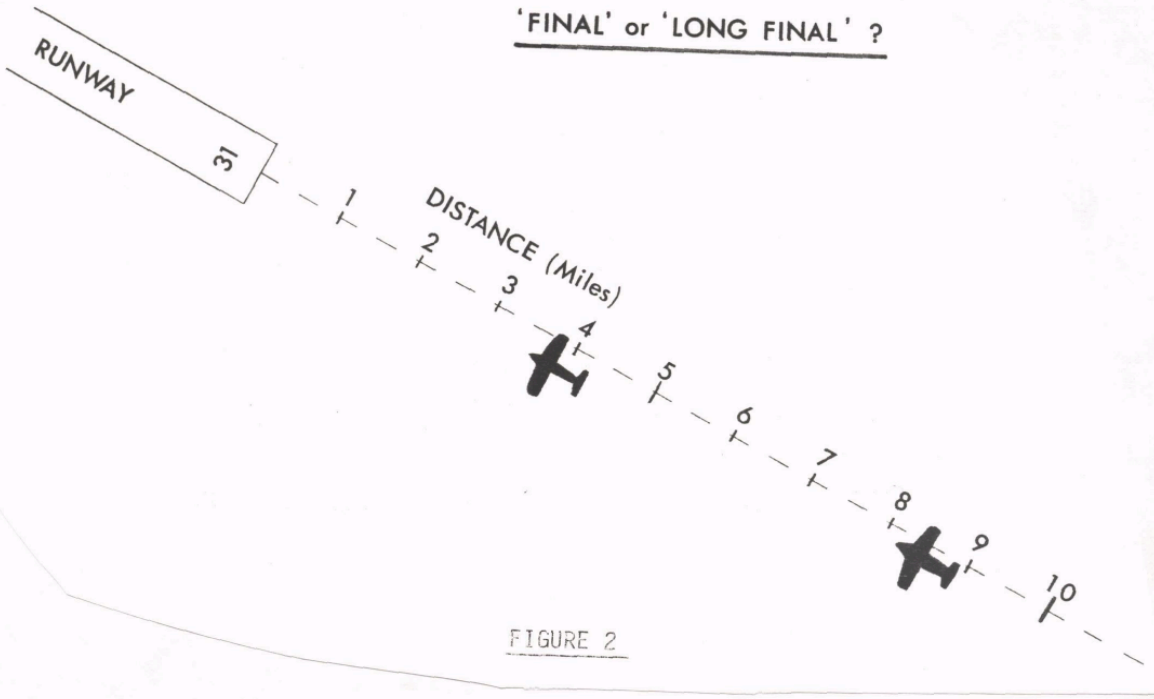


FIGURE 2

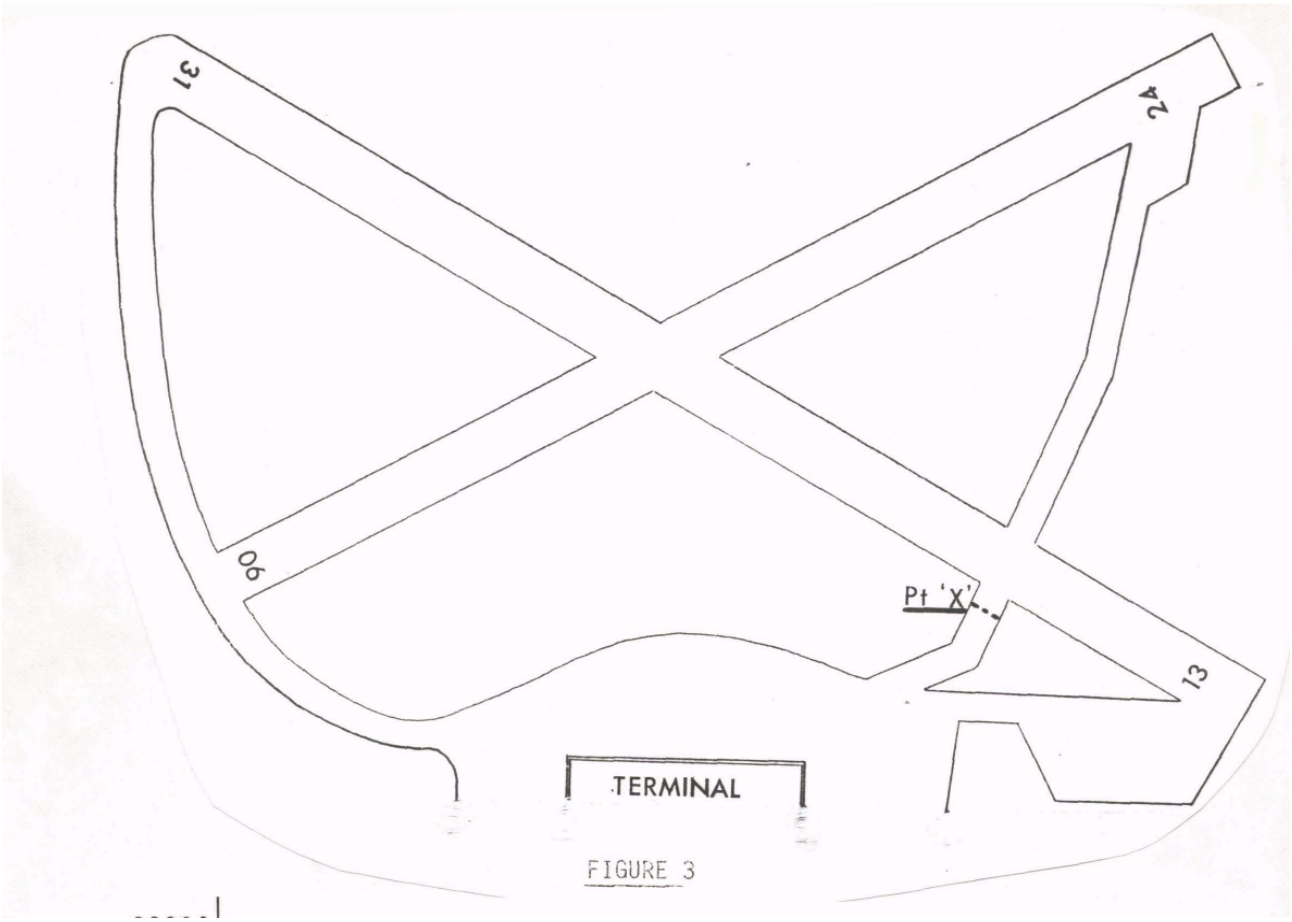
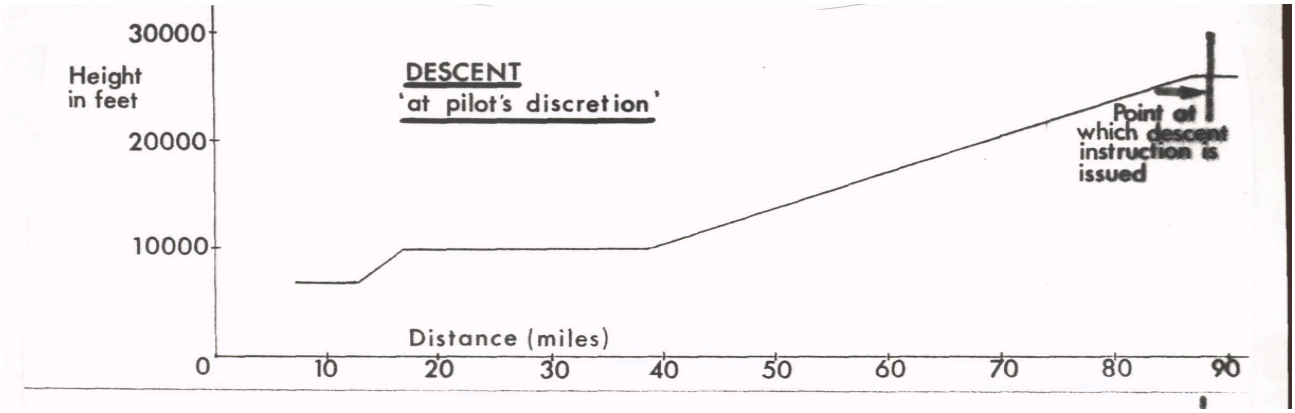


FIGURE 3



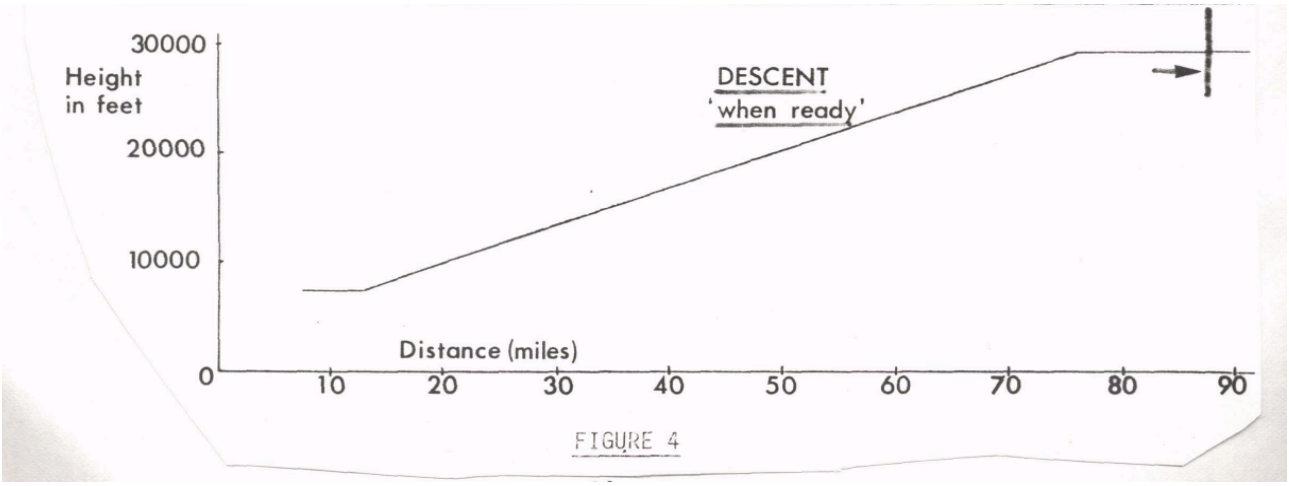


FIGURE 4

Introduction de Patrick MIGNON au seminaire du CLA

le 20 Mars 1987

Hello. I fly Boeing 737 in Air France and I am here to represent the Technical Committee of the pilots' union SNPL.

n our point of view, as long as the pilot receives a message that he is more or less expecting either because he initiated the call and/or because there is nothing unusual in it, there are no problems or very few. But when something unexpected is told o asked then come the problems mainly because of vocabulary, accents, speed and rhythm.

Let's see where those problems take place.

I. **Countries where English is the native language** (Great Britain, USA, Australia)

a) Vocabulary

Different words express the same thing, (i.e. US : to jetison fuel v. Great Britain : to dump fuel, US : to wave off Great Britain : to go around or to overshoot).

b) Accents

They vary in huge proportion from North to South and from East to West. Captain BARRAL told me the story of an Ai France flight coming into New York. The ground controller gives a clearance to Air France, on board, the three crew members are staring at each other. No one understands. New York, would you say again please...? and the ground control gives the clearance. Again : still nobody understands it. But in the end, at the third try, the clearance is understood. Then a British Airways "Speedbird", behind Air France calls New York. And the same controller gives a clearance to the "Speedbird"... Silence... Then "Speedbird" says : "Sorry New York, would you say again". And the clearance is given a second time... Silence again on the frequency. Then, was it British humor o not ? but the "Speedbird" says ; Hey Air France would you translate what this Bostonian guy is trying to tell me !!!"

c) Speed and rythm

In those countries, most usually, people try to speak at a speed and with a rythm that make them understandable.
I mean they adapt their speed to talk to what they feel the understanding is.

2. **Countries where English is not the native language**

a) Vocabulary

It is quite restricted, which is often good. One word for one thing. But in case of misunderstanding, it is hard to pass the message with very little words. This is the problem of a strict code. In North Europe, the rigid phraseology is a good thing. But we also have examples of incomplete phraseology.

In Paris airspace, a Lear-Jet is receiving a clearance to climb to flight level 040. But the controller said "... climb to fou zero". And the Lear-Jet, due to its fantastic abilities, called back "... steady flight level 240". He had been climbing ou of flight level 040 to flight level 240, without official ATC clearance and he involved lower and upper airspace problems Obviously, the two people concerned did not use the right phraseology : "... climb to flight level four zero". "... is cleared to flight level four zero".

c) Speed and rythm

c.1. Countries where the use of English is frequent

In those countries, people on the ground try to make themselves be clearly understood They speek at normal speed.

c.2. Countries where the use of English is often reserved to students, to the elite

In those countries, speaking English is often regarded as a privilege. And to prove that one speaks a better English than the other, he thinks he must speak a faster English.

Then, vocabulary, accents and speed often become a real mess.

Variations in Cognitive Processing and Variations in Language Use

P.Falzon (I.N.R.I.A.)

Reason for interest in language of ATC:2 tendancies in design for human/computor interaction

1. advocates use of natural language

2.advocates use of more or less restricted languages derived from natural language

People involved in second field have tried to design specific restrictions of the language, using mostly arbitrary criteria eg. to limit vocabulary to specified words or to limit syntax to certain patterns.

But if consider technical languages, there are spontaneous restrictions, and study of the mechanisms of such spontaneous restrictions could help in design of better adapted command languages.

THEORETICAL FRAMEWORK

(diagram 1)

Assume activity can be divided into three levels according to type of knowledge people evoke. General knowledge is evoked when operator is facing totally new situation - problem solving activity. Through experience, operator builds up new blocks of knowledge, or schemata, that are more adapted to the task and can be applied directly in order to process a situation - operative knowledge. For the most frequent situations, these elements are transformed to routine knowledge which is applied automatically by operator, (diagram 2)

OPERATIVE LANGUAGES

People tend to adapt work environment to make it more compatible with the knowledge they have built eg. in control rooms or large factories people stick papers on the panels in order to structure their environment. Control panels in a control room are a means for the designer to represent the state of a plant - it is a tool of representation. In the same way, language is a tool of representation and language can be adapted to a task in the same way as a control room can be adapted to a specific task (diagram 3)

CHARACTERISTICS OF OPERATIVE LANGUAGES

(diagrams 4 and 5)

DATA FROM STUDY OF CONTROLLER LANGUAGE

(diagram 6)

20 hours of air-ground communications, using French and English.

Number of words excludes parameters iE. digits and place names.

Number of words already very limited, but in French just a quarter (in English one third) of the words cover 90% of what is said.

(diagram 7)

Commonness: a measure of the number of speakers that use a word. Maximum no. of speakers - 20. Only 3 words used by all 20 speakers. Very slow increase in number of common words in group of speakers

The Word Vocabulary: Some Statistical Measures

- size - number of different words
- frequency - number of emissions of a given word(number of messages in which this word appears)
- occurence - number of expressions in which a word appears

4. climb level 330 at your discretion

4 messages

3 expressions

These results only consider the static characteristics of the language, not understanding or production of the language.

UNDERSTANDING

Assumption that this language could be understood in more economic way than language as a whole, with very little reference to syntax and by calling mostly bodies of knowledge associated with each category of message that could occur. First step was to describe the bodies of knowledge.

Functional categories of messages eg. modification of flight level, modification of speed.

Within each category used componential analysis

diagram 8)

Category: Modification of Flight Level

Can define schema underlying this category

These schemata were used to make a programme which was tested on

another body of language (in U.S.) to see how "stupid" a programme could be and still "understand"; to see if this language could be understood with very little information.

Results of test: (diagram 9)

		yes	ii	is	no
Messages	N	433	42	10	69
	%	78,2	7,6	1,8	12,4

DIAGRAM 9

Understanding Performance of the System for Command Messages

yes: correct schema evocation. and correct instantiation

ii: correct schema evocation and incorrect instantiation

is: incorrect schema evocation

no: nothing is memorized

FAILURES OF THE SYSTEM TO UNDERSTAND

In some cases the language used by controllers differed so much from normal language of control that it was not surprising that the system did not understand.

diagram 10)

An incident which disrupts normal work routine - language used is mix between natural language and the operative language although everything could have been said in the usual operative language. The situation is unexpected and it disrupts the use of operative language. NB. Both controller and pilot are native speakers.

diagram 11)

This example illustrates the different levels of cognitive functioning

STANDARDISING THE LANGUAGE

t is known that inevitably people will have to face totally unpredictable situations. They must be prepared for this. The questior s whether they can be prepared for this by a single type of education ie. is the training given for handling normal situations adapted for handling abnormal situations? For a long time it was assumed that the answer was yes, but now it seems tha different teaching procedures should be applied for normal situations and for abnormal situations.

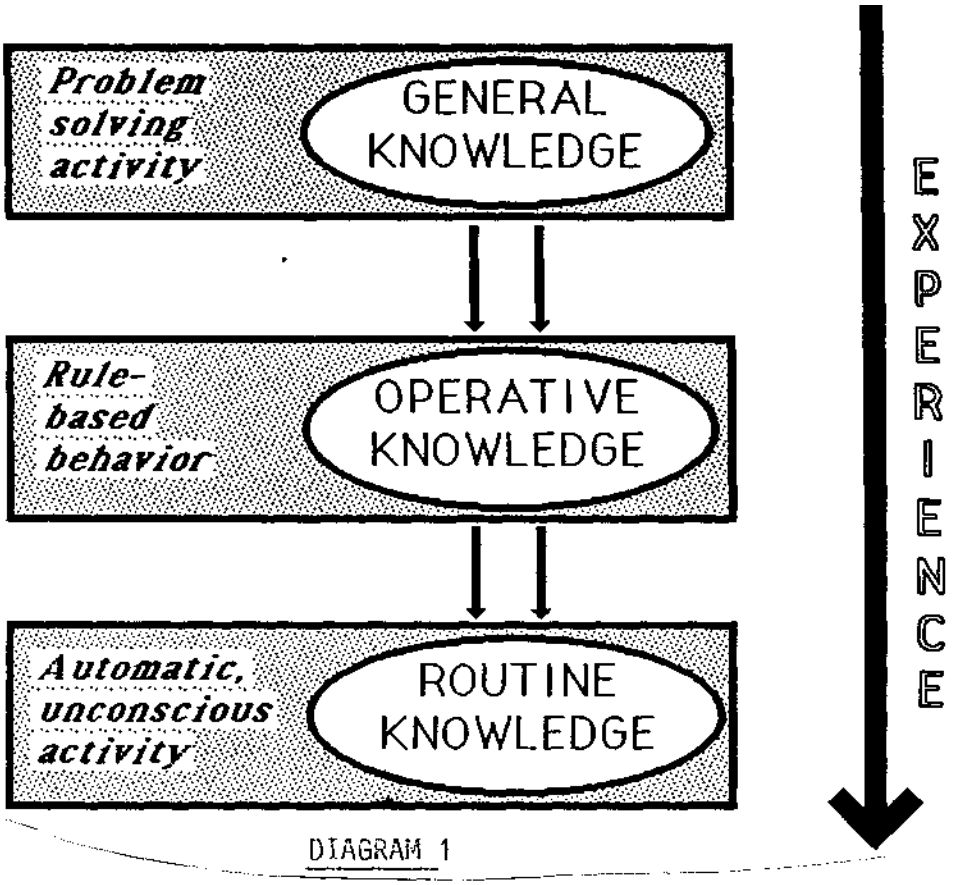


DIAGRAM 1

OPERATIVE KNOWLEDGE

&

OPERATIVE UNDERSTANDING

- Through experience, subjects elaborate specialized mental representations - operative or routine representations - In order to cope with the most frequent situations they face.

- Operative understanding Is the use of operative knowledge In the course of Interpreting situations.

DIAGRAM 2

OPERATIVE LANGUAGES

- Through experience, subjects modify their work environment ir order to make it more compatible with the operative knowledge they elaborate, i.e. they build up specialized external representations.

- Operative languages are the result of the adaptation of a genera tool of representation: natural language. Operative languages are dedicated tools of representation, less universal, but more adapted to the task than natural language.

DIAGRAM 3

THE CHARACTERISTICS OF OPERATIVE LANGUAGES (1)

➢ VOCABULARY RESTRICTIONS

- ➔ A limited vocabulary
- ➔ A vocabulary that uses rare words
- ➔ A vocabulary that uses specific words

➢ SYNTACTIC RESTRICTIONS

- ➔ A small set of syntactic rules
- ➔ These rules are not a subset of the general grammar of the language, some rules are specific: the grammar of ar operative language differs from the grammar of the language as a whole.
- ➔ Each operative language has its own grammar: the grammar of an operative language differs from the grammar o other operative languages.

DIAGRAM 4

THE CHARACTERISTICS OF
OPERATIVE LANGUAGES (2)

➢ SEMANTIC RESTRICTIONS

*W*ORD MEANINGS

- ➔ The words of operative languages tend to be monosemous.
- ➔ The meanings of the words may be rare or unknown in the "general" language.
- ➔ The same word, if used in several operative languages, will have a specific meaning in each operative language.

THE SEMANTICS OF A LIMITED DOMAIN

The semantic dimensions are limited to those dimensions that make sense within the task domain. Two consequences:

- ➔ some meanings are excluded
- ➔ some semantic meanings which are distinct in the general language cannot be distinguished in the operative language

➢ PRAGMATIC RESTRICTIONS

The pragmatic interpretations are limited by restrictions on the set of possible goals of both dialogue partners, and by a tighte application of conversational rules.

DIAGRAM 5

% of emitted words	Number of different words	
	Fre	Eng
10	2	2
20	4	4
30	7	6
40	12	9
50	18	13
60	25	19
70	40	29
80	68	46
90	127	84
100	467	247

DIAGRAM 6

Banalite	Nb de mots	Eff. Cum
20	3	3
19	4	7
18	4	11
17	3	14
16	2	16
15	5	21
14	3	24
13	3	27
12	5	36
11	3	35
10	13	48
9	9	57
8	15	72
7	14	86
6	25	111
5	17	128
4	33	161
3	27	188
2	63	251
1	216	467

BANALITE DES MOTS – VOCABULAIRE FRANCAISE

DIAGRAM 7

l - climb level 330

2 - descend level 330

3 - leave 290 for 330

4 - climb level 330 at pilot's discretion

5 - climb flight level 330

6 - climb to the -flight level 333

7 - climb 330

CHLVL: ((Act : VE) (Nat : LVL)
(Re) : (+ -))
(From : (PV P)) (To : P)
(Time: (def NOW PD)))

climb : ((Act : VE) (Nat: LVL)
(Rel: +) (From: PV))

descend : ((Act : VE) (Nat: LVL)
(Rel : -) (From: PV))

eave : ((Act : VE) (Nat : LVL))

DIAGRAM 8

C. TWA 122 heavy, 28 left, position and hold.

P. Position and hold, 28 left, TWA 122.

...]

C. TWA 122, 28 left, cleared for take-off.

P. Clear for take-off, 28 left, 122 heavy.

...]

P. TWA 122 heavy, we've got an N1 Indication and that was not acceptable for take-off.
We'll have to taxi clear and take a look at it, hold on.

C. Roger. Make a left turn next taxiway and you can taxi back.

P. Okay, we'll take the left turn and get well out of the way and then we'll hold just off the runway and I'll lock into a taxi back, okay.

...]

C. TWA 122,1 tell you what, why don't you just taxi down on the runway 19 left, make a left turn on 19 left that way you could run your engine without bothering anybody if you want, and then you can make righ or left turn at Fox, whatever.

P. Aaah, we're committed to this turn, we'll go over to ground and then we'll do that as necessary, okay.

C. All right.

P. TWA 122 heavy.

C. TWA 122 heavy, easy on the power, there'll be departing traffic behind you.

DIAGRAM 10

C. 601 Q, vous procederez ROLEX apres Luxeuil.

P. Ah. Si vous voulez...

P. Vous avez bien dit ROLEX apres Luxeuil, c'est correct?

C. ROLEX.

P.... j'ai pas trouve.

C. 601 Q, je confirme: vous procedez ROLEX apres Luxeuil.

P. Oui, je suis en train de chercher, je trouve pas ce point-la.

C. 601 Q?

P. Oui?

C. Oui alors ROLEX existe depuis un mois a peu pres, Monsieur il y a eu une circulaire d'information qui a ete envoyee. Vous auriez du la recevoir .. depuis le 15 Avril.

P. Oui mais vous confirmez c'est Romeo Oscar Lima Alpha Tango?

C. Romeo Oscar Lima Echo X-ray. C'est un ppoint intersection qui.. vous poursuivez votre route apres Luxeuil sur le radial 273 de Luxeuil pour interceptor le 153 de Rolampont, et ensuite si vous allez a Orly vous allez sur Melun direct et si vous allez a Roissy vous allez sur Troyes.

P. J'ai bien recu, merci.

DIAGRAM 11

DISCUSSION GROUPS

Groups were invited to consider some of the following questions:

1. Do you know any examples of lack of language standardisation?
2. What solutions are there for lack of standardisation?
3. Different countries produce different RT phraseologies. Why? can and should this be standardised?
4. Different manufacturers use different terms. How can this be standardised?
5. How can we persuade the powers-that-be to give more time and importance (money?) to language training?
6. How can people be guided and motivated to spend more of their own time on maintaining their English?

notes from group chaired by Philippe Domogala)

3. - Depends on national requirements and regulations
- Is pilot able to appreciate other exchanges? Is this an argument for a common language? There should be optional languages i.e. English international communication + national language
- In certain circumstances crews may not be aware of other movements because English not used
- Importance of training method for controllers
- Domestic non-prof, flights: is it acceptable to force private pilots to use English A requirement for Dutch PPL:very adamant about this point
- Canada: language policy inseparable from politics
- In non-regulated airspace: is use of English necessary?
- Standardisation on basis of safety alone, but the language used less important
- Local language acceptable for local+en route flights
- Pilots only need to understand aeronautical Eng., not social English
- Use of outdated phrsaeology by instructor pilots: pleasing your boss, bad influence on training pilots

6. - maintaining level/reaching level
- level to be maintained after school
- prof, exchanges: incentive rather than efficient way of improving
- difficult to interest controllers in aviation literature
- attending refresher courses: exam useful in motivating
- only some people have personal motivation
- evaluation/competitive spirit
- pilot recruitment: initial level insufficient not enough need to motivate extra effort
- importance of motivated/ing teacher
- having an available environment: future use of TV
- access to native speakers
- safety aspect requires awareness of rome as communicator
- preparing awareness of shortcomings in expression and comprehension -- sense of needs
- providing a goal: proficiency in American to obtain licence in US
- danger of mixing social + professional aims in English. Fluency may hide inadequacy in critical prof situation: overconfidence

- Air France pilots have always been among the most difficult to understand. Little improvement over time Ingrained resistance to English
- change in English quality in Spain for 3-4 years (6,000 people went to US for training + US logistic support)
- importance in improving comprehension
- the pilot very often speaks to the controller in his own language
- participation in international forums etc.
- the role of the institution in providing motivation
- "awareness" approach: initially
- diff. environment/ diff. needs
- promotion
- location
- awareness
- international contacts

notes from group chaired by Tony Carswell)

Question 3: R T Phraseologies

Problem What is found in books = what is used every day

- standardisation takes time. Confusing wording
- exact repetition essential: pilot said "flight level 2-4-0" and then reply was "240" is this 2-4-(or to 4-0?! Repetition, reading back, acknowledgement of requests and instructions eliminates ambiguity. But this recommendation (total aclnowledgement of a request) only came in in 1984)
- previously pilots weren't taught RT - they picked it up. Even now it's not mandatory that pilots and ATC work from same book. (Only recently did US publish standardised book)
- there's always something missing
- once a standard phrase learnt, slang and contraction creeps in. Force of peer group/wait
- no standardisation, much knowledge/use is picked up on job Example: Hold/Wait/Maintain/ Hold position/Maintain level etc.

a) 100 ways of saying same message (given human nature etc)

b) we talk about standardising phrases, but what about standardising interpretation. The problem is here

- can repetition be a way of standardising interpretation?
- In a high risk situation, pilot relies on ATC. Rapport essential for confidence, so personality essential. Mustn't be too robotic, but there must be readback. However, people accept info, too easily. Hence a mistake will be blindly read back. Robotic element leads to mistake
- 2 processes a) I heard something b)this is what I heard. Sometimes (b) is not taken in
- So there must be a verbal confirmation
- In US they don't use new terminology
- ICAO has produced new phraseology to eliminate ambiguities in pronunciation
- in-flight recordings used to analyse phraseology pronunciation
- not enough refresher training
- work with tapes, do our best, always same problem: disparity between what is taught and what is said - "clear to active" heard in Djibouti (US term - pilot US trained)
- pronunciation a major stumbling block in refresher courses

5. (motivation)

- list examples of ambiguities (with differences/different meanings) in RT books. "Our controllers on refresher training won't accept criticism of their RT" -so, show case studies of poor/ambiguous RT
- who are the powers-that-be?
- difficult to get people to listen, difficult to get many individuals to admit their English is inadequate

PRESENTATION TO THE THIRD AVIATION ENGLISH TEACHING FORUM
"LANGUAGE STANDARDISATION IN AVIATION"
at AIR INTER, ORLY - MARCH 20/21st, 1987

Background to the EGATS Forum by Geoff L. Gillett, Vice-President, EGATS

n April 1985, the Eurocontrol Guild of Air Traffic Services (EGATS) organised a two-day Pilot/Controller/Industry Forum even n Heerlen, The Netherlands.

The theme of the Forum was
'R/T - THE VITAL LINK", which had the following objectives:

- to highlight problem areas of a technical and operational nature in Radio Telephony and to identify deficiencies particularly where safety might be involved;
- to provide industry with an opportunity of giving advice and information and demonstrating curren and future developments in air/ground/air communications.

do not propose to deal here with technical, industrial or medical matters, but will concentrate on those aspects which I hope to be of more interest to this Forum, some of which have their origins from outside the context of the EGATS Forum. Since time is imited, I have also had to delete the nevertheless important topics of callsign confusion and other problems relating to specific areas.

Forum Participation

Approximately 130 persons attended the Forum, representing a wide spectrum of the aviation industry, the majority of which were pilots from more than thirty airlines from Europe and beyond. A series of presentations and discussions took place on problems which had been identified by means of a questionnaire circulated previously among approximately 100 airline controller and communications industry organisations. Opinions expressed were predictably divided, often equally 50/50.

Before we examine the Forum further, let us look back to the beginning of what we might call modern R/T.

ICAO MAKES A MODEST START

n 1950, ICAO standardised SARPS and published Recommended Phrases, terminology and pronunciation of digits and alphabetic spelling. ICAO also laid down guiding principles inter alia:

1. The English language should be the basis for development preferably using words with Latin roots.
2. Words and phrases should be avoided which could be liable to differences of pronunciation likely to cause misunderstanding
3. Clarity should not be sacrificed in the interest of brevity.
4. Positive and negative instructions or advice should be clearly differentiated.
5. Words should be avoided if difficult for non-english speakers.

am reminded that when the recent changes to phraseology were adopted, "line up and hold" was rejected because wher

dependent on technical aids and only effective communication of ATC instructions and in the final phase, visual perception o mminent danger, can prevent aircraft from colliding. It is amazing just how much technical innovation has been introduced ir he cockpit but in spite of increasing automation, the spoken word remains the vital, vulnerable link in ensuring air safety.

A NEED TO REVIEW BASIC REQUIREMENTS

Considering all this, why then has so little systematic attention been paid to the language of aeronautical communication? Mino changes in phraseology, often initiated by the users of the system rather than the responsible authorities, are all we have achieved. It seems that as long as R/T remains the main communication medium between pilot and controller, self- mprovement must be applied. Again, how valid are the fundamental principles of the 50's today? The majority of pilots and controllers then, were native speakers of European languages with Latin roots. Hence "descend" and "commence" were perhaps justified instead of "go down" and "begin". But today, developing countries have large airlines and ATC organisations staffed with their own trained personnel and even some European airlines, BCAL for example, train their own European staff to speak Arabic and other languages.

Are we then not overdue for a review of the basic requirements of the language of aviation communications, pursued not only by the enthusiastic amateurs within IFATCA, IFALPA and other Organisations but also by specialists in linguistics, phonetics and language structure. I believe that the organisers of this Forum are to be congratulated on their timely and wise choice o opic in this third event that they have arranged.

NON-STANDARD PHRASEOLOGY CONDEMNED

Since development has evolved without much official intervention, many local or fashionable variations of "R/T SLANGUAGE" have been introduced and it never ceases to amaze me just how well the system works and that more incidents do not arise which are directly attributable to poor R/T discipline. A catalogue of differences could be produced, for example between North American and European R/T. I am again reminded of the words of Winston Churchill who said that, "America and Britain are wo great countries divided by a common language".

But it must be acknowledged that ATC worldwide has benefited greatly from the pioneer work which had its origins in the USA and from the standards defined by the FAA. Perhaps it is timely to mention that the English speaking States have an obligation o train their personnel to adhere to the agreed use of their own language.

t will come as no surprise that the Forum concluded that pilots have extreme difficulty in comprehending fully and accurately some ATC instructions, due to the use of non-standard phraseology. Of course, some controllers and pilots use the R/T as a vehicle for their own ego, making witty or original remarks. No doubt this is also brought about by the boredom derived from the generally routine nature of ATC communications. And when the frequency becomes busier, talking faster does not improve pronunciation and clarity of meaning can be lost. A plea was made for more effective standardisation in official phraseology and more consciousness about the folly of personalised R/T. The first awakening of consciousness can have its beginning in Forums such as this.

An example of time-wasting with unnecessary colloquial language is illustrated by the following extract taken from an excellen article by Lucy Leveson published in the International Journal of A.T.C.

Aircraft: "Heathrow ground Swissair 801 request improved slot time".

Controller: "Swissair 801 are you filed Upper Green One or Upper Amber One?"

Aircraft: "Upper Amber One".

Surely, native speakers should set a better example.

A NEED TO MINIMISE DANGEROUS DEVELOPMENTS IN AVIATION LANGUAGE

There is no doubt we are still at great risk of misinterpretation even in simple standard phrases. As a pilot, what do you understand by the phrase "cleared for approach"? Does it mean an unrestricted descent to final approach altitude or is it your responsibility to provide terrain clearance. Clearly different terms and phrases can mean different things to different people. An increased efficiency can only be achieved If human inadequacies are taken into account when phraseologies are further developed so as to minimise the potentially fatal effects of their consequences.

Even with a vagueness of meaning, a degree of communication occurs and can even assist in the development of language not always, however, to the benefit of the language, some may argue! I trust I will not be accused of deviation from the subject if I point out that the words "queer" and "gay" had quite different meanings from those currently understood, though just how this development process happens is far from clear. One must have sympathy for the efforts of such learned bodies as the Academic Francaise in the losing battle to protect a language from anglisization or even worse.

DANGERS OF DISTRACTION AND SELECTIVE OR ANTICIPATORY HEARING

Accent or stress on words or misinterpretation of an intended interrogatory tone could be fatal as almost happened in a near collision over Stuttgart, the "eight zero clear?" was interpreted as "eight zero clear". If in doubt check it out!

Since such a high percentage of R/T communications are predictable routine, there is a very high degree of anticipation Selective hearing results – in other words, one hears what one expects to hear and not what was transmitted. The danger can increase dramatically when distraction of other senses occurs. This psycho-linguistic phenomenon is well-known but as far as am aware, has not been studied sufficiently to produce any remedial action. With a two-man cockpit configuration, the distraction of sometimes unnecessary ATC messages, will taken on an even greater significance. Perhaps it is worth mentioning that the elimination of the Radio Officer function on the flight deck, implemented probably in the interests of cost effectiveness could have resulted in a reduction of safety with the imposition of additional tasks upon the other flight deck crew.

DANGER IN BREVITY AND FAST RATE OF DELIVERY

As R/T load increases, so does the tendency to clip the beginning of transmissions. This has led to confusion in the all important distinction between "Affirmative" and "Negative". You will recall that one of the guiding principles prescribed by ICAO was that positive and negative instructions should be clearly differentiated. The distinction is totally lost if only the last syllable is transmitted or received," -tive".

In high R/T load conditions, one of the first items dispensed with is the R/T callsign in spite of the requirements of ICAO in Annex 10 Vol. 2 para. 5.2.1.6333. But it must be repeated that incidents occurring as a result of these frequent omissions of callsign are relatively rare.

Although I cannot claim much experience in this field, I am at least left with the impression that simulator training tends to encourage sloppiness in ATC communciations in favour of check-list efficiency which is a training opportunity lost. Both for the experienced captain and the senior controller, a higher level of R/T efficiency could be achieved. I frequently monitor ATC

t was stressed at the Forum that the rate of delivery is often too fast and one example was quoted by a pilot who measured 9(words being broadcast in 28 seconds. I seem to recall the ICAO recommended rate of 100 words per minute. The subject o 'courtesy comments", (good morning, good evening, etc...) was discussed and both pilots and controllers were in favour o' etaining these since they tend to be used only when there is time available. One sample of R/T analysis produced 7(unnecessary "greetings words" in a 45 minute sample. It was interesting to note, though not surprising, that the most frequentl used word is "Roger", closely followed by "Flight Level".

f I may quote from Miss Robertson's vital statistics, a study by Mr. Pierre Falzon showed that a typical French ATC vocabulary contained some 467 words compared with 247 in the English, which represents only about 10 % of a normal educated Englis vocabulary. It is not surprising, therefore, that there is a tendency to revert to one's mother tongue in times of high stress.

ONE LANGUAGE PREFERRED

Pilots answering a question on the use of more than one language in ATC communications were unanimous in thei condemnation of this, whilst controllers were more flexible. It is only fair to mention that French pilot response to the questionnaire was minimal and with more, the outcome might well have been rather different.

A pilot is clearly disadvantaged by the use of more than one language, in that he cannot create a mental picture of the traffic situation around him from monitoring the R/T. Controllers, when occupying a seat on the flight deck, feel a compulsive need to do this, at least for those aircraft at, or in proximity to, the level at which they are flying. There was once a pilot (I do not think he was english) who insisted on a translation of everything that was said on the frequency which was not in english. Perhaps tha was something of an exaggeration but it illustrates the point.

BLOCKED FREQUENCIES - A TECHNICAL SOLUTION

Firstly, in order to clarify what we are referring to, there are two different categories.

a) When an aircraft is Unintentionally transmitting for a given period of time - let us call this a "stuck microphone" problem and b) when two or more stations transmit simultaneously resulting in a squeal or whistle.

Both of these problem areas have been studied for years by pilot and controller organisations and there would appear to be a possible technical solution to both, but until it is implemented, a procedural solution is being sought but on an ad-hoc basis.

t is worthwhile to repeat yet again, that primary radar, SSR, Mode C, telephones, computers and displays are only some of the ools of our trade.

EFFECTIVE TWO-WAY RADIO COMMUNICATION REMAINS THE PRIMARY METHOD OF PREVENTING AIRCRAFT FROM COLLIDING.

One sunny afternoon in Africa, a DC10 and a DCS missed each other at FL 350, opposite direction, by only 30 feet. During a previous flight, a check pilot had used the observer seat behind the captain and both VHF1 and 2 were left in the "ON" position During the subsequent flight, the captain had put his briefcase on the empty observer seat and it eventually came to res against the transmit button, keeping it in the "send" position. This effectively blocked the frequency for further use by the

Forum, together with a presentation by a Singapore Airline's B747 captain, Derek Ellis. Trials have been conducted by KLM and the latest information I have is that an American Corporation, Teledyne Controls, has undertaken to produce the units and that a ground station evaluation is planned. The FAA has instructed the Radio Technical Commission for Aeronautics to study the problem of Frequency Blocking and Mr. Corrigan is a member of this committee.

ADDITIONAL PROBLEMS

In order not to exceed my slot time, I will summarise some remaining points.

- The lack of VHF communictions facilities worldwide and the overloading of R/T channels in many countries still not equipped with radar facilities, was highly criticised. It is questionable whether the installation of public telephone facilities in some passenger aircraft can be justified when these same aircraft might have no possibility of voice communication with ATC if all normal ATC communications fail, the captain can always telephone the ATC Centre for a clearance!!!
- The phrase "go ahead" remains official instead of "pass your message" although the former has accounted for hundreds of airfield incidents.
- In some areas, ATC units are inspected by radio-car and sloppy R/T is immediately detected.

IN CONCLUSION

The 1985 EGATS Forum was a rare, if not unique occasion where specialists from aircrew, ATC and the Communications industry could exchange views of common problems which have again been identified. No doubt in the future, a Mode S data link will provide automatic position reporting to ATC, transmit clearances and will remove the need for a common language or will it? How can we know our intended instructions have been received and understood and will be complied with?

How efficient will the speech recognition systems be, that are currently under development? Will the satellite stations, which in the future will enable long range communications and access to data base services, be technically dependent and what of their vulnerability to sabotage or interference?

Old problems will be resolved and new ones will provide an ongoing challenge. For all of us, our very existence depends on good communications, in the widest sense of the word, in the desire to understand, in the will to help and to teach, coupled with a need to care and an inclination to forgive.

ENGLISH FOR AVIATION AT THE DEFENCE SCHOOL OF LANGUAGES

presentation by Flight Lieutenant N J Thompson)

1. The Defence School of Languages (DSL) was formed on 6th January 1985 when Royal Navy, Royal Air Force and Army language training was rationalised. The School is part of a wider training establishment with other departments having no connections with language training.

2. Language training at DSL is divided amongst four wings, each specialising in one language. They are:

a. English (English Language Wing)
b. German (German Language Wing)
c. Russian (Russian Language Wing)
d. Arabic (Arabic Language Wing)

A fundamental difference between English Language Wing (ELW) and the other wings is that ELW requires a proven standard of English before students are accepted for courses. The other wings take their students ab-initio; that the theory and practice of student acceptance to ELW do not always coincide will be examined briefly later.

LANGUAGE COURSES IN ELW

3. Courses in ELW aim to give foreign students a command of English that will enable them to cope with further training in the UK. Such training, as the school name suggests, is for armed forces personnel and is mainly conducted at military training schools.

4. There are courses for all three services. Those for air f6rce personnel include:

a. Pre-Initial Officer Training
b. Pre-Flying Training
c. Pre-Air Traffic/Fighter Control Training
d. Pre-RAF Staff College
e. Pre-Engineering Officer Training
f. Miscellaneous

5. The miscellaneous courses include students such as helicopter crewmen and advanced students proceeding to flying nstructor training; in other words those with limited but very specialised demands who appear in such small numbers and who cannot realistically be fitted into a "standard" course.

6. Courses for aircrew, air traffic fighter controllers and engineers are probably of most interest to the Forum. They are designed along similar lines, with the emphasis changed as required, and contain the following elements:

a. General English. The pre-course language skills are developed in order to increase the level of general language capability. Particular problem areas, such as pronunciation are dealt with.

b. Technical English. Students learn the specific vocabulary for their specialisation, e.g. air-field layout, parts of the air-frame.

c. Maths/Science. An introduction is given to the mathematical and scientific concepts necessary for further training.

7. Whilst there is a standard pattern to courses the pattern is flexible with the emphasis changing to meet the needs of studen groups and of individuals where possible, e.g. Three Lebanese engineering students were poor linguistically but highly competent technically; they were withdrawn from Technical English and Maths/Science and given concentrated general English practice - with highly satisfactory results.

PROBLEM AREAS

8. Sadly, not all in the garden is rosy. Problems do occur and they are summarised below:

a. Student Expectations. Some students expect the courses in ELW to be abbreviated forms of their professiona training. Pilots are often surprised not to find an airfield at DSL. Inevitably this has an effect on attitude.

b. Maths/Science Level. Numeracy is not tested before students arrive at ELW let alone physics/chemistry. Standards are often appallingly low, well below GCE 0-level, and frequently showing a lack of knowledge of the basic fou mathematical processes. Meeting this problem is only achievable by a drastic pruning of the science syllabus with attendant problems later in training.

c. "Political" Pressure. English Language Wing is not always the final arbiter as to whether weak students will attend courses or will proceed to further training. For a variety of reasons - economic, political and social - UK and foreign governments may insist that students will enter or continue training irrespective of suitability.
This inevitably bears on:

d. Student Aptitude/Ability. For a variety of reasons student aptitude, ability and attitude may not compare favourably with European students. Many client governments have few, if any, selection procedures for choosing trainees; the educational background of many students is weak, "political" pressure in the student's home country combined with UK foreign policy may mean that places are given to sons, nephews or clients of rulers as rewards or as befitting their status irrespective of the abilities or even the wishes of the individuals concerned.

9. Fortunately the situation is not all bad and most students succeed at this stage of training. Interestingly marked regional and national differences do reveal themselves; these could be the subject of a presentation in its own right but this is not the place The main lesson perhaps, is that nothing can be taken for granted, certainly not the Warrant Officer clearly failing to succeed on an avionics course who turned out to be a cook, rewarded, on promotion, by the first course available. ELW felt it could not help in this cases.

CAL ENGLISH TRAINING PROGRAMME

All the recruited prospective flight crews have to take English proficiency test. The test covers 3 types of listening comprehension, AIM professional knowledge, Grammar and Structure, and reading comprehension. For those who can no meet the requirements have to take a 3-month (300 hours) intensive training. Trainees will take a post-test as evaluation.

Originally we sent flight crews to the language center, an annex of the university. As reviewing the result, it is as this, the study at language center, somehow, can not meet the needs of actual flying. Naturally, the fundamental training is the base o everything, yet, without the aviation knowledge as the support, it is difficult to meet the practical condition of flight crews. Thus CAL language is established thereby.

The current programme falls into two categories.

1) Programme for newly hired F/O: Functional English.

2) Programme for mature flight crews: On-job training.

(I): Functional English

(a) Aviation English:

(1) AIM: 50 hours.

(2) radiotelephony: 50 hours.

(b) Grammar: 50 hours.

(c) Conversation: 50 hours.

(d) General English including reading and basic writing: 50 hours.

The lecturer shall help trainees to articulate English naturally and respond spontaneously.

(II): On-job training.

A mature flight crews is expected to completely fulfill his job. Two types of training are as follows:

(a) Those who have the difficulty to completely communicate en-route flying, will be recommended to take voice-procedure training in order to strengthen the communication ability. The training hours will be varied upon the team's decision.

(b) On-job English training program will be held from time to time. Each program is usually scheduled for 108 hours. The emphasises are on the radiotelephony, AIM and oral training,and a lab will be utilized for listening practice. It is an open class, crew members can participate at leisure time. The purpose of this program is functioned as an aid to promote the flight crew members' English ability in order to fulfill the mission.

Facilities and lecturer.

CAL has newly recruited an English teacher with double Master degrees in English teaching and Psycholinguistics, and education. The lecturer takes charge of the designation of curriculum, teaching and testing. Yet, there are many other co teachers responsible for different courses individually. There is one assistant with junior college education background to be responsible for helping the teacher with daily routine work and some administration work. One language lab with 20 seats, and one recording studio are in use. Materials used for teaching programme include video tapes, voice-procedure records

ANNOUCEMENTS

(An outline of the Cabin English Workshop organised by Joan Bellec)

WHY ?

WHO FOR ?

WHEN AND HOW OFTEN ?

HOW ?

WHICH ANNOUNCEMENTS ?

WHY GIVE ANNOUNCEMENTS ?

To give information to all passengers concerning:

SAFETY

General safety instructions.

- information concerning safety equipment on board (life jacket, oxygen masks)
- situation of exits -safety leaflets - when and how to use seat belts, smoking areas
- where to place baggage etc...

Specific safety instructions.

- proceeding emergency evacuation – during disembarkation - during turbulence etc...

SERVICE

In flight Service - distribution of drinks, meals, entertainment - flight information -

Explanations concerning
- delays
- incidents
- arrival procedures

WHO FOR ?

For Native English speakers

For speakers of English as a second language

When English is the only common language.

WHEN AND HOW OFTEN ?

During each phase of flight

Problems of time available, particularly during short flights when workload is heavy.

Problems for certain frequent travellers of saturation.

HOW ?

With the use of video

With pre-recorded tapes

Announcements given by the Purser only.
By a "qualified" Flight Attendant
By any of the cabin crew.

WHICH ANNOUNCEMENTS ?

INFORMATION CONTENT

- how much information to give:
  example bomb scares, incidents etc..-
- open ended announcements:
  example delays, flight info...

LENGTH

LANGUAGE CONTENT

- Formal v Informal
- technical terms v general
- American vs. British
- modern v dated

TRAINING

Are all crew members expected to be proficient in English ?
Is this a requirement during initial selection ?
Does proficiency in conversational english necessarily indicate an adequate level in giving announcements ?

What sort of training is needed ?
- voice production
- pronunciation practice
- familiarisation with announcements booklet
- practice in improvising announcements .....

How often should training take place ? (once a year) (more regularly)

Should training in giving announcements be integrated into other courses concerning "cabin service, or contact with passengers" ?

What tools are available for the instructor ? Mock-up, Video camera, Video film, Language Lab. , Tape recorder,

Each nationality has its specific linguistic errors when speaking in English. How can these be defined and what can be done to eliminate them

SELF-ORGANISED LEARNING AS A STRATEGY FOR IN-SERVICE LANGUAGE TRAINING OF AIR TRAFFIC CONTROLLERS

presented by Marc THOMAS (ATC training centre, Roissy) and Jeremy MELL (English teacher, ENAC)

I. The background

The Ecole nationale de l'aviation civile (ENAC) in Toulouse provides ab-initio training for French Air Traffic Controllers over a period of I year, during which English instruction is given for radiotelephony and general oral communication skills Controllers should leave the ENAC with level 4 (see level chart).

Further language training varies according to the place of work and the facilities provided - some controllers having access to language instruction throughout their careers, others, usually in small aerodromes, relying on correspondence courses and occasional intensive courses at the ENAC.

The principle aims of in-service language training for French controllers are for them to maintain level 4 competence throughout their career, and, in some cases, to allow controllers with additional responsibilities to reach levels 5 and 6.

In 1985, the ENAC set up the first course to introduce working controllers to the principles of self-organised learning and the following presentation is a summary of our attempts to integrate this approach with language training facilities already available.

2. On-the-job training at Roissy

Until October '86 nothing had been planned for English tuition in the aerodromes. The CTL left the ENAC and was supposed to maintain or improve his English level on his own. A few of them could attend intensive courses provided by the ENAC.

For an airport such as Roissy, the importance of mastering spoken English is obvious. We had to define what kind of English was needed the most, and how to introduce it into the training process.

2.1. The aim is to increase the professional English level, but this can-not be achieved without improving the general English level (see Figure 1). Therefore we had to set up the framework of English tuition and to introduce it into the training process (see Figure 2).

The syllabus for professional English has been divided into 4 modules including 3 units each:

- phraseology
- vocabulary
- standard expressions

Each module corresponds to a qualification:

- preflight
- ground
- local
- APP

see Figure 3)

Here is the diagram of the linguistic subdivision within the training department: figure 4.

2.2. The English tuition is part of the initial training, and by the way, English courses are mandatory for the trainees At the present time there are 20 trainees.

Every week, trainees are programmed for the following week (in coordination with the ATC instructors).

2.3. Methods

1/ General English: listening comprehension, dictations, discussions, grammar exercises.

2/ Technical English: mainly vocabulary + phraseology. We use ENAC course books (listening comprehension gap filling, association of ideas), overhead projections

3/ Professional English: this is the use of technical English in the job situation; it is the link with general English for we have to refer to grammar (structures, tenses). We use authentic materials (live traffic, local recordings) we organise visits (airline operations), talks; we lead discussions (aeronautical themes).

Phraseology

Phraseology is not really taught but presented and explained. A manual is available for each CTL; copies of live traffic tapescripts (recorded in the centre) are distributed to the CTL. During the course we use the overhead projector fo presenting phraseology and explaining the justification of that phraseology:

- syntax: "mentions conditionnelles", "Behind ... line up behind"
- lexicon: • the problem of stress has been resolved by a lexical choice "affirmative = affirm"
  "affirmatif = affirme"
  • possible misunderstandings:
  cleared = vacated
  au-dessus = plus haut
  au-dessous = plus bas
  holding position = holding point
- phonetics: spelling alphabet: 3 /tri/ instead of /θri/
  to # two : weak forms

2.4. Follow_up

An important innovation is the use of an individual progression sheet on which are reported the date and the content o each course and the name of the animator. The aim is to adapt the professional English tuition to the training progression.

2.5. The limits

The specific organisation of an airport (visual contact with the environment from the tower, structured training process enables us to manage a structured progression; however we come up against the "pre PC/post PC" barrier (nor

3. Self-organised learning ("Autoformation")

3.1. The decision to introduce self-organised learning as an option for in-service training is a direct consequence of the specific nature of a controller's unconventional working conditions and the language requirements of air traffic control - notably the need to maintain a high level of competence and flexibility in the use of natural language when this is required only in occasional, unpredictable circumstances.

The strategy currently adopted (which is detailed below) is to offer a limited number of qualified controllers a 2-week preparatory course at the ENAC leading to the development of individual programmes of language work to be carried out with the support of language instructors at the place of work.

The aims of the programme are to:

- free controllers from the constraints of timetabled classes,
- allow controllers to select and work on learning resources individually or in small groups with or without the help of instructors,
- personalise language training so as to deal with local and individual needs,
- give controllers access to 'long term' programmes of language 'maintenance',
- encourage greater personal involvement in language learning to increase the benefit of all learning activities.

This approach is neither a glorified form of traditional programmed instruction, nor is it an attempt to leave controllers to their own resources. There are significant implications for both parties.

For language instructors these are:

- availability for consultation
- awareness of 'student-centred' approaches to language learning
- development and maintenance of resource centres.

Controllers, on the other hand, require:

- commitment to long-term language training
- awareness of problems of language and problems of learning
- training in the techniques of self-organised learning.

3.2. The initial training course has the following aims:

- establish the nature of professional objectives
- reconcile personal and professional objectives on an individual level
- introduce controllers to the skills of: - setting objectives - choosing resources and activities – evaluating results - organising a learning programme
- introduce controllers to differentiated roles of the language instructor (conversational partner, language model/reference, evaluator/co-evaluator, adviser about materials/techniques, organiser).

The initial training course takes place in English and has the following basic structure:

Week 1

Discussion sessions on various aspects of self-organised learning.

Practical workshops on principal language learning activities (reading, listening, oral practice, viewing, grammar, vocabulary).

Keeping a diary.

Week 2

Individual experimentation with resources and techniques on a self-access basis.

Continued discussion sessions (including analysis of learning activity during a typical lesson).
Individual consultations leading to the establishment of a work programme for each participant (see outline contract).

3.3. The outlook

While the approach outlined above is still at an experimental stage, the following comments can be made:

1. The initial training course is capable of generating a high degree of motivation as well as developing the skills necessary to take initiatives in language learning. The parts of the puzzle still to be developed are:
    - the exact nature of administrative support required
    - the training of local instructors in techniques of participation in individual learners' programmes
    - the appeal of this approach to controllers with lower personal motivation

2. Unexpected spin-offs are becoming apparent as this approach is being put into practice:
    - the traditional gaps between the language specialist and the control specialist is being bridged as partnerships in learning are formed;
    - a more detailed analysis of the communication problems of control is emerging - problems which may not be apparent or pre-d.i£Aab.le from simply examining a linguistic corpus.

FIGURE 1

TECHNICAL ENGLISH : list of technical terms, expressions + phraseology

PROFESSIONAL ENGLISH : language used in the job (R/T, tel.); includes technical English

GENERAL ENGLISH : includes professional English except for a specific part concerning phraseology

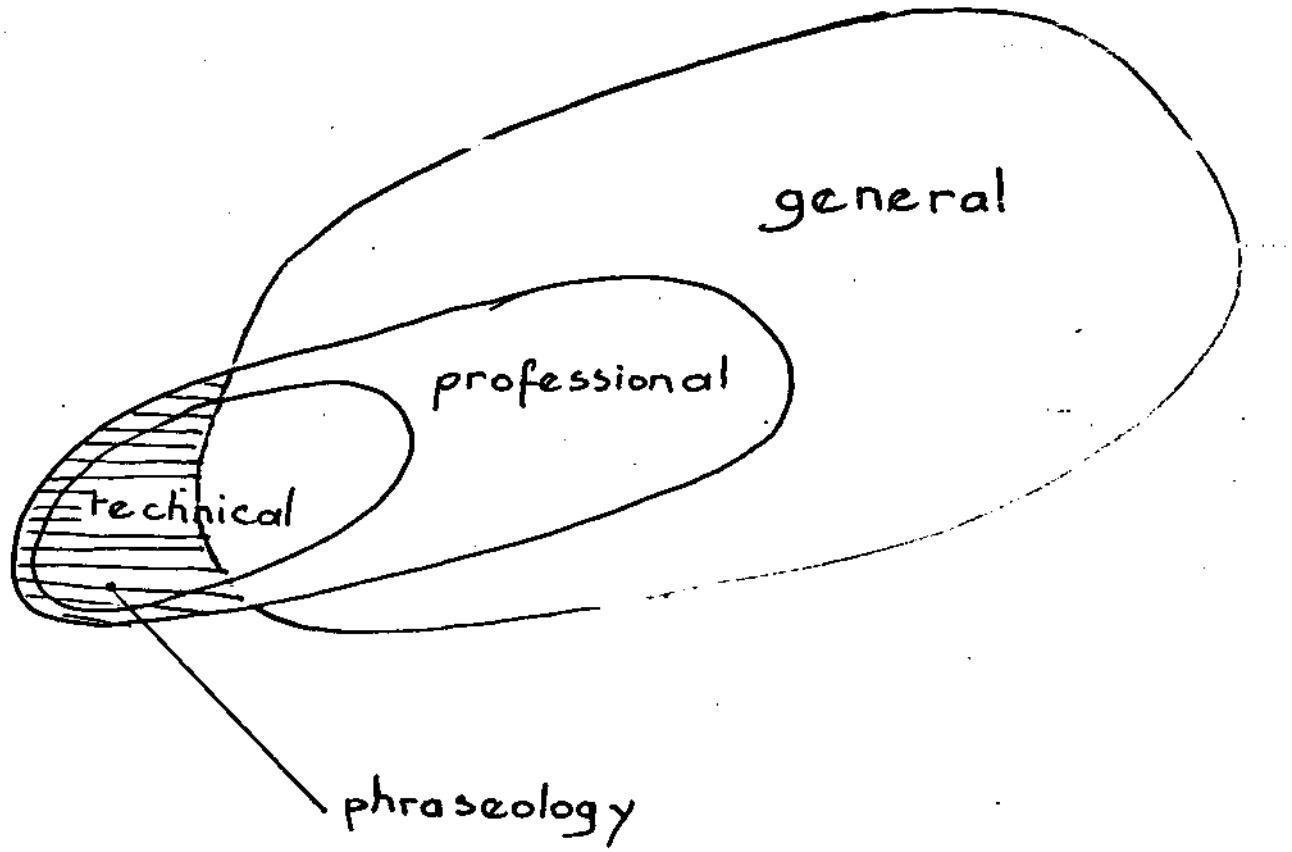


FIGURE 2

- Aeroports de Paris:

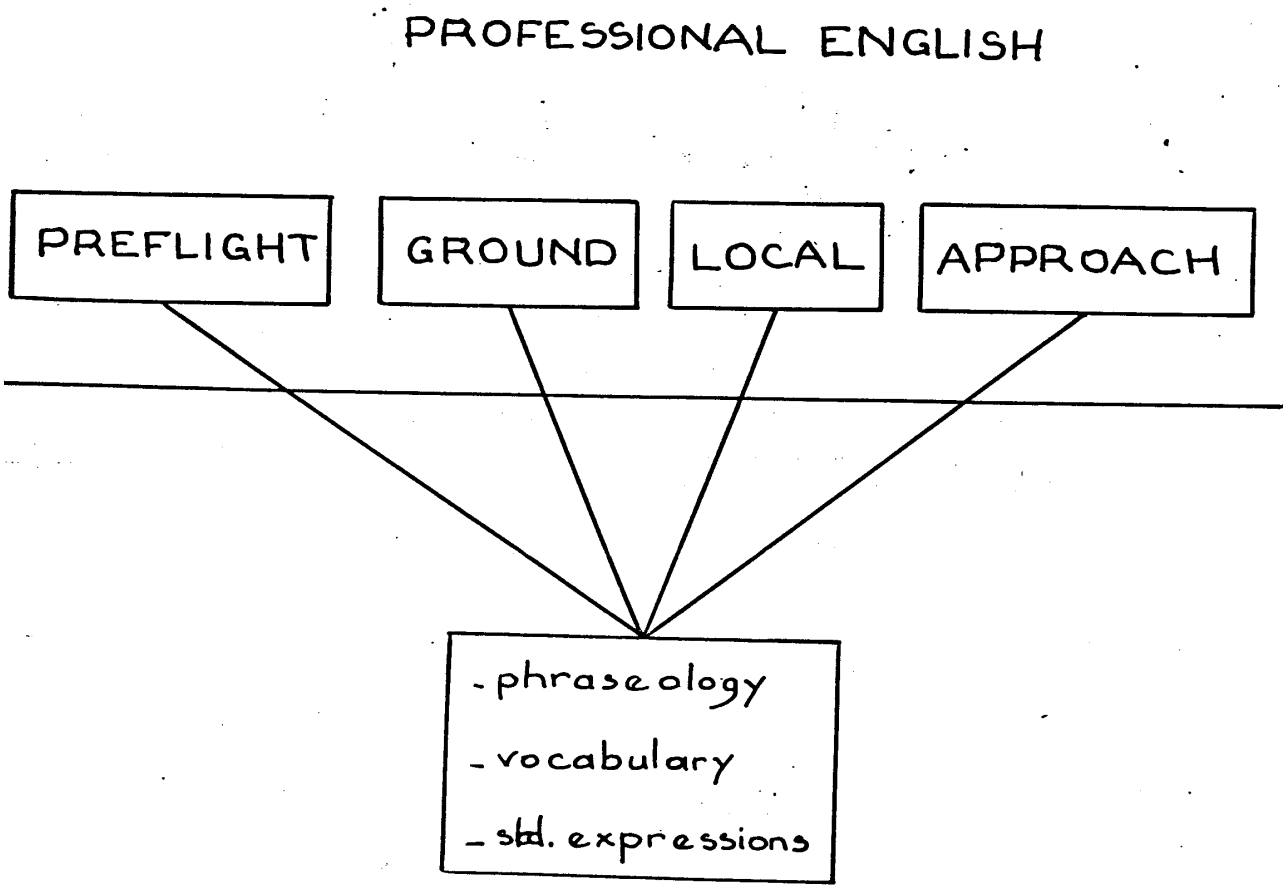
Intensive courses - 1 week long
- 2 weeks long

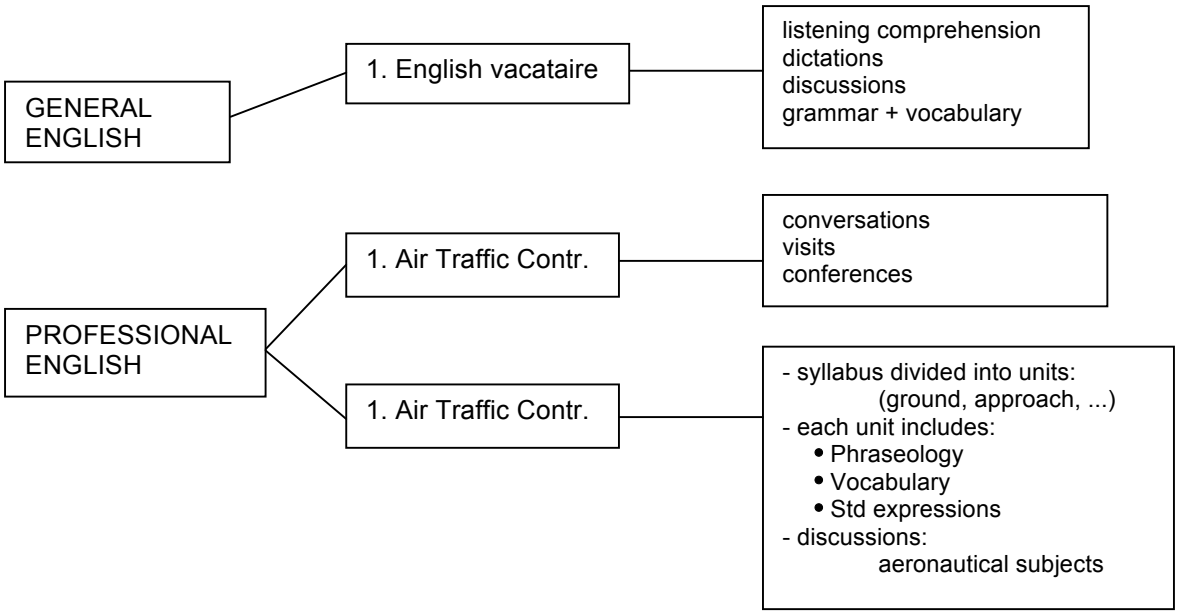
- Navigation Aerienne:

English department

- "lectrice" general English courses (3^H / week)

FIGURE 3


PROFESSIONAL ENGLISH
PREFLIGHT
GROUND
LOCAL
APPROACH
- phraseology
- vocabulary
- std. expressions


GENERAL ENGLISH
1. English vacataire
listening comprehension
dictations
discussions
grammar + vocabulary
PROFESSIONAL ENGLISH
1. Air Traffic Contr.
conversations
visits
conferences
1. Air Traffic Contr.
- syllabus divided into units:
(ground, approach, ...)
- each unit includes:
• Phraseology
• Vocabulary
• Std expressions
- discussions:
aeronautical subjects

LEVELS OF ATTAINMENT IN-ENGLISH : PROFESSIONAL

AIR TRAFFIC CONTROLLERS

Scale	Name of level	Characteristics: air traffic control
0	Beginner	
1	False beginner	Can understand some elements of standard phraseology if spoken very slowly, for example on recordings destined for the initial stage of training. Cannot, under any circumstance, monitor the frequency.
2	Pre – Inter – mediate	Can only understand a pilot on the frequency who limits himself to vocabulary and expressions related to routine situations provided that the language is not distorted by any interference, such as unusual accent, rapid speech or bad reception quality. Can use the main standard phraseology but makes errors in using less common standard expressions. May not always be understood due to accent.
3	Inter – mediate	Understands pilots using standard phraseology with varied accents and rhythms, but understanding is easily hindered by non-standard language, even if the pronunciation is standard. Uses all standard phraseology appropriately, but speech will contain errors when the situation demands wider range of language. Vocabulary only allows him to handle a limited number of non-routine situations and since this vocabulary is largely passive, its use is marked with errors which may obscure meaning. Can always be understood in normal situations.
4	Post – Inter –	Can understand a pilot making a wide range of requests or reporting unusual flight conditions, provided that the pilot has a standard accent and speaks slowly. Has a sufficient range of vocabulary and expressions to handle very varied situations, but is only able to use them if conditions do not require very rapid response. Is understood in all circumstances when using language he is familiar with, but cannot always produce correct messages when obliged to improvise.
5	Advanced	Understands a pilot in most circumstances: understanding is only hindered by very unusual speaking styles/accents or very rapid speech. Command of professional language allows effective response in all situation although stress associated with certain circumstances may induce some errors. Can always be understood, despite possible inauthenticity in some unexpected situations.
6	Very Advanced	Understands pilots in all situations; can adapt to all varieties of accent and rhythm. Command of professional language is sufficient to deal with all aspects of exceptional situations and the stress involved causes no serious deterioration in the quality of language. Has a spontaneous command of a wide range of appropriate vocabulary: pronunciation and intonation are the only clear indications of non-anglophone origins.
7	Excellent	The use of English is not an obstacle to the satisfactory fulfilment of professional duties. Is capable of expression in a variety of registers; feels completely at ease in all professional situations where the use of English is necessary : visits to control centres, meetings with foreign counterparts, advisory functions. The fact of not being fully bilingual would only become apparent in prolonged conversations due to slight faults in intonation.
8	Bilingual	Fully bilingual

CYCLE D' AUTOFORMATION EN ANGLAIS

NAME:

CONTRACT N°

I. ORGANISATION

EVALUATION

Period from ..... to .....

Organisation was respected?

Hours per week of study .....

Contact with instructor .....

3. OBJECTIVES

Objectives were reached?

a) To use English to .....

(b) Language/skills needed .....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

EVALUATION

3. Resources to be used — Resources were suitable?

.....
.....
.....
.....
.....
.....
.....
.....

4. Techniques to be used (be as precise as possible) — Techniques were suitable?

.....
.....
.....
.....
.....
.....
.....
.....

5. Decisions for next contract

Organisation: maintain or modify?

Objectives: maintain or reformulate?

Resources: find new ones?

Technique: adopt new ones?

AVIATION ENGLISH TEACHING FORUM 1987

LIST OF PARTICIPANTS

Mme Iolande ANDRADE, Teacher, Centre de Formacao Arruemento C Edifici 82
1700 Aeroporto de Lisboa PORTUGAL.

Mrs Kathleen BARTHE.Translator and Terminalogist, Aerospatiale,
A/ DCS/ SD/FT . 316 Route de Bayonne 31060 TOULOUSE

Mrs Janet BARTISSOL Teacher Ecole de 1'Air 13661 SALON DE PROVENCE

Mr. Tony CASWELL Teacher(Centre de Perfectionnement Linguistique, Tour
Montparnasse 34 ieme etage. 33, Avenue de Maine 75015 PARIS

Captain Christian DEBEURY| Flight Crew Information DepartmentfUTA DOA-IL 906
50, Rue Arago 92806 PUTEAUX

Captain Michel DELALQY Flight Crew Training Centre Manager. Air Inter Orly Aerogare 94396

Captain Gilbert Delaporte Flight Crew Training Centre, Air Inter.

Mr. Philippe DOMOGALA,Regional Vice President, Europe Vest International
Federation of Air Traffic Controllers Association.

Mr. Gradimir DUNCIC,Pilots Training Centrey JAT, 26300 VRSAC Yugoslavia.

Mme Susan DUROLLETtLabo d'anglais C.R.N.A. (lord) 9 Rue Champagne 91205/ ATHIS MONS

Mr Adrian ENRIGHT, Eurocontrol Institute of Air Navigation Services.
Blvd. K. Adenauer L 115 LUXEMBOURG

Mr Pierre FALZON(Researcher, INRIA;Domaine de Voluceau B.P. 105 Roquencaurt,
78153 LE CHESNEY Cedex

Ms Sandra Georgina FITZPATRICK,Teacher S. F. A. C.T,,(Montpellier) Aerodrome
de Frejorgues,34130 MANGUIO

Mr Richard FOXCROFT/Teacher. C.P.L. Tour Maine Montparnasse 34 Ave du Maine 75015 PARIS

Mr Pierre GAIGNEUX Regional Instructor DRAC/SE 21 Ave. Jules Isaacy13617 AIX EN PROVENCE

Mr Geoffrey GILLET(Vice President;Eurocontrol Guild of Air Traffic Services

Mr. Colin HUME, Superintendent, Air Traffic Services and Communications,
British Airways, J 313 TEA (S342) London Heathrow Airport, HOUNSLOV Middx,

Mr Edward JOHNSON Research Fellow Wolfson College , CAMBRIDGE,ENGLAND

Ms. Jakulic MILKA Teacher;JAT BELGRADE,Larka Zrenjania 36; YUGOSLAVIA

Ms Helena KUKOVEC,Teacher(Adria Airways,6100 LJUBLJANA, Cesta NA LAZE/25 YUGOSLAVIA.

Mr, Michel MAGNIN,Chief Pilot Instructor Centre d'Instruction Falcon B.P,
95 VELIZY VILLACOUBLAY 78143

Mr Jeremy MELL,TeacherfENAC, Division Langues , 7 Ave Edouard Belin TOULOUSE 31055 Cedex,

Mr Claude METZGER(Moniteur Rad :iotelephonie AIR FRANCE;Vilgenls.

Mr, Patrick MIGNON Pilot, c/o SNPL Tour Essor, Rue de Scandicci 93370 PANTIN

Mr. Zorka MILOSEVIC,Teacher, JAT Training BELGRADE 69 Dusana Vukasovica X4/69 YUGOSLAVIA.

Mr. F. MOITIER Eurocontrol 72 Rue de la Loi 1040 BRUXELLES BELGIQUE.

Mr. Villiam.NIGGLI Teacher, Swissair. Theoretische Ausgildung O.T.I.N,
CH-8058 ZURICH'FLUGHAFEN Switzerland.

Mr PACAUD Teacher, Ecole Aeronautique, ST.YAN 71600 PARAY- LE MONIAL.

Mr David PIMA Aerospatiale A/DCS/SD/FT/, 316, Route de Bayonne 31060 TOULOUSE,

Mr. Henri PLANTELIGNE Ingenieur charge d'etudes,ORLY SUD 103 OGA,, 94396 ORLY AEROGARE

Captain REBUFFBT Chef Secteur S 12 AIR INTER 94396 ORLY AEROGARE

Mr Claude SERREtIngenieur Aviation Civile,, Orly Sud 103, 94396 Orly Aerogare Cedex,

Mr Philip SHAVCROSS Teacher, Gradation Ltd., 160 Av. de Grande Bretagne 31300 TOULOUSE,

Ms Nada SIKIMIC,Teacher JAT Beograd , Tadeusa Koscuskog 72 YUGOSLAVIA.

Mrs Barbara SILVERGOLD Teacher, Pare La Raymonde 3 Rue du Puits Vieux 13090 AIX EN PROVENCE.

Mr Roland TAAR,Inspecteur General de 1'Aviation Civile. IGACEM/246 Rue Lecourbe 75015 PARIS,

Flight Lt. Neil THOMAS , RAF Education Officer. Defense School of Languages
Wilton Park BEACONSFIELD Bucks, ENGLAND.

Mr. Hsi San TIEN Assistant Manager Training Centre China Airlines. TAIWAN,
Taipei Sung Shan Airport, Taipei TAIWAN.

Mr Richard TOVNSEND,Teacher. Ecole Aeronautique de St. Tan 71600 PARAY LE MONIAL

Mr John WILLIAMS,Head of ATC Training, National Air Traffic Services, WEST
DRAYTON Middx. UB7 9AX, ENGLAND.

Mr. J.E.Wolthers Dutch Civil Flying School, C.R.L.S, P.O. Box 6 PATERSWOLDE PAYS BAS.

Ms Anne -Marie VOZNIK Teacher, UTA DAS/PF Zone Entretien Bat. Commissariat
Aeroport Charles de Gaulle^S ROISSY EN France.

Organisers
Ms Joan BELLEC/Teacher, Centre de Linguistique Appliquee,
University deBesancon. AIR INTER C.I.P.N. Orly Aerogare 94396,

Ms Fiona ROBERTSON Teacher,C.L.A, Universite de Besancon. AIR INTER C.I.P.N, Orly Aerogare 94396.