What difficulties can arise during pilot- controller communication?

Effective communication between the crew and controllers is essential for safe flights and should be provided all the time. Radio telephony sometimes may become difficult (communication difficulties may arise/happen) due to technical problems with the equipment or language problems. As for technical problems they include radio equipment failure and different interference on the frequency like: distortions (other people speaking, noise, whistles), loud feedback, background noise. Also situation is challenging in case of one- or two- way loss of communication. As for language aspect it is when due to poor English, bad pronunciation or deviation from RTF pilots and controllers may experience/face misunderstanding. Also communication may become difficult if someone doesn't follow communication rules (breaks the rules).

- ***What are possible reasons for communication failure?***

Firstly, it may happen due to communication equipment malfunction or failure (stuck microphone, sleeping receiver) but one of the main reasons, I think, is a human factor. These are situations when ATCOs and pilots set too low radio volume or when ATCOs assign incorrect frequency or forget to hand over aircraft , pilots forget to switch to a new frequency or turn to an incorrect one. Contributing factors are: high workload, frequency congestion, etc.
Potentially dangerous outcomes are :pilots are unable to receive a new clearance leading to loss of separation or even to airprox/nearmiss; pilots are unable to pass important information to controllers; increased controllers' and pilots' workload .

- ***How/why is SSR code used in case of a communication failure?***

SSR (Secondary surveillance radar) is a surveillance radar system which uses transmitters/receivers and a transponders. It has A,C and S modes . Mode A is used more frequently as it helps to identify the aircraft. SSR code is the identity of the aircraft. A controller may ask to enter a new SSR code in case of one-way communication failure.

- ***What are controller's actions if a pilot doesn't reply?***

If a pilot doesn't reply I call him several times (again and again). If it doesn't help I try to determine the nature of the problem, if it is one or two- way loss of communication. I give a pilot instructions for some maneuvers. Also I can use an emergency frequency or involve neighboring sectors and other pilots to help me.

- ***Could you explain the term "one-way communication failure"?***

It's a partial communication failure when either pilot or controller is unable to transmit or receive a message. In such a situation I immediately inform my supervisor and neighboring sectors, separate the suffering aircraft from other traffic, applying double separation. Also I may ask the pilot to squawk IDENT or to enter a new SSR code.

- ***Could you explain the term "two-way loss of communication"?***

It's complete/full communication failure when both a pilot and a controller are unable to transmit and receive a message (partners don't hear each other at all). In case of total communication failure controllers should transmit blind on all the frequencies, use/involve other aircraft or neighboring sectors to relay the message to the suffering aircraft, to separate other aircraft from it and constantly monitor the emergency frequency 121,5.

- ***What procedures do controllers use to determine if it is one-way or two-way loss of communication?***

I act in accordance with the documents. So to determine the nature of a communication failure I give the pilot instruction for different maneuvers , such as to change heading, FL, to turn left or right. I observe this actions on my radar screen. If the pilots follow my instructions I understand that it is a one- way if not a two -way (full) loss of communication.

- ***What are possible pilots' actions in case of total communication failure?***

I believe, pilots will follow their standard voice communication failure procedures. They will try to establish communication with ATC units using all available means and aids. They will set transponder code 7600. The crew can continue flight to destination in accordance with the flight plan or divert for landing at the nearest suitable aerodrome. (In most cases contact is regained quite quickly. If not, that may indicate unlawful interference or total crew incapacitation).

- ***What arrangements are necessary in case of traffic with a communication failure?***

The best way is to follow the ICAO principle to ASSIST:

A – Acknowledge

S –Separate the affected aircraft (with RCF) from other traffic

S – Silence the non-urgent calls, try to establish possible relay by other stations

I – Inform supervisor and airport authorities at the alternate aerodrome **.** Is the aircraft is approaching restricted, prohibited or danger airspace alert the military and other appropriate services.

S – Support the flight by transmitting blind (type of approach, runway length and aerodrome details, etc.)

T – Provide Time to assess the situation and carry out 'lost com procedures'.

During approach a controller should provide a long final for suffering aircraft, delay all arrivals and departures and keep the active RW clear.

- ***Have you ever had/heard of a situation connected with communication problems?***

I can remember a situations connected with miscommunication due to English language. We used to serve Turkish airlines/flights. One day they requested cross bleed engine start .We couldn't understand the situation at once , it was quite confusing for us as we don't apply such a procedure at our aerodrome. It took us some time to clear it up. So it is not the most pleasant experience communicating with the foreign crew.