

Sheet 2.1: Ambulance Service storyboard – Main story



When you dial 999 the call is initially taken by an **Operator**. She finds out if the caller needs an ambulance and transfers the call to the nearest ambulance control room.



Kirsty is a **Call Taker** in the ambulance control room. She receives the transferred emergency calls.



When she gets a call, Kirsty creates a new call record (also known as an **incident record**) that contains information such as the address, telephone number and symptoms of the caller.



The call record can be seen by the **Emergency Medical Dispatcher**.

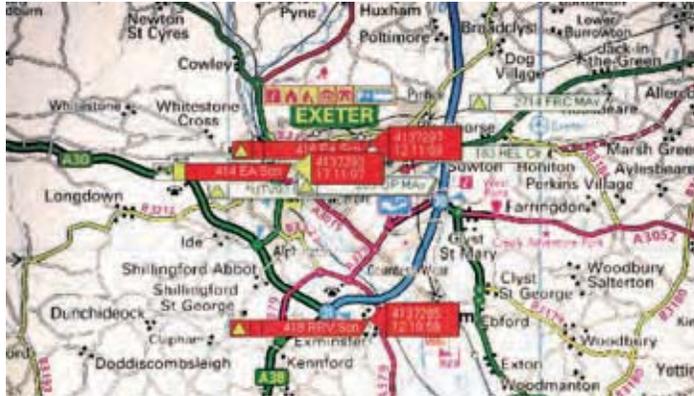


Kirsty uses a **touch screen telephone system**. When there is a new incoming call, the system beeps in her ear and flashes. The screen displays the address and telephone number of the caller, if the telephone company has that information.

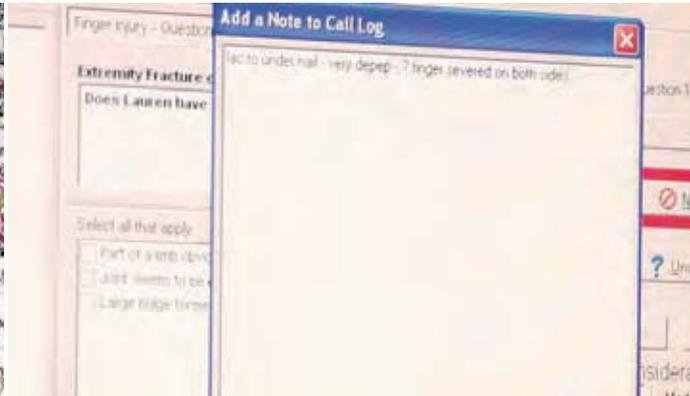


On the touch screen system there is also a list of all the resources and telephone numbers for doctors and hospitals.

Sheet 2.1: Ambulance Service storyboard – Main story



On the third computer screen is the mapping system, where all the calls are plotted.



Kirsty puts any extra relevant information into a notes panel and passes them on to the dispatcher.



Claire Pratt is a **Clinical Supervisor**. She is one of the Clinical Advisors for the control room and for the crews. Claire listens in to all incoming 999 calls.



Claire reviews the severity of a patient's condition. If she doesn't think that a patient needs an ambulance she will speak to the dispatcher, reassess the patient and possibly stand the ambulance down.



Lewis is an Emergency Medical Dispatcher. He arranges the response to 999 calls.



Lewis listens to the incoming calls on the **Integrated Command and Control System (ICCS)**.

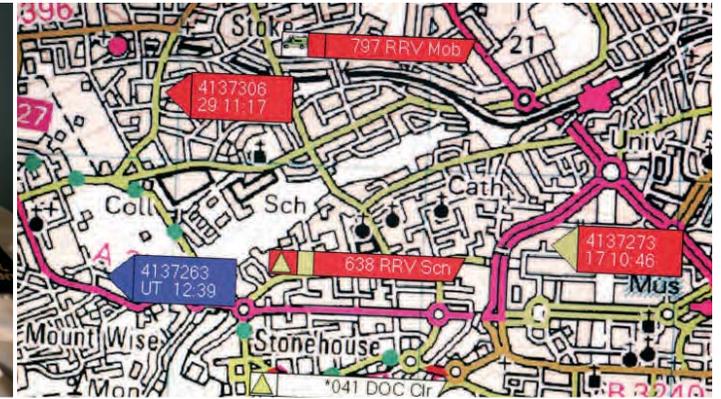
Sheet 2.1: Ambulance Service storyboard – Main story



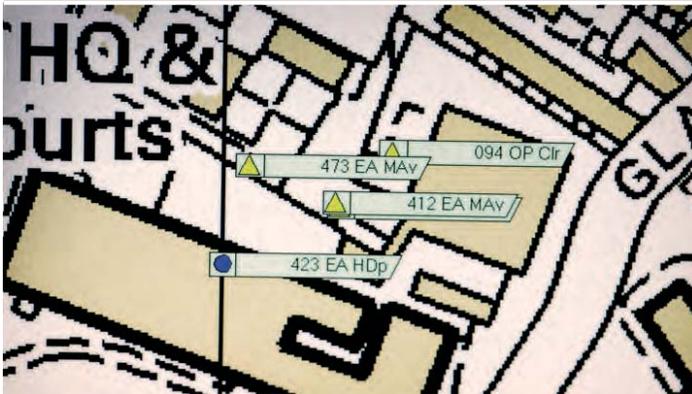
Lewis gets the address of the incident as soon as it goes into the system. He can pre-alert the crew and dispatch a vehicle within 10 to 15 seconds.



While the crew is on route, the Call Taker gathers more information for the dispatcher to send through to the crew.



Lewis has a screen which displays a map with an arrow pointing to where the incident is. This is a **Geographic Information System**.



Lewis can zoom in and out of the map to see a larger or smaller area.



Lewis can track all the emergency vehicles on the map as well, so he can see how far away they are from the incident. The map updates roughly every 10 seconds.



Lewis has a third screen which lists all the available resources, such as **ambulances** and **Rapid Response Vehicles (RRVs)**. Each resource has a unique call sign.

Sheet 2.1: Ambulance Service storyboard – Main story



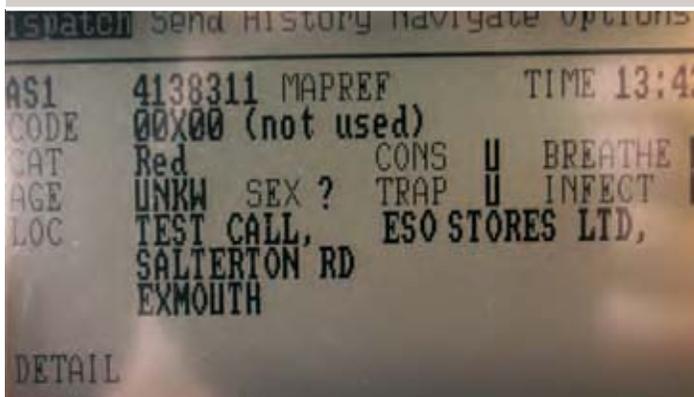
When an incident record has been set up, a short version is sent through to a screen in the ambulance. This happens instantly, via a mobile data transmission system.



Anita is a **Paramedic Supervisor** based at Exmouth Ambulance station.



Anita is alerted via her pager when an incident happens. The message on the **pager** tells Anita how urgent the call is.



Anita and her team return to their vehicle where a screen shows the details of the emergency.



The screen is part of a **Mobile Data Terminal (MDT)**. Anita uses this terminal to acknowledge that she has received the information and is on her way to the emergency.



That data goes back to the control room. Anita sends an update when she has arrived at the scene, so the dispatcher can see the status code change from 'mobile' to 'on scene'.

Sheet 2.1: Ambulance Service storyboard – Main story



The MDT is linked to the **satellite navigation system** within the vehicle. This automatically plots a route to the scene of the emergency and tells the crew which direction to go in.

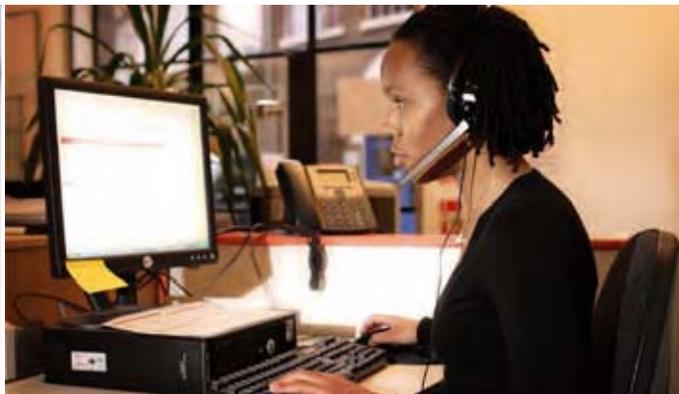


Once they've picked the patient up, Lewis can see exactly which **hospital** they are going to. He can call the hospital to pre-alert them that they're bringing a patient.

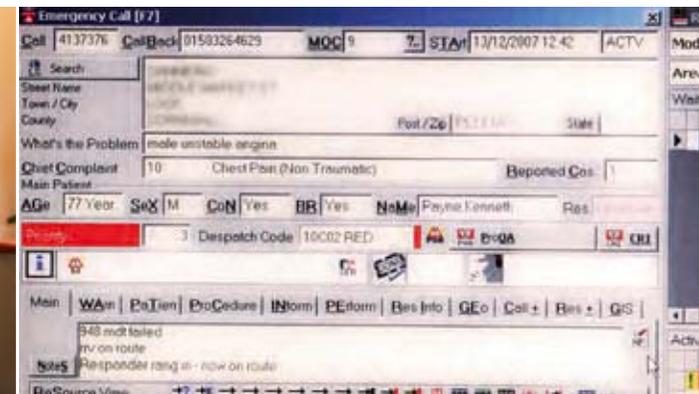
Sheet 2.2: Ambulance Service storyboard – Databases



All 999 emergency phone calls go through to a BT control room before they are passed on to a **Call Taker** at the nearest ambulance control room.



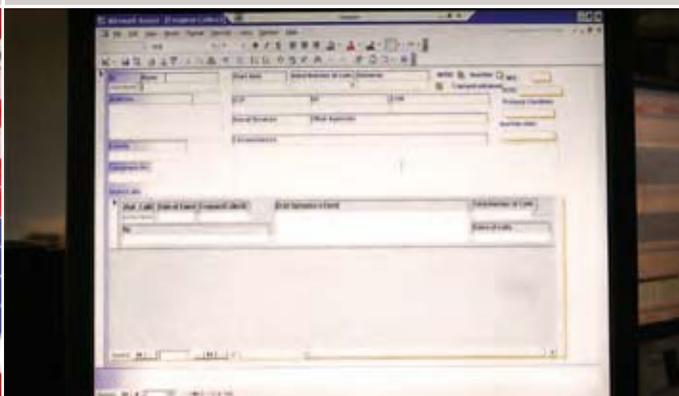
If BT have the caller's information on their database, it will bring up the address and telephone number.



This information will be transferred on to the system used by the **Emergency Medical Dispatcher**.

Call No.	Location	Rs	Act	R	Typ
4137333	Mobile Telephone: Easting 245107 Northing 55	0			U
4137335	TAVISTOCK: METHODIST CHURCH CHAPEL	0			31
4137347		0			U
4137349	TORQUAY: 82 THE REEVES RD	1	718		25
4137350	LODDISWELL KINGSBRIDGE 6 ASHWOOD C	0			
4137294	NEWTON ABBOT. 3 KEYBERRY MILL	0			
4137340	(TBYH) TORBAY HOSPITAL - LOUIS CAREY.	0			
4137243	CONGOONS SHOP LAUNCESTON. 1 MEADO	0			
4137289	TEIGNMOUTH. 7 HEATHER CL	0			

Warnings can be added to the addresses on the database for people who have been frequent callers or abusive to crews.



Having a large database of addresses and places can be helpful if a caller cannot give their exact location. For instance, shop names can be used as search criteria.

Location Search	
Location Search	Hospital Search
Location Free Text	
Location Name	AMBUL
Street Name	EAGLE
X Street 1	
X Street 2	
Town / City	EXETER
PostCode	
County	
State	

By searching the name of a shop in the database, the Call Taker might be able to find the caller's location.

Sheet 2.2: Ambulance Service storyboard – Databases



Decon Team N Devon	Ferrys Bridge Ops
Decon Team Plymouth	Fixed Wing Contacts
Decon Team Taunton	GP Surgeries SOM
Decon Team Torbay	GP Surgeries NE
Decon Team Truro	GP Surgeries SW
Decon Team Yeovil	GP Surgeries CORN
Decon Team IOS	Highway Services
Directors	Hospitals Majax
Doctors Co-operative	Hospitals OTHER

It's important for the Call Taker to get all the caller's details and any other important information, so that the Emergency Medical Dispatchers and **Clinical Supervisors** can do their job properly.

The Clinical Supervisor has four computer terminals. The first computer screen is for the **telephone dialling system**.

Within this database is a comprehensive list of telephone numbers, including hospitals, GPs and other healthcare workers.

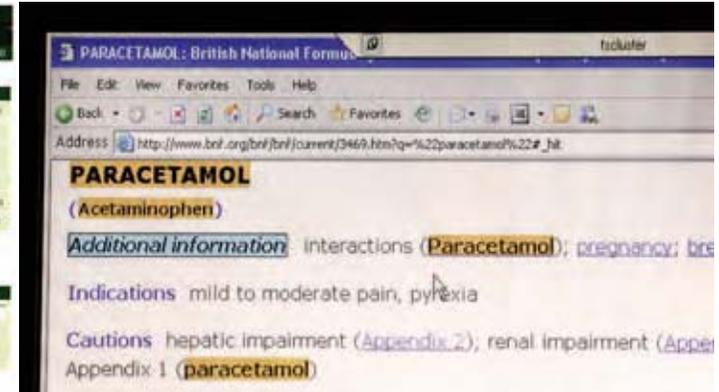


The second computer screen is used for the **nurse assessment tool**. This is a database used by nearly all the 999 ambulance services in England.

The Clinical Supervisor uses the nurse assessment tool to make a more detailed health assessment. She will take further information about the patient's past medical history, who their healthcare workers are and what their needs are that day.

The third computer system gives details of all the data that the **Control Assistants** have taken. The Clinical Supervisor can add additional information to that database also.

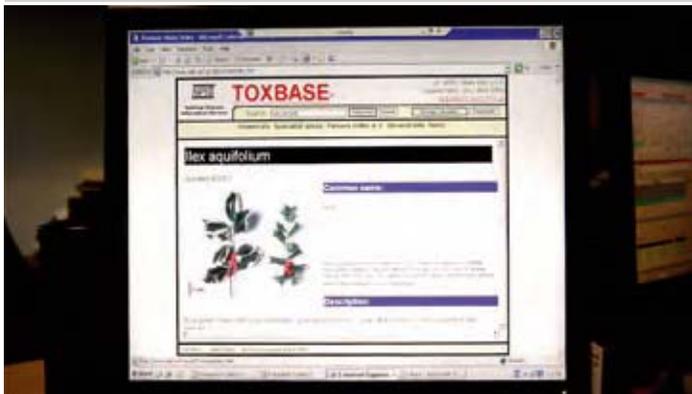
Sheet 2.2: Ambulance Service storyboard – Databases



The fourth computer screen displays the Clinical Supervisor's emails and **internet** access.

The Clinical Supervisor will also have the **internal ambulance intranet** open on the homepage.

In addition she will have the **EBNF**, which is the world drug database...



... **ToxBase**, which is a poisons database.

...and **patient.co.uk**, which can be used to give patients direct access to information about their health needs.

Sheet 2.3: Ambulance Service storyboard – GIS and GPS



GIS is a geographical map data information system, which is stored on a central server.



It can be used by everyone, but emergency control rooms are a prime candidate.



GPS stands for Global Positioning Satellites.



GPS works by referencing a series of satellites using devices on the ground, such as **satellite navigation units**.



The computer within the device does a series of calculations from the number of global positioning satellites it can see and a position is given.



When a person rings 999 the call goes through to an emergency control centre and details of the call are registered.

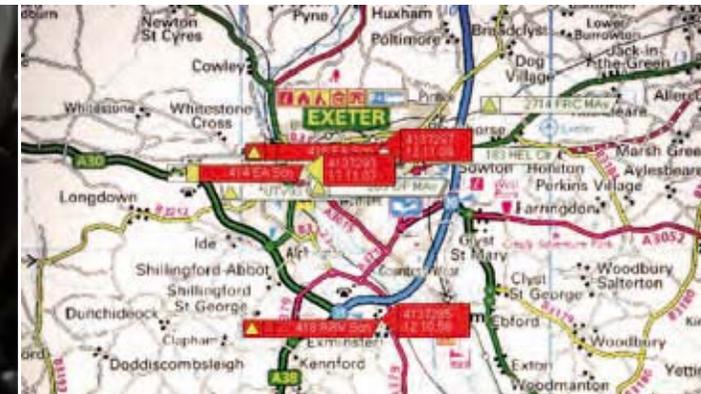
Sheet 2.3: Ambulance Service storyboard – GIS and GPS



A message containing the details of the incident is then sent out to an **ambulance**, where it's received on a small computer.



The computer is connected to the ambulance's satellite navigation system, which automatically begins to plot directions to the incident.



The ambulance crew's computer screen displays a map. The GPS satellite navigation system can plot a route to within 50 yards of any location.



When the address of each call is logged the computer system plots it on the map. This helps the emergency services locate the incident if the caller doesn't know where they are.



The **Call Taker** will also ask the caller if they can see any landmarks or whether they can remember any recent road signs, as these might be traceable on the computer system.



If a landmark is identified the call taker needs to be able to see it on the map so the incident can be plotted in the right place for the ambulance crew.

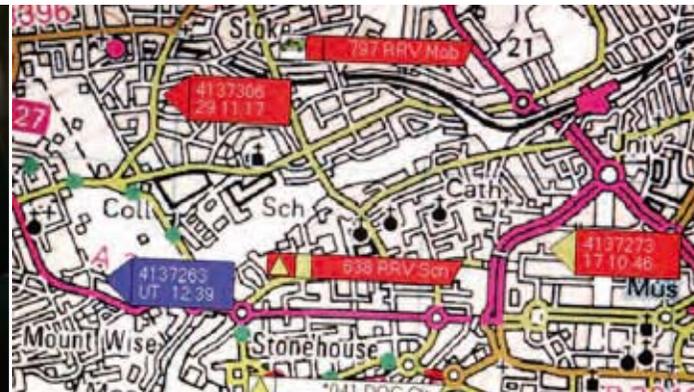
Sheet 2.3: Ambulance Service storyboard – GIS and GPS



Because the computer system ties in with the GPS system in the ambulance, it will direct them to the incident.



All the vehicles are tracked on a GPS system in the control room, which helps the call taker see how far away the crew are when he is on the phone to a caller.



The Call Taker can zoom in to road level and see exactly what street the ambulance crew are on and can help with directions if the crew become lost. The system updates every 10 seconds.



The GPS system will activate when the emergency comes through to the ambulance's **MDT** screen. It will direct the crew by the shortest route.



Occasionally there are problems: for example if the data hasn't been updated recently enough a green field on the map could now be a fully developed housing estate. Sometimes the GPS system is unable to keep up with the high speed of the ambulance racing to an emergency.

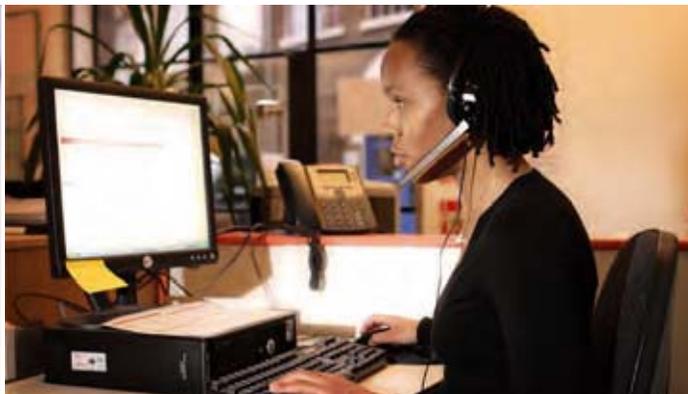


However, the system is very accurate most of the time and the crews rely on it much more than traditional maps.

Sheet 2.4: Ambulance Service storyboard – Telecoms



When a **999 call** is made it is routed through to one of the **BT call centres** spread across the country.



The call centre identify whether the caller needs fire, police or ambulance assistance, confirm the location of the caller by their telephone number and pass the call through to the nearest **999 control centre**.



The **South Western Ambulance Service** has had to address the way it's using **telephony and radio**. Their old **control centre** had separate and inflexible systems, with a phone on every desk and very few people having access to the radio.



In their new control centre they have deliberately established a communication system that allows maximum flexibility for every position.



The new communication system **ICCS (Integrated Communication Control System)** is a touch screen system which allows use of both telephony and radio from each position in the room.



When a call comes in the **Call Taker** hears a bleep in her ear and a red box appears in the centre of the screen to alert her of the call.

Sheet 2.4: Ambulance Service storyboard – Telecoms



All the calls coming in at any one time flash on the right hand side of the screen.



The **telephone system** lists all the telephone and mobile numbers for all the resources that a Call Taker might need.



By touching the screen, the Call Taker can listen to any of the 999 calls coming in.



All the **ambulance crews** carry **mobile phones** in addition to the text database system within the **ambulance**. If the **Clinical Supervisor** needs to speak to a crew her first option is to call the **mobile phone**.



If there is poor reception and the Clinical Supervisor is unable to reach the crew to discuss the patient, then the **Dispatcher** will contact the crew by text or radio. The crew will then make contact as soon as they have a mobile signal again.



Within every ambulance there are three methods of communication with the crew. Each method has a different level of coverage and **resilience**.

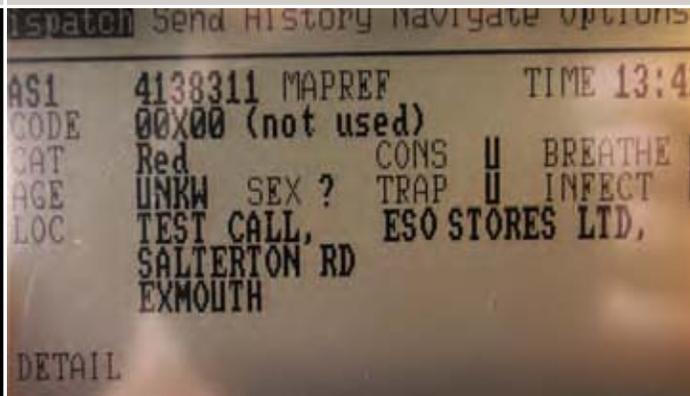
Sheet 2.4: Ambulance Service storyboard – Telecoms



The preferred means of communication is the **mobile data system** which works in a similar way to the **SMS system** on mobile phones. It allows messages to be sent to the ambulance crews very quickly.

The mobile data system is an efficient way of getting information, mostly response related, back and forth to the crews.

Messages are compressed into short data messages and carried over an **analogue radio network**. The South Western Ambulance Services have 29 aerial sites around their geographical area.



Emergency calls taken in the control room are entered on to the **CAD (Computer Aided Dispatch) system**.

A message is then sent, via the **Mobile Data Terminal (MDT)** to a terminal in the response vehicle. This gives the crew details of where they're going, what the nature of the incident is, the times associated with the call and any other information they may need.

The mobile data system is integrated with the **satellite navigation system** in the vehicle.

Sheet 2.4: Ambulance Service storyboard – Telecoms



This allows the mapping co-ordinates of the incident, which are held on the CAD system, to be transferred via the mobile data terminal to the navigation unit which will then automatically begin instructing the ambulance crew on how to reach the location.



The mobile data terminal keeps a log of all the call times and other information relating to each incident. The ambulance crews can input this information by using preset numbers or codes.



The ambulance crews need access to all this information when they are completing the **patient report form**. The mobile data terminal is also regularly used to text messages to and from the control centre



Each code on the MDT relates to a status of the vehicle. There is a code to indicate that the crew are on their way to an incident and another to indicate they've arrived at the incident. Another code is used when the crew are clear at the hospital, telling the control centre that the crew is now available for another job.



The South Western Ambulance Service is currently moving their **analogue communications system** over to a **digital radio system**.



The current system has 29 masts and is working over a radio network using many frequencies. However these **frequencies** are shortly to be withdrawn, so a new system has been set up to address this problem. The analogue coverage also fails across many geographical areas as it is affected by hills and valleys.

Sheet 2.4: Ambulance Service storyboard – Telecoms



The new system will work with different technology. There will be groups of aerials, known as 'clusters', which are much closer together. Each aerial site will use a different frequency and as long as the clusters are kept far enough apart the frequencies won't interfere. This also allows the frequencies to be re-used, so it's much more efficient.



With the new digital radio scheme the network will be provided with over 500 aerial sites, which will greatly improve coverage. This will minimise any possibility of the control room not being able to communicate with its crews.



The new system is a hard wired network consisting of **switches** and **networks**. It works by breaking up voice traffic into chunks of data and adding one **parity bit** to every **data packet**. This ensures that when the data arrives at its destination it will be put together again in the right order and that what was sent was received.



The new system will allow ambulance crews to speak to police colleagues as they will be on the same network. It is also more resilient because there is two of everything. So if one network fails there is another ready to take over.

Sheet 2.5: Ambulance Service storyboard – IT team



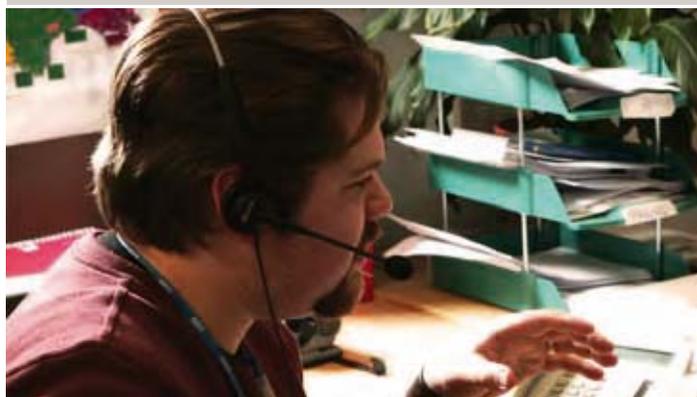
Tom Stacey is the **ICT Customer Service Officer**.



He gets a lot of calls from **Paramedics, Ambulance Technicians** and staff from within the trust headquarters who are having trouble with their machines and with the systems the South Western Ambulance Service provide.



Tom was employed because of his customer service background rather than his technical skills. A lot of his colleagues are technically gifted with a lot of experience and qualifications, but have difficulty dealing with users on a one to one basis because they haven't been users themselves for a long time.



His colleagues find it difficult to return to a user's level and explain in very simple terms what the user needs to do at any one time. Tom's customer service skills allow him to do this. Tom has worked through all the systems that the trust provides and so knows exactly what the users is seeing as he guides them over the phone.



Since Tom started working at the trust his learning curve has been immense, but he is able to learn with the users. Every time he is asked a question which he cannot answer, his colleagues help him and he is able to pass on this education to the users.



To help the users Tom needs to be relaxed and calm so that he can sit back and listen to the caller, talk them through their problem and get them to keep him informed of their progress.

Sheet 2.5: Ambulance Service storyboard – IT team



Because he'll take the caller through a normal pattern he knows what will be on the screen in front of them but he needs to stay calm and patient in order to engage with them.



Tom enjoys dealing with people. His colleagues in the trust know they need IT, so they are always happy to talk to him and learn.



The IT department are committed to the same aim as everyone in the trust – enabling paramedics to do their jobs and therefore help patients.



Richard Beaman works for the ambulance service in the networks department.



His training is following the CISCO route. CISCO is the both vendor and the exam board and the first level is called CCNA.



After a couple of years of experience and studying a person can advance to the intermediate 'Journeyman' level, which is called CCNP.

Sheet 2.5: Ambulance Service storyboard – IT team



After a further five to eight years of experience a person can advance to the top level called the CCIE. This is the equivalent to a consultant doctor in networking terms and they would be expected to be able to handle most, if not all, situations to do with networks.



Jan Parsons is an **IT Project Manager** who has a particular focus within the IT team as a practising paramedic. Her role is to glue together the technical and clinical frontline



Jan designs systems that will improve the way the service performs and the care package that can be delivered.



She has to persuade people that the change is desirable, and after coming up with a design for a piece of equipment she will then need to sell it to them. Jan engages with the teams to get her designs used on the frontline.



Jan finds that if she explains to people why changes are being made and what's happening, the change is more likely to be accepted. Communication skills are absolutely key. It is important to have an idea of where you're trying to get to, to understand each person's position and have some empathy.



The IT team are all very different with very different skill sets. There is a recognition and respect for that.

Sheet 2.5: Ambulance Service storyboard – IT team



Francis Gillen is Head of ICT for South Western Ambulance Service. There is a need for a lot of communication within his team.



Rob White is the Deputy Head of IT and is responsible for the delivery and support of services within the trust.



The IT department's main function is to look after the **Emergency control room**.



But they also look after all the IT services that users within the trust might need – such as email access, internet access and applications specific to particular jobs.



They support any problems and help to educate users who don't understand how things work.



One of the key functions of the IT department is to continually monitor the services that they offer and to anticipate problems before they happen.

Sheet 2.5: Ambulance Service storyboard – IT team



Rob White's role is to ensure that the team are up to speed with everything.



The IT department have a system to log all the user problems. These could be as simple as 'I've forgotten my password', somebody getting a message from Microsoft Word that they don't understand or a user needing to know how to do a mail merge in a product. Other problems include staff needing a new device or PC.



There is a great deal of crossover in the IT team. They don't have designated roles with somebody only dealing with Microsoft Office or somebody only dealing with fixing a PC. Because there is only a small team of six, they all have to help each other and cover for each other's absences.



As well as having technical skills the IT team need to be able to get on with their team members and also be able to talk to users. Good customer care skills are important, so the users feel their problems are being understood and dealt with.



The IT team bounce ideas off each other if they come across something they are not sure of.



As a support service, every day brings a challenge. Any plan for a Monday morning will change with the calls that come in.

Sheet 2.5: Ambulance Service storyboard – IT team



A core skill of the IT team is to know how to prioritise the work that's coming in and understand the impact of what the issue is. Everybody in the IT team knows that any calls from the control room that indicate there is a problem have to be dealt with as a priority.

Sheet 2.6: Ambulance Service storyboard – Resilience and response



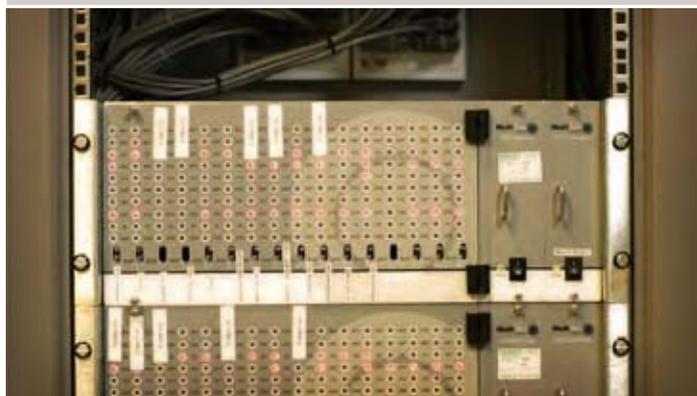
Rob White is the Deputy Head of IT at South Western Ambulance Service. One of the key functions of the IT team is to continually monitor the services they provide and try to anticipate problems before they happen.



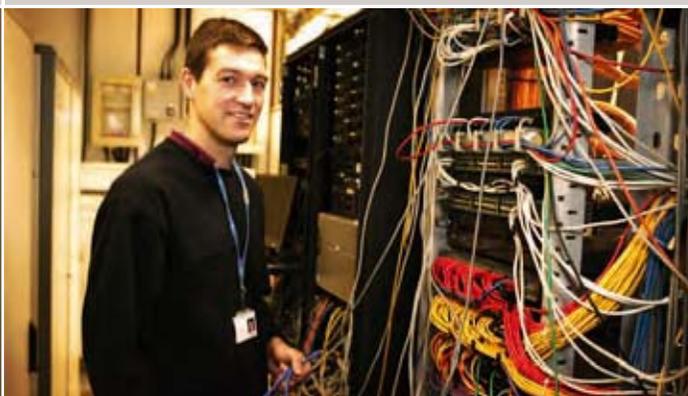
Much of their role is monitoring the systems they've got and ensuring that they aren't going to fail. They have **back-up systems** in place and regimes for backing up all the data.



The IT team rely on multiple resilience systems. For example, if a power supply were to break on one server, they have another power supply ready, so the server won't fail.



They have back up mains supply to the building and battery back-ups.

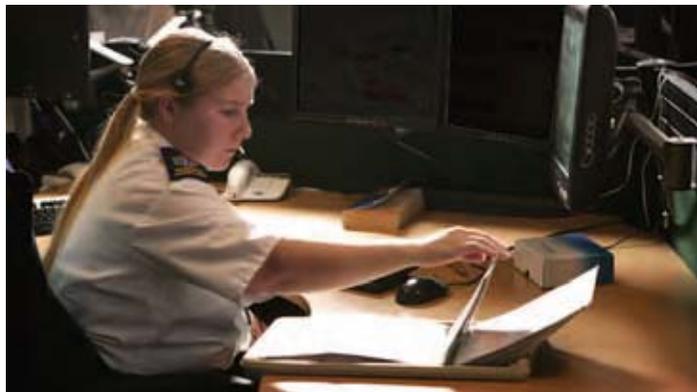


The IT team make sure there are no single points of failure. They rely on telephone and data lines so if, for example, an external contractor has dug up the road, they will have another route in.



The IT team have to give 24 hour cover to the **ambulance control room** because the service is required all the time.

Sheet 2.6: Ambulance Service storyboard – Resilience and response



If there is a serious problem in the control room they can operate a **paper based system**.



If all the phone lines go down in the control room, BT can deliver the calls to mobile phones. Every vehicle has a mobile phone so there are always ways to contact them.



Kirsty, a **Call Taker**, has worked in the control room when the computer system crashed and the computers went blank and they had to revert to writing everything down on cards...



the **AMPDS card deck** uses the same questions as the electronic system, but on a flip chart.



When a computer failure occurs the control room lose all the frontline Control Assistant databases and the **Clinical Supervisor** loses her nursing database.



When this happens she has to resort to paper and her job becomes to act as a runner in the control room.

Sheet 2.6: Ambulance Service storyboard – Resilience and response



The **Control Assistant** takes the patient's record on paper and the Clinical Supervisor runs with the information to the **Dispatcher** to get the ambulances out immediately.



Dealing with life threatening emergencies in that situation means the whole team has to pull together. It's not about what each person's normal position is but doing the best for patient care and getting the ambulances out and escalated immediately.