GREEN TINT TITLE SEQUENCE – SCIENCE BASED – MCU'S TEAM OF PEOPLE	00.00.00	[ACTUALITY WHOOSH/ NOISES]
SUBARU FAST TRACKING SHOT GV'S RALLY CARS IN ACTION OVER MOUNTAINS – INT SHOTS DRIVER'S PERSPECTIVE	10.00.20	MUSIC IN
	10.00.20	This car is a time bomb. X-28 is packed with half a million pounds worth of high technology - and it could blow up at any time.
GV'S RALLY CARS ON STAGES		This is the story of what it takes for a car to survive the greatest motor race on Earth.
	10.00.42	The Monte Carlo Rally.
GV'S RALLY CARS IN ACTION OVER MOUNTAINS – INT SHOTS DRIVER'S PERSPECTIVE	10.00.48	X-28 has a lightweight engine that's strong enough to cross mountains, a gearbox that changes in the twinkling of an eye, and enough sticking power to cling to the road within an inch of destruction.
GV'S RALLY CARS IN ACTION OVER MOUNTAINS – INT SHOTS DRIVER'S PERSPECTIVE **TITLE: DRIVEN TO DESTRUCTION**	10.01.04 10.01.15 10.01.20	But all this technology is set to self-destruct in three days' time - a sacrifice to the goal of breathtaking speed. Win or lose, X-28 will meet its end on the streets of Monte Carlo. MUSIC OUT
GV'S SUBARU ON COUNTRY ROADS	10.01.23	The story begins far from the mayhem of Monte Carlo. Because the true heartland of motor sport lies

		in the leafy English countryside.
CUT TO EXT PRODRIVE TO INT HIGH SHOT OF WORKSHOP	10.01.35`	And this modest façade in Banbury, near Oxford, is the gateway to every boy racer's dream.
CU'S WORKING ON CARS	10.01.41	MUSIC IN
	10.01.45 10.01.47	MUSIC OUT In these workshops, cars designed for comfort and reliability are turned inside out, and re-built for the rigours of rallying MUSIC FADE UP
CONTINUE GV'S/ CU'S OF RALLY CARS UNDER PREPARATION	10.01.54	Of the eighteen leading cars in the Monte Carlo Rally, nine were built within two hundred miles of here, drawing on a hot-bed of technological talent.
INT TRACK AROUND SELECTION OF RALLY CARS – TO FEATURE DAVID LAPWORTH BEHIND THE WHEEL TO CU GOLD ALLOY WHEEL	10.02.05	Every one is based on a mass-market production car, but the similarity is skin deep.
	10.02.13	X-28 is the brainchild of David Lapworth, one of the most successful engineers in the sport.
MCU DAVID LAPWORTH CUT TO GV'S RALLY CARS TO EXT SUBARU LS OVER	10.02.21	DAVID LAPWORTH: "The expertise is here, probably more concentrated here than in any other country in the world. We have a cross section of all the Formula One teams within fifty miles of here, and in rallying we have the Subaru team, the Mitsubishi team, the Hyundai team, all very closely

BONNET		Hyundai team, all very closely congregated."
FEATURE SHOTS / GV'S X28	10.02.39	Major manufacturers come here in search of the science of speed. The technology in X-28 is not built to last, it's built to win.
CUT TO CU LAPWORTH GV'S AROUND WORKSHOPS AND PEOPLE WORKING ON COMPONENTS INTERSPERSED SHOTS OF LAPWORTH IN CU EXT NIGHT SHOT TRUCK IN STREET	10.02.49 10.03.04	DAVID LAPWORTH: There's a huge amount of work to turn the road car into a rally car. They share the same genes, but the process we go through is extremely extensive, we almost re-design the whole car. It's a very specialised business, in its own way comparable with Formula One in technology. The real challenge is the sheer speed. It's hard for the average person to understand the limits that these guys take the car to. So, everything is taken to an extreme in terms of performance, and right on the edge of reliability.
EXT EARLY MORNING – CU SUBARU TEAM FLAG – COMMENCE SEQUENCE OF SHOT AROUND PEOPLE AT THE TEAM BASE	10.03.29	7am, on a freezing January morning. The Monte Carlo Rally begins, high in the French Alps.
	10.03.36	David Lapworth steps into his laboratory.
MS SUBARU X28 CROSSES SCREEN – L- R – INTO TEAM BAY – DRIVER EXITS	10.03.44	For three days and fifteen hundred kilometres, the science of speed will be measured against the clock.

VARIOUS SHOTS AROUND VEHICLE - WHEELS – JACKS & TEAM MEMBERS	10.03.51	This is ultimate test of X-28's technology. It must survive to the finish line, and no further.
CONTINUES VARIOUS SHOTS AROUND VEHICLE - WHEELS – JACKS & TEAM MEMBERS	10.04.00	And the first experiment is with an engine that will literally explode into life.
MS DAVID LAPWORTH – TO TEAM MEMBERS LOOKING UNDER BONNET	10.04.07	DAVID LAPWORTH: The risk of detonation is worse. So you need to be sure that Graham has mapped it so that it's safe at twenty degrees.
	10.04.16	In the quest for speed, much of the engine has been built using aluminium. Light-weight, but also fragile.
TEAM MEMBERS AND LAPWORTH	10.04.23	DAVID LAPWORTH: Every component on the engine ought to be stressed right to its limit. If it's not at its limit it's too heavy, it's a handicap. We have to take it as close to the edge as the driver does.
	10.04.33	Or maybe over the edge.
MS SUBARU REVERSING OUT MCU DRIVER THROUGH WINDSCREEN	10.04.36	Because, this car is practically a jet engine on wheels. It has an *afterburner* that will give it a baptism of fire.
CUT TO EXT NIGHT SCENE RALLY CAR ON SPECIAL STAGE	10.04.45	

CU'S FLAMES COMING OUT OF EXHAUST	10.04.50	
CUT TO INT MS DAVID LAPWORTH TALKING WHILST LOOKING UNDER BONNET CU ENGINE BAY/ TO LAPWORTH/ BACK TO ENGINE BACK TO LAPWORTH	10.04.53 10.05.08	DAVID LAPWORTH: So the engine, whilst it's based on the production cylinder blocks and cylinder heads, is quite a special item. A huge amount of work goes into special internals, special electronics. The sum total is something that starts off as 280 horsepower in the road car and goes to, all I can say is, well over that in the rally version.
CGG INTERNAL COMBUSTION CYLINDER – SHOWS HOW THE ENGINE PERFORMS	10.05.18	A rally engine needs to get as much air as possible into its cylinders – the more air there is, the more fuel it can burn for maximum power.
COMMENCE SEQUENCE BETWEEN EXT SUBARU ON TRACK TO CGG OF HOW TURBO WORKS – REPEATS	10.05.27	High performance road cars do this with a turbo charger.
	10.05.32	Driven by hot gas from the exhaust, a fast-spinning turbine sucks in huge amounts of air at the front of the car, and squeezes it. The air is then cooled to make it even more densely packed, and then force fed into the engine.
	10.05.48	But there's a major drawback. It's called turbo lag.
	10.05.53	The turbine doesn't get up to speed until the engine revs up, because it needs exhaust gas to drive it.

SEQUENCE BETWEEN EXT SUBARU ON TRACK TO CGG OF HOW TURBO WORKS – REPEATS	10.06.02	So every time you put your foot down, there's a time delay before the turbo kicks in - which is fine if you're on your way to work.
CUT TO RALLY CAR ON STAGE TO CGG OF HOW TURBO WORKS	10.06.11	In rallying there's no time to hang around – but the solution wouldn't make you popular with the neighbours.
CGG TURBO – DIAGRAM CUT TO EXT SPECIAL STAGE – INTO FAST ZOOM OUT ON HOTEL – TO SHOW VEHICLE GOING THROUGH STAGE IN TOWN	10.06.18	Rally engines fire fuel directly into the exhaust causing an explosion that rockets back to the turbo charger, *tripling* the engine's air supply. A rally engine goes with a bang.
	10.06.34	X-28 does nought to sixty in three seconds, twice as fast as a road car.
INT CAMERA VIEW FROM CAR ON WINDING COAST ROAD SWEEPS AT SPEED THROUGH BENDS	10.06.39	FINISH? PACE NOTES READ ALOUD
VIS MIX TO INT LABORATORY AND PEOPLE REVIEWING SCREENS [CU COMPONENTS AND SCREENS]	10.06.44	But the engine's constantly on a knife edge. Its lightweight components are designed to last just a few thousand kilometres – and if they're pushed too hard, the whole thing could blow.
	10.06.58	During testing, each engine is run in at maximum revs, to make sure it can survive a rally.

CU COMPONENTS AND SCREENS/ CLIPBOARDS	10.07.09	Some never make it past the factory.
EXT MAN IN RED LOOKING UNDER BONNET	10.07.23	At the Monte Carlo, two cars have already blown their engines, and are heading back to the drawing board.
INT WORKSHOP – ENGINE COMPONENTS	10.07.32	If X-28's engine survives, it has a theoretical advantage over the other cars.
	10.07.38	It's the only car in the race with its four engine cylinders laid flat rather than upright.
TO CGI SHOWING DRIVE TRAIN OF 4WD	10.07.44	This gives it a lower centre of gravity, perfect for high speed cornering.
	10.07.49	And the drive from the engine comes straight down the middle of the car like a propeller, making it easy to take the power to all four wheels.
CUT TO CU'S MAKINEN BEHIND WHEEL OF SUBARU AT SPEED AND TALKING IN THE TEAM ENCLOSURE	10.07.57	But only competition can put the theory into practice.
CUT TO SUBARU AT SPEED ON SPECIAL STAGE	10.08.01	X-28 is in the capable hands of Finland's Tommi Makinen, arguably the greatest rally driver of all time.
CU KAI LINDSTROM IN COMPETITION AND TALKING	10.08.09	Co-driver Kaj Lindstrom has detailed notes on every twist in the road. And at this speed, they come thick and fast.
MCU TEAM CONTROLLERS AT HIGH TECH NOTEBOOK	10.08.20	Lapworth and his engineers keep the car under the microscope.

COMPUTERS AND TIMING GEAR MCU LAPWORTH		
VARIOUS CUTS BETWEEN TEAM AND HIGH ACTION SHOTS OF SUBARU 'YUMPING' / SPECIAL STAGES MS SUBARU X28 PULLS INTO ITS PIT ENCLOSURE	10.08.24	DAVID LAPWORTH: We're sort of balancing the risks. The drivers do it all the time, deciding where to push and how hard to push, they're always taking the chance that they'll make a mistake and go off the road. We're doing the same kind of things, should we take maximum risk and go for the win, or do we want to do something more conservative, it's managing all those things.
CUT TO MCU ENGINEER REMOVING FRONT WHEEL	10.08.44	The riskiest decision revolves around tyres.
CU'S OF TEAM WORKING AROUND THE CAR	10.08.49	If Lapworth doesn't get it right, all the technology in X-28 will be for nothing.
MS TYRES BEING TROLLEYED CONTINUES SEQUENCE CENTRED ON TYRE PREPARATION ETC. TO MCU LAPWORTH – PANS DOWN TO TYRE	10.08.55	DAVID LAPWORTH: Tyres are the most under-rated part of the equation, with the layman and even in motor sport. No matter how much we spend on sophisticated control systems on the car, on special suspension and transmission and so on, the grip that's generated is through the tyre on the road. The performance of the tyre is absolutely critical to the performance of the car. So much so that if you take *this* tyre and swap it with the tyre off the road car, then you'll find that if anything the road car is slightly faster. So it makes or breaks the rally, you can

		win or lose according to whether you make the right tyre choice."
CUT TO GV OF VARIOUS TYRES	10.09.30	Don't experiment with these tyres on your own car. *Racing slicks* are incredibly smooth. There are hardly any grooves, so that as much rubber as possible can grip the tarmac.
MCU LOW MOUNTED CAMERA TO EXTERIOR OF VEHICLE CU OF FRONT TYRE	10.09.49	But slicks only work if it's dry.
CUT TO TYRES OUT TO RP TUTHILL SLOW ZOOM IN TO TYRES – HIS FINGERS DEMONSTRATE THE VARIOUS TYRES OF TYRES	10.09.52	RICHARD TUTHILL: In front of me here we have three choices. This tyre would be taken in pure dry conditions. It has an imprint in it but <u>this is purely for regulation, you're not allowed to run a pure slick any more.</u> This is what they call a slick these days.
CONTINUES IN CU – FOLLOWING TREAD PATTERNS	10.10.05	RICHARD TUTHILL: The tyre next to it you see has many more grooves in it, this is to help distribute the water out of the sides. This is called an intermediate, but this also has an extra cut in the middle, between here, this helps get rid of the water.
CUTS FROM DEMONSTRATION TO SHOW RALLY CAR ON SNOW COVERED STAGE AND BACK TO TUTHILL	10.10.18	RICHARD TUTHILL: Now this tyre here's purely for snow. You can see here it has some metal studs in it which dig into the ice beneath the snow. Sometimes for example the car will do a 20km stage: 18km of it will be dry tarmac but 2km will be snow. In this instance you'll take the slick

		because on the 18km you're going to gain far more than you're going to lose over that 2km.
CU TEAM MEMBER ON CELL PHONE	10.10.43	TEAM MEMBER The air temperature now at the moment is plus eight.
	10.10.45	It's a guessing game. There's a chance of ice, but all the teams are going for the slickest rubber they can get away with.
VARIOUS CU'S TYRES AND TYRE HEATERS	10.10.57	The tyres are stored in electric warmers beforehand. When rubber heats up, it gets softer and tackier, providing extra grip.
MCU TUTHILL EXT CU TYRE FROM CAR MOUNTED CAMERA	10.11.07	RICHARD TUTHILL: When you have new set of tyres on, for the first kilometre you have to be very very careful, the tyre isn't up to operating temperature and so therefore you have to allow for this in your driving. As the tyre warms up then you start to feel you have full grip, you have no problems then and you can go as fast as you wish.
CU PIRELLI & SUBARU TEAM MEMBERS	10.11.26	These tyres need to last just fifty kilometres, not fifty thousand. Getting the hardness of the rubber right is critical.
CU TYRE FITTING TO MCU LAPWORTH	10.11.40	DAVID LAPWORTH: The trick is to try and choose the softest compound that will last the distance. If you misjudge that, then towards the end of the stage you lose a lot of time as the tyres wear

		down to the canvas, and if you choose too hard a tyre then you just lose grip all the way through both stages.
MS TEAM MEMBERS INFLATING TYRES SUBARU GOING SIDEWAYS ON HAIRPIN ON SPECIAL STAGE CUT TO	10.11.56	Lapworth gambles on harder rubber than the other teams. X-28 should lose time at first, then win it back with interest if the tyres last longer.
MCU DAVID LAPWORTH TO HOVERING HELICOPTER	10.12.07	DAVID LAPWORTH: We think, at the moment, we've got it about right, we've got a medium soft compound which we think will last the whole distance, so hopefully we'll gain a few seconds.
TELE SHOTS SPECTATORS	10.12.22	By late afternoon, things are looking up.
MCU'S TEAM MEMBERS	10.12.25	CONTROL: Tommi minus eight, Gronholm minus one. Harri plus one.
	10.12.29	DAVID LAPWORTH: Tommi's fastest so far… Tommi must be leading by two or three seconds.
	10.12.35	But now the ice comes into play.
SEQUENCE OF SHOTS OF TEAM MEMBERS CONTINUE	10.12.39	DAVID LAPWORTH: Tommi's gone from plus two to minus three. Tommi's probably had a half spin or something. On the ice.
MS	10.12.49	Bad luck, but fortunately there's no

		damage to the car.
TO MS DAVID LAPWORTH IN INTERVIEW	10.12.54	DAVID LAPWORTH: Well it nearly went according to plan. Tommi was going very well on the asphalt section, and then unfortunately had a bit of a spin on, on the ice. So altogether we reckon we lost about 24 or 25 seconds in there.
BCU'S TYRES SPINNING/ MCU TEAM MEMBERS	10.13.11	The long lasting tyres have survived - just - gaining back time on the dry sections. After 100 kilometres, X-28 is still only five seconds off the pace.
	10.13.24	MUSIC IN
BCU DISCS	10.13.27	This is the last service before dark, and the tyres are not the only parts that need to be changed.
MS TEAM MEMBERS FITTING PARTS	10.13.33	The brakes are already wearing out.
	10.13.39	They work like a bicycle's. Inside the calliper, pistons push heavy-duty pads on to the brake disc, and friction slows the wheel.
MS VIDEO MONITOR – TO MS MAN LEANING OVER TOOL SETS	10.13.48	But a rally car has to brake from a hundred and fifty kilometres an hour every few seconds. To handle the friction, brake discs have to be massive.
CU'S BRAKE DISCS INTO NIGHT STAGES	10.13.59	DAVID LAPWORTH The brakes are much bigger than you'd find in a road car, because of the abuse that they get from the

TO MS / MCU'S TEAM WORKING ON BRAKE DISCS		drivers, and the nature of the roads. The extreme condition is on asphalt, where there's lots of grip and therefore the drivers brake very late and very hard. So for rallies like Monte Carlo, the asphalt rallies, the front disks are something like 370mm in diameter, that's probably bigger than the wheels on most road cars.
TO NIGHT STAGE CUT TO CU RED HOT GLOWING BRAKE DISC	10.14.22	Braking shifts the weight of the car on to the front wheels. The massive friction cooks the discs at over six hundred degrees.
CUT TO TEAM AT FRONT OF VEHICLE	10.14.33	The new discs are a vital precaution.
PAN RIGHT TO LEFT MS THROUGH WINDSCREEN TEAM IN CAR TO MS CAR LEAVING FROM SCREEN LEFT	10.14.39	In total darkness, X-28 will cover thirty kilometres just half a minute more slowly than in daylight.
VARIOUS SHOTS OF TEAM PREPARING TO MOVE OUT	10.14.51	Day One ends with no further mishap, and the mechanics up sticks for Monte Carlo. The bill so far: three full sets of tyres, one new set of brakes, plus labour. But at least there's no overtime.
CUT TO NIGHT SCENE BOATS IN SUN SET & LS MONTE CARLO IN SUNSET AT NIGHT FADE TO BLACK	10.15.05	MECHANIC: Cheerio!

EXT DAY TEA MEMBERS MS FISHING	10.15.17	Day Two. Of eighteen leading contenders, only fourteen are still in the rally.
	10.15.23	And the pressure is reaching its peak.
CUT TO HS FEATURING STEEP MOUNTAIN ROADS AND SPECTATORS PRECARIOUSLY PERCHED ON ROCKS CUTS TO INT MOUNTED CAMERA FOLLOWING ROAD VISION MIX MOUNTAIN SIDE AND ROAD	10.15.28	On today's mountain stages, the cars must cling to icy twisting hairpins, at an incredible average of ninety kilometres per hour.
HS RALLY CARS ON STAGE	10.15.37	The smallest mistake will launch the car into the abyss - enough to sort the sharks from the small fry.
HS FOLLOWS X28 UP STAGE ON MOUNTAIN	10.15.49	At this speed, no ordinary car could stay on the road. But X-28 has a computerised traction system that in theory should keep every wheel pinned to the tarmac.
MIX OF HS' & LS' OF X28 SHOWING DYNAMICS OF CAR IN ACTION	10.16.01	If the theory's correct, then X-28 will gain vital seconds.
VIS MIX TO HS CAR HANGING OVER EDGE OF MOUNTAIN AFTER ACCIDENT	10.16.07	If it's wrong, the car could end up taking the low road back to Monte Carlo.
CUT TO SUBARU X27 REVERSING OUT OF	10.16.19	The secrets of advanced traction technology can be discovered back

GARAGE		in the UK.
CAR DRIVES OFF CUT TO X27 ON TEST TRACK	10.16.25	Because it's also contained in the car for Tommi Makinen's next race, the Rally of Sweden, which starts in just two weeks' time.
SEQUENCE SHOWING TESTING OF TRACTION CONTROL	10.16.33	Test drivers are already making fine adjustments to the car's traction control.
SEQUENCE SUBARU LS ON TRACK TO LS ON STAGE TO REPEAT SHOT IN SLO-MO CU REMOVING DIFFERENTIAL TO CGG	10.16.41 10.16.46 10.16.54	A car loses traction if any of the wheels start to slip and spin too fast. But the rally car maintains traction on even the tightest turns, because a computer is controlling each wheel individually. This is only possible thanks to the differentials, which allow the wheels to rotate at different speeds
CGG DIAGRAM SHOWING HOW TRACTION CONTROL WORKS	10.17.02	When a car is moving in a straight line, left and right wheels rotate at the same rate.
CGG CONTINUES	10.17.07	But when the car turns left, the differential allows the right wheel to spin faster, to travel the greater distance around the outside of the curve. The left wheel spins more slowly.
CGG CONTINUES	10.17.22	But there can be problems. If the rotation rates are locked together too much, the car will be difficult to turn – this is called understeering.

CGG CONTINUES CUT TO SUBARU ON TEST	10.17.32	Or if the differential allows the wheels to spin too freely, the car'll tend to oversteer.
	10.17.39	Unlike a road car, the rally car actively controls the differentials and hence the speed of each wheel.
SUBARU STILL ON TEST CUT TO INT MLS DAVID LAPWORTH SITTING ON TYRE WITH TRANSMISSION PARTS LAID, IN SEMBLANCE OF HOW THEY WOULD APPEAR INSITU ON THE VEHICLE OUT IN FRONT OF HIM	17.46	DAVID LAPWORTH When it comes to competition use, where we've got generally a lot more power than we need, and where there's potential for lots of wheel spin, then as well as being able to allow those wheels to go at different speeds when we're driving sensibly, we need to be able to control those wheel speeds, to divert the power to the wheels that have got the most grip when the car's being driven on the limit. So there's a slightly different role between the competition car and the road car.
MS RP PERSON HANGING UP WIRES/ SENSORS	10.18.11	The car's complex electronics contain sensors which can detect if a wheel is spinning too fast and losing traction.
CUT TO CGG DIAGRAM TO INDICATE SENSOR USE	10.18.21	A computer linked to the differentials then diverts engine power to the wheels with enough grip to use it.
EXT SUBARU DEMONSTRATING ROAD HOLDING	10.18.30	The end result is that the driver keeps his foot down. With good traction, all the engine power goes into driving the car forwards.
	10.18.39	DAVID LAPWORTH That set-up of the differentials is key

RETURN TO **INT MLS DAVID LAPWORTH SITTING ON TYRE WITH TRANSMISSION PARTS LAID, IN SEMBLANCE OF HOW THEY WOULD APPEAR INSITU ON THE VEHICLE OUT IN FRONT OF HIM**		to getting the car to feel the way the driver wants. The way we distribute the torque around the four wheels changes the balance of the car, and the forces that are fed into the suspension and into the steering give the driver a lot of input as to where the grip is and how close he is to the limit
EXT MS MAKINEN GETTING INTO CAR – IN TEAM 'GARAGE' – CAR REVERSES OUT OF PARKING	10.18.58 10.18.59	**MUSIC IN** You're about to see X-28 being driven right on that limit, with Tommi Makinen relying on the car to control the traction of each wheel.
EXT LS OF PART OF STAGE WITH WATER ON THE CURVE CUTS TO SPECTATORS	10.19.10	On this corner there's a tiny damp patch, but Makinen will take the car right to the edge.
MS TUTHILL WATCHING MAKINEN THROUGH	10.19.26	RICHARD TUTHILL: Very smooth, the car just moving such a small bit there, just on the damp patch on the inside of the corner. Outstanding.
CUT TO INT MOUNTED CAR CAMERAS	10.19.36 10.19.44	Technology like this gains only a few seconds – but it's enough to win a rally. MUSIC OUT
SEQUENCE AMONGST TEAM MEMBERS	10.19.46	In testing, David Lapworth often takes the co-driver's seat himself, to see the fruits of his labour.
	10.19.53	DAVID LAPWORTH On a wide open road, it's quite easy to look at the way a driver's driving, and see the lines that they take, when they get on the throttle, and

TO INT CAR CAM		get a real feeling for each driver's technique. But on the twisty, bumpy section of road that we were going down with Tommi there was a point where things were happening so fast that all I could do was sit there in awe and admire the speed that he was able to carry through the twisty section.
TEAM MEMBERS	10.20.17	Man and machine are working in perfect harmony X-28 will enter the final day with a lead of a minute and a half.
EXT TEAM GARAGE MCU DAVID LAPWORTH – INTERSPERSED BETWEEN HIM AND TEAM WORKING ON CAR	10.20.26	DAVID LAPWORTH So far so good, no, it's gone very well. There's been a lot of hard work. We took a big step forward about twelve months ago we introduced a lot of new technology. Then we had six months of real hard work, to try and refine it, to get on top of all the technical problems. I think we've done that now and we're starting to see the rewards.
CONTINUE VARIOUS MCU'S OF X28	10.20.46	The true rewards will only come if the car reaches the finish line and wins.
CUT FROM CAR TO MEN WORKING UNDER SPOT LIGHTS PREPARING TEAM GARAGE	10.20.55	But X-28 is about to enter the last day of its working life, and there's one last vital component which could fail at any moment.

CUT TO TILT DOWN EXT CASINO NIGHT LIT – MLS FOUNTAINS	10.21.05	Within sight of Monte Carlo's famous Casino, David Lapworth faces a gamble with the most valuable technology in the car.
FADE DOWN NIGHTSCAPE	10.21.11 10.21.19	MUSIC IN MUSIC OUT
– CUT TO CU FROTHING MILK FOR COFFEE RAPID SEQUENCE OF SHOTS AROUND MONTE CARLO	10.21.19 10.21.27	MUSIC IN DAVID LAPWORTH The last day in particular is a real nail-baiting feeling. From the moment you make up in the morning you can't relax because there are decisions to be made. And also there are so many things that can go wrong. You have to be absolutely on the case.
PAN INTO SUBARU GARAGE	10.21.44	X-28 is reaching the built-in lifetime of its technology, and Lapworth takes out insurance.
	10.21.49	MUSIC OUT
CUT SEQUENCE ENGINEERS REPLACING GEARBOX	10.21.52	The single most expensive component of the car will be replaced now.
CONTINUE IN MCU WORKING ON GEARBOX FIT	10.21.58	The gearbox. Like engines, gearboxes must weigh as little as possible – they're designed to last for the duration of the rally, and no more.

CONTINUE SEQUENCE ENGINEERS AND SUPPORT CREW WORKING AROUND THE CAR	10.22.07 10.22.17	Changing it early is an expensive precaution. Rally car gearboxes cost sixty times as much as road car models – because they have to change gear ten times faster. MUSIC IN
CUT TO CARS ON STAGES	10.22.20	A rally driver hardly ever goes flat out in top gear on a straight road.
CUT TO SUBARU	10.22.25	Instead he's constantly dropping in and out of lower gears to make sharp turns. He needs to get the gear he wants, at the instant he demands it.
CUT TO SHOT OF SUBARUS PARKED UP TOGETHER TO INT CAR SHOWING GEAR STICK AND PEDALS TO INT MAKINEN IN COMPETITION	10.22.34	In a road car, it takes half a second for even a top driver to change gear, using the stickshift and clutch pedal. For Tommi Makinen, half a second is a lifetime.
CONTINUES WITH MORE CAR CAM SHOTS TO INT AND THROUGH WINDSCREEN TO EXT SUBARU IN FULL COMPETITION	10.22.46	He needs to change gear so fast you can hardly see it.
CUT TO CU GEAR CHANGE PADDLE ON STEERING COLUMN – TEST EQUIPMENT AND TESTER	10.22.58	The gearboxes that make it possible are developed at the team factory in the UK.

PANS LEFT TO GEARBOX MOUNTED ON TEST BED	10.23.04	And the secret is hydraulic control.
	10.23.08	**MUSIC OUT**
TO INT MLS DAVID LAPWORTH SITTING ON TYRE WITH TRANSMISSION PARTS LAID, IN SEMBLANCE OF HOW THEY WOULD APPEAR IN SITU ON THE VEHICLE OUT IN FRONT OF HIM BCU'S GEARS AND COMPONENTS OF GEARBOX	10.23.08	DAVID LAPWORTH This is the gearbox which bolts on behind the engine, and the power comes in from the front there. Inside the gearbox there are six ratios, six speeds which are fully automated as far as the driver is concerned.
BCU'S SHOW GEARS & COLLARS OPERATING	10.23.22	The gears themselves are set up something like the gears on a bicycle. The collars in between act like the bicycle chain, locking into each gear in turn.
BCU'S SHOW GEARS & COLLARS OPERATING	10.23.34	In a conventional gearbox, the driver has to physically shift these collars using the stickshift, but it takes time.
CUT TO GEAR BOX ON TEST BED	10.23.44	In the rally car's gearbox, all the work is done for him , at lightning speed.
	10.23.52	The gears are shifted hydraulically, by internal oil pressure.
TO INT MLS DAVID LAPWORTH SITTING ON TYRE WITH TRANSMISSION PARTS LAID, IN SEMBLANCE	10.23.57	DAVID LAPWORTH All the driver does is flick a small paddle on the steering wheel, and the hydraulics of the gearbox change gear in about thirty, forty

OF HOW THEY WOULD APPEAR INSITU ON THE VEHICLE OUT IN FRONT OF HIM		milliseconds which believe me is fast.
CUT TO CU GEARBOX PART / ALTERNATES BETWEEN ENGINEER AND PART	10.24.08	Inside a sealed unit in the gearbox, oil pressure moves a small pin that does the job of the stickshift.
ASTON PAUL ROBERTS TRANSMISSION ENGINEER CU GEARBOX PART / ALTERNATES BETWEEN ENGINEER AND PART	10.24.16 10.24.33	PAUL ROBERTS Imagine you were in say first gear for example, that would be in that position there. And if you want to go into second gear it just moves it back like that, hydraulically. And then if you want to go into third gear, then it goes into neutral, and then this needs to move and then into your third gear like that. What happens is you can imagine this is moving very quickly backwards and forwards with the hydraulic pressure, and its milliseconds for this to move
CUT TO TESTS ON VEHICLE	10.24.44	At the test track, preparations for the next rally are almost over.
	10.24.50	This team were the first to introduce the so-called fly-by-wire gearbox, but the battle for technological supremacy never ends.
CU COMPUTER SCREEN MONITORING TESTS	10.24.59	An engineer tunes each vital component electronically - shaving every possible millisecond.
CU WHEEL SPINNING	10.25.06	But the ultimate test is on the road.
TEAM MEMBERS WORK AROUND THE CAR	10.25.10	In Monte Carlo, the new gearbox is already in position.

	10.25.15	The engineer takes it through the same final tests.
CONTINUE SHOTS AROUND VEHICLE TO MS SMILING SPECTATORS	10.25.29	It passes. The entire gearbox has been replaced in just twelve minutes – and it could be a life-saving transplant.
CUT TO MS MAKINEN THROUGH GLASS THEN TO EXT SHOTS OF SUBARU SPEEDING THROUGH SPECIAL STAGE	10.25.41	If X-28 survives just one hundred kilometres more, victory is assured.
CUT TO IN CAR CAM LOOKING OVER CREWS SHOULDERS – VISUALLY DEMONSTRATES SPEED	10.25.48	A car designed for this single purpose enters the last few seconds of its life.
CUTS TO TEAM GATHERED AROUND TIMING GEAR – CUT TO SUBARU BURSTING INTO PICTURE FROM SCREEN LEFT LS OF MOUNTAINS MCU LAPWORTH AND TEAM	10.25.56	Its turbo-charged engine has almost survived three days of twisting mountain hairpins, at an average speed of ninety kilometres an hour.
MLS OF SUBARU ON STAGE	10.26.05	It has worn through ten full sets of racing tyres, and a brand new gearbox. Now all it has to do is reach the finish line.
	10.26.13	MUSIC IN
REPEAT SEQUENCE / TEAM AND SHOTS OF / THROUGH AND IN CAR CAM OUT / AND	10.26.19	DAVID LAPWORTH He's losing time, he's losing a lot of time!

IN		
		[PHONE RINGS]
	10.26.32	DAVID LAPWORTH Oh, it's me! It's me
	10.26.54 10.26.55	MUSIC OUT [BY MIX] MUSIC IN
SUPPORT TEAM CELEBRATE IN CAR CAM MAKINEN AND LINDSTROM CELEBRATE CAR DRAWS UP – TO WINNERS ENCLOSURE CELEBRATIONS	10.26.58	X-28 has won the Monte Carlo Rally.
	10.27.06	Its mission accomplished, the car will be returned to the factory in the UK, to be broken down for parts.
SEQUENCE OF SHOTS AROUND CAR – CLAPPING AND CHEERING	10.27.14	But now a new story begins. Two weeks from now, Tommi Makinen has a rendezvous in Sweden, and one more car is destined to be driven to destruction.
RUN END CREDITS	10.27.26	
With thanks to International Sportsworld Communications Ltd Prodive Subaru World Rally Team Mira Ltd. Lighting Cameraman		

Geoff Perry Sound Recordist Simon Jones Online Editor Alex Archer Graphic Design Mark Peters Production Manager Selina Kay Series Editor Ron Blythe Executive Producer Ed Barman Editor John Moratiel Associate Producer Ravi Kapur Produced and Directed by Kenny Scott		
LOGO Clark Pictures Infonation Graphic	27.53	MUSIC OUT
TO BLACK	10.28.11	